INSTITUTE OF AGRICULTURAL RESEARCH STATISTICS

NATIONAL INDEX

OF

AGRICULTURAL

FIELD

EXPERIMENTS

VOL. 11 PART 2

PUNJAB, HIMACHAL PRADESH AND JAMMU & KASHMIR

1954–59

PUBLISHED BY
INDIAN COUNCIL OF AGRICULTURAL RESEARCH
NEW DELHI

FOREWORD

Increase in agricultural production is one of the main objectives of our agricultural planning. It is only by the exploitation of scientific methods of agriculture that we can hope to increase our agricultural production to the level needed for maintaining a reasonable standard of living to the country's population. The technical worth of improvement measures is best judged from carefully conducted field experiments. While it is true that a large number of agricultural field experiments are conducted in the country, the results of these experiments have not been brought together in an integrated manner for the use of research workers. The absence of such a unified account has often led to duplication of work and delay in the utilisation of results for practical farming. The Institute of Agricultural Research Statistics has rendered a very valuable service by preparing a compendium of agricultural field experiments conducted in the country. The first series of compendium containing the results of all agricultural field experiments during the period 1948-53 have already been published by the Institute.

The present compendium is the second in the series covering the period 1954-59. As in the earlier compendium, the present series also contains critical summaries of results of experiments bearing on important agronomic factors, such as the response of crops to fertilizers and manures, inter-relationship of fertilizers, varieties and cultivation practices and other information of value for giving sound advice to farmers in different regions. Judging from the demand for the first series of the compendium, I am sure that the present series will also prove equally useful.

A Standing Committee consisting of the Agricultural Commissioner with the Government of India, the Director, Indian Agricultural Research Institute, and the Statistical Adviser, Indian Council of Agricultural Research, has been set up to provide general guidance to the work under this scheme. I congratulate the members of this Committee and, in particular, the Statistical Adviser and his associates at the Institute of Agricultural Research Statistics for bringing out this compendium. The preparation of this compendium has been made possible only by the wholehearted co-operation of the States and other organisations in making available the results of their experimental researches for this purpose. My thanks are due to the officers of the State Departments of Agriculture and other institutions for participating in this work. I hope that the present series will be followed by periodical publications of similar compendia for later years, in order that the availability, in a consolidated form, of results of scientific experiments in agriculture in India may be maintained up-to-date.

A. D. PANDIT
Vice-President,
Indian Council of Agricultural Research.

NEW DELHI,
March 26, 1965.

PREFACE

The present set of volumes form Part II in the series of compendia of Agricultural Field Experiments being published by the Indian Council of Agricultural Research under the project for National Index of Field Experiments and contains a unified record of experiments conducted at agricultural research stations and institutes all over the country. Volumes in Part I in this series were published in 1962 and contained results of some 7,500 experiments conducted during the period 1948-53. The present set of volumes includes results of experiments conducted during the next period that is 1954-59. After the period, covered by Part I of the series, agricultural research and experimentation has expanded so much that for the period 1954-59, to which the present volumes refer, results of more than 15,000 experiments are available.

The present compendium is prepared on the same pattern as the previous one and is divided into 15 volumes one each for (1) Andhra Pradesh, (2) Assam, Manipur and Tripura, (3) Bihar, (4) Gujarat, (5) Kerala, (6) Madhya Pradesh, (7) Madras, (8) Maharashtra, (9) Mysore, (10) Orissa, (11) Punjab, Jammu and Kashmir and Himachal Pradesh, (12) Rajasthan, (13) Uttar Pradesh (14) West Bengal and (15) All Central Institutes. In each volume, background information of the respective state regarding its division into different soils and agro-climatic regions, rainfall and cropping pattern followed in each region and agricultural production and area under different crops in the State is given. The experiments reported in each volume have been arranged crop-wise for each State. All the experiments belonging to a particular crop at various research stations are Grouped together. For a particular crop, experiments are arranged according to the following classification :

Manurial (M), Cultural (C), Irrigational (I), Diseases, pests and chemicals other than fertilizers (D), Rotational (R), Mixed cropping (X) and combinations of these wherever they occur (*e.g.* CM as Cultural-cum-Manurial). Experiments in which crop varieties also form a factor are denoted by adding V to their symbol and are grouped together (*e.g.* MV as Manurial-cum-Varietal).

This publication owes its origin to the guidance and help of Dr. D.J. Finney, F.R.S., Professor of Statistics, Aberdeen University, Scotland, in formulating the project during his stay at the Institute of Agricultural Research Statistics as an F.A.O. expert in 1952-53.

At the Institute of Agricultural Research Statistics the work under the scheme was carried out under the supervision of Shri. T.P. Abraham, Assistant Statistical Adviser. The actual working of the scheme was conducted by Shri G.A. Kulkarni, Statistician till he left the Institute in July, 1964. The work was subsequently taken over by Shri O.P. Kathuria, Assistant Statistician. Messrs. L.B.S. Somayazulu, P.P. Rao, M.L. Sahni, Harbhajan Singh, A.L. Punhani, M.K. Joshi, N.K. Worrier, H.C. Jain and J.K. Kapoor of the statistical staff of the Institute deserve special mention for careful and painstaking work in editing and scrutiny of the manuscript as well as proofs of the compendium.

The burden of collecting the data from the various research stations and the analysis of a large number of experiments once again fell on the regional staff of the Council placed in different States. They deserve to be congratulated for the hard work they have put in.

Thanks are due to the State Departments of Agriculture, the Central Institutes and the Commodity Committees who made the data of the experiments conducted under their jurisdiction readily available to the staff of the Institute. The present publication has become possible only through their unstinted co-operation. The Institute is also thankful to the various

officers in the States who worked as Regional Supervisors for the project from time to time and took keen interest in the working of the Scheme. The list of the names of the regional supervisors and the regional staff of the project is given on the following page.

V.G. PANSE
Statistical Adviser,
Institute of Agricultural Research Statistics (I.C.A.R.).

NEW DELHI,
March 25, 1965.

REGIONAL SUPERVISORS AND REGIONAL STAFF FOR THE NATIONAL INDEX OF FIELD EXPERIMENTS

Region and Headquarter	*Statistical staff from the Institute of Agricultural Research Statistics.*	*Regional Supervisors*
1. Andhra Pradesh (Hyderabad)	S.K. Jilani P.R. Yeri	Dr. Mohd. Quadiruddin khan, Joint Director of Agricultural. Late Dr. Syed Waheeduddin. Shri Md. Khasim Adoni, Joint Director of Extension. Shri N.V. Mohana Rao, Joint Director, Agricultural Research Institute, Rajendranagar. Shri L. Venkataratnam, Deputy Director of Agriculture (Research).
2. Maharashtra (Poona)	P.D. Mehta B. Ramakrishnan	Shri D.S. Rangarao, Statistician, Department of Agriculture.
3. Gujarat (Ahmedabad)	S.P. Doshi	Dr. D. K. Desai, Deputy Director of Agriculture (Statistics). Shri J.B. Trivedi, Deputy Director of Agriculture (Statistics).
4. Uttar Pradesh (Lucknow)	S.N. Bajpai M.P. Saxena G.N. Bahuguna A.C. Srivastava	Dr. K. Kishen, Joint Director of Agriculture (Statistics).
5. Madhya Pradesh (Bhopal)	T. Lokeswara Rao H.C. Gupta	Shri A.G. Khare, Statistician, Department of Agriculture.
6. Punjab, Jammu & Kashmir & Himachal Pradesh (Chandigarh)	A.C. Kaistha B.L. Kaistha M.S. Batra	Shri Piara Singh Sahota, Director of Crop Insurance. Shri Mohinder Singh Pannu, Statistician, Department of Agriculture.
7. Bihar (Sabour)	M.K. Joshi P.C. Kholia	Shri G.P. Singh, Statistician, Department of Agriculture. Shri R.S. Roy, Principal, Agricultural Research Institute, Sabour.
8. Rajasthan (Jaipur)	B.P. Dyundi N.K. Ohri	Shri H.C. Kothari, Statistician, Department of Agriculture,
9. Orissa (Bhubaneswar)	L.B.S. Somayazulu	Shri B. Misra, Deputy Director of Agriculture (Hq.) Shri D. Misra, Principal, Uttakal Krushi Mahavidyalaya, Bhubaneswar.
10. West Bengal (Calutta)	S.N. Nath	Shri S.N. Mukerjee, Statistical Officer, Directorate of Agriculture.

11. Madras (Coimbatore)	P. Prabhakara Rao V. Venkateswara Rao	Late Shri M. Bhavani Sankar Rao, Vice-Principal and Secretary, Research Council, Agricultural College and Research Institute, Coimbatore. Shri T. Natarajan, Agronomist. Shri A.H. Sarma, Extension Specialist. Shri V. Raman, Secretary, Research Council. Shri K.R. Nagaraja Rao, Secretary, Research Council.
12. Assam (Shillong)	T.K. Gupta	Dr. S.R. Barooha, Director of Agriculture, Assam. Shri B.N. Duara, Joint Director of Agriculture, Assam.
13. Mysore (Bangalore)	K.A. Balakrishnan	Shri M.A. Wali, Director of Statistics, Shri B.V.S. Rao, Assistant Director of Statistics.
14. Kerala (Trivandrum)	V.N. Iyer	Shri M. Janardanan nair, Director of Agriculture. Shri N. Shankara Menon Director of Agriculture. Shri P.D. Nair, Director of Agriculture.

ABBREVIATIONS COMMON TO EXPERIMENTS ON ANNUAL AND PERENNIAL CROPS AND EXPERIMENTS ON CULTIVATORS' FIELDS.

Crops :- In the top left corner is given the name of the crop on which the experiment is conducted. Within brackets along side the crop is mentioned the season wherever the information is available.

Ref :- Against the sub-title 'reference' is mentioned the name of the State, the year in which the experiment is conducted and the serial number of the experiment for that year given in brackets.

Abbreviations adopted for States are as follows :—

1. A.P.—Andhra Pradesh
2. As.—Assam
3. Bh.—Bihar
4. Gj.—Gujarat
5. H.P.—Himachal Pradesh
6. J.K.—Jammu and Kashmir
7. K.—Kerala
8. M.P.—Madhya Pradesh
9. M.—Madras
10. Mh.—Maharashtra
11. Ms.—Mysore
12. Or.—Orissa
13. Pb.—Punjab
14. Rj.—Rajasthan
15. U.P.—Uttar Pradesh
16. W.B.—West Bangal

For the experiments conducted under the schemes sponsored by the Indian Concil of Agricultural Research like the Model Agronomic Experiments or the Simple Fertilizer Trials scheme no serial numbers have been given at the source as the data of these experiments were collected at the Headquarters (New Delhi). In such cases the abbreviations MAE, SFT or TCM are given in the brackets against the year in which the experiment is conducted.

Site :—Name of the Research Station is mentioned alongwith the place where it is located, e.g. Agri. Res. Stn. for Agricultural Research Station.

For Central Institutes, the corresponding standard abbreviations have been adopted e.g. I.A.R.I. for the Indian Agricultural Research Institute.

In case of the experiments conducted on cultivators' fields whether under an Indian Council of Agricultural Research scheme or by the State Government, the abbreviation (c.f.) is given along with the site or centre as, for example, Cuttack (c.f.).

Type :- Abbreviations used against this item are one or more than one of the following :—

C—Cultural ; D—Control of Diseases and Pests ; I—Irrigational ; M—Manurial ; R—Rotational ; V—Varietal and X—Mixed cropping. e.g. CM is to be read as Cultural-cum-manurial.

Object :- A statement of the objective of the experiment is given indicating the main crop and type of the experiment. In case of M.A.E., S.F.T. and T.C.M. experiments, the type to which the experiment corresponds is also given, e.g. Type V, Type A or B or C etc.

Results :- Information under this heading should be read against the following items :—

(i) General mean. (ii) S.E. per plot. (iii) Results of test of significance. (iv) Summary table(s) with S.E. of comparison(s).

Other abbreviations used in the text of experiments :

Nitro. Phos.—Nitro. Phosphate
Ammo. Phos.—Ammonium Phosphate
A/S—Ammonium Sulphate
A/S/N.—Ammonium Sulphate Nitrate
C/A/N—Calcium Ammonium Nitrate
A/N—Ammonium Nitrate
A/C—Ammonium Chloride
C/N—Chilean Nitrate
N—Nitrogen
P—Phosphate

K—Potash	F.M.—Fish Manure
B.M.—Bone meal	G.N.C.—Groundnut cake
Mur. Pot.—Muriate of Potash	M.C.—Municipal Compost
Pot. Sul.—Potassium Sulphate	T.C.—Town Compost
Super—Super Phosphate	lb.—Pounds
Zn. Sul.—Zinc Sulphate	Srs.—Seers
C,S—Copper Sulphate	B.D.—Basal dressing
G.M.—Green Manure	C.L.—Cart load
F.Y.M.—Farm Yard Manure	ac.—Acre
F.W.C.—Farm Waste Compost	Dical. Phos.—Dicalcium Phosphate

Under the item (ii) (b) of the sub-heading 'Basal conditions' in the text of the experiment, the respective farm/station at which the experiment was conducted has been referred to for the soil analysis. The soil analysis of the farm, with other details of the research station is given under the background information of each state. The information regarding the details of experimental stations may be obtained under the respective items as given below :

DETAILS OF EXPERIMENTAL STATIONS

A. General information :

(i) District and the nearest railway station with Latitude, Longitude and Altitude if available. General topography of the experimental area. (ii) Type of tract it represents. (iii) Year of establishment. (iv) Cropping pattern. (v) Programme of research.

B. Normal rainfall :

Average monthly rainfall specifying the period on which the figures are based.

C. Irrigation and drainage facilities :

(i) (a) Whether available, if so, since when. (b) Type of facilities available. (ii) Whether there is a proper drainage system.

D. Soil type and soil analysis :

(i) Broad soil type with depth, colour. and structure etc. (ii) Chemical analysis. (iii) Mechanical analysis.

E. No. of experiments :

No. of experiments conducted on different crops that have been included in the compendium.

Information under the following heads is to be read against the respective items as given below.

BASAL CONDITIONS

A. For experiments on annual crops :

(i) (a) Crop rotation if any. (b) Previous crop. (c) Manuring of previous crop. (State amount and kind). (ii) (a) Soil type. (b) Soil analysis. (iii) Date of sowing/planting. (iv) Cultural practices. (a) Preparatory cultivation. (b) Method of sowing/planting. (c) Seed-rate. (d) Spacing. (e) No. of seedlings per hole. (v) Basal manuring with time and method of application. (vi) Variety. (vii) Irrigated or Unirrigated. (viii) Post-sowing planting cultural operations. (ix) Rainfall during crop season (x) Date of harvest.

B. For experiments on perennial crops :

(i) History of site including manuring and other operations. (ii) (a) Soil type. (b) Soil analysis. (iii) Method of propagation of plants. (iv) Variety. (v) Date and method of sowing planting, (vi) Age of seedlings at the time of planting. (vii) Basal dressing with time and method of application. (viii) Cultural operations during the year. (ix) Inter cropping if any. (x) Irrigated or Unirrigated. (xi) Rainfall during crop season. (xii) Date of harvest.

C. For experiments on cultivators' fields :

(i) (a) Crop rotation, if any. (b) Previous crop. (c) Manuring of previous crop. (ii) Soil type in general. (iii) Basal manuring with time and method of application. (iv) Variety. (v) Cultural practices. (a) Preparatory cultivation. (b) Method of sowing. (c) Seed-rate. (d) Spacing. (e) No. of seedlings per hole. (vi) Period of sowing/planting. (vii) Irrigatedg or Unirrigated. (viii) Post-sowing/planting cultural operations. (ix) Rainfall duriu. crop season. (x) Period of harvesting.

DESIGN

A. For experiments on annual crops :

(i) Abbreviations for design : C.R.D.—Completely Randomised Design. R.B.D.—Randomised Block Design , L. Sq.—Latin Square , Confd.—Confounded , Fact.—Factorial. (other designs and modifications of the above to be indicated in full.). (ii) (a) No. of plots per block. (b) Block dimensions. (iii) No. of replications. (iv) Plot size. (a) Gross (b) Net. (v) Border or guard rows kept. (vi) Whether treatments are randomised (separately in each block).

B. For experiments on perennial crops :

(i) Abbreviations for designs : C.R.D.—Completely Randomised Design ; R.B.D.—Randomised Block Design ; L.Sq.—Latin Square ; Confd.—Confounded. (other designs and modifications of the above indicated in full). (ii) (a) No. of plots per block. (b) Block dimensions. (iii) No. of replications. (iv) No. of trees/plot. (v) Border or guard rows kept. (vi) Are treatments randomised.

C. For experiments on cultivators' fields :

(i) Method of selection of experimental sites. (ii) No. and distribution of experiments. (iii) Plot size. (a) Gross. (b) Net. (iv) Whether treatments are randomised.

GENERAL

A. For experiments on annual crops :

(i) Crop conditions during growth with date of lodging, if any. (ii) Incidence of pests and diseases with control measures taken. (iii) Quantitative observations taken. (iv) In case of repetition in successive years—(a) from what year to what year, (b) whether treatments were assigned to the same plots in the same manner every year, (c) reference to combined analysis, if any. (v) In case of repetition in other places (a) names of the places along with reference and (b) reference to combined analysis, if any. (vi) Abnormal occurrences like heavy rains, frost, storm etc., if any. (vii) Any other important information.

B. For experiments on perennial crops :

(i) Crop condition during the year. (ii) Incidence of pests and diseases with control measures taken. (iii) Quantitative observations taken. (iv) In case of repetition in successive years—(a) from what year to what year, (b) reference to combined analysis, if any. (v) Abnormal occurrences like heavy rains, frost, storm etc., if any. (vi) Any other important information.

C. For experiments on cultivators' fields :

(i) Crop condition during growth. (ii) Incidence of pests and diseases with control measures taken. (iii) Quantitative observations taken. (iv) In case of repetition in successive years, (a) from what year to what year, (b) whether treatments were assigned to the same plots in the same manner every year, (c) reference to combined analysis, if any. (v) In case of repetition in other places names of places alongwith reference. (vi) Abnormal occurrances, like heavy rains, frost, storm etc., if any. (vii) Any other important information.

TABLE OF CONVERSIONS TO METRIC UNITS

1 foot	=	304.8 mm.
1 acre	=	0.404606 hectare.
1 gram	=	0.035274 ounce = 0.085735 tola = 0.017147 chatak
1 kg.	=	2.20462 pounds = 1.07169 seers.
1 metric tone	=	0.9842 ton = 26.7923 maunds.
1 maund	=	0.373242 quintal = 37.3242 kg.
1 lb./ac.	=	1.12085 kg./hectare.
1 md./ac.	=	92.23002 kg./hectare = 0.9223 quintal/hectare.
1 ton/ac.	=	2.51071 metric tones/hectare.
1 gallon (Imp.)	=	4.54596 litres.

GLOSSARY OF VERNACULAR NAMES OF CROPS

Sl. No.	Name of Crop	Botanical Name	Assamese	Bengali	Oriya	Telugu	Tamil	Malayalam	Kannada	Marathi	Guj arati	Hindi	Punjabi
1.	Paddy	*Oryza sativa* L.	Dhan	Dhan	Dhano	Vadlu ; Biyyamu	Nel	Nellu	Bhatta	Bhat	Dangar	Dhan ; Chawal	Chaul ; Dhan
2.	Wheat	*Triticum sativum* Lamk. ; *Triticum aestivum* L.	Gaum ; Ghehu	Gam	Gaham	Godumalu	Kothumai	Gothambu	Godhi	Gahu	Ghahu	Gehon	Kanak
3.	Barley	*Hordeum vulgare* L.	Ja'dhan	Joba	Jaba, Barlhi or Jabadhana	Barley	Baarli arisi	Barley	Barley akki	Satu ; Jav	Jav	Jau	Jaun
4.	*Jowar*	*Andropogon sorghum* Brot.	—	Jowar	Juara	Jonna	Cholam	Cholam	Jola	Jowari Jondhla	Jowari ; Juar	Jowar ; Jaur	Jowar
5.	*Bajra*	*Pennisetum typhoides* Stapf Es Hubbard	—	Bajra	Bajra	Saija	Kambu	Kambu	Sajje	Bajri	Bajri	Bajra	Bajra
6.	Maize	*Zea mays* L.	Gom dhan	Bhutta	Macca	Mokkajonna	Makka cholam	Cholam ; Makka cholam	Musukina jola	Makka	Makkai	Makka	Makki ; Makayee
7.	Sugarbeet (Beet root)	*Beta vulgaris* L.	Beet	Beet	Beet	Beetu dumpa	—	Beet root	Beet root	Beet	Beet	Chukandar	Chakandar
8.	Potato	*Solanum tuberosum* L.	Alooguti	Alu	Bilati Alu	Bangala-dumpa, Urlagadda	Uruzhai kilangu	Urala kizangu	Alu gedde	Batata	Aloo ; Batata	Aaloo	Alu
9.	Cabbage	*Brassica oleracea* L. var. *capitata* L.	Bandha Kabi	Bandhakapi	Bandha Kobi	L. Akugobi	Muttaikose	Muttakose	Yele kosu	Kobi	Kobij	Patgobhy	Band gobhi
10.	Cauliflower	*Brassica oleracea* L. var. *botrytis* L.	Phcol Kabi	Fulkabi	Fula kobi	Poogobi	Gospoovu	Cauliflower	Hukosu	Phul kobi, Fulvar	Fulkobi ; Fulvar	Phool Gobhy	Phul gobhi
11.	Onion	*Allium cepa* L.	Piyaz	Piaj	Peas ; Ulli	Ulli	Vengayam ; Erangagam	Ulli	Eerulli	Kanda	Dungli ; Kando	Piaz	Ganda ; Payaz
12.	Knolkhol	*Brassica oleracea* var. *caulocarpa*	Olkabi	Old kapi	Olkobi (Ganthi kobi)	Gadda gobi	Nool khol	—	Navilu kosu	Nawal kol	Nolkol	Gaanth gobi	Gandh gobhi
13.	Arhar	*Cajanus cajan* Milsp.	Arahar	Arahar	Harad	Kandulu	Thuvarai	Thuvaran payaru	Thogari	Tur	Tuver	Arhar	Harhar ; Arhar

GLOSSARY OF VERNACULAR NAMES OF CROPS—*contd.*

Sl. No.	Name of Crop	Botanical Name	Assamese	Bengali	Oriya	Telugu	Tamil	Malayalam	Kannada	Marathi	Gujarati	Hindi	Punjabi
14.	Pea	*Pisum Sativum* L.	Motor mah	Bara matar	Matar	Batancelu	Pattani	Pattani	Batani	Matar	Vatana	Muttar	Mattar
15.	Gram	*Cicer arietinum* L.	Butmah	Chola	Boot	Sanagalu	Kadalai;Sundal Kadalai	Kadala	Kadale	Harbara	Chana	Chana	Chhole ; Chana
16.	Urid	*Phaseolus mungo* var. *radiatus* Linn.	Matimah	Mashkalai	Biri	Minumulu	Uzhundu	Uzhunnu	Uddu	Udid	Adad ; Udad	Urd	Mash ; Urd
17.	*Lobia*, Cowpea	*Vigna catjang* Walp ; *Vigna sinensis* Savi.	— —	Barbati	——	——	Thatapayaru	Mambayar	Alasande	Chavli	Chola ; Choli	——	Lobia
18.	*Moong*	*Phaseolus aureus* Roxb.	Magum	Sonamug	Mung	Pachapesalu	Pachaipayru; Pasipayaru	Cerupayaru ; Payaru	Hesaru	Mug	Mag	Moong	Moong, Mug
19.	Sugarcane	*Saccharum officinarum* L.	Kuhiar	Akh	—	Cheruku	Karumbu	Karimbu	Kabbu	Oos	Sherdi	Ganna ; Kamad ; Naishakar	Kamad ; Ganna ; Eakh
20.	Cotton	*Gossypium* spp.	Kapah	Karpas	Kapa	Pratti	Paruthi	Paruthi	Hatti	Kapus	Kapas	Kapas	Kapah
21.	Tobacco	*Nicotiana tabacum* L.	Dhopat	Tamak	Uanpatra	Pogaku	Pugayilai	Pukayila	Hoge Soppu	Tambaku	Tamaku	Tambaku	Tamaku, Tambaku
22.	Groundnut	*Arachis hypogaea* L.	China Badam	Cheena badam	China-badam	Nelashanga	Nilakadalai	Nilakkadala	Kadale kayi	Bhuimug	Bhoising ; Magafali	Mungphali	Mungfali
23.	*Soyabean*	*Glycine hispida* ; *Glycine max* Merr.	Garo mah	Gari kalai	Soyabin	Soya-chikkudu	Soya-payaru	Soybean	Soya bean	Soybin	Soyabin	Soyabeen or Bhat	Soyabean
24.	Castor	*Ricinus communis* L.	Eri	Rehri	Jada	Amudalu	Amanakku	Avanakku	Haralu	Erandi	Diveli ; Erando	Rehri	Arind ; Harind ; Rind
25.	Mustard	*Brassica juncea* Coss.	Sariah	Rai Sarisha	Rai	Avalu	Kadugu	Kaduku	Kempu-sasive	Mohri	Rai	Rai	Rai
26.	*Toria* (Indian rape)	*Brassica campestris* var. *toria* Duth.	Sariah	Tori sarisha	—	Ava	Kadugu	—	—	Saras	Sarsav	Toria	Toria

GLOSSARY OF VERNACULAR NAMES OF CROPS—*contd.*

Sl. No.	Name of Crop	Botanical Name	Assamese	Bengali	Oriya	Telugu	Tamil	Malayalam	Kannada	Marathi	Gujarati	Hindi	Punjabi
27.	*Taramira* (Rocket salad)	*Eruca sativa* Mill.	Salad	Shet Sarisha	—	—	—	—	—	Tarmira, Jambo	—	—	Taramira
28.	*Berseem*	*Trifolium alexandrinum* L.	—	Berseem	Gini ghasa	—	—	—	—	Bersim gavat	Barsim	Berseem	Berseem
29.	Cluster bean	*Cyamopsis psoraloides*	Thupi Urahi	Guar	Gunar chhuin	Goruchik-kudu	Kotha-varnkai Seenia-varaikai	Kothavara	Gori kayi	Guwar	Gavar	Guar	Guara
30.	*Senji* (Indian clover)	*Melilotus Parviflora* Desv.	—	Banmethi	Barsim	—	—	—	—	—	—	Senji	Senji
31.	Sudan grass	*Sorghum sudanese* Stapf.	—	—	Sujan ghasa	Sudan gaddi	—	—	Sudan hullu	—	—	Sudan ghas	Sudan ghass
32.	Teosinto	*Euchlaena mexicana* Schrad.	—	—	—	Tiyosente	—	—	—	—	—	—	Makchari
33.	Apple	*Pyrus malus* L.	——	Apel	Seo	Apple ; Sabe	Appel	Apple	Sebu	Apple	Safarjan	Seb	Seo ; Seb
34.	Sweet lime	*Citrus aurantifolia* Swingle ; *Citrus limetioides* Tanaka.	Mitha Nemu	Sarbathi lebu	Sarbatika mitha embu	Nimma	Elummi-chchai	—	Kittale	Shakkar limbu	Mitha limboo	Meetha Nemboo	Mitha
35.	Grape fruit	*Citrus pardisi* Macf.	Grape Fruit	——	——	Pamparapa-nasa	China bombi i maas	——	——	Grape fruit	— —	Grape fruit	Grape phal
36.	Sweet orange	*Citrus sinensis* Osbeck.	Malta ; Mozambique	Mosambi	Mitha kamala ; Mhata kamala	Battayi	Sathugudi ; Cheeni	Madura naranga	Sathkudi	Mosambi	Mosambi	Malta ; Mausmee	Malta
37.	Tea	*Camellia thea* ; *Camellia sinensis* O. Ktze.	Ch h	Cha	Cha	Theyaku	Theyilai	Theyila	Tea	Chaha	Chah	Chaie	Chah

CONTENTS

FOREWORD	...	(iii)
PREFACE	...	(v)
LIST OF ABBREVIATIONS	...	(ix)
GLOSSARY OF VERNACULAR NAMES OF CROPS	...	(xiii)
PUNJAB	...	(xix)
HIMACHAL PRADESH	...	(xxv)
JAMMU AND KASHMIR		(xxxi)
PARTICULARS OF RESEARCH STATIONS		(xxxv)
EXPERIMENTAL RESULTS (CROP-WISE)		
PUNJAB		
Paddy	...	1
Wheat	...	41
Barley	...	180
Jowar	...	181
Maize	...	182
Bajra	...	228
Potato	...	232
Pulses (Gram, *Mash*, *Mung*, *Arhar*, and *Lobia*)	...	237
Sugarcane	...	254
Cotton	...	338
Tobacco	...	514
Oilseeds (Groundnut, *Mustard*, *Toria*, *Taramira*, Castor, and Raya)	...	557
Fodder crops and grasses (*Barjra*, *Berseem*, Cowpea, Guara, *Jowar* Lucerne, Maize, Oats, *Sanai*, Sudangrass, fodder, and Grass)	...	600
Teosint e	...	651
Fruits (Apple, Grape fruit, *Malta*. and Sweet Lime)	...	651
Tea	...	658
HIMACHAL PRADESH :		
Paddy	...	669
Wheat	...	674
Barley	...	693
Maize	...	693

Pea ... 701

Cabbage ... 702

Potato ... 702

Berseem ... 735

Apple ... 736

Sweet Orange ... 740

JAMMU AND KASHMIR :

Paddy ... 743

Wheat ... 764

Potato ... 774

Onion ... 778

Sugar Beet ... 783

Knolkhol ... 785

Cauliflower ... 787

Saffron ... 788

DELHI :

Wheat ... 795

Gram ... 797

Sugarcane ... 798

PUNJAB

1. General :

Punjab State lies between 27½° and 34° N latitude with an area of 47,456 square miles. It is surrounded by Jammu and Kashmir and Himachal Pradesh in the north, Pakistan in the west, Rajasthan in the south and river Jamuna in the east. The State has three administrative divisions viz., Ambala, Jullundur and Patiala comprising of 18 districts in all. The land utilisation statistics of Punjab State are given in the table 1 below :

TABLE 1

Land utilisation statistics of Punjab (1961-62).

Classification of area	in '000 acres.
Reporting area as per village papers	30291
Forests	915
Land put to non-agricultural uses	1757
Barren and unculturable land	6369
Permanent pastures and other grazing lands	309
Land under miscellaneous tree crops	27
Culturable waste	1061
Fallows other than current fallows	(a)
Current fallows	1248
Net area sown	18604
Total cropped area	24059
Area sown more than once	5455

(a) means below 500 acres

2. Topography :

Physically, the State is divided into three natural divisions, namely (i) Himalayan, (ii) Sub-Himalayan and (iii) the Indo-Gangetic plain.

The Himalayan division includes Simla and Kangra districts *i.e.* the country lying on the sides of outer range of Himalayas, whereas the Sub-Himalayan division is a narrow strip adjoining Himalayas called the sub-mountainous region where some of the spurs of Himalayas such as Shivaliks and the high hills of Kasauli and Dalhousie are situated. It is in the Sub-Himalayan region that Ambala, Hoshiarpur and Gurdaspur districts lie. The third regoin is the Indo-Gangetic plain comprising of the remaining 13 districts viz., Hissar, Rohtak, Gurgaon, Karnal, Jullundur, Ludhiana, Amritsar, Ferozepur, Bhatinda, Patiala, Sangrur, Kapurthala and Mohindergarh.

There are only three principal snowfed rivers which came to the share of this State as a result of the partition of Punjab. They are Sutlej, Beas and a part of Ravi. These rivers, however, neither give access to the sea nor they are navigable even for medium sized crafts. In the early parts of their course amidst the snow clad ranges, they do not serve any purpose, except that at Jogindernagar in Kangra district, water of the river Uhl, a tributary of Beas, which joins the latter in Mandi district of Himachal Pradesh, is utilised to produce electric power. In the plains too, even until the partition, these rivers were not put to much use for the benefit of western part of Punjab. The Bhakra-Nagal Project over the river Sutlej now provides the main source of irrigation and electric power to this State.

3. Soils :

On the basis of morphological, physico-chemical and chemical studies of the soil profiles of different meteorological divisions, the soils of Punjab can be classified into 5 zones. These are as follows :

Zone 1 : This includes Simla hills and the district of Kangra. The soils are mostly sandy clay upto about a depth of 30" and clay between 30" to 36". Calcium carbonate is conspicuously absent and the soils are acidic in reaction. Rainfall in this zone is approximately 126" per year.

Zone II : The districts of Ambala, Hoshiarpur and Gurdaspur are included in this region. The soils are clayey with a large preponderance of clay and silt fraction. Calcium carbonate is absent throughout the soil profile. These soils are designated as transitional soils of alluvial origin.

Zone III : This covers part of the districts of Ambala, Jullundur, Amritsar and Karnal. The soils in this zone are clayey with a large preponderance of clay. Silica-Sesqui oxide ratio, exchange capacity and other characteristics of the clay point to mont morillonite being the predominating clay mineral. Thus the Karnal soil has been classified as a pedocal, chestnut coloured soil of alluvial origin.

Zone IV : This includes part of the districts of Ludhiana, Amritsar, Jullundur and Patiala. It represents the soils developed under semi-arid conditions of the central Punjab. Soils are typically sandy loam with a large preponderance of coarse sand. The open texture of the soil has resulted in low C/N ratio. Calcium carbonate is present throughout the profile. Soils are neutral in reaction. They are classed as pedocal, brown coloured soils of alluvial origin, in this zone.

Zone V : This includes mostly the districts of Ferozepur and Hissar. The soils are sandy loam with large preponderance of fine sand. The open texture and high temperature have resulted in low C/N ratio.

4. Rainfall and climate :

There are two well-marked rainfall seasons in the State (i) the monsoon period lasting from middle of June till September on which the autumn crops and spring sowing periods depend and (ii) the winter rains which fall early in January and although insignificant in amount, materially affect the prosperity of spring harvest. Since the monsoon gets exhausted in its passage over the great plains of Sindh and Rajasthan while west winds from Baluchistan pass over arid tracts and leave such moisture as they have collected on the western slopes of Sulemann range, Punjab has to depend largely on south winds from the Bay of Bengal. According to rainfall the State can be divided into three main natural divisions in each of which the general meteorological conditions are believed to be homogeneous. These are mountainous (stations like Simla, Dalhousie and Dharmsala), the sub-montane region (Hoshiarpur, Pathankot etc.) and plains.

The rainfall in the foot hills averages 30", but a large part of Punjab has rainfall under 20" a year and in the driest portion the rainfall amounts to only 4". The irrigated area is situated in the rainfall belt below 20".

The climate of Punjab, over the greater part of it, is of a most pronounced continental character, extreme summer heat alternating with great winter cold. The maximum temperature occurs in May and June and may be as high as 120° F. The minimum temperature occurs in January when at some places the temperature comes down to freezing point.

5. Irrigation :

In Punjab State an area of about 7933 thousand acres is under irrigation. It works out to about 42.6 per cent of the cropped area in the State. The area under different sources of

irrigation is given in table 2 below :

TABLE 2

Source of irrigation	area in '000 acres	%
Govt. canals	5303	66.85
Private canals	123	1.55
Tanks	16	0.20
Wells	2419	30.49
Other sources	72	0.91
Total	7933	100.00

6. Agricultural production and normal cropping pattern :

Wheat is the main crop of Punjab State. Millets like *bajra* and maize and pulses like gram are also extensively grown. Among the cash crops cotton is the most prominent one. Paddy covers comparatively less area, but its cultivation is on the increase in the areas receiving irrigation from the Bhakra-Nangal system. The distribution of area under different crops, their total producation and average yield per acre is given in table 3 below :

TABLE 3

Area and production of Punjab 1963-64.

Crop	Area in '000 acres	Production in '000 tons	Average yield in lb./ac.
Rice	1-47	529	1033
Wheat	5816	2789	1074
Jowar	756	48	143
Bajra	1903	296	348
Maize	1447	798	1236
Small millets	28	4	320
Gram	5408	1099	455
Other pulses	357	74	464
Sugarcane	575	879 (*Gur*)	1.5*
Cotton	1703	1165**	268
Groundnut	288	99	768
Mustard	789	189	537
Sesamum	47	7	333
Linseed	27	4	332
Barley	356	110	692

*Tons/ac. **bales of 392 lb. each.

The distribution of different crops among the districts is given below :

Wheat : Almost all districts except Ambala, Kangra, Kapurthala and Mohindergarh account for 90 per cent of the total production of the crop.

Gram : Hissar, Rohtak, Karnal, Ferozepur, Sangrur and Bhatinda districts produce more than 75 per cent of the total production of gram.

Paddy : Karnal, Kangra, Ferozepur, Amritsar, Ambala, Hoshiarpur and Gurdaspur districts account for nearly 75 per cent of the total production of the crop.

Bajra : Hissar, Rohtak, Gurgaon and Mohindergarh are major *bajra* producing districts.

Sugarcane: Rohtak, Karnal, Ambala, Jullundur, Amritsar, Gurdaspur, Patiala and Sangrur produce *gur* accounting for about 66 per cent of the total production.

Cotton : Ferozepur district alone accounts for about 41 per cent of the total production. Hissar, Bhatinda, Sangrur and Amritsar are other districts which grow cotton.

7. Experimentation and Agricultural Research Stations :

Agricultural Research Stations at Gurdaspur, Hansi, Jullundur Ferozepur, Sirsa Abohar are some of the important centres in the State of Punjab. In all 864 experiments conducted during 1954—59 were reported from the State and the distribution of these experiments crops-wise and type-wise is given in table 4 below. Besides, 260 experiments conducted under the Coordinate Model Agronomic project of the Indian Council of Agricultural Research are also included in the compendium.

TABLE 4.

Type

Crop :	M	MV	C	CV	CM	CMV	(I+IV+IMV+IC)	(D+DV)	Total
Paddy	30	3	5	2	11	—	—	4	55
Wheat	139	3	4	—	1	—	—	13	160
Barley	2	—	—	—	—	—	—	—	1
Jowar	2	—	—	—	—	—	—	—	2
Maize	51	—	1	—	—	—	—	4	56
Bajra	3	—	—	—	—	—	—	—	3
Potato	—	2	—	2	—	—	—	—	4
Gram	9	—	—	—	—	—	—	—	9
Mash	1	—	—	—	—	—	—	—	1
Moong	2	—	—	—	—	—	—	—	2
Arhar	2	—	—	—	—	—	—	—	2
Soyabean	3	—	—	—	—	—	—	—	3
Lobia	5	—	—	—	—	—	—	—	5
Sugarcane	47	1	3	4	2	—	7	9	73
Cotton	145	3	13	—	47	—	26	2	236
Tobacco	36	2	3	6	8	6	—	1	62
Groundnut	16	3	—	—	1	—	—	3	23
Mustard	2	—	4	—	—	—	5	—	11
Toria	13	—	—	—	—	—	4	—	17
Turmeric	—	—	—	2	—	—	—	—	2
Castor	—	—	1	—	2	—	—	—	3
Raya	3	—	—	—	—	—	6	—	9
Fodder crops	86	—	3	3	1	—	1	—	94
Apple	—	—	—	1	—	—	—	—	1
Grape fruit	—	4	—	—	—	—	—	—	4
Malta	—	3	—	—	—	—	—	—	3
Sweet lime	4	—	—	—	—	—	—	—	4
Tea	9	—	—	5	5	—	—	—	19
Total	609	24	37	25	78	6	49	36	864

A little over 73 per cent of the total number of experiments were purely manurial type while cultural and cultural-cum-manurial type of experiments accounted for about 14.4 per cent of the total. About 27.3 per cent and 18.5 per cent of the experiments were conducted on cotton and wheat respectively.

About 71.2 per cent of the experiments were laid out in Randomised Blocks while 19.4 per cent and 9.2 per cent of the experiments were laid out in split-plot and confounded designs. The minimum and the maximum plot sizes adopted in the experiments were 4.44 sq. yds. and 605 sq. yds. respectively. As many as 10 replications were adopted in some experiments while there were some of the confounded type laid out in a single replication only. Maximum number of plots in a block in an experiment was as high as 48.

HIMACHAL PRADESH

1. General :

Himachal Pradesh lies between 30 °30′ and 33°10′ N latitudes and 75° 55′ and 79° 50′E longitudes. It is surrounded on the north and north-west by Jammu and Kashmir, on the north-east, south-west and west by Punjab, on the east by Tibet and on the south-east by Uttar Pradesh. It has a total area of about 6,966 thousand acres. It is divided into 5 administrative districts of Mahasu, Sirmur, Mandi, Chamba and Bilaspur. Land utilization statistics of the State are given in Table 1 below :

TABLE 1

Land utilization statistics of Himachal Pradesh (1963-64).

Classification of area	in ,000 acres.
Total geographical area as per professional survey	6,966
Total geographical area as per village papers	4,656
Forests	841
Land put to non-agricultural uses	140
Barren and unculturable land	80
Permanent pastures and other grazing land	2,679
Land under miscellaneous tree crops and groves etc.	77
Culturable waste	114
Fallows other than current fallows	6
Current fallows	34
Net area sown	685
Total cropped area	1,105
Area sown more than once	420

[Source of the above information is Director of Land Records, H.P. published in the "Quarterly Bulletin of Statistics" (Sept.-Dec., 1965) Vol. X No 3-4, Himachal Pradesh].

2. Topography :

The State can broadly be divided into three regions :—(i) Outer Himalayan Region, (ii) Inner Himalayan Region and (iii) Alpine Pastures.

The boundaries of the Outer Himalayan region touch the plains of Punjab. The whole area abounds in valleys, and each group of villages is bounded by hills and streams. The Inner Himalayan region is thinly populated having high mountains and narrow valleys. The Alpine pasture lands, which remain under snow for about six months in the year, are very sparsely populated. Wherever cultivation is done, Yak are used for ploughing the fields. Most of the inhabitants migrate during the winter months to warmer parts and return to their homes only when snow begins to melt. The mountain system (excluding Bushahr) may be mapped out roughly into three portions: the Chaurpeak and the spurs radiating from it, occupying the south-east corner ; the Simla range extending from central Himalayas to the neighbourhood of Sabathuj and the mountains of the Sub-Himalayan series, running from north-west to south-east, and forming boundary of Ambala plains. The last mentioned group may be sub-divided into Sub-Himalayas proper and an outer range corresponding to the Shivalik hills of Hoshiarpur on the one side and of the Gangetic *Doab* on the other. The Sub-Himalayan and the Shivalik ranges form parallel lines, having between them an open space of varying width known as Kiarda Dun, a broad and well cultivated valley.

The principal rivers by which the drainage of the Simla hills is effected are the Sutlej, the Pabar, the Gori or Giri Ganga, the Gambhar and the Sirsa. Sutlej enters Bushahr by a pass between two peaks and flows south-west through Bushahr, receiving the drainage from the

central Himalayas on one side and from the Spiti hills on the other, till it reaches the border of Kulu. The Pabar which is one of the principal rivers of the Tona, rises in Bushahr having feeders on the southern slopes of both central Himalayas and the transverse Simla range. The Gori or Giri Ganga rises in the hills north of the Chaur and collecting the drainage of the whole tract between that mountain and the Simla range, flows in the south-west direction meeting the outer Himalayas, and turns sharply to the south-east near Sirmur. The Gambhar rises in the Dagshai hills.

3. Soils :

The soils of Himachal Pradesh fall into five major zones; Low hills, Middle hills, High hills, Mountain and Dry hills.

Low hills zone :—This includes Pamta valley and covers Nahan *tehsil* of Sirmur district, parts of Arki, Kasumpti and Suni *tehsil* of Mahasu district, Solan and Ghumarwin areas of Bilaspur district, Mandi and Jogindernagar *tehsils* of Mandi district and Bhattiyah of Chamba district. The altitude of the area ranges from 1500 ft. to 3000 ft. above sea level and the soils are located mainly in the narrow valleys through which numerous hill streams flow.

The soils are mostly sandy loams, varying from light grey to brown in colour. They are not very deep and abound in pebbles, stones and boulders. Irrigation facilities are available at a number of places and the soils are well-drained. They are neutral and respond well to organic manures and chemical fertilizers.

Middle hills zone :—This includes lower part of Rainka *tehsil* and the Ces-Giri area of Pachhad *tehsil* in Sirmur district, parts of Arki, Solan, Kasumpti, Suni, and Theog *tehsils* of Mahasu district, Sarkaghat, Sundernagar, Chacliot and part of Karsog *tehsil* in Mandi district and Chamba and part of Tissa *tehsil* of Chamba district. It lies over an altitude of 3000 ft. to 5000 ft. above sea level.

The soils in this zone are located mostly on the hilly slopes which are of varying gradients. They vary from loam to silt loam; texture is medium fine and colour ranges from grey to black. On account of rapid sub-soil drainage they are susceptible to drought. The response to organic manures as well as fertilizers is good. The soil reaction varies from neutral to slightly acidic.

High hills zone :—The zone comprises the upper parts of Rainka *tehsil* and the Trans-Giri area of Pachhad *tehsil* of Sirmur district, Theog, Jubbal, Chopal and Rampur *tehsils* of Mahasu district, Karsog *tehsil* of Mandi and Bharmour, Chamba and Tissa *tehsils* of Chamba district. The altitude varies from 5000 ft. to 7000 ft. above sea level.

The soils are of a very fine texture and darkish brown in colour. They vary from silt loam to dry loam, with little gravel percentage. They are often quite deep, the depth at some places being 60 ft. There are no irrigation facilities. The soils have good drainage and fertility is also quite high. They are rich in potassium and respond well to nitrogenous and phosphatic fertilizers. They yield a very good crop of seed potato and temperate fruits. There is wide difference in the carbon and nitrogen content of the soil and rate of decomposition is low. The soil is acidic in reaction.

Mountainous zone :—The zone comprises of the high elevation tracts in Mahasu, Chamba and Sirmur districts, which vary in altitude from 7000 ft to 10,000 ft. above sea level. The area is mostly under forests and only in some parts potato and temperate fruits are grown. There are good grazing grounds in the region.

The soils of this area are generally more shallow than those in High hills zone. They range from slightly acidic to moderately acidic. The surface drainage is very good and the sub-soil drainage is fairly good. The carbon and nitrogen contents are very high.

Dry hill zone :—Chini *tehsil* of Mahasu districts and Pangi *tehsil* of Chamba district, where rainfall is almost negligible, form a separate zone called the Dry hill zone. These areas are suitable for the cultivation of dry fruits.

4. Rainfall and climate :-

Himachal Pradesh is largely a mountainous territory with an altitude ranging from 2000 ft. to 22,000 ft. and climate conditions accordingly vary from the semi-tropical to semi-arctic. The climate in Beas valley is similar to that of Kangra and Shivalik area. The heat in summer is intense though less severe than that experienced in the plains of Punjab. The rainy season is heavy and prolonged. Winter is pleasant and bracing, with only a moderate variation in the day and night temperatures. Snow fall is rare. In the upper portions of Bhattiyat, adjoining the high range, the climate is temperate. The rainfall is very heavy, and in winter snow fall is quite heavy for some months as on main range.

In the Ravi valley, the climatic conditions vary with altitude. In the lower portion they are semi-tropical in character. The heat is more and rainy season well-marked, while the winter is mild, and the snowfall light. In Chamba the average maximum temperature is about 80° F and the average minimum about 56° F, though temperatures of 108° F and 30° F have also been recorded. From there upwards the conditions are most severe and vary from temperate to semi-arctic.

In the Chandrabhaga valley the climate is temperate in summer and semi-arctic in winter. As the lowest altitude in the Pangi valley is 7000 ft., severe heat is never experienced. The summer is exceedingly mild and pleasant while owing to scanty rainfall, humidity is always low. The winter generally is very severe. Snowfall begins in October and after December the whole valley is under snow till March or April. Communications are sometimes cut off and the villages are completely isolated.

The yearly average rainfall in Chamba is about 50″. The major portion of it falls during the summer months from June to September. The average being 25″. The average precipitation between January and May is about 21″. The remaining months of the year i.e. from October to December, show an average of only 3″ to 4″. The rainfall is heaviest in the Dhaula, Dhav and Pangi ranges.

In Bhattiyat,south of Dhaula Dhar, the rains are heavy and the Ravi valley also receives a fair porportion of rain. The Brahmaur area has probably the lowest rainfall. Owing to the high altitude of Pangi range the rain clouds deposit most of their burden on its southern slopes and only a part of the rain cloud reaches the Chandrabhaga valley, where it rains in heavy showers during July and August. The yearly average is not more than 25″.

In Simla hills, the monsoon rains are heaviest in the southern parts. The rainfall becomes less and less towards the south-west and north-east and is practically nil in the northern portion of a Kanawar in Bushahr.

Along the valley of Sutlej as far east as Wangtu and on Pabar side of the water shed, the rainfall does not greately vary from that at Simla (i. e. about 65″), but beyond Wangtu the difference is considerable, the rainfall becoming less and less as Shipki is approached so that the climate of upper Kanawar is semi-arid. West of Wangtu the Sutlej valley has an annual rainfall of about 70″. At Kilba, ten miles east of Wangtu, this drops to 43″ and at Poe, some twelve miles from the border at Shipki to 16″. The monsoon is spent before it reaches Chini. During summer months heat is intense along the Sutlej, and in the secluded valeys at low elevations. The Pabar valley is too hot, the temperature in inhabited places is moderate in summer, and in the Kanawar valley the winters are comparatively genial. The snow line varies with locality and is lower in the north than in the south side of hills.

5. Irrigation :

Out of the cropped area of about 685 thousand acres in the State only about 14.3 per cent was irrigated and the source of irrigation for almost the whole area is other than canals, tanks and wells.

6. Agricultural production and normal cropping pattern :-

Rabi Crops :- The principal *rabi* crops are wheat, barley, paddy, peas, coriander and lentils.

Wheat : It is the principal food crop, grown mostly at lower and mid elevations. Wheat is grown generally as a rainfed crop as very limited irrigation facilities are available.

Barley : It is generally grown in *bakhal* lands.

Kharif Crops :- These consists mainly of maize, paddy, sugarcane, potato, millets and *bhang*. Maize is grown abundantly throughout the State and paddy is alternated with maize and is grown both as rainfed and irrigated crop.

Gram is grown on a small scale in Bilaspur district and some other areas of lower elevation. Sugarcane is grown in the valleys adjoining the plains, particularly in Paonter valley and parts of Sirmur and Sundernagar in Mandi district.

Potato is the most important cash crop of Himachal Pradesh. The rural economy largely depends on the seed potato produced for export which meets nearly 20% of the total seed requirements of the country. The production is concentrated mainly in Mahasu district, being more than 70% of the total quantity of seed potato produced in the State.

Two crops of potato are raised annually, but the summer crop is more important as 98% of total potato growing area is devoted to its cultivation.

Himachal Pradesh is best suited for cultivation of disease free ginger seed, but the acreage under the crop is small. It is grown mostly in Sirmur and Mahasu districts.

Fruits : Apple, pear, peach, apricot and plum are the principal fruits grown in the State. Their cultivation is mostly confined to Kotgarh, Kotkhai Suburbs of Simla, Arki, Solan and Rampur-Bushahr in Mahasu district. Citrus fruits are also grown at places, mainly in the sub-montane parts of Sirmur and Mandi districts.

The table 2 below shows the area and production of different crops in the State.

TABLE 2

Area, production and average yield per acre of principal crops of Himachal Pradesh (1963-64).

Crop	Area in '000 acres	Production in '000 tons.	Av. yield in lb./ac.
Paddy	114	37.4	735
Wheat	356	103.3	650
Barley	72	12.8	398
Maize	301	169.3	1260
Ragi	37	7.9	478
Small millets	62	9.8	354
Gram	15	2.0	299
Other pulses	54	5.9	(c)
Rape seed and mustard	7	1 0	320
Linseed	2	(b)	(c)
Sesamum	5	(b)	(c)
Sugarcane	5	2.0	896
Potato	30	28.5	2128

(b) below 500 tons. (c) below 200 lb./ac.

(The source of the above information is "Agricultural situation in India Vol. 20 1965-66")

7. Agricultural Research Stations and Experimentation.

Only 86 experiments were reported from different Agricultural Research Stations of Himachal Pradesh for the period 1954-59. The distribution of these experiments crop wise and type-wise is given in table 3 below :

TABLE 3.

Crop-wise and type-wise distribution of the number of experiments.

Crop	M	MV	C	CV	CM	CMV	Total
Paddy	4	—	—	—	—	—	4
Wheat	9	1	2	—	—	1	13
Barley	—	1	—	—	—	—	1
Maize	5	—	—	—	2	—	7
Pea	1	—	—	—	—	—	1
Cabbage	1	—	—	—	—	—	1
Potato	40	2	4	1	1	—	48
Berseem	1	—	—	—	—	—	1
Apple	7	—	2	—	—	—	9
Sweet orange	—	—	1	—	—	—	1
Total	68	4	9	1	3	1	86

Besides these, there are 42 experiments conducted under the co ordinated Model Agronomic project of the Indian Council of Agricultural Research which are also included in this compendium. Research stations at Shilaroo, Kamarah and Mashlara are a few of the important ones in the State.

Mostly the experiments are of manurial type and over 50% of the experpriments are conducted on potato crop. About 72% of the experiments are laid out in Randomised Block Design while 20% and 8% of the experiments are laid out in confounded and split-plot designs. The minimum and maximum plot sizes adopted in the experiments are 2.92 sq. yds. and 60.5 sq. yds. respectively. Maximum number of plots taken in a Randomised Block Design is 16 and maximum number of replications is 8.

JAMMU & KASHMIR

1. General :

The State of Jammu and Kashmir has an area of about 85,861 sq. miles. It is extending from 32°17′ to 36°58′ N latitude and 73°26 to 80°30′ E longitude. It is situated east of Indus and west of Ravi. For administrative purposes the State is divided into 2 regions viz. Jammu, comprising Jammu, Kathua, Udhampur and Doda districts and Kashmir comprising Srinagar, Baramulla, Anantnag and Ladakh districts. Land utilization statistics of the State are given in table 1 below :

TABLE 1

Land utilization statistics of Jammu and Kashmir (1961-62).

Classification of area	in '000 acres
Reporting area as per village papers	12,037
Forests	7,743
Land put to non-agricultural uses	699
Barren and unculturable land	657
Permanent pastures and other grazing lands	299
Land under miscellaneous tree crops and groves etc.	321
Culturable waste	400
Fallows other than current fallows	28
Current fallows	267
Net area sown	1,623
Total cropped area	2,000
Area sown more than once	377

(Source : 'Agricultural Situation in India' 1964-65 Vol. 19).

2. Topography :

The State shows two broad physical divisions. The south-western division through which flow Jhelum, Kishanganga and Chenab and the north-eastern division which comprises the area drained by Indus and its tributaries. The south-western region may be divided into three parts : the belt of the outer hills, the middle mountains and the Kashmir valley. The north-eastern region has three administrative divisions, namely, Ladakh or Little Tibet, Baltistan which is called *Chira Bhotan* by the Kashmiris and Dardistan. The dividing line between the two regions is formed by the great central mountain range which runs from Nanga Parbat in a south-east direction for about 240 miles before it enters the territory of Lahaul.

3. Soils :

In Kashmir valley the soils are texturally clay loam to loam and nitrogen content varies from 0.4% to 0.08%. Nitrogen content is usually high in or near forest areas under cultivation whereas it is low in eroded areas locally known as '*Karewas*'. Phosphate and Potash content of the soils are usually high throughout the valley. The soils are mostly Calcium soils with high Magnesium content. In low lying areas, there is accumulation of Iron and Alluminium in B horrizon with characteristic mottlings. The pH value of the soils lies between 6.5 and 7.2 except in areas near the forests where the soils are acidic. The Kashmiris recognise four classes of soil. These are known as *Grutu*, *Bahil*, *Sekil and Dazanlad*. *Grutu* soil contains a large proportion of clay. It holds water and in years of scanty rainfall is the safest land for rice. But if the rains become heavy, the soil cakes and the out-turn of the crop is poor. *Bahil* is rich loam of great natural strength and there is always a danger that by over-manuring the soil may become too strong and plant run to blade. *Sekil* is light loam with a sandy sub-soil and if

there be sufficient irrigation and good rains, the out-turn of rice is always large. *Dazanlad* soil is chiefly found in low lying areas near the swamps, but it sometimes occurs in the higher villages also. Special precautions are taken to run off irrigation water when the rice plant shows signs of too rapid a growth and if these are taken in time, the out-turn in *Dazanlad* land is sometimes very heavy. A peculiarity of this soil is that the irrigation water turns red in colour. Near the banks of Jhelum and in the vicinity of the Wular lake, is found a rich, and peaty soil *(nambal)* which in years of fair rainfall yields enormous crops of rapeseed and maize. This will not produce rice and requires no manure. It is, however, custom to burn standing weeds and the stubble of the previous year's crop before ploughing.

The '*karewas*' which form a striking feature in the scenery of the country, form the most part of *grutu* soil, with varieties distinguished by colour. The most fertile is the dark blackish soil known as *Surhzamin*, the red *Grutu* is the next best, while yellow soil is considered worst of all. Below Jammu is the sub-mountane region and the foot hill soils are of alluvial nature. Above Jammu the whole region is mountainous with small valleys here and there. The texture of the soils is loam to sandy loam Nitrogen content varies from 0.08 to 0.14 per cent. Phosphate and potash are moderate, pH of the soils in this region is above 7.0.

4. Rainfall and climate :

The climatic conditions in Kashmir show great diversity due to marked differences in the altitude of various regions, the elevation varying from 1200 ft. at Jammu to 25000 ft. on the highest mountain peaks.

The mean daily temperature is the lowest in January and highest in June or July. At Srinagar, the average for January is about 33° F, and for July, which is the hottest month, about 74° F. The range of temperature between maximum and minimum is 25° to 75° F at Skardu; 3° to 65° F at Deas, 18° to 62° F at Leh and 37° to 85° F at Gilgit. The noteworthy features of the annual variation are the very rapid increase of temperature in March or April at the end of winter and an equally rapid decrease in October when skies clear after the south-west monsoon.

The precipitation is confined to two well defined periods namely winter season from December to April, and south-west monsoon periods from June to September. The rainfall in October and November is small in amount and November is usually the driest month of the year. The cold season precipitation from December to March is chiefly due to storms from Persia and Baluchistan. These disturbances occasionally give very stormy weather in Kashmir with violent winds on the higher elevations and much snow.

5. Irrigation :

Out of 1.623 million acres of cropped area about 677 thousand acres are irrigated. The distribution of this area covered by different sources of irrigation is given in table 2 below :

TABLE 2

Source of irrigation	Area in '000 acres	%
Govt. Canals	153	22.6
Private canals	480	70.9
Tanks	—	
Wells	12	1.8
Other sources	32	4.7
Total	677	100.0

6. Agricultural production and normal cropping pattern :

The principal crops of the State are paddy, maize, cotton, saffron, tobacco, millets, *amarnath*, buck-wheat, pulses and sesamum in the autumn and wheat, barley, poppy, rape flax, peas and beans in the spring. In Kashmir rice and maize are main crops while in Jammu, wheat and maize are the main crops.

Rice : Rice is grown throughout the entire Kashmir part of the State. There are a number of varieties of rice grown in Kashmir, but they may roughly be divided into two classes, the white and the red. The white varieties are held in esteem, the best among them being the *basmati* and the *kanyum*.

Maize : In importance, maize is second only to rice. Enormous crops are raised in the black peaty land bordering the banks of Jhelum, as also in the high tracts occupied by the *Guzar* graziers.

Another important millet is *Cheena* or *ping (panicum miliaceum)* which is very much like rice in appearance, but is grown on dry land.

Amarnath : The *ganhar* or *amarnath*, with its fold, coral and crimson stalks and flowers is an exceeding beautiful crop. It is frequently sown in rows in the cotton fields or on borders of maize plots.

Buck-Wheat : *Trumba* or buck-wheat *(Fagopyrum esculentum)* is a very useful plant as it can be sown late in any soil.

Pulses : Pulses till lately were not popular, only *mung (Phaseolus mungo)* was having some importance. The other pulses are *mah (Phaseolus radiatus)* and *methi (P. acenitigolium)*.

Oilseeds : The principal oilseed is rape. Linseed is cultivated all over the valley, but best fields are on the lower slopes of mountains. *Til* is also a very common crop.

Cotton : Cotton is grown up to a certain elevation only. Its cultivation is concentrated mostly in the *Karewas* and low lying rice land.

Wheat and Barley : These are the major spring crops of the valley. From the point of view of area, barley is more important of the two.

Saffron : It is cultivated in the vast plateau of Pampur.

Fruits : Kashmir is a land of fruits and flowers. Apple, peas, vine, mulberry, walnut, hazel, cheug. peach, apricot, raspberry, goosebery, currant, plum and strawberry are grown in most parts of the valley.

The table 3 below shows the area, production and yield per acre of the principal crops in the State.

TABLE 3

Area, production and yield per acre of the principal crops of Jammu and Kashmir

Crop	Area in '000 acres	Production in '000 tons	Yield in lb./ac.
Paddy	558	248.9	999
Wheat	427	112.1	588
Bajra	61	11.8	433
Maize	593	186.9	706
Barley	44	12.7	647
Small millets	61	15.7	577
Pulses	121	19.6	363
Sugarcane	3	17.7	5.9*
Oilseeds	85	15.7	414

*tons/ac.

7. Agricultural Research Stations and Experimentation :

78 experiments in all were reported from different Agricultural Research Stations of the State of Jammu and Kashmir for the period of 1954-59. The distribution of these experiments crop-wise and type-wise is given in the table 4 below :

TABLE 4

Crop-wise and type-wise distribution of the number of experiments

Crop	M	MV	C	CV	CM	CMV	Total
Paddy	3	16	2	7	—	4	32
Wheat	7	1	—	8	—	—	16
Potato	6	—	—	—	—	—	6
Onion	—	—	3	—	4	—	7
Sugarbeet	—	3	—	—	—	—	3
Knolkhol	—	—	—	—	—	3	3
Cauliflower	—	—	—	—	1	—	1
Saffron	4	—	6	—	—	—	10
Total	20	20	11	15	5	7	78

Agricultural Research Stations at Kawa and Shalimar are the main stations in the State where maximum number of experiments were conducted during 1954—59. About 50 per cent of the reported experiments are of manurial type and a little over 40 per cent of the experiments are conducted on paddy crop. About 77% of the experiments are laid out in Randomised Block Design while the remaining of them are in split-plot design. The net plot size adopted in the experiments varies from 4 sq. yards to 60 sq. yards. Maximum number of plots taken in a R.B.D. is as high as 81 and in the case of a split-plot design as many as 16 sub-plots were taken in a main-plot.

PARTICULARS OF RESEARCH STATIONS, PUNJAB STATE

1. Cotton Research Station, Abohar.

A. General information :

(i) In Fuzellea *tehsil* of Ferozepur district. (ii) Dry area. (iii) Established in 1949. (iv) Cotton—Fallow—cotton ; Gram or wheat—Cotton. (v) Scheme for breeding of extra long staple cotton and scheme for the study of agronomy and physiology of cotton.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
3	2	8	16	—	—	—	—	—	10	—	—	39

(The average rainfall data is for the year 1966—67.)

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation is done by canal since 1949. (ii) Well drained soil.

D. Soil type and soil analysis :

(i) Sandy loam to loamy soil. Shallow, darkish brown and light brown in colour, semi loose to loose in structure. (ii) Chemical analysis and (ii) Mechanical analysis—N.A.

E. No. of experiments :

Wheat—6, Cotton—59, *Toria*—3 and *Berseem*—3, Total=71.

2. District Demonstration Farm, Ambala.

A. General information :

(i) In Ambala *tehsil* of Ambala district. (ii) Plain tract. (iii) Established in 1945. (iv) and (v) N.A.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
11	31	24	26	1	—	2	5	5	2	1	—	108

(Average rainfall data is based on the period 1960—1962).

C. Irrigation and drainage facilities and *D. Soil type and soil analysis* :

Information—N.A.

E. No. of experiments :

Wheat—1, Gram—1, Sugarcane—1, Cotton—2, Total=5.

3. Fruit Research Station, Attari.

A. General information :

(i) In Amritsar *tehsil* of Amritsar district. (i) Plain tract. (iii) to (v) N.A.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
8	19	18	22	1	—	2	5	2	3	1	—	76

(Average rainfall data is based on the period 1960—1962).

C. Irrigation and drainage facilities and *D. Soil type and soil analysis* :

Information—N.A.

E. No. of experiments :

Grape fruit—4, Malta—3, Sweet lime—4, Total=11.

4. Soil Conservation Research Demonstration and Training Centre, Chandigarh.

A. General information :

(i) In Kharar *tehsil.* (ii) Sub-mountain tract. (iii) Established in 1956. (iv) and (v) N.A.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
9	29	22	28	2	1	3	6	5	3	1	—	109

(Average rainfall data is based on the period 1960 to 1962).

C. Irrigation and drainage facilities and *D. Soil type and soil analysis :*

Information—N.A.

E. No. of experiments :

Wheat—3, *Moong*—2, *Arhar*—2, *Soyabean*—2, *Lobia*—4, Groundnut—2, *Guara*—2, Grass—1, Total=18.

5. Oilseed Research Station, Faridkot.

A. General information :

(i) In Faridkot *tehsil* of Bhatinda district. (ii) Plain tract. (iii) Established in 1910. (iv) and (v) N.A.

B. Normal rainfall in cm. to *D. Soil type and soil analysis :*

Information—N.A.

E. No. of experiments :

Mustard—5, *Toria*—9, *Taramira*—2, Castor—1, *Raya*—2. Total=19.

6. Cotton Research Station, Faridkot.

A. General information :

(i) In Faridkot *tehsil* of Bhatinda district. (ii) Dry area. (iii) Established in 1910. (iv) Cotton—fallow—cotton ; Wheat or gram—cotton. (v) Improvement of cotton in western district of Punjab.

B. Normal rainfall in cm. and *C. Irrigation and drainage facilities :*

Information—N.A.

D. Soil type and soil analysis :

(i) Sandy loam to sandy soil. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Cotton—33, Maize fodder—1, Total=34.

7. Agricultural Experimental Farm (Millets Sub-Station), Ferozepur.

A. General information :

(i) In Ferozepur *tehsil* of Ferozepur district. Latitude 30°, Longitude 75° and Altitude 649 feet above the mean sea level. (ii) It represents Central Punjab tract. (iii) Established in 1941. (iv) Gram—fallow—gram barani ; *Bajra*—wheat—fallow and *Bajra*—tobacco—fodder. (v) Evolution of varieties of gram and *bajra* for irrigaed barani area of Punjab.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
3	10	10	15	—	—	1	2	1	1	1	1	45

(Average rainfall data is based on the period 1958—1962).

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation is done with the help of Persian wheels and seasonal canal from the very establishment of the farm. (ii) No proper drainage system exists.

D. Soil type and soil analysis :

(i) Loam, sandy loam and clay loam, 2' deep, light brown in colour. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Bajra—1, Gram—1, Tobacco—58, *Bajra* fodder—4, Total=64.

8. Oilseed Sub-Station, Gummar.

A. General information :

(i) In Dehra Gopipur *tehsil* of Kanjra district. Latitude 32°, longitude 72° and altitude 2000'. Plots are in terraces. (ii) Hilly area. (iii) Established in 1959. (iv) Sesamum—paddy—linseed and wheat. (v) N.A.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
9	29	55	28	1	3	6	7	5	8	5	3	159

(Average rainfall data is based on the period 1960—1964).

C. Irrigation and drainage facilities :

(i) (a) and (b) Barani. (ii) Proper drainage system exists for normal rainfall.

D. Soil type and soil analysis :

(i) Sandy loam, clay loam and marshy land, light grey. reddish grey and black soil respectively. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Maize—3, Total=3.

9. Government Agricultural Station, Gurdaspur.

A. General information :

(i) In Gurdaspur district. 4 furlongs from Gurdaspur Railway Station. Levelled fields. (ii) Sub-montaneous tract. (iii) N.A. (iv) Wheat—g.m.—wheat—, wheat—maize—wheat, Wheat—paddy—wheat, Wheat—maize—*berseem* and maize—*berseem*—maize. (v) Varietal, manurial trials are conducted on different crops.

B. Normal rainfall in cm. and *C. Irrigation and drainage facilities* :

Information—N.A.

D. Soil type and soil analysis :

(i) Single grain of sub-angular blocky, upto 3' deep, grey to reddish brown in colour. (ii) Chemical analysis : Conductivity—0.1 to 0.2, Organic matter—0.2 to 0.8 and pH—7.0 to 7.6. (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—24, Wheat—43, Maize—23, *Mash*—1, Cotton—9, *Berseem*—7, Total=107.

10. Rice Breeding Sub-Station, Gurdaspur.

A. General information :

(i) In Gurdaspur *tehsil* of Gurdaspur district. Altitude—1000′. Humid area with abundant rainfall. (ii) Sub-montaneous. (iii) Established in 1950. (iv) Rice—lentil ; Rice—Gram ; Rice—wheat. (v) Breeding varieties for this tract.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
5	36	33	23	1	1	9	5	2	4	1	1	121

(Average rainfall is based on the period 1960—1964).

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation is done by canal warer in *Kharif* season. (ii) No proper drainage system exists.

D. Soil type and soil analysis :

(i) Loamy sand, 4′ to 5′ deep and brown in colour. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—6, Total=6.

11. Sugarcane Sub-Station, Gurdaspur.

A. General information :

(i) In Gurdaspur *tehsil* of Gurdaspur district. Latitude 32.03°E, longitude 75.25°N, altitude 875′ above sea level. Even land. (ii) Sub-montane tract. (iii) Established in 1948. (iv) Wheat—maize—*senji*—sugarcane. (v) Development of high yielding and resistant varieties of sugarcane suitable for cultivation in the sub-montane tract of Punjab.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
2	13	6	7	3	—	1	3	1	1	1	—	38

(Average rainfall data is for the year 1963—1964).

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation is done by tube well and canal since 1948. (ii) Proper drainage system exists.

D. Soil type and soil analysis :

(i) Chest nut coloured soils of alluvial origin. Sandy loam to loams, silty loam to clay loam. Brown, yellowish and dark brown. Moderately well drained soil. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Sugarcane—14, Total=14.

12. Barley Research Station, (Tobacco Sub-Station), Gurgaon.

A. General information :

(i) In Gurgaon *tehsil* of Gurgaon district. Latitude 28°—34′ N, longitude 77°—07′E and altitude 765′ above mean sea level. Moderate to gently slopping. (ii) Dry arid zone. (iii) Established in 1919. (iv) Oilseed—fallow—wheat ; Oilseed—fallow—barley ; Tobacco—

fallow – wheat. (v) To evolve high yielding, early maturing varieties of barley, oilseeds, tobacco suitable for growing in arid tracts, besides testing of *bajra*, gram and wheat varieties.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
3	22	12	17	11	—	—	3	2	1	—	1	72

(Average rainfall data is based on the period 1954 to 1959).

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation facilities are available since 1954. (ii) No proper drainage system exists.

D. Soil type and soil analysis :

(i) Sandy loam, 36" deep, pale brown to yellowish and sub-angular blocky. (ii) Chemical analysis and (iii) Mechanical analysis : The fields are extremely light containing about 90% fine sand. Comparatively low amounts of calcium carbonate, organic matter (carbon) and total nitrogen are normally associated with light soil texture. Generally most of the fields are alkaline and *kallar* appears in patches.

E. No. of experiments :

Wheat—2, Barley—1, Tobacco—4, Total=7.

13. Oilseed Research Sub-Station, Gurgaon.

A. General information :

(i) In Gurgaon district, 4 miles from Gurgaon Railway Station. (ii) South eastern district of Punjab. (iii) Established in 1952. (iv) Groundnut in *khàrif* and *brassica* oilseeds in *rabi*. (v) To evolve high yielding varieties of oilseeds for south-eastern districts of Punjab.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
65	476	513	377	210	7	26	54	1	51	10	8	1798

(The average rainfall data is based on the period 1956—1960).

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigated by pump set since 1956. (ii) No proper drainage system exists.

D. Soil type and soil analysis :

(i) Sandy loam to loam soil, deep alluvial soils and brown in colour. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Groundnut—1, Mustard—6, Castor—2, *Raya*—7, Total=16.

14. Government Research Station, Hansi.

A. General information :

(i) In Hissar district, 4½ miles from Hansi Railway Station. (ii) South-eastern district of the state. (iii) Established in 1914. (iv) Wheat, cotton, sugarcane, *methi*, lincerence and barley are the major crops.

B. Normal rainfall in cm. :

Annual rainfall is about 42 cm.

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation is done by canal. (ii) No proper drinage system exists.

D. Soil type and soil analysis :

(i) Loam to clay loam. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—11, Maize—21, *Berseem*—7, *Jowar* fodder—5, Total=44.

15. Cotton Research Station, Hansi.

A. General information :

(i) In Hansi *tehsil* of Hissar district. (ii) Clay loam. (iii) Established in 1939. (iv) Cotton—fallow—cotton ; Gram or wheat—cotton. (v) Improvement of cotton for south eastern tract of State. Newly developed strains are tested in replicated trials. In addition to this, genetic collection is maintained for use in crossing programme.

B. Normal rainfall in cm. :

Information—N.A.

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation facilities are available since the inception of the farm. (ii) Proper drainage system exists.

D. Soil type and soil analysis :

(i) Clay loam, very deep, blackish in colour. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Wheat—40, Cotton—46, *Berseem*—4, Total=90.

16. Jullundur Agriculture Station, Jullundur.

A. General information :

(i) In Jullundur district, ½ mile from Jullundur Railway Station. (ii) Central Punjab tract. (iii) Established in 1914. (iv) Wheat—cotton—sugarcane—maize—Groundnut and Potato etc. (v) N.A.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
3	28	23	11	—	1	1	1	1	2	1	1	73

(Average rainfall data is based on the period 1963—1964).

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation is done by tube well. (ii) No proper drainage system exists.

D. Soil type and soil analysis :

(i) Loam, sandy loam and sandy. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Wheat—7, Maize—5, Potato—4, Sugarcane—2, Cotton—23, Groundnut—5, *Toria*—2, Total=48.

17. Sugarcane Research Station, Jullundur.

A. General information :

(i) In Jullundur district. One mile from Jullundur Cantt. Railway Station. Flat land. (ii) Central tract of Punjab. (iii) Established in 1947. (iv) Sugarcane. (v) Research on evolution, testing and selection of sugarcane varieties. Combining high yield and sugar contant and resistance to drought, frost and water logging. To conduct cultural, manurial, irrigational experiments and control measures for different pests and diseases.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
135	512	525	316	112	15	46	88	81	83	28	33	1974

(The average rainfall data is based on the period 1933 on 1963.)

C. Irrigation and drainage facilities :

(i) Irrigation facilities are available since 1952. (ii) Four pumping sets and one tube well. (b) Proper drainage facilities are available.

D. Soil type and soil analysis :

(i) Single grain to clay soil, dull grey, deep and leached soils. (ii) Chemical analysis : Organic carbon—0.2 to 0.5%, total N—0.04 to 0.06%, pH—6.8 to 7.0. (iii) Mechanical analysis : Loamy sand to sand loam.

E. No of experiments :

Sugarcane—43, Total=43.

18. Cotton Research Station, Jullundur.

A. General information :

(i) In Jullundur *tehsil* of Jullundur district. (ii) Sandy loam. (iii) Established in 1948. (iv) Cotton after cotton. (v) Breeding high yielding superior cotton varieties with particular reference to jassid resistence.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
4	17	15	18	12	—	—	2	5	6	1	2	82

(The average rainfall data is based on the period 1954—1956.)

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation facilities are available since 1948. (ii) Proper drainage system exists.

D. Soil type and soil analysis :

(i) Tropical, very deep, brownish in colour. (ii) Chemical analysis and (ii) Mechanical analysis—N.A.

E. No. of experiments :

Wheat—29, Cotton—39, *Toria*—3, *Berseem*—8, Total=79.

19. District and Demonstration Farm, Kangra.

A. General information :

(i) In Kangra *tehsil* of Kangra district. (ii) Sub-mountain tract. (iii) to (v) N.A.

B. Normal rainfall in cm. to D. Soil type and soil analysis :

Information—N.A.

E. No. of experiments :

Paddy—1, Wheat—2, Maize—3, *Soyabean*—1, Total=7.

20. Agricultural Station, Karnal.

A. General information :

(i) In Karnal district, 3 miles from Karnal Railway Station. (ii) N.A. (iii) 1929. (iv) Sugarcane, cotton, barley and wheat are the major crops. (v) N.A.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
2	16	28	14	4	—	5	5	2	1	—	—	77

(Average rainfall data is based on the period 1960 to 1962).

C. Irrigation and drainage facilities .

(i) (a) and (b) Irrigation it done by canal. (ii) No proper drainage system exists.

D. Soil type and soil analysis :

(i) Clay loam. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—1, Wheat—1, Maize—1, *Soyabean*—1, Cotton—1, Total=5.

21. Horticultural Research Station, Kulu.

A. General information :

(i) In Kulu *tehsil* of Kulu district. 90 miles from Joginder Nagar Railway Station. Clay loam abounding in stones. (ii) Temperate zone. (iii) Year of establishment—N.A. (iv) Fruit gardens and nurseries. (v) Varietal, manurial, collection and comparative trials.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
6	1	5	15	—	3	7	—	5	24	7	7	80

(Average rainfall data is for the year 1962—63.)

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation facilities are available since 1956. (ii) No proper drainage system exists.

D. Soil type and soil analysis :

(i) Clay loam. (ii) Chemical analysis : Organic carbon—1.652, C/N ratio—10 : 1, organic matter—2.154, Calcium carbonate—0.100, total nitrogen—0.176, pH—6.40. (iii) Mechanical analysis : Coarse sand—14.57%, fine sand—14.73%, silt—46.62% and clay—27.78%.

E. No. of experiments :

Apple—1, Total=1.

22. Cereal Breeding Sub-Station, Kulu.

A. General information :

(i) In Kulu *tehsil* of Kulu district. Altitude—4000 feet. The lands which are under experiments on different crops are thoroughly levelled. (ii) Hilly tract. (iii) N.A. (iv) Wheat

and barley during *rabi* and pulses during *kharif*. (v) To evolve suitable varieties of wheat, barley and pulses for the district.

B. Normal rainfall in cm. :

Information—N.A.

C. Irrigation and drainage facilities :

(i) (a) and (b) No irrigation facilities are available. (ii) Proper drainage system exists except for 2 acres of experimental area.

D. Soil type and soil analysis :

(i) The soil of Katrain farm is light and that of Kulu farm is quite rich and heavy. Light grey in colour and loam in structure. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—2, Total=2.

23. Rice Breeding Sub-Station, Nagrota Bagwan.

A. General information :

(i) In Kangra *tehsil* of Kangra district. Altitude—1891'. Fields in terraces. (ii) Hilly tract. (iii) Established in 1936. (iv) Paddy—wheat—paddy. (v) Improvement in paddy varieties for hill areas.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
9	29	56	28	1	3	6	7	5	8	5	3	159

(Average rainfall data is for the year 1960 to 1964.)

C. Irrigation and drainage facilities

(i) (a) and (b) Irrigation is done with the help of *Kuhal* since 1936. (ii) There is no necessity of drainage, as the land is sloppy.

D. Soil type and soil analysis :

(i) Clayey loam, brownish in colour and clayey structure. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—4, Wheat—1, Total=5.

24. Government Experimental Tea Farm, Palampur.

A. General information :

(i) In Palampur *tehsil* of Kangra district. Altitude 4000' feet above sea level. (ii) Palam area. (iii) Established in 1939. (iv) Tea. (v) Collection and evalution of tea varieties etc.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
24	74	77	38	4	1	5	—	6	26	1	3	259

(Average rainfall data is for the year 1966—1967).

C. Irrigation and drainage facilities :

(i) (a) and (b) No irrigation facilities are available. (ii) Proper drainage system exists.

D. Soil type and soil analysis :

(i) Loam and clay loam, 24" to 60" deep, black and red in colour. (ii) Chemical analysis : pH—5.50 to 6.20, organic carbon—0.350 to 1.545%, available nitrogen—274 to 619 lb./ac. and available P_2O_5—Very low : (iii) Mechanical analysis—N.A.

E. No. of experiments :

Tea—19, Total=19.

25. Soil Sub-Station, Rauni.

A. General information :

(i) In Patiala *tehsil* of Patiala district. Latitude—30.35° N, Longitude 76.39° E and Altitude 710'. Levelled Farm. (ii) and (iii) N.A. (iv) Rice—wheat—rice—fallow—rice. (v) Agronomic trials.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
—	24	11	—	1	—	—	3	1	—	5	4	49

(Average rainfall data is for the year 1965—1966.)

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation is done by canal water and the system is very old. (ii) Natural surface drainage system exists.

D. Soil type and soil analysis :

(i) Sandy loam, deep, light grey and brown in colour. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—6, Wheat—12, Sugarcane—5, *Berseem*—1, Total=24.

26. Cotton Research Station, Rauni.

A. General information :

(i) In Patiala *tehsil* of Patiala district. (ii) Central Punjab. (iii) Established in 1922 (iv) Cotton—fallow—cotton, wheat or Gram—cotton. (v) Improvement of cotton strains.

B. Normal rainfall in cm. to *D. Soil type and soil analysis :*

Information—N.A.

E. No. of experiments :

Cotton—12, Total=12.

27. Soil Sub-Station, Rohtak.

A. General information :

(i) In Rohtak *tehsil* of Rohtak district. (ii) Plaintract. (iii) Established in 1928. (iv) and (v) N.A.

B. Normal rainfall in cm. to D. Soil type and soil analysis :

Information—N.A.

E. No. of experiments :

Wheat—13, *Jowar*—2, *Bajra*—2, Gram—6, Sugarcane—7, Cotton—11, *Bajra* fodder—1, Oats fodder—1, Total=43.

28. Government Agricultural Farm, Rohtak.

A. General information :

(i) In Rohtak *tehsil* of Rohtak district. Latitude—28.87° N, longitude—76.64° E. Normal levelled fields. (ii) Arid brown soils. (iii) N.A. (iv) *Bajra*—Gram, Wheat—Fallow—Wheat, *Jowar (cheri)*—gram—wheat. (v) To conduct manurial and micronutrient trials.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
—	—	23	10	3	—	—	—	—	—	—	3	39

(Average rainfall data is for the year 1965—1966).

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation facilities are available since very long. (ii) Natural surface drainage system exists.

D. Soil type and soil analysis :

(i) Sandy loam, very deep soil, light brown in colour, angular to sub-angular blocky. (ii) Chemical analysis : pH—8.0, E.C.%—0.33, organic carbon—0.27% and available P_2O_5—15.0 lb./ac. (iii) Mechanical analysis—N.A.

E. No. of experiments :

Gram—1, Total=1.

29. Millets Breeding Sub-Station, Rohtak.

A. General information :

(i) In Rohtak *tehsil* of Rohtak district. Latitude 28° 55′ N, longitude 76° 35′ E, altitude 718′. Good sandy loam to loam soil. (ii) Haryana tract. (iii) and (iv) N.A. (v) Research on gram and *bajra.*

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
3	16	23	7	1	1	1	1	2	1	—	1	57

(Average rainfall data is for the year 1960—1964).

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation is done by canal and tube well. (ii) Proper drainage system exists.

D. Soil type and soil analysis :

Information—N.A.

E. No. of experiments :

Gram—1, Total=1.

30. Groundnut Experimental Farm, Samrala.

A. General information :

(i) In Samrala *tehsil* of Ludhiana district. Latitude 31° N, altitude 700′. The fields are levelled. (ii) Sandy soils with annual rainfall of about 35″. (iii) Established in 1946. (iv) Groundnut—Fallow—Groundnut. (v) To evolve and test groundnut varieties suitable for rainfed conditions and to determine their agronomic requirements.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
3	28	25	17	4	—	3	4	1	4	—	—	89

(Average rainfall data is for the year 1958—1964).

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation is done by Persian wheel since 1956. (ii) No proper drainage system exists.

D. Soil type and soil analysis :

(i) Sandy loam, sufficiently deep. (ii) Chemical analysis and (iii) Mechanical analysis :

Depth	0″—6″	6″—12″	12″—24″
pH	7.10	7.46	7.30
Conductivity MMH	0.32	0.23	0 21
Organic matter %	0.13	0.19	0.30
Total nitrogen %	0.035	0.039	0.042
Available P_2O_5	0.008	0.005	0 008
Coarse sand%	57.65	47.60	40.65
Fine sand%	22.80	23.55	22.92
Silt %	10.32	15.06	16.88
Clay%	6.48	10.04	14.20
Texture	Sand	Sandy loam	Sandy loam

E. No. of experiments :

Groundnut—15, Total=15.

31. Fodder Research Station, Sirsa.

A. General information :

(i) In Sirsa *tehsil* of Hissar district. One furlong away from Hissar Railway Station. Area is divided into levelled fields of an acre each. (ii) Arid district of Punjab. (iii) Established in 1933, (iv) Fodder crops. (v) Evolution of improved varieties of fodder crops.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
22	116	98	73	35	6	5	12	14	12	3	6	402

(Average rainfall data is for the year 1951—1960).

C. Irrigation and drainage facilities :

(i) (a) Irrigation facilities exist from the start. (b) Canal water—Perennial but running by rotalie. (ii) Proper drainage system exists.

D. Soil type and soil analysis :

(i) Medium loam soil, deep alluvial and grey in colour. (ii) Chemical analysis : Iron available—7.98%, CaO—2.5%, P_2O_5—0.227%, P_2O_5 available—0.067%, K_2O—0.725%, K_2O available—0 033%, Nitrogen—0.076%. (iii) Mechanical analysis : $CaCO_3$—2.0%, organic matter—0.68%, coarse sand—1.78%, fine sand—69.00%, silt—13.60%, clay—12.20% and *Olistre*—6.74%.

E. No. of experiments :

Lobia—1, *Berseem*—17, Cowpea—2, *Guara*—1, *Jowar*—10. *Lucerne*—1, Oats—8, *Senji*—1, Sudan grass—4, Fodder—4, Teosinte—1, Total=50.

PARTICULARS OF RESEARCH STATIONS OF HIMACHAL PRADESH

1. Potato Development and Research Station, Ahla.

A. General information to D. Soil type and soil analysis :

Information—N.A.

E. No. of experiments :

Wheat—1, Potato—7. Total=8.

2. Seed Multiplication-cum-Demonstration Farm, Auhar.

A. General information :

(i) In Ghumarmin *tehsil* of Bilaspur district. 65 miles from Kiratpur Saheb in Punjab. Even surface. (ii) Lower hills tract. (iii) Established in 1938. (iv) Wheat—gram and linseed in *rabi* and Maize—Paddy—Sugarcane and *Sannhemp* in *kharif*. (v) The main object of the farm is the multiplication of pure and disease prefoundation seed of different cereals.

B. Normal rainfall in cm. :

Annual rainfall is about 76 cm.

C. Irrigation and drainage facilities :

(i) (a) and (b) N.A. (ii) Drainage facilities are poor.

D. Soil type and soil analysis :

(i) Sandy loam, 1′ to 1½′, large size pabbles are found below the layer, grey in colour. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Wheat—1. Total=1.

3. Potato Development Station, Bagpashog.

A. General information to D. Soil type and soil analysis :

Informations—N.A.

E. No. of experiments :

Potato—3. Total=3.

4. Cereal Multiplication Farm, Bhanota.

A. General information :

(i) In Chamba district. 67 miles from Pathankot Railway Station. (ii) N.A. (iii) Established in 1949. (iv) Wheat, Rice, Maize and other crops. (v) N.A.

B. Normal rainfall in cm. :

Annual rainfall is about 102 cm.

C Irrigation and drainage facilities :

(i) (a) and (b) Irrigation is done by *kuhal*. (ii) No proper drainage system exist.

D. Soil type and soil analysis :

(i) Loam to sandy loam. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—1, Wheat—2, Maize—4. Total=7.

5. Seed Multiplication-cum-Demonstration, Farm, Deoth.

A. General information :

(i) In Sadar *tehsil* of Bilaspur district. 52 miles from Simla. Uneven surface and undeveloped fields. (ii) Lowar hills of H.P. (iii) Established in 1958. (iv) Wheat—maize with *sannhemp* or *dhaincha* in alternate years. (v) To multipyling the seeds to the needs of the cultivators.

B. Normal rainfall in cm. :

Information—N.A.

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation facilities are available. (ii) No proper drainage system exists.

D. Soil type and soil analysis :

(i) Whitish grey in colour, 6" to 9" deep. Crum, peices of quarts common, irregular shaped. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Maize—1. Total=1.

6. Agricultural Research Station, Dhaulakuan.

A. General information :

(i) In Paonta *tehsil* of Sirmur district. 50 miles from Jagadhari (Yamuna Nagar) (N.R.) Railway Station, connected by lines. Latitude 30°-30', longitude 77°-28' and Altitude 1800', level to undulating with gentle slope 0'—2' per 100 feet length. (ii) Lono hills area of H.P. (iii) Established in 1945. (iv) N.A. (v) Crop improvement and crop production.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
10	57	55	32	12	1	3	8	3	3	1	2	187

(Av. rainfall is for years 1955 to 1963).

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation is done by tube well and pumping sets, since 1963 and 1958 respectively. (ii) Highly satisfactory natural drainage.

D. Soil type and soil analysis :

(i) Sandy loam, 1' to 5' deep, light grey in colour and loose in structure. (ii) Chemical annalysis : pH—6.5, total nitrogen—0.10%, total P_2O_5—0.16%, total K_2O—0.13%. (iii) Mechanical analysis : Coarse sand—3.6%, fine sand—48.9% silt—35.5%, clay—12.0%, Texture—sandy loam.

E. No of experiments :

Paddy—3, *Berseem*—1, Sweet-orange—1. Total=5.

7. Seed Multiplication-cum-Demonstration Farm, Gangloli Basa.

A. General information to D. Soil type and soil analysis

Information—N.A.

E. No. of experiments :

Wheat—1. Total=1,

8. Potato Development Station, Joginder Nagar.

A. General information to D. Soil type and soil analysis :

Information—N.A.

E. No. of experiments :

Potato—2. Total=2.

9. Potato Development Station, Kamrah.

A. General information :

(i) In Kursog *tehsil* of Mandi district. 77 miles from Joginder Nagar Railway Station. The farm is bench terraced. (ii) Hilly tract. (iii) Established in 1954. (iv) Potato—Wheat/fallow—Potato, G.M.—Fallow—Potato, Potato—Pea—G.M.—Potato and Potato—Fallow—Potato. (v) To conduct manurial trials on Potato.

B. Normal rainfall in cm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
18	51	43	21	2	1	1	—	—	—	5	3	145

(Average rainfall is for years 1960 to 1962.)

C. Irrigation and drainage facilities :

(i) (a) and (b) N.A. (ii) Proper drainage system does not exists.

D. Soil type and soil analysis :

(i) Clay loam, 3′ to 5′ deep, light brown to dark brown in colour. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Wheat—2, Potato—8, Total=10.

10. Potato Development Station, Khedrala.

A. General information to D. Soil type and soil analysis :

Informations—N.A.

E. No. of experiments :

Potato—3, Total=3.

11. Potato Development Research Station, Kherdhar.

A. General information to D. Soil type and soil analysis :

Informations—N.A.

E. No. of experiments .

Patato—2, Total=2.

12. Potato Development Station, Khuradhan.

A. General information to D. Soil type and soil analysis :

Informations—N.A.

E. No. of experiments :

Wheat—1, Total=1.

13. Cereal Seed Multiplication and Demonstration Farm, Parala.

A. General information :

(i) In Mahasu district, 28 miles from Simla Railway Station. (ii) Sub-tropical tract. (iii) Established in 1948. (iv) Cereals. (v) N.A.

B. Normal rainfall in cm. :

Annual rainfall is about 127 cm.

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation done by *kuhal.* (ii) Proper drainage system does not exist.

D. Soil type and soil analysis :

(i) Sandy loam intermingled with stones. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Maize—1, Total=1.

14. Fruit Research Station, Mashobra.

A. General information to D. Soil type and soil analysis :

Informations—N.A.

E. No. of experiments :

Apple—9, Total=9.

15. Regional Potato Development and Research Station, Shilaroo.

A. General information :

(i) In Mahasu district. 32 miles from Simla Railway Station. (ii) High hills tract. (iii) Established in 1949. (iv) Potato. (v)N.A.

B. Normal rainfall in cm. :

Annual rainfall is about 178 cm.

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation facilities are not available. (ii) Proper drainage system does not exist.

D. Soil type and soil analysis :

(i) Loam to clay loam. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Wheat—5, Barley—1, Potato—23, Total=29.

16. Crops and Vegetable Research Station, Solan.

A. General information :

(i) In Solan *tehsil* of Mahasu district. 2 miles from Solan Railway Station. Small terraced fields made on slopes with more or less uniform fertility, soil profile quite shallow. (ii)Mid hills of H.P. (iii) Established in 1957. (iv) Due to urgency of planting of the breeding material, no regular croping pattern is being followed. (v) To carry out breeding, testing and agronomical research work on crops and vegetables.

B. Normal rainfall in cm. and *C. Irrigation and drainage facilities* :

Informations—N.A.

D. Soil type and soil analysis :

(i) Very light in colour, Gravelly with bold soil particals of sand. (il) Chemical analysis and (iii)Mechanical analysis—N.A.

E. No. of experiments :

Maize—1, Pea—1, Cabbage—1, Total=3.

PARTICULARS OF RESEARCH STATIONS JAMMU & KASHMIR

1. Agriculture Farm, Gramwala.

A. General information :

(i) In Reasi *tehsil* of Udhampur district. 120 miles from Pathankot Railway Station. (ii) N.A. (iii) Established in 1952. (iv) Wheat and Maize. (v) N.A.

B. Normal rainfall in cm. :

Annual rainfall is about 81 cm.

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation facilities are not available. (ii) Proper drainage system does not exists.

D. Soil type and soil analysis :

(i) Sandy loam. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Wheat—4, Total=4.

2. Potato Research Sub-Station, Gulmarg.

A. General information to D. Soil type and soil analysis :

Information—N.A.

E. No. of experiments :

Potato—2, Total=2.

3. Central Provincial Agriculture Farm, Jammu.

A. General information to D. Soil type and soil analysis :

Information—N.A.

E. No. of experiments :

Paddy—25, Wheat—10, Total=35.

4. Agriculture Farm, Kawa.

A. General information :

(i) In Udhampur *tehsil* of Udhampur district. 114 miles from Pathankot Railway Station. (ii) N.A. (iii) Established in 1952. (iv) Paddy—Wheat—Maize and Fodder crops. (v) N.A.

B. Normal rainfall in cm. :

Annual rainfall is about 81 cm.

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation facilities are not available. (ii) Proper drainage system does not exists.

D. Soil type and soil analysis :

(i) Sandy loam. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Wheat—2, Total=2.

5. Provincial Agriculture Farm, Shalimar.

A. General information :

(i) In Srinagar *tehsil* of Srinagar district. 281 miles from Pathankot Railway Station. (ii) N.A. (iii) Established in 1952. (iv) Paddy—Wheat—Maize—Vegetables Pulses and Fruits. (v) N.A.

B. Normal rainfall in cm. :

Annual rainfall is about 64 cm.

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation facilities are not available. (iii) Proper drainage system does not exist.

D. Soil type and soil analysis :

(i) Loam. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—7, Potato—4, Onion—7, Sugarbeet—3, Khol-Khol—3, Cauliflower—1, Saffor—10, Total=35.

Crop :- Paddy. **Ref :- Pb. 54(35).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the best combination of N, P and K for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Maize—*Senji Oats*—Paddy. (b) *Senji Oats.* (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 6, 7.7.1954. (iv) (a) 4 ploughings and passing *Sohaga* 4 times. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) *Jhona*—349 (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 27.61". (x) 16.10.1954.

2. TREATMENTS :

9 manurial treatments : M_0=Control, M_1=50 lb./ac. of N, M_2=100 lb./ac. of N, M_3=50 lb./ac. of N+50 lb./ac. of P_2O_5, M_4=100 lb./ac of N+50 lb./ac. of P_2O_5, M_5=100 lb./ac. of N+100 lb./ac. of P_2O_5, M_6=50 lb./ac. of N+50 lb./ac. of P_2O_5+25 lb./ac. of K_2O, M_7=100 lb./ac. of N+50 lb./ac. of P_2O_5+25 lb./ac. of K_2O and M_8=100 lb./ac. of N+100 lb./ac. of P_2O_5+25 lb./ac. of K_2O.

N as A/S : Half dose applied on 5.7.1954. and ½ dose on 3.8.1954; P_2O_5 as Super, applied on 5.7.1954. and K_2O as Pot. Sul., applied on 5.7.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 15'×80'. (b) 15'×66'. (v) 7' on either side. (vi) Yes.

4. GENERAL :

(i) All plots except M_0, M_1, M_3 and M_6 lodged. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—contd. with modifications. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2849 lb./ac. (ii) 333.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8
Av. yield	2765	2775	3024	3216	2625	2904	3133	2643	2561

S.E./mean = 166.8 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- Pb. 55(71).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of combinations of N, P and K on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 22.7.1955. (iv) (a) 8-9 ploughings with *Sohaga.* (b) Transplanted. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) *Jhona*—349 (medium). (vii) Irrigated. (viii) 4 weedings. (ix) 29.14". (x) 28.10.1955 and 1.11.1955.

2. TREATMENTS :

9 manurial treatments : M_0=Control (no manure), M_1=25 lb./ac. of N, M_2=50 lb./ac. of N, M_3=25 lb./ac. of N+25 lb./ac. of P_2O_5, M_4=50 lb./ac. of N+25 lb./ac. of P_2O_5, M_5=50 lb./ac. of N+50 lb./ac. of P_2O_5, M_6=25 lb./ac. of N+25 lb./ac. of P_2O_5+25 lb./ac. of K_2O, M_7=50 lb./ac. of N+25 lb./ac. of P_2O_5+25 lb./ac. of K_2O and M_8=50 lb./ac. of N+50 lb./ac. of P_2O_5+25 lb./ac. of K_2O.

N as A/S, P_2O_5 as Super and K_2O as Pot. Sul. Full dose of Super, Pot. Sul. and ½ dose of A/S was given at planting and ½ dose of A/S two months after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 14'3"×50'11.3". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1953—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1986 lb./ac. (ii) 382.7 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8
Av. yield	1462	1610	2129	1890	1975	2013	1851	2496	2449

S.E./mean = 191.4 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 56(34).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of combinations of N, P and K applied to Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 1.7.1956. (iv) (a) 4 ploughings with *Sohaga*. (b) Transplanted. (c) to (e) N.A. (v) Nil. (vi) *Jhona*—349 (medium). (vii) Irrigated. (viii) N.A. (ix) 30.89". (x) 26.9.1956.

2. TREATMENTS :

Same as in expt. no. 55(71) on page 1.

N as A/S, P_2O_5 as Super were applied on 14.7.1956 and 30.6.1956. respectively, K_2O applied as Pot. Sul.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 14'3"×66½'. (b) 1/44 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1953—contd. (modified after1956). (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2263 lb./ac. (ii) 336.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8
Av. yield	1519	2106	2441	1972	2407	2574	2300	2322	2724

S.E./mean = 168.3 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 57(36).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To compare the effects of different combinations of N, P and K on Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Clay loam soil. (b) N.A. (iii) N.A./19.7.1957. (iv) (a) 4 ploughings. (b) Transplanted. (c) and (d) N.A. (e) 1. (v) N.A. (vi) *Jhona*—349. (vii) Irrigated. (viii) 1 hoeing. (ix) 26.97". (x) 29.9.1957.

2. TREATMENTS :

9 manurial treatments : M_0=Control (no manure), M_1=25 lb./ac. of N, M_2=50 lb./ac. of N, M_3=25 lb./ac. of N+25 lb./ac. of P_2O_5, M_4=50 lb./ac. of N+25 lb./ac. of P_2O_5, M_5=50 lb./ac. of N+50 lb./ac. of P_2O_5, M_6=25 lb./ac. of N+25 lb./ac. of P_2O_5+25 lb./ac. of K_2O, M_7=50 lb./ac. of N+25 lb./ac. of P_2O_5+25 lb./ac. of K_2O and M_8=50 lb./ac. of N+50 lb./ac. of P_2O_5+50 lb./ac. of K_2O.

N as A/S, P_2O_5 as Super and K_2O as Pot. Sul. Full dose of Super, Pot. Sul. and ½ dose of A/S was given at planting and ½ dose of A/S two months after planting,

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/72 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2400 lb./ac. (ii) 356.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8
Av. yield	2231	2268	2490	2435	2407	2370	2349	2513	2541

S.E./mean = 178.4 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 58(40).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M':**

Object :— To compare the effect of different combinations of N, P and K on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Clay loam soil. (b) N.A. (iii) 9, 10.7.1958. (iv) (a) N.A. (b) Transplanted. (c) N.A. (d) 9″×9″. (e) 1. (v) N.A. (vi) *Jhona.* (vi) Irrigated. (viii) N.A. (ix) 34.06″. (x) 6.10.1958.

2. TREATMENTS :

Same as in expt. no. 55(71) on page 1.
P_2O_5 was applied in the form of Triple Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 60.5′×6′. (v) N.A. (v) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958—not contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2356 lb./ac. (ii) 256.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8
Av. yield	1763	2206	2499	2461	2511	2654	2322	2553	2237

S.E./mean = 128.4 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 59(36).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :— To study the effect of N, P and K applied alone and in combinations on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy. (b) N.A. (iii) N.A./21.7.1959. (iv) (a) N.A. (b) Transplanted in lines. (c) and (d) N.A. (e) 1. (v) N.A. (vii) *Basmati*—370. (vii) Irrigated. (viii) N.A. (ix) 14.20″. (x) 3.11.1959.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as C/A/N : N_0=0, N_1=40 and N_2=60 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=20 and P_2=40 lb./ac.

(3) 3 levels of K_2O as Mur. of Pot. : K_0=0, K_1=30 and K_2=60 lb./ac.

3. DESIGN :

(i) 3^3 Fact. confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 9′×80′. (b) 9′×60.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1814 lb./ac. (ii) 159.3 lb./ac. (iii) Main effect of N and interactions NPK, NPK^2 and NP^2K are highly significant. Intercation PK is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	1696	1658	1535	1626	1604	1631	1644
N_1	1795	1837	1782	1805	1850	1809	1754
N_2	1946	2097	1987	2010	1974	2124	1933
Mean	1809	1864	1768	1814	1809	1855	1777
K_0	1878	1823	1727				
K_1	1823	1823	1919				
K_2	1727	1946	1658				

S.E. of any marginal mean = 37.6 lb./ac.
S.E. of the body of any table = 65.1 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 59(32).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :— To find out the best combination of N, P and K for Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam soil. (b) N.A. (iii) 24.7.1959. (iv) (a) N.A. (b) Transplanted. (c) and (d) N.A. (e) 1. (v) 46 lb./ac. of A/S on 20.8.1959. (vi) *Jhona*—349. (vii) Irrigated. (viii) N.A. (ix) 49·21″. (x) 18.10.1959.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as C/A/N : N_0=0, N_1=30 and N_2=60 lb./ac.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=25 lb./ac.

(3) 2 levels of Sodium silicate : S_0=0 and S_1=500 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nii.

5. RESULTS :

(i) 1415 lb./ac. (ii) 196.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1
S_0	1435	1440	1412	1429	1450	1407
S_1	1306	1520	1378	1401	1347	1455
Mean	1370	1480	1395	1415	1399	1431
P_0	1352	1471	1373			
P_1	1388	1489	1417			

S.E. of S or P marginal mean = 40.1 lb./ac.
S.E. of N marginal mean = 49.1 lb./ac.
S.E. of body of S×N and N×P tables = 69.5 lb./ac.
S.E. of body of P×S table. = 56.7 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 59(33).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :— To study the effect of N, P and K with different trace elements on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 20.8.1959. (iv) (a) N.A. (b) Transplanted. (c) and (d) N.A. (e) 1. (v) Nil. (vi) *Jhona*—349 (late). (vii) Irrigated. (viii) N.A. (ix) 22.70". (x) 29.10.1959.

2. TREATMENTS :

8 manurial treatments : M_0=Control, M_1=40 lb./ac. of N as C/A/N+20 lb./ac. of P_2O_5 as Super+20 lb./ac. K_2O as Mur. Pot. $M_2=M_1$+Zinc, $M_3=M_1$+Iron, $M_4=M_1$+Manganese, $M_5=M_1$+Copper, $M_6=M_1$+Borax and $M_7=M_1$+all trace elements.
Trace elements applied as spray on 21.8.1959. Quantity applied—N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1803 lb./ac. (ii) 176.5 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Av. yield	1553	2034	1779	1759	1743	1903	1743	1908

S.E./mean = 88.2 lb./ac.

Crop :- Paddy *(Kharif)* **Ref :- Pb. 59(34).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of time of application of fertilizer on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 17.7.1959. iv) (a) N.A. (b) Transplanted. (c) and (d) N.A. (e) 1. (v) 130 lb./ac. of C/A/N and 34 lb./ac. of Super and 15 lb./ac. of Mur. Pot. (vi) *Jhona*—349 (vii) Irrigated. (viii) N.A. (ix) 49.21". (x) 15.10.1959.

2. TREATMENTS :

5 times of application of 40 lb./ac. of N : T_0=Control (no manure applied), T_1=Full dose at transplanting, T_2=½ dose at transplanting+½ dose after 3 weeks, T_3=⅓ dose at transplanting+⅓ dose after 3 weeks+⅓ dose after 6 weeks and T_4= Full dose 3 weeks after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nill. (iii) Yield of grain. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1486 lb./ac. (ii) 212.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4
Av. yield	1173	1414	1538	1332	1975

S.E./mean = 106.4 lb./ac.

Crop :-Paddy *(Kharif)*. **Ref :- Pb. 59(35).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Obect :—To study the effect of time of application of fertilizer on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam soil. (b) N.A. (iii) 17.7.1959. (iv) (a) N.A. (b) Transplanted. (c) N.A. (d) 9″×9″. (e) 3. (v) 40 lb./ac. of N+ 20 lb./ac. of P_2O_5+20 lb./ac. of K_2O. (vi) *Jhona*—349. (vii) Irrigated. (viii) N.A. (ix) 49.21″. (x) 15.10.1959.

2. TREATMENTS :

T_1=Full dose at transplanting, T_2=½ dose at transplanting+½ dose after 3 weeks, T_3=⅓ at transplanting+⅓ after 3 weeks + ⅓ after 6 weeks and T_4=Full dose after 3 weeks.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1602 lb./ac. (ii) 157.2 lb. ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3	T_4
Av. yield	1461	1574	1471	1903

S.E./mean = 78.6 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 55(63).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different sources of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 5.7.1955. (iv) (a) 6 ploughings and 2 puddlings. (b) to (e) N.A. (v) Nil. (vi) *Jhona*—349 (medium). (vii) Irrigated. (viii) N.A. (ix) 29.14″. (x) 18,19.10.1955.

2. TREATMENTS :

4 sources of 40 lb./ac. of N : S_0=Control (no manure), S_1=A/S, S_2=Urea and S_3=C/N. Fertilizers applied on 5.7.1955.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 18′×81′. (b) 18′×67′2⅔″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. Crop lodged in Oct., due to which there was loss of grain. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—contd. (modified in 1956). (b) and (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 2832 lb./ac. (ii) 173.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	2528	3023	2836	2939

S.E./mean = 70.7 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 56(28).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different sources of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 5.7.1956. (iv) (a) 5 ploughings. (b) to (e) N.A. (v) Nil. (vi) *Jhona*—349 (medium). (vii) Irrigated. (viii) 1 weeding and 1 puddling. (ix) 37.92″. (x) 6.10.1956.

2. TREATMENTS :

8 sources of 40 lb./ac. of N : S_0=Control (no manure applied), S_1=A/S ; S_2=C/N ; S_3=A/N, S_4=Urea, S_5=A/S/N, S_6=A/C and S_7=Nitro chalk.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 9′×80⅔′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—contd. (modified in 1956). (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 3558 lb./ac. (ii) 243.7 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	3142	3736	3448	3687	3552	3745	3601	3581

S.E./mean = 121.9 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 57(37).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect different sources of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 17.7.1957. (iv) (a) 4 ploughings. (b) Transplanted. (c) to (e) N.A. (v) Nil. (vi) *Jhona*—349. (vii) Irrigated. (viii) 1 hoeing. (ix) 28.05″. (x) 10.10.1957.

2. TREATMENTS :

Same as in expt. no. 56(28) on page 7.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3326 lb./ac. (ii) 350.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	3003	3550	3174	3334	3278	3632	3342	3292

S.E./mean = 175.4 lb./ac.

———

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 58(39).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different sources of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam soil. (b) N.A. (iii) 8, 9.7.1958. (iv) (a) 2 ploughings. (b) Transplanted. (c) N.A. (d) 9″×9″. (e) 2. (v) Nil. (vi) *Jhona*—349. (vii) Irrigated. (viii) N.A. (ix) 34.06″. (x) 6.10.1958.

2. TREATMENTS :

7 sources of 40 lb./ac. of N ; S_0=Control (no manure applied), S_1=A/S, S_2=A/S/N, S_3=Nitrochalk, S_4=Urea, S_5=A/C and S_6=A/N.

Fertilizers applied on 9.8.1958.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 60.5′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2187 lb./ac. (ii) 116.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	1969	2241	2106	2125	2268	2226	2376

S.E./mean = 83.4 lb./ac.

———

Crop :- Paddy. **Ref :- Pb. 54(125).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of different green manures on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Fallow—guara—sann—jantar.* (c) Nil. (ii) (a) Loam. (b) N.A. (iii) N.A./21,22.7.1954. (iv) (a) 8 *desi* ploughings. passing *Sohga* twice and 2 levellings. (b) to (e) N.A. (v) 30 srs./ac. of A/S applied to the exptl. plot on 15.7.1954 and 30½ seers on 14.8.1954. (vi) *Jhona*—349. (vii) Irrigated. (viii) Gap filling and weeding. (ix) 16.78″. (x) 27.10.1954.

2. TREATMENTS :

4 green manures : G_0=Control (no G.M. applied), G_1=*Guara*, G_2=*sann* and G_3=*Jantar*. Green manures were grown in *situ*.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 15′×45′. (b) 12′×45′. (v) 1½′ on either side. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 4421 lb./ac. (ii) 288.6 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	G_0	G_1	G_2	G_3
Av. yield	4169	4439	4844	4232

S.E./mean = 144.3 lb./ac.

Crop :- Paddy. **Ref :- Pb. 54(119).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of different manures on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nill. (b) *Berseem.* (c) Nil. (ii) (a) Loam. (b) N.A. (iii) N.A./31.7.1954. (iv) (a) 4 *Desi* ploughings, passing *sohaga* 5 times. (b) to (e) N.A. (v) Nil. (vi) *Jhona*—349- (medium). (vii) Irrigated. (viii) Weeding. (ix) 16.78″. (x) 6.11.1954.

2. TREATMENTS :

5 manurial treatments : M_0=Control, M_1=80 lb./ac. of N as A/S, M_2=80 lb./ac. of N as Urea, M_3= 80 lb./ac. of N as Urea+40 lb./ac. of P_2O_5 as Super and M_4=Mixed fertilizer to give 80 lb./ac. of N and 40 lb./ac. of P_2O_5.

Super on 31.7.1954 ; others applied in equal doses on 22.8.1954, 28.8.1959 and 6.9.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A.(iii) 5. (iv) (a) and (b) 72.6′×10′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 3486 lb./ac. (ii) 237.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4
Av. yield	2160	3716	3604	3752	4197

S.E./mean = 106.0 lb./ac.

Crop :- Paddy (*Kharif*) **Ref :- Pb. 58(52).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of different sources of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Berseem.* (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 6.8.1958 (iv) (a) 8 ploughings by *desi* plough, *sohaga* twice and passing roller once. (b) Transplanted. (c) and (d) N.A. (e) Nil. (v) Nil. (vi) *Jhona*—349. (vii) Irrigated. (viii) 2 weedings. (ix) 23.18". (x) 23 to 26.10.1958.

2. TREATMENTS :

8 sources of 50 lb./ac. of N : S_0=Control (no manure), S_1=A/S, S_2=A/N, S_3=A/C, S_4=A/S/N, S_5= Urea S_6=C/A/N and S_7=C/N.
Fertilizers were applied on 19.8.1958.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 44'×11'-3". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Crop damaged due to heavy rains. (iii) Yield of grain. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3960 lb./ac. (ii) 668.3 lb./ac. (iii) Tretament differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	4141	3847	3349	3892	4413	3892	4096	4051

S.E./mean = 334.2 lb./ac.

Crop :- Paddy (*Kharif*). **Ref :- Pb. 59(128).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To study the effect of different sources of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 17.7.1959. (iv) (a) N.A. (b) Transplanted. (c) 10 srs./ac. (d) 6"×9". (e) 2 to 3. (v) Nil. (vi) *Jhona*—349. (vii) Irrigated. (viii) 4 weedings. (ix) 10.5". (x) 14, 15.10.1959.

2. TREATMENTS :

Same as in expt. no. 58(52) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 44'×11' 3". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) B.H.C. dusting on 9. 9.1959 and 16.9.1959. (iii) Yield of grain. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3336 lb./ac. (ii) 236.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treament	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	3287	3174	3369	3111	3473	3227	3380	3666

S.E./mean = 118.2 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 56(61).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To study the effect of different sources of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) *Berseem*—Paddy—*Berseem*. (b) *Berseem*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 26.7.1956. (iv) (a) 1 *raja*, 4 *desi*, 3 *sohaga* and 1 roller. (b) Transplanting in lines. (c) Nil. (d) 9″×9″. (e) 2 to 3. (v) Nil. (vi) *Jhona*—349. (vii) Irrigated. (viii) Nil. (ix) 3.57″. (x) 31.10.1956 to 12.11.1956.

2. TREATMENTS :

7 sources of 50 lb./ac. of N : S_0=Control (no manure), S_1=A/S, S_2=Urea, S_3=A/C, S_4=A/N, S_5=A/S/N and S_6=C/N.

A/N applied on 25.8.1956 ; other fertilizers on 18.8.1956.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 66′×11′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) to (vii) Nil.

4. RESULTS :

(i) 3760 lb./ac. (ii) 549.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	2893	3857	4027	3973	4166	3687	3718

S.E./mean = 270.4 lb./ac.

———

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 57(58).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To study the effect of different sources of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Berseem*. (c) N.A. (ii) (a) Heavy loam. (b) N.A. (iii) 24,25.7.1957. (iv) (a) 1 ***desi*** ploughing and 1 *sohaga*. (b) Transplanted. (c) N.A. (d) 9″×9″. (e) 2 to 13. (v) Nil. (vi) ***Jhona*** —349. (vii) Irrigated. (viii) Gap filling on 8, 9.8.1957 and 4 weedings. (ix) 18·66″. (x) 15.10.1957.

2. TREATMENTS :

Same as in expt. no. 56(61) above.
Fertilizers applied on 14.8.1957.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 44′×11¼′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 4031 lb./ac. (ii) 263.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	3680	3943	4189	4624	4645	4396	4237

S.E./mean = 131.8 lb./ac.

———

Crop :- Paddy. **Ref :- Pb. 55(35).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To find out the best manures combination of for Paddy.

1. BASAL CONDITIONS :

(i) Nil. (b) *Berseem*. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 23.7.1955. (iv) (a) 6 *desi* ploughings, passing horse hoe once and roller once. (b) to (e) N.A. (v) Nil. (vi) *Jhona*—349 (medium). (vii) Irrigated. (viii) Nil. (ix) 10.50". (x) 19.10.1955.

2. TREATMENTS :

6 manurial treatments : M_0=Control, M_1=50 lb./ac. of N as A/N, M_2=50 lb./ac. N as A/S, M_3=50 lb./ac. of N as Urea, M_4=50 lb./ac. of N as Urea+40 lb./ac. of P_2O_5 as Super and M_5=Mixed fertilizer to give 50 lb./ac. af N and 40 lb./ac. of P_2O_5.

Super was broadcast on 20.7.1955 while other fertilizers were applied on 25.8.1957 by broadcasting.

5. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 12'×55'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory but poor growth in control plots only. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—contd (with modifications). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 4478 lb./ac. (ii) 404.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	4305	4560	4712	4707	4500	4082

S.E./mean = 165.2 lb./ac.

Crop :- Paddy. **Ref :- Pb. 54(172).**

Site :- Dist. and Demons. Farm, Kangra. **Type :- 'M'.**

Object :—To study the effect of A/S alone and in combination with Super on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 23 to 25.7.1954. (iv) (a) 5 ploughings and 5 times passing *sohaga*: (b) to (e) N.A. (v) Nil. (vi) *Lal Nakanda* (Improved ; medium). (vii) Irrigated. (viii) 2 weedings. (ix) 8.96". (x) 20.12.1954.

2. TREATMENTS :

5 manurial treatments : M_0=Control, M_1=30 lb./ac. of N, M_2=50 lb./ac. of N, M_3=30 lb./ac. of N+15 lb./ac. of P_2O_5 as Super and M_4=50 lb./ac. of N+25 lb./ac. of P_2O_5 as Super.

N as A/S applied on 6.9.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) Nil. (iii) 2. (iv) (a) and (b) 20'×62.2'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1977 lb./ac. (ii) 145.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4
Av. yield	1297	1819	2170	2233	2364

S.E./mean = 102.9 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 55(102).**

Site :-Agri. Res. Stn., Karnal. **Type :- 'M'.**

Object :—To study the effect of N and P on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 5.7.1955. (iv) (a) N.A. (b) Transplanted. (c) to (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) *Jhona*—349 (early). (vii) Irrigated. (viii) N.A. (ix) 33.65". (x) 9.10.1955.

2. TREATMENTS :

6 manurial treatments : T_0=Control (no manure), T_1=50 lb./ac. of N as A/S, T_2=50 lb./ac. of N as A/S +25 lb./ac. of P_2O_5, T_3=50 lb./ac. of N as A/S/N+25 lb./ac. of P_2O_5, T_4=50 lb./ac. of N as Urea+25 lb./ac. of P_2O_5 and T_5=50 lb./ac. of N as A/C+25 lb./ac. of P_2O_5.

P_2O_5 applied as Super.

3. DESIGN :

R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fairly good. (ii) N.A. (iii) Yield of grain. (iv) (a) to (c) N.A. (v) (a) and (b) Nil. (vi) Crop was damaged due to heavy rains and floods. (vii) Nil.

5. RESULTS :

(i) 2293 lb./ac. (ii) 398.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. yield	2534	2107	2650	1810	2600	2057

S.E./ mean = 281.6 lb./ac.

Crop :- Paddy. **Ref :- Pb. 54(13).**

Site :- Cereal Breeding Sub- Stn., Kulu. **Type :- 'M'.**

Object :—To study the effect of fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) Paddy—Fallow. (b) Fallow. (c) Nil. (ii) Loamy soil. (b) N.A. (iii) N.A./17.7.1954. (iv) (a) N.A. (b) Transplanting. (c) and (d) N.A. (e) 3. (v) Nil. (vi) 43—*Dunder* (improved; early). (vii) Irrigated. (viii) N.A. (ix) 26.58". (x) 3.11.1954.

2. TREATMENTS :

All combinations of (1) and (2)+ a control (no manure).

(1) 3 levels of N as A/S : N_1=45, N_2=60 and N_3=75 lb./ac.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=25 lb./ac. of P_2O_5.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 33'×5½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1955. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1738 lb./ac. (ii) 475.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 1311 lb./ac.

	N_1	N_2	N_3	Mean
P_0	1527	2021	1851	1800
P_1	1620	1813	2021	1818
Mean	1574	1917	1936	1809

S.E. of N marginal mean = 168.2 lb./ac.
S.E. of P marginal mean = 137.3 lb./ac.
S.E. of body of table or control mean = 237.8 lb./ac.

Crop :- Paddy. **Ref :- Pb. 55(1).**

Site :- Cereal Breeding Sub-Stn., Kulu. **Type :- 'M'.**

Object :—To study the effect of fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) N.A./17.7.1955. (iv) (a) N.A. (b) Transplanted. (c) and (d) N.A. (e) 3. (v) Nil. (vi) 43—*Dunder* (improved; early). (vii) Irrigated. (viii) N.A. (ix) 17.35". (x) 3.11.1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(13) on page 13.

5. RESULTS :

(i) 2254 lb./ac. (ii) 377.3 lb./ac. (iii) Only "control *vs* others" effect is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1689 lb./ac.

	N_1	N_2	N_3	Mean
P_0	1975	2422	2615	2337
P_1	2260	2253	2561	2358
Mean	2118	2338	2588	2348

S.E. of N marginal mean = 133.3 lb./ac.
S.E. of P marginal mean = 108.9 lb./ac.
S.E. of body of table or control mean = 188.6 lb./ac.

Crop :- Paddy **Ref :- Pb. 54(29).**

Site :- Rice Breeding Sub. Stn., Nagrota Bagwan. **Type :- 'M'.**

Object :—To study the effect of A/S on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Wheat. (b) Wheat. (c) 100 mds./ac. of F.Y.M. (ii) Clayey loam. (b) N.A. (iii) N.A./7 to 10.7.1954. (iv) (a) 2 ploughings. (b) Transplanted. (c) N.A. (d) 9"×6". (e) 1. (v) Nil. (vi) *Ram Jawain*—100 (medium). (vii) Irrigated. (viii) 2 weedings and 1 hoeing. (ix) 105.47". (x) 16.10.1954.

2. TREATMENTS :

4 levels of N as A/S : N_0=0, N_1=15, N_2=30 and N_3=45 lb./ac. of N.
A/S was broadcast 15 days after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 13′6″×31′6″. (b) 12′×30′. (v) 9″×9″. (vi) Yes.

4. GENERAL ;

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) The soil was very poor lacking in organic matter. (vii) Nil.

5. RESULTS :

(i) 1296 lb./ac. (ii) 155.8 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	N_0	N_1	N_2	N_3
Av. yield	1110	1322	1400	1351

S.E./mean = 63.6 lb./ac.

Crop :- Paddy. **Ref :- Pb. 54(30).**

Site :- Rice Breeding Sub-Stn., Nagrota Bagwan. **Type :- 'M'.**

Object :—To find out a suitable method of applying A/S to Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) N.A./29, 30.6.1954. (iv) (a) 3 ploughings. (b) Transplanted. (c) N.A. (d) 9″×6″. (e) 1. (v) 100 mds./ac. of F.Y.M. (vi) *Ram Jawain*—100 (medium). (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 105.47″. (x) 15.10.1954.

2. TREATMENTS :

4 methods of applying 25 lb./ac. of N as A/S : M_0=Control (no manure), M_1=N placed deep in dry soil before transplanting, M_2=N applied on surface 15 days after planting and M_3=Deep placement of 25 lb./ac. of N 15 days before planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 14′×15′. (b) 12′×15′. (v) 1′ on either side. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—1954. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 3144 lb./ac. (ii) 281.1 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	2847	3267	3132	3329

S.E./mean = 114.8 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 58(17).**

Site :- Rice Breeding Sub-Stn., Nagrota Bagwan. **Type :- 'M'.**

Object :—To find out the best time of application of different nitrogenous fertilizers.

1. BASAL CONDITIONS :

(i) Paddy—Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay soil. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanting. (c) 10 srs./ac. (d) and (e) N.A. (v) N.A. (vi) China—988. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) N.A.

2. TREATMENTS :

4 manurial treatments : T_0=Control, T_1=20 lb./ac. of N as A/S at puddling, T_2=20 lb./ac. of N as C/A/N at puddling and T_3=6 lb./ac. of N at puddling+14 lb./ac. one month after transplanting.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 25′×8′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 4881 lb./ac. (ii) 513.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	4625	5000	5000	4902

S.E./mean = 182.1 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- Pb. 54(93).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To study the effect of different levels and methods of application of fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow—Paddy—Oats—Paddy. (b) Oats. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) N.A./5, 6.7.1954. (iv) (a) Ploughing. (b) N.A. (c) 12. srs./ac. (d) 9″×9″. (e) N.A. (v) Nil. (vi) 370—*Basmati.* (medium). (vii) Irrigated. (viii) N.A. (ix) 19.79″. (x) 21.10.1954.

2. TREATMENTS :

Main-plot treatments :

7 fertilizers : L_0=Control (no manure), L_1=30 lb./ac. of N, L_2=60 lb./ac. of N, L_3=90 lb./ac. of N, L_4=30 lb./ac. of N+30 lb./ac. of P_2O_5, L_5=60 lb./ac. of N+60 lb./ac. of P_2O_5 and L_6=90 lb./ac. of N+60 lb./ac. of P_2O_5,

Sub-plot treatments

2 times of applications of fertilizers : T_1=Whole Super+½ A/S at puddling+½ N one month later and T_2=Whole fertilizer at puddling.

N applied as A/S and P_2O_5 as Super.

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 62′×7′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) to (c) N.A. (v) and (vi) Nil. (vii) Expt. conducted by chemical section.

5. RESULTS :

(i) 1019 lb./ac. (ii) (a) 243.7 lb./ac. (b) 163.7 lb./ac. (iii) L effect is highly significant and T effect is significant. (iv) Av. yield of grain in lb./ac.

	L_0	L_1	L_2	L_3	L_4	L_5	L_6	Mean
T_1	603	955	1116	1455	971	1049	1332	1069
T_2	607	890	1019	1220	1023	926	1100	969
Mean	605	923	1079	1337	997	987	1216	1019

S.E. of difference of two

1. L marginal means = 121.9 lb./ac.
2. T marginal means = 43.7 lb./ac.
3. T means at the same level of L = 115.8 lb./ac.
4. L means at the same level of T = 146.8 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 58(138).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To find out the best combination of dose and source of N for Paddy.

1. BASAL CONDITIONS :

(i) Cotton—Wheat—Paddy. (b) Wheat. (c) N.A. (ii) (a) Heavy loam soil. (b) N.A. (iii) N.A./22.7.1958. (iv) (a) to (e) N.A. (v) Nil. (vi) *Jhona*. (vii) Irrigated. (viii) and (ix) N.A. (x) 31.10.1958.

2. TREATMENTS :

All combinations of (1) and (2)+a control

(1) 6 sources of N : S_1=A/S, S_2=A/S/N, S_3=A/N, S_4=Nitro chalk, S_5=A/C and S_6=Urea.

(2) 2 levels of N : N_1=30 lb./ac. and N_2=45 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) 1/36.3 ac. (b) 11′×49½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 3148 lb./ac. (ii) 334.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 2622 lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean
N_1	3187	3263	3139	2930	2865	3331	3119
N_2	3208	3181	3331	3468	3208	3194	3265
Mean	3198	3222	3235	3199	3037	3263	3192

S.E. of S marginal mean = 136.5 lb./ac.
S.E. of N marginal mean = 78.8 lb./ac.
S.E. of body of table or control mean = 193.0 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 57 (MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type V :—To study the effect of sources and times of application of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium soil. (b) N.A. (iii) N.A./End of July, 1957. (iv) (a) 5 ploughings. (b) Transplanting. (c) N.A. (d) 9″×9″. (e) 2. (v) Nil. (vi) *Jhona*—349 early. (vii) Irrigated. (viii) 1 weeding. (ix) 20″. (x) 3rd week of Oct., 1957.

2. TREATMENTS :

All combinations of (1) and (2)+a control

(1) 2 sources of 40 lb./ac. of N : S_1=A/S and S_2=Urea.

(2) 7 times of applications of N : T_1=Before planting, T_2=At planting, T_3=At tillering, T_4=$\frac{1}{3}$ before sowing+$\frac{1}{3}$ at tillering, T_5=$\frac{1}{2}$ at planting+$\frac{1}{2}$ at tillering, T_6=$\frac{1}{3}$ before planting+$\frac{1}{3}$ at tillering+$\frac{1}{3}$ at flowering and T_7=$\frac{1}{3}$ at planting+$\frac{1}{3}$ at tillering+$\frac{1}{3}$ at flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 51′×8.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 3806 lb./ac. (ii) 349.7 lb./ac. (iii) Main effect of S and "control *vs.* others" are significant. (iv) Av. yield of grain in lb./ac.

Control = 3357 lb./ac.

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
S_1	4065	3629	3900	4065	3983	3999	4065	3958
S_2	3398	3769	3802	3481	3703	3933	3933	3717
Mean	3732	3699	3851	3773	3843	3966	3999	3838

S.E. of S marginal mean = 76.3 lb./ac.
S.E. of T marginal mean = 142.8 lb./ac.
S.E of body of table or control mean = 201.9 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 59(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type V :—To study the effect of sources and times of application of N on Paddy.

BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Indus alluvium soil. (b) N.A. (iii) 1st week of July, 1959. (iv) (a) 4 ploughings. (b) Transplanting. (c) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 weedings. (ix) 19″. (x) 2nd week of Oct., 1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt no. 57 (MAE) type V on page 17.

4. GENERAL :

(i) Good. (ii) Attack of grass hoppers controlled. (iii) Grain yield. (iv) 1957—contd. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 4233 lb./ac. (ii) 315.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 4081 lb./ac.

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
S_1	4386	4114	4147	4114	4312	4452	4353	4268
S_2	4114	4188	4246	4180	4114	4213	4485	(
Mean	4250	4151	4196	4147	4213	4332	4419	4244

S.E. of S marginal mean = 68.8 lb./ac.
S.E. of T marginal mean = 128.7 lb./ac.
S.E. of body of table or control mean = 182.0 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 54(TCM).**

Centre :- Nilokheri. **Type :- 'M'.**

Object :—Type I :— To study the effect of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Grey and brown soils of indo-gangetic basins impregnated with salts. (b) N.A. (iii) to (v) N.A. (vi) July—August, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) October—November, 1954.

2. TREATMENTS :

0 =Control
N_1=20 lb./ac. of N as A/S.
N_2=40 lb./ac. of N as A/S.
N_1'=20 lb./ac. of N as Urea.
N_2'=40 lb./ac. of N as Urea.

3. DESIGN :

(i) R.B.D. with 5 plots/replication. (ii) For layout of the experiments in each block, villages were selected at random and a list was prepared of the cultivators growing Paddy crop in each selected village. From this list two cultivators were selected at random and one field each belonging to the selected cultivators was taken and in each selected field an unreplicated trial was laid out. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) 1953—1955. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

Treatment	0	N_1	N_2	N_1'	N_2'
Av. yield	1944	2446	2789	2417	2510

G.M. = 2421 lb./ac. S.E./mean = 122.4 lb./ac. and no. of trials = 11.

Crop :- Paddy *(Kharif)*. **Ref :.Pb. 55(TCM).**

Centre :- Nilokheri. **Type :- 'M'.**

Object :—Type I :—To study the effect of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Grey and brown soil of gangetic basins impregnated with salts. (b) N.A. (iii) to (v) N.A. (vi) N.A./June, 1955. (vii) Irrigated. (viii) and (ix) N.A. (x) Nov.,.1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type I above.

5. RESULTS :

Treatment	0	N_1	N_2	N_1'	N_2'
Av. yield	1656	2374	2813	2459	2567

G.M. = 2374 lb./ac. ; S.E./mean = 91.7 lb./ac. and no. of trails = 8.

Crop :- Paddy *(Kharif).* **Ref :- Pb. 54(TCM).**

Centre :- Nilokheri. **Type :- 'M'.**

Object :—Type II :—To study the effect of N and P on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Grey and brown soils of indo-gangetic basin impregnated with salts. (b) N.A. (iii) to (v) N.A. (vi) N.A./July-August, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) Oct.—Nov., 1954.

2. TREATMENTS :

0 =Control
P =20 lb./ac. of P_2O_5 as Super.
N_1P =20 lb./ac. of P_2O_5 as Super + 20 lb./ac. of N as A/S.
N_2P =20 lb./ac. of P_2O_5 as Super + 40 lb./ac. of N as A/S.
$N_1'P$=20 lb./ac. of P_2O_5 as Super + 20 lb./ac. of N as Urea.
$N_2'P$=20 lb./ac. of P_2O_5 as Super + 40 lb./ac. of N as Urea.

3. DESIGN :

(i) R.B.D. with 6 plots/block. (ii) For layout of the experiments in each block, villages were selected at random and a list was prepared of the cultivators growing paddy crop in each selected village. From this list two cultivators were selected at random and one field each belonging to the selected cultivators was taken and in each selected field an unreplicated trial was laid out. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1955. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS :

Treatment	0	P	N_1P	N_2P	$N_1'P$	$N_2'P$
Av. yield	2491	2989	3235	3519	3170	3548

G.M. = 3159 lb./ac. ; S.E./mean = 120.3 lb./ac. and no. of trials = N.A.

Crop :- Paddy *(Kharif).* **Ref :- Pb. 55(TCM).**

Centre :- Nilokheri. **Type :- 'M'.**

Object :—Type II :—To study the effect of N and P on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Grey and brown soils of indo-gangetic basin impregnated with salts. (b) N.A. (iii) to (v) N.A. (vi) N.A./June, 1955. (vii) Irrigated. (viii) and (ix) N.A. (x) Nov., 1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type II above.

5. RESULTS :

Treatment	0	P	N_1P	N_2P	$N_1'P$	$N_2'P$
Av. yield	2511	2567	3334	3779	3357	3690

G.M. = 3206 lb./ac. ; S.E./mean = 155.7 lb./ac. and no. of trials = 9.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 54(TCM).**

Ceutre :- Nilokheri. **Type :- 'M'.**

Object :—Type IV :— To study the effect of N, P and K on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Grey and brown soils of gangetic basin impregnated with salts. (b) N.A. (iii) to (v) N.A. (vi) N.A./July-August, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) Oct.-Nov., 1954.

2. TREATMENTS :

0 =Control,
N =20 lb./ac. of N as A/S.
NP_1 =20 lb./ac. of N as A/S + 20 lb./ac. of P_2O_5 as Super.
NP_2 =20 lb./ac. of N as A/S + 40 lb./ac. of P_2O_5 as Super.
NP_1K_1=20 lb./ac. of N as A/S + 20 lb./ac. of P_2O_5 as Super + 20 lb./ac. of K_2O as Pot. Sul.
NP_1K_2=20 lb./ac. of N as A/S + 20 lb./ac. of P_2O_5 as Super + 40 lb./ac. of K_2O as Pot. Sul.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 54(TCM) type II on page 20.

5. RESULTS :

Treatment	0	N	NP_1	NP_2	NP_1K_1	NP_1K_2
Av. yield	1988	2827	2930	2610	2830	2809

G.M. = 2666 lb./ac. ; S.E./mean = 113.9 lb./ac. and no. of trials = 11.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 58(SFT)**

Centre :- Ambala. **Type :- 'M'.**

Object :—Type A—To study the response of Paddy to levels of N, P and K, applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) and (iv) N.A. (v) (a) N.A. (b) Transplanting. (c) to (e) N.A. (vi) July. (vii) Irrigated. (viii) and (ix) N.A. (x) October-November.

2. TREATMENTS :

Control (no manure).
n =20 lb./ac. of N as A/S.
p =20 lb./ac. P_2O_5 as Super.
np =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
k =20 lb./ac. of K_2O as Mur. of Pot.
nk =20 lb./ac. of N as A/S+20 lb./ac. of K_2O as Mur. of Pot.
pk =20 lb./ac. of P_2O_5 as Super+20 lb./ac. K_2O as Mur. of Pot.
npk=20 lb./ac. of N as A/S +20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. of Pot.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crops, 4 on an oil seed crop and 3 on a leguminous crop. Half the number of trials conducted are of Type A and the other half of Type B on crops other than the legumes. The three trials on legumes are of Type C. Residual effects of phosphate application are studied on Type C trials in two out of the four zones in each district every year. The above experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) N.A. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) Nil.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	230	107	—33	69.1	33	—66	82	148	65.0

Control mean = 1925 lb./ac. and number of trials = 6.

Crop :- Paddy. **Ref :- Pb. 59(SFT).**

Centre :- Ambala. **Type :- 'M'.**

Object :—Type A :—To study the response of Paddy to levels of N, P and K, applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A on page 21 conducted in Ambala district.

RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	403	255	148	103.7	—65	—8	8	65	37.9

Control mean = 1168 lb./ac. and number of trials = 2

Crop :- Paddy. **Ref :- Pb. 58(SFT).**

Centre :- Ferozepur. **Type :- 'M'.**

Object :—Type A :—To study the response of Paddy to levels of N, P and K, applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A on page 21 conducted in Ambala district.

5. RESULTS :

Effect	n	p	k	S. E.	np	nk	pk	npk	S. E.
Av. response in lb./ac.	716	189	173	69.9	99	—99	49	58	67.5

Control mean = 1275 lb./ac. and no. of trials = 4.

Crop :- Paddy. **Ref :- Pb. 59(SFT).**

Centre :- Ferozepur. **Type :- 'A'.**

Object :—Type A :—To study the response of Paddy to levels of N, P and K, applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A on page 21 conducted in Ambala district.

5. RESULTS :

Effect	n	p	k	S. E.	np	nk	pk	npk	S. E.
Av. response in lb./ac.	494	148	214	27.2	16	—8	0	74	20.6

Control mean = 2139 lb./ac. and no. of trials = 8.

Crop :- Paddy. **Ref :- Pb. 59(SFT).**

Centre :- Hoshiarpur. **Type :- 'M'.**

Object :— Type A :— To study the response of Paddy to levels of N, P and K, applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Tarai and sub-mountainous. (iii) Nil. (iv) N.A. (v) (a) N.A. (b) Transplanting. (c) to (e) N.A. (vi) July. (vii) Irrigated. (viii) and (ix) N.A. (x) October—November.

2. TREATMENTS to 4. GENERAL :

Same as expt. no. 58(SFT) type A on page 21 conducted at Ambala district.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	np	npk	S.E.
Av. response in lb./ac.	214	66	16	15.6	—82	—25	16	16	5.8

Control mean = 1193 lb./ac. and no. of trials = 3.

———

Crop :- Paddy. **Ref :- Pb. 59(SFT).**

Centre :- Kangra. **Type :- 'M'.**

Object :— Type A :—To study the response of Paddy to levels of N, P and K, applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) and (iv) N.A. (v) (a) N.A. (b) Transplanting. (c) to (e) N.A. (vi) July. (vii) Irrigated. (viii) and (ix) N.A. (x) October—November.

2. TREATMENTS to 4. GENERAL :

Same as expt. no. 58(SFT) type A on page 21 conducted at Ambala district.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	197	197	33	36.2	8	—49	8	82	40.3

Control mean = 1465 lb./ac. and number of trials = 5.

———

Crop :- Paddy. **Ref :- Pb. 58(SFT).**

Centre :- Karnal. **Type :- 'M'.**

Object :— Type A :— To study the response of Paddy to levels of N, P and K, applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 21 conducted in Ambala district.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	239	25	115	38.7	—181	—206	—263	115	28.8

Control mean = 2098 lb./ac. and no. of trials = 7.

———

Crop :- Paddy. **Ref :- Pb. 59(SFT).**

Centre :- Patiala. **Type :- 'M'.**

Object :— Type A :—To study the responce of Paddy to levels of N, P and K, applied individually andi combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 21 conducted in Ambala district.

2. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	370	304	189	74.1	—82	16	25	8	51.8

Control mean = 2082 lb./ac. and no. of trials = 4.

Crop :- Paddy. **Ref :- Pb. 59(SFT).**

Centre :- Ferozepur. **Type :- 'M'.**

Object :— Type B :—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) and (iv) N.A. (v) (a) N.A. (b) Transplanting. (c) to (e) N.A. (vi) July. (vii) Irrigated. (viii) and (ix) N.A. (x) October—November.

2. TREATMENTS :

0 =Control (no manure).
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1' =20 lb./ac. of N as Urea.
n_2' =40 lb./ac. of N as Urea.
n_1''' =20 lb./ac. of N as C/A/N.
n_2''' =40 lb./ac. of N as C/A/N.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crops, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of Type A and the other Type B on crops other than the legumes. The three trials on legumes are of Type C. Residual effects of phosphate application are studied of Type C trials in two out of the four zones in each district every year. The above experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) N.A. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) Nil.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	1967	2337	2584	2427	2699	2197	2353

G.M. = 2366 lb./ac. ; S.E./mean = 40.1 lb./ac. and no. of trials = 8.

Crop :- Paddy. **Ref :- Pb. 59(SFT).**

Centre :- Hoshiarpur. **Type :- 'M'.**

Object :— Type B :—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Tarai sub-mountainous. (iii) and (iv) N.A. (v) (a) N.A. (b) Transplanting. (c) to (e) N.A. (vi) July. (vii) Irrigated. (viii) and (ix) N.A. (x) October—November.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 24 conducted in Ferozepur district.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	1300	1498	1613	1374	1465	1448	1498

G.M. = 1457 lb./ac. ; S.E./mean = 36.1 lb./ac. and no. of trials = 4.

———

Crop :- Paddy. **Ref :- Pb. 59(SFT).**

Centre :- Kangra. **Type :- 'M'.**

Object :—Type B :—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) and (iv) N.A. (v) (a) N.A. (b) Transplanting. (c) to (e) N.A. (vi) July. (vii) Irrigated. (viii) and (ix) N.A. (x) October—November.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 24 conducted in Ferozepur district.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	848	1325	1407	1160	1300	1226	1481

G.M. = 1250 lb./ac. ; S.E./mean = 41.9 lb./ac. and no. of trials = 8.

———

Crop :- Paddy. **Ref :- Pb. 58(SFT).**

Centre :- Karnal. **Type :- 'M'.**

Object :—Type B :—To investigate the reletive efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) Alluvial. (iii) and (iv) Nil. (v) (a) N.A. (b) Transplanting. (c) to (e) N.A. (vi) July. (vii) Irrigated. (viii) and (ix) N.A. (x) October—November.

2. TREATMENTS :

0 =Control (no manure).
n_1' =20 lb./ac. of N as Urea.
n_2' =40 lb./ac. of N as Urea.
n_1'' =20 lb./ac. of N as A/S/N.
n_2'' =40 lb./ac. of N as A/S/N.
n_1''' =20 lb./ac. of N as C/A/N.
n_2''' =40 lb./ac. of N as C/AN.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 24 conducted in Ferozepur district.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield in lb./ac.	2000	3250	2444	2353	2436	2213	2485

G.M. = 2454 lb./ac. S.E./mean = 61.1 lb./ac. and no. of trials = 8.

Crop :- Paddy. **Ref :- Pb. 59(SFT).**

Centre :- Patiala. **Type :- 'M'.**

Object :—Type B :—To investigate the relative effieciency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt no. 59 (SFT) type B on page 24 conducted in Ferozepur district.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	2181	2460	2584	2353	2526	2312	2633

G.M. = 2436 lb./ac. ; S.E./mean = 104.7 lb./ac. and no. of trials = 4.

Crop :- Paddy. **Ref :- Pb. 54(66).**

Site :- Rice Breeding Sub-Stn., Gurdaspur. **Type :- 'MV'.**

Object :—To find out the best source of N for different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Dhaincha.* (c) Nil. (ii) Sandy loam soil. (b) N.A. (iii) N.A./22.7.1954. (iv) (a) 5 ploughings, passing *sohaga* 4 times and 1 puddling. (b) Transplanting. (c) 12 srs./ac. (d) 9″×9″. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 3 weedings and 2 hoeings. (ix) 27.77″. (x) 19.10.1954. and 28.10.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 5 manurial treatments : M_0 - Control, M_1=50 lb./ac. of N as A/S, M_2=50 lb./ac. of N as G.N.C., M_3=25 lb./ac. of N as A/S+25 lb./ac. of N as G.N.C. and M_4=G.M. *Dhaincha.*

(2) varieties : V_1=*Jhona*—349 and V_2=*Basmati*—370.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 9′×80′. (b) 8.25′×75.42′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1951—1954. (b) No. (c) N.A. (v) to (vii) Nil.

5 RESULTS :

(i) 1713 lb./ac. (ii) 115.1 lb./ac. (iii) V and M effects are highly significant, while interaction V×M is not significant. (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean
V_1	1405	2188	2065	2192	2057	1981
V_2	1050	1604	1431	1689	1453	1445
Mean	1227	1896	1748	1941	1755	1713

S.E. of M marginal mean = 40.7 lb./ac.
S.E. of V marginal mean = 25.7 lb./ac.
S.E. of body of table = 57.5 lb./ac.

Crop :- Paddy. **Ref :- Pb. 54(65).**

Site :- Rice Breeding Sub-Stn., Gurdaspur. **Type :- 'MV'.**

Object :—To find out the optimum dose of N for different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Lentils. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 18.7.1954. (iv) (a) 4 ploughings and passing of *Sohaga* 2 times. (b) N.A. (c) 12 srs./ac. (d) 9″×9″. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 1 hoeing and 3 weedings. (ix) 27.77″. (x) 27.10.1954.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 5 levels of N as A/S : N_0=0, N_1=20, N_2=40, N_3=60 and N_4=80 lb./ac.
(2) 2 varieties : V_1=*Jhona*—349 and V_2=370—*Basmati*.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 9′×80′. (b) 8.25′×75.42′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1951—1954. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1789 lb./ac. (ii) 108.0 lb./ac. (iii) All the effects are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
V_1	989	1763	2323	2372	2424	1974
V_2	888	1435	1868	1873	1960	1605
Mean	938	1599	2096	2122	2192	1789

S.E. of N marginal mean = 38.2 lb./ac.
S.E. of V marginal mean = 48.3 lb./ac.
S.E. of body of table = 54.0 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 57(117).**

Site :- Soil Sub-Stn., Rauni. **Type 'MV'.**

Object :—To find out the best source of N for different Paddy varieties.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Heavy loam soil. (b) N.A. (iii) N.A./28, 29.7.1957. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) V_1 on 30.10.1957 and V_2 on 13.11.1957.

2. TREATMENTS :

All combinations of (1) and (2)+a control (no manure)
(1) 7 sources of N : S_1=A/S, S_2=A/S/N, S_3=A/N, S_4=Nitrochalk, S_5=C/N, S_6=A/C and S_7=Urea.
(2) 2 levels of N : N_1=30 lb./ac. and N_2=45 lb./ac.
(3) 2 varieties : V_1=*Jhona* and V_2=*Basmati*.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 30. (b) N.A. (iii) 2. (iv) (a) 1/80 ac. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—Nil. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1744 lb./ac. (ii) 341.2 lb./ac. (iii) Only N effect is significant. (iv) Av. yield of grain in lb./ac.

Control (V_1) = 1322 lb./ac. and Control (V_2) = 1400 lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	S_7	Mean	V_1	V_2
N_1	1597	1581	1452	1728	1536	1913	1922	1675	1690	1660
N_2	1911	1834	1809	1869	1689	1864	2088	1866	1853	1879
Mean	1754	1708	1630	1798	1612	1888	2005	1771		
V_1	1716	1716	1580	1834	1600	1847	2112			
V_2	1792	1700	1681	1762	1625	1930	1898			

S.E. of V or N marginal mean = 64.5 lb./ac.
S.E. of S marginal mean = 120.6 lb./ac.
S.E. of body of V×N table = 91.2 lb./ac.
S.E. of body of S×N or S×V table = 170.6 lb./ac.
S.E. of control mean = 241.3 lb./ac.

Crop :- Paddy. **Ref :- Pb. 54(64).**

Site :- Rice Breeding Sub-Stn., Gurdaspur. **Type :- 'C'.**

Object :—To find out the best combination of age of seedling at transplanting and seed rate on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy loam soil. (b) N.A. (iii) N.A./13.7.1954. (iv) (a) 3 ploughings, passing *Sohaga* 3 times and 1 puddling. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) 1 md./ac. of A.S broadcast on 13.7.1954. (vi) *Jhona*—349 (medium). (vii) Irrigated. (viii) 1 weeding and 2 hoeings. (ix) 27.77". (x) 19.10.1954.

2. TREATMENTS :

All combination of (1) and (2)

(1) 3 seed rates : S_1 0.5, S_2=1 and S_3=1.5 srs./plot.

(2) 4 ages of seedling : A_1=4, A_2=5, A_3=6 and A_3=7 weeks.

3. DESIGN :

(i) Fact. in. R.B.D. (ii) (a) 12. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 16'×72.6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1950—1954. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 499 lb./ac. (ii) 30.9 lb./ac. (iii) All the effects are highly significant. (iv) Av. yield of grain in lb./ac.

	A_1	A_2	A_3	A_4	Mean
S_1	491	661	640	504	574
S_2	472	611	596	378	514
S_3	550	529	498	420	499
Mean	504	600	578	434	529

S.E. of A marginal mean = 8.0 lb./ac.
S.E. of S marginal mean = 6.9 lb./ac.
S.E. of body of table = 13.8 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 58(18).**

Site :- Rice Breeding Sub.-Stn., Nagrota Bagwan. **Type :- 'C'.**

Object :—To compare different methods of sowing of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay soil. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (c) to (d) and (e) N.A. (v) N.A. (vi) China—988. (vii) Irrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

3 methods of sowing : S_1=Broadcasting, S_2=Dibbling and S_3=Transplanting.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 25′×47′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958—N.A. (b) and (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 3270 lb./ac. (ii) 13.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_1	S_2	S_3
Av. yield	3355	3196	3258

S.E./mean = 5.6 lb./ac.

Crop :- Paddy. **Ref :- Pb. 54(92).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'C'.**

Object :—To study the effect of different number of seedlings/hill and spacing on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Berseem*. (c) Nil. (ii) (a) Heavy loam soil. (b) N.A. (iii) 17, 20.7.1955. (iv) (a) Ploughing. (b) N.A. (c) 12 srs./ac. (d) and (e) As per treatments. (v) 1 md./ac. of A/S broadcast on 3.9.1954. (vi) 370—*Basmati* (medium). (vii) Irrigated. (viii) N.A. (ix) 12.58″. (x) 20.10.1955.

2. TREATMENTS :

Main-plot treatments :

Number of plants/hill : E_1=1, E_2=2 and E_3=3 plants/hill

Sub-plot treatments :

3 spacings : D_1=6″×6″, D_2=9″×9″ and D_3=12″×12″.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 45′-4½″×16′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) and (vi) Nil. (vii) Expt. conducted by chemical section.

5. RESULTS :

(i) 2795 lb./ac. (ii) (a) 586.0 lb./ac. (b) 177.8 lb./ac. (iii) Only D effect is highly significant while interaction E×D is significant. (iv) Av. yield of grain in lb./ac.

	E_1	E_2	E_3	Mean
D_1	2638	3128	2654	2807
D_2	2837	3009	2916	2920
D_3	2499	2607	2870	2659
Mean	2658	2915	2813	2795

S.E. of the difference of two

1. E marginal means = 169.2 lb./ac.
2. D marginal means = 51.3 lb./ac.
3. D means at the same level of E = 125.7 lb./ac.
4. E means at the same level of D = 260.3 lb./ac.

Crop :- Paddy. **Ref :- Pb. 55(16).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'C'.**

Object :—To study the effect of different number of seedlings/hill and spacing on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Heavy loam soil. (b) N.A. (iii) N.A./23, 24.7.1955. (iv) (a) to (c) N.A. (d) and (e) As per treatments. (v) 40 lb./ac. of N applied on 25.8.1955. (vi) *Jhona*—349 (medium). (vii) Irrigated. (viii) N.A. (ix) 39.15". (x) Last week of Oct., 1955.

2. TREATMENTS :

Main-plot treatments :

Number of seedlings/hill : E_1=1, E_2=2 and E_3=4 plants/hill.

Sub-plot treatments :

3 spacings : D_1=6"×6", D_2=9"×9" and D_3=12"×12".

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 39'×9'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) B.H.C. dusting done on 3rd to 8th Oct., and 12th and 15th Oct., 1955. (iii) Yield of grain. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) and (b) No. (vi) Very heavy rains, but no visible damage was caused. (vii) Expt. conducted by chemical section.

5. RESULTS :

(i) 1005 lb./ac. (ii) (a) 58.0 lb./ac. (b) 140.0 lb./ac. (iii) Only D and E effects are highly significant. (iv) Av. yield of grain in lb./ac.

	E_1	E_2	E_3	Mean
D_1	1123	1166	1555	1281
D_2	825	962	1060	949
D_3	656	785	911	784
Mean	868	971	1175	1005

S.E. of the difference of two

1. E marginal means = 16.8 lb./ac.
2. D marginal means = 40.4 lb./ac.
3. D means at the same level of E = 99.0 lb./ac.
4. E means at the same level of D = 84.2 lb./ac.

Crop :- Paddy. **Ref :- Pb. 56(124).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'C'.**

Object :—To study the effect of different number of seedlings/hill and spacing on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—*Berseem*—Paddy. (b) *Berseem.* (c) Nil. (ii) (a) Heavy soil. (b) N.A. (iii) N.A./12, 13.7.1956. (iv) (a) to (c) N.A. (d) and (e) As per treatments. (v) Nil. (vi) 370—*Basmati*. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) Number of plants/hill : $E_1=1$, $E_2=2$ and $E_3=4$ plants.

(2) 3 spacings : $D_1=6''\times6''$, $D_2=9''\times9''$ and $D_3=12''\times12''$.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/124 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1070 lb./ac. (ii) 111.3 lb./ac. (iii) Both D and E effects are highly significant while interaction D×E is not significant. (iv) Av. yield of grain in lb./ac.

	E_1	E_2	E_3	Mean
D_1	1271	1306	1492	1356
D_2	957	976	1238	1057
D_3	697	781	914	798
Mean	975	1021	1215	1070

S.E. of any marginal mean = 32.1 lb./ac.
S.E. of the body of the table = 55.6 lb./ac.

Crop :- Paddy. **Ref :- Pb. 54(67).**

Site :- Rice Breeding Sub-Stn., Gurdaspur. **Type :- 'CV'.**

Object :—To study the comparative utility of unnoded seedling to noded seedling.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy loam soil. (b) N.A. (iii) N.A./27, 28.7.1954. (iv) (a) 3 ploughings, passing *Sohaga* 3 times and 1 puddling. (b) Transplanting. (c) 12 srs./ac. (d) 9"×9" (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 weedings. (ix) 27.77". (x) 8.11.1954.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 varieties : V_1=*Jhona*—349 and V_2=*Basmati*—370.

(2) 2 types of seedling : N_0=Unnoded seedling, N_1=Noded seedling.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 6"—9"×80'. (b) 6'×72.6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) 1950—1954. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1552 lb./ac. (ii) 104.9 lb./ac. (iii) N and V effects are highly significant, while interaction N×V is not significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	Mean
V_1	1558	2008	1783
V_2	1175	1467	1321
Mean	1367	1738	1552

S.E. of any marginal mean = 30.3 lb./ac.
S.E. of body of table = 42.8 lb./ac.

Crop :- Paddy. **Ref :- Pb. 54(63).**

Site :- Rice Breeding Sub-Stn., Gurdaspur. **Type :- 'CV'.**

Object :—To find out the best combination of spacings and number of seedlings/hole for different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Sandy loam soil. (b) N.A. (iii) N.A./25.6.1953. (iv) (a) 3 ploughings, passing *Sohaga* 3 times and 1 puddling. (b) Transplanting. (c) N.A. (d) and (e) As per treatments. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 27.77". (x) 4, 25.10.1954.

2. TREATMENTS :

Main-plot treatments:

2 varieties : V_1=*Jhona*—349 and V_2=S—20.

Sub-plot treatments :

All combinations of (1) and (2).

(1) 3 spacings : S_1=6"×6", S_2=9"×9" and S_3=12"×12".

(2) No. of seedlings/hill : E_1=1, E_2=2 and E_3=3 seedlings/hill.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (vi) (a) 80'×6¼' to 80'×6½'. (b) 75.63'×6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to good. (ii) Nil. (iii) Grain yield. (iv) (a) 1950—1954. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 143 lb./ac. (ii) (a) 45.8 lb./ac. (b) 17.7 lb./ac. (iii) S and E effects and interaction V×E alone are highly significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	Mean	E_1	E_2	E_3
V_1	181	134	101	139	119	142	154
V_2	184	139	117	147	110	148	183
Mean	182	137	109	143	114	145	169
E_1	155	108	80				
E_2	177	140	118				
E_3	215	162	129				

S.E. of the difference of two

1. V marginal means = 10.8 lb./ac.
2. S or E marginal means = 5.1 lb./ac.
3. S or E means at the same level of V = 7.2 lb./ac.
4. V means at the same level of S or E = 12.4 lb./ac.

S.E. of body of E×S table = 6.3 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 54(62).**

Site :- Rice Breeding Sub-Stn., Gurdaspur. **Type :- 'CM'.**

Object :— To find out the best combination of transplanting date, levels of N, P and spacing for Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 3 ploughing, passing *soh aga* 3 times and puddling. (b) Transplanted. (c) N.A. (d) As per treatment. (e) N.A. (v) Nil. (vi) *Jhona*—349 (early). (vii) Irrigated. (viii) 3 weedings. (ix) 28.04". (x) 29.9.1954 to 23.10.1954.

2. TREATMENTS :

Main-plot treatments :

3 dates of transplanting : D_1=15th June, D_2=5th July and D_3=25th July, 1954.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=40 and N_2=80 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=40 and P_2=80 lb./ac.

Sub-Sub-plot treatments :

3 spacings : S_1=6"×6", S_2=9"×9" and S_3=12"×12".

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 9 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) 62'×25'. (b) 60'×6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1951—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1443 lb./ac. (ii) (a) 840.0 lb./ac. (b) 390.2 lb./ac. (c) 159.5 lb./ac. (iii) Main effects of N and S and interactions D×S and N×P×S are highly singnificant. (iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	P_0	P_1	P_2	S_1	S_2	S_3	Mean
N_0	1539	1228	855	1118	1378	1126	1470	1163	989	1207
N_1	1943	1427	1102	1408	1458	1607	1667	1486	1320	1491
N_2	1853	1776	1268	1623	1604	1669	1800	1632	1464	1632
Mean	1778	1477	1075	1383	1480	1467	1646	1427	1258	1443
S_1	1850	1778	1310	1654	1707	1576				
S_2	1780	1430	1071	1334	1411	1536				
S_3	1705	1223	845	1162	1322	1289				
P_0	1679	1423	1048							
P_1	1869	1586	985							
P_2	1787	1422	1193							

S.E. of difference of two

1. D marginal means = 132.0 lb./ac.
2. N or P marginal means = 61.3 lb./ac.
3. S marginal means = 25.1 lb./ac.
4. N or P means at the same level of D = 106.2 lb./ac.
5. D means at the same level of N or P = 47.3 lb./ac.
6. S means at the same level of D, P or N = 43.7 lb./ac
7. D means at the same level of S = 41.0 lb./ac.
8. N or P means at the same of S = 21.2 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 57(38).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'CM'**

Object :— To compare Japanese method of paddy cultivation to Chinese method.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) N.A./14.8.1957. (iv) (a) 4 ploughings. (b) Transplanting. (c) N.A. (d) and (e) As per treatments. (v) A/S at 164 lb./ac. (vi) Local. (vii) Irrigated. (viii) 1 hoeing. (ix) 18.46". (x) 28.10.1957.

2. TREATMENTS :

4 treatments : C_1=Japanese method with 3 seedlings/hole and 9" apart, C_2=Japanese method with 4 seedlings/hole and 9" apart, C_3=Chinese method with 1 plant/hole and 4½" apart and C_4= Chinese method with 2 plants/hole and 4½" apart.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/160 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—Nil. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2174 lb./ac. (ii) 262.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	C_1	C_2	C_3	C_4
Av. yield	1579	1625	2808	2684

S.E./mean = 131.1 lb./ac.

Crop :- Paddy. **Ref :- Pb. 54(36).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'CM'.**

Object :—To compare the effects of Japanese method and local method of cultivation of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Berseem.* (c) Nil. (ii) (a) Medium loamy soil. (b) N.A. (iii) N.A./10, 12.7.1954. (iv) (a) 5 ploughings, passing *Sohaga* 4 times. (b) N.A. (c) 9 srs./ac. (d) and (e) N.A. (v) N.A. (vi) *Jhona*—349 (medium). (vii) Irrigated. (viii) 2 hoeings and 2 weedings. (ix) 27.61". (x) 11.10.1954.

2. TREATMENTS :

4 treatments : C_1=Japanese method, C_2=Local method, C_3=Upto nursery stage Japanese method, but planting and manuring local method and C_4=Upto nursery by local method but planting and manuring by Japanese method.

8 C.L./ac. of F.Y.M. was applied in C_1 and C_4 treatments on 5, 6.7.1954. A/S and Super were applied on 9.7.1954. and A/S alone at 20 lb./ac. of N on 3.8.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 33'×66'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1954—contd. (with modifications). (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2835 lb./ac. (ii) 197.1 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	C_1	C_2	C_3	C_4
Av. yield	3109	2836	2562	2832

S.E./mean = 98.2 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 55(70).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'CM'.**

Object :—To compare Japanese and local method of Paddy cultivation.

1. BASAL CONDITIONS :

(i) Nil. (b) *Berseem.* (c) Nil. (ii) (a) Loam soil. (b) N.A. (iii) 14.7.1955. (iv) (a) 7 ploughings and passing *Sohaga* 4 times. (b) Transplanted. (c) 9 srs./ac. (d) and (e) N.A. (v) 9 C.L./ac. of F.Y.M.+60 srs./ac. of A/S+50 srs./ac. of Super. A/S applied on 14.7.1955. and 24.8.1955, half dose each time and Super on 12.7.1955. (vi) *Jhona*—349 (medium). (vii) Irrigated. (viii) 3 hoeings and weedings. (ix) 29.14". (x) 24.10.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) Two methods of cultivation : N_1=Nursery by local method and N_2=Nursery by Japanese method.
(2) Two methods of planting : T_1=Planting by local method and T_2=Planting by Japanese method.
(3) Two methods of manuring : M_1=Manuring by local method and M_2=Manuring by Japanese method.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 14'3"×84'. (b) 14'3"×58'9'.4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—contd. (with modifications). (b) and (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 1824 lb./ac. (ii) 238.0 lb./ac. (iii) Only M effect is highly significant. (iv) Av. yield of grain in lb./ac.

	T_1	T_2	Mean	N_1	N_2
M_1	1554	1600	1577	1698	1457
M_2	2029	2110	2070	2124	2016
Mean	1792	1855	1824	1916	1736
N_1	1811	2011			
N_2	1773	1700			

S.E. of any marginal mean = 59.5 lb./ac.
S.E. of body of any table = 84.1 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 56(33).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'CM'.**

Object :—To compare Japanese and local method of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Berseem.* (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 30.6.1956. (iv) 7 ploughings and passing *Sohaga* 5 times. (b) As per treatments. (c) to (e) N.A. (v) N.A. (vi) *Jhona*—349 (medium). (vii) Irrigated. (viii) N.A. (ix) 30.89". (x) 21.9.1956.

2. TREATMENTS :

Two methods of cultivation : C_1=Japanese method of and C_2=Local method.

3. DESIGN :

(i) Paired plots. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 15'×84'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of rice hopper; Gammexane sprayed on 3.9.1956. (iii) Yield of grain. (iv) (a) 1954—contd. (with modifications). (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 4000 lb./ac. (ii) 249.9 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of grain in lb./ac.

Treatment	C_1	C_2
Av. yield	4089	3911

S.E./mean = 102.0 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- Pb. 57(35).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'CM'.**

Object :—To compare Japanese and local method of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Clay loam soil. (b) N.A. (iii) 16.7.1957. (iv) (a) 4 ploughings. (b) Transplanting. (c) Nil. (d) and (e) As per treatments. (v) 1½ mds./ac. of A/S for C_1 and 1 md./ac. of A/S for C_2. (vi) *Jhona*—349. (vii) Irrigated. (viii) 2 hoeings. (ix) 28.05". (x) 9.10.1957.

2. TREATMENTS :

Two methods of cultivation : C_1=Japanese method and C_2=Local method.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—contd. (with modifications). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 4944 lb./ac. (ii) 293.3 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	C_1	C_2
Av. yield	5647	4241

S.E./mean = 119.7 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- Pb. 59(31).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type 'CM'.**

Object :—To compare Chinese, Japanese and Local methods of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam soil. (b) N.A. (iii) 30.7.1959. (iv) (a) As per treatments. (b) Transplanted. (c) and (d) N.A. (e) 1. (v) As per treatments. (vi) *Jhona*—349. (vii) Irrigated. (viii) Nil. (ix) 49.21". (x) 26.10.1959.

2. TREATMENTS :

Three methods of cultivations : C_1=Chinese, C_2=Japanese and C_3=Local.
20 ton./ac. of F.Y.M. at transplanting. 40 lb./ac. of Mur. Pot. 40 lb./ac. of Super and 40 lb./ac. of A/S at transplanting and 40 lb./ac. of each 3 weeks afterwards for C_1 plot ; 40 lb./ac. of Super+100 lb./ac. of A/S at transplanting and 20 lb./ac. of Super before flowering for C_2 and 40 lb./ac. of Super+100 lb./ac. of A/S for C_3 at the time of transplanting.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 12. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Yield of grain. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 1343 lb./ac. (ii) 29.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	C_1	C_2	C_3
Av. yield	1363	1294	1371

S.E./mean = 8.7 lb./ac.

Crop :- Paddy. **Ref :- Pb. 55(34).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'CM'.**

Object :—To find out the best method of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Berseem.* (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 21.7.1955. (iv) (a) 6 *desi* ploughings, passing 2 roller once and 1 hoeing. (b) to (e) N.A. (v) N.A. (vi) *Jhona*—349 (medium). (vii) Irrigated. (viii) Nil. (ix) 11.50". (x) 21.10.1955.

2. TREATMENTS :

Same as in expt. no. 54(36) on page 34.
A/S applied on 25.8.1955, and 8.9.1955.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 13'×66'. (b) 12'×66'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 4385 lb./ac. (ii) 260.0 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	C_1	C_2	C_3	C_4
Av. yield	4685	4094	4290	4469

S.E./mean = 106.1 lb./ac.

Crop :- Paddy (*Kharif*). **Ref :- Pb. 57(54).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'CM'.**

Object :—To compare different methods of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Heavy loam soil. (b) N.A. (iii) 24, 25.7.1957. (iv) (a) 1 *Desi* ploughing and passing *Sohaga* once. (b) Sown in lines. (c) N.A. (d) 9"×9". (e) 2to 3. (v) Nil. (vi) *Jhona*—349. (vii) Irrigated. (viii) 4 weedings and gap-filling. (ix) 18.56". (x) 16.10.1957.

2. TREATMENTS :

4 methods of cultivation : C_1=Japanese method ordinary, C_2=Japanese method in rows. C_3=Local method and. C_4=Chinese method.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 49½′×11⅓′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 4520 lb./ac. (ii) 279.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	C_1	C_2	C_3	C_4
Av. yield	4477	4782	4030	4791

S.E./mean = 114.1 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 58(53).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'CM'.**

Object :—To compare different methods of Paddy cultivation .

1. BASAL CONDITION :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 6.8.1958. (iv) (a) N.A. (b) Transplanted. (c) to (e) N.A. (v) Nil. (vi) *Jhona*—349. (vii) Irrigated. (viii) N.A. (ix) 23.18″. (x) 26.10.1958.

2. TREATMENTS :

4 methods of cultivation : C_1=Local method, C_2=Japanese method, C_3=Chinese method and C_4=Japanese method nursury sown in lines.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 44′×11′3″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) to (c) No. (v) (a) and (b) Nil. (vi) Crop was affected by heavy rains. (vii) Nil.

5. RESULTS :

(i) 3749 lb./ac. (ii) 1035 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	C_1	C_2	C_3	C_4
Av. yield	3455	3952	3922	3666

S.E./mean = 423.1 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 59(129).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'CM'.**

Object :—To compare different methods of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 17.7.1959. (iv) (a) N.A. (b) As per treatments. (c) 10 srs./ac. (d) 6″×9″. (e) 2 to 3. (v) 2 mds./ac. of Super on 9.7.1959 and 34 srs./ac. of A/S on 20.8.1959. (vi) *Jhona*—349. (vii) Irrigated. (viii) 4 weedings. (ix) 10.5″. (x) 14, 15.10.1959.

2. TREATMENTS :

Same as in expt. no. 58(53) above

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 44′×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) B.H.C. dusting on 9 and 16.9.1959. (iii) Yield of grain (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2759 lb./ac. (ii) 573.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	C_1	C_2	C_3	C_4
Av. yield	2572	2811	3000	2654

S.E./mean = 234.2 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 57(40).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'D'.**

Object :—To test the efficacy of different chemicals in controlling weeds in Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 20.7.1957. (iv) (a) 5 ploughings. (b) Transplanted. (c) to (e) N.A. (v) 224 lb./ac. of A/S. (vi) *Jhona*—349. (vii) Irrigated. (viii) Nil. (ix) 28.05″. (x) 15.10.1957.

2. TREATMENTS :

Main-plot treatments :

4 chemicals : C_1=Fernoxone, C_2=Dicotox, C_3=Kathon and C_4=Agroxone.

Sub-plot treatments :

5 doses of chemicals : D_0=Control, D_1=8, D_2=12 D_3=16 and D_4=20 ozs.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/120 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 4168 lb./ac. (ii) (a) 1246 lb./ac. (b) 367 lb./ac. (iii) Only 'control *vs.* D' effect is significant. (iv) Av. yield of grain in lb./ac.

	D_0	D_1	D_2	D_3	D_4	Mean
C_1	4388	4318	4002	4298	4534	4308
C_2	3752	4002	4512	4665	4407	4268
C_3	3821	4079	3941	4080	3794	3943
C_4	4018	4126	4133	4129	4319	4145
Mean	3995	4131	4147	4293	4264	4168

S.E. of the difference of two

C marginal means	=	394 lb./ac.
D marginal means	=	130 lb./ac.
D means at the same level of C	=	257 lb./ac.
C means at the same level of D	=	457 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 59(29).**

Site :- Govt. Agri. Stn. Gurdaspur. **Type :- 'D'.**

Object :—To test the efficacy of different chemicals in controlling weeds in Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 18.7.1959. (iv) (a) 4 ploughings. (b) Transplanted. (c) and (d)N.A. (e) 1. (v) 112 lb./ac. of Super on 18.7.1959. and 123 lb./ac. of A/S on 1.9.1959. (vi) *Jhona* —349. (vii) Irrigated. (viii) N.A. (ix) 49.21". (x) 15.10.1959.

2. TREATMENTS :

All combinations of (1) and (2) + 2 extra treatments

(1) 4 weedicides : W_1=Fernoxone, W_2=Dicotox, W_3=Kathon and W_4=Agroxone.

(2) 3 levels of weedicides : D_1=8, D_2=12 and D_3=16 ozs.

Extra treatments : E_1=Control, E_2=Local method of weeding.

3. DESIGN :

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 686 lb./ac. (ii) 130.8 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

E_1 = 753 lb./ac. and E_2 = 786 lb./ac.

	W_1	W_2	W_3	W_4	Mean
D_1	712	627	658	605	650
D_2	741	806	650	580	669
D_3	749	708	588	634	670
Mean	734	714	632	606	663

S.E. of D marginal mean = 29.2 lb./ac.
S.E. of W marginal mean = 33.8 lb./ac.
S.E. of body of table or extra treatment mean = 58.5 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. 57(39).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'D'.**

Object :— To compare different methods of weedings.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 21.7.1957. (iv) (a) 3 ploughings. (b) Transplanted. (c) to (e) N.A. (v) 470 lb./ac. of A/S applied 3 weeks and 6 weeks after transplanting. (vi) *Jhona*—349. (vii) Irrigated. (viii) 3 hoeings for W_0, W_2 and W_3 and 1 hoeing for W_1 and W_4. (ix) 28.05". (x) 15.10.1957.

2. TREATMENTS :

5 methods of weedings : W_0=Control, W_1=Local method, W_2=1 post emergence application of weedicide, W_3=2 post emergance application of weedicide and W_4=2 post emergence applicatian of weedicide+local method.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2114 lb./ac. (ii) 47.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	W_0	W_1	W_2	W_3	W_4
Av. yield	2108	2098	2115	2064	2184

S.E./mean = 100.9 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- Pb. :- 59(30).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :— To study the effect of spraying Feronoxone against the local method of weeding.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 23.7.1959. (iv) (a) N.A. (b) Transplanted. (c) and (d) N.A. (e) 1. (v) N.A. (vi) *Jhona*—349. (vii) Irrigated. (viii) N.A. (ix) 49.21". (x) 17.10.1959.

2. TREATMENTS :

6 methods of weeding : W_0=Control, W_1=Local method, W_2=post emergence application once, W_3= Two post emergence application, W_4=1 post emergence application+cultural method and W_5=Cultural method of weeding.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 9'×60.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1198 lb./ac. (ii) 144.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	W_0	W_1	W_2	W_3	W_4	W_5
Av. yield	1136	1214	1275	1244	1131	1188

S.E./mean = 72.3 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(177).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Toria. (b) and (c) N.A. (ii) Sandy loam soil. (b) Refer soil analysis, Abohar. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and T_2 to T_{12} plots received B.D. at 50 lb./ac. of P_2O_5. ½, 1, and 2 in other treatments indicate 25, 50, and 100 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) As per rotation.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1955—1957. (b) Yes. (c) Nil. (v) (a) Hansi and Jullundur. (b) Nil (vi) and (vii) Nil.

5. RESULTS :

(i) 1199 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield	1185	1093	1637	1144	1358

S.E.'s—N.A.

Crop :- Wheat (*Rabi*) **Ref :- Pb. 56(181).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) *Toria*—Wheat—Cotton. (b) N.A. (c) As per treatments. (ii) (a) Sandy loam soil. (b) Refer soil analysis, Abohar. iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. viii) 1 hoeing and weeding (ix) and (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and T_2 to T_{12} plots received B.D. at 25 lb./ac. of P_2O_5. while ½, 1, and 2 in other treatments indicate 25, 50, and 100 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) As per treatments.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1955—1957. (b) Yes. (c) Nil. (v) (a) Hansi and Jullundur. (vi) and (vii) Nil.

5. RESULTS :

(i) 1417 lb./ac. (ii) 229.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	1440	1280	699	864	1440	2074	1555	1761	2049

S.E. of $(T_2+T_3+T_4+T_5)$ mean = 81.2 lb./ac.
S.E. of any other mean = 162.5 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(211).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) Cotton—*Toria*—Wheat. (b) N.A. (c) As per treatments. (ii) (a) Fine sandy loam soil. (b) Refer soil analysis, Abohar. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(181) above.

5. RESULTS :

(i) 944 lb./ac. (ii) 297.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	782	736	502	946	773	856	1292	1498	872	1325	1012

S.E. of (T_2+T_3)/mean = 148.7 lb./ac. and S.E. of any other mean = 210.3 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(183).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P_2O_5 applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Berseem*. (b) and (c) N.A. (ii) (a) Sandy loam soil. (b) Refer soil analysis, Abohar. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and no super, T_2 to T_{12} plots received B.D. at 50 lb./ac. of N. ½, 1, and 2 in other treatments indicate 25, 50 and 100 lb./ac. of supers.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) As per rotation.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1955—1957. (b) Yes. (c) Nil. (v) (a) Hansi and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1112 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield	889	1151	1103	1210	1012

S.E.'s — N.A.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(187).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'**

Object :— To study the direct, residual and cumulative effect of P_2O_5 applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) *Berseem*—Wheat—Cotton. (b) N.A. (c) As per treatments. (ii) (a) Sandy loam soil. (b) Refer soil analysis, Abohar. (iii) N.A. (iv) (a) 2 ploughing (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and super, T_2 to T_{12} plots received B.D. at 25 lb./ac. of N. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of super.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) As per rotations.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a)1955—1957. (b) Yes. (c) Nil. (v) (a) Hansi and Jullundur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1844 lb./ac. (ii) 280.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	1547	1738	1917	1761	2123	2205	1555	1942	2123

S.E. $(T_2+T_3+T_4+T_5)$ mean = 99.2 lb./ac. and S.E. of any other mean = 198.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. :- 57(217),**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :— To study the direct, residual and cumulative effect of P_2O_5 applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Berseem*—Wheat. (b) N.A. (c) As per treatments. (ii) (a) Sandy loam soil. (b) Refer soil analysis, Abohar. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(187) on page 43.

5. RESULTS :

(i) 1084 lb./ac. (ii) 183.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	880	1090	782	1037	996	1152	905	1284	1218	1366	1210

S E. of (T_2+T_3) mean = 91.92 lb./ac. and S.E. of any other mean = 130.0 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(42).**

Site -: Dist. Demons. Farm, Ambala. **Type :- 'M'.**

Object :—To study the effect of N through different sources on Wheat crop

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam soil. (b) N.A. (iii) 21.11.1956. (iv) (a) 5 *desi hal* and 4 *sohaga*. (b) Sown by *kera*. (c) 35 srs./ac. (d) 8″ between rows. (e) N.A. (v) N.A. (vi) C—228 (medium). (vii) Irrigated. (viii) N.A. (ix) 6.03″. (x) 1.5.1957.

2. TREATMENTS :

5 sources of 40 lb./ac. of N : S_0=Control (no manure), S_1=A/S, S_2=Urea, S_3=A/N and S_4=A/C.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 72.6′×15′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 978 lb./ac. (ii) 171.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4
Av. yield	501	1169	1100	1101	1018

S.E./mean = 70.1 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(147).**

Site :- Soil. Cons. Res. Demons. and Trg. Centre, Chandigarh. Type :- 'M'.

Object :—To study the effect of micronutrients on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) *Lobia*—Wheat. (b) *Lobia*. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Chandigarh. (iii) N.A. (iv) (a) N.A. (b) Drilled. (c) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 9 micronutrients : M_0=Control, M_1=20 lb./ac. of Fe as $FeSO_4$, M_2=100 lb./ac. of Mg as $MgSO_4$, M_3=5 lb./ac. of B as Sod. Borate, M_4=10 lb./ac. of Zn as $ZnSO_4$, M_5=4 ozs./ac. of M_0 as Sod. Molybdate, M_6=10 lb./ac. of Cu as C/S, M_7=5 lb./ac. of Co as cobalt chloride and M_8=5 lb./ac. of Mn as $MnSO_4$.

(2) 2 types of application of micronutrients : T_1=Foliar spray and T_2=Ground application.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/1000 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 898 lb./ac. (ii) 235.6 lb./ac. (iii) Only main effect of T is highly significant. (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	Mean
T_1	—	1547	1609	1469	1422	1234	1250	1406	1266	1400
T_2	—	531	437	297	453	375	562	391	359	426
Mean	781	1039	1023	883	937	805	906	898	812	

S.E. of M marginal mean = 83.3 lb./ac.
S.E. of T marginal mean = 41.6 lb./ac.
S.E. of body of table = 117.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(168).**

Site :- Soil Cons. Res. Demons. and Trg. Centre, Chandigarh. Type :- 'M'.

Object :—To study the effect of micronutrients on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Chandigarh. (iv) (a) N.A. (b) Drilling. (c) and (d) N.A. (e) Nil. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(147) on page 45.

5. RESULTS :

(i) 825 lb./ac. (ii) 276.9 lb./ac. (iii) Main effect of T is highly significant. (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	Mean
T_1	—	1266	1172	1312	1063	1125	1172	1016	1219	1168
T_2	—	531	656	469	531	469	469	500	437	508
Mean	719	898	914	891	797	797	820	758	828	

S.E. of M marginal mean = 97.9 lb./ac.
S.E. of T marginal mean = 48.9 lb./ac.
S.E. of body of table = 138.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(170).**

Site :- Soil Cons. Res. Demons. and Trg. Centre, Chandigarh. Type :- 'M'.

Object :—To study the effect of application of P at different levels on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Chandigarh. (iii) N.A. (iv) (a) N.A. (b) Drilled. (c) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

5 levels of P_2O_5 : P_0=0, P_1=15, P_2=30, P_3=45 and P_4=60 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1958 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 315 lb./ac. (ii) 80.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2	P_3	P_4
Av. yield	217	321	363	318	357

S.E./mean = 40.5 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(39).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the best method of placement of N as A/S to Wheat.

1. BASAL CONDITIONS :

(i) (a) Fallow—Wheat. (b) Fallow. (c) Nil. (ii) (a) Medium to heavy loamy soil. (b) Refer soil analysis, Gurdaspur. (iii) 11.11.1954. (iv) (a) 8 ploughings, 11 *sohaga* and spring harrowings. (b) N.A. (c) 35 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—250 (medium). (vii) Unirrigated. (viii) 1 hoeing. (ix) 6.59". (x) 21.4.1955.

2. TREATMENTS :

6 methods of application of N : M_0=Control (no manure), M_1= Drilled below seed row with *Por* by mixing seed and fertilizer before application, M_2=Drilled below seed row by *por* followed by sowing seed with *kera* in open furrows, M_3=By dropping the fertilizer in furrows in contact with seed by *kera* followed by seeding, M_4=Broadcast before sowing and M_5=Broadcast with shower of rain on 6.1.1955.

N applied at 20 lb./ac. as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 1/48 ac. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1953—1954. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1324 lb./ac. (ii) 133.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	1351	1075	1387	1485	1391	1257

S.E./mean = 54.7 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(41).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the best method of placement of N as A/S to Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Gacha* fodder. (c) 12 C.L./ac. of F.Y.M.+30 srs./ac. of A/S+20 srs./ac. of Super. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 18.11.1954. (iv) (a) 7 ploughings and 11 *sohaga*. (b) N.A. (c) 32 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 6.59". (x) 27.4.1955 and 3.5.1955.

2. TREATMENTS :

6 methods of application of N : M_0=Control, M_1=Drilled below seed row with *por* by mixing the seed and fertilizer before application, M_2=Drilled below the seed row by *por* followed by sowing seed with *kera*, M_3=By dropping the fertilizer in furrows in contact with seed by *kera* followed by seeding, M_4=Broadcast before sowing and M_5=Broadcast at first irrigation on10.1.1955.

N applied at 30 lb./ac. as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 1/50 ac. (b) 1/54 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1954 only. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2040 lb./ac. (ii) 111.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	1748	1967	2108	2158	2121	2136

S.E./mean = 45.6 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(57).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best time and method of application of A/S to Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sannhemp*. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 24.11.1954. (iv) (a) 7 ploughings and 10 *sohaga*. (b) N.A. (c) 35 srs./ac. (d) 9" between rows. (e) N.A. (v) *Sannhemp* was buried as G.M. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix)7.59". (x) 29.4.1955.

2. TREATMENTS :

5 methods of application of N : M_0=Control, M_1=Full dose broadcast at first irrigation, M_2=Full dose applied in contact with seed, M_3=$\frac{1}{2}$ the dose applied in contact with seed+$\frac{1}{2}$ the dose broadcast at ear formation and M_4=$\frac{1}{2}$ the dose broadcast at first irrigation+$\frac{1}{2}$ the dose broadcast at ear formation.

N at 30 lb./ac. as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 81'×12'. (b) 55'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1954. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS:

(i) 2346 lb./ac. (ii) 198.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4
Av. yield	2270	2322	2379	2383	2377

S.E./mean = 81.0 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(43).**

Site Govt. Agri. Stn , Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different doses of N and P, alone and in combination on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Gacha* fodder—Maize and *Bajra*. (c) 8 C.L./ac. of F.Y.M.+82 lb./ac. of A/S. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 27.11.1954. (iv) (a) 6 ploughings and 10 *sohaga*. (b) N.A. (c) 36 srs./ac. (d) 9" between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 6.59". (x) 2.5.1955. and 4.5.1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=25 and N_2=50 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=25 and P_2=50 lb./ac.

A/S and Super applied at the time of sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 5′×55′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3731 lb./ac. (ii) 193.1 lb./ac. (iiii) Main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	3085	3350	3126	3187
N_1	3829	4190	4032	4017
N_2	3966	4083	3920	3990
Mean	3627	3874	3692	3731

S.E. of N or P marginal mean = 55.7 lb./ac.
S.E. of body of table = 96.6 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(42).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of B.M., B.M. compost and Super alone and in combination, with A/S on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Gacha* fodder. (c) 8 C.L./ac. of F.Y.M. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 23.11.1954. (iv) 8 ploughings and 11 *sohaga*. (b) N.A. (c) 32 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 6.59″. (x) 28.4.1955.

2. TREATMENTS :

9 manurial treatments : M_0=Control, M_1=25 lb./ac. of P_2O_5 as B.M., M_2=25 lb./ac. of P_2O_5 as B.M. compost, M_3=25 lb./ac. of P_2O_5 as B.M.+25 lb./ac. of N as A/S, M_4=25 lb./ac. of P_2O_5 as B.M. compost+25 lb./ac. of P_2O_5 as B.M., M_5=25 lb./ac. of P_2O_5 as B.M. compost+25 lb./ac. of N as A/S, M_6=25 lb./ac. of P_2O_5 as Super, M_7=25 lb./ac. of N as A/S+25 lb./ac. of P_2O_5 as Super and M_8=25 lb./ac. of N as A/S.

Fertilizers applied at the time of sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 12′×70.5′. (b) 12′×60.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of loose smut. Affected ear heads removed. (iii) Grain and straw yield. (iv) (a) 1953—1955. No. (c) Nil. (v) to) (vii) Nil.

5. RESULTS :

(i) 1404 lb./ac. (ii) 149.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8
Av. yield	1190	1344	1117	1633	1136	1651	1263	1730	1570

S.E./mean = 74.8 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 55(69).**

Site :- Govt Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of B.M., B.M. compost and Super alone and in combinations with A/S on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fodder. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 7.12.1955. (iv) (a) 11 ploughings, 11 *sohaga* and 1 roller. (b) Sown by *kera*. (c) 32 srs./ac. (d) 8" between rows. (e) Nil. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) 1 hoeing. (x) 6.29". (x) 30.4.1956.

2. TREATMENTS :

Same as in expt. no. 54(42) on page 49.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 71'×9'. (b) 55'×9'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 742 lb./ac. (ii) 83.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8
Av. yield	605	670	690	645	673	699	987	1097	611

S.E./mean = 41.7 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 54(59).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :— To find out the best combination of different levels of N, P and K for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Chari* fodder. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil anylysis, Gurdaspur. (ii) 4.12.1954. (iv) (a) 5 ploughings and 6 *sohaga*. (b) N.A. (c) 45 srs/ac. (d) 9" between rows. (e) N.A. (v) Nil. (vi) C—273. (vii) Irrigated. (viii) Nil. (ix) 9.84". (x) 27.4.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : N_0=0, N_1=20 and N_2=40 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=20 and P_2=40 lb./ac.

(3) 3 levels of K_2O as Pot. Sul. : K_0=0, K_1=20 and K_2=40 lb./ac.

Pot. Sul. and Super applied at the time of sowing. Half dose of A/S at the time of sowing and half 2½ months after sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) 44'×9'. (b) 40'-4"×9'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—1958. (b) No. (c) N.A. (vi) to (vii) Nil.

5. RESULTS :

(i) 1564 lb./ac. (ii) 142·5 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	1072	1088	1101	1087	1077	1071	1112
N_1	1551	1657	1666	1625	1581	1661	1632
N_2	1950	1950	2040	1980	1894	2021	2026
Mean	1524	1565	1602	1564	1517	1584	1590
K_0	1473	1529	1550				
K_1	1522	1572	1659				
K_2	1578	1594	1598				

S.E. of any marginal mean = 23.8 lb./ac.
S.E. of body of any table = 41.1 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(65).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :— To find out the best combination of different levels of N, P and K for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fodder. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 3.12.1955. (iv) (a) 3 ploughings and 3 *sohaga*. (b) Sown by *kera*. (c) 40 srs./ac. (d) 8″ between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 6.29″. (x) 29.4.1956.

2. TREATMENTS :

All combinations (1), (2) and (3)

(1) 3 levels of N as A/S : N_0=0, N_1=20 and N_2=40 lb/ac.
(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=20 and P_2=40 lb./ac.
(3) 2 levels of K_2O as Pot. Sul. : K_0=0 and K_1=20 lb./ac.

Fertilizers applied before sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) 12′ 4½″×44′. (b) 12′4½″×44′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Wheat seedlings attacked by rust. (iii) Yield of grain. (iv) (a) 1954—1959 (modified in 1955). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1131 lb./ac. (ii) 112·8 lb./ac. (iii) Main effect of N, P and K are highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1
N_0	816	815	942	858	825	891
N_1	1188	1179	1266	1211	1156	1266
N_2	1261	1353	1355	1323	1265	1381
Mean	1089	1116	1188	1131	1082	1179
K_0	1036	1085	1125			
K_1	1141	1146	1251			

S.E. of N or P marginal mean	=	23.0 lb./ac.
S.E. of K marginal mean	=	18.8 lb./ac.
S.E. of body of N×P table	=	39.9 lb./ac.
S.E. of body of N×K or P×K table	=	32.6 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref -: Pb. 56(27).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best combination of different levels of N, P and K for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 13.12.1956. (iv) (a) 7 ploughings and 5 *sohaga*. (b) Sown by *kera*. (c) 40 srs./ac. (d) 9″ between rows. (e) Nil. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 8.83″. (x) 29.4.1957.

2. TREATMENTS :

Same as in expt. no. 55(65) on page 51.

3. DESIGN :

(i) Fact. in R.B.D.. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) 38′×8¼′. (b) 38′×8¼′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—1958. (modified in 1955). (b) No. (c) Nil. (v) to (vii) Nil.

ESULTS :

(i) 954 lb./ac. (ii) 112.5 lb./ac. (iii) Main effects of N and K are highly significant and N×K intraction is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1
N_0	723	648	694	688	686	691
N_1	993	1133	975	1027	965	1089
N_2	1116	1173	1152	1447	1058	1236
Mean	944	978	940	954	903	1005
K_0	895	931	883			
K_1	993	1025	998			

S.E. of N or P marginal mean	=	23.0 lb./ac.
S.E. of K marginal mean	=	18.7 lb./ac.
S.E. of body of N×P table	=	39.8 lb./ac.
S.E. of body of N×K or P×K table	=	32.5 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(42).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best combination of different levels of N, P and K for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 13.12.1957. (iv) (a) 4 ploughings. (b) Sown by *kera*. (c) 30 srs./ac. (d) 9″ between rows. (e) N.A. (v) N.A. (vi) C—273. (vii) Irrigated. (viii) 1 hoeing. (ix) 3.38″. (x) 24.4.1958.

2. TREATMENTS :

Same as in expt. no. 55(65) on page 51.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (a) 1954—1958 (modified in 1955). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1416 lb./ac. (ii) 187.1 lb./ac. (iii) Main effects of N and P are highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1
N_0	1146	1278	1290	1238	1256	1220
N_1	1302	1570	1527	1466	1478	1454
N_2	1380	1599	1652	1544	1502	1586
Mean	1276	1482	1490	1416	1412	1420
K_0	1275	1482	1480			
K_1	1277	1483	1500			

S.E. of N or P marginal mean = 38.2 lb./ac.
S.E. of K marginal mean = 31.2 lb./ac.
S.E. of body of N×P table = 66.1 lb./ac.
S.E. of body of N×K or P×K table = 54.0 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(36).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Gurdaspur. (iii) 19.11.1958. (iv) (a) 5 ploughings. (b) By *kera*. (c) 36 srs./ac. (d) 9″ between rows. (e) N.A. (v) N.A. (vi) C—273. (vii) Irrigated. (viii) N.A. (ix) 11.11″. (x) 1.5.1959.

2. TREATMENTS :

Same as in expt. no 55(65) on page 51.

3. DESIGN :

(i) $3^2 \times 2$ Fact. confd. (NP and NPK confd.). (ii) (a) 6 plots/block and 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 40′×4.75′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2697 lb./ac. (ii) 274.7 lb./ac. (iii) Only N, P and K effects are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
K_0	2304	2606	2665	2525	2486	2395	2695
K_1	2557	2970	3085	2870	2650	2923	3038
Mean	2430	2788	2875	2697	2568	2659	2866
P_0	2329	2634	2741				
P_1	2354	2760	2863				
P_2	2609	2970	3021				

S.E. of N or P marginal mean = 56.3 lb./ac.
S.E. of K marginal mean = 45.8 lb./ac.
S.E. of body of N×P table = 94.3 lb./ac.
S.E. of body of N×K or P×K table = 79.3 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(25).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different combinations of N, P and K on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 27.11.1959. (iv) (a) 6 ploughings. (b) Sown by *kera*. (c) 82 lb./ac. (d) 8" between rows. (e) Nil. (v) Nil. (vi) C—286. (vii) Irrigated. (viii) N.A. (ix) 4.71". (x) 26.4.1960.

2. TREATMENTS :

7 manurial treatments : M_0=Control, M_1=30 lb./ac. of N+30 lb./ac. of P_2O_5, M_2=40 lb./ac. of N+30 lb./ac. of P_2O_5, M_3=60 lb./ac. of N+30 lb./ac. of P_2O_5, M_4=30 lb./ac. of N+30 lb./ac. of P_2O_5+20 lb./ac. of K_2O, M_5=40 lb./ac. of N+30 lb./ac. of P_2O_5+20 lb./ac. of K_2O and M_6=60 lb./ac. of N+30 lb./ac. of P_2O_5+20 lb./ac. of K_2O. N as C/A/N, P_2O_5 as Super and K_2O as Mur. Pot. applied at the time of sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 50'-5"×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 743 lb./ac. (ii) 96.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	285	711	771	833	808	923	870

S.E./mean = 48.3 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(40).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 13.11.1954. (iv) (a) 10 ploughings and 15 *sohaga*, (b) Sown by *kera*. (c) 32 srs./ac. (d) 8″ between rows. (e) Nil. (v) Nil. (vi) C—250 (medium). (vii) Unirrigated. (viii) 1 hoeing. (ix) 6.59″. (x) 23.4.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : N_0=O, N_1=15 and N_2=30 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=O, P_1=15 and P_2=30 lb./ac.

(3) 3 levels of K_2O as Pot. Sul : K_0=O, K_1=8 and K_2=16 lb./ac.

Festilizers broadcast at the time of sowing.

3. DESIGN :

() 3^3 confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 15′×39′-11″. (b) 15′×36′-3″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1954 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 182 lb./ac. (ii) 119.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	155	175	175	168	164	172	169
N_1	163	188	197	183	183	182	183
N_2	177	197	207	194	189	201	191
Mean	165	187	193	182	179	185	181
K_0	166	188	182				
K_1	163	193	198				
K_2	165	179	199				

S.E. of any marginal mean = 28.1 lb./ac.
S.E. of body of any table = 48.7 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(44).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different sources of N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize and *Bajra*. (c) 82 lb./ac. of A/S. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 4.12.1954. (iv) (a) 8 ploughings and 11 *sohaga*. (b) N.A. (c) 35 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—273 (medium). (vii) Irrigated. (viii) Nil. (ix) 6.59″. (x) 30.4.1955.

2. TREATMENTS :

6 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S, S_2=A/N, S_3=C/N, S_4=Urea and S_5=A/S/N.

N broadcast at the time of sowing.

3. DESIGN :

(i) L. Sq. (ii) and (iii) 6. (iv) (a) 7½′×48′. (b) 7½′×40⅓′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1954—1955. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1631 lb./ac. (ii) 101.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5
Av. yield	901	1814	1768	1796	1663	1845

S.E./mean = 41.2 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(67).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :— To study the effect of different sources of N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 1.12.1955. (iv) (a) 5 ploughings and 4 *sohaga*. (b) Sown by *kera*. (c) 35 srs/ac. (d) 8" between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 6.29". (x) 28.4.1956.

2. TREATMENTS :

7 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S, S_2=A/N, S_3=A/S/N, S_5=Urea and S_6=Bloodmeal.

N broadcast at the time of sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 9'×61'. (b) 9'×55'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 947 lb./ac. (ii) 129.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	560	1080	993	1013	970	1007	1004

S.E./mean = 64.7 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(47).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :— To study the effect of different sources of N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fodder. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 2.12.1954. (iv) (a) 8 ploughings. (b) N.A. (c) 19 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) 1 hoeing. (ix) 6.59". (x) 24.5.1955.

2. TREATMENTS :

6 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S, S_2=A/N, S_3=C/N, S_4=Urea, and S_5=A/S/N.

N broadcast at the time of sowing.

3. DESIGN :

(i) L. sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 9'×40'-4". (b) 9'×33'-7½". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1460 lb./ac. (ii) 200.6 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5
Av. yield	1429	1571	1555	1463	1160	1580

S.E./mean = 81.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(62).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different sources of N on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize fodder. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 7.12.1955. (iv) (a) 6 ploughings and 7 *sohaga*. (b) Sown by *kera*. (c) 40 srs./ac. (d) 8″ between rows. (e) N.A. (v) Nil. (vi) C—250 (medium). (vii) Irrigated. (viii) Nil. (ix) 6.29″. (x) 28.4.1956.

2. TREATMENTS :

5 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S, S_2=C/N, S_3=Urea and S_4=A/N.
N applied before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 9′×81′. (b) 9′×60.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—1959 (treatments changed every year). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1190 lb./ac. (ii) 138.8 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4
Av. yield	908	1286	1296	1245	1214

S.E./mean = 69.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(26).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different sources of N on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 24.11.1956. (iv) (a) 8 ploughings and 9 *sohaga*. (b) Sown by *pore*. (c) 40 srs./ac. (d) 8″ between rows. (e) N.A. (v) Nil. (vi) C—273 (late). (vii) Irrigated. (viii) Nil. (ix) 8.83″. (x) 28.4.1957.

2. TREATMENTS :

6 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S, S_2=A/N, S_3=A/C, S_4=C/N and S_5=Urea.

N is applied before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 8′×80′. (b) 8′×68′. (v) N.A. (vi) Yes.

4. GENERAL :

(i Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—1959 (treatments changed every year). (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1558 lb./ac. (ii) 146.1 lb./ac. (iii Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5
Av. yield	1049	1671	1659	1787	1592	1587

S.E./mean = 73.1 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(43).**

Site :- Govt Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different sources of N on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. b) Maize. (c) N.A. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 27.11.1957. (iv) (a) 5 ploughings. (b) Sown by *kera*. (c) 40 srs./ac. (d) 8″ between rows. (e) N.A. (v) N.A. (vi) C—273. (vii) Irrigated. (viii) 1 hoeing. (ix) 3.92″. (x) 25.4.1958.

2. TREATMENTS :

8 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S, S_2=A/C, S_3=A/N, S_4=A/S/N, S_5=Urea, S_6=Nitro. chalk and S_7=C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—1959 (treatments changed every year). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1531 lb./ac. (ii) 141.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	1054	1527	1661	1669	1656	1414	1597	1671

S.E./mean = 70.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(37).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different sources of N on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) N.A. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 19.11.1958. (iv) (a) 5 ploughings. (b) Sown by *kera*. (c) 36 srs./ac. (d) 8″ between rows. (e) N.A. (v) N.A. (vi) C—273. (vii) Irrigated. (viii) N.A. (ix) 11.11″. (x) 1.5.1959.

2. TREATMENTS :

Same as in expt. no. 57(43) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—1959 (treatments changed every year). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1706 lb./ac. (ii) 388 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	1315	1716	1938	1697	1816	1781	1591	1794

S.E./mean = 194.0 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(23).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different sources of N on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 2.12.1959. (iv) (a) 7 ploughings. (b) Sown by *kera*. (c) 82 lb./ac. (d) 9" between rows. (e) N.A. (v) N.A. (vi) C—286. (vii) Irrigated. (viii) 1 hoeing. (ix) 4.71". (x) 26.4.1960.

2. TREATMENTS :

10 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S, S_2=A/S/N, S_3=A/N, S_4=C/A/N, S_5=A/C, S_6=C/N, S_7=Urea, S_8=Ammo. phos. and S_9=Liquor ammonia.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/88 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—1959. (treatments changed every year). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 184 lb./ac. (ii) 45.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9
Av. yield	124	144	153	164	147	255	215	198	337	105

S.E./mean = 22.6 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(68).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effects of N and P alone and in combinations on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fodder. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 3.12.1955. (iv) (a) 10 ploughings, 7 *sohaga* and 2 roller applications. (b) Sown by *kera*. (c) 82 lb./ac. (d) 8" between rows. (e) N.A. (v) N.A. (vi) C—591 (medium). (vii) Unirrigated. (viii) Nil. (ix) 6.29". (x) 26.4.1956.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=15 and N_2=30 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=15 and P_2=30 lb./ac.

A/S and Super applied first after sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 9′×60′. (b) 9′×55′. (v) N.A. (vi) Yes

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1955—1958 (treatments changed every year). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 623 lb./ac. (ii) 59.5 lb./ac. (iii) Main effects of N and P are highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	320	334	331	328
N_1	571	690	713	658
N_2	786	911	948	882
Mean	559	645	664	623

S.E. of any marginal mean = 17.2 lb./ac.
S.E. of body of table = 29.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(32).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effects of N and P alone and in combinations on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 10.12.1956. (iv) (a) N.A. (b) Sown by *kera*. (c) 82 lb./ac. (d) 8″ between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 8.83″. (x) 28.4.1957.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=40 and N_2=80 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=20 and P_2=40 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 12′×70′. (b) 12′×60.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1955—1958 (treatments changed every year). (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 981 lb./ac. (ii) 254.2 lb./ac. (iii) Main effect of N is highly significant. N×P interaction is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	689	690	670	683
N_1	1068	1126	1159	1118
N_2	1003	1213	1209	1142
Mean	920	1010	1013	981

S.E. of any marginal mean = 73.4 lb./ac.
S.E. of body of table = 127.1 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(51).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effects of N and P alone and in combinations on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 22.11.1957. (iv) (a) N.A. (b) Sown by *kera*. (c) 36 srs./ac. (d) 8″—9″ between rows. (e) N.A. (v) N.A. (vi) C—273. (vii) Irrigated. (viii) N.A. (ix) 3.92″. (x) 21.4.1958.

2. TREATMENTS :

Same as in expt. no. 56(32) on page 60.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 71′×6′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(ii) 1371 lb./ac. (ii) 114.3 lb./ac. (iii) Main effect of N is highly significant and main effect of P is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	1208	1268	1304	1260
N_1	1338	1397	1668	1468
N_2	1417	1337	1404	1386
Mean	1321	1334	1459	1371

S.E. of any marginal mean = 33.0 lb./ac.
S.E. of body of table = 57.2 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(34).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effects of N and P alone and in combinations on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) N.A. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 27.11.1958. (iv) 5 ploughings. (b) Sown by *kera*. (c) N.A. (d) 9″ between rows. (e) N.A. (v) N.A. (vi) C—273. (vii) Irrigated. (viii) N.A. (ix) 10.35″. (x) 30.4.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as C.A.N : N_0=0, N_1=15 and N_2=30 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=15 and P_2=30 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 6'×60.5'. (b) 6'×55'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 749 lb./ac. (ii) 118.8 lb./ac. (iii) Main effects of N and P are highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	420	577	598	532
N_1	619	827	875	774
N_2	641	1035	1146	941
Mean	560	813	873	749

S.E. of any marginal mean = 34.3 lb./ac.
S.E. of body of table = 59.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(56).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object —To study the residual effect of N and P applied to Maize crop on succeeding Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) As per treatments. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 23.11.1954. (iv) (a) 5 ploughings, 7 *sohaga* and 4 roller applications. (b) N.A. (c) 32 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—250 (medium). (vii) Irrigated. (viii) Nil. (ix) 7.59". (x) 25.4.1955.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 levels of N as A/S : N_0=O and N_1=60 lb./ac.

(2) 2 levels of P_2O_5 as Super : P_0=O and P_1=60 lb./ac.

Fertilizers applied to previous maize crop.

3. DESIGN :

(i) Fact. in R.B.D. (ii) 4. (iii) 6. (iv) (a) 12'×75.62'. (b) 12'×75.62'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1018 lb./ac. (ii) 87.4 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	Mean
N_0	941	965	953
N_1	1065	1103	1084
Mean	1003	1034	1018

S.E. of N or P marginal mean = 25.2 lb./ac.
S.E. of body of table = 35.7 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(45).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of N and P applied to previous crop of Maize on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Wheat-Maize. (b) Maize. (c) As per treatments. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 28.11.1957. (iv) (a) 4 ploughings. (b) Sown by *kera*. (c) 82 lb./ac. (d) 8″ between rows. (e) Nil. (v) N.A. (vi) C—273. (vii) Irrigated. (viii) 1 hoeing. (ix) 3.92″. (x) 25.4.1958.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 levels of N as A/S : N_0=O, N_1=60 and N_2=120 lb./ac.
(2) 3 levels of P_2O_5 as Super : P_0=O, P_1=30 and P_2=60 lb./ac.
N and P applied to previous crop.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1957—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 907 lb./ac. (ii) 116.1 lb./ac. (iii) Main effect of N and P and interaction N×P are highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	704	830	1183	906
N_1	717	609	877	734
N_2	823	1245	1172	1080
Mean	748	895	1077	907

S.E. of any marginal mean = 33.5 lb./ac.
S.E. of body of table = 58.1 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(27).**

Sitt :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :— To study the effect of N and P applied to previous crop of Maize on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 30.11.1959. (iv) (a) 6 ploughings. (b) Sown by *kera*. (c) 82 lb./ac. (d) 8″—9″ between rows. (e) N.A. (v) N.A. (vi) C—273. (vii) Irrigated. (viii) 1 hoeing. (ix) 6.89″. (x) 1.5.1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(45) above.

5. RESULTS :

(i) 519 lb./ac. (ii) 59.4 lb./ac. (iii) Only interaction N×P is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	471	463	561	498
N_1	471	519	525	505
N_2	555	609	499	554
Mean	499	530	528	519

S.E. of any marginal mean = 17.1 lb./ac.
S.E. of body of table = 29.7 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(33).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :— To study the effect of N and P on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Maize. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 24.11.1958. (iv) (a) 6 ploughings. (b) Sown by *kera*. (c) 36 srs./ac. (d) 9" between rows. (e) N.A. (v) N.A. (vi) C—273. (vii) Irrigated. (viii) N.A. (ix) 10.35". (x) 30.4.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as C.A./N : N_0=0, N_1=40 and N_2=80 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=20 and P_2=40 lb./ac.

N and P applied at the time of sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 71'×6'. (b) 60.5'×6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1958—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 938 lb./ac. (ii) 51.6 lb./ac. (iii) Main effects of N and P and interaction N×P are highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	760	810	833	801
N_1	891	999	1084	991
N_2	972	999	1095	1022
Mean	874	936	1004	938

S.E. of any marginal mean = 14.9 lb./ac.
S.E. of body of table = 25.8 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 59(26).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :— To study the effect of N and P on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Maize. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 4.12.1959. (iv) (a) 5 ploughings. (b) Sown by *kera*. (c) 35 srs./ac. (d) 8″ between rows. (e) N.A. (v) N.A. (vi) C—286. (vii) Irrigated. (viii) 1 hoeing. (ix) 4.71″. (x) 28.4.1960.

2. TREATMENTS :

Same as in expt. no. 58(33) on page 64.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/240 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

SULTS :

(i) 913 lb./ac. (ii) 135.6 lb./ac. (iii) Main effects of N and P are highly significant and interaction N×P is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	679	686	702	689
N_1	848	1103	1242	1064
N_2	771	972	1211	985
Mean	766	920	1052	913

S.E. of any marginal mean = 39.1 lb./ac.
S.E. of body of table = 67.8 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 59(37).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of N and P on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i)) (a) Wheat—Maize. (b) Maize. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 4.12.1959. (iv) (a) 6 ploughings. (b) Sown by *kera*. (c) 82 lb./ac. (d) 8″ between rows. (e) N.A. (v) N.A. (vi) C—286. (vii) Irrigated. (viii) N.A. (ix) 4.71″. (x) 27.4.1960.

2. TREATMENTS :

Same as in expt. no. 58(33) on page 64.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/240. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 831 lb./ac. (ii) 160.7 lb./ac. (iii) Main effects of N and P and interaction N×P are highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	501	887	694	694
N_1	479	579	1065	708
N_2	1072	1057	1142	1090
Mean	684	841	967	831

S.E. of any marginal mean = 46.4 lb./ac.
S.E. of body of table = 80.4 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb.57(44).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different micronutrients in combination with N, P and K on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 22.11.1957. (iv) (a) N.A. (b) Sown by *kera.* (c) 32 srs./ac. (d) 8" to 9" between rows. (e) N.A. (v) Nil. (vi) C—273. (vii) Irrigated. (viii) N.A. (ix) 3.92". (x) 24.4.1958.

2. TREATMENTS :

10 manurial treatments : M_0=Control, M_1=60 lb./ac. of N, $M_2=M_1+30$ lb./ac. of P_2O_5, $M_3=M_1+30$ lb./ac. of K_2O. M_4=60 lb./ac. of N + 30 lb./ac. of P_2O_5 + 30 lb./ac. of K_2O, $M_5=M_4$ + 10 lb./ac. of Cu, $M_6=M_4$ + 50 lb./ac. of Mn, $M_7=M_4$ + 10 lb./ac. of Fe, $M_8=M_4$ + 20 lb./ac. of Zn, $M_9=M_4$ + 10 lb./ac. of Cu + 50 lb./ac. of Mn + 10 lb./ac. of Fe + 20 lb./ac. of Zn.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 6'×60'. (b) 6'×55'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1957 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1803 lb./ac. (ii) 124.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9
Av. yield	1039	1693	1646	1960	1935	1858	2015	2007	1969	1905

S.E./mean = 62.4 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 57(41).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different micronutrients in combination with N, P and K on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Medium to heavy loam soil, (b) Refer soil analysis, Gurdaspur. (iii) 22.11.1957. (iv) (a) 5 ploughings. (b) Sown by *kera.* (c) 30 srs./ac. (d) 8" between rows. (e) N.A. (v) N.A. (vi) C—273. (vii) Irrigated. (viii) N.A. (ix) 3.92". (x) 24.4.1958.

2. TREATMENTS :

10 manurial treatments : M_0=Control, M_1=40 lb./ac. of N, $M_2=M_1$ + 20 lb./ac. of P_2O_5, $M_3=M_1$ + 20 lb./ac. of K_2O, M_4=40 lb./ac. of N + 20 lb./ac. of P_2O_5 + 20 lb./ac. of K_2O, $M_5=M_4$ + 10 lb./ac. of Cu, $M_6=M_4$ + 50 lb./ac. of Mn, $M_7=M_4$ + 10 lb./ac. of Fe, $M_8=M_4$ + 20 lb./ac. of Zn, $M_9=M_4$ + 10 lb./ac. of Cu + 50 lb./ac. of Mn + 10 lb./ac. of Fe + 20 lb./ac. of Zn.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 57(44) on page 66.

5. RESULTS :

(i) 1694 lb./ac. (ii) 140.5 lb./ac. (ii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9
Av. yield	1116	1629	1553	1824	1892	1905	1841	1756	1667	1752

S.E./mean = 70.3 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 58(38).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different micronutrients on Wheat.

1. BASAL CONDITIONS :

(i) Nil. (b) and (c) N.A. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 30.10.1958. (iv) (a) 6 ploughings. (b) Sown by *kera*. (c) 82 lb./ac. (d) 8" between rows. (e) —. (v) 60 lb./ac. of N as A/S+30 lb./ac. of P_2O_5 as Super+30 lb./ac. of K_2O as Pot. Sul. (vi) C—273. (vii) Irrigated. (viii) N.A. (ix) 10·35". (x) 27.4.1959.

2. TREATMENTS :

All combinations of (1), (2), (3), (4) and (5)

(1) 2 levels of Borax : A_0=0, and A_1=2 lb./ac. of Borax in 100 gallons of water.
(2) 2 levels of $CuSO_4$: B_0=0 and B_1=4 lb./ac. of $CuSO_4$+2 lb./ac. of lime in 100 gallons of water.
(3) 2 levels of $FeSO_4$: C_0=0 and C_1=4 lb./ac. of $FeSO_4$+2 lb./ac. of lime in 100 gallons of water.
(4) 2 levels of $MnSO_4$: D_0=0 and D_1=8 lb./ac. of $MnSO_4$+4 lb./ac. of lime in 100 gallons of water.
(5) 2 levels of $ZnSO_4$: E_0=0 and E_1=6 lb./ac. of $ZnSO_4$+3 lb./ac. of lime in 100 gallons of water.

3. DESIGN :

(i) (a) 2^5 confd. (ii) (a) 8 plots/block and 4 blocks/replication. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) Hansi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1534 lb./ac. (ii) 113.0 lb./ac. (iii) Interactions B×E and C×D are highly significant and A×E, C×E, D×E are significant. (iv) Table of mean and differential response in lb./ac.

Mean response	Differential response									
	A		B		C		D		E	
	—	+	—	+	—	+	—	+	—	+
A—21.1	—	—	1.0	—43.2	—13.6	—28.6	—29.9	—12.3	15.2	—57.4
B—21.7	0.3	—43.7	—	—	—37.3	—6.1	—29.3	—14.1	—72.3	28.9
C—18.1	—10.5	—25.7	—33.7	—2.5	—	—	—115.9	79.7	—64.5	28.3
D—35.9	—44.7	—27.1	—43.4	—28.4	—183.8	62.0	—	—	—82.1	10.3
E— 5.0	31.1	—41.1	—55.6	45.6	—51.4	41.4	—51.1	41.1	—	—

S.E. of mean response = 17.9 lb./ac.
S.E. of differential response = 25.3 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 59(28).**
Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different micronutrients on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) G.M. crop. (c) Nil. (ii) (a) Medium to heavy loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 4.12.1959. (iv) (a) 5 ploughings. (b) Sown by *kera*. (d) 8"—9" between rows. (e) Nil. (v) 60 lb./ac. of N as C/A/N+30 lb. ac. of P_2O_5 as Super+30 lb./ac. of K_2O as Mur. Pot. (vi) C—273. (vii) Irrigated. (viii) 1 hoeing. (ix) 4.71". (x) 30.4.1960.

2. TREATMENTS :

All combinations of (1), (2), (3), (4) and (5)
(1) 2 levels of Borax : A_0 - 0 and A_1=1 lb./ac. of Borax in 100 gallons of water.
(2) 2 levels of $CuSO_4$: B_0=0 and B_1=4 lb./ac. of $CuSO_4$ in 100 gallons of water.
(3) 2 levels of $FeSO_4$: C_0=0 and C_1=4 lb./ac. of $FeSO_4$ in 100 gallons of water.
(4) 2 levels of $MnSO_4$: D_0=0 and D_1=6 lb./ac. of $MnSO_4$ in 100 gallons of water.
(5) 2 levels of $ZnSO_4$: E_0=0 and E_1=6 lb./ac. of $ZnSO_4$ in 100 gallons of water.

3. DESIGN :

(i) 2^5 confd. (ii) (a) 8 plots/block and 4 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 81'×6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) Hansi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1020 lb./ac. (ii) 79.7 lb./ac. (iii) Main effect of B and D and interaction C×D are significant. Main effect of E and interaction D×E are highly significant. (iv) Table of mean and differential response in lb./ac.

Differential response

Mean response	A		B		C		D		E	
	—	+	—	+	—	+	—	+	—	+
A 17.6	—	—	12.9	22.3	3.5	31.7	—1.0	36.2	14.4	20.8
B —31.7	—36.4	—27.0	—	—	—33.9	—29.5	—12.6	—50.8	—30.2	—33.2
C —17.3	—31.3	— 3.3	—19.5	—15.1	—	—	11.2	—45.8	—1.4	—33.2
D 30.6	11.9	49.3	49.7	11.5	59.0	2.2	—	—	68.4	—7.2
E 50.4	47.1	53.7	51.8	49.0	66.2	34.6	88.3	12.5	—	—

S.E. of mean response = 14.1 lb./ac.
S.E. of differential response = 19.9 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 54(1).**
Site :- Barley Res. Farm, Gurgaon. **Type :- 'M'.**

Object :—To study the effect of N and P on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam soil. (b) N.A. (iii) 31.10.1954. (iv) (a) 5 ploughings. (b) Sown by *pore*. (c) 82 lb./ac. (d) N.A. (e) Nil. (v) Nil. (vi) C—281 (early). (vii) Irrigated. (viii) 1 weeding and 1 hoeing. (ix) 0.99″. (x) 30.3.1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=25 and N_2=50 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=25 and P_2=50 lb./ac.

Super drilled along with seed and A/S at the time of first irrigation.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 1/170 ac. (b) 1/270 ac. (v) 1 row on each side. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Height of plant, ear length and yield of grain. (iv) (a) 1952—1954. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1940 lb./ac. (ii) 195.7 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	1180	1128	1232	1180
N_1	1927	2031	2048	2002
N_2	2569	2760	2586	2638
Mean	1892	1973	1955	1940

S.E. of any marginal mean = 56.5 lb./ac.
S.E. of body of table = 97.8 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 54(2).**

Site :- Barley Res. Farm, Gurgaon. **Type :- 'M'.**

Object :—To compare the effect of N through A/S and C/N on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam soil. (b) N.A. (iii) 31.10.1954. (iv) (a) 6 ploughings. (b) Sown by *por*. (c) 82 lb./ac. (d) and (e) N.A. (v) Nil. (vi) C—281 (early). (vii) Irrigated. (viii) 1 weeding and 1 hoeing. (ix) 0.99″. (x) 30.3.1955.

2. TREATMENTS:

All combinations of (1) and (2)+one control.

(1) 2 levels of N : N_1=15 and N_2=30 lb./ac.

(2) 2 sources of N : S_1=A/S and S_2=C/N

N applied at the time of first irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 1/170 ac. (b) 1/270 ac. (v) 1 row on each side. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Height of plant, ear length and grain yield. (iv) (a) 1953—1954. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2022 lb./ac. (ii) 255.5 lb./ac. (iii) Main effect of P and "control *vs.* others" are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1553 lb./ac.

	S_1		Mean
N_1	1987	2421	2204
N_2	1927	2222	2075
Mean	1957	2322	2139

S.E. of any marginal mean = 90.3 lb./ac.
S.E. of body of table or control mean = 117.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(179).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Toria*. (b) and (c) N.A. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots receive no B.D. and no N. T_2 to T_{12} plots received B.D., at 50 lb./ac. of P_2O_5. ½, 1, and 2 in other treatments indicate 25, 50 and 100 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) (a) and (b) N.A. (v) N.A. (vi) As per treatment rotation.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1955—1957. (b) As per treatment rotation. (c) Nil. (iv) to (viii) Nil.

5. RESULTS :

(i) 2262 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield	1481	1725	2329	2900	3592

S.E's—N.A.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(183).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) *Toria*—Wheat—Cotton. (b) *Toria*. (c) As per treatments. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	$\frac{1}{2}$	1	2
1956	C	0	0	0	0	1	2	0	0	$\frac{1}{2}$	1	2
1957	C	0	0	1	2	0	0	0	0	$\frac{1}{2}$	1	2

T_1 plots receive no B.D. and no N, T_2 to T_{12} plots received B.D. at 25 lb./ac. of P_2O_5. $\frac{1}{2}$, 1. and 2 in other treatments indicate 25, 50 and 100 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) (a) and (b) N.A. (v) N.A. (vi) As per treatment rotation.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1955—1957. (b) As per treatment rotation. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1312 lb./ac. (ii) 104.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	831	870	848	938	2008	1843	1646	2032	2115

S.E. of $(T_2+T_3+T_4+T_5)$ mean = 36.9 lb./ac. and S.E. of any other mean = 73.7 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(212).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Toria*—Wheat. (b) *Toria*. (c) As per treatments. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) N.A. iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(183) on page 70.

5. RESULTS :

(i) 1218 lb./ac. (ii) 208.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	699	675	642	724	732	798	1893	2016	1810	1835	2123

S.E. of (T_2+T_3) mean = 104.4 lb./ac. and S.E. of any other mean = 147.7 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb.55 (185).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :— To study the direct, residual and cumulative effect of P applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Berseem*. (b) and (c) N.A. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	1

T_1 plots receive no. B.D. and no super, T_2 to T_{12} plots received B.D. 50 lb./ac. of N. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of super.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) As per treatment rotation.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1955—1957. (b) As per treatments. (b) Nil. (v) Abohar and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2788 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield	1629	2894	2600	2929	3003

S.E.'s — N.A.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 56(189).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :— To study the direct, residual and cumulative effect of P applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) *Berseem*—Wheat—Cotton. (b) *Berseem*. (c) As per treatments. (ii) (a) Sandy loam to clay loam soil. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and no super, T_2 to T_{12} plots received B.D. at 25 lb./ac. of N. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of super.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) As per treatment rotation.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1955—1957. (b) As per treatment rotation. (c) Nil. (v) Abohar and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1377 lb./ac. (ii) 165.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	897	1271	1506	1448	1605	1572	1432	1275	1703

S.E. of $(T_2+T_3+T_4+T_5)$ mean = 58.6 lb./ac. and S.E. of any other mean = 117.3 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 57(218).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Berseem*—Wheat. (b) *Berseem*. (c) As per treatments. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 56(189) on page 72.

5. RESULTS :

(i) 1844 lb./ac. (ii) 108.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	1070	1917	1744	1835	1810	1794	1679	1777	1835	1917	2839

S.E. of (T_2+T_3) mean = 54.2 lb./ac.
S.E. of any other mean = 76.6 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 55(30).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of different sources of P alone and in combination with N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 19.11.1955. (iv) (a) 1 *raja* ploughing, 13 *desi* ploughings, 2 roller and 14 *sohaga*. (b) N.A. (c) 36 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 4.79". (x) 12.5.1956.

2. TREATMENTS :

All combinations of (1) and (2) + one control.

(1) 2 levels of N as A/S : N_0=O and N_1=40 lb./ac.

(2) 3 sources of 20 lb./ac. of P_2O_5 : S_1=Super, S_2=B.M. and S_3=Digested Bone.

N and P_2O_5 broadcast at the time of sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 9'×73'. (b) 9'×60.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2226 lb./ac. (ii) 187.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 2273 lb./ac.

	S_1	S_2	S_3	Mean
N_0	2378	2247	2273	2299
N_1	2016	2309	2083	2136
Mean	2197	2278	2178	2218

S.E. of S marginal mean = 66.2 lb./ac.
S.E. of N marginal mean = 54.0 lb./ac.
S.E. of body of table or control mean = 93.6 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 56(70).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of different sources of P alone and in combination with N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Lentil. (c) N.A. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 8.11.1956. (iv) (a) 1 *raja* ploughing, 10 *desi* ploughings, 5 *sohaga* and 2 rollers. (b) Sown by *kera*. (c) 30 srs./ac. (d) 9" between rows. (e) Nil. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) 4 weedings. (xi) 3.57". (x) 17.4.1957.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 55(30) on page 73.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2020 lb./ac. (ii) 232.4 lb./ac. (iii) Main effects of N and S are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1874 lb./ac.

	S_1	S_2	S_3	Mean
N_0	1944	1694	1849	1829
N_1	2708	2006	2065	2260
Mean	2326	1850	1957	2044

S.E. of S marginal mean = 82.2 lb./ac.
S.E. of N marginal mean = 67.1 lb./ac.
S.E. of body of table or control mean = 116.2 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 57(63).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of different sources of P alone and in combination with N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Lentil. (c) N.A. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 15.11.1957. (iv) (a) 1 *raja* ploughing, 10 *desi* ploughings and 4 *sohaga*. (b) Sown by *kera*. (c) 30 srs./ac. (d) 9″ between rows. (e) Nil. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) Nil. (ix) 1.97″. (x) 9.4.1958.

2. TREATMENTS :

Same as in expt. no. 55(30) on page 73.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 73′×7.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) to (vii) Nil.

RESULTS :

(i) 1709 lb./ac. (ii) 207.6 lb./ac. (iii) Only main effect of N is significant. (iv) Av. yield of grain in lb./ac.

Control = 1575 lb./ac.

	S_1	S_2	S_3	Mean
N_0	1764	1600	1498	1621
N_1	1989	1800	1741	1843
Mean	1876	1700	1620	1732

S.E. of S marginal mean = 73.4 lb./ac.
S.E. of N marginal mean = 59.9 lb./ac.
S.E. of body of table or control mean = 103.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(117).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To find out the best method of placement of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Guar*—Cotton. (b) Cotton. (c) 37 srs./ac. of A/S. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 17.11.1954. (iv) (a) 2 *raja* ploughings, 10 *desi* ploughings, 7 *sohaga* and 1 roller. (b) N.A. (c) 35 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 0.53″. (x) 12.4.1955.

2. TREATMENTS :

5 manurial applications and one control : M_0=Control, M_1=40 lb./ac. of N as A/S broadcast before sowing, M_2=40 lb./ac. of N as A/S applied with first irrigation, M_3=40 lb./ac. of N as A/S by *pore* before sowing, M_4=40 lb./ac. of N as A/S mixed with seed and drilled at sowing and M_5=40 lb./ac. of N as A/S applied at pre-flowering stage.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 75.5′×10.5′. (b) 66′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—1958 (treatments changed in 1955 and 1957). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2310 lb./ac. (ii) 267.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	2279	2536	2098	2470	2291	2187

S.E./mean = 133.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(26).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To find out the best method of placement of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Guar*—Cotton. (b) Cotton. (c) 20 srs./ac. of A/S. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 10.11.1955. (iv) (a) 1 *raja* ploughing, 12 *desi* ploughings 9 *sohaga* and 2 roller. (b) N.A. (c) 35 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 4.79". (x) 12.4.1956.

2. TREATMENTS :

4 manurial applications + one control : M_0=Control, M_1=40 lb./ac. of N as A/S broadcast before sowing, M_2=40 lb./ac. of N as A/S applied with first irrigation, M_3=40 lb./ac. of N as A/S by *pore* before sowing and M_4=40 lb./ac. of N as A/S mixed with seed and drilled at sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 73'.×12'. (b) 63'1"×10'5". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—1958 (treatments changed in 1955 and 1957). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1866 lb./ac. (ii) 232.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4
Av. yield	1868	1828	1898	1966	1771

S.E./mean = 116.2 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(63).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To find out the best method of placement of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Lentil. (c) N.A. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 10.11.1956. (iv) (a) 1 *raja* ploughing, 10 *desi* ploughings and 8 *sohaga*. (b) Sown by *kera*. (c) N.A. (d) 9" between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) 4 weedings. (ix) 1.97". (x) 17.4.1957.

2. TREATMENTS :

Same as in expt. no. 55(26) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 66'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fairly good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—1958 (treatments changed in 1955 and 1957). (b) No, (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1962 lb./ac. (ii) 463.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4
Av. yield	1739	2202	2243	1910	1718

S.E./mean = 232.0 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(65).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To find out the best method of placement of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Lentil. (c) N.A. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 16.11.1957. (iv) (a) 1 *raja* ploughing, 10 *desi* ploughings and 4 *sohaga*. (b) Sown by *kera*. (c) 82 lb./ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) N.A. (ix) 1.97″. (x) 16.4.1958.

2. TREATMENTS :

4 manurial applications+one control : M_0=Control, M_1=40 lb./ac. of N as A/S drilled before sowing, M_2=40 lb./ac. of N as A/S broadcast before sowing, M_3=40 lb./ac. of N as A/S mixed with seed and drilled at sowing, and M_4=40 lb./ac. of N as A/S applied with first irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 60.5′×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fairly good. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—1958. (Treatments changed in 1955 and 1957). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2049 lb./ac. (ii) 283.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4
Av. yield	1901	2275	2140	2101	1830

S.E./mean = 141.6 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(66).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To find out the best method of placement of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 8.11.1958. (iv) (a) 11 *desi* ploughing, 9 *sohaga* and 3 roller. (b) Sown by *kera*. (c) 35 srs./ac. (d) 8″ between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) Nil. (ix) 3.63″. (x) 12 to 14.4.1959.

2. TREATMENTS :

Same as in expt. no. 57 (65) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 60.5′×7.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—1958 (Treatments changed in 1955 and 1957). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2507 lb./ac. (ii) 412.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4
Av. yield	2437	2795	2470	2578	2255

S.E./mean = 206.4 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 54(122).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To compare the effects of N through different sources on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Maize. (c) Nil. ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 11.11.1954. (iv) (a) 3 *desi* ploughings, 8 *sohaga* and 1 roller. (b) to (e) N.A. (v) Nil. (vi) C—591 (medium) (vii) Irrigated. (viii) Nil. (ix) 0.53". (x) 21.4.1955.

2. TREATMENTS :

3 sources of 40 lb. ac. of N : S_0 =Control S_1 =A/S and S_2 =C/N.
N broadcast on 31.11.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 96′×45′4″. (b) 85′ 7″×42′ 4″. (v) N.A. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1953 —1959. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1142 lb./ac. ii 58.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2
Av. yield	422	1349	1654

S.E./mean = 29.1 lb./ac.

Crop :- Wheat *(Rabi)* **Ref :-Pb. 55(27).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To compare the effect of N through different sources on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat-Maize. (b) Maize. (c) 25 lb./ac. of N as A/S. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 16.11.1955. (iv) (a) 1 *raja* ploughing, 7 *desi* ploughings, 14 *sohaga* and 7 roller. (b) to (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) N.A. (ix) 4.79". (x) 2.5.1956.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(122) above.
N broadcast on 14.1.1956.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Yield of grain. (iv) (a) 1953—1959. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1001 lb./ac. (ii) 238.2 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2
Av. yield	569	1110	1325

S.E./mean = 119.1 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(67).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To compare the effects of N through different sources on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Maize. (c) N.A. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 23.10.1956. (iv) (a) 3 *desi* ploughings and 4 *sohaga*. (b) Sown by *kera*. (c) 82 lb./ac. (d) 9″ between rows. (e) Nil. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) 1 weeding. (ix) 6.91″. (x) 27.4.1957.

2. TREATMENTS :

3 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S and S_2=C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 96′×45′4″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1959. (b) No. (c) Nil. (v) to (vii) Nil.

6. RESULTS :

(i) 1164 lb./ac. (ii) 96.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2
Av. yield	504	1446	1543

S.E./mean = 48.0 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(66).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To compare the effects of N through different sources on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Maize. (c) N.A. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 5.11.1957. (iv) (a) 2 *desi* ploughings and 3 *sohaga*. (b) Sown by *kera*. (c) 82 lb./ac. (d) 9″ between rows. (e) Nil. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) Nil. (ix) 1.97″. (x) 12.4.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(67) above.
N applield on 26.12.1957.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 848 lb./ac. (ii) 120.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2
Av. yield	263	1140	1140

S.E./mean = 60.0 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 58(65).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To compare the effects of N through differents sources on Wheat.

1. BASAL CONDITIONS :

(i) a) Maize—Wheat. (b) Maize. (c) N.A. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 28.10.1958. (iv) (a) N.A. (b) Sown by *kera*. (c) 35 srs./ac. (d) 8" between rows. (e) Nil. (v) N.A. (vii) Irrigated. (viii) N.A. (ix) 3.63". (x) April, 1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56 (67) on page 79.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1953—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1028 lb./ac. (ii) 252.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2
Av. yield	767	1107	1210

S.E./mean = 126.2 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 59(135)**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To compare the effects of N through different sources on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Maize. (c) N.A. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 30.10.1959. (iv) (a) N.A. (b) Sown by *kera*. (c) 36 srs./ac. (d) 9" between rows. (e) Nil. (v) Nil. (vi) C—591. - (vii) Irrigated. (viii) N.A. (ix) 3.5". (x) April, 1960.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56 (67) on page 79.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1953—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1407 lb./ac. (ii) 114.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2
Av. yield	1059	1525	1635

S.E./mean = 57.3 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(31).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To find out the best source of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) 50 lb./ac. of N as A/S. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 19.11.1955. (iv) (a) 6 ploughings and 4 *sohaga*. (b) N.A. (c) 36 srs/ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 4.79″. (x) 11.5.1956.

2. TREATMENTS :

5 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S, S_2=A/N, S_3=A/C and S_4=Urea.
N broadcast on 4.1.1956.

S. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 10.5′×73′. (b) 10.5′×63′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—1959. (Treatments changed in 1957 and 1958). (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1977 lb./ac. (ii) 188.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4
Av. yield	1960	1788	2019	2081	2036

S.E./mean = 94.0 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(69).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To find out the best source of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Cotton—Wheat. (b) Cotton. (c) N.A. (ii) (a) Sandy loam and clayey loam soil. (b) N.A. (iii) 8.11.1956. (iv) (a) 1 *raja* ploughing, 10 *desi* ploughings, 5 *sohaga* and 2 roller. (b) Sown by *kera*. (c) 36 srs./ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) 4 weedings. (ix) 3.57″. (x) 17.4.1957.

2. TREATMENTS :

Same in expt. no. 55(31) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 73′×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—1959. (Treatments changed in 1957 and 1958). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2065 lb./ac. (ii) 155.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4
Av. yield	1760	2126	2150	2145	2146

S.E./mean = 77.5 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(64).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To find out the best source of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Lentil. (c) N.A. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 15.11.1957. (iv) (a) 1 *raja* ploughing, 10 *desi* ploughings and 4 *sohaga*. (b) Sown by *kera*. (c) 82 lb./ac. (d) 9" between rows. (e) N.A. (v) Nil. (vi, C—591. (vii) Irrigated. (viii) N.A. (ix) 1.97". (x) 9.4.1958.

2. TREATMENTS :

8 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S, S_2=A/N, S_3=A/C, S_4=Urea, S_5=A/S/N, S_6=Nitro chalk and S_7=C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 73'×7.5'. (b) 60.5'×7.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fairly good. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—1959. (Treatments changed in 1957 and 1958). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1980 lb./ac. (ii) 335.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	1879	2270	1897	1900	1937	1949	2079	1931

S.E., mean = 167.5 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(67).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To find out the best source of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 7.11.1958. (iv) (a) 14 *desi* ploughings, 6 *sohaga* and 1 roller. (b) Sown by *kera*. (c) 30 srs./ac. (d) 8" between rows. (e) N.A. (v) Nil. (vi, C—591. (vii) Irrigated. (viii) Nil. (ix) 3.63". (x) May, 1959.

2. TREATMENTS :

9 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S, S_2=A/N, S_3=A/C, S_4=Urea, S_5=A/S/N, S_6=Nitro Chalk, S_7=C/N and S_8=C/A/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 51'10"×6'. (v) N.A. (vi, Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—1959 (Treatments changed in 1957 and 1958). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2097 lb./ac. (ii) 226.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8
Av. yield	1955	2221	2094	2365	1637	2365	1822	2227	2186

S.E./mean = 113.1 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(137).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To find out the best source of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow. (c) Nil. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 5.11.1959. (iv) (a) 12 ploughings and 7 *sohaga*. (b) Sown by *kera*. (c) 30 srs./ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) N.A. (ix) 3.5″. (x) April, 1960.

2. TREATMENTS :

8 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S, S_2=A/N, S_3=A/C, S_4=Urea, S_5=A/S/N, S_6=C/N and S_7=C/A/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 66′×8′3″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fairly good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—1959. (Treatments changed in 1957 and 1958). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3041 lb./ac. (ii) 402.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	2916	3108	3077	3218	2695	3043	3158	3115

S.E./mean = 142.3 lb./ac.

———

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(121).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of application of C/N and A/S at different stages on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Maize. (c) Nil. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 5.11.1954. (iv) (a) 2 *raja* ploughings, 12 *desi* ploughings, 6 *sohaga* and 1 roller. (b) to (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) 1 bar harrow. (ix) 0.53″. (x) 24.4.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)+one control

(1) 2 levels of N : N_1=25 and N_2=40 lb./ac.

(2) 2 sources of N : S_1=A/S and S_2=C/N.

(3) 2 times of application : T_1=With first irrigation and T_2=At flowering stage.

N broadcast on 11.12.1954 and 4.2.1955.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 13.5′×73′. (b) 12′×66′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (b) Nil. (iii) Yield of grain. (iv) (a) 1949—1958. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2286 lb./ac. (ii) 241.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 2105 lb./ac.

	N_1	N_2	Mean	S_1	S_2
T_1	2259	2423	2341	2373	2309
T_2	2198	2355	2276	2190	2362
Mean	2228	2389	2308	2281	2336
S_1	2154	2409			
S_2	2303	2368			

S.E. of any marginal mean = 60.3 lb./ac.
S.E. of body of any table = 85.3 lb./ac.
S.E. of control mean = 120.7 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(25).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of application of C/N and A/S at different stages on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara.* (c) Nil. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 8.11.1955. (iv) (a) 1 *raja* ploughing, 10 *desi* ploughings, 2 rollers and 9 *sohaga.* (b) N.A. (c) 36 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) 1 bar harrow. (ix) 4.79". (x) 6.5.1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(121) on page 83.
N applied by broadcast on 3.12.1955 and 19.1.1956.

5. RESULTS :

(i) 1935 lb./ac. (ii) 242.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 1708 lb./ac.

	N_1	N_2	Mean	S_1	S_2
T_1	1957	2125	2041	2074	2008
T_2	1889	1881	1885	1768	2002
Mean	1923	2003	1963	1921	2005
S_1	1823	2019			
S_2	2023	1987			

S.E. of any marginal mean = 60.6 lb./ac.
S.E. of body of any table = 85.7 lb./ac.
S.E. of control mean = 121.2 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(66).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of application of C/N and A/S at different stages on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Lentil. (c) N.A. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 10.11.1956. (iv) (a) 11 ploughings, 5 *sohaga* and 2 rollers. (b) Sown by *kera*. (c) 36 srs./ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) Nil. (ix) 3.57″. (x) 17.4.1957.

2. TREATMENTS :

Same as in expt. no. 54(121) on page 83.
N applied by broadcast on 5.12.1956 and Jan., 1957.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 75′×6′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. Crop lodged. (ii) Nil. (iii) Yield of grain. (iv) (a) 1949—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1956 lb./ac. (ii) 218.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 1971 lb./ac.

	N_1	N_2	Mean	S_1	S_2
T_1	1943	1934	1939	2020	1858
T_2	2051	1886	1968	1936	2001
Mean	1997	1910	1954	1978	1929
S_1	2013	1942			
S_2	1981	1878			

S.E. of any marginal mean = 54.7 lb./ac.
S.E. of body of any table = 77.4 lb./ac.
S.E. of control mean = 109.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(67).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of application of C/N and A/S at different stages on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Lentil. (c) N.A. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 16.11.1957. (iv) (a) 1 *raja* ploughing, 10 *desi* ploughings and 4 *sohaga*. (b) Sown by *kera*. (c) 82 lb./ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) 1 bar harrow. (ix) 1.97″. (x) 10.4.1958.

2. TREATMENTS :

Same as in expt. no. 54(121) on page 83.
N applied by broadcast on 28.12.1957 and Jan., 1958.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 18.5′×6′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1949—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1901 lb./ac. (ii) 159.8 lb./ac. (iii) Main effect of T is significant and 'control *vs.* others' is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1639 lb /ac.

	N_1	N_2	Mean	S_1	S_2
T_1	2046	1977	2012	2042	1981
T_2	1872	1840	1856	1883	1829
Mean	1959	1909	1934	1963	1905
S_1	1998	1927			
S_2	1920	1890			

S.E. of any marginal mean = 39.9 lb./ac.
S.E. of body of any table = 56.5 lb./ac.
S.E. of control mean = 79.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(64).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of application of C N and A/S at different stages on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 2.12.1958. (iv) (a) 14 *desi* ploughings, 6 *sohaga* and 1 roller. (b) Sown by *kera*. (c) 35 srs./ac. (d) 9" between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) Nil. (ix) 3.63". (x) 13.4.1959.

2. TREATMENTS :

Same as in expt. no. 54(121) on page 83.
N applied by broadcast on 4.12.1958 and Jan., 1959.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 75'×6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1949—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1323 lb./ac. (ii) 172.9 lb./ac. (iii) Main effect of T and 'control *vs.* others' are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1070 lb./ac.

	N_1	N_2	Mean	S_1	S_2
T_1	1445	1474	1459	1426	1493
T_2	1299	1199	1249	1291	1207
Mean	1372	1336	1354	1358	1350
S_1	1384	1333			
S_2	1360	1340			

S.E. of any marginal mean = 43.2 lb./ac.
S.E. of body of any table = 61.1 lb./ac.
S.E. of control mean = 86.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(134).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To study the effect of application of A/S and C/A/N at different stages on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 3.11.1959. (iv) (a) 14 ploughings and 8 *sohaga*. (b) Sown by *kera*. (c) 34 srs./ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) N.A. (ix) 3.5″. (x) April, 1960.

2. TREATMENTS :

All combinations of (1) and (2)+one control

(1) 2 sources of 40 lb./ac. of N : S_1=A/S and S_2=C/A/N.

(2) 5 times of applications : T_1=With first irrigation, T_2=Before sowing, $T_3=\frac{1}{2}$ before sowing and $\frac{1}{2}$ with first irrigation, $T_4=\frac{1}{2}$ before sowing+$\frac{1}{2}$ at pre-flowering stage and $T_5=\frac{1}{2}$ with first irrigation+$\frac{1}{2}$ at pre-flowering stage.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 66′×8′ 3″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fairly good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2695 lb./ac. (ii) 281.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 2805 lb./ac.

	T_1	T_2	T_3	T_4	T_5	Mean
S_1	2587	2512	2829	2672	2613	2643
S_2	2777	2859	2525	2685	2780	2725
Mean	2682	2686	2677	2678	2696	2684

S.E. of S marginal mean = 63.0 lb./ac.
S.E. of T marginal mean = 99.6 lb./ac.
S.E. of body of table or control mean = 140.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(136).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To find out a suitable dose of K in combination with N and P for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Maize. (c) Nil. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 28.10.1959. (iv) (a) N.A. (b) Sown by *kera*. (c) 32 srs./ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) N.A. (ix) 3.5″. (x) April, 1960.

2. TREATMENTS :

6 manurial treatments : M_0=Control, M_1=40 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as super, M_2=M_1+20 lb./ac. of K_2O as Pot. Sul., M_3=M_1+40 lb./ac. of K_2O as Pot. Sul., M_4=M_1+60 lb./ac. of K_2O as Pot. Sul., and M_5=M_1+80 lb./ac. of K_2O as Pot. Sul.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 75′×10′. (b) 66′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3350 lb./ac. (ii) 368.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	2749	3310	3541	3376	3652	3469

S.E./mean = 150.51 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(68).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of different micronutrients on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 14.11.1538. (iv) (a) N.A. (b) Sown by *kera*. (c) 36 srs./ac. (d) 8" between rows. (e) N.A. (v) N.A. (vi) C—591. (vii) Irrigated. (viii) N.A. (ix) 3.63". (x) 12,14.4.1959.

2. TREATMENTS :

All combinations of (1), (2), (3), (4) and (5)

(1) 2 levels of Borax : A_0=0 and A_1=2 lb./ac. of borax in 100 gallons of water.
(2) 2 levels of $CuSO_4$: B_0=0 and B_1=4 lb./ac. of $CuSO_4$+2 lb./ac of lime in 100 gallons of water.
(3) 2 levels of $FeSO_4$: C_0=0 and C_1=4 lb./ac. of $FeSO_4$+2 lb./ac. of lime in 100 gallons of water.
(4) 2 levels of $MnSO_4$: D_0=0 and D_1=8 lb./ac. of $MnSO_4$+4 lb./ac. of lime in 100 gallons of water.
(5) 2 levels of $ZnSO_4$: E_0=0 and E_1=6 lb./ac. of $ZnSO_4$+3 lb./ac. of lime in 100 gallons of water.

3. DESIGN :

(i) 2^5 confd. (ii) (a) 8 plots./block and 4 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 36'×6'-9". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) (a) Gurdaspur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2741 lb./ac. (ii) 264.7 lb./ac. (iii) Only interaction A×C and B×C are highly significant. (iv) Table of mean and differential responses in lb./ac.

Mean response		A		B		C		D		E	
		—	+	—	+	—	+	—	+	—	+
A	37.1	—	—	10.1	64.1	164.2	—90.0	0.7	73.5	30.9	43.3
B	—50.1	—77.0	—23.0	—	—	86.4	—186.4	—13.6	—86.4	—49.7	—50.3
C	—3.9	123.2	—131.0	132.5	—140.3	—	—	—3.6	—4.2	—43.9	36.1
D	—6.2	—42.6	302.	30.1	—42.5	—5.8	—6.6	—	—	9.4	—21.8
E	—21.9	—28.2	—15.8	—21.5	—22.3	—61.8	18.0	—6.5	—37.3	—	—

Differential respons:

S.E. of mean response = 46.8 lb./ac.
S.E. of differential response = 66.2 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- 59(142).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of different micronutrients on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam to clayey loam soil. (b) N.A. (iii) 19.11.1959. (iv) (a) N.A. (b) Sown by *kera.* (c) 36 srs./ac. (d) 9″ between rows. (e) N.A. (v) 60 lb./ac. of N as A/S+30 lb./ac. of P_2O_5 as Super+30 lb./ac. of K_2O as Pot. Sul. (vi) C—591. (vii) Irrigated. (viii) N.A. (ix) 3.0″. (x) 14.4.1960.

2. TREATMENTS :

Same as in expt. no. 58(68) on page 88.

3. DESIGN :

(i) 2^5 confd. (ii) (a) 8 plots/block and 4 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 33′×7′4″ (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (li) Nil. (iii) Yield of grain. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) (a) Gurdaspur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2252 lb./ac. (ii) 157.7 lb./ac. (iii) Main effect of D and interactions A×B, A×C, A×D, B×C, B×D, C×D, A×B×D, A×C×D, B×C×D, B×C×E, C×D×E, A×B×C×D and A×B×D×E are highly significant. Main effects of A, B and interactions D×E and A×B×C are significant. (iv) Table of mean and differential responses in lb./ac.

		Differential response									
		A		B		C		D		E	
Mean response		—	+	—	+	—	+	—	+	—	+
A	—47.4	—	—	—4.4	—90.4	—132.4	37.6	—42.7	—52.1	—9.4	—85.4
B	86.4	129.4	43.4	—	—	19.5	153.3	116.4	56.4	191.6	—18.8
C	43.0	—42.0	128.0	—23.9	109.9	—	—	69.4	16.6	13.7	72.3
D	69.1	—64.4	—73.8	—39.1	—99.1	—42.7	—95.5	—	—	—145.4	7.2
E	43.7	81.7	5.8	149.0	—61.5	14.5	73.0	—32.5	120.0	—	—

S.E. of mean response = 27.9 lb./ac.
S.E. of differential response = 3.94 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 55(181).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effects of N applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Toria.* (b) and (c) N.A. (ii) (a) Sandy loam soil. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots receive no. B.D. and no N. T_2 to T_{12} plots received B.D. at 50 lb./ac. of P_2O_5. $\frac{1}{2}$, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. b, N.A. (iii, 2. (iv) and (v) N.A. (vi) As per rotations.

4. GENERAL :

(i) Normal. ii, N.A. (iii) Grain yield. iv a) 1955—1957. (b) As per rotations. (c) Nil. (v) (a) Abohar and Hansi. (b N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1088 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield	996	849	1481	1308	1436

S.E.'s = N.A.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 56(185).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the direct, residual and cumulative effect of N applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) *Toria*—Wheat—Cotton. (b) N.A. (c) As per treatments. (ii) (a) Sandy loam soil. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. b to e, N.A. (v) As per treatments. (vi) N.A. vii Irrigation. viii) 1 hoeing and weeding. (ix) and (x) N.A.

2, TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	$\frac{1}{2}$	1	2
1956	C	0	0	0	0	1	2	0	0	$\frac{1}{2}$	1	2
1957	C	0	0	1	2	0	0	0	0	$\frac{1}{2}$	1	2

T_1 plots receive no B.D. and no N. T_2 to T_{12} plots received B.D. at 25 lb./ac. of P_2O_5. $\frac{1}{2}$, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. b N.A. (iii) 2. (iv) and (v) N.A. (vi) As per rotations.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1955—1957. (b) As per rotation (c) Nil. (v) (a) Abohar and Hansi. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1239 lb./ac. ii) 225.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	872	1107	1020	1234	1744	1251	1391	1687	1242

S.E. of $(T_2+T_3+T_4+T_5)$ mean = 79.9 lb./ac.
S.E. of any other mean = 159.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(213).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Toria*—Wheat. (b) N.A. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(185) on page 90.

5. RESULTS :

(i) 1066 lb./ac. (ii) 100.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	1259	1081	1317	1292	1300	1004	996	1053	1201	658	551

S.E. of (T_2+T_3) mean = 50.4 lb./ac.
S.E. of any other mean = 71.3 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(87).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Berseem*. (b) and (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots receive no B.D. and no super, T_2 to T_{12} plots received B.D. at 50 lb./ac. of N. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of super.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) As per rotations.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1955—1957. (b) As per rotation. (c) Nil. (v) Abohar and Hansi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1196 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield	1366	1221	954	1177	1177

S.E.'s = N.A.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(191).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :--To study the direct, residual and cumulative effect of P applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) *Berseem*—Wheat– Cotton. (b) *Berseem*. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (iv) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) to (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots receive no B.D. and no super., T_2 to T_{12} plots received B.D. at 25 lb./ac. of N. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of super.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) As per treatment rotation.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1955—1957. (b) As per rotations. (c) Nil. (v) (a) Hansi and Abohar. (b) Nil. (vi) to (vii) Nil.

5. RESULTS :

(i) 1683 lb./ac. (ii) 248.1 lb./ac. (iii) Treatment differences are not significants. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	1407	1656	1621	1818	1687	1613	1506	2074	1843

S.E. of $(T_2+T_3+T_4+T_5)$ mean = 87.7 lb./ac.
S.E. of any other mean = 175.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(219).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Berseem*—Wheat. (b) Cotton. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(191) above.

5. RESULTS :

(i) 771 lb./ac. (ii) 71.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	913	864	839	963	889	913	535	551	502	872	543

S.E. of (T_2+T_3) mean = 35.7 lb./ac.
S.E. of any other mean = 50.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(25).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of trace elements on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam soil. (b) Refer soil analysis, Jullundur. (iii) 1.11.1958. (iv) (a) 1 *raja*, 1 *desi* ploughing and 1 *sohaga*. (b) Sown by *kera*. (c) 31 srs./ac. (d) 8″ between rows. (e) Nil. (v) 200 lb./ac. of A/S, 180 lb./ac. of super+53 lb./ac. of Nit. of potash. (vi) C—591. (vii) Irrigated. (viii) and (ix) N.A. (x) 7 to 9.5.1959.

2. TREATMENTS :

All combinations of (1), (2), (3), (4) and (5)

(1) 2 levels of Borax : A_0=0 and A_1=2% solution.
(2) 2 levels of C/S+lime : B_0=0 and B_1=4 % solution of $CuSO_4$+1 lb. of lime.
(3) 2 levels of $FeSO_4$+lime : C_0=0 and C_1=4 % solution of $FeSO_4$+1½ lb. of lime.
(4) 2 levels of $MnSO_4$+lime : D_0=0 and D_1=6 % solution of $MnSO_4$+1½ lb. of lime.
(5) 2 levels of $ZnSO_4$: E_0=0 and E_1=6 % solution of $ZnSO_4$.

3. DESIGN :

(i) 2^5 fact. confd. (ii) (a) 8 plots/block, 4 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 46′×6.25′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) 1958—N.A. (b) No. (c) Nil. (v) to (viii) Nil.

5. RESULTS :

(i) 2025 lb./ac. (ii) 299.1 lb./ac. (iii) Only D×E ineraction is highly significant. A×C and B×C interactions are significant. (iv) Table of mean and differential response in lb./ac.

Mean response	Differential response									
	A		B		C		D		E	
	—	+	—	+	—	+	—	+	—	+
A —31.6	—	—	— 81.4	18.1	—149.6	86.3	—132.1	69.9	— 43.1	—20.1
B —58.4	—108.3	—8.6	—	—	—164.2	47.3	— 49.3	—67.4	— 31.0	—85.7
C 15.8	—102.3	133.8	— 90.0	121.6	—	—	—123.5	155.1	54.2	—22.6
D 18.9	— 82.8	120.4	28.1	9.7	—120.4	155.1	—	—	— 15.2	52.8
E 104.0	92.5	125.5	131.5	76.6	142.4	65.6	69.9	138.1	—	—

S.E. of mean response = 52.9 lb./ac.
S.E. of differential response = 74.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(58).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the residual effect of N and P applied to previous crop Maize on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 9.11.1956.(iv) (a) 1 *raja* ploughing, 5 *desi* ploughings and 11 *sohaga*. (b) to (e) N.A. (v) N.A. (vi) C—591. (vii) Irrigated. (viii) 1 weeding. (ix) 8.70″. (x) 21.4.1956.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=60 and N_2=120 lb./ac.
(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=30 and P_2=60 lb./ac.

N and P_2O_5 applied to previous maize crop.

3. DESIGN :

(i) Fact. in R.B.D. (ii) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10′×43.56′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1259 lb./ac. (ii) 271.2 lb./ac. (iii) None of the effects is significant. (iv) Av, yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	1067	1215	1215	1166
N_1	1157	1192	1318	1222
N_2	1221	1491	1453	1388
Mean	1148	1299	1329	1259

S.E. of any marginal mean = 78.6 lb./ac.
S.E. of body of table = 135.6 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 57(29).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the residual effect of N and P applied to previous crop Maize on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 20.11.1957. (iv) (a) 1 *raja* and 2 *desi* ploughings and 3 *sohaga*. (b) Sown by spray. (c) 36 srs./ac. (d) and (e) N.A. (v) N.A. (vi) C—591. (vii) Irrigated. (viii) N.A. (ix) 6.68″. (x) 23.5.1958 to 24.5.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(58) on page 93.

5. RESULTS :

(i) 1037 lb./ac. (ii) 210.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	948	983	884	938
N_1	1070	1109	1000	1060
N_2	1045	1077	1221	1114
Mean	1021	1056	1035	1037

S.E. of any marginal mean = 60.9 lb./ac.
S.E. of body of table = 105.4 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 58(27).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the residual effect of manures applied to previous maize crop on Wheat crop.

1. BASAL CONDITIONS :

(i) Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 19.11.1958. (iv) (a) 1 *raja* and 3 *desi* ploughings and 8 *sohaga*. (b) Sown by *kera*. (c) 32 srs./ac. (d) 8″ between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) Nil. (ix) 8.38″. (x) 19.5.1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(58) on page 93.

5. RESULTS :

(i) 1086 lb./ac. (ii) 169.5 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	891	1055	936	961
N_1	1001	994	1133	1043
N_2	1248	1277	1236	1254
Mean	1047	1109	1102	1086

S.E. of any marginal mean = 48.9 lb./ac.
S.E. of body of table = 84.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(16).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the residual effect of manures applied to previous Maize crop on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 13.11.1959. (iv) (a) 1 *raja* and 2 *desi* ploughings and 5 *sohaga*. (b) Sown by *kera*. (c) 30 srs./ac. (d) 8″ to 9″ between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 20,21.14.1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(58) on page 93.

5. RESULTS :

(i) 1895 lb./ac. (ii) 191.6 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	1686	1750	1596	1677
N_1	2066	1931	1988	1995
N_2	1950	1950	2143	2014
Mean	1901	1877	1909	1895

S.E. of any marginal mean = 55.4 lb./ac.
S.E. of body of table = 95.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(81).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 22, 23.12.1954. (iv) 1 *raja hul*, 1 *desi hul*, 1 horse hoe and 2 *sohaga*. (b) N.A. (c) 30 srs/ac. (d) 8. (e) N.A. (v) Nil. (vi) C –281 (late). (vii) Irrigated. (viii) N.A. (ix) 4.81". (x) 23, 25.4.1955, 13, 14.5.1955.

2. TREATMENTS :

Main-plot treatments :

3 levels of N as A/S : N_0 =0, N_1 =25 and N_2 =50 lb./ac.

Sub-plot treatments :

3 levels of P_2O_5 : P_0 =0, P_1 =20 and P_2 =40 lb./ac.

Sub-sub-plot treatments :

3 levels of K_2O as Pot. Sul : K_0 =0, K_1 =8 and K_2 =16 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main plots/replication, 3 sub-plots/main plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1.66 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1954 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (viii) Nil.

5. RESULTS :

(i) 988 lb./ac. (ii) (a) 1043 lb./ac. (b) 295.8 lb./ac. (c) 210.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	640	740	697	692	703	651	724
N_1	998	1010	914	974	971	994	957
N_2	*1153*	*1201*	*1542*	*1298*	*1273*	*1289*	*1332*
Mean	993	984	1051	988	982	978	1004
K_0	895	1008	1044				
K_1	973	946	1016				
K_2	923	996	1094				

S.E. of difference of two :

1. N marginal means = 245.8 lb./ac.
2. P marginal means = 69.7 lb./ac.
3. K marginal means = 49.5 lb./ac.
4. P means at the same level of N = 120.8 lb./ac.
5. N means at the same level of P = 264.9 lb./ac.
6. K means at the same level of P = 85.8 lb./ac.
7. P means at the same level of K = 98.8 lb./ac.
8. K means at the same level of N = 85.8 lb./ac.
9. N means at the same level of K = 255.6 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(88).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii 11.11.1955. (iv) (a) N.A. (b) Sown by *kera*. (c) 30 srs/ac. (d) 8" between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) N.A. (ix) 3.09". (x) 7, 8.5.1956.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : N_0=0, N_1=20 and N_2 =40 lb./ac.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=25 lb./ac.

(3) 2 levels of K_2O as Pot. Sul. : K_0=0 and K_1=25 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 5. (iv) (a) 51.75′×10.5′. (b) 47.56′×9.16′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1955 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 571 lb./ac. (ii) 127.1 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	K_0	K_1
P_0	284	548	783	538	536	541
P_1	366	562	881	603	591	615
Mean	325	555	832	571	563	578
K_0	319	573	797			
K_1	332	536	867			

S.E. of N marginal mean = 28.4 lb./ac.
S.E. of P or K marginal mean = 23.2 lb./ac.
S.E. of body of N×P or N×K table = 40.2 lb./ac.
S.E. of body of P×K table = 32.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(76).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To find out a suitable method of application of A/S to Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 15, 16.11.1954. (iv) (a) 3 *desi hul* and 2 *tarphali*. (b) N.A. (c) 40 srs./ac. (d) and (e) N.A. (v) 25 lb./ac. of P_2O_5 as Super on 16.11.1954. (vi) C—591. (vii) Irrigated. (viii) 1 hoeing. (ix) 4.81″. (x) 13.5.1955.

2. TREATMENTS :

5 methods of application of N : M_0=Control (no application), M_1=spread before sowing, M_2=Spread after sowing, M_3=Drilled 4″ deep at sowing and M_4=Applied with irrigation.
N is applied at 40 lb./ac. as A/S.

3. DESIGN :

(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 30′×20′. (b) 25.9′×18.7′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1197 lb./ac. (ii) 298.4 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4
Av. yield	705	1279	1312	1428	1261

S.E./mean = 133.4 lb./ac.

Wheat :- *(Rabi).* **Ref :- Pb. 54(80).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of time of application of N as A/S on Wheat crop.

1 BASAL CONDITIONS :

(i) (a) Groundnut—Wheat. (b) Groundnut. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 9, 10.12.1954. (iv) (a) 2 *desi hul*, 1 horse *hoe* and 2 *sohaga*. (b) N.A. (c) 35 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 4.81". (x) 4, 5.5.1955.

2. TREATMENTS :

4 times of application of N : T_1=12½ lb./ac. of N at sowing+12½ lb./ac. of N with each of 3 irrigations, T_2=25 lb./ac. of N at sowing+25 lb./ac. after sowing, T_3=50 lb./ac. of N at sowing and T_4=50 lb./ac of N with Ist irrigation.

N applied as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 96'×14'. (b) 88'×12.4'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 756 lb./ac. (ii) 138.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3	T_4
Av. yield	797	735	849	643

S.E./mean = 69.4 lb./ac.

Crop :- Wheat. **Ref :- Pb. 54(75).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the effect of different sources of N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cowpeas (fodder). (c) Nil. (ii) (a) Sandy loam soil. (b) Refer soil analysis, Jullundur. (iii) 13.11.1954. (iv) (a) 2 *desi hul*, 1 horse hoe, *tarphali* and 3 *sohaga*. (b) N.A. (c) 1 md./ac. (d) 8" between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) 1 weeding. (ix) 4.81". (x) 15.5.1955.

2. TREATMENTS :

3 sources of of N : S_0=Control (no manure), S_1=A/S and S_2=C/N.
N applied at 40 lb./ac. by broadcast before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 106'×8.66'. (b) 97.3'×7.46'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1717 lb./ac. (ii) 221.6 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2
Av. yield	1566	2014	1570

S.E./mean = 110.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(89).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the effect of different sources of N on Wheat,

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fodder. (c) Nil. (ii) (a) Sandy loam soil. (b) Refer soil analysis, Jullundur. (iii) 16.11.1955. (iv) (a) N.A. (b) Sown by *kera*. (c) 32 srs./ac. (d) 8″ between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 3.09″. (x) 12 to 14.5.1956.

2. TREATMENTS :

5 sources of N at 50 lb./ac. : S_0=Control, S_1=C/N, S_2=A/S, S_3=A/S/N and S_4=Urea.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 105′×72.3′. (b) 11′×99′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1953—1955. (b) and (c) No. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1978 lb./ac. (ii) 516.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4
Av. yield	1580	2324	2100	1965	1920

S.E./mean = 230.8 lb./ac.

———

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(92).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of different sources of N on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fodder. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 26.11.1955. (iv) (a) N.A. (b) Sown by *kera*. (c) 30 srs./ac. (d) 8″ to 9″ between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 3.09″. (x) 7.5.1956.

2. TREATMENTS :

5 sources of N at 40 lb./ac. : S_0=Control, S_1=A/N, S_2=A/S, S_3= Urea and S_4=A/C.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 93′×11.4′. (b) 90′×10.08′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1955—N.A. (b) and (c) No. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 502 lb./ac. (ii) 54.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4
Av. yield	235	555	614	565	543

S.E./mean = 27.0 lb./ac.

———

Crop :- Wheat *(Rabi).* **Ref :- Pb. 56(56).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of different sources of N on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fodder crop. (c) 80 lb./ac. of A/C. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 27.10.1956. (iv) (a) 1 *raja,* 5 *desi* ploughings and 8 *sohaga.* (b) N.A. (c) 32 srs./ac. (d) and (e) N.A. (v) N.A. (vi) C—591. (vii) Irrigated. (viii) 1 bar harrow. (ix) 8.70". (x) 24.4.1957.

2. TREATMENTS :

7 sources of N at 40 lb./ac. : S_0=Control, S_1=C/N, S_2=A/C, S_3=A/S/N, S_4=Urea S_5=A/N and S_6=A/S. N applied on 5.12.1956.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 99'×11'. (v) N.A, (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nll.

5. RESULTS :

(i) 1731 lb./ac. (ii) 165.4 lb./ac. (iii) Treatment differences are highly significant. (lv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	990	1893	1864	1959	1738	1949	1723

S.E./mean = 82.7 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 56(57).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of different sources of N on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Guara* for G.M. (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 30.10.1956. (iv) (a) 1 *raja,* 4 *desi* ploughings, 5 *sohaga* and 8 horse hoe. (b) to (e) N.A. (v) N.A. (vi) C—591. (vii) Irrigated. (viii) Nil. (ix) 8.7". (x) 18.4.1957.

2. TREATMENTS :

8 sources of N at 40 lb./ac. : S_0=Control, S_1=A/N, S_2=Nitro chalk, S_3=Urea, S_4=C/N, S_5=A/C, S_6=A/S and S_7=A/S/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 99'×11'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1115 lb./ac. (ii) 191.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	627	1257	550	1038	1309	1476	1437	1224

S.E./mean = 95.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(27).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of different sources of N on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Guara* for G.M. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 31.10 1957. (iv) (a) 1 *raja*, 6 *desi* ploughings, 2 hoeings and 5 *sohaga*. (b) Sown by *kera*. (c) 32 srs./ac. (d) 8″ to 9″ between rows. (e) Nil. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) Nil. (ix) 6.68″. (x) 10.5.1958 to 13.5.1958.

2. TREATMENTS :

8 sources of N at 40 lb /ac. : S_0=Control, S_1=A/S, S_2=A/S/N, S_3=A/C, S_4=A/N, S_5=Nitro chalk, S_6=C/N and S_7=Urea.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 96′×11.34″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1037 lb./ac. (ii) 183.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	1134	1118	1028	1008	946	1034	1077	954

S.E./mean = 91.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(28).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To find out the best source of N for Wheat crop.

1. BASAL CONDITIONS ;

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 2.12.1958. (iv) (a) 1 *raja*, 1 *desi* ploughing and 1 *sohaga*. (b) Sown by *kera*. (c) 35 srs./ac. (d) 9″ between rows. (e) Nil. (v) Nil. (vi) C—281. (vii) Irrigated. (viii) N.A. (ix) 8.38″. (x) 6.5.1959.

2. TREATMENTS :

8 sources of N at 40 lb./ac. : S_0=Control, S_1=A/S, S_2=A/C, S_3=C/A/N, S_4=A/S/N, S_5=C/N S_6=Urea and S_7=A/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 36′×20.2′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 321 lb./ac. (ii) 129.3 lb./ac. (iit) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	106	506	110	404	421	332	371	317

S.E./mean = 64.6 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(13).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of different sources of N on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 13.11.1959. (iv) (a) 1 *raja*, 2 *desi* ploughings and 5 *sohaga*. (b) Sown by *kera*. (c) 36 srs./ac. (d) 8" between rows. (e) Nil. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) and (ix) N.A. (x) 20, 21.4.1960.

2. TREATMENTS :

7 sources of 40 lb./ac. of N—one control : S_0=Control, S_1=C/A/N, S_2=A/S, S_3=A/C, S_4=A/S/N, S_5=C/N, S_6=Urea and S_7=Nitro chalk.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2064 lb./ac. (ii) 225.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	2239	2252	2110	1853	2046	1866	1988	2155

S.E. mean = 112.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(77).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the effect of different doses of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 17, 18.11.1954. (iv) (a) 1 *raja*, 4 *desi* ploughings, 1 *jarphali* and 4 *sohaga*. (b) N.A. (c) 40 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—591. (vi) Irrigated. (viii) Nil. (ix) 4.81". (x) 12.5.1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : N_0=0, N_1=20, N_2=30 and N_3=40 lb./ac.

(3) 4 levels of P_2O_5 as Super : P_0=0, P_1=20, P_2=30 and P_3=40 lb./ac.

N and P_2O_5 applied before sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 6. (iv) (a) 8'×61.5'. (b) 6.7'×54.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1954 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 773 lb./ac. (ii) 142.1 lb./ac. (iii) Main effect of N is highly significant and P effect is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	Mean
N_0	286	335	245	351	304
N_1	667	795	857	837	789
N_2	867	970	888	901	907
N_3	952	1019	1207	1187	1091
Mean	693	780	799	819	773

S.E. of any marginal mean = 29.0 lb./ac.
S.E. of body of table = 58.0 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(78).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the effect of different doses of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 20.11.1954. (iv) (a) 1 *raja*, 1 *desi hul* and 1 *sohaga*. (b) N.A. (c) 45 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) 1 bar harrow and 1 hoeing. (ix) 4.81″. (x) 21, 25 to 28.4.1955.

2. TREATMENTS :

Same as in expt. no. 54(77) on page 102.
N and P_2O_5 applied on 20.11.1954.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 52′×11′. (b) 47.16′×9.62′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1766 lb./ac. (ii) 249.8 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	Mean
N_0	1367	1336	1302	1312	1329
N_1	1679	1666	1737	1882	1741
N_2	1923	1950	2108	1913	1974
N_3	1815	2071	2111	2074	2018
Mean	1696	1756	1815	1795	1766

S.E. of any marginal mean = 62.4 lb./ac.
S.E. of body of table = 124.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(29).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :— To find out the best combination of N and P for Wheat.

1. BASAL CONDITIONS :

(i) (a) Cotton—Wheat—Cotton. (b) Cotton. (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 30.12.1958. (iv) (a) 1 *raja*, 1 *desi* ploughing and 1 *sohaga*. (b) Sown by *kera*. (c) 32 srs./ac. (d) 9" between rows. (e) N.A. (v) Nil. (vi) C—281. (vii) Irrigated. (viii) Nil. (ix) 8.38". (x) 5, 6.5.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=25 and N_2=50 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=20 and P_2=40 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 9. (iv) (a) N.A. (b) 39.6′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (v) and (vii) Nil.

5. RESULTS :

(i) 692 lb./ac. (ii) 134.2 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	417	418	370	402
N_1	714	697	721	711
N_2	1092	884	917	964
Mean	741	666	669	692

S.E. of any marginal mean = 25.8 lb./ac.
S.E. of body of table = 44.7 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 56(59).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the direct effect of N and P and residul effect of N applied to previous crop on Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) As per treatments. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (ii) 24.12.1956. (iv) (a) 1 *raja*, 1 *desi* ploughing and 3 *sohaga*. (b) N.A. (c) 40 srs./ac. (d) and (e) N.A. (v) N.A. (vi) C—281. (vii) Irrigated. (viii) Nil. (ix) 8.18". (x) 29.4.1957.

2. TREATMENTS :

Main-plot treatments :

3 levels of N as A/S applied to previous crop : N_0=0, N_1=60 and N_2=120 lb./ac.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N'_0=0, N'_1=25 and N'_2=50 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=20 and P_2=40 lb./ac.

A/S applied on 28.1.1957 and Super applied on 28.1.1957.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 9 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 38.6′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1163 lb./ac. (ii) (a) 257.4 lb./ac. (b) 220.9 lb./ac. (iii) Main effect of N is highly significant and interaction N×P is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	N_0'	N_1'	N_2'
N_0	986	903	1036	975	647	969	1410
N_1	1055	1248	1124	1142	828	1075	1524
N_2	1423	1299	1399	1373	999	1403	1719
Mean	1155	1150	1186	1163	791	1149	1551
N_0'	727	913	733				
N_1'	1172	1141	1134				
N_2'	1564	1396	1692				

S.E. of differences of two

1. N marginal means = 70.4 lb./ac.
2. N′ or P marginal means = 60.1 lb./ac.
3. N′ or P means at the same level of N = 104.1 lb./ac.
4. N means at the same level of N′ or P = 190.6 lb./ac.

S.E. of body of N′×P table = 67.0 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(30).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the direct effect of N and P and residual effect of N and P applied to previous crop on Wheat.

1. BASAL CONDITIONS :

(i) (a) Cotton—Wheat—Cotton. (b) Cotton. (c) As per treatments. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 27.12.1957. (iv) (a) 1 *raja*, 2 *desi* ploughings and 2 *sohaga*. (b) Sown by *kera*. (c) 40 srs./ac. (d) 8″ between rows. (e) N.A. (v) Nil. (vi) C—281. (vii) Irrigated. (viii) N.A. (ix) 5.12″. (x) 1 to 3.5.1958.

2. TREATMENTS :

Main-plot treatments :

3 levels of N as A/S applied to previous crops : N_0=0, N_1=60 and N_2=120 lb./ac.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0'=0, N_1'=25 and N_2'=50 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=20 and P_2=40 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block, 9 sub-plots/main-plot. (b) N.A. (iii) 9. (iv) (a) N.A. (b) 39.6′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 687 lb./ac. (ii) (a) 132.2 lb./ac. (b) 90.4 lb./ac. (iii) N.A. (iv) Av. yield of grain in lb./ac.

	N_0'	N_1'	N_2'	Mean	P_0	P_1	P_2
N_0	426	616	814	619	591	611	654
N_1	456	743	965	721	702	710	751
N_2	552	742	869	721	688	638	836
Mean	478	700	883	687	660	653	747
P_0	486	641	854				
P_1	457	696	806				
P_2	490	764	987				

S.E. of difference of two

1. N marginal means = 20.8 lb./ac.
2. P or N' marginal means = 14.2 lb./ac.
3. P or N' means at the same level of N = 24.6 lb./ac.
4. N means at the same level of N' or P = 28.9 lb./ac.

S.E. of body of N' x P table = 17.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(90).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of P and different sources of N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Sandy loam soil. (b) Refer soil analysis, Jullundur. (iii) 19.11.1955. (iv) (a) N.A. (b) Sown by *kera*. (c) 34 srs./ac. (d) 8" to 9" between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 3.09". (x) 10, 12.5.1956.

2. TREATMENTS :

7 manurial treatments : M_0 = Control, M_1 40 lb./ac. of N as A/S, M_2 = 40 lb./ac. of N as A/S/N, M_3 = 40 lb./ac. of N as Urea, M_4 = 40 lb./ac. of N as A/C, M_5 = M_1 + 20 lb./ac. of P_2O_5 as Super and M_6 = M_1 + 20 lb./ac. of P_2O_5 as digested bones.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 105' × 10'6". (b) 99' × 9'2". (v) 3' × 8". (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1955—only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1788 lb./ac. (ii) 91.5 lb./ac. iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	1071	1975	1953	1605	2092	1833	1987

S.E./mean = 45.7 lb./ac.

Crop :- Wheat. **Ref :- Pb. 54(173).**

Site :- Dist. and Demons. Farm, Kangra. **Type :- 'M'.**

Object :—To study the effect of N and P alone and in combination on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 15.11.1954. (iv) (a) 4 ploughings and 4 *sohaga*. (b) N.A. (c) 40 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—250 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 42.67″. (x) 5.5.1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 sources of 30 lb./ac. of N : S_0=Control (no manure), S_1=A/S and S_2=C/N.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) and (b) 77′9½″×7′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1578 lb./ac. (ii) 163.2 lb./ac. (iii) Main effect of S alone is highly significant. (iv) Av. yield of grain in lb./ac.

	S_0	S_1	S_2	Mean
P_0	1162	1717	1810	1563
P_1	1219	1692	1867	1593
Mean	1191	1705	1839	1578

S.E. of S marginal mean = 81.6 lb./ac.
S.E. of P marginal mean = 66.6 lb./ac.
S.E. of body of table = 115.4 lb./ac.

Crop :- Wheat. **Ref :- Pb. 54(174).**

Site :- Dist. and Demons. Farm, Kangra. **Type :- 'M'.**

Object :—To study the effect of N and P on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Soya bean. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (ii) 16.11.1954. (iv) (a) 5 ploughings, and 6 *sohaga*. (b) N.A. (c) 40 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—250 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 42.67″. (x) 5.5.1955.

2. TREATMENTS :

4 manurial treatments : M_0=Control, M_1=30 lb./ac. of N+24 lb./ac. of P_2O_5, M_2=30 lb./ac of N as Urea and M_3=30 lb./ac. of N as A/S.

A/S applied on 19.12.1954, Super before sowing and Urea on 15.11.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) and (b) 99′×11′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1729 lb./ac. (ii) 114.1 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1288	1977	1913	1738

S.E./mean = 80.7 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(103).**

Site :- Agri. Stn., Karnal. **Type :- 'M'.**

Object :—To study the effect of N through different sources on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 20.11.1955. (iv) (a) N.A. (b) sown by *kera*. (c) 40 srs./ac. (d) 8" between rows. (e) N.A. (v) Nil. (vi) C—518 (early). (vii) Irrigated. (viii) N.A. (ix) 3.28". (x) 14 and 16.4.1956.

2. TREATMENTS :

5 manurial treatments : M_0=Control, M_1=2'/5 lb./ac. of A/S, M_2=330 lb./ac. of C/N, M_3=136 lb./ac. of A/S/N and M_4=197 lb./ac. of Urea.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 81'×23.5'. (b) 77'×23.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1955 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1115 lb./ac. (ii) 113.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4
Av. yield	700	1225	1176	1179	1293

S.E./mean = 56.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(167).**

Site :- Rice Breeding Sub-Stn., Nagrota. **Type :- 'M'.**

Object :—To study the effect of different levels of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) Paddy—Wheat. (b) Paddy. (c) Nil. (ii) (a) Loam to clayey loam. (b) N.A. (iii) 19.11.1954. (iv) (a) 2 ploughings by *desi* plough and 2 plankings. (b) N.A. (c) 40 srs./ac. (d) 9" between lines. (e) N.A. (v) Nil. (vi) C—250. (vii) Irrigated. (viii) N.A. (ix) 12.27". (x) 10.5.1955.

2. TREATMENTS :

5 levels of N as A/S : N_0=Control (no manure), N_1=20, N_2=30, N_3=40 and N_4=50 lb./ac.
A/S applied on 10.2.1955.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 8'3"×30'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2452 lb./ac. (ii) 246.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	N_0	N_1	N_2	N_3	N_4
Av. yield	2806	2100	2177	2489	2688

S.E./mean = 110.3 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(94).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To study the residual effect of manures applied to previous crop Berseem on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Berseem.* (c) As per treatments. (ii) (a) Heavy loam soil. (b) N.A. (iii) 18, 19.10.1954. (iv) (a) and (b) N.A. (c) 40 srs./ac. (d) 6" between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) N.A. (ix) 4.24". (x) 8 to 10.4.1955.

2. TREATMENTS :

4 levels of Super applied to previous crop : P_0=0, P_1=200, P_2=400 and P_3=600 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 80.7'×18'. (b) 68'×16'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1954 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1954 lb./ac. (ii) 151.5 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2	P_3
Av. yield	1740	1924	2170	1982

S.E./mean = 75.7 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(96).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To compare the effect of N through organic and inorganic manures on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize (Fodder). (c) 10 tons/ac. of F.Y.M. (ii) (a) Heavy loam soil. (b) N.A. (iii) 13, 14.11.1954. (iv) (a) and (b) N.A. (c) 40 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—59 (medium). (vii) Irrigated. (viii) N.A. (ix) 4.24". (x) 22.4.1955.

2. TREATMENTS :

6 manurial treatments : N_0=0, N_1=30 lb./ac. of N as A/S, N_2=30 lb./ac. of N as F.Y.M., N_3=40 lb./ac. of N as A/S, N_4=40 lb./ac. of N as F.Y.M. and N_5=20 lb./ac. of N as A/S+20 lb./ac. of N as F.Y.M

F.Y.M. and ½ A/S applied at sowing and ½ A/S on 12.12.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 45'×18'. (b) 41.5'×15'. (v) 1.75'×1.50'. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—55. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1839 lb./ac. (ii) 170.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	N_0	N_1	N_2	N_3	N_4	N_5
Av. yield	1538	2085	1707	1991	1714	1997

S.E./mean = 85.5 lb./ac.

Crop :- Wheat. **Ref :- Pb. 55(17).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To compare the effect of N through organic and inorganic manures on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam soil. (b) N.A. (iii) 19.11.1955. (iv) (a) 5 ploughings and 2 *sohaga*. (b) N.A. (c) 32 srs./ac. (d) 9" between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 3.5". (x) 19.4.1956.

2. TREATMENTS :

Same as in expt. no. 54/96) on page 109.
F.Y.M. applied 3 days before sowing, ½ A/S at sowing and ½ A/S on 21.12.1955.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 42.5'×18'. (b) 33'×16.5'. (v) 4.25'×1.75'. (vi) Yes.

4. GENERAL :

(i) Good. Lodging on 14.3.1956. due to high velocity of wind. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1952—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1429 lb./ac. (ii) 112.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	N_0	N_1	N_2	N_3	N_4	N_5
Av. yield	1280	1555	1375	1605	1365	1395

S.E./mean = 56.3 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 56(123).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :— To study the effect of G.M. on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) G.M. crops. (c) N.A. (ii) (a) Heavy loam (b) N.A. (iii) 23.11.1956. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

5 G.M. crops : G_0=Control, G_1=*Sanai* as G.M., G_2=*Moong* as G.M., G_3=*Sanai* sown and removed for seed and G_4=*Moong* sown and removed for seed.

Sanai and *moong* green manure applied on 16.8.1956 and 2nd week of Oct., 1956.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 1/50 ac. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Crop severely affected by rust. (iii) Grain yield. (iv) (a) 1956 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1423 lb./ac. (ii) 147.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	G_0	G_1	G_2	G_3	G_4
Av. yield	1207	1440	1690	1297	1479

S.E./mean = 73.6 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(19).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :— To compare the effect of A/S and C/N on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 23.11.1955. (iv) (a) 6 ploughings and 6 *sohaga*. (b) N.A. (c) 32 srs./ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) C—281 (medium). (vii) Irrigated. (viii) Nil. (ix) 3.5″ (x) 27, 28.4.1956.

2. TREATMENTS :

All combinations of (1) and (2)+one control

(1) 3 levels of N : N_1=20, N_2=30 and N_3=40 lb./ac.

(2) 2 sources of N : S_1=A/S and S_2=C/N

Half of the fertilizer applied by broadcast before sowing and other half as top dressing.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 60.5′×18′. (b) 48.5′×15′. (v) 6′×1.5′. (vi) Yes.

4. GENERAL :

(i) Good. Lodging on 13.3.1956 due to high wind velocity and heavy showers of rain. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1955—1956. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1973 lb./ac. (ii) 49.9 lb./ac. (iii) Main effect of N, S and 'cotrol *vs.* others' are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1691 lb./ac.

	N_1	N_2	N_3	Mean
S_1	1856	2010	2092	1986
S_2	2028	2029	2107	2055
Mean	1942	2019	2099	2020

S.E. of S marginal mean = 14.4 lb./ac.
S.E. of N marginal mean = 17.6 lb./ac.
S.E. of body of table or control mean = 24.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(125).**

Site :- Soil Sub Stn., Rauni. **Type :- 'M'.**

Object :—To compare the effect of A/S and C/N on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) N.A. (ii) (a) Heavy loam (b) N.A. (iii) 18.11.1956. (iv) (a) to (e) N.A. (v) Nil. (vi) C—281. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 25, 27.4.1957.

2. TREATMENTS :

Same as in expt. no. 55(19) on page 111.
Half of fertilizer applied on 18.11.1956 and other half on 28.1.1957.

3. DESIGN :

(i) R.B.D. *(ii) (a) 7. (b)* N.A. *(iii) 4. (iv) (a) 1/60 ac, (b) 1/90 ac. (v)* N.A. *(vi)* Yes.

4. GENERAL :

(i) Good. (ii) Crop severely affected by orange rust. (iii) Grain yield. (iv) (a) 1955—1956. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1726 lb./ac. (ii) 202.7 lb./ac. (iii) Only 'control *vs.* others' is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1312 lb./ac.

	N_1	N_2	N_3	Mean
S_1	1621	1732	1932	1762
S_2	1738	2001	1748	1829
Mean	1679	1866	1840	1795

S.E. of N marginal mean = 71.7 lb./ac.
S.E. of S marginal mean = 58.5 lb./ac.
S.E. of body of table = 101.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(97).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To study the effect of N and P on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) 10 tons./ac. of F.Y.M. (ii) (a) Heavy loam soil. (b) N.A. (iii) 16, 17.11.1954. (iv) (a) and (b) N.A. (c) 40 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) N.A. (ix) 4.24". (x) 10.4.1955.

2. TREATMENTS :

6 manurial treatments : M_0=Control, M_1=25 lb./ac. of N, M_2=50 lb./ac. of N, M_3=M_1+25 lb./ac. of P_2O_5, M_4=M_2+25 lb./ac. of P_2O_5 and M_5=M_2+50 lb./ac. of P_2O_5.
N as A/S applied ½ at sowing and ½ on 12.12.1954. P_2O_5 as Super drilled 3" to 4" deep before sowing.

8. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 47.5'×18'. (b) 41.5'×15'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. Lodged slightly. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1778 lb./ac. (ii) 180.7 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	1466	1793	1842	1970	1799	1795

S.E./mean = 90.3 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(18).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object:—To study the effect of N and P on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Berseem.* (c) Nil. (ii) (a) Heavy loam soil. (b) N.A. (iii) 18.11.1955. (iv) (a) and (b) N.A. (c) 32 srs./ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 3.5″. (x) 19.4.1956.

2. TREATMENTS :

Same as in expt. no. 54(97) on page 112.
½ A/S top dressed on 14.12.1955.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 42.5′×18′. (b) 34′×16.5′. (v) 4.25′×0.75′. (vi) Yes.

4. GENERAL :

(i) Good. Lodged due to high wind velocity and heavy rain on 14.3.1956. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1852 lb./ac. (ii) 127.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	1440	1790	1930	1880	2035	2040

S.E./mean = 63.6 lb./ac.

———

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(126).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To study the effect of N and P on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—Wheat. (b) Sugarcane. (c) N.A. (ii) (a) Heavy loam. (b) N.A. (iii) 19.11.1956. (iv) (a) to (e) N.A. (v) Nil. (vi) C—281. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 26, 27.4.1957.

2. TREATMENTS :

Same as in expt. no. 54(97) on page 112.
½ A/S applied on 28.1.1957.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 1/60 ac. (b) 1/90 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Crop severly attacked by orange dust. (iii) Grain yield. (iv) (a) 1953—1956. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1880 lb./ac. (ii) 266.4 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	1436	1805	2078	1817	2099	2046

S.E./mean = 133.2 lb./ac.

———

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(118).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To study the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—Wheat. (b) Sugarcane. (c) N.A. (ii) (a) Heavy loam. (b) N.A. (iii) 1.11.1957. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 bar harrow. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=40 and N_2=80 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=20 and P_2=40 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 1/70 ac. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1924 lb./ac. (ii) 246.7 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	1337	2070	2517	1975
P_1	1334	2201	2229	1921
P_2	1355	2062	2214	1877
Mean	1342	2111	2320	1924

S.E. of any marginal mean = 71.2 lb./ac.
S.E. of body of table = 123.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(139).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To study the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Sannhemp*—Wheat. (b) *Sannhemp*. (c) N.A. (ii) (a) Heavy loam (b) N.A. (iii) 18.11.1958. (iv) (a) to (e) N.A. (v) Nil. (vi) C—273 (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 15.4.1959.

2. TREATMENTS :

Same as in expt. no. 57(118) above.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 1/71.8 ac. (b) 1/121 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1580 lb./ac. (ii) 284.3 lb./ac. (iii) Only N effect is highly significant and P effect is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	1097	1525	1606	1409
P_1	1019	1917	1820	1585
P_2	1124	1976	2135	1745
Mean	1080	1806	1854	1580

S.E. of any marginal mean = 82.1 lb./ac.
S.E. of body of table = 142.2 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(140).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To compare the effect of different sources of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) N.A. (ii) (a) Heavy loam (b) N.A. (iii) 19.11.1958. (iv) (a) to (e) N.A. (v) Nil. (vi) C—273. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 16.4.1959.

2. TREATMENTS :

8 sources of 40 lb./ac. of N : S_0=Control, S_1=A/N, S_2=A/S, S_3=A/C, S_4=A/S/N, S_5=C/A/N, S_6=Urea and S_7=C/N.

N applied before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 1/66.5 ac. (b) 1/121 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1958 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1853 lb./ac. (ii) 202.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av.yield	1194	1921	1719	1672	1967	2014	2240	2100

S.E./mean = 101.2 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(164).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of different times of application of N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Rohtak. (iii) 3.11.1954. (iv) (a) to (e) N.A. (v) Nil. (vi) C—518. (vii) Irrigated. (viii) 1 weeding. (ix) 5.49″. (x) 1.3.1955.

2. TREATMENTS :

4 times of application of 25 lb./ac. of N : T_0=Control, T_1=Before sowing, T_2=At sowing and T_3=At 1st irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1826 lb./ac. (ii) 141.4 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	1679	1862	2041	1722

S.E./mean = 70.7 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 54(156).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To find out the best method of application of Urea and A/S to Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Mash. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Rohtak. (iii) 14.11.1954. (iv) (a) to (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) 1 weeding. (ix) 5.49". (x) 30.3.1955.

2. TREATMENTS :

6 applications of manures : M_0=Control, M_1=40 lb./ac. of N as Urea by broadcast and mixed with cultivator and sowing of wheat with *kera*, M_2=40 lb./ac. of N as Urea drilled 3" below the seed and sowing with *kera*, M_3=20 lb./ac. of N as Urea broadcast and mixed with cultivator before sowing+20 lb./ac. of N as Urea with 1st irrigation, M_4=40 lb./ac. of N as A/S by broadcast and mixed with cultivator before sowing of wheat with *kera* and M_5=40 lb./ac. of N as A/S drilled 3" below seed and sowing with *kera*.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 1/50. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1954 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1173 lb./ac. (ii) 192.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	707	1294	1245	1176	1207	1411

S.E./mean = 96.1 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 56(106).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :— To study the effect of different times of application of N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Cotton—Wheat—Cotton. (b) Cotton. (c) N.A. (ii) (a) Loam soil. (b) Refer soil analysis, Rohtak. (iii) 18.11.1956. (iv) (a) N.A. (b) As per treatments. (c) 40 srs./ac. (d) 8″ between rows. (e) N.A. (v) Nil. (vi) C—281. (vii) Irrigated. (viii) N.A. (ix) 4.51″. (x) 5.5.1957.

2. TREATMENTS :

All combinations of (1) and (2) + control (4 plots).

(1) 4 sources of 40 lb./ac. of N : S_1=A/S, S_2=A/C, S_3=Urea and S_4=Liquid Ammonia.

(2) 4 times of application : T_1=Broadcast at sowing, T_2=Drilling at sowing, T_3=At first irrigation and T_4=At pre flowering stage.

3. DESIGN :

(i) R.B.D. (ii) (a) 20. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/180 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Grain yield. (iv) (a) 1956 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1346 lb./ac. (ii) 196.5 lb./ac. (iii) All effects are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 759 lb./ac.

	T_1	T_2	T_3	T_4	Mean
S_1	1998	1971	1925	775	1667
S_2	1763	1697	1689	910	1515
S_3	2067	1686	1929	768	1612
S_4	1215	1173	1466	860	1178
Mean	1761	1632	1752	828	1493

S.E. of any marginal mean or control mean = 40.1 lb./ac.
S.E. of body of table = 80.2 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(137).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :— To study the effect of placement of fertilizer on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loam soil. (b) Refer soil analysis, Rohtak. (iii) 8.11.1955. (iv) (a) N.A. (b) Sown by *kera*. (c) 40 srs./ac. (d) 9″ between rows. (e) N.A. (v) 50 lb./ac. of manure mixture on 8.11.1955. (vi) C—518. (vii) Irrigated. (viii) N.A. (ix) 0.59″. (x) 31.5.1956.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 sources of 40 lb./ac. of N : S_1=Urea and S_2=A/S.

(2) 3 methods of application of N : M_1=Broadcast before sowing, M_2=Drilled 3″ below the seed and M_3=Broadcast at 1st irrigation.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/50 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1955 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (v)) and (vii) Nil.

5. RESULTS :

(i) 2285 lb./ac. (ii) 251.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	Mean
S_1	2273	2382	2244	2300
S_2	2374	2109	2323	2269
Mean	2324	2246	2284	2285

S.E. of S marginal mean = 72.7 lb./ac.
S.E. of M marginal mean = 89.0 lb./ac.
S.E. of body of table = 125.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(140).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Loam soil. (b) Refer soil analysis, Rohtak. (iii) 24.11.1955. (iv) (a) N.A. (b) Sown by *kera*. (c) 40 srs./ac. (d) 8" between rows. (e) N.A. (v) 112 lb./ac. of manure mixture on 24.11.1955. (vi) C—228. (vii) Irrigated. (viii) N.A. (ix) 2.49". (x) 4.6.1956.

2. TREATMENTS :

4 manurial treatments : M_0=Control, M_1=80 lb./ac. of N + 40 lb./ac. of P_2O_5, M_2=120 lb./ac. of N + 60 lb./ac. of P_2O_5 and M_3=120 lb./ac. of N + 60 lb./ac. of P_2O_5 + 30 lb./ac. of K_2O.

N as A/S, P_2O_5 as Super and K_2O as Mur. Pot. were applied.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—1956. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1880 lb./ac. (ii) 220.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	338	2329	2521	2331

S.E./mean = 155.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(157).**

Site :- Soil Sub-Stn., Rohtak **Type :- 'M'.**

Object :—To compare the effect of different sources of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Mash. (c) Nil. (ii) (a) Loam soil. (b) Refer soil analysis, Rohtak. (iii) 14.11.1954. (iv) (a) to (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) 1 weeding. (ix) 5.49". (x) 31.3.1955.

TREATMENTS :

6 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S, S_2=Urea, S_3=A/N, S_4=A/S/N and S_5=C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 1/50 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1204 lb./ac. (ii) 103.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5
Av. yield	589	1418	1309	1369	1471	1067

S.E./mean = 51.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(138).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of different sources of N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam soil. (b) Refer soil analysis, Rohtak. (iii) 8.11.1955. (iv) (a) N.A. (b) Sown by *kera*. (c) 40 srs./ac. (d) 9″ between rows. (e) N.A. (v) 50 lb./ac. of manure mixture on 8.11.1955. (vi) C—518. (vii) Irrigated. (viii) N.A. (ix) 0.59″. (x) 31.5.1956.

2. TREATMENTS :

6 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S, S_2=Urea, S_3=A/N, S_4=A/S/N and S_5=Liquor Ammonia.

N applied at 8.11.1955.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/50 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2442 lb./ac. (ii) 293.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5
Av. yield	2380	2820	2568	2477	2116	2293

S.E./mean = 146.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(139).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of different manures on the yield of Wheat.

BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam soil. (b) Refer soil analysis, Rohtak. (iii) 24.11.1955. (iv) (a) N.A. (b) Sown by *kera*. (c) 40 srs./ac. (d) 9″ between rows. (e) N.A. (v) 112 lb./ac. of manure mixture on 24.11.1955. (vi) C—228. (vii) Irrigated. (viii) N.A. (ix) 0.59″. (x) 4.6.1956.

2. TREATMENTS :

All combinations of (1) and (2)+one control and 1 extra treatment.

(1) 2 levels of N as A/S : N_0=0 and N_1=40 lb./ac.

(2) 3 sources of 20 lb./ac. of P_2O_5 : S_1=Super, S_2=Bone meal and S_3=Bone meal digested.

Extra treatment : E 20 lb./ac. of P_2O_5 as F.Y.M.+40 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/68 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1955 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1027 lb./ac. (ii) 216.7 lb./ac. (iii) Main effects of N, S, 'control *vs.* others' and 'E *vs.* others' are highly significant. Interaction N×S is significant. (iv) Av. yield of grain in lb./ac.

Control = 566 lb./ac. ; E = 849 lb./ac.

	S_1	S_2	S_3	Mean
N_0	714	387	669	590
N_1	2080	1520	1433	1678
Mean	1397	953	1051	1134

S.E. of S marginal mean = 76.6 lb./ac.
S.E. of N marginal mean = 62.5 lb./ac.
S.E. of body of table, control or E mean = 108.3 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 59(62).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of time and method of application of C/A/N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara* for G.M. (c) Nil. (ii) (a) Loam soil. (b) Refer soil analysis, Rohtak. (iii) 18.11.1959. (iv) (a) N.A. (b) Sown by *kera*. (c) 40 srs./ac. (d) 8" between rows. (e) Nil. (v) Nil. (vi) C—281. (vii) Irrigated. (viii) N.A. (ix) 2.84". (x) 8.4.1960.

2. TREATMENTS :

7 times of application of 40 lb./ac. of N_2 as C/A/N : T_0=Control, T_1=Drilled before sowing, T_2=Mixed with seed, T_3=Broadcast before sowing, T_4=At 1st irrigation, T_5=Drilled at sowing and T_6=Band placement.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/21 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1959 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2040 lb./ac. (ii) 139.2 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	1847	2182	1859	1946	2167	2283	1996

S.E/mean = 80.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(114).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of N, P and K on Wheat.

1. BASAL CONDITIONS :

(i) (a) *Guara*—Wheat—Sugarcane. (b) *Guara* as G.M. (c) Nil. (ii) (a) Loam soil. (b) Refer soil analysis, Rohtak. (iii) 30.10.1959. (iv) (a) Sown by *kera*. (c) 40 srs./ac. (d) 9″ between rows (e) Nil (v) Nil. (vi) C—281. (vii) Irrigated. (viii) N.A. (ix) 2.84″. (x) 2.4.1960.

2. TREATMENTS :

8 manurial treatments : T_0=Control, T_1=40 lb./ac. of N as A/S/N, T_2=T_1+20 lb./ac. of P_2O_5 as Super, T_3=T_1+40 lb./ac. of P_2O_5 as Super, T_4=T_3+40 lb./ac. of K_2O as Mur. Pot., T_5=T_1+80 lb./ac. of P_2O_5 as Super+40 lb./ac. of K_2O as Mur. Pot., T_6=80 lb./ac. of N as A/S/N+80 lb./ac. of P_2O_5 as Super+40 lb./ac. of K_2O as Mur. Pot. and T_7=80 lb./ac. of N as A/S/N+80 lb./ac. of P_2O_5 as Super+80 lb./ac. of K_2O as Mur. Pot.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Crop lodged in Jan., 1960. (ii) Nil. (iii) Grain yield. (iv) (a) 1959 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2397 lb./ac. (ii) 434.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. yield	2063	2295	2470	2825	2349	2582	2506	2086

S.E./mean = 250.6 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(117).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of time and method of application of N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Guara* for G.M. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Rohtak. (iii) 30.10.1959. (iv) (a) N.A. (b) Sown by *kera*. (c) 40 srs./ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) C—281. (vii) Irrigated. (viii) N.A. (ix) 2.84″. (x) 5.4.1960.

2. TREATMENTS :

6 manurial treatments : T_0=Control, T_1=40 lb./ac. of N as C/A/N drilled at sowing, T_2=40 lb./ac. of N as A/S drilled at sowing, T_3=40 lb./ac. of N as Urea sowing in 8 doses after germination at 15 days interval, T_4=40 lb./ac. of N as Liquid Ammonia sprayed in 8 doses after germination at 15 days interval and T_5=40 lb./ac. of N as A/C drilled at sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Crop damaged due to rains. (vii) Nil.

5. RESULTS :

(i) 1934 lb./ac. (ii) 186.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. yield	1582	2180	2039	1963	1892	1946

S.E./mean = 93.2 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(197).**

Site :- Govt. Agri. Farm, Rohtak. **Type :- 'M'.**

Object :—To study the effect of different sources of N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Rohtak. (iii) N.A. (iv) (a) N.A. (b) By *kera*. (c) N.A. (d) 8" between rows. (e) Nil. (v) N.A. (vi) C—591 (medium). (vii) to (x) N.A.

2. TREATMENTS :

6 sources of 40 lb./ac. of N : S_0 = 0, S_1 = A/S, S_2 = Urea, S_3 = A/N, S_4 = A/S/N and S_5 = liquor Ammonia.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1194 lb./ac. (ii) 114.2. lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5
Av. yield	579	1418	1309	1344	1470	1043

S.E./mean = 57.0 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(198).**

Site :- Govt. Agri. Farm, Rohtak. **Type :- 'M'.**

Object :— To study the effect of different methods of application of N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Rohtak. (iii) N.A. (iv) (a) N.A. (b) As per treatments. (c) to (e) N.A. (v) N.A. (vi) C—518. (vii) Irrigated. (viii) and (ix) N.A. (x) April 1955.

2. TREATMENTS :

6 methods of application of N : S_0 = No application, S_1 = Urea by broadcast and mixed with cultivator and *kera*, S_2 = Urea drilled 3" below the seed sown by *kera*, S_3 = 20 lb./ac. of N as Urea before sowing and 20 lb./ac. of N as Urea with 1st irrigation, S_4 = A/S by broadcast and mixed with cultivator and *kera* and S_5 = A/S drilled 3" below the seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type II—To study the cumulative, direct and residual effect of manuring on Wheat.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat—Cotton—*Senji*. (b) Maize. (c) As per treatments. (ii) (a) Indus alluvium. (b) N.A. (iii) 1st week of Nov., 1958. (iv) (a) 3 ploughings. (b) N.A. (c) 70 lb./ac. (d) 9". (e) N.A. (v) Nil. (vi) C—273 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 3". (x) 2nd week of April, 1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(M.A.E.) type II on page 123.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) and (c) Yes. (v) and (vi) Nil. (vii) Analysis has been done for cumulative, direct and residual effects seperately.

5. RESULTS :

I Cumulative effect

(i) 2072 lb./ac. (ii) 218.7 lb./ac. (iii) Main effect of N and K are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	1581	2105	2483	2034	2018	2116	1745	2085	2338	2056
F_1	1792	2084	2441	2115	2202	2001	1876	2112	2330	2106
F_2	1612	2110	2442	1969	2077	2119	1831	2081	2253	2055
Mean	1662	2100	2455	2039	2099	2079	1817	2093	2307	2072
K_0	1357	1760	2334	1771	1928	1752				
K_1	1695	2140	2444	2086	2078	2115				
K_2	1934	2400	2587	2260	2291	2370				
P_0	1700	2016	2401							
P_1	1598	2210	2489							
P_2	1688	2074	2475							

S.E. of any marginal mean = 42.1 lb./ac.
S.E. of body of any table = 72.9 lb./ac.

II Direct effect

(i) 2004 lb./ac. (ii) 186.3 lb./ac. (iii) Main effect of N and K are highly significant. Main effect of P and interactions P×K and P×M are significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	1596	2112	2335	1916	2154	1972	1705	2067	2276	2014
F_1	1682	1967	2304	1953	1924	2075	1810	2032	2110	1984
F_2	1634	1983	2422	1887	2015	2137	1746	2026	2267	2013
Mean	1637	2021	2354	1919	2031	2061	1754	2042	2216	2004
K_0	1267	1829	2166	1652	1880	1730				
K_1	1727	2064	2335	2025	2034	2066				
K_2	1918	2170	2560	2080	2179	2388				
P_0	1507	1905	2346							
P_1	1623	2112	2358							
P_2	1781	2046	2357							

S.E. of any marginal mean = 35.9 lb./ac.
S.E. of body of any table = 62.1 lb./ac.

III Residual effect

(i) 1362 lb./ac. (ii) 194.4 lb./ac. (iii) Main effect of N is highly significant. Interactions N×P, N×F and P×F are significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	1312	1223	1346	1323	1201	1358	1290	1268	1324	1294
F_1	1252	1379	1603	1495	1425	1313	1478	1442	1313	1411
F_2	1228	1475	1436	1292	1459	1389	1336	1284	1520	1380
Mean	1264	1359	1462	1370	1362	1353	1368	1331	1386	1362
K_0	1251	1346	1507	1402	1324	1378				
K_1	1191	1351	1451	1284	1413	1296				
K_2	1350	1380	1428	1424	1349	1385				
P_0	1234	1492	1384							
P_1	1212	1323	1551							
P_2	1346	1262	1451							

S.E. of any marginal mean = 37.4 lb./ac.
S.E. of body of any table = 64.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type II—To study the cumulative, direct and residual effect of manurings on Wheat.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat—Cotton—*Senji*. (ii) (a) Indus alluvium. (b) Maize. (c) As per treatments. (iii) 4th week of Oct., 1959. (iv) (a) 5 ploughings. (b) N.A. (c) 70 lb./ac. (d) and (e) N.A. (v) Nil. (vi) C—273 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 2". (x) 1st week of April, 1960.

2. TREATMENTS :

Same as in expt. no 56(M.A.E.) type II on page 123.

3. DESIGN :

(i) 3^4 fact. confd. (ii) (a) 9 plots/block and 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 15'×30'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) and (c) Yes. (v) and (vi) Nil. (vii) Analysis has been done for cumulative, direct and residual effects sperately.

5. RESULTS :

I Cumulative effect

(i) 1616 lb./ac. (ii) 235.7 lb./ac. (iii) Main effect of N and F are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Me
F_0	971	1523	2083	1555	1473	1550	1613	1481	1484	1526
F_1	1052	1506	2164	1465	1629	1628	1563	1596	1563	1574
F_2	1226	1654	2361	1596	1786	1859	1637	1695	1909	1747
Mean	1083	1561	2203	1539	1629	1679	1604	1591	1652	1616
K_0	1078	1539	2195	1481	1646	1685				
K_1	996	1613	2164	1555	1679	1539				
K_2	1175	1531	2250	1581	1562	1813				
P_0	1045	1456	2116							
P_1	1111	1531	2245							
P_2	1093	1696	2248							

S.E. of any marginal mean = 45.4 lb./ac. S.E. of body of any table = 78.6 lb./ac.

II Residual effect

(i) 998 lb./ac. (ii) 206.5 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	906	970	1070	1020	963	963	1004	946	996	982
F_1	889	905	1070	938	897	1030	930	963	972	955
F_2	922	1086	1160	971	1070	1127	1029	1053	1086	1056
Mean	906	987	1100	976	977	1040	988	987	1018	998
K_0	856	1053	1055	955	1012	997				
K_1	880	996	1085	987	938	1036				
K_2	982	912	1160	986	981	1087				
P_0	971	955	1002							
P_1	848	1020	1063							
P_2	899	986	1235							

S.E. of any marginal mean = 39.7 lb./ac. S.E. of body of any table = 68.8 lb./ac

III Direct effect

(i) 1504 lb./ac. (ii) 280.6 lb./ac. (iii) Main effect of N and P are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	963	1481	2041	1374	1465	1646	1547	1481	1457	1495
F_1	1029	1415	1958	1317	1555	1529	1465	1481	1455	1467
F_2	1103	1556	1990	1333	1662	1655	1539	1424	1687	1550
Mean	1032	1484	1996	1341	1561	1610	1517	1462	1533	1504
K_0	1004	1465	2082	1275	1588	1688				
K_1	1020	1399	1967	1358	1481	1547				
K_2	1071	1588	1940	1390	1614	1595				
P_0	922	1259	1842							
P_1	1053	1547	2083							
P_2	1121	1646	2063							

S.E. of any marginal mean = 54.0 lb./ac.
S.E. of body of any table = 93.5 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 57(MAE).**

Site :- M.A E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type IV—To study the effect of direct and indirect manuring of Wheat.

1. BASAL CONDITIONS :

(i) (a) Legume—Wheat. (b) Legumes. (c) As per treatments. (ii) Indus alluvium. (b) N.A. (iii) 7 to 15.11.1957. (iv) (a) 5 to 6 ploughings. (b) N.A. (c) 70 lb./ac. (d) 7" to 10". (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) 3.48". (x) 7 to 15.4.1958.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2 +a control L_0P_0.

(1) 2 previous legume crops : L_1 - *Guara* and L_2 - *Mash*.

(2) 3 levels of P_2O_5 as Super applied to legumes : P_0 =0, P_1=40 and P_2=80 lb./ac.

Sub-plot treatments :

3 levels of N as A/S applied to Wheat : N_0 =0, N_1=15 and N_2=30 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 30' × 14.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1419 lb./ac. (ii) (a) 236.7 lb./ac. (b) 210.8 lb./ac. (iii) Main effect of L and N are highly significant. (iv) Av. yield of grain in lb./ac.

	L_0P_0	L_1P_0	L_1P_1	L_1P_2	L_2P_0	L_2P_1	L_2P_2	Mean
N_0	1051	1636	1602	1335	868	935	1102	1218
N_1	1268	1769	1452	1352	1302	1235	1118	1357
N_2	1702	1703	1902	1769	1569	1619	1502	1681
Mean	1340	1703	1652	1485	1246	1263	1241	1419

S.E. of difference of two

1. LP marginal means = 111.6 lb./ac.
2. N marginal means = 65.1 lb./ac.
3. N means at the same level of LP = 172.1 lb./ac.
4. LP means at the same level of N = 179.4 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 58(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type IV—To study the effect of direct and indirect manuring of Wheat.

1. BASAL CONDITIONS :

(i) (a) Legume—Wheat. (b) Legumes. (c) As per treatments. (ii) (a) Indus alluvium. (b) N.A. **(iii)** 1st week of Nov., 1958. (iv) (a) 3 ploughings. (b) N.A. (c) 70 lb./ac. (d) 9". (e) N.A. (v) Nil. **(vi)** C—273 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 3". (x) 2nd week of April, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(MAE) type IV on page 128.

5. RESULTS :

(i) 2144 lb./ac. (ii) (a) 217.6 lb./ac. (b) 275.2 lb./ac. (iii) Main effect of N and "L_0P_0 *vs.* others" are highly significant. (iv) Av. yield of grain in lb./ac.

	L_0P_0	L_1P_0	L_1P_1	L_1P_2	L_2P_0	L_2P_1	L_2P_2	Mean
N_0	3555	1596	1588	1893	1637	1646	1786	1957
N_1	3835	1958	1794	1991	1794	1629	1835	2119
N_2	3826	2427	1761	2024	1983	2279	2197	2357
Mean	3739	1994	1714	1969	1805	1851	1939	2144

S.E. of difference of two

1. LP marginal means = 102.6 lb./ac.
2. N marginal means = 84.9 lb./ac.
3. N means at the same level of LP = 224.7 lb./ac.
4. LP means at the same level of N = 210.2 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :-Pb. 59(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type IV :—To study the effect of direct and indirect manuring of Wheat.

BASAL CONDITIONS :

(i) (a) Legume—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) Indus alluvium. (b) N.A. **(iii) 4th** week of Oct., 1959. (iv) (a) 5 ploughings. (b) N.A. (c) 70 lb./ac. (d) and (e) N.A. (v) Nil. (vi) **C**—273 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 2". (x) 1st week of April, 1960.

TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(MAE) type IV on page 128.

4. GENERAL :

(i) Normal. (ii) Attack of rats controlled. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1304 lb./ac. (ii) (a) 250.8 lb./ac. (b) 263.3 lb./ac. (iii) Main effect of N is highly significant. Main effect of P and "L_0P_0 *vs.* others $\times$N" are significant. (iv) Av. yield of grain lb./ac.

	L_0P_0	L_1P_0	L_1P_1	L_1P_2	L_2P_0	L_2P_1	L_2P_2	Mean
N_0	699	1177	996	1308	1136	1251	1218	1112
N_1	1531	1366	1506	1456	1086	1308	1489	1392
N_2	1440	1045	1333	1851	1251	1531	1407	1408
Mean	1223	1196	1278	1538	1158	1363	1371	1304

S.E. of difference of two

1. LP marginal means = 118.2 lb./ac.
2. N marginal means = 81.3 lb./ac.
3. N means at the same level of LP = 215.0 lb./ac.
4. LP means at the same level of N = 211.6 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'**

Object :—Type V :—To study the effect of time of application of different sources and doses of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A, (iii) 4 to 12.11.1956. (iv) (a) and (b) N.A. (c) 70 lb./ac. (d) 9". (e) N.A. (v) Green manuring by burying *berseem*. 5000 lb./ac. of F.Y.M. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 4.76". (x) 5 to 12.4.1957.

2. TREATMENTS :

All combinations of (1), (2) and (3) +3 control plots

(1) 3 sources of N : S_1=A/S, S_2=A/N and S_3=Urea.

(2) 3 times of application of N : T_1=At sowing, T_2=At first irrigation and T_3=½ at sowing+½ at first irrigation.

(3) 2 levels of N : N_1=20 and N_2=40 lb./ac.

3. DESIGN :

(i) $3^2 \times 2+3$ confd. (ii) (a) 3 blocks/replication and 7 plots/block including one control plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. Crop slightly lodged. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) N.A. (v) and (vi) Nil. (vii) Means in S×T table and the corresponding S.E. are unadjusted.

5. RESULTS :

(i) 2167 lb./ac. (ii) 246.9 lb./ac. (iii) "Control *vs.* others" is significant. (iv) Av. yield of grain in lb./ac.

Control = 2032 lb./ac.

	S_1	S_2	S_3	Mean	N_1	N_2
T_1	2138	2168	2148	2151	2223	2079
T_2	2358	2158	2173	2230	2223	2237
T_3	2118	2238	2208	2188	2163	2213
Mean	2205	2188	2176	2190	2203	2176
N_1	2243	2256	2110			
N_2	2167	2120	2241			

S.E. of marginal mean of S or T = 50.4 lb./ac.
S.E. of marginal mean of N = 41.2 lb./ac.
S.E. of body of S×N or T×N table = 71.3 lb./ac.
S.E. of body of S×T table = 87.3 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 57(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type V :—To study the effect of time of application of different sources and doses of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A. (iii) 7 to 15.11.1957. (iv) (a) 5 to 6 ploughings. (b) N.A. (c) 70 lb./ac. (d) 7″ to 10″. (e) N.A. (v) 5000 lb./ac. of F.Y.M.+*Guara* as G.M. (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) 3.48″. (x) 7 to 15.4.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(MAE) type V on page 130.

5. RESULTS :

(i) 2086 lb./ac. (ii) 287.0 lb./ac. (iii) "Control *vs.* others" is highly sinificant and main effect of N is signifinant. (iv) Av. yield of grain in lb./ac.

Control = 1824 lb./ac.

	S_1	S_2	S_3	Mean	N_1	N_2
T_1	2221	2114	2177	2171	2083	2259
T_2	2127	2202	1964	2098	2033	2163
T_3	2209	2058	2096	2121	2043	2199
Mean	2186	2125	2079	2130	2053	2207
N_1	2071	2100	1987			
N_2	2301	2150	2171			

S.E. of marginal mean of S or T = 58.6 lb./ac.
S.E. of marginal mean of N = 47.8 lb./ac.
S.E. of body of S×N or T×N table = 82.8 lb./ac.
S.E. of body of S×T table = 101.5 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 58(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type V :—To study the effect of time of application of different sources and doses of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A. (iii) 1st week of Nov., 1958. (iv) (a) 3 ploughings. (b) N.A. (c) 70 lb./ac. (d) 9″. (e) N.A. (v) 5000 lb./ac. of F.Y.M.+*Guara* as G.M. (vi) C—273 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 3″. (x) 2nd week of April, 1959.

2. TREATMENTS :

Same as in expt. no. 56(MAE) type V on page 130.

3. DESIGN :

(i) $3^2 \times 2+3$ confd. (ii) 3 blocks/replication and 7 plots/block including one control plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 41.5′×10.5′ for two replications and 21.5′×20.25′ for the other two. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) 1956—contd. (b) No. (c) N.A. (v) and (vi) Nil. (vii) Means in S×T table and the corresponding S.E. are adjusted for block effects.

5. RESULTS :

(i) 3021 lb./ac. (ii) 230.7 lb./ac. (iii) Main effect of N is highly significant. Interaction T×S×N and "control *vs.* others" are significant. (iv) Av. yield of grain in lb./ac.

Control = 2870 lb./ac.

	S_1	S_2	S_3	Mean	N_1	N_2
T_1	3110	2979	3028	3039	2946	3132
T_2	3143	3135	2938	3072	3053	3091
T_3	3077	3061	2946	3028	2896	3160
Mean	3110	3058	2971	3046	2965	3128
N_1	3094	2954	2847			
N_2	3126	3162	3096			

S.E. of S or T marginal mean = 47.1 lb./ac.
S.E. of N marginal mean = 38.4 lb./ac.
S.E. of body of S×N or T×N table = 66.6 lb./ac.
S.E. of body of S×T table = 87.2 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type V :—To study the effect of time and application of different sources and doses of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A. (iii) 4th week of Oct., 1959. (iv) (a) 5 ploughings. (b) N.A. (c) 70 lb./ac. (d) and (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) C—273 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 2". (x) 1st week of April, 1960.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(MAE) type V on page 130.

4. GENERAL :

(i) Good. (ii) Attack of rats controlled. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) N.A. (v) and (vi) Nil. (vii) Means in S×T table and the corresponding S.E. are adjusted for block effects.

5. RESULTS :

(i) 2472 lb./ac. (ii) 313.1 lb./ac. (iii) "Control *vs.* others" is highly significant and main effect of N is significant. (iv) Av. yield of grain in lb./ac.

Control = 2000 lb./ac.

	S_1	S_2	S_3	Mean	N_1	N_2
T_1	2683	2320	2394	2466	2362	2570
T_2	2493	2543	2534	2523	2378	2668
T_3	2748	2543	2699	2663	2641	2635
Mean	2641	2469	2542	2551	2460	2641
N_1	2485	2304	2591			
N_2	2797	2634	2492			

S.E. of S or T marginal mean = 63.9 lb./ac.
S.E. of N marginal mean = 52.2 lb./ac.
S.E. of body of S×N or T×N table = 90.4 lb./ac.
S.E. of body of S×T table = 118.3 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 56(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type VI :—To study the effect of method of application of different sources and levels of P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A. (iii) 4 to 12.11.1956. (iv) (a) and (b) N.A. (c) 70 lb./ac. (d) 9". (e) N.A. (v) Green manuring by burying *guara.* (vi) NP—718 (late). (vii) Irrigated. (viii) N.A. (ix) 4.76". (x) 5 to 12.4.1957.

2. TREATMENTS :

All combination of (1), (2) and (3)+a control

(1) 2 sources of P_2O_5 : S_1=Super and S_2=Ammo. Phos.

(2) 2 levels of P_2O_5 : P_1=20 and P_2=40 lb./ac.

(3) 3 methods of application : M_1=Broadcast before final cultivation, M_2=Drilling $2\frac{1}{2}$" below seed and M_3=Band placement.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 30'×14.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1963 lb./ac. (ii) 530.8 lb./ac. (iii) "Control *vs.* others" alone is significant. (iv) Av. yield of grain in lb./ac.

Control = 1669 lb./ac.

	M_1	M_1	M_2	Mean	S_1	S_2
P_1	1969	1930	2163	2021	2038	2004
P_2	1955	2070	1841	1955	1906	2005
Mean	1962	2000	2002	1988	1972	2005
S_1	1836	2050	2029			
S_2	2089	1949	1976			

S.E. of S or P marginal mean = 125.1 lb./ac.
S.E. of M marginal mean = 153.2 lb./ac.
S.E. of body of S×M or P×M table = 216.7 lb./ac.
S.E. of body of S×P table = 176.9 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 57(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type VI :—To study the effeet of method of application of different sources and levels of P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A. (iii) 7 to 15.11.1957. (iv) (a) 5 to 6 ploughings. (b) N.A. (c) 70 lb./ac. (d) 7" to 10". (e) N.A. (v) *Guara* applied as G.M. (vi) C—273 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 3.48". (x) 7 to 15.4.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(MAE) type VI above.

5. RESULTS :

(i) 1877 lb./ac. (ii) 251.7 lb./ac. (iii) 'Control *vs.* others' alone is significant. (iv) Av. yield of grain in lb./ac.

Control = 1586 lb./ac.

	M_1	M_2	M_3	Mean	S_1	S_2
P_1	1827	1934	1851	1871	1913	1829
P_2	1835	1893	2065	1931	1813	2048
Mean	1831	1913	1958	1901	1863	1938
S_1	1819	1802	1969			
S_2	1843	2024	1947			

S.E. of S or P marginal mean = 59.3 lb./ac.
S.E. of M marginal mean = 72.7 lb./ac.
S.E. of body of S×M or P×M table = 102.8 lb./ac.
S.E. of body of S×P table = 83.9 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 58(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type VI :—To study the effect of method of application of different sources and levels of P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A. (iii) 4th week of Oct. to 1st week of Nov., 1958. (iv) (a) 3ploughings. (b) N.A. (c) 70 lb./ac. (d) 9". (e) N.A. (v) *Guara* as G.M. (vi) C—273 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 3". (x) 2nd week of April, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(MAE) type VI on page 133.

5. RESULTS :

(i) 2470 lb./ac. (ii) 284.8 lb./ac. (iii) "Control *vs.* others". is highly significant and interaction S×P is significant. (iv) Av. yield of grain in lb./ac.

Control = 1991 lb./ac.

	M_1	M_2	M_3	Mean	S_1	S_2
P_1	2427	2510	2633	2523	2362	2684
P_2	2263	2691	2534	2496	2558	2434
Mean	2345	2600	2584	2510	2460	2559
S_1	2263	2584	2534			
S_2	2427	2616	2633			

S.E. of S or P marginal mean = 67.1 lb./ac.
S.E. of M marginal mean = 82.2 lb./ac.
S.E. of body of S×M or P×M table = 116.3 lb./ac.
S.E. of body of S×P table = 94.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type VI :—To study the effect of method of application of different sources and levels of P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A. (iii) 4th week of Oct., 1959. (iv) (a) 5 ploughings. (b) N.A. (c) 70 lb./ac. (d) and (e) N.A. (v) Nil. (vi) C—273 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 2". (x) 1st week of April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(MAE) type VI on page 133.

5. RESULTS :

(i) 2663 lb./ac. (ii) 389.7 lb./ac. (iii) "Control *vs.* others" alone is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 2123 lb./ac.

	M_1	M_2	M_3	Mean	S_1	S_2
P_1	2938	2427	2831	2732	2707	2757
P_2	2691	2551	2814	2685	2593	2777
Mean	2814	2489	2822	2708	2650	2767
S_1	2798	2288	2864			
S_2	2830	2690	2780			

S.E. of S or P marginal mean = 91.9 lb./ac.
S.E. of M marginal mean = 112.5 lb./ac.
S.E. of body of S×M or P×M table = 159.1 lb./ac.
S.E. of body of S×P table = 129.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(MAE).**

Site :- M.A.E. Centre, Sirsa. **Type :- 'M'.**

Object :—Type VI :—To study the effect of method of application of different sources and levels of P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A. (iii) 15.12.1956. (iv) (a) 1 ploughing with horse-hoe and 1 planking. (b) N.A. (c) 82 lb./ac. (d) 9". (e) N.A. (v) 30 lb./ac. of N. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 3.16". (x) 3rd week of April, 1957.

2. TREATMENTS :

All combinations of (1) and (2) + a control
(1) 2 levels of P_2O_5 : P_1=20 and P_2=40 lb./ac.
(2) 3 methods of application : M_1=Broadcast before final cultivation, M_2=Drilled 2½" below seed and M_3=Band placement.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) and (c) Nil. (v) Nasirpur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1922 lb./ac. (ii) 135.0 lb. ac. (iii) "Control *vs.* others" alone is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1679 lb./ac.

	M_1	M_2	M_3	Mean
P_1	1980	1920	2000	1967
P_2	2060	1899	1920	1960
Mean	2020	1909	1960	1963

S.E. of P marginal mean = 34.9 lb./ac.
S.E. of M marginal mean = 42.7 lb./ac.
S.E. of body of P × M table or control mean = 60.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(TCM).**

Centre :- Bhadson (c.f.). **Type :- 'M'.**

Object :—Type I (i) :—To study the effect of different sources and levels of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial soil. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

0 =Control
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1'=20 lb./ac. of N as Urea.
n_2'=40 lb./ac. of N as Urea.

3. DESIGN :

(i) R.B.D. with 5 plots/block. (ii) For layout of the experiments in each block, villages were selected at random and a list was prepared of the cultivators growing wheat crop in each selected village. From this list two cultivators were selected at random and one field each belonging to the selected cultivators was taken and in each selected field an unreplicated trial was laid out. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—55. (b) No. (c) N.A. (v) Nilokheri and Nawanshahar. (vi) and (vii) Nil.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'
Av. yield	1258	1556	1607	1560	1738

G.M. = 1544 lb./ac. ; S.E./mean = 48.5 lb./ac. and no. of trials = 15.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(TCM).**

Centre :- Bhadson (c.f.). **Type :- 'M'.**

Object :—Type I (i) :—To study the effect of different sources and levels of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial soil. (iii) to (v) N.A. (vi) Nov., 1955. (vii) Irrigated. (viii) and (ix) N.A. (x) April 1956.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(TCM) type I (i) on page 136.

4. GENERAL :

(i) Normal, (ii) In about 20% of the experiments some damage by stray animals and a few cases of smut were noticed. (iii) Grain yield. (iv) (a) 1953—55. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'
Av. yield	1113	1463	1683	1517	1670

G.M. = 1489 lb./ac. ; S.E./mean = 50.2 lb./ac. and no. of trials = 17.

———

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(TCM).**

Centre :- Bhadson (c.f.). **Type :- 'M'.**

Object Type II (i) :—To find out the effect of N and P on Wheat.

1. BASAL CONDITIONS :

Same as in expt. no. 54(TCM) type I (i) on page 136.

2. TREATMENTS :

0 =Control
p_1 =20 lb./ac. of P_2O_5 as Super.
n_1p_1 =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
n_2p_1 =40 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
$n_1'p_1$=20 lb./ac. of N as Urea+20 lb./ac. of P_2O_5 as Super.
$n_2'p_1$=40 lb./ac. of N as Urea+20 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D.with 6 plots/block. (ii) For layout of the experiments in each block, villages were selected at random and a list was prepared of the cultivators growing wheat crop in each selected village. From this list two cultivators were selected at random and one field each belonging to the selected cultivators was taken and in each selected field an unreplicated trial was laid out. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—55. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

Treatment	0	p_1	n_1p_1	n_2p_1	$n_1'p_1$	$n_2'p_1$
Av. yield	1479	1562	1837	2222	1946	2171

G.M. = 1870 lb./ac. ; S.E./mean = 60.9 lb./ac. and no. of trials = 27.

———

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(TCM).**

Centre :- Bhadson (c.f.). **Type :- 'M'.**

Object :—Type II :—(i) To find out the effect of N and P on Wheat.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) Alluvial soil. (iii) to (v) N.A. (vi) Nov., 1955. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54 (TCM) type II (i) on page 137.

5. RESULTS :

Treatment	0	p_1	n_1p_1	n_2p_1	$n_1'p_1$	$n_2'p_1$
Av. yield	1073	1047	1405	1670	1461	1675

G/M. = 1388 lb./ac. ; S.E./mean = 53.0 lb./ac. and no. of trials = 20.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(TCM).**

Centre :- Bhadson (c.f.). **Type :- 'M'.**

Object :—Type IV—To study the effect of N, P and K on Wheat.

1. BASAL CONDITIONS :

Same as in expt. no. 54(TCM) type I (i) on page 136.

2. TREATMENTS :

0 =Control.
N_1 =20 lb./ac. of N as A/S.
N_1P_1 =20 lb./ac. of N as A/S + 20 lb./ac. of P_2O_5 as Super.
N_1P_2 =20 lb. ac. of N as A/S+40 lb./ac. of P_2O_5 as Super.
$N_1P_1K_1$=20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Pot. Sul.
$N_1P_1K_2$=20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super+40 lb./ac. of K_2O as Pot. Sul.

3. DESIGN :

(i) R.B.D. with 6 plots/block. (ii) For layout of the experiments in each block, villages were selected at random and a list was prepared of the cultivators growing wheat crop in each selected village. From this list two cultivators were selected at random and one field each belonging to the selected cultivators was taken and in each selected field an unreplicated trial was laid out. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1955. (b) No. (c) N.A.. (v) to (vii) Nil.

5. RESULTS :

Treatment	0	N_1	N_1P_1	N_1P_2	$N_1P_1K_1$	$N_1P_1K_2$
Av. yield	1633	2083	2374	2266	2260	2294

G.M. = 2152 lb./ac. ; S.E./mean = 72.7 lb./ac. and no. of trials = 14.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(TCM).**

Centre :- Bhadson (c.f.). **Type :- 'M'.**

Object :—Type IV—To study the effect of N, P and K on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial soil. (iii) to (v) N.A. (vi) Nov., 1955. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1956.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(TCM) type IV above.

4. GENERAL :

(i) Normal. (ii) 20% damage by stray animals and smut in few cases was noticed. (iii) Grain yield. (iv) (a) 1953—1955. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

Treatment	0	N_1	N_1P_1	N_1P_2	$N_1P_1K_1$	$N_1P_1K_2$
Av. yield	1391	1639	1683	1633	1686	1677

G.M. = 1618 lb./ac. ; S.E./mean = 52.3 lb./ac. and No. of trials = 18.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(TCM).**

Centre :- Nawanshahr (c.f.). **Type :- 'M'.**

Object :—Type I (i)—To study the effect of different sources and levels of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Loamy soil. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type I (i) conducted at Bhadson centre on page 136.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'
Av. yield	1350	1728	2047	1714	1939

G.E. = 1756 lb./ac. ; S.E./mean = 41.5 lb./ac. and No. of trials = 43.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(TCM).**

Centre :- Nawanshahr (c.f). **Type :- 'M'.**

Object :—Type II (i)—To find out the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Loamy soil. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type II (i) conducted at Bhadson centre on page 137.

5. RESULTS :

Treatment	0	p_1	n_1p_1	n_2p_1	$n_1'p_1$	$n_2'p_1$
Av. yield	1263	1587	1911	2162	1852	2013

G.M. = 1798 lb./ac. ; S.E./mean = 44.1 lb./ac. and no. of trials = 43.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(TCM).**

Centre :- Nawanshahr. **Type :- 'M'.**

Object :—Type—III (i) —To study the effect of N and P on Wheat.

1. BASAL CONDITIONS :

Same as in expt. no. 54(TCM) type II (i) conducted at Nawanshahr centre above.

2. TREATMENTS :

0 =Control
N_1 =20 lb./ac. of N as A/S
N_1P_1=20 lb./ac. of N as A/S+20 lb./ac. of P_5Os as Super.
N_1P_2=20 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. with 4 plots/block. (ii) For layout of the experiments in each block, villages were selected at random and a list was prepared of the cultivators growing wheat crop in each selected village. From this list two cultivators were selected at random and one field each belonging to the selected cultivators was taken in each selected field and an unreplicated trial was laid out. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) 1953—1954. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

Treatment	0	N_1	N_1P_1	N_1P_2
Av. yield	1466	1808	2074	2197

G.M. = 1886 lb./ac.; S.E./mean = 64.9 lb./ac. and no. of trials = 11.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 54(TCM).**

Centre :- Nawanshahr (c.f.). **Type :- 'M'.**

Object :—Type IV :—To study the effect of N, P and K on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Loamy soil. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type IV conducted at Bhadson centre on page 138.

5. RESULTS :

Treatment	0	N_1	N_1P_1	N_1P_2	$N_1P_1K_1$	$N_1P_1K_2$
Av. yield	1325	1799	1870	2051	2011	2143

G.M. = 1866 lb./ac.; S.E./mean = 61.1 lb./ac. and no. of trials = 25

Crop :- Wheat *(Rabi).* **Ref :- Pb. 54(TCM).**

Centre :- Nilokheri (c.f.). **Type :- 'M'.**

Object :—Type I (i) :—To study the effect of different sources and levels of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Loamy soil. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1955.

2. TREATMENTS to 4. GENERAL ;

Same as in expt. no. 54(TCM) type I (i) conducted at Bhadson centre on page 136.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'
Av. yield	1428	1795	2121	1730	1921

G.M. = 1799 lb./ac.; S.E/mean = 88.9 lb./ac. and no. of trials = 15

Crop :- Wheat *(Rabi).* **Ref :- Pb. 55(TCM).**

Centre :- Nilokheri (c f). **Type :- 'M'.**

Object :—Type I :—To study the effect of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Loamy soil. (iii) to (v) N.A. (vi) Nov., 1955. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1956.

2. TREATMENTS :

0 =Control.
N_1 =20 lb./ac. of N as A/S.
N_2 =40 lb./ac. of N as A/S.
N_1' =20 lb./ac. of N as Urea.
N_2' =40 lb./ac. of N as Urea.
N_1''=20 lb./ac. of N as Nitro chalk.
N_2''=40 lb./ac. of N as Nitro chalk.

3. DESIGN :

(i) R.B.D. with 7 plots/block. (ii)For layout of the experiments in each block, villages were selected at random and a list was prepared of the cultivators growing wheat crop in each selected village. From this list two cultivators were selected at random and one field each belonging to the selected cultivators was taken and in each selected field an unreplicated trial was laid out. (iii) (a) N.A. (b) 1/160 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Severe root infestation. (iii) Grain yield. (iv) 1953—1954. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

Treatment	0	N_1	N_2	N_1'	N_2'	N_1''	N_2''
Av. yield	1212	1646	1759	1474	1429	1419	1507

G.M. = 1492 lb./ac.; S.E./mean = 38.7 lb./ac. and no. of trials = 26

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(TCM).**

Centre :- Nilokheri (c.f.). **Type :- 'M'.**

Object :—Type II (i)—To find out the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Loamy soil. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type II (i) conducted at Bhadson centre on page 137.

5. RESULTS :

Treatment	0	p_1	n_1p_1	n_2p_1	$n_1'p_1$	$n_2'p$
Av. yield	1224	1432	1592	1898	1498	1678

G.M.=1554 lb./ac. ; S.E./mean = 64.2 lb./ac. and no. of trials = 19.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(TCM).**

Centre :- Nilokheri (c.f.). **Type :- 'M'.**

Object :—Type II (i)—To find out the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Loamy soil. (iii) to (v) N.A. (vi) Nov., 1955. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type II (i) conducted at Bhadson centre on page 137.

5. RESULTS :

Treatment	0	p_1	n_1p_1	n_2p_1	$n_1'p_1$	$n_2'p_1$
Av. yield	1115	1370	1521	1405	1268	1348

G.M. = 1338 lb./ac. ; S.E./mean = 61.7 lb./ac. and no. of trials = 15.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 55(TCM).**

Centre :- Nilokheri (c.f.) **Type :- 'M'.**

Object :—Type III (ii)—To find out the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Loamy soil. (iii) to (v) N.A. (vi) Nov. 1955. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1956.

2. TREATMENTS :

0 =Control.
N_1 =20 lb./ac. of N as A/S.
N_1P_1 =20 lb./ac. of N as A/S+20 lb. ac. of P_2O_5 as Super.
N_1P_2 =20 lb./ac. of N as A/S+40 lb. ac. of P_2O_5 as Super.
N_1P_1' =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_2 as B.M.
N_1P_2' =20 lb. ac. of N as A/S+40 lb./ac. of P_2O_5 as B.M.

3. DESIGN :

(i) R.B.D. with 6 plots/block. (ii) For layout of the experiments in each block, villages were selected at random and a list was prepared of the cultivators groving wheat crop in each selected village. From this list two cultivators were selected at random and one field each belonging to the selected cultivators was taken and in each selected field an unreplicated trial was laid out. (iii) (a) N.A. (b) 1/160 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Severe rust infection. (iii) Grain yield. (iv) (a) 1953—1955. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

Treatment	0	N_1	N_1P_1	N_1P_2	N_1P_1'	N_1P_2'
Av. yield	1084	1452	1321	1327	1212	1298

G.M. = 1282 lb./ac. ; S.E./mean = 49.4 lb./ac. and no. of trials = 6.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 54(TCM).**

Centre :- Nilokheri (c.f.). **Type :- 'M'.**

Object :—Type IV—To study the effect of N, P and K on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Loamy soil. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no 54(TCM) type IV conducted at Bhadson centre on page 138.

5. RESULTS :

Treatment	0	N_1	N_1P_1	N_1P_2	$N_1P_1K_1$	$N_1P_1K_2$
Av. yield	1570	1954	2023	2304	2195	2155

G.M. = 2034 lb./ac. ; S.E./mean = 88.0 lb./ac. and no. of trials = 19.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 55(TCM).**

Centre :- Nilokheri (c.f.). **Type :- 'M'.**

Object :—Type IV—To study the effect of N, P and K on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Loamy soil. (iii) to (v) N.A. (vi) Nov., 1955. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type IV conducted at Bhadson centre on page 138.

5. RESULTS :

Treatment	0	N_1	N_1P_1	N_1P_2	$N_1P_1K_1$	$N_1P_1K_2$
Av. yield	1184	1503	1565	1416	1416	1285

G.M. = 1395 lb./ac. ; S.E./mean = 54.4 lb./ac. and no. of trials = 15.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(107).**

Centre :- Rohtak (c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (iii) Nil. (iv) C—228. (v) and (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 4.51". (x) N.A.

2. TREATMENTS :

M_0=Control.
M_1=40 lb./ac. of N as A/C.
M_2=40 lb./ac. of N as A/C+40 lb./ac. of P_2O_5 as Super.
M_3=40 lb./ac. of N as A/C+40 lb./ac. of P_2O_5 as Super+40 lb./ac. of K_2O as Mur. Pot.

3. DESIGN :

(i) and (ii) Random method. 2 fields were selected in Medana village. (iii) (a) N.A. (b) 1/16 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2134 lb./ac. (ii) 289.1 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1788	2095	2498	2156

S.E./mean = 144.6 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 56(110).**

Centre :- Rohtak (c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (iii) Nil. (iv) C—228. (v) and (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 4.51". (x) N.A.

2. TREATMENTS :

M_0=Control.
M_1=40 lb./ac. of N as A/S.
M_2=40 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super.
M_3=40 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Pot. chloride.

3. DESIGN :

(i) Random Method. Two fields were selected in 3 villages viz., Jassia, Bohar and Patwapur. (iii) (a) N.A (b) $\frac{1}{8}$ ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (iii) Nil. (iii) Fodder yield/plot. (iv) (a) to (c) No. (v) (a) N.A. (b) Nil. (vi) and. (vii) Nil.

5. RESULTS :

(i) 3305 lb./ac. (ii) 333.6 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of fodder in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	2552	3329	3459	3880

S.E./mean = 235.9 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 57(SFT).**

Centre :- Ambala (c.f). **Tppe :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K, applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November. (vii) Irrigated. (viii) and (ix) N.A. (x) April.

2. TREATMENTS :

0 =Control (no manure).
n =20 lb./ac. of N as A/S.
p =20 lb./ac. of P_2O_5 as Super.
np =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
k =20 lb./ac. of K_2O as Mur. of Pot.
nk =20 lb./ac. of N as A/S+20 lb./ac. of K_2O as Mur. of Pot.
pk =20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. of Pot.
npk=20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. of Pot.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant posted in each zone. The field assistant conducted the trials in one Revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on *kharif* cereal, 8 on *rabi* cereal, 8 on cash crops, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of Type B on crops other than the legumes. The three trials on legumes are of Type C. Residual effects of phosphate application are studied on Type C trials in two out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) 1/40 ac. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) Nil.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	370	255	156	43.6	—49	—33	33	82	43.6

No. of trials = 7.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Ambala (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November, 1959. (vii) As per results. (viii) and (ix) N.A. (x) April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Irrigated

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	165	230	33	60.9	49	—58	0	8	37.9

Control yield = 913 lb./ac. and no. of trials = 3.

Unirrigated

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	214	123	33	45.3	132	—33	58	—41	37.9

Control yield = 897 lb./ac. and no. of trials = 12.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(SFT).**

Centre :- Ferozepur (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	206	140	49	28.8	—25	—33	—8	—16	27.2

Control yield = 1613 lb./ac. and no. of trials = 21.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Ferozepur (c.f). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	214	148	115	42.8	41	8	8	33	36.2

Control yield = 1514 lb./ac. and no. of trials = 12.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(SFT).**

Centre :- Hissar (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	642	206	165	85.6	107	—66	—74	25	84.8

Control yield = 1218 lb./ac. and no. of trials = 6.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Hissar (c f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	156	66	33	32.9	—41	33	33	74	27.2

Control yield = 1465 lb./ac. any no. of trials = 10.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(SFT).**

Centre :- Hoshiarpur (c.f.). **Type :- 'M'.**

Object :—Type A :—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) *Tarai* and sub-mountain. (iii) to (v) N.A. (vi) October and November. (vii) As per results. (viii) and (ix) N.A. (x) April, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Irrigated

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	239	91	132	42.8	0	41	16	33	23.9

Control yield = 1094 lb./ac. and no. of trials = 6.

Unirrigated

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	337	165	123	19.7	41	25	33	58	14.8

Control yield = 798 lb./ac. and no. of trials = 15.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Hoshiarpur (c.f.). **Type :- 'M'.**

Object :—Type A :—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) *Tarai* and sub-mountain. (iii) to (v) N.A. (vi) October and November, 1959. (vii) As per results. (viii) and (ix) N.A. (x) April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Irrigated

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	584	82	197	85.6	58	49	33	148	32.1

Control yield = 889 lb./ac. and no. of trials = 4.

Unirrigated

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	461	123	74	24.7	33	16	25	—25	13.2

Control yield = 642 lb./ac. and no. of trials = 17.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—Type A :—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	667	304	115	41.1	165	25	41	41	41.1

No. of trials = 12.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—Type A :—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	510	239	181	60.1	49	8	33	0	38.7

Control yield = 1506 lb./ac. and no. of trials = 16.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—Type A :—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	255	140	91	30.4	—25	—25	8	25	19.7

Control yield = 1432 lb./ac. and no. of trials = 19.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Kangra (c.f.). **Type :- 'M'.**

Object :—Type A :—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (v) N.A. (vi) October and November, 1959. (vii) As per results. (viii) and (ix) N.A. (x) April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Irrigated

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	461	395	255	69.1	33	33	107	16	14.8

Control yield = 650 lb./ac. and no. of trials = 4.

Unirrigated

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	272	230	132	18.1	—25	0	0	—41	13.2

Control yield =469 lb./ac. and no. of trials = 11.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(SFT).**

Centre :- Karnal (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied indivdually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	206	41	74	23.0	33	8	8	8	21.4

Control yield = 987 lb./ac. and no. of trials = 12.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Karnal (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	115	33	156	44.4	—148	—66	—49	25	23.0

Control yield = 1144 lb./ac. and no. of trials = 10.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Ludhiana (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N,P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	379	222	—33	78.2	—33	—91	—33	58	54.3

Control yield = 1728 lb./ac. and no. of trials = 12.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(SFT).**

Centre :- Patiala (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SET) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	np	npk	S.E.
Av. response in lb./ac.	444	197	82	54.3	—33	99	74	66	54.3

No. of trials = 7.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Patiala (c.f.) **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENER AL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac	485	296	99	46.1	—8	66	—16	181	52.7

Control yield = 1267 lb./ac. and no. of trials = 10.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Patiala (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57 (SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	428	197	91	57.6	16	25	—8	58	24.7

Control yield = 1448 lb./ac. and no. of trials = 8.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Rohtak (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	337	148	58	74.1	—49	41	0	99	65.0

Control yield = 2123 lb./ac. and no. of trials = 9.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	485	230	206	31.3	0	—16	33	0	31.3

No. of trials = 14.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	296	115	8	32.1	—16	16	0	16	29.6

Control yield = 1201 lb./ac. and no. of trials = 10.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL ;

Same as in expt. no. 57(SFT) type A on page 144 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac	313	247	91	43.6	—16	25	74	82	35.4

Control yield = 1572 lb./ac. and no. of trials = 16.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(SFT).**

Centre :- Ambala (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) Nil. (vi) October—November. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1958.

2. TREATMENTS :

0 =Control (no manure).
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1' =20 lb./ac. of N as Urea.
n_2' =40 lb./ac. of N as Urea.
n_1'' =20 lb./ac. of N as A/S/N.
n_2'' =40 lb./ac. of N as A/S/N.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crops, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The above experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) N.A. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) N.A. (v) As per design (vi) and (vii) Nil.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1''	n_2''
Av. yield	1407	1991	2288	1942	2181	2172	2222

G.M. = 2029 lb./ac. ; S.E./mean = 61.1 lb./ac. and no. of trials = 6.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Ambala (c.f.). **Type :- 'M'.**

Object :—Type B—To study the relative efficiencies of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November 1959. (vii) Unirrigated. (viii) and (ix) N.A. (ix) April, 1960.

TREATMENTS :

0 =Control (no manure).
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1' =20 lb./ac. of N as Urea.
n_2' =40 lb./ac. of N as Urea.
n_1''' =20 lb./ac. of N as C/A/N.
n_2''' =40 lb./ac. of N as C/A/N.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant posted in each zone. The field assistant conducts the trials in one Revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on *kharif* cereal, 8 on *rabi* cereal, 8 on cash crops, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) 1/40 ac. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) Nil.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	905	996	1111	955	1086	979	1152

G.M. = 1026 lb./ac. ; S.E./mean = 50.6 lb./ac. and no. of trials = 12.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(SFT).**

Centre :- Ferozepur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November 1958. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	1588	1876	2123	1827	2082	1744	2057

G.M. = 1900 lb./ac. ; S.E./mean = 38.4 lb./ac. and no. of trials = 25.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Ferozepur (c.f.). **Type :- 'M'.**

Object :— Type B—To investigate the relative efficiency of different nitrogenous fertilizes at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October— November. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	1415	1654	1901	1712	1884	1654	1893

G.M. = 1730 lb./ac. ; S.E./mean = 32.6 lb./ac. and no. of trials = 14.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 58(SFT).**

Centre :- Hissar (c.f.). **Type :- 'M'.**

Object :—Type B :—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November, 1958. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	1465	2000	2320	1794	2205	1843	2115

G.M. = 1963 lb./ac.; S.E./mean = 52.4 lb./ac. and no. of trials = 8.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 59(SFT).**

Centre :- Hissar (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November, 1959. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	1440	1629	1810	1580	1712	1514	1728

G.M. = 1630 lb./ac. ; S.E./mean = 54.1 lb./ac. and no. of trials = 12.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 57(SFT).**

Centre :- Hoshiarpur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) Nil. (iv) and (v) N.A. (vi) October—November, 1957. (vii) Irrigated (viii) and (ix) N.A. (x) April, 1958.

2. TREATMENTS :

0 =Control.
n_1' =20 lb./ac. of N as Urea.
n_2' =40 lb./ac. of N as Urea.
n_1'' =20 lb./ac. of N as A/S/N.
n_2'' =40 lb./ac. of N as A/S/N.
n_1'''=20 lb./ac. of N as C/A/N.
n_2'''=40 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	1218	1637	1786	1522	1843	1539	1802

G.M. = 1621 lb./ac. ; S.E./mean = 63.4 lb./ac. and no. of trials = 9.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(SFT).**

Centre :- Hoshiarpur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) *Tarai* and sub-mountain. (iii) to (v) N.A. (vi) October—November, 1958. (vii) As per results. (viii) and (ix) N.A. (x) April, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Irrigated

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	955	1300	1514	1349	1522	1284	1489

G.M. = 1345 lb./ac. ; S.E./mean = 65.2 lb./ac. and no. of trials = 9.

Unirrigated

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	839	1275	1547	1144	1317	1144	1399

G.M. = 1238 lb./ac. ; S.E./mean = 31.4 lb./ac. and no. of trials. = 13.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Hoshiarpur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) *Tarai* and sub-mountain. (iii) to (v) N.A. (vi) October—November, 1958. (vii) As per results. (viii) and (ix) N.A. (x) April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Irrigated

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	782	1333	1637	1111	1432	1127	1481

G.M. = 1272 lb./ac. ; S.E./mean = 101.8 lb./ac. and no. of trials = 5.

Unirrigated

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	724	1160	1391	880	1201	955	1267

G.M. = 1083 lb./ac, ; S.E./mean = 33.7 lb./ac. and no. of trials = 11.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) Nil. (iv) and (v) N.A. (vi) October—November, 1957. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1958.

2. TREATMENTS :

0 =Control.
n_1' =20 lb./ac. of N as Urea.
n_2' =40 lb./ac. of N as Urea.
n_1'' =20 lb./ac. of N as A/S/N.
n_2'' =40 lb./ac. of N as A/S/N.
n_1'''=20 lb./ac. of N as C/A/N.
n_2'''=40 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	1407	2024	2477	1909	1958	1802	1893

G.M. = 1924 lb./ac. ; S.E./mean = 89.0 lb./ac. and no. of trials = 8.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(SFT),**

Centre :- Jullundur (c.f.). **Type :- 'M'**

Object :—Type B—To investigate to relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November, 1958. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	1160	1547	1843	1399	1621	1440	1662

G.M. = 1525 lb./ac. ; S.E./mean = 46.0 lb./ac. and no. of trials = 17.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November, 1959. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	1325	1621	1819	1506	1786	1588	1777

G.M. = 1632 lb./ac. ; S.E./mean = 29.7 lb./ac. and no. of trials = 14.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Kangra (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (v) N.A. (vi) October—November. (vii) As per results. (viii) and (ix) N.A. (x) April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Irrigated

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	938	1349	1925	987	1687	1292	1580

G.M. = 1394 lb./ac. ; S.E./mean = 85.5 lb./ac. and no. of triais = 6.

Unirrigated

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	395	625	848	609	757	617	839

G.M. = 670 lb./ac. ; S.E./mean = 19.2 lb./ac. and no. of trials = 10.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(SFT).**

Centre :- Karnal (c.f.). **Type :-'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November, 1958. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	1053	1243	1465	1177	1284	1177	1292

G.M. = 1242 lb./ac. ; S.E./mean = 35.5 lb./ac. and no. of trials = 9.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 59(SFT).**

Centre :- Karnal (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November, 1959. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	930	1300	1621	1292	1415	1432	1646

G.M. = 1377 lb./ac.; S.E./mean = 40.7 lb./ac. and no. of trials = 9.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 59(SFT).**

Centre :- Ludhiana (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November, 1959. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	1983	2518	2501	2255	2205	2386	2740

G.M. = 2370 lb./ac.; S.E./mean = 902 lb./ac. and no. of trials = 11.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 5 (SFT).**

Centre :- Patiala (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November, 1958. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	1144	1465	1728	1572	1868	1531	1827

G.M. = 1591 lb./ac.; S.E./mean = 61.7 lb./ac. and no. of trials = 8.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Patiala (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November, 1959. (vii) Irrigated. (viii) axd (ix) N.A. (x) April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	1267	1563	1761	1596	1843	1563	1835

G.M. = 1633 lb./ac.; S.E./mean = 51.8 lb./ac. and no. of trials = 8.

Crop :- Wheat. **Ref :- Pb. 59(SFT).**

Centre :- Rohtak (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November, 1959. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	1531	1596	1950	1802	1925	1942	1975

G.M. = 1817 lb./ac.; S.E./mean = 76.8 lb./ac. and no. of trials = 8.

Crop :- Wheat *(Rabi)*. **Ref :- Pb.57(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) Nil. (iv) and (v) N.A. (vi) October—November, 1957. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1958.

2. TREATMENTS :

0 =Control.
n_1' =20 lb./ac. of N as Urea.
n_2' =40 lb./ac. of N as Urea.
n_1'' =20 lb./ac. of N as A/S/N.
n_2'' =40 lb./ac. of N as A/S/N.
n_1'''=20 lb./ac. of N as C/A/N.
n_2'''=40 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 57(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	1884	2271	2485	2345	2567	2255	2427

G.M. = 2319 lb./ac.; S.E./mean = 35.5 lb./ac. and no. of trials = 10.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 59(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November, 1959. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type B on page 152 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Bv. yield	1679	1991	2189	1884	2098	1843	2148

G.M. = 1976 lb./ac.; S.E./mean = 54.7 lb./ac. and no. of trials = 16.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 54(46).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'MV'.**

Object :—To study the effect of N and P on different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Gurdaspur. (iii) 26.11.1954. (iv) (a) 7 ploughings, 3 plankings, 1 rolling and 2 hoeings. (b) N.A. (c) 24 srs./ac. for C—591 and 16 srs./ac. for C—230. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) N.A. (ix) 6.59". (x) 25.4.1955.

2. TREATMENTS :

Main-plot treatmeuts :

2 varieties : V_1=C—250 (medium) and V_2=C—591 (medium).

Sub-plot treatments :

3 levels of N as A/S : N_0=0, N_1=20 and N_2=40 lb./ac.

Sub-sub-plot treatments :

2 levels of P_2O_5 as Super : P_0=0 and P_1=20 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication, 3 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 6. (iv) (a) 9′×40′. (b) 9′×36′8″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954 only. (b) No. (c) Nil. (v) (a) N.A, (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1716 lb./ac. (ii) (a) 321.4 lb./ac. (b) 223.8 lb./ac. (c) 162.2 lb./ac. (iii) Only V effect is highly significant. (iv) Av. yield of grain in lb./ac

	N_0	N_1	N_2	Mean	P_0	P_1
V_1	1909	1939	1974	1941	1908	1973
V_2	1489	1488	1496	1491	1461	1521
Mean	1699	1714	1735	1716	1685	1747
P_0	1636	1683	1735			
P_1	1732	1744	1735			

S.E. of difference of two

1. V marginal means = 75.8 lb./ac.
2. N marginal means = 64.6 lb./ac.
3. P marginal means = 38.2 lb./ac.
4. N means at the same level of V = 91.4 lb./ac.
5. V means at the same level of N = 106.3 lb./ac.
6. P means at the same level of V = 54.1 lb./ac.
7. V means at the same level of P = 84.9 lb./ac.
8. P means at the same level of N = 66.2 lb./ac.
9. N means at the same level of P = 79.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(26).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'MV'.**

Object :—To study the effect of N on different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 30.10.1957. (iv) (a) 11 ploughings and plankings. (b) Sown by *kera*. (c) 11 srs./ac. (d) 8″ between rows. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 6.68″. (x) 13 to 18.5.1958.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 varieties : V_1=C—273, V_2=C—518 and V_3=C—591.

(2) 8 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S, S_2=A/C, S_3=Urea, S_4=Nitrochalk, S_5=A/N, S_6=A/S/N and S_7=C/N.

Manures applied on 28.1.1958.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 16.5′×22′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1608 lb./ac. (ii) 173.9 lb./ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of grain in lb./ac.

	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7	Mean
V_1	1442	1473	1616	1647	1589	1581	1643	1496	1561
V_2	1643	1743	1921	1643	1666	1743	1674	1639	1709
V_3	1383	1581	1496	1535	1674	1543	1597	1620	1554
Mean	1620	1599	1678	1608	1643	1622	1638	1585	1608

S.E. of V marginal mean = 30.7 lb./ac.
S.E. of S marginal mean = 50:1 lb./ac.
S.E. of body of table = 86.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(26).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'MV'.**

Object :—To study the effect of N through different sources on different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara* for G.M. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 7.11.1958. (iv) (a) 2 *raja*, 4 *desi* ploughings and 6 *sohaga*. (b) Sown by *kera*. (c) 10 to 12 srs./ac. (d) 8" between rows. (e) N.A. (v) 8000 lb./ac. of G.M. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 8.38". (x) 15.5.1959.

2. TREATMENTS :

Main-plot treatments :

3 varieties : V_1=C—273, V_2=C—518 and V_3=C—591.

Sub-plot treatments :

8 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S, S_2=A/C, S_3=Nitrochalk, S_4=A/S/N, S_5=C/N, S_6=Urea and S_7=A/N.

Manures applied on 19.12.1958.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30.25'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1359 lb./ac. (ii) (a) 378.4 lb./ac. (b) 190.7 lb./ac. (iii) Main effect of S is highly significant and that of V is significant. (iv) Av. yield of grain in lb./ac.

	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7	Mean
V_1	1702	1336	1559	1644	1081	1455	1065	1405	1406
V_2	1891	1432	1706	1845	1197	1413	1100	1299	1485
V_3	1366	1034	1332	1397	988	1224	915	1166	1187
Mean	1653	1291	1532	1629	1088	1364	1027	1289	1359

S.E. of difference of two

1. V marginal means = 94.6 lb./ac.
2. S marginal means = 77.9 lb./ac.
3. S means at the same level of V = 134.8 lb./ac.
4. V means at the same level of S = 157.6 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(58).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'C'.**

Object :—To study the effect of spacing on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Maize. (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Gurdaspur. (iii) 20.11.1954. (iv) (a) 7 ploughings. 8 plankings, 1 hoeing and 1 rolling. (b) N.A. (c) 30 srs./ac. (d) As per treatments. (e) N.A. (v) 8 C.L./ac. of F.Y.M. on 29, 30.3.1954+40 lb./ac. of N as A/S ½ dose on 6.1.1955 and ½ dose on 26.2.1955. (vi) C—518 (medium). (vii) Irrigated. (viii) 1 hoeing. (ix) 7.59". (x) 26.4.1955.

2. TREATMENTS :

3 spacings : S_1=9" between rows, S_2=6" between rows and S_3=9"×9".

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 72'×9'. (b) 67'2⅜"×9'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—1955. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2334 lb./ac. (ii) 94.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_1	S_2	S_3
Av. yield	2332	2276	2395

S.E./mean = 33.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(28).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'C'.**

Object :—To study the effect of seedrate and dates of sowing on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 7 ploughings and 3 plankings. (b) Sown by *kera*. (c) As per treatments. (d) 8" between rows. (e) N.A. (v) Nil. (vi) C—591 (late). (vii) Irrigated. (viii) N.A. (ix) 6.68". (x) 19 to 22.5.1958.

2. TREATMENTS :

Main-plot treatments :

2 dates of sowing : D_1=6.11.1957 and D_2=26.11.1957.

Sub-plot treatments :

5 seedrates : S_1=12, S_2=18, S_3=24, S_4=30 and S_5=36 srs./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 103'×8.5'. (b) 83.4'×8.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Crop damaged by hail storm on 3.8.1958. (vii) Nil.

5. RESULTS :

(i) 1411 lb./ac. (ii) (a) 272.4 lb./ac. (b) 164.7 lb./ac. (iii) Main effect of D is significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	S_4	S_5	Mean
D_1	1251	1287	1389	1265	1095	1258
D_2	1346	1575	1612	1597	1691	1564
Mean	1299	1431	1501	1431	1393	1411

S.E. of difference of two

1. D marginal means = 86.1 lb./ac.
2. S marginal means = 82.3 lb./ac.
3. S means at the same level of D = 116.4 lb./ac.
4. D means at the same level of S = 135.2 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 58(24).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'C'.**

Object :—To study the effect of seedrate and dates of sowing on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fodder crop. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 10 ploughings and 8 plankings. (b) Sown by *kera*. (c) As per treatments. (d) 8" between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) N.A. (ix) 15.38". (x) 10, 11.5.1959.

2. TREATMENTS :

Main-plot treatments :

2 dates of sowings : D_1=30.10.1958 and D_2=1.12.1958.

Sub-plot treatments :

5 seedrates : S_1=12, S_2=18, S_3=24, S_4=30 and S_5=36 srs./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 8'×108'. (b) 8'×97.3'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1747 lb./ac. (ii) (a) 187.7 lb./ac. (b) 102.4 lb./ac. (iii) Main effects of D and S are highly significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	S_4	S_5	Mean
D_1	1859	1910	2068	2184	2025	2009
D_2	1393	1431	1549	1539	1514	1485
Mean	1626	1670	1809	1861	1769	1747

S.E. of difference of two

1. D marginal means = 59.4 lb./ac.
2. S marginal means = 51.2 lb./ac.
3. S means at the same level of D = 72.4 lb./ac.
4. D means at the same level of S = 87.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(15).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'C'.**

Object :—To study the effect of different methods of sowing of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 2.12.1959. (iv) (a) 5 ploughings and 7 plankings. (b) and (c) As per treatments. (d) 9″×6″. (e) 2. (v) 212 lb./ac. of C/A/N +82 lb./ac. of P_2O_5 as Super. (vi) C—591. (vii) Irrigated. (viii) and (ix) N.A. (x) 28.4.1960.

2. TREATMENTS :

2 cultural treatments : C_1=*Kera* sowing with 30 srs./ac. of seedrate and C_2=Dibbling with 10 srs./ac. of seedrate.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 5.5′×108′. (b) 5.5′×99′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2032 lb./ac. (ii) 231.6 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of grain in lb./ac.

Treatment	C_1	C_2
Av. yield	1924	2140

S.E./mean = 94.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 54(79).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'CM'.**

Object :—To study the effect of spacing, seedrate and N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fodder crop. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 23 and 24.11.1954. (iv) (a) 8 ploughings and 8 *sohaga*. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) N.A. (ix) 4.81″. (x) 16, 17.5.1955.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)+one control (no manure)

(1) 2 levels of N as A/S : N_1=40 and N_2=60 lb./ac.
(2) 2 levels of P_2O_5 as Super : P_1=20 and P_2=40 lb./ac.
(3) 2 seedrates : R_1=32 and R_2=40 lb./ac.
(4) 2 spacings between furrows : S_1=6″ and S_2=9″.

3. DESIGN :

(i) R.B.D. (ii) (a) 17. (b) N.A. (iii) 4. (iv) (a) 51.6′×10.5′. (b) 48.44′×7.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2135 lb./ac. (ii) 182.5 lb./ac. (iii) Only "control *vs.* others" is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1848 lb./ac.

	P_1	P_2	R_1	R_2	S_1	S_2	Mean
N_1	2191	2132	2113	2210	2107	2216	2162
N_2	2144	2147	2199	2092	2125	2165	2145
Mean	2167	2139	2156	2151	2116	2190	2153
S_1	2096	2136	2116	2117			
S_2	2238	2143	2196	2185			
R_1	2182	2129					
R_2	2152	2149					

S.E. of any marginal mean = 32.3 lb./ac.
S.E. of body of any table = 45.6 lb./ac.
S.E. of control mean = 91.2 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'CM'.**

Object :—Type VIII—To find out the best combination of seed rate, date of sowing, N and P for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A. (iii) As per treatments. (iv) (a) and (b) N.A. (c) As per treatments. (d) 9". (e) N.A. (v) Gram manuring by burying *berseem* and *senji*+5000 lb./ac. of F.Y.M. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 4.76". (x) 5 to 12.4.1957.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2).

(1) 3 seed rates : S_1=50, S_2=70 and S_3=90 lb./ac.

(2) 3 dates of sowing : D_1=10 days before normal, D_2=Normal and D_3=10 days after normal.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=20 and N_2=40 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=20 and P_2=40 lb./ac.

Dates of sowing are : D_1=21.10.1956, D_2=31.10.1956 and D_3=10.11.1956.

3. DESIGN :

(i) Split-plot. (ii) 9 main-plots/block; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1815 lb./ac. (ii) (a) 385.5 lb./ac. (b) 258.4 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	D_1	D_2	D_3	N_0	N_1	N_2	Mean
P_0	1809	1751	1807	1820	1702	1845	1667	1778	1922	1789
P_1	1760	1896	1842	1814	1789	1896	1722	1942	1835	1833
P_2	1838	1781	1854	1782	1842	1848	1620	1974	1878	1824
Mean	1802	1809	1834	1805	1778	1863	1670	1898	1878	1815
N_0	1707	1582	1720	1620	1623	1767				
N_1	1879	1898	1917	1832	1849	2013				
N_2	1820	1947	1866	1963	1862	1809				
D_1	1731	1856	1827							
D_2	1747	1778	1808							
D_3	1928	1793	1868							

S.E. of difference of two

1. S or D marginal means = 74.2 lb./ac.
2. N or P marginal means = 49.7 lb./ac.
3. N or P means at the same level of S or D = 86.1 lb./ac.
4. S or D means at the same level of N or P = 177.1 lb./ac.

S.E. of body of S×D table = 90.9 lb./ac.

S.E. of body of N×P table = 60.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'CM'.**

Object :—Type VIII—To find out the best combination of seed rate, date of sowing, N and P for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Indus alluvium. (b) N.A. (iii) As per treatments. (iv) (a) 5 to 6 ploughings. (b) N.A. (c) As per treatments. (d) 7″ to 10″. (e) N.A. (v) *Guara* applied as G.M. (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) 3.48″. (x) 7 to 15.4.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56 (MAE) type VIII on page 166.

Dates of sowing are : D_1=21.10.1957, D_2=31.10.1957, S_3=10.11.1957.

5. RESULTS :

(i) 1865 lb./ac. (ii) (a) 542.8 lb./ac. (b) 307.8 lb./ac. (iii) Main effect of D and N are highly significant and interaction D×N is significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	D_1	D_2	D_3	N_0	N_1	N_2	Mean
P_0	1803	1911	1808	1544	2017	1962	1663	1883	1977	1841
P_1	1791	1894	1841	1522	2058	1947	1733	1847	1946	1842
P_2	1997	2025	1711	1652	2114	1967	1694	1897	2142	1911
Mean	1864	1943	1787	1573	2062	1959	1697	1876	2022	1865
N_0	1711	1797	1583	1547	1897	1647				
N_1	1844	1997	1786	1527	2111	1990				
N_2	2037	2035	1993	1646	2178	2241				
D_1	1644	1574	1501							
D_2	2061	2173	1952							
D_3	1887	2082	1908							

S.E. of difference of two

1.	S or D marginal means	= 104.5 lb./ac.
2.	N or P marginal means	= 59.2 lb./ac.
3.	N or P means at the same level of S or D	= 102.6 lb./ac.
4.	S or D means at the same level of N or P	= 231.9 lb./ac.
	S.E. of body of S × D table	= 127.9 lb./ac.
	S.E. of body of N × P table	= 72.5 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'CM'.**

Object :—Type VIII—To find out the best combinations of seed rate, date of sowing, N and P for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A. (iii) As per treatments. (iv) (a) 3 ploughings. (b) N.A. (c) As per treatments. (d) 9". (e) N.A. (v) *Guara* as G.M. (vi) C—273 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 3". (x) 2nd week of April, 1959.

2. TREATMENTS :

Same as in expt. no. 56(MAE) type VIII on page 166.
Dates of sowing are : D=21.10.1958, D_2=31.10.1958 and D_3=10.11.1958.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 29'2" × 12'9". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1976 lb./ac. (ii) (a) 792.4 lb./ac. (b) 277.8 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	D_1	D_2	D_3	N_0	N_1	N_2	Mean
P_0	1794	2032	1934	1695	2164	1901	1646	1983	2131	1920
P_1	1967	2107	1934	1868	2213	1928	1695	2041	2273	2003
P_2	1950	2008	2057	1860	2213	1942	1720	2057	2238	2005
Mean	1904	2049	1975	1808	2197	1924	1687	2027	2214	1976
N_0	1629	1744	1688	1563	1901	1598				
N_1	1934	2107	2040	1777	2271	2034				
N_2	2149	2296	2197	2084	2419	2139				
D_1	1646	1802	1976							
D_2	2172	2271	2147							
D_3	1894	2074	1803							

S.E. of difference of two

1.	S or D marginal means	= 152.5 lb./ac.
2.	N or P marginal means	= 53.5 lb./ac.
3.	N or P means at the same level of S or D	= 92.6 lb./ac.
4.	S or D means at the same level of N or P	= 294.8 lb./ac.
	S.E. of body of S × D table	= 186.8 lb./ac.
	S.E. of body of N × P table	= 65.5 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'CM'.**

Object: —Tpye VIII—To find out the best combinations of seed rate, date of sowing, N and P for Wheat

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A. (iii) As per treatments. (iv) (a) 5 ploughings. (b) N.A, (c) As per treatments. (d) and (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) C—273 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 2″. (x) 1st week of April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no 56(MAE) type VIII on page 166.
Dates of sowing are : D_1=21.10.1959, D_2=31.10.1959 and D_3=10.11.1959.

5. RESULTS :

(i) 2609 lb./ac. (ii) (a) 226.1 lb./ac. (b) 341.9 lb./ac. (iii) Main effect of P and interactions S×D and N×P are significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	D_1	D_2	D_3	N_0	N_1	N_2	Mean
P_0	2501	2395	2625	2469	2551	2501	2345	2485	2692	2507
P_1	2683	2601	2584	2617	2584	2668	2600	2674	2595	2623
P_2	2773	2632	2683	2724	2691	2673	2748	2699	2642	2696
Mean	2652	2543	2631	2603	2609	2614	2564	2619	2643	2609
N_0	2584	2518	2590	2534	2543	2615				
N_1	2658	2600	2599	2600	2641	2616				
N_2	2714	2511	2704	2675	2643	2611				
D_1	2518	2543	2748							
D_2	2674	2551	2602							
D_3	2764	2535	2543							

S.E. of difference of two

1.	S or D marginal means	= 43.5 lb. ac.
2.	N or P marginal means	= 65.8 lb./ac.
3.	N or P means at the same level of S or D	= 114.0 lb./ac.
4.	S or D means at the same level of N or P	= 177.9 lb./ac.
	S.E. of body of S×D table	= 53.3 lb./ac.
	S.E. of body of N×P table	= 80.6 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 56(MAE).**

Site :- M.A.E. Centre, Sirsa. **Type :- 'CM'.**

Object :— Type VIII—To find out the best combinations of seed rate, date of sowing, N and P for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A. (iii) As per treatments. (iv) (a) 6 ploughings. (b) N.A. (c) As per treatments. (d) 9″. (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 3.16″. (x) 3rd week of April, 1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56 (MAE) type VIII conducted at Nasirpur on page 166.
Dates of sowing are : D_1=25.10.1956, D_2=9.11.1956 and 24.11.1956.

5. RESULTS :

(i) 1790 lb./ac. (ii) (a) 504.0 lb./ac. (b) 250.5 lb./ac. (iii) Main effect of N and interaction N×D are highly significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	D_1	D_2	D_3	N_0	N_1	N_2	Mean
P_0	1866	1766	1822	1721	1939	1794	1638	1921	1895	1818
P_1	1821	1727	1656	1622	1894	1689	1672	1677	1856	1735
P_2	1872	1877	1699	1711	1939	1798	1711	1838	1899	1816
Mean	1853	1790	1726	1685	1924	1760	1674	1812	1883	1790
N_0	1805	1655	1562	1405	1844	1773				
N_1	1850	1822	1764	1816	1961	1659				
N_2	1904	1893	1852	1834	1967	1848				
D_1	1650	1644	1761							
D_2	2177	1822	1773							
D_3	1732	1904	1644							

S.E. of difference of two

1. S or D marginal means = 97.0 lb./ac.
2. N or P marginal means = 48.2 lb./ac.
3. N or P means at the same level of S or D = 83.5 lb./ac.
4. S or D means at the same level of N or P = 205.3 lb./ac.

S.E. of body of S×D table = 118.8 lb./ac.

S.E. of body of N×D table = 59.0 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 57(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'IM'.**

Object :— Type I—To study the effect of frequencies and intensities of irrigation and manures on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A. (iii) 7 to 15.11.1957. (iv) (a) 5 to 6 ploughings. (b) N.A. (c) 70 lb./ac. (d) 7″ to 10″. (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) 3.48″. (x) 7 to 15.4.1958.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4).

(1) 3 frequencies of irrigation : F_1=2, F_2=3 and F_3=4 irrigations.
(2) 3 intensities of irrigation : I_1=2″, I_2=3″ and I_3=4″ depth.
(3) 3 levels of N as A.S : N_0=0, N_1=30 and N_2=60 lb./ac.
(4) 3 levels of P_2O_5 as Super : P_0=0, P_1=30 and P_2=60 lb./ac.

3. DESIGN :

(i) 3^4 fact. confd. (ii) (a) 9 plots/block and 9 blocks/replication, (b) N.A. (iii) 1. (iv) (a) N.A. (b) 30′×14′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1979 lb./ac. (ii) 304.3 lb./ac. (iii) Main effect of N is highly significant and interaction F×P is significant. (iv) Av. yield of grain in lb./ac.

	F_1	F_2	F_3	I_1	I_2	I_3	N_0	N_1	N_2	Mean
P_0	1802	2071	1925	1917	1901	1981	1613	1835	2351	1933
P_1	2035	1761	2013	1868	1947	1993	1654	2065	2089	1936
P_2	1832	2192	2178	2112	1912	2177	1868	1901	2432	2067
Mean	1890	2008	2039	1966	1920	2050	1712	1934	2291	1979
N_0	1594	1805	1737	1690	1827	1618				
N_1	1838	1942	2022	1994	1742	2065				
N_2	2237	2277	2359	2214	2191	2468				
I_1	1884	1975	2040							
I_2	1860	1851	2050							
I_3	1926	2198	2026							

S.E. of any marginal mean = 58.6 lb./ac.
S.E. of body of any table = 101.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'IM'.**

Object :—Type I—To study the effect of frequencies and intensities of irrigation and manures on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A. (iii) 4th week of Oct. to 1st week of Nov., 1958. (iv) (a) 3 ploughings. (b) N.A. (c) 70 lb./ac. (d) 9". (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) C—273 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 3". (x) 3rd week of April, 1959.

2. TREATMENTS :

Same as in expt. no. 57(MAE) type I on page 170.

3. DESIGN :

(i) 3^4 fact. confd. (ii) (a) 9 plots/block ; 9 blocks/replications. (b) N.A. (iii) 1. (iv) (a) 18'9"×20'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2620 lb./ac. (ii) 419.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	F_1	F_2	F_3	I_1	I_2	I_3	N_0	N_1	N_2	Mean
P_0	2663	2803	2414	2507	2683	2691	2559	2732	2590	2627
P_1	2699	2754	2680	2762	2540	2831	2666	2724	2743	2711
P_2	2556	2608	2400	2441	2518	2604	2510	2691	2362	2521
Mean	2639	2722	2498	2570	2580	2709	2578	2716	2565	2620
N_0	2759	2608	2367	2474	2639	2621				
N_1	2650	2833	2665	2803	2523	2822				
N_2	2508	2725	2462	2433	2578	2684				
I_1	2526	2699	2485							
I_2	2699	2699	2342							
I_3	2692	2768	2667							

S.E. of any marginal mean = 80.8 lb./ac.
S.E. of body of any table = 139.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'IM'.**

Object :—Type I—To study the effect of frequencies and intensities of irrigation and manures on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A. (iii) 4th week of Oct., 1959. (iv) (a) 5 ploughings. (b) N.A. (c) 70 lb./ac. (d) and (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) C—273 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 2". (x) Ist week of April, 1960.

2. TREATMENTS :

Same as in expt. no. 57(MAE) type I on page 170.

3. DESIGN :

(i) 3^4 fact. confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 1/116 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of rats—controlled. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1887 lb./ac. (ii) 449.1 lb./ac. (iii) Main effect of N is highly significant and main effect of F is significant. (iv) Av. yield of grain in lb./ac.

	F_1	F_2	F_3	I_1	I_2	I_3	N_0	N_1	N_2	Mean
P_0	1706	1887	2148	1731	1876	2135	1687	1868	2187	1914
P_1	1873	1816	1986	1832	1975	1869	1744	1827	2105	1892
P_2	1718	1700	2145	1934	1953	1675	1728	1950	1884	1854
Mean	1766	1801	2093	1832	1935	1893	1720	1882	2059	1887
N_0	1495	1717	1947	1728	1717	1714				
N_1	1879	1783	1983	1736	1887	2022				
N_2	1924	1903	2350	2032	2201	1944				
I_1	1670	1810	2016							
I_2	1654	1967	2184							
I_3	1974	1626	2079							

S.E. of any marginal mean = 86.4 lb./ac.
S.E. of body of any table = 149.7 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(48).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'D'.**

Object :—To study the effect of weedicides for control of weeds on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Gurdaspur. (iii) 16.11.1957. (iv) (a) N.A. (b) Sown by *kera*. (c) 8″ to 9″. between rows. (d) 40 srs./ac. (e) N.A. (v) N.A. (vi) C—273. (vii) Irrigated. (viii) N.A. (ix) 3.92″. (x) 18, 19.4.1958.

2. TREATMENTS :

5 weedicidal treatments : W_0=Control (no weedicide), W_1=Local method, W_2=Spraying once, W_3=spraying twice and W_4=Spraying once+local method.

Fernoxone is used as weedicide.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 8′×70′ (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of Grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1641 lb./ac. (ii) 110.9 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	W_0	W_1	W_2	W_3	W_4
Av. yield	1633	1784	1577	1604	1605

S.E./mean = 45.3 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 58(31).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'D'.**

Object :—To study the effect of spraying fernoxone for controlling of weeds on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 15.11.1958. (iv) (a) 5 ploughings. (b) Sown by *kera*. (c) 40 srs./ac. (d) 9″ between rows. (e) N.A. (v) 112 lb./ac. of A/S. (vi) C—273. (vii) Irrigated. (viii) N.A. (ix) 10.35″. (x) 29.4.1959.

2. TREATMENTS :

5 weedicidal treatments : W_0=Control (no weedicide), W_1=Local method, W_2=Post emergence spraying once, W_3=Post emergence spraying twice and W_4=Post emergence spraying once +local method.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 9′×60.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1440 lb./ac. (ii) 124.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	W_0	W_1	W_2	W_3	W_4
Av. yield	1551	1432	1448	1378	1391

S.E./mean = 25.1 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(21).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'D'.**

Object :—To study the effect of spraying fernoxone for controlling of weed on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, Gurdaspur. (iii) 5.12.1959. (iv) (a) 7 ploughings. b, Sown by *kera*. (c) 40 srs./ac. (d) 8" between rows. (e) N.A. (v) 56 lb./ac. of A,S,N on 1.12.1959. (vi) C—286. (vii) Irrigated. (viii) 1 hoeing. (ix) 4.71". (x) 29.4.1960.

2. TREATMENTS :

6 weedicidal treatments : W_0=Control (no weedicide), W_1=Local method, W_2=Post emergence application once, W_3=Post emergence application twice, W_4=Post emergence+cultural method and W_5=Cultural method.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 60.5'×9'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 639 lb./ac. (ii) 118.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	W_0	W_1	W_2	W_3	W_4	W_5
Av. yield	625	676	625	589	571	746

S.E./mean = 59.2 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(22).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'D'.**

Object :—To study the effect of weedicides with different doses for weed control on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, Gurdaspur. (iii) 5.12.1959. (iv) (a) 7 ploughings and 2 plankings. (b) Sown by *kera*. (c) 40 srs./ac. (d) 8" between rows. (e) N.A. (v) 112 lb./ac. of A,S,N on 1.12.1959. (vi) C—286. (vii) Irrigated. (viii) 1 hoeing. (ix) 4.71". (x) 29.4.1960.

2. TREATMENTS :

All combinations of '1 and '2 +2 extra treatments.

(1) 4 weedicides : W_1 Fernoxone, W_2 Dicotox, W_3 Kathone and W_4 Agroxone.

(2) 3 doses of weedicides : D_1 8, D_2=12 and D_3 =16 ozs.

Extra treatments : T_0 =Control and T_1=Local weeding.

3. DESIGN :

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 60.5'×6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1094 lb./ac. (ii) 127.0 lb. ac. (iii) Main effect of W and interaction W×D are significant. (iv) Av. yield of grain in lb./ac.

T_0 = 1122 lb./ac. and T_1 = 1180 lb./ac.

	W_1	W_2	W_3	W_4	Mean
D_1	1064	1053	1022	1157	1074
D_2	1362	1142	1092	933	1132
D_3	1068	1003	1003	1115	1047
Mean	1165	1066	1039	1068	1084

S.E. of W marginal mean = 36.7 lb./ac.
S.E. of D marginal mean = 31.8 lb./ac.
S.E. of body of table, T_0 or T_1 mean = 63.5 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(46).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'D'.**

Object :—To study the effect of weedicides for controlling weeds on Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fodder. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Gurdaspur. (iii) 30.11.1957. (iv) (a) 2 ploughings. (b) Sown by *kera*. (c) 30 srs./ac. (d) 8″ between rows. (e) N.A. (v) N.A. (vi) C—273. (vii) Irrigated. (viii) Nil. (ix) 3.92″. (x) 25.4.1958.

2. TREATMENTS :

Main-plot treatments :

4 weedicides : W_1=Fernoxone (Sodium salt of 2—4—D), W_2=Dicotox (Ethyl ester 22—4—D), W_3= Kathone—M_7 (Ammo. salt of 2—4—D) and W_4=Agroxone (Sodium salt M.C.P.A).

Sub-plot treatments :

5 doses of weedicides : D_0=0, D_1=8, D_2=12, D_3=16 and D_4=20 ozs./ac.

Only one spray after 6 weeks of sowing. 60 gallons of water/ac. on 5.11.1959.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/120 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

3. RESULTS :

(i) 1029 lb./ac. (ii) (a) 395.6 lb./ac. (b) 134.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	D_0	D_1	D_2	D_3	D_4	Mean
W_1	—	1033	1045	995	1014	1022
W_2	—	868	952	1064	1002	972
W_3	—	1087	1168	956	1049	1065
W_4	—	1060	1049	1126	1048	1071
Mean	1015	1012	1053	1035	1028	—

S.E. of difference of two

1. W marginal means = 140.0 lb./ac.
2. D marginal means = 47.7 lb./ac.
3. D means at the same level of W = 95.3 lb./ac.
4. W means at the same level of D = 151.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(32).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'D'.**

Object :— Tc study the effect of weedicides for controling weeds on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Gurdaspcr. (iii) 15.11.1958. (iv) (a) 4 ploughings. (b) Sown bp *kera*. (c) 40 srs ac. (b) 8″ to 9″ between rcws. (e) N.A. (v) 112 lb./ac. of A/S on 15.11.1958. (vi) C—273. (vii) Irrigated. (viii) N.A. (ix) 10.35″. (x) 29.4.1959.

2. TREATMENTS :

Same as in expt. no. 57(46) on page 175.

Only one spraying after 6 weeks of sowing. 60 gallons of water/ac. on 5.1.1959.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots replication and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 69′×6′. (b) 60.5′×6′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1309 lb./ac. (ii) (a) 267.4 lb./ac. (b) 184.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	D_0	D_1	D_2	D_3	D_4	Mean
W_1	—	1226	1334	1211	1357	1282
W_2	—	1261	1241	1311	1403	1304
W_3	—	1311	1284	1334	1369	1325
W_4	—	1280	1365	1280	1461	1347
Mean	1290	1269	1306	1284	1397	—

S.E. of difference of two

1. W marginal means = 94.5 lb./ac.
2. D marginal means = 65.3 lb./ac.
3. D means at the same level of W = 130.5 lb./ac.
4. W means at the same level of D = 144.1 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 57(53).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'D'.**

Object :— To study the effect of weedicides for controlling weeds on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Lentil. (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 15.11.1957. (iv) (a) 11 ploughings and 5 plantings. (b) Sown by *kera*. (c) 40 srs./ac. (d) 8″ to 9″ between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) 1 weeding and 1 hoeing. (ix) 1.97″. (x) 10, 16 4.1958.

2. TREATMENTS :

5 weedicidal treatments : W_0=Control, W_1=Local method of weeding, W_2= Post emergence spraying (once), W_3=Post emergence sprayings (twice) and W_4=Post emergence spraying once+ local method.

Fernoxone is used as weedicide.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N A. (iii) 6. (iv) (a) N.A. (b) 60½′×7½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1493 lb./ac. (ii) 410.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	W_0	W_1	W_2	W_3	W_4
Av. yield	1644	1613	1613	1193	1405

S.E./mean = 167.6 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(69).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'D'.**

Object :—To study the effect of weedicides for controlling weeds on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 6.11.1958. (iv) (a) 11 ploughings, 5 plankings and 1 rolling. (b) Sown by *kera*. (c) 35 srs./ac. (d) 8″ between rows. (e) N.A. (v) N.A. (vi) C—591. (vii) Irrigated. (viii) N.A. (ix) 3.63″. (x) 24.4.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(53) on page 176.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1391 lb./ac. (ii) 114.7 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	W_0	W_1	W_2	W_3	W_4
Av. yield	1524	1435	1372	1295	1330

S E./mean = 46.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(141).**

Site :- Govt. Agri. Stn , Hansi. **Type :- 'D'.**

Object :—To study the effect of weedicides for controlling weeds on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 28.10.1959. (iv) (a) N.A. (b) Sown by *kera*. (c) 36 srs./ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) N.A. (ix) 3.58″. (x) April, 1960.

2. TREATMENTS :

6 weedicidal treatments : W_0=Control, W_1=Local method of weeding, W_2=Post emergence spray once, W_3=Post emergence spray twice, W_4=Post emergence spray once+weeding and W_5=Cultural method of weeding.

Fernoxone used as weedicide.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 48′×7½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2937 lb./ac. (ii) 473.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	W_0	W_1	W_2	W_3	W_4	W_5
Av. yield	3195	2903	2894	2551	3108	3059

S.E./mean = 211.9 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 57(52).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'D'.**

Object :—To study the effect of weedicides for controlling weeds on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Lentil. (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 15.11.1957. (iv) (a) 11 ploughings, 5 plankings and 1 hoeing. (b) Sown by *kera*. (c) 40 srs./ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) 1 weeding. (ix) 1.97″. (x) 10/16.4.1958.

2. TREATMENTS :

Same as in expt. no. 57(46) on page 175.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 5 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 36′8″×9′2″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2303 lb./ac. (ii) (a) 403.7 lb./ac. (b) 199.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	D_0	D_1	D_2	D_3	D_4	Mean
W_1	—	2103	2212	2266	2158	2185
W_2	—	2266	2388	2307	2294	2314
W_3	—	2293	2198	2029	2103	2156
W_4	—	2470	2511	2524	2483	2497
Mean	2361	2283	2327	2281	2259	

S.E. of difference of two

1. W marginal means = 127.7 lb./ac.
2. D marginal means = 63.0 lb./ac.
3. D means at the same level of W = 126.0 lb./ac.
4. W means at the same level of D = 160.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 58(70).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'D'.**

Object :—To study the effect of weedicides for controlling weeds on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 6.11.1958. (iv) (a) 11 ploughings, 5 plankings and 1 rolling. (b) Sown by *kera*. (c) 35 srs./ac. (d) 8″ between rows. (e) Nil. (v) N.A. (vi) C—591. (vii) Irrigated. (viii) N.A. (ix) 5.33″. (x) 29.4.1959.

2. TREATMENTS:

Main-plot treatments :

4 weedicides : W_1=Fernoxone, W_2=Dicoton, W_3=Kathon—M_7 and W_4=Agroxone.

Sub-plot treatments :

5 doses of weedicides : D_0=0, D_1=16, D_2=24, D_3=32 and D_4=40 oz./ac. acid equivalent.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication; 5 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 36′.8″×4′.6″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1678 lb./ac. (ii) (a) 601.5 lb./ac. (b) 193.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	D_0	D_1	D_2	D_3	D_4	Mean
W_1	—	1623	1425	1460	1670	1544
W_2	—	1779	1853	1799	1568	1750
W_3	—	1826	1704	1792	1853	1794
W_4	—	1602	1690	1724	1507	1631
Mean	1672	1707	1668	1694	1649	—

S E. of difference of two

1. W marginal means = 190.2 lb./ac.
2. D marginal means = 61.1 lb./ac.
3. D means at the same level of W = 122.2 lb./ac.
4. W means at the same level of D = 202.2 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- Pb. 59(140).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'D'.**

Object :—To study the effect of weedicides for controlling weeds on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 29.10.1959. (iv) (a) N.A. (b) Sown by *kera*. (c) 36 srs./ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) Nil. (ix) 3.0″. (x) April, 1960.

2. TREATMENTS :

Same as in expt. no. 59(22) on page 174.

3. DESIGN :

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 44′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2784 lb./ac. (ii) 301.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

T_0 = 2504 lb./ac. and T_1 = 2634 lb./ac.

	W_1	W_2	W_3	W_4	Mean
D_1	2711	2765	2761	2775	2753
D_2	2734	3094	3161	2591	2895
D_3	2634	3023	2733	2860	2812
Mean	2693	2961	2885	2742	2820

S.E. of W marginal mean = 87.0 lb./ac.
S.E. of D marginal mean = 75.3 lb./ac.
S.E. of body of table, T_0 or T_1 mean = 150.6 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- Pb. 59(14).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'D'.**

Object :—To study the effect of weedicides for controlling of weeds on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 2.12.1959. (iv) (a) 5 ploughings and 7 plankings. (b) Sown by *kera*. (c) N.A. (d) 8" between rows. (e) Nil. (v) 112 lb./ac. of C/A/N on 23.1.1960 and 82 lb./ac. of Super. (vi) C—273. (vii) Irrigated. (viii) and (ix) N.A. (x) 28.4.1960.

2. TREATMENTS :

2 weedicidal treatments : D_1=Seed treated with talcum activated powder at 1 to 400 lb. of seed and D_2=Un treated.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 5.5'×108'. (b) 5.5'×99'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2387 lb./ac. (ii) 144.4 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of grain in lb./ac.

Treatment	D_1	D_2
Av. yield	2409	2366

S.E./mean = 58.9 lb./ac.

Crop :- Barley. **Ref :- Pb. 54(3).**

Site :- Barley Res. Stn., Gurgaon. **Type :- 'M'.**

Object :—To study the effect of different doses of A/S and C/N on the yield of barley.

1. BASAL CONDITIONS :

(i) Barley—*Mung*—Barley. (b) and (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 3.11.1954. (iv) (a) Preparatory tillage, 1 hindustan ploughing and 5 *desi* hal plough. (b) *pore*. (c) 1 md./ac. (d) and (e) N.A. (v) Nil. (vi) Barley type 4 (approved and early). (vii) Irrigated. (viii) 1 weeding and 1 hoeing. (ix) 0.99". (x) 26.3.1955.

2. TREATMENTS :

All combinations of (1) and (2)+a control
(1) 2 sources of N : S_1=A/S and S_2=C/N.
(2) 2 levels of N : N_1=15 and N_2=30 lb./ac.
A/S and C/N applied at first irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 1/200 ac. (b) 1/270 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Hight, length of earhead and grain yield. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1848 lb./ac. (ii) 207.1 lb./ac. (iii) Main effect of N and "control *vs.* others" are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1553 lb./ac.

	S_1	S_2	Mean
N_1	1736	1666	1701
N_2	2248	2039	2144
Mean	1992	1852	1922

S.E. of any marginal mean = 73.2 lb./ac.
S.E. of body of table or control mean = 103.6 lb./ac.

Crop :- Jowar *(Kharif)*. **Ref :- Pb. 58(63).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of different bulky manures on Jowar.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Gram. (c) N.A. (ii) (a) Heavy loam. (b) N.A. (iii) 8.7.1958. (iv) (a) N.A. (b) Sown by *kera*. (c) 20 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 23.18". (x) Sept., 1958.

2. TREATMENTS :

4 manurial treatments : M_0=Control, M_1=8 tons/ac. of F.Y.M. (compost), M_2=8 tons/ac. of F.Y.M. (heap) and M_3=8 tons/ac. of F.Y.M. (pit).

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 75'×9' 8". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Crop was affected by heavy rains. (vii) Nil.

5. RESULTS :

(i) 746 lb./ac. (ii) 155.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	666	802	765	753

S.E./mean = 109.7 lb./ac.

Crop :- Jowar *(Kharif)*. **Ref :- Pb. 59(113).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To test the effect of N, P and K fertilizers on Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) N.A. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (iii) 18.6.1959. (iv) (a) N.A. (b) Broadcast. (c) 15 srs./ac. (d) and (e) N.A. (v) Nil. (vi) No—20. (vii) Irrigated. (viii) N.A. (ix) 13.82". (x) 1.12.1959.

2. TREATMENTS :

4 manurial treatments : M_0=Control, M_1=30 lb./ac. of N as C/A/N, M_2=30 lb./ac. of N as C/A/N+15 lb./ac. of P_2O_5 as Super and M_3=30 lb./ac. of N as C/A/N+15 lb./ac. of P_2O_5 as Super+15 lb./ac. of K_2O as Mur. Pot.

Fertilizers applied on 27.7.1959.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $\frac{1}{8}$ ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 494 lb./ac. (ii) 52.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb /ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	398	461	522	593

S.E./mean = 26.0 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 54(190).**

Site :- Oil Seed Sub-Stn., Gummar. **Type :- 'M'.**

Object :—To study the effect of application of N with and without Super on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 17.7.1954. (iv) (a) and (b) N.A. (c) 15 srs./ac. (d) and (e) N.A. (v) 60 lb./ac. of N as F.Y.M. applied by broadcast. (vi) Local (medium). (vii) Unirrigated. (viii) N.A. (ix) 8.96". (x) 8.10.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 sources of 60 lb./ac. of N : S_0=Control, S_1=A/S and S_2=A/N.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=50 lb./ac.

Fertilizers applied on 17.7.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 1/121 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1954 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 933 lb./ac. (ii) 295.1 lb./ac. (iii) S effect is highly significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	Mean
P_0	555	1122	1273	984
P_1	474	1122	1053	883
Mean	515	1122	1163	933

S.E. of P marginal mean = 85.2 lb./ac.
S.E. of S marginal mean = 104.3 lb./ac.
S.E. of body of table = 147.5 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 54(191).**

Site :- Oil Seed Sub-Stn., Gummar. **Type :- 'M'.**

Object :—To study the effect of different times of application of Super and A/S on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 17.7.1954. (iv) (a) and (b) N.A. (c) 15 srs./ac. (d) and (e) N.A. (v) 60 lb./ac. of N as F.Y.M. applied by broadcast. (vi) Local (medium). (vii) Unirrigated. (viii) Nil. (ix) 8.96". (x) 8/9.10.1954.

2. TREATMENTS :

6 times of application of N : T_0=Control (no application), T_1=At sowing, T_2=One month after sowing, T_3=Half at sowing+half $1\frac{1}{2}$ months after sowing, T_4=$\frac{1}{2}$ at sowing+$\frac{1}{2}$ two months after sowing and T_5=$\frac{1}{3}$ at sowing+$\frac{1}{3}$ one and a half months after sowing+$\frac{1}{3}$ two months after sowing.

N at 60 lb./ac. applied as A/S. All plots except control were given a basal dressing of 50 lb./ac. of P_2O_5 as Super at the time of sowing.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 54(190) on page 182.

5. RESULTS :

(i) 795 lb./ac. (ii) 279 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. yield	671	1111	636	879	706	764

S.E./mean = 139.5 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 54(193).**

Site :- Oil Seed Sub-Stn., Gummar. **Type :- 'M'.**

Object :—To study the effect of time and method of application of A/S and Super on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 30.7.1954. (iv) (a) N.A. (b) Sown in lines. (c) 15 srs./ac. (d) and (e) N.A. (v) F.Y.M. at 84 mds./ac. applied by broadcast on 8.6.1954. (vi) Local (medium). (vii) Unirrigated. (viii) N.A. (ix) 8.96". (x) 9.10.1954.

2. TREATMENTS :

6 methods of application of 60 lb./ac. of N as A/S+50 lb./ac. of P_2O_5 as Super : T_0=Control (no application), T_1=N broadcast at sowing+P_2O_5 drilled below seed at sowing, T_2=N broadcast one week after sowing+P_2O_5 drilled below seed at sowing, T_3=Both drilled at sowing below seed, T_4=Both applied in contact with seed at sowing and T_5=Both drilled on sides at sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 43′×12′8″. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1954 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 635 lb./ac. (ii) 161.2 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. yield	440	456	663	856	478	717

S.E./mean = 80.6 lb./ac.

Crop :- Maize *(Kharif)* **Ref :- Pb. 54(52).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of N and P alone and in combination on Maize.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Wheat. (c) Nil. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 19.6.1954. (iv) (a) 5 ploughings, 2 horse hoe and 3 *sohaga*. (b) N.A. (c) 20 srs./ac. (d) 12″×12″. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 1 hoeing. (ix) 27.34″. (x) 17.9.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : N_0=0 and N_1=60 lb./ac.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=60 lb./ac.

Treatments applied at sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 81′×12′. (b) 12′×75′7½″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1289 lb./ac. (ii) 176.1 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	Mean
N_0	955	1021	988
N_1	1572	1609	1590
Mean	1264	1315	1289

S.E. of any marginal mean = 50.8 lb./ac.

S.E. of body of table = 71.9 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 54(55).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the effect of rare elements on yield of Maize when applied with high doses of N, P and K.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Wheat. (c) Nil. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 30.7.1954. (iv) (a) 6 ploughings and 7 *sohaga*. (b) N.A. (c) 30 srs./ac. (d) and (e) N.A. (v) 10 C.L./ac. of F.Y.M. applied by broadcast on 9.6.1956. (vi) Local. (vii) Irrigated. (viii) 3 hoeings and 2 thinnings. (ix) 18.18". (x) 25.10.1954.

2. TREATMENTS :

5 manurial treatments : T_0=Control, T_1=100 lb./ac. of N as A/S, $T_2=T_1+100$ lb./ac. of P_2O_5 as Super, $T_3=T_2+100$ lb./ac. of K_2O as Pot. Sul. and $T_4=T_3+$trace elements magnesium+Copper+Boron+Zinc+Manganese each at 5 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 12'×75'10". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Crop lodged slightly—growth was normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2290 lb./ac. (ii) 246.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4
Av. yield	1444	2421	2626	2577	2380

S.E./mean = 100.6 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 55(61).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the effect of rare elements on yield of Maize when applied with high doses of N, P and K.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 28.7.1955. (iv) (a) 10 ploughings and 5 *sohaga*. (b) N.A. (c) 16 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local (medium). (vii) Unirrigated. (viii) 1 hoeing. (ix) 29.14", (x) 23.10.1955.

2. TREATMENTS :

5 manurial treatments : T_0=Control, T_1=100 lb./ac. of N as A/S, $T_2=T_1+100$ lb./ac. of P_2O_5 as Super, $T_3=T_2+100$ lb./ac. K_2O as Pot. Sul. and $T_4=T_3+$trace elements Magnesium, Zinc and Copper each at 5 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 12'×80'. (b) 12'×60½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2272 lb./ac. (ii) 298.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4
Av. yield	1056	2283	2633	2613	2777

S.E./mean = 121.7 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 54(61).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different methods of application of A/S on Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii 20.6.1954. (iv) (a) 6 ploughings and 6 *sohaga*. (b) N.A. (c) 20 srs./ac. (d) 12″×12″. (e) N.A. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) 1 thinning and 2 hoeings. (ix) 27.98″. (x) 2.10.1954.

2. TREATMENTS :

7 methods of application of 60 lb./ac. of N as A/S : M_0=Control (no application), M_1=In contact with seed, M_2=Drilled at sowing below seed, M_3=Broadcast at sowing, M_4=Broadcast with 2nd irrigation, M_5=Lateral application of 6″ on both sides of seed row with 2nd irrigation and M_6=Lateral application 6″ on both sides at sowing time.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 12′×90′. (b) 12′×82′.6″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Spray with D.D.T. against maize borer attack. (iii) Grain and straw yield. (iv) (a) 1953—1958. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2366 lb./ac. (ii) 377.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	1833	2263	2172	2376	2602	2602	2715

S.E./mean = 188.8 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 55(64).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different methods of application of N on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 13.7.1955. (iv) (a) 5 ploughings and 3 *sohaga*. (b) Sown by *kera*. (c) N.A. (d) 18″ between rows. (e) N.A. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) 2 hoeings and 1 gap-filling. (ix) 29.14″. (x) 21.10.1955.

2. TREATMENTS :

Same as in expt. no. 54(61) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) 8′×72′. (b) 8′×60.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1953—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2316 lb./ac. (ii) 206.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	1720	2344	2245	2351	2407	2527	2617

S.E./mean = 92.3 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 54(50).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best source of P in combination with A/S for Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 12.6.1954. (iv) (a) 3 ploughings and 4 plankings, (b) N.A. (c) 20 srs./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 1 hoeing. (ix) 27.34″. (x) 16.9.1954.

2. TREATMENTS :

6 manurial treatments : T_0=Control, T_1=60 lb./ac. of N as A/S, T_2=T_1+25 lb./ac. of P_2O_5 as Super, T_3=T_1+50 lb./ac. of P_2O_5 as Super, T_4=T_1+25 lb./ac. of P_2O_5 as B.M. and T_5=T_1+50 lb./ac. of P_2O_5 as B.M.

B.M. and Super drilled at sowing and A/S broadcast with 1st irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 12′×81′. (b) 12′×75′ 7½″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Maize borer attack ; spraying of Agrocide. (iii) Grain and straw yield. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1251 lb./ac. (ii) 253.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. yield	848	1263	1103	1358	1366	1572

S.E./mean = 103.6 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 55(58).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best source of P in combination with A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Berseem*. (c) Nil. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 23.6.1955. (iv) (a) 7 ploughings and 7 *sohaga*. (b) to (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) 1 hoeing. (ix) 29.14″. (x) 17.9.1955.

2. TREATMENTS :

Same as in expt. no. 54(50) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 12′×75′ 7½″. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1944 lb./ac. (ii) 252.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. yield	1394	2028	1944	2037	2103	2157

S.E./mean = 103.2 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 57(32).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of application of A'S alone and in combination with different levels of Super and B.M.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Wheat. (c) N.A. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 31.7.1957. (iv) (a) 3 ploughings. (b) Sown by *kera* in lines. (c) 10 srs./ac. (d) 12″ between rows. (e) Nil. (v) 8 C.L./ac. of F.Y.M. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 27.99″. (x) 24.9.1957.

2. TREATMENTS :

Same as in expt. no. 54(50) on page 187.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 8′×80′. (b) 8′×68.06′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1976 lb./ac. (ii) 290.7 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. yield	1399	2137	2137	2108	1949	2126

S.E./mean = 145.3 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 54(53).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best combination of N and P for Maize.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Wheat. (c) Nil. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 19.5.1954. (iv) (a) 3 ploughings, 4 Lyallpur hoe and 4 *sohaga*. (b) N.A. (c) 20 srs./ac. (d) 12″×12″. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 1 hoeing. (ix) 27.71″. (x) 17.9.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=80 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=25 and P_2=50 lb./ac.

N and P applied broadcast on 19.6.1954.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 81′×12′. (b) 12′×75′7½″. (v) N.A. (vi) Yes.

4. GENERAL :

Normal. (ii) Nil. (iii) Straw and grain yield. (iv) (a) 1954–contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1037 lb./ac. (ii) 145.2 lb./ac. (iii) Main effect of N and interaction N×P are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	525	1024	1376	975
P_1	697	1197	1351	1082
P_2	620	839	1703	1054
Mean	614	1020	1477	1037

S.E. of any marginal mean = 41.9 lb./ac.
S.E. of body of table = 72.6 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Fb. 55(59).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best combination of N and P for Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Berseem*. (c) Nil. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 13.7.1955. (iv) (a) 6 ploughings and 6 *sohaga*. (b) N.A. (c) 16 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings. (ix) 29.14″. (x) 12,13.10.1955.

2. TREATMENTS :

Same as in expt. no. 54(53) on page 188.
A/S and Super applied on 12.7.1955.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 12′×60½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2535 lb./ac. (ii) 226.6 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	2291	2754	2916	2654
P_1	2052	2499	2746	2432
P_2	2253	2715	2592	2520
Mean	2199	2656	2751	2535

S.E. of any marginal mean = 65.4 lb./ac.
S.E. of body of table = 113.3 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 57(31).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of N and P on Maize.

1. BASAL CONDITIONS :
(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 28.6.1957. (iv) (a) 5 ploughings. (b) N.A. (c) 16 srs./ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings. (ix) 27.99". (x) 23.9.1957.

2. TREATMENTS :
Same as in expt. no. 54(53) on page 188.
N and P drilled with the seed on 28.6.1957.

3. DESIGN :
(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 8'×80'. (b) 8'×68.06'. (v) N.A. (vi) Yes.

4. GENERAL :
(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
(i) 1570 lb./ac. (ii) 186.0 lb./ac. (iii) Main effects of N and P are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	843	1507	1890	1413
P_1	951	1836	1962	1583
P_2	1106	1738	2301	1715
Mean	967	1694	2051	1570

S.E. of any marginal mean = 53.7 lb./ac.
S.E. of body of table = 93.0 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 57(33).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :— To study the effect of N and P on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 12.8.1957. (iv) (a) 6 ploughings. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) 3 hoeings. (ix) 17.38″. (x) 4.11.1957.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=60 and N_2=120 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=30 and P_2=60 lb./ac.

Manures applied on 7.9.1957 and 31.7.1957.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 1/68 ac. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1322 lb./ac. (ii) 333.4 lb./ac. (iii) Main effects of N and P are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	583	1208	1440	1077
P_1	797	1543	1723	1354
P_2	1183	1568	1851	1534
Mean	854	1440	1671	1322

S.E. of any marginal mean = 96.2 lb./ac.
S.E. of body of table = 166.7 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 59(17).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of N and P on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Wheat. (c) Nil. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 26.6.1959. (iv) (a) 6 ploughings. (b) Sown in lines. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 46.76″. (x) 28.9.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(33) on page 190.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) 1957—contd. (b) Yes. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2358 lb./ac. (ii) 202.3 lb./ac. (iii) Main effects of N and P are highly significant. Interaction N×P is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	1383	2039	1694	1706
N_1	2355	2445	2682	2494
N_2	2782	2849	2988	2873
Mean	2174	2444	2455	2358

S.E. of any marginal mean = 58.4 lb./ac.
S.E. of body of table = 101.2 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 58(41).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best combination of N and P for Maize.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Wheat. (c) Nil. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 23.7.1958. (iv) (a) 2 ploughings. (b) Sown by *kera*. (c) 12 srs./ac. (d) 9" beetwn rows. (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 34.06". (x) 16.10.1958.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as C/A/N : N_0 =0, N_1=40 and N_2=80 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0 -0, P_1=20 and P_2=40 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 71'×6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 293 lb./ac. (ii) 115.4 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	242	228	172	214
N_1	324	258	225	269
N_2	331	404	454	396
Mean	299	297	284	293

S.E. of any marginal mean = 33.3 lb./ac.
S.E. of body of table = 57.7 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 59(19).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best combination N and P for Maize.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Wheat. (c) N.A. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 7.6.1959. (iv) (a) 4 ploughings. (b) Sown in lines. (c) 15 srs./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 46.76″. (x) 11.9.1959.

2. TREATMENTS :

Same as in expt. no. 58(41) on page 192.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 71′×6′. (b) 60.5′×6′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 174.3 lb./ac. (ii) 25.2 lb./ac. (iii) Main effects of N and P are highly significant and interaction N×P is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	100	120	147	122
N_1	174	185	197	185
N_2	185	220	243	216
Mean	153	175	196	174

S.E. of any marginal mean = 7.3 lb./ac.
S.E. of body of table = 12.6 lb./ac.

Crop :- Maize (*Kharif*). **Ref :- Pb. 59(18).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the residual effect of the manures applied to the previous wheat crop on Maize crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Wheat. (c) As per treatments. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 7.6.1959. (iv) (a) N.A. (b) Sown in lines. (c) 18 srs./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 46.76″. (x) 11.9.1959.

2. TREATMENTS :

Same as in expt. no. 58(41) on page 192.
Treatments applied to the previous wheat crop.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 71′×6′. (b) 60.5′×6′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 131 lb./ac. (ii) 18.8 lb./ac. (iii) Main effects of N, P and interaction N×P are highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	77	69	85	77
N_1	104	147	170	140
N_2	131	177	216	175
Mean	104	131	157	131

S.E. of any marginal mean = 5.4 lb./ac.
S.E. of body of table = 9.4 lb./ac.

Crop :- Maize (*Kharif*). **Ref :- Pb. 54(34).**
Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To compare the effect of different sources of N on Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 23.6.1954. (iv) (a) 4 ploughings and 4 *sohaga*. (b) Dibbling. (c) 12 srs./ac. (d) 12″×12″. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 1 hoeing. (ix) 27.77″. (x) 2.10.1954.

2. TREATMENTS :

5 sources of 60 lb./ac. of N : S_1 =Control (no manure), S_1 =Blood meal, S_2=A/S, S_3=C/N and S_4= Urea. All treatments applied at sowing time.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 12′×60.5′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of Maize borer and stem borer. D.D.T. sprayed. (iii) Grain yield. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2372 lb./ac. (ii) 204.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4
Av. yield	2327	2665	2650	2121	2094

S.E./mean = 83.6 lb./ac.

Crop :- Maize (*Kharif*). **Ref :- Pb. 55(60).**
Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To compare the effect of different sources of N on Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat (c) Nil. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 27.7.1955. (iv) (a) 4 ploughings. (b) N.A. (c) 16 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local (medium). (vii) Unirrigated. (viii) 1 hoeing. (ix) 29.14″. (x) 5.11.1955.

2. TREATMENTS :

4 sources of 50 lb./ac. of N : S_0=Control (no manure), S_1=A/S, S_2=C/N and S_3=Urea.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 8′×75.6′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1250 lb./ac. (ii) 178.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	889	1241	1204	1667

S.E./mean = 89.1 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 55(72).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of N through different sources on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 12.7.1955. (iv) (a) to (e) N.A. (v) Nil. (vi) Local (medium). (vii) Unirrigated. (viii) 2 hoeings. (ix) 29.14". (x) 21.10.1955.

2. TREATMENTS :

All combinations of (1) and (2) + one control

(1) 2 sources of N : S_1=A/S and S_2=C/N.

(2) 2 doses of N : N_1=40 and N_2=60 lb./ac.

Manures applied in two doses half at sowing and half one month after sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 8′×72′. (b) 8′×60.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1955 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2388 lb./ac. (ii) 160.4 lb./ac. (iii) Main effect of N, S and "control *vs.* others" are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1979 lb./ac.

	S_1	S_2	Mean
N_1	2387	2222	2304
N_2	2876	2476	2676
Mean	2632	2349	2490

S.E. of any marginal mean = 56.7 lb./ac.
S.E. of body of table or control mean = 80.2 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 57(34).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best source of N for Maize.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 12.6.1957. (iv) (a) 5 ploughings. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 27.99″. (x) 17.9.1957.

2. TREATMENTS :

8 sources of 60 lb./ac. of N : S_0=Control (no manure), S_1=A/S, S_2=A/S/N, S_3=A/N, S_4=C/A/N, S_5=Urea, S_6=C/N and S_7=A/C.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2110 lb./ac. (ii) 272.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	1498	2234	2337	2089	1893	2272	2362	2195

S.E./mean = 136.3 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 58(42).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best source of N for Maize.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 12.7.1958. (iv) (a) 3 ploughings. (b) Sown by *kera*. (c) 12 srs./ac. (d) 9″ between rows. (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 34.06″. (x) 7, 9.10.1958.

2. TREATMENTS :

6 sources of 60 lb./ac. of N : S_0=Control (no manure), S_1=A/S, S_2=A/C, S_3=A/S/N, S_4=Urea and S_5=C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 70′×8′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (with changed treatments). (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1722 lb./ac. (ii) 238.7 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5
Av. yield	1256	1873	1830	1938	1808	1627

S.E./mean = 119.3 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 59(20).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best source of N for Maize.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 7.6.1959. (iv) (a) N.A. (b) Sown in lines. (c) 15 srs./ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 46.76". (x) 11.9.1959.

2. TREATMENTS :

Same as in expt. no. 57(34) on page 195.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 71'×6'. (b) 60.5'×6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Grain yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 373 lb./ac. (ii) 52.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	285	420	482	339	309	363	409	374

S.E./mean = 26.3 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 55(33).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 9.7.1955. (iv) (a) 13 *desi* ploughings and 3 *sohaga*. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 1 hoeing. (ix) 11.48". (x) 12.10.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=20 and P_2=40 lb./ac.

(3) 3 levels of K_2O as Pot. Sul. : K_0=0, K_1=20 and K_2=40 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) and (b) 10.5'×40'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2563 lb./ac. (ii) 430.6 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	2292	2235	2535	2354	2292	2413	2358
N_1	2552	2499	2642	2664	2462	2582	2649
N_2	2563	2916	2834	2771	2737	2784	2793
Mean	2469	2550	2671	2563	2497	2593	2600
K_0	2440	2392	2659				
K_1	2536	2603	2640				
K_2	2431	2655	2713				

S.E. of any marginal mean = 71.7 lb./ac.
S.E. of body of any table = 124.4 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 56(62).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Maize.

1. BASAL CONDITIONS :

(i) (a) *Berseem*—Maize, (b) *Berseem*. (c) Nil. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 15.7.1956. (iv) (a) 1 *raja*, 5 *desi* ploughings and 3 *sohaga*. (b) Sown in line by *kera*. (c) 10 srs./ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 bar harrow and 2 hoeings. (ix) 13.85". (x) 22.10.1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(33) on page 197.
N applied on 19.8.1956, P_2O_5 and K_2O on 15.7.1956.

5. RESULTS :

(i) 2777 lb./ac. (ii) 455.6 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	2673	2591	2604	2623	2620	2713	2535
N_1	2856	3008	2954	2939	2982	2893	2944
N_2	2911	2691	2708	2770	2771	2751	2788
Mean	2813	2763	2755	2777	2791	2786	2755
K_0	2808	2910	2659				
K_1	2993	2702	2662				
K_2	2640	2682	2946				

S.E. of any marginal mean = 75.9 lb./ac.
S.E. of body of any table = 131.5 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 57(57).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Maize.

1. BASAL CONDITIONS :

(i) (a) *Berseem*—Maize. (b) *Berseem.* (c) N.A. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 30.7.1957. (iv) (a) N.A. (b) Sown by *kera.* (c) 10 srs./ac. (d) 18″ between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 27.52″. (x) 31.10.1957 and 11.11.1957.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : N_0=0, N_1=40 and N_2=80 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=20 and P_2=40 lb./ac.

(3) 3 levels of K_2O as Pot. Sul. : K_0=0, K_1=20 and K_2=40 lb./ac.

N applied on 24.8.1957, P_2O_5 and K_2O on 30.7.1957.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30.25′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1618 lb./ac. (ii) 280.3 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	K_0	K_1	K_2	Mean	P_0	P_1	P_2
N_0	1572	1486	1342	1467	1396	1495	1509
N_1	1719	1611	1642	1657	1654	1692	1624
N_2	1768	1666	1754	1730	1620	1833	1736
Mean	1686	1588	1579	1618	1557	1673	1623
P_0	1638	1444	1588				
P_1	1760	1663	1597				
P_2	1660	1655	1554				

S.E. of any marginal mean = 46.7 lb./ac.

S.E. of body of any table = 80.9 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 58(54).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Maize.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 1.7.1958. (iv) (a) 11 *sohaga* and 3 *desi* ploughings. (b) Sown by *kera.* (c) 10 srs./ac. (d) 12″ between rows. (e) Nil. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 1 bar harrow and 3 hoeings. (ix) 15.74″. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 57(57) above.
Manures applied on 18.8.1958.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30.25′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Crop damaged due to heavy rains. (vii) Nil.

5. RESULTS :

(i) 894 lb./ac. (ii) 236.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	970	872	901	914	915	830	998
N_1	903	825	818	849	859	828	858
N_2	992	906	858	918	904	846	1006
Mean	955	868	859	894	893	835	954
K_0	879	903	896				
K_1	929	788	787				
K_2	1057	912	893				

S.E. of any marginal mean = 39.4 lb./ac.
S.E. of body of any table = 68.3 lb./ac.

Crop :-Maize *(Kharif)*. **Ref :- Pb. 59(130).**
Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Berseem.* (c) N.A. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 10.7.1959. (iv) (a) N.A. (b) Sown by *kera.* (c) 8 srs./ac. (d) 24" between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 10.5". (x) 17, 18.10.1959.

2. TREATMENTS :

Same as in expt. no. 57(57) on page 199.
Manures applied one month after sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30.25'×8'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1079 lb./ac. (ii) 384.2 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	964	876	957	932	1009	1022	766
N_1	1138	1082	1053	1091	1200	1082	991
N_2	1115	1444	1086	1215	1346	1049	1250
Mean	1072	1134	1032	1079	1185	1051	1002
K_0	1232	1246	1076				
K_1	1157	1070	926				
K_2	827	1086	1094				

S.E. of any marginal mean = 64.0 lb./ac.
S.E. of body of any table = 110.9 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 54(118).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To compare the effect of A/S and C/N on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 9.7.1954. (iv) (a) 4 *desi* ploughings and 3 *sohaga*. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 3 hoeings and 2 thinnings. (ix) 16.78". (x) N.A.

2. TREATMENTS :

3 sources of 60 lb./ac. of N : S_0=Control, S_1=A/S and S_2=C/N.
Manures applied in two equal doses on 2.8.1954. and 29.8.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 96'×45'4". (b) 85'7"×42'4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1622 lb./ac. (ii) 381.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2
Av. yield	692	2180	1994

S.E./mean = 190.8 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 56(64).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To compare the effect of A/S and C/N on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Wheat. (c) N.A. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 9.7.1956. (iv) (a) 2 *desi* ploughings and 4 *sohaga*. (b) Sown by *kera*. (c) 10 srs./ac. (d) 18" between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Hoeing and weeding. (ix) 13.85". (x) 17.10.1956.

2. TREATMENTS :

3 sources of 60 lb./ac. of N : S_0=Control, S_1=A/S and S_2=C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 96'×45'4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—N.A. (b) Yes. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1374 lb./ac. (ii) 110.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2
Av. yield	991	1557	1574

S.E./mean = 55.1 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 57(60).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To compare the effect of A/S and C/N on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 30.7.1957. (iv) (a) N.A. (b) Sown by *kera*. (c) 10 srs./ac. (d) 18" between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 18.66". (x) 31.10.1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(64) on page 201.

5. RESULTS :

(i) 843 lb./ac. (ii) 105.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2
Av. yield	638	951	941

S.E./mean = 52.6 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 58(57).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To compare the effect of A/S and C/N on Maize.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Wheat. (c) N.A. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 2.7.1958. (iv) (a) N.A. (b) Sown by *kera*. (c) 8 srs./ac. (d) 12"×18". (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 23.18", (x) 2.9.1958.

2. TREATMENTS :

3 sources of 40 lb./ac. of N : S_0 = Control, S_1 = A/S and S_2 = C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 96'×45'4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—N.A. (b) Yes. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 543 lb./ac. (ii) 179.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2
Av. yield	561	564	504

S.E./mean = 89.8 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 56(63).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To compare different sources of N for Maize.

1. BASAL CONDITIONS :

(i) (a) *Berseem*—Maize. (b) *Berseem*. (c) Nil. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 15.7.1956. (iv) (a) 1 *raja*, 5 *desi* ploughings and 2 *sohaga*. (b) Sown by *kera*. (c) 10 srs./ac. (d) 18″ between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 1 bar-harrow and 2 hoeings. (ix) 13.85″. (x) 21.10.1956.

2. TREATMENTS :

7 sources of 50 lb./ac. of N : S_0=Control, S_1=Urea, S_2=A/S, S_3=A/C, S_4=A/N, S_5=A/S/N and S_6=C/N. Manures applied on 25.8.1956.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 40′×10.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2644 lb./ac. (ii) 260.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	2563	2489	2773	2686	2543	2753	2699

S.E./mean = 130.0 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 57(62).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To compare different sources of N for Maize crop.

1. BASAL CONDITIONS :

(i) (a) Maize—*Berseem*. (b) *Berseem*. (c) N.A. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 2.8.1957. (iv) (a) 4 *desi* ploughings. (b) Sown by *kera*. (c) 10 srs./ac. (d) 18″ between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and 1 gapfilling. (ix) 18.66″. (x) 29.10.1957.

2. TREATMENTS :

Same as in expt. no. 56(63) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 49½′×11′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Crop damaged by heavy rains. (vii) Nil.

5. RESULTS :

(i) 602 lb./ac. (ii) 176.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	581	558	591	678	630	666	511

S.E./mean = 88.4 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 58(55).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To compare different sources of N for Maize.

1. BASAL CONDITIONS :

(i) (a) *Berseem*—Maize. (b) *Berseem.* (c) N.A. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 3.7.1958. (iv) (a) N.A. (b) Sown by *kera.* (c) 10 srs./ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 23.18". (x) N.A.

2. TREATMENTS :

8 sources of 50 lb./ac. of N : S_0=Control, S_1=Urea, S_2=A/N, S_3=A/S/N, S_4=A/C, S_5=C/N, S_6=A/S and S_7=C/A/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $49\frac{1}{2} \times 11'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Heavy rains damaged the crop. (vii) Nil.

5. RSULTS :

(i) 1337 lb./ac. (ii) 319.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	1399	1275	1275	1543	1286	1090	1533	1296

S.E./mean = 159.7 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 56(65).**

Site :- Govt. Agri. Stn., Hansi. **Type:- 'M'.**

Object :— To find out the best source of N for Malze.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Wheat. (c) N.A. (ii) Sand loam to clayey loam. (b) N.A. (iii) 29.6.1956. (iv) (a) 1 *raja* and 3 *desi* ploughings. (b) Sown by *kera.* (c) 10 srs./ac. (d) 18" between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings. (ix) 13.85". (x)19 9.1956.

2. TREATMENTS :

Same as in expt. no.56(63) on page 203.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 66'×11'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2459 lb./ac. (ii) 542.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	1688	2922	2386	2839	3059	1473	2847

S.E./mean = 271.2 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 57(61).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To compare the effect of different sources of N on Maize.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Wheat. (c) N.A. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 31.7.1957. (iv) (a) 2 *desi* ploughings. (b) Sown by *kera.* (c) 10 srs./ac. (d) 18″ between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings (ix) 18.66″. (x) 30.10.1957.

2. TREATMENTS :

Same as in expt. no. 56(63) on page 203.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 49.5′×11′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1255 lb./ac. (ii) 564.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	1170	1088	1255	1535	928	1594	1214

S.E./mean = 282.4 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 58(56).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To compare the effect of different sources of N on Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 1.7.1958. (iv) (a) 3 *desi* ploughings and 1 *sohaga.* (b) Sown by *kera.* (c) 10 srs./ac. (d) 12″ betwen rows. (e) N.A. (v) Nil. (vi) Local. (vil) Irrigated. (viii) Nil. (ix) 23.18″. (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(55) on page 204.

5. RESULTS :

(i) 1583 lb./ac. (ii) 405.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	1398	1675	1562	1820	1532	1645	1706	1326

S.E./mean = 202.6 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 59(131).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To compare the effect of different sources of N on Maize.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 10.7.1959. (iv) (a) N (b) Sown by *kera.* (c) 8 srs./ac. (d) 24″ between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. N.A. (ix) 10.5″. (x) 16.10.1959.

2. TREATMENTS :

7 sources of 50 lb./ac. of N : S_0=Control (2 plots), S_1=C/N, S_2=A/N, S_3=A/C, S_4=A/S, S_5=Urea and S_6=C/A/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30.25′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 787 lb./ac. (ii) 273.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	544	1004	990	768	879	838	727

S.E./mean (excluding control) = 136.7 lb./ac.

S.E. of control mean = 96.7 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 54(123).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of different levels of N on Maize.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Wheat. (c) Nil. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 7.7.1954. (iv) (a) 4 *desi* plougings, 2 *sohaga* and 1 *karah*. (b) to (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) Local. (vii) Irrigated. (viii) 1 thinning and 2 hoeings. (ix) 16.78″. (x) 9.11.1954.

2. TREATMENTS :

3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.
N applied in two equal doses by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 61′×27′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vii) and (viii) Nil.

5. RESULTS :

(i) 1813 lb./ac. (ii) 355.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	N_0	N_1	N_2
Av. yield	1366	1917	2156

S.E./mean = 125.8 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 54(72).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Wheat. (c) Nil. (ii) (a) Loam and sandy loam. (b) Refer soil analysis, Jullundur. (iii) 9.8.1954. (iv) (a) 1 *raja hal*, 2 *desi hal*, 2 horse hoe and 4 *sohaga*. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated, (viii) 1 weeding and 3 hoeings. (ix) 18.22″. (x) 8.11.1954.

Crop -: Maize *(Kharif)*. **Ref :- Pb. 57(24).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of A/S and Super on the yield of Maize crop.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) and (c) N.A. (ii) (a) Loam and sandy loam. (b) Refer soil analysis, Jullundur. (iii) 5.8.1957. (iv) (a) 5 *sohaga*, 1 *raja*, 2 *desi* ploughings and 3 horse hoe. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) 16 C.L./ac. of F.Y.M. applied. (vi) Local (medium). (vii) Irrigated. (viii) 3 hoeings. (ix) 11.29". (x) 2.11.1957 and 5.11.1957.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=60 and N_2=120 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=30 and P_2=60 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10'×43.56'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2375 lb./ac. (ii) 213.6 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	2057	2160	2031	2083
N_1	2391	2314	2520	2408
N_2	2597	2584	2726	2636
Mean	2348	2353	2426	2375

S.E. of any marginal mean = 195.0 lb./ac.
S.E. of body of table = 106.8 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 58(30).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of A/S and Super on the yield of Maize crop.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Wheat. (c) N.A. (ii) (a) Loam and sandy loam. (b) Refer soil analysis, Jullundur. (iii) 1.8.1958. (iv) (a) 1 *raja*, 2 *desi* ploughings and 5 *sohaga*. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 1 hoeing. (ix) 27.88". (x) 31.10.1958.

2, TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(24) above.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1900 lb./ac. (ii) 274.1 lb./ac. (iii) Only N effect is significant. (iv) Av. yield of grain in lb./ac.

2. TREATMENTS :

6 manurial treatments : T_0=0, T_1=60 lb./ac. of N as A/S, T_2=100 lb./ac. of N as A/S, T_3=T_1+25 lb./ac. of P_2O_5 as Super, T_4=T_2 +50 lb./ac. of P_2O_5 as Super and T_5=T_4+25 lb./ac. of K_2O as Pot. Sul.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 1/41 ac. (b) 1/42 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Crop lodged and badly damaged by rain and hail storm. (ii) Severe damage due to borer. Spraying with D.D.T. (iii) Grain yield. (iv) (a) 1953—1954. (b) No., (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1018 lb./ac. (ii) 226.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. yield	790	1096	1053	1056	988	1128

S.E./mean = 92.3 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 59(9).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Maize.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loam and sandy loam. (b Refer soil analysis, Jullundur. (iii) 15.7.1959. (iv) (a) 1 *raja*, 3 *desi* ploughings, 7 *sohaga* and 1 horse hoe. (b) N.A. (c) 16 lb./ac. (d) and (e) N.A. (v) 16 C.L./ac. of F.Y.M. (vi) Hybrid. (vii) Irrigated. (viii) 3 hoeings, (ix) 21.48". (x) 1.10.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 manurial treatments : M_1=60 lb./ac. of N as C/A/N+60 lb./ac. of P_2O_5 as Super, M_2=120 lb./ac. of N as C/A/N+120 lb./ac. of P_2O_5 as Super.

(2) 3 levels of K_2O as Mur. Pot. : K_0=0, K_1=60. and K_2=120 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Spraying of D.D.T. (iii) Grain yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1387 lb./ac. (ii) 187.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	K_0	K_1	K_2	Mean
M_1	1415	1330	1312	1352
M_2	1463	1395	1406	1421
Mean	1439	1362	1359	1387

S.E. of K marginal mean = 54.1 lb./ac.
S.E. of M marginal mean = 44.2 lb./ac.
S.E. of body of table = 76.5 lb./ac.

	P_0	P_1	P_2	Mean
N_0	1876	1815	1631	1774
N_1	1692	1827	2021	1847
N_2	2140	2030	2066	2078
Mean	1903	1891	1906	1900

S.E. of any marginal mean = 79.1 lb./ac.
S.E. of body of table = 137.1 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 59(10).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of A/S and Super on the yield of Maize crop.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Wheat. (c) Nil. (ii) (a) Loam and sandy loam. (b) Refer soil analysis, Jullundur. (iii) 30.7.1959. (iv) (a) 1 *raja*, 5 *desi* ploughings and 8 *sohaga*. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) 112 lb./ac. of C/A/N applied on 17.9.1959. (vi) Pb. No. 1. (vii) Irrigated. (viii) 2 hoeings. (ix) 21.48". (x) 22.10.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(24) on page 208.

4. GENERAL :

(i) Good. (ii) 2 lb./ac. of D.D.T. sprayed. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1448 lb./ac. (ii) 280.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	1557	1280	1551	1462
N_1	1416	1628	1268	1437
N_2	1493	1345	1499	1445
Mean	1489	1418	1437	1448

S.E. of any marginal mean = 81.2 lb./ac.
S.E. of body of table = 140.4 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 54(169).**

Site :- Distt. and Demons. Farm, Kangra. **Type :- 'M'.**

Object :—To study the effect of placement of fertilizers on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 21.5.1954. (iv) (a) 5 ploughings and 4 *sohaga*. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and 2 weedings. (ix) 7.54". (x) 13.9.1954.

2. TREATMENTS :

6 methods of application of N : M_0 =Control, M_1=Drilled below seed row at sowing, M_2=In contact with seed at sowing, M_3=On both sides of rows at sowing, M_4=Broadcast at sowing and M_5=One month after sowing with 1st hoeing.

N at 50 lb./ac. as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 50.4′×7.5′. (b) 48.4′×7.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3383 lb./ac. (ii) 397.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	2438	3317	3641	3888	3788	3225

S.E./mean = 198.8 lb./ac.

Crop :- Maize. **Ref :- Pb. 54(171).**

Site :- Distt. and Demons. Farm, Kangra. **Type :- 'M'.**

Object :—To study the effect of B.M. and Super alone and in combination with A/S on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 22.5.1954. (iv) (a) 3 ploughings and 4 *sohaga*. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and 2 weedings. (ix) 7.54″. (x) 2.9.1954.

2. TREATMENTS :

6 manurial treatments : M_0=0, M_1=100 lb./ac. of N as A/S, M_2=100 lb./ac. of N as A/S+50 lb./ac. of P_2O_5 as Super, M_3=100 lb./ac. of N as A/S+50 lb./ac. of P_2O_5 as B.M., M_4=50 lb./ac. of P_2O_5 as B.M. and M_5=50 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 7.5′×48.4′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2460 lb./ac. (ii) 384.1 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	2036	2777	2978	2484	2229	2253

S.E./mean = 192.1 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 54(170).**

Site :- Distt. and Demons. Farm, Kangra. **Type :- 'M'.**

Object :—To compare the effect of A/S and C/N alone and in combination with Super on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 25.5.1954. (iv) (a) 3 ploughings and 4 *sohaga*. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viiii) 2 hoeings and 2 weedings. (ix) 7.54". (x) 11.9.1954.

2. TREATMENTS :

5 manurial treatments : M_0=Control, M_1=60 lb./ac. of N as C/N applied ½ at 1st hoeing and ½ at earing, M_2=60 lb./ac. of N as A/S applied ½ at hoeing and ½ at earing, M_3=60 lb./ac. of N as C/N applied ½ at hoeing and ½ before tashing+30 lb./ac. of P_2O_5 as Super at sowing and M_4=60 lb./ac. of N as A/S applied ½ at hoeing and ½ before tashing+30 lb./ac. of P_2O_5 as Super at sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) For rep. I and II 6′×53′ and for rep. III and IV 6′×50′. (b) 6′×45.4′, (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3108 lb./ac. (ii) 383.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4
Av. yield	2740	3176	3130	3264	3228

S.E./mean = 191.5 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 55(101).**

Site :- Agri. Stn., Karnal. **Type :- 'M'.**

Object :—To find out the best source of N alone and along with P for Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 27.6.1955. (iv) (a) and (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 25.37". (x) 14, 17.9.1955.

2. TREATMENTS :

6 manurial treatments : M_0=0, M_1=50 lb./ac. of N as A/S, M_2=50 lb./ac. of N as A/S+30 lb./ac. of P_2O_5 as Super, M_3=50 lb./ac. of N as Urea, M_4=50 lb./ac. of N as A/S/N and M_5=50 lb./ac. of N as A/S+25 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 81′×18′10". (b) 77′×18′10". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1955 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 593 lb./ac. (ii) 154.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	124	600	687	656	728	761

S.E./mean = 77.1 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 57(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type—II—To study the direct, residual and cumulative effect of manuring on Maize.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat—Cotton—*Senji.* (b) Cotton+*Senji.* (c) As per treatments. (ii) (c) Indus alluvium. (b) N.A. (iii) 1st week of July, 1957. (iv) (a) 6 to 9 cultivations and 1 hoeing. (b) Drilling. (c) 20 lb./ac. (d) 12″×12″. (e) Nil. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 1 thinning. (ix) 19″. (x) 3rd and 4th week of Sept., 1957.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 3 levels of N as A/S : N_0=0, N_1=30 and N_2=60 lb./ac.
(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=30 and P_2=60 lb./ac.
(3) 3 levels of K_2O as Pot. Sul. : K_0=0, K_1=30 and K_2=60 lb./ac.
(4) 3 levels of F.Y.M. : F_0=0, F_1=5000 and F_2=10000 lb./ac.

3. DESIGN :

(i) 3^4 fact. confd. (ii) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 30′×13′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Top borer attack. No control measures. (iii) Grain yield. (iv) (a) 1956—contd.(failed in 1956). (b) Yes. (c) N.A. (v) (a) Nil. (b) N.A. (vi) Crop damaged by birds. (vii) Expt. analysed as a split-plot, taking N, P, K and F in main-plots and the phases in sub-plots. The phases are : R_1=Manuring every crop in rotation, R_2=Manuring alternate crops in rotation starting with 1st and R_3=Manuring alternate crop in rotation starting with 2nd.

5. RESULTS :

(i) 1444 lb./ac. (ii) (a) 368.5 lb./ac. (b) 264.1 lb./ac. (iii) Main effect of R and interaction R×P are highly significant. Main effect of F and interactions N×F and K×F are significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	F_0	F_1	F_2	Mean
R_1	1453	1547	1547	1506	1485	1557	1435	1555	1558	1446	1415	1687	1516
R_2	1367	1365	1393	1240	1338	1547	1411	1373	1341	1311	1390	1424	1375
R_3	1492	1393	1442	1512	1368	1446	1328	1471	1527	1367	1445	1513	1442
Mean	1437	1435	1461	1419	1397	1517	1391	1466	1475	1375	1417	1541	1444
F_0	1392	1462	1271	1365	1303	1457	1361	1297	1467				
F_1	1356	1330	1565	1378	1414	1459	1409	1524	1317				
F_2	1563	1513	1547	1514	1474	1635	1403	1577	1642				
K_0	1386	1367	1421	1366	1365	1442							
K_1	1456	1451	1492	1440	1384	1575							
K_2	1469	1487	1469	1451	1442	1533							
P_0	1375	1396	1486										
P_1	1378	1367	1446										
P_2	1558	1542	1451										

S.E. of difference of two

1. N, P, K or F marginal means	= 57.9 lb./ac.
2. R marginal means	= 41.5 lb./ac.
3. R means at the same level of N, P, K or F	= 71.9 lb./ac.
4. N, P, K or F means at the same level of R	= 82.4 lb./ac.
S.E. of body of N×P, N×K, N×F, P×K, P×F or K×F table	= 70.9 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 58(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type II—To study the direct, residual and cumulative effects of manuring on Maize.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat—Cotton—*Senji*. (b) Cotton+*Senji*. (c) As per treatments. (ii) (a) Indus alluvium. (b) N.A. (iii) and (iv) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

3. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(MAE) type II on page 212.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

I. Cumulative effect

(i) 1156 lb./ac. (ii) 264.7 lb./ac. (iii) Main effect of N is highly significant and main effect of P is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	810	920	1478	1179	926	1102	987	1040	1180	1069
F_1	784	1094	1710	1263	1204	1121	1373	963	1252	1196
F_2	877	1211	1522	1332	1111	1166	1148	1225	1236	1203
	824	1075	1570	1258	1080	1130	1169	1076	1223	1156
K_0	791	1192	1524	1314	1186	1007				
K_1	769	984	1476	1127	972	1129				
K_2	912	1049	1709	1333	1082	1254.				
P_0	922	1172	1680							
P_1	633	1056	1552							
P_2	917	997	1477							

S.E. of any marginal mean = 50.9 lb./ac.
S.E. of body of any table = 88.2 lb./ac.

II. Residual effect

(i) 679 lb./ac. (ii) 300.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	507	581	750	609	752	478	674	647	518	613
F_1	880	760	661	796	731	774	864	693	744	767
F_2	569	792	607	691	596	681	717	635	616	656
Mean	652	711	673	699	693	644	752	658	626	679
K_0	656	835	765	784	702	770				
K_1	622	636	716	690	724	560				
K_2	678	662	538	623	653	602				
P_0	671	708	718							
P_1	582	826	671							
P_2	703	599	630							

S.E. of any marginal mean = 57.8 lb./ac.
S.E. of body of any table = 100.1 lb./ac.

III. Direct effect

(i) 1090 lb./ac. (ii) 236.5 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	645	954	1292	1093	968	831	976	904	1012	964
F_1	728	1146	1648	1227	1166	1129	1284	1173	1065	1174
F_2	712	1178	1502	1183	1070	1140	1208	1052	1133	1131
Mean	695	1093	1481	1168	1068	1033	1156	1043	1070	1090
K_0	717	1158	1593	1157	1178	1133				
K_1	682	1008	1439	1149	1023	957				
K_2	686	1113	1411	1198	1003	1009				
P_0	717	1163	1624							
P_1	682	1037	1485							
P_2	686	1079	1334							

S.E. of any marginal mean = 45.5 lb./ac.
S.E. of body of any table = 78.8 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 59(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type II—To study the cumulative, direct and residual effects of manures on Maize crop.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat—Cotton—*Senji.* (b) Cotton+*Senji.* (c) As per treatments. (ii) (a) Indus alluvium. (b) N.A. (iii) 4th week of June, 1959. (iv) (a) 3 harrowings. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 weedings. (ix) 19". (x) 4th week of Sept., 1959.

2. TREATMENTS :

Same as in expt. no. 57(MAE) type II on page 212.

3. DESIGN :

(i) 3^4 fact. confd. (ii) (a) 9 plots block; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 16.5'×33'. (b) 12.5'×31'. (v) N.A. (vi Yes.

4. GENERAL :

(i) Normal. (ii) Thrips and jassids controlled. (iii) Grain yield. (iv) (a) 1956—contd. (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

I. Cumulative effect

(i) 1242 lb./ac. (ii) 250.3 lb./ac. (iii) Main effect of N and F and interactions N×K and F×K are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	716	1029	1498	1070	1201	972	1103	1086	1054	1081
F_1	782	1325	1506	1300	1111	1201	1210	1144	1258	1204
F_2	1201	1399	1720	1317	1522	1481	1349	1391	1580	1440
Mean	900	1251	1575	1229	1278	1218	1221	1207	1297	1242
K_0	815	1168	1681	1185	1358	1120				
K_1	1053	1168	1400	1210	1160	1251				
K_2	832	1417	1643	1292	1316	1283				
P_0	815	1168	1705							
P_1	913	1349	1573							
P_2	972	1236	1446							

S.E. of any marginal mean = 48.2 lb./ac. ; S.E. of body of any table = 83.4 lb./ac.

II. Direct effect

(i) 1203 lb./ac. (ii) 353.9 lb./ac. (iii) Main effect of N is highly significant and main effect of F is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	658	1251	1448	1275	1103	979	1086	1070	1201	1119
F_1	798	1185	1432	1037	1258	1119	1201	1086	1127	1138
F_2	955	1465	1637	955	1465	1636	1399	1300	1357	1352
Mean	804	1300	1506	1089	1275	1245	1229	1152	1228	1203
K_0	831	1210	1647	1300	1292	1095				
K_1	790	1210	1456	1020	1259	1177				
K_2	791	1480	1414	947	1274	1463				
P_0	765	1333	1170							
P_1	806	1391	1628							
P_2	841	1176	1719							

S.E. of any marginal mean = 68.1 lb./ac. ; S.E. of body of any table = 118.0 lb./ac.

III. Residual effect

(i) 869 lb./ac. (ii) 115.3 lb./ac. (iii) Main effect of N and F and interactions N×P, P×K and F×K are highly significant. Interaction N×K is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	683	757	872	716	782	815	831	708	774	771
F_1	815	872	955	913	897	833	798	831	1014	881
F_2	996	905	963	922	996	947	1029	946	890	955
Mean	831	845	930	850	892	865	886	828	893	869
K_0	790	839	1028	848	1012	798				
K_1	831	815	837	782	848	854				
K_2	872	881	926	920	816	943				
P_0	831	889	830							
P_1	790	872	1013							
P_2	872	774	948							

S.E. of any marginal mean = 22.2 lb./ac.
S.E. of body of any table = 38.4 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 58(SFT).**

Centre :- Ambala (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Maize to different levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) June—July. (vii) to (ix) N.A. (x) September—October.

2. TREATMENTS :

0 =Control (no manure).
n =20 lb./ac. of N as A/S.
p =20 lb./ac. of P_2O_5 as Super.
np =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
k =20 lb./ac. of K_2O as Mur. Pot.
nk =20 lb./ac. of N as A/S+20 lb./ac. of K_2O as Mur. Pot.
pk =20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. Pot.
npk =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. Pot.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crops, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of Type A and the other half of Type B on crops other than legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The above experiments are laid out in randomly located fields in randomly selected villeges in each of the 4 zones at the rate of one experiment per village. (iii) (a) N.A. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) Nil.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	132	33	66	54.3	58	0	0	82	52.7

Control yield = 576 lb./ac. and no. of trials = 7.

Crop :- Maize *(Kharif).* **Ref :- Pb. 59(SFT).**

Centre :- Ambala (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Maize to different levels of N, P and K applied individually and in combination.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A above conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. respone in lb./ac.	453	280	239	58.4	115	41	82	82	36.2

Control yield = 1399 lb./ac. and no. of trials = 4.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 58(SFT).**

Centre :- Hoshiarpur (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Maize to different levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Tarai and Sub-mountain. (iii) to (v) N.A. (vi) June—July, 1958. (vii) to (ix) N.A. (x) September—October, 1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 216 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	280	197	165	47.7	41	49	49	140	37.0

Control yield = 1136 lb./ac. and no. of trials = 14.

Crop :- Maize *(Kharif)*, **Ref :- Pb. 59(SFT).**

Centre :- Hoshiarpur (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Maize to different levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Tarai and Sub-mountain. (iii) to (v) N.A. (vi) June—July, 1959. (vii) to (ix) N.A. (x) September—October 1999.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 216 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	403	156	148	140.7	0	8	49	0	79.0

Control yield = 1053 lb./ac. and no. of trials = 20.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 58(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Maize to different levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 216 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	551	337	49	42.8	—33	—25	49	66	39.5

Control yield = 1596 lb./ac. and no. of trials = 16.

Crop :- Maize *(Kharif).* **Ref :- Pb. 59(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Maize to different levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 216 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	420	214	66	25.5	16	—16	49	49	28.0

Control yield = 1399 lb./ac. and no. of trials = 14.

Crop :- Maize *(Kharif).* **Ref :- Pb. 58(SFT).**

Centre :- Karnal (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Maize to different levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 216 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	123	99	41	25.5	8	—33	8	33	14.0

Control yield = 790 lb./ac. and no. of trials = 8.

Crop :- Maize *(Kharif).* **Ref :- Pb. 59(SFT).**

Centre :- Ludhiana (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Maize to different levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58 (SFT) type A on page 216 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	239	148	—16	156.3	—148	91	33	91	139.9

Control yield = 2107 lb./ac. and no. of trials = 5.

Crop :- Maize *(Kharif).* **Ref :- Pb. 58(SFT).**

Centre :- Patiala (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Maize to different levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 216 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	346	263	41	56.0	16	181	148	33	38.7

Control yield = 1300 lb./ac. and no. of trials = 6.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 59(SFT).**

Centre :- Patiala (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Maize to different levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 216 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	313	49	123	47.7	—82	0	49	16	56.0

Control yield = 1835 lb./ac. and no. of trials = 8.

Crop :- Maize *(Kharif)*. **Ref :- 58(SFT).**

Centre :- Sangrur. **Type :- 'M'.**

Object :—Type A—To study the response of Maize to different levels of N, P and K, applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 216 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	247	33	115	41.1	16	41	—16	115	51.8

Control yield = 1613 lb./ac. and no. of trials = 6.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 59(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Maize to different levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 216 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	206	49	123	94.6	—99	—8	—8	189	111.1

Control yield = 1901 lb./ac. and no. of trials = 6.

Crop :- Maize *(Kharif)*. **Ref : Pb. 58(SFT).**

Centre :- Ambala (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) June—July. (vii) to (ix) N.A. (x) September—October.

2. TREATMENTS :

0 =Control (no manure).
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1' =20 lb./ac. of N as Urea.
n_2' =40 lb./ac. of N as Urea.
n_1''=20 lb./ac. of N as C/A/N.
n_2''=40 lb./ac. of N as C/A/N.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant posted in each zone. The field assistant conducted the trials in one Revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on *kharif* cereal, 8 on *rabi* cereal, 8 on cash crops, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) 1/40 ac. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) Nil.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	905	963	1259	1053	1053	1061	1251

G.M. = 1078 lb./ac. ; S.E./mean = 59.3 lb./ac. and no. of trials = 7.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 59(SFT).**

Centre :- Ambala (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B above conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	1440	1646	1991	1687	1794	1580	1703

G.M. = 1692 lb./ac. ; S.E./mean = 68.7 lb./ac. and no. of trials = 7.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 58(SFT).**

Centre :- Hoshiarpur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) *Tarai* and sub-mountain. (iii) to (v) N.A. (vi) June—July. (vii) to (ix) N.A. (x) September—October.

2. TREATMENTS :

0 =Control.
n_1' =20 lb./ac. of N as Urea.
n_2' = 40 lb./ac. of N as Urea.
n_1'' =20 lb./ac. of N as A/S/N.
n_2'' =40 lb./ac. of N as A/S/N.
n_1'''=20 lb./ac. of N as C/A/N.
n_2'''=40 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 220 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield in lb./ac.	1177	1514	1810	1415	1679	1448	1605

G.M. = 1521 lb./ac. ; S.E./mean = 35.5 lb./ac. and no. of trials = 14.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 59(SFT).**

Centre :- Hoshiarpur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) *Tarai* and sub-mountain. (iii) to (v) N.A. (vi) June—July 1959. (vii) to (ix) N.A. (x) September—October 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 220 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	1193	1563	1901	1555	1843	1547	1868

G.M. = 1639 lb./ac. ; S.E./mean = 46.0 lb./ac. and no. of trials = 16.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 58(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 220 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	1267	1868	2263	1753	2049	1761	2131

G.M. = 1870 lb./ac. ; S.E./mean = 55.9 lb./ac. and no. of trials = 13.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 59(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 220 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	1218	1580	1810	1539	1769	1621	1909

G.M. = 1635 lb./ac. ; S.E./mean = 43.6 lb./ac. and no. of trials = 15.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 59(SFT).**

Centre :- Kangra (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (v) N.A. (vi) June—July, 1959. (vii) to (ix) N.A. (x) September—October, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 220 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	1119	1300	1679	1349	1860	1349	1728

G.M. = 1483 lb./ac. ; S.E./mean = 29.1 lb./ac. and no. of trials = 5.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 58(SFT).**

Centre :- Karnal (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 220 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	971	996	1078	996	1136	1111	1160

G.M. = 1064 lb./ac. ; S.E./mean = 20.4 lb./ac. and no. of trials = 7.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 59(SFT).**

Centre :- Ludhiana (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 220 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	2831	2691	3168	2683	3250	2683	2765

G.M. = 2867 lb./ac. ; S.E./mean = 258.9 lb./ac. and no. of trials = 4.

Crop :- Maize *(Kharif).* **Ref :- Pb. 58(SFT).**

Centre :- Patiala (c.f.) **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 220 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	1251	1481	1588	1563	1744	1547	1843

G.M. = 1574 lb./ac. ; S.E./mean = 51.2 lb./ac. and no. of trials = 8.

Crop :- Maize *(Kharif).* **Ref :- Pb. 59(SFT)**

Centre :- Patiala (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 85(SFT) type B on page 220 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	1958	2205	2403	2172	2279	2238	2526

G.M. = 2254 lb./ac. ; S.E./mean = 87.3 lb./ac. and no. of trials = 8.

Crop :- Maize *(Kharif).* **Ref :- Pb. 58(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 220 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	1646	1753	1958	1884	2024	1827	1950

G.M. = 1863 lb./ac. ; S.E./mean = 46.0 lb./ac. and no. of trials = 8.

Crop :- Maize *(Kharif).* **Ref :- Pb. 59(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 220 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	1637	1884	2255	1909	2255	2123	2271

G.M. = 2048 lb./ac. ; S.E./mean = 84.4 lb./ac. and no. of trials = 5.

Crop :- Maize *(Kharif).* **Ref :- Pb. 54(51).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'C'.**

Object :— To find out the optimum date of sowing for Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) As per treatments. (iv) (a) 7 ploughings, 3 *sohaga* and 2 roller. (b) N.A. (c) 20 srs./ac. (d) 12″×12″, (e) N.A. (v) 10 C.L./ac. of F.Y.M. applied by broadcast and 10 srs. of A/S applied on 5.7.1954 by broadcast. (vi) Local. (vii) Irrigated. (viii) 1 thinning and 2 hoeings. (ix) 27.34″. (x) 18.9.1954, 18.9.1954 and 21.9.1954.

2. TREATMENTS :

3 dates of sowing : D_1=15.6.1954, D_2=25.6.1964 and D_3=5.7.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 14′×81′. (b) 12′×75′ 7½″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1954—only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (v) and (vii) Nil.

5. RESULTS :

(i) 1491 lb./ac. (ii) 334.9 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	D_1	D_2	D_3
Av. yield	1790	1572	1111

S.E./mean = 136.7 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- Pb. 59(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'CM'.**

Object :— Type VIII—To study the effect of manures and cultural operations on Maize.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Indus alluvium. (b) N.A. (iii) 4th week of June 1959. (iv) (a) 3 harrowings. (b) to (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) N.A. (vii) Irrigated. (viii) 2 weedings. (ix) 19″. (x) 4th week of Sept. 1959.

2. TREATMENTS :

Main-plot treatments :

All combinations (1) and (2)

(1) 3 dates of sowing : D_1=15.6.1959, D_2=30.6.1959 and D_3=15.7.1959.

(2) 3 spacings : S_1=1′×1′, S_2=1.5′×1.25′ and S_3=2′×1.5′.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=20 and N_2=40 lb./ac.

(2) levels of P_2O_5 as Super : P_0=0, P_1=20 and P_2=40 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block and 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Thrips and jassids attack—controlled. (iii) Grain yield. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1287 lb./ac. (ii) (a) 929.9 lb./ac. (b) 324.2 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	S_1	S_2	S_3	N_0	N_1	N_2	Mean
P_0	1308	1177	1301	1440	1391	955	1087	1177	1522	1262
P_1	1358	1308	1218	1374	1465	1046	1078	1218	1589	1295
P_2	1234	1259	1423	1481	1415	1018	1201	1193	1521	1305
Mean	1300	1248	1314	1432	1424	1006	1122	1196	1544	1287
N_0	1210	971	1185	1185	1275	906				
N_1	1218	1218	1152	1284	1382	922				
N_2	1472	1555	1605	1827	1615	1190				
	1646	1308	1342							
S_2	1531	1284	1457							
S_3	723	1152	1143							

S.E. of difference of two

1. D or S marginal means	=	179.0 lb./ac.
2. N or P marginal means	=	62.4 lb./ac.
3. N or P means at the same level of D or S	=	108.1 lb./ac.
4. D or S means at the same level of N or P	=	345.6 lb./ac.
S.E. of body of D×S table	=	219.2 lb./ac.
S.E. of body of N×P table	=	76.4 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 57(55).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'D'.**

Object :—To study the effect of weedicides on Maize crop.

1. BASAL CONDITIONS :

(i) (a) *Berseem*—Maize. (b) *Berseem*. (c) N.A. (ii) (a) Sandy loam to clay loam. (b) N.A. (iii) 2.8.1957. (iv) (a) 4 *desi* plough. (b) Sown by *kera*. (c) 10 srs./ac. (d) 18″ between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and 1 gap silling. (ix) 18.66″. (x) 29.10.1957.

2. TREATMENTS :

T_0=Control, T_1=Local method of weeding, T_2=Pre-emergence spray of weedicide, T_3=Post-emergence spray of weedicide, (once), T_4=Post-emergence spray of weedicide (twice), T_5=Combinations of pre-emergence+post emergence spray of weedicide (one application), T_6=Pre-emergence application of weedicide and cultural method of weeding, T_7=Post-emergence application of weedicide and cultural method of weeding and T_8=Pre-emergence + post-emergence of application of weedicide (once) + cultural method of weeding.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 49.5′×11′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Crops damaged by heavy rains. (vii) Nil.

5. RESULTS :

(i) 657 lb./ac. (ii) 180.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8
Av. yield	674	591	867	566	555	699	594	584	787

S.E./mean = 90.4 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb.58(58).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'D'.**

Object :—To study the effect of weedicides on Maize.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 3.7.1958. (iv) (a) N.A. (b) Sown by *kera*. (c) 10 srs./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 23.18″. (x) 20, 21.10.1958.

2. TREATMENTS :

Same as in expt. no. 57(55) on page 225.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 54′×10′.1″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Crop badly damaged by heavy rains. (vii) Nil.

5. RESULTS :

(i) 1139 lb./ac. (ii) 359.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8
Av. yield	1105	1419	1254	802	1095	1079	1352	966	1182

S.E./mean = 179.8 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 57(56).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'D'.**

Object :—To study the effect of weedicide on Maize crop.

1. BASAL CONDITIONS :

(i) (a) *Berseem*—Maize. (b) *Berseem*. (c) N.A. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 1.8.1957. (iv) (a) 4 *desi* ploughings. (b) Sown by *kera*. (c) 10 srs./ac. (d) 18″ between rows. (e) N.A. (v) 3 mds./ac. of A/S and 3 mds./ac. of Super applied on 1.8.1957. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and 1 gap-filling. (ix) 12.08″. (x) 29.10.1957.

2. TREATMENTS :

Main-plot treatments :

4 weedicides : W_1=Feronoxone, W_2=Dicotox, W_3=Kathon and W_4=Agroxone.

Sub-plot treatments :

5 doses of weedicides : D_0=0, D_1=8, D_2=12, D_3=16 and D_4=20 ozs./ac.

Weedicides applied on 22.8.1957.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 5 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 44′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Crop damaged by rains. (vii) Nil.

5. RESULTS :

(i) 744 lb./ac. (ii) (a) 367.0 lb./ac. (b) 208.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	D_0	D_1	D_2	D_3	D_4	Mean
W_1	—	921	901	768	794	846
W_2	—	776	712	768	720	744
W_3	—	832	753	776	789	787
W_4	—	667	651	580	593	624
Mean	722	799	754	723	724	—

S.E. of difference of two

1. W marginal means = 116.0 lb./ac.
2. D marginal means = 65.9 lb./ac.
3. D means at the same level of W = 131.9 lb./ac.
4. W means at the same level of D = 162.9 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 58(59).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'D'.**

Object :—To study the effect of weedicides on Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam to clayey loam. (b) N.A. (iii) 3.7.1958. (iv) (a) N.A. (b) Sown by *kera*. (c) 10 srs./ac. (d) 12″×18″. (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) and (ix) N.A. (x) 20, 21.10.1958.

2. TREATMENTS :

Same as in expt. no. 57(56) on page 226.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 5 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/264 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Crop damaged due to heavy rains. (vii) Nil.

5. RESULTS :

(i) 2227 lb./ac. (ii) (a) 1706 lb./ac. (b) 558 lb./ac. (iii) Interaction W×D alone is significant. (iv) Av. yield of grain in lb./ac.

	D_0	D_1	D_2	D_3	D_4	Mean
W_1	—	2090	2545	2382	2620	2409
W_2	—	2070	2796	2124	1527	2129
W_3	—	2504	1954	2009	2232	2175
W_4	—	2111	1819	2199	2043	2043
Mean	2380	2194	2278	2178	2105	—

S.E. of difference of two

1. W marginal means = 539.4 lb./ac.
2. D marginal means = 185.9 lb./ac.
3. D means at the same level of W = 371.9 lb./ac.
4. W means at the same level of D = 620.0 lb./ac.

Crop :- Bajra *(Kharif)*. **Ref :- Pb. 58(81).**

Site :- Agri. Exptl. Stn., Ferozepur. **Type :- 'M'.**

Object :—To study the effect of different methods and times of application of A/S on Bajra.

1. BASAL CONDITIONS :

(i) (a) *Bajra*—Wheat. (b) Wheat. (c) Nil. (ii) (a) Clay loam to sandy loam. (b) N.A. (iii) 11.7.1958. (iv) (a) 4 ploughings and 4 *sohaga*. (b) Sown by *kera*. (c) 3 srs./ac. (d) 12″×9″ to 12″. (e) N.A. (v) Nil. (vi) A/3. (vii) Irrigated. (viii) 3 hoeings and 1 thinning. (ix) N.A. (x) Last week of Dec., 1958.

2. TREATMENTS :

8 methods of application of N : M_0=Control (no application), M_1=Pre-sowing by broadcast, M_2=Pre-sowing in plough furrows, M_3=Half before sowing by broadcast+half at earing time, M_4=After thinning, M_5=At earing time, M_6=Half at pre-sowing and half after thinning in equal doses and M_7=Half at thinning +half at earing.

N at 40 lb./ac. as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 58′×11′. (b) 48.4′×9′. (v) 4.8′×1′. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 696 lb./ac. (ii) 122.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Av. yield	469	673	733	906	692	520	855	722

S.E./mean = 50.1 lb./ac.

Crop :- Bajra. **Ref :- Pb. 54(160).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of different sources of N on the yield of Bajra.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Berseem.* (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Rohtak. (iii) 17.7.1954. (iv) (a) to (e) N.A. (v) Nil. (vi) T—55 (medium). (vii) Irrigated. (viii) Nil. (ix) 15.00". (x) 11.11.1954.

2. TREATMENTS :

4 sources of 30 lb./ac. of N : S_0=Control, S_1=A/S, S_2=A/N and S_3=Urea.

3. DESIGN :

(i) R.B.D. (Ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) and (b) 1/16 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 340 lb./ac. (ii) 36.0 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	275	286	467	331

S.E./mean = 25.4 lb./ac.

Crop :- Bajra. **Ref :- Pb. 54(161).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :— To study the effect of manures on the yield of Bajra.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Rohtak. (iii) 17.7.1954. (iv) (a) to (e) N.A. (v) Nil. (vi) T—55 (medium). (vii) Irrigated. (viii) Nil. (ix) 15.00". (x) 11.11.1954.

2. TREATMENTS :

4 manurial treatments : M_0=Control, M_1=30 lb./ac. of N, M_2=M_1+15 lb./ac. of P_2O_5 and M_3=60 lb./ac. of N +30 lb./ac. of P_2O_5+15 lb./ac. of K_2O.

N applied as A/S, P_2O_5 as Super and K_2O as Pot. Sul.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1954 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 352 lb./ac. (ii) 25.3 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	250	406	345	409

S.E./mean = 17.9 lb./ac.

Crop :- Bajra *(Kharif).* **Ref :- Pb. 59(SFT).**

Centre :- Hissar (c.f.). **Type :- 'M'.**

Object :— Type A—To study the response of Bajra to diffrent levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) July. (vii) to (ix) N.A. (x) October—November.

2. TREATMENTS :

0 =Control (no manure).
n =20 lb./ac. of N as A/S.
p =20 lb./ac. of P_2O_5 as Super.
np =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
k =20 lb./ac. of K_2O as Mur. Pot.
nk =20 lb./ac. of N as A/S+20 lb./ac. of K_2O as Mur Pot.
pk =20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. Pot.
npk =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. Pot.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one Revenue circle or *thana* in the one zone and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal,8 on a *rabi* cereal, 8 on cash crop, 4 on an oilseed crop and 3 on a legumenous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate applications are being studied on type C trials in two out of the four zones in each district every year. The above experiments will be laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) N.A. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) Nil.

5, RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	165	8	49	49.4	—33	—16	8	49	18.1

Control yield = 453 lb./ac. and no. trials = 5.

———

Crop :- Bajra *(Kharif).* **Ref :- Pb. 59(SFT).**

Centre :- Rohtak (c.f.). **Type :- 'M'.**

Object :— Type A—To study the response of Bajra to different levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 59(SFT) type A above conducted at Hissar.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	74	49	—34	47.7	—58	—74	16	—41	46.1

Control yield = 527 lb./ac. and no. of trials = 5.

———

Crop :- Bajra *(Kharif)*. **Ref :- Pb. 59(SFT).**

Centre :- Ferozepur (c.f.). **Type :- 'M'.**

Object :— Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) Nil. (vi) July, 1959. (vii) to (ix) N.A. (x) October—November 1959.

2. TREATMENTS :

0 =Control (no manure).
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1' =20 lb./ac. of N as Urea.
n_2' =40 lb./ac. of N as Urea.
n_1''' =20 lb./ac. of N as C/A/N.
n_2''' =40 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 59(SFT) type A on page 230 conducted at Hissar.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	1382	1580	1744	1547	1728	1563	1769

G.M. = 1616 lb./ac. ; S.E./mean = 26.2 lb./ac. and no. of trials = 4.

Crop :- Bajra *(Kharif)*. **Ref :- Pb. 59(SFT).**

Centre :- Rohtak (c.f.). **Type :- 'M'.**

Object :— Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) Nil. (vi) July, 1959. (vii) to (ix) N.A. (x) October—November, 1959.

2. TREATMENTS :

0 =Control (no manure).
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1' =20 lb./ac. of N as Urea.
n_2' =40 lb./ac. of N as Urea.
n_1''' =20 lb./ac. of N as C/A/N.
n_2''' =40 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 59(SFT) type A on page 230 conducted at Hissar.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	741	765	773	872	880	955	815

G.M. = 829 lb./ac. ; S.E./mean = 58.2 lb./ac. and no. of trials = 5.

Crop :- Potato *(Rabi).* **Ref :- Pb. 59(11).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'MV'.**

Object :—To find out the best combination of N, P and K for different varieties of Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 20, 23.10.1959. (iv) (a) Ploughing and hand hoeing. (b) Sown in lines by dibbling. (c) 802 lb./ac. (d) and (e) N.A. (v) 25 tons/ac. of F.Y.M. in replication I and III. (vi) As per treatments. (vii) Irrigated. (viii) 1 hoeing and 1 earthing (ix) N.A. (x) 1 to 4.3.1960.

2. TREATMENTS :

Main-plot treatments :

3 varieties : V_1=Up to date, V_2=Craig's defiance and V_3=O.N. 2236.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 4 levels of N : N_0=0, N_1=50, N_2=100 and N_3=150 lb./ac.

(2) 2 levels of P_2O_5 : P_0=0 and P_1=50 lb./ac.

(3) 2 levels of K_2O : K_0=0 and K_1=50 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 16 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 15′×6′. (b) 12′×6′. (v) 1.5′ on either side. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Spraying of 2 lb./ac. of D.D.T. (iii) Potato yield. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 26412 lb./ac. (ii) (a) 16728 lb./ac. (b) 3453 lb./ac. (iii) Only main effect of V is significant. (iv) Av. yield of potato in lb./ac.

	N_0	N_1	N_2	N_3	P_0	P_1	K_0	K_1	Mean
V_1	29381	28205	28118	29444	28286	29289	28487	29087	28787
V_2	28711	29118	30227	31655	30275	29580	29692	30163	29928
V_3	20521	21048	19707	20708	20445	20597	20032	21010	20521
Mean	26238	26124	26017	27269	26335	26489	26070	26753	26412
K_0	26464	25887	25259	26671	26296	25845			
K_1	26011	26360	26775	27867	26375	27132			
P_0	26192	25919	26173	27057					
P_1	26283	26328	25862	27481					

S.E. of difference of two

1. V marginal means = 2957 lb./ac.
2. N marginal means = 705 lb./ac.
3. P or K marginal means = 498 lb./ac.
4. N means at the same level of V = 1221 lb./ac.
5. V means at the same level of N = 3140 lb./ac.
6. P or K means at the same level of V = 863 lb./ac.
7. V means at the same level of P or K = 3019 lb./ac.

S.E. of body of N×P or N×K table = 705 lb./ac.

S.E. of body of P×K table = 498 lb./ac.

Crop :- Potato *(Rabi).* **Ref :- Pb. 59(12).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'MV'.**

Object :—To find out the best combination of N, P and K for different varieties of Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 20, 23.10.1959. (iv) (a) N.A. (b) Sown in lines by dibbling. (c) 10 mds./ac. (d) and (e) N.A. (v) 25, tons/ac. of F.Y.M. in replication I and III. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) 1 to 4.3.1960.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1=P.S. 408 and V_2=Kufri Red.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 4 levels of N as C/A/N : N_0=0, N_1=50, N_2=100 and N_3=150 lb./ac.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=50 lb./ac.

(3) 2 levels of K_2O as Mur. Pot. : K_0=0 and K_1=50 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 16 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 15′×6′. (b) 12′×6′. (v) 1½′ on either side. (vi) Yes.

4. GENERAL :

(t) Good. (ii) D.D.T. sprayed on 14.12.1959. (iii) Potato yield. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 42805 lb./ac. (ii) (a) 896 lb./ac. (b) 4144 lb./ac. (iii) Only the main effects of V and N are highly significant. (iv) Av. yield of potato in lb./ac.

	N_0	N_1	N_2	N_3	P_0	P_1	K_0	K_1	Mean
V_1	38025	39295	41978	43327	40455	40857	40546	40766	40656
V_2	41965	45867	45660	46321	44312	45595	45368	44539	44953
Mean	39995	42581	43819	44824	42384	43226	42957	42653	42805
K_0	38712	43158	44727	45233	42127	43787			
K_1	41278	42004	42911	44415	42640	42665			
P_0	38932	42497	43780	44325					
P_1	41058	42665	43858	45323					

S.E. of difference of two

1. V marginal means = 182.89 lb./ac.
2. N marginal means = 1196.27 lb./ac.
3. P or K marginal means = 845.89 lb./ac.
4. N means at the same level of V = 1691.77 lb./ac.
5. V means at the same level of N = 1476.50 lb./ac.
6. P or K means at the same level of V = 1196.27 lb./ac.
7. V means at the same level of P or K = 865.44 lb./ac.

S.E. of body of N×P or N×K table = 1196.27 lb./ac.

S.E. of body of P×K table = 845 89 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- Pb. 57(25).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'CV'.**

Object :—To find out the best date of sowing, seed rate, and spacing for different varieties of Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) and (b) N.A. (c) and (d) As per treatments. (e) Nil. (v) 20 C.L./ac. of F.Y.M. on 31.8.1957, 112 lb./ac. of Super and 41 lb./ac. of Pot. Sul. on 30.9.1957, 136 lb./ac. of A/S on 13.11.1957 and 112 lb./ac. of A/S on 29.11.1957 and 30.9.1957. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 6.58″. (x) 1 to 9.2.1958.

2. TREATMENTS :

Main-plot treatments :

2 dates of sowing : D_1=20.9.1957 and D_2=1.10.1957.

Sub-plot treatments :

3 spacings : R_1=Single row 1½' apart, R_2=Single row 2' apart and R_3=Double row 2½' apart.

Sub-sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 2 varieties : V_1=Improved and V_2=Patna Red.

(2) 2 seed rates : S_1=7-8 sets and S_2=10-12 sets.

(3) 2 types af seed : W_1=Whole tuber and W_2=Cut tuber.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 3 sub-plots/main-plot and 8 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 11'×182'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) D.D.T. was sprayed against potato blight. (iii) Yield of potato. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 17335 lb./ac. (ii) (a) 7141 lb./ac. (b) 1194 lb./ac. (c) 2943 lb./ac. (iii) Main effects of R, S and interactions D×R, V×S and D×V×R are highly significant. (iv) Av. yield of potato in lb./ac.

	R_1	R_2	R_3	V_1	V_2	S_1	S_2	W_1	W_2	Mean
D_1	16457	15651	19586	15774	18688	16848	17614	23403	11059	17231
D_2	17866	16092	18361	17367	17512	15911	18969	23326	11554	17440
Mean	17161	15871	18973	16570	18100	16379	18291	23364	11306	17335
W_1	23712	21103	25277	22244	24484	20782	25947			
W_2	10611	10639	12669	10896	11716	11976	10636			
S_1	15904	15306	17927	15307	17451					
S_2	18418	16436	20020	17833	18750					
V_1	16952	14444	18314							
V_2	17370	17299	19632							

S.E. of difference of two

1. D marginal means = 1190.2 lb./ac.
2. R marginal means = 243.7 lb./ac.
3. V or S or W marginal means = 490.5 lb./ac.
4. R means at the same level of D = 344.7 lb./ac.
5. D means at the same level of R = 1223.0 lb./ac.
6. V or S or W means at the same level of D = 693.7 lb./ac.
7. D means at the same level of V or S or W = 1287.3 lb./ac.
8. V or S or W means at the same level of R = 849.6 lb./ac.
9. R means at the same level of V or S or W = 648.3 lb./ac.

S.E. of body of V×S or V×W or S×W table = 490.5 lb./ac.

Crop :- Potato *(Rabi)*. **Ref :- Pb. 58(23).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'CV'.**

Object :—To find out the best date of sowing, spacing and seed rate for different varieties of Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) and (b) N.A. (c) 22 mds. 17 seers. (d) and (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) Gap-filling on 23.10.1958. (ix) 12.03". (x) 9, 10, 16 to 18, 20.2.1959.

2. TREATMENTS :

Main-plot treatments :

2 dates of sowing : D_1=21.9.1958 and D_2=7.10.1958.

Sub-plot treatments :

3 spacings : R_1=Single row 1½′ apart, R_2=Single row 2′ apart and R_3=Double row 2¼′ apart.

Sub-sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 2 varieties : V_1=Up to date and V_2=Patna red.

(2) 2 seed rates : S_1=7-8 and S_2=10-12 sets.

(3) 2 types of seeds : W_1=Whole tuber and W_2=Cut tuber.

3. DESIGN :

(i) Split-plot. (ii) 2 main-plots/replication, 3 sub-plots/main-plot and 8 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 11′×18′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) 1 lb./ac. and 2¼ lb./ac. of D.D.T. sprayed on 30.10.1958 and 4.12.1958 respectively. (iii) Potato yield. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 12196 lb./ac. (ii) (a) 2939 lb./ac. (b) 2166 lb./ac. (c) 1371 lb./ac. (iii) Main effects of R, V, W and interactions D×R and S×W are highly significant. Interaction V×R is significant. (iv) Av. yield of potato in lb./ac.

	R_1	R_2	R_3	V_1	V_2	S_1	S_2	W_1	W_2	Mean
D_1	11597	10979	13902	10779	13540	12959	11359	16889	7429	12159
D_2	11785	12291	12623	10709	13757	12980	11487	16931	7535	12233
Mean	11691	11635	13262	10744	13648	12969	11423	16910	7482	12196
W_1	16223	16208	18300	14867	18953	16139	17682			
W_2	7159	7062	8225	6621	8344	9800	5164			
S_1	12458	12473	13976	11380	14559					
S_2	10924	10797	12548	10108	12738					
V_1	10733	10181	11318							
V_2	12649	13089	15207							

S.E. of difference of two

1. D marginal means = 489.8 lb./ac.
2. R marginal means = 442.1 lb./ac.
3. V or S or W marginal means = 228.5 lb./ac.
4. R means at the same level of D = 625.3 lb./ac.
5. D means at the same level of R = 707.5 lb./ac.
6. V or S or W means at the same level of D = 323.2 lb./ac.
7. D means at the same level of V or S or W = 540.5 lb./ac.
8. V or S or W means at the same level of R = 395.8 lb./ac.
9. R means at the same level of V or S or W = 523.3 lb./ac.

S.E. of body of V×S or V×W or S×W table = 228.5 lb./ac.

Crop :- Potato. **Ref :- Pb. 59(SFT).**

Centre :- Kangra (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Potato to different levels of N, P and K applied individually and in conbinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (x) N.A.

2. TREATMENTS :

0 =Control (no manure).
n =50 lb./ac. of N as A/S.
p =25 lb./ac. of P_2O_5 as Super.
np =50 lb./ac. of N as A/S+25 lb./ac. of P_2O_5 as Super.
k =50 lb./ac. of K_2O as Mur. Pot.
nk =50 lb./ac. of N as A/S+50 lb./ac. of K_2O as Mur. Pot.
pk =25 lb./ac. of P_2O_5 as Super+50 lb./ac. of K_2O as Mur. Pot.
npk =50 lb./ac. of N as A/S+25 lb./ac. of P_2O_5 as Super+50 lb./ac. of K_2O as Mur. Pot.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one Revenue circle or *thana* in the one and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crop, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are being studied on type C trials in two out of the four zones in each district every year. The above experiments will be laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Tuber yield. (iv) (a) 1959—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) N.A.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in tons/ac.	2.869	1.231	0.973	0.428	—0.140	0.349	—0.077	—0.029	0.277

Control yield = 3.589 tons/ac. and no. of trials = 8.

Crop :- Potato. **Ref :- Pb. 59(SFT).**

Centre :- Kangra (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (x) N.A.

2. TREATMENTS :

0 =Control (no manure).
n_1 = 50 lb./ac. of N as A/S.
n_2 =100 lb./ac. of N as A/S.
n_1' = 50 lb./ac. of N as Urea.
n_2' =100 lb./ac. of N as Urea.
n_1'' = 50 lb./ac. of N as C/A/N.
n_2'' =100 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 59(SFT) type A on page 235 conducted at Kangra.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in tons/ac.	5.198	7.604	9.984	8.100	9.801	7.891	10.451

G.M. = 8.433 tons/ac. ; S.E./mean = 0.377 tons/ac. and no. of trials = 8.

Crop :- Gram *(Rabi)*. **Ref :- Pb. 56(41).**

Site :- Distt. Demons. Farm, Ambala. **Type :- 'M'.**

Object :—To compare the effects of A/S and super on yield of Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Clay. (b) N.A. (iii) 6.11.1956. (iv) (a) 4 *desi hal* and *sohaga* 2 times. (b) N.A. (c) 17½ srs./ac. (d) and (e) N.A. (v) N.A. (vi) Punjab no. 7. (vii) Irrigated. (viii) N.A. (ix) 5.42". (x) 10.4.1957.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 2 levels of N as A/S : N_0=0 and N_1=25 lb./ac.
(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=50 lb./ac.
2½ lb./plot of Super and 3 lb./plot of A/S drilled.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 16.5'×66'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 1617 lb./ac. (ii) 195.3 lb./ac. (iii) Main effect of P alone is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	Mean
N_0	1452	1691	1571
N_1	1609	1717	1663
Mean	1530	1704	1617

S.E. of any marginal mean = 56.4 lb./ac.
S.E. of body of table = 79.7 lb./ac.

Crop :- Gram. **Ref :- Pb. 54(104).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To study the effect of super on Gram crop.

1. BASAL CONDITIONS :

(i) (a) Gram—*Bajra*—Wheat—Fallow. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 16.10.1954. (iv) (a) 1 *raja hal*, 6 *desi hal* and 12 plankings. (b) N.A. (c) 42 srs./ac. (d) 1' between rows. (e) N.A. (v) Nil. (vi) C—104 (medium). (vii) Irrigated. (viii) 2 hoeings and weeding. (ix) 1.27". (x) 12.4.1955.

2. TREATMENTS :

4 levels of P_2O_5 as Super : P_0=0, P_1=50, P_2=75 and P_3=100 lb./ac.
P_2O_5 applied in furrows by *kera* behind the plough on 16.10.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) 132'×15'. (b) 121'×15'. (v) 5.5' on either side. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) Germination, growth, date of flowering and yield of grain. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Rohtak. (b) N.A. (vi) and (vii) Nil.

RESULTS :

(i) 965 lb./ac. (ii) 54.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2	P_3
Av. yield	921	996	964	979

S.E./mean = 19.4 lb./ac.

Crop :- Gram. **Ref :- Pb. 54(158).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of N, P and K on Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) 16.10.1954. (iv) (a) to (e) N.A. (v) Nil. (vi) I.P—58 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 5.49". (x) 25.3.1955.

2. TREATMENTS :

6 manurial treatments : M_0 =Control, M_1 =25 lb./ac. of N as A/S, M_2=25 lb./ac. of P_2O_5 as Super, M_3= M_1+M_2, M_4 = M_1+2M_2 and $M_5=M_1+25$ lb./ac. of K_2O as Pot. Sul.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 1/25 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 980 lb./ac. (ii) 106.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	1090	896	1002	823	1041	1029

S.E./mean = 53.4 lb./ac.

Crop :- Gram *(Rabi)*. **Ref :- Pb. 56(105).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of N and P on Gram.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (iii) 24.10.1956. (iv) (a) N.A. (b) Sown by *pore*. (c) 1md./ac. 'd' 10" row to row. (e) N.A. (v) Nil. (vi) C—104 (*kabli*). (vii) Irrigated. (viii) N.A. (ix) 4.51". (x) 7.5.1957.

2. TREATMENTS :

4 manurial treatments : M_0=Control, M_1= 25 lb./ac. of N as A/S, M_2 = M_1+25 lb./ac. of P_2O_5 as Super and $M_3=M_1+50$ lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 578 lb./ac. (ii) 51.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	568	525	599	620

S.E./mean = 26.0 lb./ac.

Crop :- Gram *(Rabi)*. **Ref :- Pb. 55(135).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of N and P on Gram crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak (iii) 25.10.1955. (iv) (a) N.A. (b) Sown by *kera*. (c) 20 srs./ac. (d) 10″ row to row. (e) N.A. (v) Nil. (vi) I.P. 58. (vii) Irrigated. (viii) N.A. (ix) 0.59″, (x) 1.4.1956.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 sources of 25 lb./ac. of N : S_0=Control, S_1=A/S, S_2=Urea and S_3=A/N.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=25 and P_2=50 lb./ac.

N and P_2O_5 drilled at sowing.

3. DESIGN ;

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) to (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1172 lb./ac. (ii) 329.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	S_0	S_1	S_2	S_3	Mean
P_0	1148	1107	1205	1106	1142
P_1	1206	1262	1247	1163	1219
P_2	1246	1174	1273	929	1156
Mean	1200	1181	1242	1066	1172

S.E. of P marginal mean = 82.5 lb./ac.
S.E. of S marginal mean = 95.2 lb./ac.
S.E. of body of table = 164.9 lb./ac.

Crop :- Gram *(Rabi)*. **Ref :- Pb. 55(136).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of N and P on Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak, (iii) 18.11.1955. (iv) (a) N.A. (b) Sown by *kera*. (c) 1 md./ac. (d) 10″ row to row. (e) N.A. (v) Nil. (vi) Gram—104. (vii) Irrigated. (viii) N.A. (ix) 0.59″. (x) 2.4.1956.

2. TREATMENTS and 3. DESIGN :
Same as in expt. no. 55(135) on page 239.

4. GENERAL :

(i) Very poor. (ii) N.A. (iii) Yield of grain. (iv) (a) 1955 only. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 546 lb./ac. (ii) 151.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	S_0	S_1	S_2	S_3	Mean
P_0	392	513	530	592	507
P_1	555	548	525	536	541
P_2	592	530	608	633	591
Mean	513	530	554	587	546

S.E. of P marginal mean = 37.8 lb./ac.
S.E. of S marginal mean = 43.7 lb./ac.
S.E. of body of table = 75.7 lb./ac.

Crop :- Gram *(Rabi)*. **Ref :- Pb. 59(115).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Bajra*. (c) N.A. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (iii) 14.10.1959. (iv) (a) N.A. (b) Sown by *kera*. (c) 20 srs./ac. (d) 10" row to row. (e) N.A. (v) Nil. (vi) 2673. (vii) Irrigated. (viii) N.A. (ix) 2.84". (x) 1.4.1960.

2. TREATMENTS :

4 manurial treatments : M_0 - Control, M_1=15 lb./ac. of N as C/A/N, $M_2=M_1+30$ lb./ac. of P_2O_5 as Super and $M_3=M_2+30$ lb./ac. of K_2O as Mur. of Pot.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1568 lb./ac. (ii) 148.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1584	1511	1521	1655

S.E./mean = 74.0 lb./ac.

Crop :- Gram *(Rabi)*. **Ref :- Pb. 59(116).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (iii) 13.11.1959. (iv) (a) N.A. (b) Sown by *kera*. (c) 20 srs./ac. (d) 10″ row to row. (e) N.A. (v) *Kisan khad* at 112 lb./ac. applied on 1.8.1959. (vi) 2673. (vii) Irrigated. (viii) N.A. (ix) 2.84″. (x) 31.3.1960.

2. TREATMENTS :

5 manurial treatments : M_0=Control, M_1=15 lb./ac. of N as C/A/N, M_2=30 lb./ac. of P_2O_5 as Super, $M_3=M_1+M_2$ and $M_4=2\,M_1+M_2+30$ lb./ac. of K_2O as Mur. Pot.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 59(115) on page 240.

5. RESULTS :

(i) 1532 lb./ac. (ii) 119.4 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4
Av. yield	1386	1347	1745	1547	1633

S.E./mean = 68.9 lb./ac.

Crop :- Gram. **Ref :- Pb. 54(165).**

Site :- Millet Breeding Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of P on Gram.

1. BASAL CONDITIONS :

(i) (a) No. (b) *Bajra*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) 6.11.1954. (iv) (a) 2 *desi hal*, 1 cultivator and 3 plankings. (b) Sown by *pore*. (c) 40 srs./ac. (d) 1′×3″ to 6″. (e) N.A. (v) Nil. (vi) C—104 (medium). (vii) Irrigated. (viii) Nil. (ix) 5.49″. (x) 4.4.1955.

2. TREATMENTS :

Same as in expt. no. 54(104) on page 237.
Super applied with *kera* on 6.11.1954, then *sohaga* was given.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 60.5′×15′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Germination, growth and yield of grain. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) (a) Ferozepur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1587 lb./ac. (ii) 180.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2	P_3
Av. yield	1318	1595	1760	1673

S.E./mean = 73.7 lb./ac.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 58(SFT).**

Centre :- Ambala (c.f.). **Type :- 'M'.**

Object :— Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November. (vii) to (ix) N.A. (x) April.

2. TREATMENTS :

0 =Control (no manure).
p_1 =30 lb./ac. of P_2O_5 as Super.
p_2 =60 lb./ac. of P_2O_5 as Super.
p_1' =30 lb./ac. of P_2O_5 as dicalcium phosphate.
p_2' =60 lb./ac. of P_2O_5 as dicalcium phosphate.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one Revenue circle or *thana* the one and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crop, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are being studied on type C trials in two out of the four zones in each district every year. The above experiments will be laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) N.A.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	1152	1168	1325	1366	1432

G.M. = 1289 lb./ac. ; S.E./mean = 51.2 lb./ac. and no. of trials = 6.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Ambala (c.f.). **Type :- 'M'.**

Object :— Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type C on page 241 conducted at Ambala.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	979	1136	1234	1267	1168

G.M. = 1157 lb./ac. ; S.E./mean = 49.5 lb./ac. and no. of trials = 11.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 58(SFT).**

Centre :- Ferozepur (c.f.). **Type :- 'M'.**

Object :— Type C—To compare the responses of leguminous crops to aletrnative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type C on page 241 conducted at Ambala.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	1078	1234	1374	1201	1391

G.M. = 1256 lb./ac. ; S.E./mean = 34.3 lb./ac. and no. of trials = 9.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Ferozepur (c.f.). **Type :- 'M'.**

Object :— Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type C on page 241 conducted at Ambala.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	1168	996	1152	1061	1136

G.M. = 1103 lb./ac. ; S.E./mean = 21.5 lb./ac. and no. of trials = 9.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 58(SFT).**

Centre :- Hissar (c.f.). **Type :- 'M'.**

Object :—Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type C on page 241 conducted at Ambala.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	1588	1802	1967	1868	1958

G.M. = 1837 lb./ac.; S.E./mean = 48.9 lb./ac. and no. of trials = 4.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Hissar (c.f.). **Type :- 'M'.**

Object :—Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type C on page 241 conducted at Ambala.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	996	1012	1382	1070	1210

G.M. = 1134 lb./ac. ; S.E./mean = 44.2 lb./ac. and no. of trials = 7.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 58(SFT).**

Centre :- Hoshiarpur (c.f.). **Type :- 'M'.**

Object :—Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) *Tarai* and sub-mountain. (iii) to (v) N.A. (vi) October—November. (vii) to (ix) N.A. (x) April.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) type C on page 241 conducted at Ambala.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	897	1391	1794	1349	1662

G.M. = 1419 lb./ac.; S.E./mean = 13.4 lb./ac. and no. of trials = 7.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Hoshiarpur (c.f.). **Type :- 'M'.**

Object :—Type C —To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) *Tarai* and sub-mountain. (iii) to (v) N.A. (vi) October—November. (vii) to (ix) N.A. (x) April.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) type C on page 241 couducted at Ambala.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	699	1012	1160	806	1045

G.M. = 944 lb./ac.; S.E./mean = 98.9 lb./ac. and no. of trials = 9.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 58(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type C on page 241 conducted at Ambala.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	815	1086	1210	1160	1251

G.M. = 1104 lb./ac.; S.E./mean = 83.8 lb./ac. and no. of trials = 11.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58 (SFT) type C on page 241 conducted at Ambala.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	708	872	963	856	971

G.M. = 874 lb./ac. ; S.E./mean = 32.6 lb./ac. and no. of trials = 11.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Karnal (c.f.). **Type :- 'M'.**

Object :—Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type C on page 241 conducted at Ambala.

5 RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	955	1020	1218	996	1136

G.M. = 1065 lb./ac.; S.E./mean = 50.0 lb./ac. and no. of trials = 8.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Ludhiana (c.f.). **Type :- 'M'.**

Object :—Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type C on page 241 conducted at Ambala.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	1317	1382	1440	1366	1531

G.M. = 1407 lb./ac.; S.E./mean = 57.6 lb./ac. and no. of trials = 6.

Crop :- Gram. **Ref :- Pb. 57(SFT).**

Centre :- Patiala (c.f.). **Type :- 'M'.**

Object :—Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL

Same as in expt. no. 58(SFT) type C on page 241 conducted at Ambala.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	1160	1448	1687	1267	1473

G.M. = 1407 lb./ac. ; S.E./mean = 77.4 lb./ac. and no. of trials = 7.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 58(SFT).**

Centre :- Patiala (c.f.). **Type :- 'M'.**

Object :—Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type C on page 241 conducted at Ambala.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Ay. yield of grain in lb./ac.	913	1259	1473	1267	1547

G.M. = 1292 lb./ac. ; S.E./mean = 56.4 lb./ac. and no. of trials = 8.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Patiala (c.f.). **Type :- 'M'.**

Object :—Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type C on page 241 conducted at Ambala.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	1259	1498	1531	1481	1654

G.M. = 1485 lb./ac. ; S.E./mean = 106.5 lb./ac. and no. of trials = 4.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Patiala (c.f.). **Type :- 'M'.**

Object :—Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type C on page 241 conducted at Ambala.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	1160	1218	1284	1185	1275

G.M. = 1224 lb./ac ; S.E./mean = 32.6 lb./ac. and no. of trials = 4.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 58(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :—Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type C on page 241 conducted at Ambala.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	1267	1407	1498	1473	1432

G.M. = 1415 lb./ac, ; S.E./mean = 41.9 lb./ac. and no. of trials = 9.

Crop :- Bengal gram *(Rabi)*. **Ref :- Pb. 59(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :—Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type C on page 241 conducted in Ambala.

5. RESULTS :

Treatment	0	p_1	p_2	p_1'	p_2'
Av. yield of grain in lb./ac.	1489	1827	1942	1876	1876

G.M. = 1802 lb./ac. ; S.E./mean = 64.6 lb./ac. and no. of trials = 8.

Crop :- Mash. **Ref :- Pb. 54(37).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of N and P on the yield of Mash.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Chari*—Wheat—Pea—*Mash*. (c) Nil. (ii) (a) Light loam. (b) Refer soil analysis, Gurdaspur. (iii) 24.7.1954. (iv) (a) 3 ploughings and *sohaga* 5 times. (b) N.A. (c) 8 srs./ac. (d) and (e) N.A. (v) Nil. (vi) *Mash*—48 (medium). (vii) Unirrigated. (viii) Nil. (ix) 27.61". (x) 20.11.1954.

2. TREATMENTS :

All combinations of (1) and (2)+a control

(1) 2 levels of P_2O_5 as Super : P_1=50 and P_2=100 lb./ac.

(2) 2 levels of N as A/S : N_0=0 and N_1=20 lb./ac.

N and P_2O_5 broadcast on 24.7.1954.

3. DESIGN ;

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 12'×71.5'. (b) 12'×66'. (v) 2'.9" on either side. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 578 lb./ac. (ii) 105.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 575 lb./ac.

	P_1	P_2	Mean
N_0	610	569	590
N_1	493	640	567
Mean	552	605	579

S.E. of N or P marginal mean = 37.4 lb./ac.
S.E. of body of table or control mean = 52.8 lb./ac.

Crop :- Mung *(Kharif).* **Ref :- Pb. 57(134).**

Site :- Soil Cons. Res. Demons. and Trg. Centre, Chandigarh. Type :- 'M'.

Object :—To study the effect of P on the canopy development and yield of Mung.

1. BASAL CONDITIONS :

(i) (a) Fallow—*Mung*—Wheat. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Chandigarh. (iii) N.A. (iv) (a) N.A. (b) Broadcast. (c) 6 to 8 lb./ac. (d) and (e) N A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

2 levels of P_2O_5 as Super : P_0=0 and P_1=25 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/120 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Pod yield, canopy development, no. of pods/plant, height of plant and yield of straw. (iv) (a) 1957—1958. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1182 lb./ac. (ii) 20.8 lb./ac. (iii) Treatment difference is significant. (iv) Av. yield of *mung* in lb./ac.

Treatment	P_0	P_1
Av. yield	1120	1245

S.E./mean = 12.0 lb./ac.

Crop :- Mung *(Kharif).* **Ref :- Pb. 58(157).**

Site :- Soil Cons. Res. Demons. and Trg. Centre, Chandigarh. Type :- 'M'.

Object :—To study the residual effect of P on the yield of Mung.

1. BASAL CONDITIONS :

(i) (a) *Mung*—Wheat—*Mung*. (b) *Mung*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Chandigarh. (iii) 3.7.1958. (iv) (a) N.A. (b) Broadcast. (c) 6 to 8 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Weeding. (ix) N.A. (x) Oct., 1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(134) above.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Pod yield, canopy development, no. of pods, height of plants and yield of straw. (iv) (a) 1957—1958. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1240 lb./ac. (ii) 148.5 lb./ac. (iii) Treatment difference is significant. (iv) Av. yield of *mung* in lb./ac.

Treatment	P_0	P_1
Av. yield	923	1557

S.E./mean = 85.7 lb./ac.

Crop :- Arhar *(Kharif)*. **Ref :- Pb. 57(135).**

Site :- Soil Cons. Res. Demons. and Trg. Centre, Chandigarh. Type :- 'M'.

Object :—To study the effect of P on the yield of Arhar.

1. BASAL CONDITIONS :

(i) (a) Fallow—*Arhar*—Wheat. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Chandigarh. (iii) N.A. (iv) (a) N.A. (b) Broadcast. (c) 6 to 8 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(134) on page 248.

5. RESULTS :

(i) 2728 lb./ac. (ii) 199.1 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of *arhar* in lb./ac.

Treatment	P_0	P_1
Av. yield	2430	3027

S.E./mean = 115.0 lb./ac.

Crop :- Arhar *(Rabi)*. **Ref :- Pb. 58(158).**

Site :- Soil Cons. Res. Demons. and Trg. Centre, Chandigarh. Type :- 'M'.

Object :—To study the residual effect of P on the crop yield of Arhar.

1. BASAL CONDITIONS :

(i) (a) and (b) *Arhar*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Chandigarh. (iii) 3.7.1958. (iv) (a) N.A. (b) Broadcast. (c) 6 to 8 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Weeding. (ix) N.A. (x) October, 1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(134) on page 248.

5. RESULTS :

(i) 1572 lb./ac. (ii) 290.8 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of *arhar* in lb./ac.

Treatment	P_0	P_1
Av. yield	1305	1840

S.E./mean = 167.9 lb./ac.

Crop :- Soyabean *(Kharif).* **Ref :- Pb. 57(132).**

Site :- Soil Cons. Res. Demons. and Trg. Centre, Chandigarh. Type :- 'M'.

Object :— To study the effect of P on the canopy development and yield of Soyabean.

1. BASAL CONDITIONS :

(i) (a) Fallow—*Lobia*—Wheat. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Chandigarh. (iii) N.A. (iv) (a) N.A. (b) Broadcast. (c) 6 to 8 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(134) on page 248.

5. RESULTS :

(i) 991 lb./ac. (ii) 100.8 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of soyabean in lb./ac.

Treatment	P_0	P_1
Av. yield	832	1150

S.E./mean = 58.2 lb./ac.

———

Crop :- Soyabean *(Kharif).* **Ref :- Pb. 58(153).**

Site :- Soil Cons. Res. Demons. and Trg. Centre, Chandigarh. Type :- 'M'.

Object :— To study the residual effect of P on the yield of Soyabean.

1. BASAL CONDITIONS :

(i) (a) Soyabean—Wheat. (b) Wheat. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Chandigarh. (iii) 3.7.1958. (iv) (a) N.A. (b) Broadcast. (c) 6 to 8 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Weeding. (ix) 40.6". (x) 7.10.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(134) on page 248.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Canopy development, height of plant and yield of soyabean. (iv) (a) 1957—1958. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 227 lb./ac. (ii) 11.6 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1
Av. yield	180	274

S.E./mean = 6.7 lb./ac.

———

Crop :- Soyabean. **Ref :- Pb. 54(168).**

Site :- Distt. and Demons. Farm, Kangra. **Type :- 'M'.**

Object :— To study the effect of different manures on Soyabean yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 21.5.1954. (iv) (a) 3 ploughings and *sohaga* (b) N.A. (c) 42 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Pb—I. (vii) Irrigated. (viii) 2 weedings. (ix) 9.44". (x) 30.10.1954.

Crop :- Lobia *(Kharif).* **Ref :- Pb. 57(131).**

Site :- Soil Cons. Res. Demons. and Trg. Centre, Chandigarh. Type :- 'M'.

Object :— To study the effect of P on the canopy development and yield of Lobia.

1. BASAL CONDITIONS :

(i) (a) Fallow—*Lobia*—Wheat. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Chandigarh. (iii) N.A. (iv) (a) N.A. (b) Broadcast. (c) 6 to 8 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(134) on page 248.

5. RESULTS :

(i) 108 lb./ac. (ii) 6.5 lb./ac. (iii) Treatment difference is significant. (iv) Av. yield of pod in lb./ac.

Treatment	P_0	P_1
Av. yield	95	120

S.E./mean = 3.8 lb./ac.

Crop :- Lobia *(Kharif).* **Ref :- Pb. 57(146).**

Site :- Soil Cons. Res. Demons. and Trg. Centre, Chandigarh. Type :- 'M'.

Object :—To study the effect of micro-nutrients on canopy development and yield of Lobia.

1. BASAL CONDITIONS :

(i) (a) *Lobia*—Wheat. (b) N.A. (c) Nil. (ii) Sandy loam. (b) Refer soil analysis, Chandigarh. (iii) N.A. (iv) (a) N.A. (b) Broadcast. (c) 6 to 8 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 9 micro-nutrients : M_0=Control, M_1=20 lb./ac. of Iron as Ferrous sulphate, M_2=100 lb./ac. of Magnesium as Magnesium sulphate, M_3=5 lb./ac. of Boron as Sodium borate, M_4=10 lb./ac. of Zn. as Zn. Sul., M_5=4 ozs./ac. of Molybdenum as Sodium molybdate, M_6=10 lb./ac. of Cu as C/S, M_7=5 lb./ac. of Cobalt as Cobalt chloride and M_8=5 lb./ac. of Mn as Manganese sulphate.

(2) 2 methods of application : A_1=Folier spray and A_2=Ground application.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/120 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Pod yield, canopy development, no. of pods, height of plant and straw yield. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 499 lb./ac. (ii) 205.6 lb./ac. (iii) A effect alone is significant. (iv) Av. yield of pod in lb./ac.

	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	Mean
A_1	625	594	656	688	594	797	750	563	688	662
A_2	414	414	331	281	344	266	251	320	414	337
Mean	519	504	493	484	469	531	500	441	551	499

2. TREATMENTS :

All combinations of (1) and (2)+a control

(1) 2 sources of 50 lb./ac. of P_2O_5 : S_1=B.M. and S_2=Super.

(2) 2 levels of N as A/S : N_0=0 and N_1=20 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 9′×37′. (b) 9′×32.2′. (v) 2.4′ on either side. (v) Yes.

4. GENERAL :

(i) Normal. (ii) Crop attacked badly by some funus 4 disease. (iii) Soyabean and straw yield. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 623 lb./ac. (ii) 72.8 lb./ac. (iii) Main effect of N and "control *vs.* others" are highly significant. (iv) Av. yield of soyabean in lb./ac.

Control = 387 lb./ac.

	S_1	S_2	Mean
N_0	560	618	589
N_1	759	792	775
Mean	659	705	682

S.E. of N or S marginal mean = 25.7 lb./ac.
S.E. of body of table or control mean = 36.4 lb./ac.

Crop :- Lobia. **Ref :- Pb. 54 (17).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :— To study the effect of P on Lobia.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Rapes. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 29.7.1954. (iv) (a) 5 ploughings by country plough and one furrow turning plough. (b) Sown by *kera*. (c) N.A. (d) 3″ between rows. (e) N.A. (v) Nil. (vi) Fos. no. 1 (medium ripening). (vii) Irrigated. (viii) 1 hoeing before flowering. (ix) 9.45″. (x) 24.11.1954 and 8, 24.12.1954.

2. TREATMENTS :

3 levels of P_2O_5 as Super : M_0=Control, M_1=30 and M_2=60 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 21′×132′. (v) No. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of lobia seed. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 614 lb./ac. (ii) 79.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of pod in lb./ac.

Treatment	M_0	M_1	M_2
Av. yield	591	580	670

S.E./mean = 35.6 lb./ac.

S.E. of M marginal mean	= 72.7 lb./ac.
S.E. of A marginal mean	= 34.3 lb./ac.
S.E. of body of table	= 102.8 lb./ac.

Crop :- Lobia *(Kharif)*. **Ref :- Pb. 58(154).**

Site :- Soil Cons. Res., Demons. and Trg. Centre, Chandigarh. Type :- 'M'.

Object :—To study the residual effect of P on the yield of Lobia.

1. BASAL CONDITIONS :

(i) (a) *Lobia*—Wheat. (b) Wheat. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Chandigarh. (iii) N.A. (iv) (a) N.A. (b) Broadcast. (c) 6 to 8 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Un-irrigated. (viii) Weeding. (ix) 40.6″. (x) Oct., 1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(134) on page 248.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Pod yield, canopy development, no. of pods, height of plant and straw yield. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 482 lb./ac. (ii) 30.6 lb./ac. (iii) Treatment difference is significant. (iv) Av. yield of pod in lb./ac.

Treatment	P_0	P_1
Av. yield	387	577

S.E./mean = 17.7 lb./ac.

Crop :- Lobia *(Kharif)*. **Ref :- Pb. 58(172).**

Site :- Soil Cons Res. Demons. and Trg. Centre, Chandigarh. Type :- 'M'.

Object :—To study the effect of application of P at different levels on Lobia crop.

1. BASAL CONDITIONS :

(i) (a) and (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Chandigarh. (iii) 3.7.1958. (iv) (a) N.A. (b) Broadcast. (c) 6 to 8 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Weeding. (ix) N.A. (x) Oct., 1958.

2. TREATMENTS :

5 levels of P_2O_5 as Super : $P_0=0$, $P_1=15$, $P_2=30$, $P_3=45$ and $P_4=60$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30′×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of pod, canopy development, height of plant and straw yield. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

RESULTS :

(i) 167 lb./ac. (ii) 46.8 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of pod in lb./ac.

Treatment	P_0	P_1	P_2	P_3	P_4
Av. yield	95	196	174	216	153

S.E./mean = 23.4 lb./ac.

Crop :- Sugarcane. **Ref :- Pb. 54(196).**

Site :- Dist. Demons. Farm, Ambala. **Type :- 'M'.**

Object :—To study the effect of N through different sources on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Bhindi.* (c) 8 C.L./ac. of F.Y.M. (ii) (a) Clayey loam. (b) N.A. (iii) 5.3.1954. (iv) (a) 6 hoeings. (b) Planted in lines. (c) 35,000 setts./ac. (d) 2′×2′. (e) N.A. (v) N.A. (vi) CO—312. (vii) Irrigated. (viii) 6 hoeings. (ix) 27.02″. (x) 24.2.1955.

2. TREATMENTS :

All combinations of (1) and (2)+one control

(1) 2 sources of N : S_1=A/S and S_2=C/N.

(2) 2 levels of N : N_1=60 and N_2=100 lb./ac.

Half of the fertilizer applied on 11.5.1954. and the other half on 14.8.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 14′×55′. (b) 14′×51′. (v) 2′ on either side. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1954 only. (b) and (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 15.14 tons/ac. (ii) 3.18 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

Control = 12.73 tons/ac.

	S_1	S_2	Mean
N_1	15.65	13.22	14.44
N_2	16.18	17.89	17.04
Mean	15.92	15.56	15.74

S.E. of N or S marginal mean = 1.12 tons/ac.
S.E. of body of table or control mean = 1.59 tons/ac.

Crop :- Sugarcane *(Ratoon).* **Ref :- Pb. 54(201).**

Site :- Sugarcane Sub-Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Fodder—*Senji*—Sugarcane. (b) *Senji.* (c) Nil. (ii) (a) Loam. (b) Nil. (iii) 23.3.1953. (iv) (a) 6 *desi hal*, 10 *sohaga*, 1 bar harrow and 1 horse hoe. (b) Planting in lines. (c) 35,000 setts/ac. (d) 2′ between rows. (e) N.A. (v) 100 lb./ac. of N as F.Y.M. applied on 3.4.1954. (vi) CO—312. (vii) Irrigated. (viii) 4 hoeings. (ix) 75.84″. (x) 16.2.1955 and 12.3.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : N_0=0, N_1=100 and N_2=200 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=100 and P_2=200 lb./ac.

(3) 3 levels of K_2O as Pot. Sul. : K_0=0, K_1=100 and K_2=200 lb./ac.

A/S applied on 19.6.1954 , P_2O_5 and K_2O applied on 25.4.1954.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replications. (b) N.A. (iii) 4. (iv) (a) 72′×14′. (b) 62.75′×14′. (v) N.A. (vi) Yes.

GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 19.99 tons/ac. (ii) 2.69 tons/ac. (iii) Main effect of N is highly significant and that of P is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	15.49	16.36	16.94	16.26	16.32	16.24	16.23
N_1	20.80	22.62	21.15	21.52	20.80	21.59	22.17
N_2	20.89	23.01	22.66	22.19	21.85	22.28	22.43
Mean	19.06	20.66	20.25	19.99	19.66	20.04	20.28
K_0	19.04	19.98	19.95				
K_1	18.11	21.23	20.77				
K_2	20.02	20.78	20.02				

S.E. of any marginal mean = 0.45 tons/ac.
S.E. of body of any table = 0.78 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(197).**

Site :- Sugarcane Sub-Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Chari—Senji*—Sugarcane. (b) *Senji.* (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 24, 25.3.1954. (iv) (a) 8 *desi hal*, 12 *sohaga* and 1 horse hoe. (b) Planted in lines. (c) 35,000 setts/ac. (d) 2′ between rows. (e) N.A. (v) F.Y.M. at 100 C.L./ac. on 13.3.1954. (vi) CO—312. (vii) Irrigated. (viii) 5 hoeings. (ix) 34.63″. (x) 12.3.1955 to 4.4.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 levels of N as A/S : N_0=0, and N_1=100 lb./ac.
(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=100 lb./ac.
(3) 2 levels of K_2O as Pot. Sul. : K_0=0 and K_1=100 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 36′×72′. (b) 36′×60′6″. (v) 5′9″ on either side. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1954—1957. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 29.66 tons/ac. (ii) 2.22 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	26.05	26.27	26.16	25.44	26.88
N_1	33.19	33.12	33.15	32.32	33.98
Mean	29.62	29.69	29.66	28.88	30.43
K_0	28.95	28.81			
K_1	30.28	30.58			

S.E. of any marginal mean = 0.55 tons/ac.
S.E. of body of any table = 0.78 tons/ac.

Crop :- Sugarcane *(Kharif)*. **Ref :- Pb. 55(121).**

Site :- Sugarcane Sub-Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Fodder—*Senji*—Sugarcane. (b) *Senji.* (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 16.3.1955 to 20.3.1955. (iv) (a) 3 *desi hal*, 1 horse hoe and 8 *sohaga*. (b) Planted in lines. (c) 40,000 setts/ac. (d) 2' between rows. (e) N.A. (v) 100 lb./ac. of N as F.Y.M. applied on 11.3.1955. (vi) CO—312. (vii) Irrigated. (viii) 4 hoeings. (ix) 63.79". (x) N.A.

2. TREATMENTS :

Same as in expt. no. 54(197) on page 255.
N applied on 28.5.1955, 9.6.1955 and 23.6.1955. P_2O_5 on 16, 17.3.1955 and K_2O on 15.3.1955.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 72'×40'. (b) 68.1'×40'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Sugarcane yield. (iv) (a) 1954—1957. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 18.06 tons/ac. (ii) 1.05 tons/ac. (ii) Main effect of N and P are highly significant. Interaction P×K is significant. (iv Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_1	11.60	12.84	12.22	12.20	12.24
N_2	23.45	24.34	23.89	24.56	23.22
Mean	17.53	18.59	18.06	18.38	17.73
K_0	17.45	19.31			
K_1	17.59	17.87			

S.E. of any marginal mean = 0.26 tons/ac.
S.E. of body of any table = 0.37 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(92).**

Site :- Sugarcane Sub-Stn., Gurdaspur. **Type :- 'M'.**

Object:—To find out the best combination of N, P and K for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Chari—Senji*—Sugarcane. (b) *Senji.* (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 29, 30.3.1956. (iv) (a) 5 *desi hal*, 1 bar harrow and 4 *sohaga*. (b) Planted in lines. (c) 40,000 setts/ac. (d) 2' between rows. (e) N.A. (v) 100 lb./ac. of N as F.Y.M. on 10.2.1956. (vl) CO—312. (vii) Irrigated. (viii) 5 hoeing. (ix) 2.1.1957 to 13.3.1957.

2. TREATMENTS :

Same as in expt. no. 54(197) on page 255.
A/S applied on 15, 29.6.1956; P_2O_5 and K_2O applied on 29, 30.3.1956.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(121) on page 256.

5. RESULTS :

(i) 25.37 tons/ac. (ii) 1.63 tons/ac. (iii) Main effect of N is highly significant. Main effect of K and interaction N×P are significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	22.01	23.85	22.93	22.47	23.40
N_1	28.09	27.51	27.80	26.90	28.70
Mean	25.05	25.68	25.37	24.68	26.05
K_0	24.46	24.91			
K_1	25.64	26.46			

S.E. of any marginal mean = 0.41 tons/ac.
S.E. of body of any table = 0.58 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 57(73).**

Site :- Sugarcane Sub-Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Chari—Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 12, 13.3.1957. (iv) (a) 6 *desi hal* and 5 *sohaga*. (b) Planted in lines. (c) 30000 setts/ac. (d) 2′ between rows. (e) N.A. (v) 100 lb./ac. of N as F.Y.M. on 20.2.1957. (vi) CO—312. (vii) Irrigated. (viii) 4 hoeings. (ix) 35.30″. (x) 31.1.1958 to 20.3.1958.

2. TREATMENTS :

Same as in expt. no. 54(197) on page 255.
A/S applied half on 17.5.1957 and half on 19.6.1957 ; P_2O_5 and K_2O applied on 12, 13.3.1957.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(121) on page 256.

5. RESULTS :

(i) 19 85 tons/ac. (ii) 2.69 tons/ac. (iii) Interaction N×P and N×P×K are significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	18.86	17.08	17.97	17.69	18.26
N_1	20.49	22.94	21.72	22.53	20.89
Mean	19.68	20.01	19.85	20.11	19.58
K_0	19.92	20.31			
K_1	19.43	19.72			

S.E. of any marginal mean = 0.67 tons/ac.
S.E. of body of any table = 0.95 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 58(80).**

Site :- Sugarcane Sub-Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Chari—Senji*—Sugarcane. (b) *Senji.* (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 22, 24.3.1958. (iv) (a) 4 *desi hal,* 5 *sohaga* and 1 horse hoe. (b) Planted in lines. (c) 40000 setts/ac. (d) 2' between rows. (e) N.A. (v) F.Y.M. at 100 lb./ac. of N on 1.2.1958. (vi) CO—312. (vii) Irrigated. (viii) 5 hoeings. (ix) 43.86". (x) 26.3.1959 to 1.4.1959.

2. TREATMENTS :

Same as in expt. no. 54(197) on page 255.
Half of A/S applied on 23.5.1958 and half on 13.7.1958. P_2O_5 and K_2O applied at planting.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(121) on page 256.

5. RESULTS :

(i) 21.16 tons/ac. (ii) 3.85 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	19.36	20.26	19.81	18.22	21.41
N_1	21.06	23.94	22.50	22.26	22.74
Mean	20.21	22.10	21.16	20.24	22.08
K_0	19.60	20.87			
K_1	20.82	23.33			

S.E. of any marginal mean = 0.96 tons/ac.
S.E. of body of any table = 1.36 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 59(58).**

Site :- Sugarcane Sub-Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Chari—Senji*—Sugarcane. (b) *Senji.* (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 3.4.1959. (iv) (a) 3 *desi hal,* 1 horse hoe and 4 *sohaga,* (b) Planted in lines. (c) 36000 setts/ac. (d) 2' between rows. (e) N.A. (v) F.Y.M. at 100 lb./ac. of N on 28.3.1959. (vi) CO—312. (vii) Irrigated. (viii) 8 hoeings. (ix) 55.07". (x) 18.12.1959.

2. TREATMENTS :

Same as in expt. no. 54(197) on page 255.
Half A/S applied on 23.5.1959 and half on 26.6.1959. P_2O_5 and K_2O as Mur. Pot. were applied at sowing time.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(121) on page 256.

5. RESULTS :

(i) 18.07 tons/ac. (ii) 1.80 tons/ac. (iii) Main effect of N and interaction N × P × K are highly significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	13.56	14.26	13.91	13.56	14.25
N_1	21.55	22.88	22.22	22.15	22.28
Mean	17.56	18.57	18.07	17.86	18.27
K_0	17.53	18.19			
K_1	17.57	18.96			

S.E. of any marginal mean = 0.45 tons/ac.
S.E. of body of any table = 0.64 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(198).**

Site :. Sugarcane Sub-Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different sources of N and levels of P on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Fodder—*Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 30.3.1954. (iv) (a) 5 *desi hal* and 3 *sohaga*. (b) Planted in lines. (c) 35,000 setts/ac. (d) 2′ between rows. (e) N.A. (v) 100 lb./ac. of N as F.Y.M. (vi) CO—312. (vii) Irrigated. (viii) 4 hoeings. (ix) 34.63″. (x) 1st week of May, 1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 sources of 140 lb./ac. of N : S_0=Control, S_1=A/S, S_2=G.N.C, and S_3=F.Y.M.
(2) 2 levels of P_2O_5 : P_0=0 and P_1=100 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 14′×72′. (b) 14′×62′3″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 26.84 tons/ac. (ii) 1.65 tons/ac. (iii) Main effect of S alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	S_0	S_1	S_2	S_3	Mean
P_0	18.42	30.77	32.42	24.31	26.48
P_1	20.13	32.87	30.93	24.89	27.20
Mean	19.28	31.82	31.68	24.60	26.84

S.E. of S marginal mean = 0.67 tons/ac.
S.E. of P marginal mean = 0.48 tons/ac.
S.E. of body of table = 0.95 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 55(120).**

Site :- Sugarcane Sub-Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different levels of N and F.Y.M. on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Chari—Senji*—Sugarcane. (b) *Senji.* (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 23.3.1955. (iv) (a) 5 *desi hal,* 1 horse hoe and 7 *sohaga.* (b) Planted in lines. (c) 40000 setts./ac. (d) 2′ between rows. (e) N.A. (v) Nil. (vi) CO—312. (vii) Irrigated. (viii) 5 hoeings. (ix) 63.79″. (x) 22.1.1956. to 22.2.1956.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 5 levels of N as A/S : N_0=0, N_1=50, N_2=100, N_3=150 and N_4=200 lb./ac.

(2) 2 levels of N as F.Y.M. : F_0=0 and F_1=70 lb./ac.

Half of A/S applied on 4.6.1955. and half on 24.6.1955. F.Y.M. applied on 23.3.1955.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 78′×12′. (b) 72′7″×12′. (v) 2′8″ on either side of length. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1955—1959. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 21.98 tons/ac. (ii) 1.56 tons/ac. (iii) Main effects of N and F are highly significant. (iv) Av. yield of sugarcane in tons/ac.

	N_0	N_1	N_2	N_3	N_4	Mean
F_0	12.44	17.71	22.97	23.69	27.77	20.92
F_1	13.90	20.53	24.70	26.27	29.76	23.03
Mean	13.17	19.12	23.84	24.98	28.77	21.98

S.E. of N marginal mean = 0.55 tons/ac.
S.E. of P marginal mean = 0.35 tons/ac.
S.E. of body of table = 0.78 tons/ac.

———

Crop :- Sugarcane. **Ref :- Pb. 56(93).**

Site :- Sugarcane Sub-Stn, Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different levels of N and F.Y.M. on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Chari—Senji*—Sugarcane. (b) *Senji.* (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 9.3.1956. (iv) (a) 4 *desi,* 1 hindustan ploughing and 6 *sohaga.* (b) Planted in lines. (c) 40000 setts/ac. (d) 2′ between rows. (e) N.A. (v) Nil. (vi) CO—312. (vii) Irrigated. (viii) Hoeing. (ix) 47.56″. (x) 18.12.1956. to 26.12.1956.

2. TREATMENTS :

Same as in expt. no. 55(120) above.
Half of A/S applied on 25.5.1956. and half on 17.6.1956. F.Y.M. applied on 8.3.1956.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 99′×8′. (b) 90′9″×8′. (v) 4′2″ on either side of length. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1955—1959. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 20.06 tons/ac. (ii) 2.13 tons/ac. (iii) Main effect of N and F are highly significant. (iv) Av. yield of sugarcane in tons/ac.

	N_0	N_1	N_2	N_3	N_4	Mean
F_0	10.11	15.08	20.73	22.40	26.72	19.01
F_1	14.15	18.25	22.84	26.46	29.82	22.30
Mean	12.13	16.67	21.78	24.43	28.27	20.66

S.E. of N marginal mean = 0.75 tons/ac.
S.E. of F marginal mean = 0.48 tons/ac.
S.E. of body of table = 1.07 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 57(72).**

Site :- Sugarcane Sub-Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different levels of N and F.Y.M. on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Fodder—*Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 8.3.1957. (iv) (a) 5 *desi hal*, 1 horse hoe and *sohaga* 8 times. (b) Planted in lines. (c) 30000 setts/ac. (d) 2′ between rows. (e) N.A. (v) Nil. (vi) CO—312. (vii) Irrigated. (viii) 5 hoeings. (ix) 35.30″. (x) 11 to 16.2.1958.

2. TREATMENTS :

Same as in expt. no. 55(120) on page 260.
Half of A/S applied on 21.5.1957 and half on 29.6.1957. F.Y.M. applied on 7.3.1957.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 80′ × 12′. (b) 72′7″ × 12′. (v) 3′8″ on either side of length. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Sugarcane yield. (iv) (a) 1955—1959. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 24.87 tons/ac. (ii) 2.48 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
F_0	21.93	24.32	24.72	24.03	28.21	24.64
F_1	21.22	22.89	26.44	26.83	28.13	25.10
Mean	21.58	23.61	25.58	25.43	28.17	24.87

S.E. of N marginal mean = 0.88 tons/ac.
S.E. of F marginal mean = 0.55 tons/ac.
S.E. of body of table = 1.24 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 58(79).**

Site :- Sugarcane Sub-Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different levels of N and F.Y.M. on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Chari—Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 17.3.1958. (iv) (a) 5 *desi hal*, 1 bar harrow, 1 horse hoe and 4 *sohaga*. (b) Planted in lines. (c) 35000 setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) CO—312. (vii) Irrigated. (viii) 7 hoeings. (ix) 43.86". (x) 30.1.1959 to 17.2.1959.

2. TREATMENTS :

Same as in expt. no. 55(120) on page 260.
Half of A/S applied on 19.5.1958 and half on 7.7.1958. F.Y.M. applied on 14.3.1958.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 78'×12'. (b) 72.6'×12'. (v) 2'9" on either side of length. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Sugarcane yield. (iv) (a) 1955—1959. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 21.28 tons/ac. (ii) 2.11 tons/ac. (iii) Main effects of N and F are highly significant. (iv) Av. yield of sugarcane in tons/ac.

	N_0	N_1	N_2	N_3	N_4	Mean
F_0	16.80	20.49	20.53	19.68	20.53	19.61
F_1	19.91	23.15	20.99	24.46	26.28	22.96
Mean	18.36	21 82	20.76	22.07	23.41	21.28

S E. of N marginal mean = 0.86 tons/ac.
S.E. of F marginal mean = 0.54 tons/ac.
S.E. of body of table = 1.22 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 59(57).**

Site :- Sugarcane Sub-Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of different levels of N and F.Y.M. on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Chari—Senji*—Sugarcane. (b) *Senji*.. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.4.1959. (iv) (a) 2 *desi hal*, 8 *sohaga* and 1 hoeing. (b) Planted in lines. (c) 40000 setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) CO—312. (vii) Irrigated. (viii) 7 hoeings and 1 earthing up. (ix) 55.07". (x) 3.2.1960 to 10.2.1960.

2. TREATMENTS :

Same as in expt. no. 55(120) on page 260.
Half of A/S applied on 25.6.1959 and half on 10.7.1959. F.Y.M. applied on 4.4.1959.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 60.5'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Sugarcane yield. (iv) (a) 1955—1959. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 23.18 tons/ac. (ii) 2.18 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	N_0	N_1	N_2	N_3	N_4	Mean
F_0	15.30	23.06	24.98	25.24	25.12	22.74
F_1	17.80	20.52	24.57	26.35	28.85	23.62
Mean	16.55	21.79	24.78	25.80	26.99	23.18

S.E. of F marginal mean = 0.49 tons/ac.
S.E. of N marginal mean = 0.77 tons/ac.
S.E. of body of table = 1.09 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(129).**

Site :- Sugareane Res. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the effect of Sannhemp as G.M. with and without P on Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—G.M.—Fallow—Sugarcane. (b) *Sennhemp.* (c) N.A. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 5, 7.3.1954. (iv) (a) 6 *desi* ploughings and 4 *sohaga.* (b) N.A. (c) 40,000 lb./ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) Co—312 (late). (vii) Irrigated. (viii) 4 hoeings (ix) 23.66". (x) 12.4.1955 to 18.4.1955.

2. TREATMENTS :

9 manurial treatments : M_0=Control, M_1=Whole plant of 70 days old *sannhemp* green manured, M_2=Whole plant of 90 days old *sannhemp* green manured, M_3=Roots only green manured at 70 days as in M_1, M_4=Roots+tops green manured at 90 days as in M_2, M_5=Roots+leaves green manured at seed formation, M_6=M_1+100 lb./ac. of P_2O_5 at sowing, M_7=M_1+200 lb./ac. of P_2O_5 at sowing and M_8= Green manured from plants taken from M_3.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) (a) 105'×12'. (b) 90' 9"×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good, lodged on 6.9.1654 and 2.10.1954. (ii) Nil. (iii) Germination percentage, no. of tillers and yield of Sugarcane. (iv) (a) 1953—N.A. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 29.13 tons/ac. (ii) 1,71 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8
Av. yield	21.09	30.49	31.39	28.01	29.58	28.30	32.60	32.85	27.84

S.E./mean = 0.76 lb./ac.

Crop :- Sugarcane. **Ref :- Pb. 54(135).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of the application of A/S, G.N.C. and mohwa cake on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Senji*—Sugarcane. (b) *Senji*. (c) 11 C.L./ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 8 and 9.4.1954. (iv) (a) to (e) N.A. (v) Nil. (vi) CO—312 (late). (vii) Irrigated. (viii) 6 hoeings and 1 earthing up. (ix) 23.66″. (x) 25, 27.4.1955.

2. TREATMENTS :

Main-plot treatments :

2 methods of planting : P_1=Planting in moist soil and P_2=Planting in moist soil but irrigated after sowing.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 4 sources of 100 lb./ac. of N : S_0=Control, S_1=A/S, S_2=G.N.C. and S_3=*Mohwa* cake.

(2) 2 methods of application of manures : M_1=Broadcast and M_2=Furrow application.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 12′×46′. (b) 12′×42′9″. (v) 1′8″ on either side of length. (vi) Yes.

4. GENERAL :

(i) Normal ; lodged on 21, 23.8.1954 ; 21, 26.9.1954 and 2.10.1954. (ii) Moderate attack of top borer and pyrilla. Hand picking of moths and egg clusters in case of borer and dusting the crop with B.H.C. dust in the case of pyrilla was done to control these pests. (iii) Germination, tillering, no. of green leaf, juice analysis and yield of sugarcane. (iv) (a) 1951—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 31.03 tons/ac. (ii) (a) 6.04 tons/ac. (b) 3.11 tons/ac. (iii) Main effect of S and interaction S×P are significant. (iv) Av. yield of sugarcane in tons/ac.

	S_0	S_1	S_2	S_3	Mean	M_1	M_2
P_1	25.16	31.65	32.00	30.00	29.70	29.93	29.47
P_2	32.37	31.26	33.27	32.56	32.36	31.04	33.69
Mean	28.76	31.45	32.63	31.28	31.03	30 48	31.58
M_1	28.07	30.83	31.61	31.44			
M_2	29.46	32.08	33.66	31.11			

S.E. of difference of two

1. P marginal means = 1.74 tons/ac.
2. S marginal means = 1.27 tons/ac.
3. M marginal means = 0.90 tons/ac.
4. S means at the same level of P = 1.79 tons/ac.
5. P means at the same level of S = 2.34 tons/ac.
6. M means at the same level P = 1.27 tons/ac.
7. P means at the same level of M = 1.96 tons/ac.

S.E. of body of S×M table = 1.27 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(130).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To find out the effect of A/S, C/N, Lime and F.Y.M. on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 14.3.1954. (iv) (a) 1 *raja*, 3 tractor, 3 *desi* ploughings and 4 *sohaga*. (b) to (e) N.A. (v) Nil. (vii) Irrigated. (viii) 6 hoeings and 1 earthing up. (ix) 23.66″. (x) 12, 16.5.1955.

2. TREATMENTS :

Main-plot treatments :

3 basal dressings : D_0=0, D_1=50 lb./ac. of lime and D_2=50 lb./ac. of N as F.Y.M.

Sub-plot treatments :

5 manurial treatments : M_0=Control, M_1=100 lb./ac. of N as A/S, M_2=200 lb./ac. of N as A/S, M_3=100 lb./ac. of N as C/N and M_4=200 lb./ac. of N as C/N.

Lime and F.Y.M. applied on 13.3.1954. Half of A/S+C/N applied in the mid of May and half of A/S+C/N on 25.6.1954.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 105′×12′. (b) 90′9″×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good ; lodging on 26.8.1954. (ii) Nil. (iii) Germination percentage, no. of tillers and yield of sugarcane. (iv) (a) 1952—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 29.17 tons/ac. (ii) (a) 3.33 tons/ac. (b) 2.12 tons/ac. (iii) Main effect of M alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	M_0	M_1	M_2	M_3	M_4	Mean
D_0	30.81	31.05	30.59	30.08	24.67	29.44
D_1	31.43	31.91	31.89	30.19	23.58	29.80
D_2	28.56	30.27	30.49	29.55	22.53	28.28
Mean	30.27	31.08	30.99	29.94	23.59	29.17

S.E. of difference of two

1. D marginal means = 1.05 tons/ac.
2. M marginal means = 0.87 tons/ac.
3. M means at the same level of D = 1.50 tons/ac.
4. D means at the same level of M = 1.70 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(131).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To find out the optimum time of application of A/S on Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 13.3.1954. (iv) (a) 1 *raja* plough, 3 *desi hal* and 3 tractor cultivation with *sohaga*. (b) to (e) N.A. (v) Nil. (vi) CO—312 (late). (vii) Irrigated. (viii) One blind hoeing, 1 horse hoe, 1 earthing up and 1 weeding. (ix) 23.66″. (x) 28, 30.4.1955.

2. TREATMENTS :

11 times of application of N : T_0=Control (no application), T_1=At planting, T_2=At the end of April, T_3=In the middle of May, T_4=At the end of May, T_5=In the middle of June, T_6=At the end of June, T_7=In the middle of July, T_8=Half N in the middle of May+half N in the middle of June, T_9=$\frac{1}{3}$ N in the middle of May+$\frac{1}{3}$ N in the middle of June and $\frac{1}{3}$ in the middle of July and T_{10}=$\frac{1}{2}$ N at the end of May+$\frac{1}{2}$ N at the end of June.

N applied at 100 lb./ac. as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 12′×105′. (b) 12′×90′9″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good ; lodged on 16.8.1954 and 17.9.1954. (ii) Nil. (iii) Germination percentage, no. of tillers and yield of sugarcane. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 30.95 tons/ac. (ii) 2.65 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}
Av. yield	24.84	33.09	33.31	33.19	32.45	30.56	30.06	30.48	30.20	31.90	30.32

S.E./mean = 1.32 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(133).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of A/S, G.N.C. and C/N on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Sannhemp*—*Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 3.4.1954. (iv) (a) 4 tractor cultivations, 1 *desi* plough and 4 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) CO—312 (late). (vii) Irrigated. (viii) 1 blind hoeing, 3 horse-hoe hoeings and 1 earthing up. (ix, 23.66″. (x) 28, 29.3.1955.

2. TREATMENTS :

All combinations of (1) and (2)+one control

(1) 3 sources of N : S_1=G.N.C., S_2=A/S and S_3=C/N.

(2) 2 levels of N : N_1=100 and N_2=200 lb./ac.

G.N.C. broadcast on 3.4.1954, A/S and C/N broadcast on 10 and 29.6.1954 respectively.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 12′×105′. (b) 12′×90′9″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good; lodged on 5.10.1954. (ii) Nil. (iii) Germination percentage, no of tillers, yield of sugarcane. (iv) (a) 1952—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 28.59 tons/ac. (ii) 2.35 tons/ac. (iii) 'Control *vs.* rest' alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

Control = 20.74 tons/ac.

	S_1	S_2	S_3	Mean
N_0	29.21	28.72	29.67	29.20
N_1	29.19	32.48	30.15	30.61
Mean	29.20	30.60	29.91	29.90

S.E. of N marginal mean = 0.68 tons/ac.
S.E. of S marginal mean = 0.83 tons/ac.
S.E. of body of table or control mean = 1.18 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 57(88).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of adding chemical mixture of ferrous sulphate and lime to F.Y.M. and *Mohwa* cake on Sugarcana yield.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—G.M.—Wheat—Cotton. (b) Cotton. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 2.4.1957. (iv) (a) 6 Ploughings and 6 *sohaga*. (b) Planted in lines. (c) 30000 setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) CO—312. (vii) Irrigated. (viii) 1 blind hoeing and weedings after every irrigation. (ix) N.A. (x) 26, 27.2.1958.

2. TREATMENTS :

6 manurial treatments : M_0=Control, M_1=100 lb./ac. of A/S, M_2=100 lb./ac. of F.Y.M., M_3=M_2+ chemical mixture of $FeSO_4$+40 lb./ac. of lime, M_4=100 lb./ac. of N as *Mohwa* cake and M_5=M_4+Chemical mixture of $FeSO_4$.

Manures applied four weeks before planting and A/S applied at planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 1/72.6 ac. (b) 1/85 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Germination, tillering and yield of sugarcane. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 20.49 tons/ac. (ii) 3.35 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	17.55	26.45	19.19	18.44	21.77	19.52

S.E./mean = 1.67 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 57(84).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To find out the best source of N for Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 3.4.1957. (iv) (a) 6 ploughings and 6 *sohaga*. (b) Planted in lines. (c) 30000 setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) CO—312. (vii) Irrigated. (viii) 1 blind hoeing and weeding after every irrigation. (ix) N.A. (x) 29.1.1958. to 2.2.1958.

2. TREATMENTS :

10 sources of 100 lb./ac. of N : S_0=Control, S_1=Caster cake, S_2=*Neem* cake, S_3=G.N.C., S_4=*Mohwa* cake, S_5=Maize cake, S_6=Fish cake, S_7=Blood cake, S_8=*Mohwa* cake composted and S_9=A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 1/36 ac. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Tiller count and sugarcane yield. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 27.38 tons./ac. (ii) 2.56 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9
Av. yield	32.49	29.31	25.43	28.71	27.02	29.31	26.67	25.17	27.32	22.34

S.E./mean = 1.28 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 58(97).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of different sources of N on the yield of Sugarcane (Ratoon).

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 3.4.1957. (iv) (a) 6 ploughings and 6 *sohaga*. (b) Planted in lines. (c) 30000 two budded setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) CO—312. (vii) Irrigated. (viii) Blind hoeing and weeding after every irrigation during pre-monsoon period. (ix) 64.82". (x) 29.11.1958 to 7.12.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(84) on page 267.

5. RESULTS :

(i) 17.83 tons/ac. (ii) 1.56 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9
Av. yield	17.13	19.29	16.45	17.33	18.12	19.02	16.14	18.10	18.07	18.67

S.E./mean = 0.78 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 57(85).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of application of N, P and K partly through soil and partly as foliar spray.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) G.M. crops. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 6, 11.3.1957. (iv) (a) 6 ploughings and 6 *sohaga*. (b) N.A. (c) 35000 setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) CO—312. (vii) Irrigated. (viii) Blind hoeing, weeding after every irrigation during pre-monsoon period. (ix) 32.95". (x) 6, 7.2.1958.

2. TREATMENTS :

14 manurial treatments : M_0=Control, M_1=Water spray, M_2=100 lb./ac. of N through soil at planting, M_3=75 lb./ac. of N through soil+25 lb./ac. of N as spray, M_4=50 lb./ac. of N through soil+50 lb./ac. of N as spray, M_5=100 lb./ac. of P_2O_5 through soil, M_6=75 lb./ac. of P_2O_5 through soil+25 lb./ac. of P_2O_5 as spray, M_7=50 lb./ac. of P_2O_5 through soil+50 lb./ac. of P_2O_5 as spray, M_8=100 lb./ac. of K_2O through soil, M_9=75 lb./ac. of K_2O through soil+25 lb./ac. of K_2O as spray, M_{10}=50 lb./ac. of K_2O through soil+50 lb./ac. of K_2O as spray, M_{11}=100 lb./ac. of N, P and K mixture through soil, $M_{12}=\frac{3}{4}$ of N, P and K mixture through soil+$\frac{1}{4}$ of N, P and K mixture as spray and $M_{13}=\frac{1}{2}$ of N, P and K mixture through soil+$\frac{1}{2}$ of N, P and K mixture as spray.

N as A/S, P_2O_5 as Super and K_2O as Pot. Sul. were applied.

3. DESIGN :

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) 1/75.6 ac. (b) 1/85 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Sugarcane yield. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 19.53 tons/ac. (ii) 3.25 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	18.38	17.20	22.77	21.89	22.34	15.32	17.25
Treatment	M_7	M_8	M_9	M_{10}	M_{11}	M_{12}	M_{13}
Av. yield	17.88	17.42	16.90	14.68	25.42	24.70	21.34

S.E./mean = 1.62 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 59(88).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object: —To study the effect of application of N, P and K partly through soil and partly as foliar spray.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) G.M. crop. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 6 ploughings and 6 *sohaga*. (b) N.A. (c) 35000 setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) CO—312. (vii) N.A. (viii) Blind hoeing and weeding after every irrigation during pre-monson period. (ix) and (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(85) on page 268.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Germination percentage, tiller count and sugarcane yield. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 13.79 tons/ac. (ii) 2.58 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	11.71	12.98	17.64	15.90	14.97	14.18	13.54
Treatment	M_7	M_8	M_9	M_{10}	M_{11}	M_{12}	M_{13}
Av. yield	12.44	10.24	11.41	9.78	15.56	16.75	15.90

S.E./mean = 1.29 tons/ac.

Crop :- Sugarcane *(Ratoon)*. **Ref :- Pb. 54(127).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Sugarcane (plant)—*Ratoon*. (b) Sugarcane. (c) As per treatments. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 7, 9.3.1953. (iv) (a) to (e) N.A. (v) 100 lb./ac. of N as F.Y.M. broadcast on 4, 5.4.1954. (vi) COL—9 (medium). (vii) Irrigated. (viii) 1 hoeing and earthing up. (ix) 23.65". (x) 12.11.1954 to 28.12.1954.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : N_0=0, N_1=100 and N_2=200 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=100 and P_2=200 lb./ac.

(3) 3 levels of K_2O as Pot. Sul. : K_0=0, K_1=100 and K_2=200 lb./ac.

Pot. Sul. applied on 10, 20.4.1954 ; Super on 15, 21.4.1954 and ½ A/S on 5.5.1954 and ½ A/S on 25, 27.6.1954.

3. DESIGN :

(i) 3^3 partial confd. (ii) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 12′×105′. (b) 12′×90′9″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Number of tillers and cane and yield of sugarcane. (iv) (a) 1953—N.A. (b) Yes. (c) No. (v) (a) Gurdaspur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 21.28 tons/ac. (ii) 2.75 tons/ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	14.89	16.34	15.11	15.45	15.06	15.90	15.38
N_1	24.11	23.94	23.38	23.81	24.65	23.46	23.31
N_2	25.03	24.30	24.40	24.57	24.19	24.84	24.70
Mean	21.34	21.53	20.96	21.28	21.30	21.40	21.13
K_0	21.71	21.69	20.52				
K_1	20.31	22.56	21.53				
K_2	22.02	20.54	20.84				

S.E. of any marginal mean = 0.46 tons/ac.
S.E. of body of any table = 0.79 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(128).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 6, 11.4.1954. (iv) (a) 1 *raja* plough, 4 *desi* plough and 3 *sohaga*. (b) to (e) N.A. (v) N.A. (vi) CO—312. (vii) Irrigated. (viii) 3 hoeings with horse hoe and earthing up. (ix) 23.65″. (x) 18. 23.4.1955.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(127) on page 269.

Pot. Sul. applied on 5, 10.4.1954 ; Super on 6, 10.4.1954 and half A/S on 7.6.1954 and half A/S on 5, 7.7.1954.

4. GENERAL

(i) Fair. (ii) Nil. (iii) Germination percentage, no. of tillers and yield of sugarcane. (iv) (a) 1950—N.A. (b) No. (c) Nil. (v) (a) Gurdaspur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 24.02 tons/ac. (ii) 2.74 tons/ac. (iii) Main effect of N is highly significant and interaction N×P×K is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	20.72	20.47	20.42	20.54	20.54	19.32	21.76
N_1	24.19	26.21	25.25	25.22	24.19	25.39	26.07
N_2	26.59	26.43	25.88	26.30	26.16	27.07	25.68
Mean	23.83	24.37	23.85	24.02	23.63	23.92	24.50
K_0	24.21	23.04	23.63				
K_1	23.62	24.83	23.33				
K_2	23.67	25.25	24.59				

S.E. of any marginal mean = 0.46 tons/ac.
S.E. of body of any table = 0.79 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 57(83).**

Site :- Sugarcane Res. Stn. Jullundur. **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—*Ratoon*—*Chari*—Fallow. (b) *Chari*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 21, 24.2.1957. (iv) (a) 6 *sohaga*. (b) Planted in lines. (c) 30000 setts/ac. (d) 2′ between rows. (e) N.A. (v) 100 lb./ac. of N as F.Y.M. (vi) CO—312. (vii) Irrigated. (viii) Blind hoeing, weeding after every irrigation during pre-monsoon period. (ix) 32.96″. (x) 13, 14.2.1958.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S : N_0=0, N_1=100 and N_2=200 lb./ac.
(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=100 and P_2=200 lb./ac.
(3) 3 levels of K_2O as Pot. Sul. : K_0=0. K_1=100 and K_2=200 lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 1/36 ac. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Growth data, tillering, no. of canes, thickness of canes and yield of sugarcane. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 30.56 tons/ac. (ii) 1.97 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	27.00	25.86	26.20	26.35	26.91	25.08	27.07
N_1	32.65	32.96	32.16	32.59	32.87	32.30	32.60
N_2	32.30	33.41	32.50	32.74	32.31	32.75	33.15
Mean	30.65	30.75	30.29	30.56	30.70	30.04	30.94
K_0	31.74	30.11	30.24				
K_1	28.77	31.62	29.75				
K_2	31.45	30.51	30.87				

S.E. of any marginal mean = 0.33 tons/ac.
S.E. of body of any table = 0.57 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 58(95).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—*Ratoon—Chari.* (b) *Chari.* (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 12, 15.3.1958. (iv) (a) 6 ploughings and 6 *sohaga.* (b) Planted in lines. (c) 40000 setts/ac. (d) 2′ between rows. (e) N.A. (v) 100 lb./ac. of N as F.Y.M. (vi) CO—312. (vii) Irrigated. (viii) Blind hoeing, weeding after every irrigation during per-monsoon period. (ix) 41.22″. (x) 2, 3.2.1959.

2. TREATMENTS to 4. GENFRAL :

Same as in expt. no. 57(83) on page 271.

5. RESULTS :

(i) 24.05 tons/ac. (ii) 1.35 tons/ac. (iii) Main effects of N, P and K are highly significant. (iv) Av. yield of sugarcane tons/ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	19.36	18.43	18.88	18.89	18.54	19.69	18.44
N_1	26.46	26.15	27.51	26.71	26.47	26.69	26.96
N_2	27.56	25.42	26.67	26.55	25.59	27.40	26.66
Mean	24.46	23.33	24.35	24.05	23.53	24.59	24.02
K_0	24.01	22.66	23.94				
K_1	24.96	23.44	25.38				
K_2	24.42	23.91	23.74				

S.E. of any marginal mean = 0.23 tons/ac.
S.E. of body of any table = 0.39 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 59(80).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—*Ratoon—Chari*—Fallow. (b) *Chari.* (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullunder. (iii) 5, 8.4.1959. (iv) (a) 6 ploughings and 6 *sohaga.* (b) Planted in lines. (c) 40000 setts/ac. (d) 2′ between rows. (e) N.A. (v) 100 lb./ac. of N as F.Y.M. (vi) CO—312. (vii) Irrigated. (viii) Blind hoeing and weeding after every irrigation during pre-monsoon period. (ix) 29.73″. (x) 16, 25.1.1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(83) on page 271.

5. RESULTS :

(i) 21.93 tons/ac. (ii) 1.89 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	17.60	18 40	18.67	18.23	17.51	18.78	18.39
N_1	23.74	22.26	23.71	23.24	23.23	23.05	23.43
N_2	23.85	24.17	25.00	24.34	24.54	24.53	23.95
Mean	21.73	21.61	22.46	21.93	21.76	22.12	21.92
K_0	21.47	21.25	22.55				
K_1	21.92	22.08	22.37				
K_2	21.81	21.49	22.47				

S.E. of any marginal mean = 0.31 tons/ac.
S.E. of body of any table = 0.55 tons/ac.

Crop :- Sugarcane *(Ratoon)*. **Ref :- Pb. 58(96).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the residual effect of N, P and K applied to plant cane on Ratoon crop.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—*Ratoon*—*Chari*—Fallow. (b) *Chari*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 21, 24.2.1957. (iv) (a) 6 ploughings and 6 *sohaga*. (b) Planted in lines. (c) 40,000 setts/ac. (d) 2′ between rows. (e) N.A. (v) 100 lb./ac. of N as F.Y.M. (vi) CO—312. (vii) Irrigated. (viii) Blind hoeing, weeding after every irrigation during pre-monsoon period. (ix) 73:13″. (x) 1, 2.1.1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(83) on page 271.
Manures applied to plant cane crop.

5. RESULTS :

(i) 18.30 tons/ac. (ii) 2.36 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	17.54	17.22	16.47	17.07	17.07	17.22	16.93
N_1	17.90	18.99	17.56	18.15	18.25	18.20	18.01
N_2	19.15	19.86	19.99	19.67	19.54	19.37	20.10
Mean	18.20	18.69	18.01	18.30	18.28	18.26	18.35
K_0	18.70	18.21	17.95				
K_1	17.33	19.64	17.82				
K_2	18.56	18.22	18.25				

S.E. of any marginal mean = 0.39 tnns/ac.
S.E. of body of any table = 0.68 tons/ac.

Crop :- Sugarcane *(Ratoon).* **Ref :- Pb. 59(81).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the residual effect of N, P and K applied to plant cane on Ratoon crop.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—*Ratoon—Chari*—Fallow. (c) *Chari.* (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 12, 15.3.1958. (iv) (a) 6 ploughings and 6 *sohaga.* (b) Planted in lines. (c) 40000 setts./ac. (d) 2' between rows. (e) N.A. (v) 100 lb./ac. of N as F.Y.M. (vi) CO—312. (vii) Irrigated. (viii) Blind hoeing and weeding after every irrigation during pre-monsoon period. (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(83) on page 271.
Manures applied to plant cane crop.

5. RESULTS :

(i) 11.07 tons/ac. (ii) 1.79 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	9.66	9.39	11.13	10.24	10.13	10.70	9.90
N_1	11.08	10.19	11.35	10.87	10.26	11.57	10.79
N_2	12.63	11.67	11.96	12.09	12.33	12.39	11.54
Mean	11.12	10.60	11.48	11.07	10.91	11.55	10.74
K_0	11.06	11.96	11.08				
K_1	11.26	10.73	12.66				
K_2	11.06	10.47	10.69				

S.E. of any marginal mean = 0.30 tons/ac.
S.E. of body of any table = 0.52 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 57(89).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of some micro-nutrients on the yield and quality of Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Senji*—Sugarcane. (b) *Senji.* (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 14, 15.3.1957. (iv) (a) 6 ploughings and 6 *sohaga.* (b) Planted in lines. (c) 30000 two budded setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) CO—453. (vii) and (viii) N.A. (ix) 32.96". (x) 24.2.1958.

2. TREATMENTS :

Main-plot treatments :

3 levels of N : N_0=0, N_1=100 and N_2=200 lb./ac.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 2 levels of $CuSO_4$: C_0=0 and C_1=3 lb./ac. in soil at planting.

(2) 2 levels of $FeSO_4$: F_0=0 and F_1=$FeSO_4$ as spray of 0.5 % solution.

(3) 2 levels of Borax : B_0=0 and B_1=HBO_3 as spray of 0.286 % solution.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/36 ac. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Growth data, tillering, thickness of canes and yield of sugarcane. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 28.20 tons/ac. (ii) (a) 4.67 tons/ac. (b) 2.21 tons/ac. (iii) Main effect of F is higly significant and interaction N×F is significant. (iv) Av. yield of sugarcane in tons/ac.

	C_0	C_1	F_0	F_1	B_0	B_1	Mean
N_0	18.93	19.80	20.11	18.62	19.11	19.63	19 37
N_1	31.37	32.06	31.47	31.95	32.24	31.18	31.71
N_2	33.41	33.61	34.72	32.30	33.84	33.18	33.51
Mean	27.90	28.49	28.77	27.62	28.40	27.99	28.20
B_0	27.94	28.86	28.87	27.93			
B_1	27.87	28.12	28.67	27.32			
F_0	28.52	29.01					
F_1	27.29	27.96					

S.E. of difference of two

1.	N marginal means	= 1.17 tons/ac.
2.	B, C or F marginal means	= 0.45 tons/ac.
3.	B, C or F means at the same level of N	= 0.78 tons/ac.
4.	N means at the same level of B, C or F	= 1.29 tons/ac.
S.E. of body of B×C, F×B or F×C table		= 0.45 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 58(100).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the effect of micro-nutrients on the yield and quality of Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Senji*—Sugarcane. (b) N.A. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 10, 11.3.1958. (iv) (a) Ploughing and *schaga*. (b) Planted in lines. (c) 30000 two budded setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (v) CO—453. (vii) and (viii) N.A. (ix) 73.13". (x) 20 to 28.2.1959.

2. TREATMENTS :

Same as in expt. no. 57(89) on page 274.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/76 ac. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Growth data, tillering, no. of sugarcanes, thickness of sugarcane and yield of sugarcane. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 23.94 tons/ac. (ii) (a) 9.54 tons./ac. (b) 2.71 tons./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	C_0	C_1	F_0	F_1	B_0	B_1	Mean
N_0	17.60	17.85	17.97	17.49	17.89	17.56	17.73
N_1	26.08	26.47	25.81	26.74	26.34	26.21	26.27
N_2	27.37	28.25	27.17	28.45	27.14	28.48	27.81
Mean	23.68	24.19	23.65	24.23	23.79	24.08	23.94
B_0	23.36	24.23	23.51	24.07			
B_1	24.01	24.16	23.79	24.38			
F_0	23.58	23.72					
F_1	23.78	24.67					

S.E. of difference of two

1. N marginal means = 2.38 tons/ac.
2. B, C or F marginal means = 0.55 tons/ac.
3. B, C or F means at the same level of N = 0.96 tons/ac.
4. N means at the same level of B, C or F = 2.48 tons/ac.

S.E. of body of B×C, C×F or F×B table = 0.55 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(68).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :— To find out the suitable time of application of A/S on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize—*Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 19.3.1954. (iv) (a) 12 ploughings and 13 *sohaga*. (b) N.A. (c) 32000 setts./ac. (d) 2'×2'. (e) N.A. (v) Nil. (vi) CO—312 (late). (vii) Irrigated. (viii) 6 hoeings, 1 weeding and tying. (ix) 19.90". (x) 23.2.1955 to 1.4.1955.

2. TREATMENTS :

All combinations of (1) and (2) +one control

(1) 3 levels of N as A/S : N_1=50, N_2=100 and N_3=150 lb./ac.

(2) 3 times of application of N : T_1=½ dose in May+½ dose in July, T_2=⅓ dose at planting+⅓ dose in July+⅓ dose in August and T_3=1/5 dose at planting+1/5 dose during each month from April to July.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 14'×51'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Sugarcane yield. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 44.27 tons/ac. (ii) 3.27 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of cane in tons/ac.

Control = 41.61 tons/ac.

	T_1	T_2	T_3	Mean
N_1	44.50	44.16	42.23	43.63
N_2	44.36	44.02	44.17	44.18
N_3	43.81	47.39	46.50	45.90
Mean	44.22	45.19	44.30	44.57

S.E. of N or T marginal mean = 0.94 lb./ac.
S.E. of body of table or control mean = 1.63 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 55(76).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :— To find out the suitable time of application of A/S on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Senji*. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 27.3.1955. (iv) (a) N.A. (b) Planted in lines. (c) 40000 setts./ac. (d) 2′×2′. (e) N.A. (v) Nil. (vi) CO—312 (late). (vii) Irrigated. (viii) 5 hoeings and 5 weedings. (ix) 52.03″. (x) 23, 24.2.1956 and 8.3.1956.

2. TREATMENTS :

All combinations of (1) and (2)+one control

(1) 3 levels of N as A/S : N_1=50, N_2=100 and N_3=150 lb./ac.

(2) 3 times of application of N : T_1=½ dose in May+½ dose in July, T_2=⅓ dose at planting+⅓ dose in July+⅓ in August and T_3=1/5 dose at planting+1/5 dose during each month upto September.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 14′×50.18′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Sugarcane yield. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 32.90 tons/ac. (ii) 2.70 tons/ac. (iii) Main effect of N and 'control *vs.* others' are highly significant. (iv) Av. yield of cane in tons/ac.

Control = 22.86 tons/ac.

	T_1	T_2	T_3	Mean
N_1	30.02	30.56	32.82	31.13
N_2	33.99	31.54	36.52	34.02
N_3	38.24	35.62	36.75	37.87
Mean	34.08	32.57	35.36	34.01

S.E. of N or T marginal mean = 0.78 tons/ac.
S.E. of body of table or control mean = 1.35 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(90).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To find out the best source of N for Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Berseem*—Sugarcane. (b) *Berseem*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 26.3.1954. (iv) (a) Ploughing. (b) N.A. (c) 22,000 setts/ac. (d) 2′ between rows. (e) N.A. (v) Nil. (vi) Col—9 (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 23.41″. (x) 24 to 26.3.1955.

2. TREATMENTS :

10 manurial treatments : M_0=Control, M_1=60 lb./ac. of N as A/S, M_2=60 lb./ac. of N as F.Y.M., M_3=60 lb./ac. of N as *Toria* cake, M_4=90 lb./ac. of N as A/S, M_5=45 lb./ac. of N as A/S+45 lb./ac. of N as F.Y.M., M_6=45 lb./ac. of N as A/S+45 lb./ac. of N as *Toria* cake, M_7=120 lb./ac. of N as A/S, M_8=60 lb./ac. of N as A/S+60 lb./ac. of N as F.Y.M. and M_9=60 lb./ac. of N as A/S+60 lb./ac. of N as *Toria* cake.

F.Y.M. and *Toria* cake applied before sowing. Half of A/S applied before sowing and half on 6.7.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 58.7′×16.5′. (b) 45.5′×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Sugarcane yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 16.42 tons/ac. (ii) 2.63 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9
Av. yield	12.93	15.50	12.79	13.44	16.44	14.98	17.29	20.62	19.92	20.26

S.E./mean = 1.52 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 55(15).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To find out the best source of N for Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Cotton—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 18, 21.3.1955. (iv) (a) 4 ploughings and 6 *sohaga*. (b) N.A. (c) 22000 setts/ac. (d) 2′ between rows. (e) N.A. (v) Nil. (vi) CO—312 (medium). (vii) N.A. (viii) Tying up twice. (ix) 44.54″. (x) February and March, 1956.

2. TREATMENTS :

Same as in expt. no. 54(90) on page 277.
F.Y.M. and *Toria* cake applied at sowing. ⅓ A/S at sowing, ⅓ A/S on 10.7.1955 and ⅓ A/S on 23.8.1955.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (ii) 4. (iv) (a) 54.5′×16′. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Below normal. (ii) Nil. (iii) Sugarcane yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Heavy rain and wind damaged the crop. (vi) Nil..

5. RESULTS :

(i) 14.52 tons/ac. (ii) 2.89 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9
Av. yield	11.31	14.12	12.10	12.57	15.10	13.16	17.46	16.53	14.79	18.04

S.E./mean = 1.44 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(122).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To find out the best source of N for Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Cotton—Sugarcane—Cotton. (b) Cotton. (c) N.A. (ii) (a) Heavy loam. (b) N.A. (iii) 8, 9.3.1956. (iv) (a) to (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) CO—312. (vii) Irrigated. (viii) 1 hoeing. (ix) N.A. (x) 1, 3.4.1957.

2. TREATMENTS :

Same as in expt. no. 54(90) on page 277.

F.Y.M. and *Toria* cake applied 4 days before sowing. $\frac{1}{3}$ A/S on 7.3.1956, $\frac{1}{3}$ A/S on 20.6.1956 and $\frac{1}{3}$ A/S on 21.8.1956.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 64'×12'. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 14.93 tons/ac. (ii) 0.45 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9
Av. yield	13.29	14.18	13.76	14.55	14.97	15.40	14.85	16.12	15.74	16.44

S.E./mean = 0.26 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 58(137).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To study the effect of different combinations of manures on Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Paddy—Sugarcane. (b) Paddy. (c) N.A. (ii) (a) Heavy loam. (b) Nil. (iii) 26.4.1958. (iv) (a) to (e) N.A. (v) Nil. (vi) CO—312. (vii) Irrigated. (viii) 2 hoeings. (ix) N.A. (x) 20.3.1959.

2. TREATMENTS :

6 manurial treatments : M_0=Control, M_1=50 lb./ac. of N as A/S, M_2=100 lb./ac. of N as A/S, M_3=M_2+50 lb./ac. of P_2O_5, M_4=M_2+50 lb./ac. of K_2O and M_5=M_3+50 lb./ac. of K_2O.

N applied before sowing but K_2O and P_2O_5 applied on 8.7.1958.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1958 only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 10.94 tons/ac. (ii) 1.52 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	9.57	11.61		12.32	10.73	10.40

S.E./mean = 0.76 tons/ac.

Crop :- Sugarcane. **Ref - Pb. 57(116).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Cotton—Cotton—Sugarcane. (b) Cotton. (c) N.A. (ii) (a) Heavy loam. (b) N.A. (iii) 21, 22.3.1957. (iv) (a) te (e) N.A. (v) Nil. (vi) CO—312. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3) + 4 extra treatments

(1) 3 levels of N as A/S : N_1=120, N_2=180 and N_3=240 lb./ac.

(2) 2 levels of P_2O_5 as Super : P_1=60 and P_2=120 lb./ac.

(3) 2 levels of K_2O as Mur. Pot. : K_1=120 and K_2=240 lb./ac.

Extra treatments : E_0=0, E_1=120, E_2=180 and E_3=240 lb./ac. of N as A/S. Whole of Mur. Pot. and Super applied at sowing while half of A/S applied at sowing and half A/S on 20.7.1957.

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) 1/80 ac. (b) 1/99 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1957—only. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Heavy rains on 22 to 26th July 1957. (vii) Nil.

5. RESULTS :

(i) 27.83 tons/ac. (ii) 6.33 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

E_0=23.95 tons/ac., E_1=29.59 tons/ac., E_2=26.38 tons/ac. and E_3=25.70 tons/ac.

	N_1	N_2	N_3	Mean	K_1	K_2
P_1	27.96	26.23	27.23	27.14	26.82	27.47
P_2	29.06	31.71	27.61	29.96	27.20	31.73
Mean	28.51	28.97	27.42	28.30	27.01	29.60
K_1	28.54	27.76	24.72			
K_2	28.49	30.19	30.11			

S.E. of N marginal mean	=	1.83 tons/ac.
S.E. of P or K marginal mean	=	1.49 tons/ac.
S.E. of body of N×P table	=	2.58 tons/ac.
S.E. of body of K×P or K×N table	=	2.11 tons/ac.
S.E. of E mean	=	3.66 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 57(104).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of different manurial combinations on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Silty loam soil. (b) Refer soil analysis, Rohtak. (iii) 26.3.1957. (iv) (a) N.A. (b) Planted in lines. (c) 100 mds./ac. (d) 1½' between rows. (e) N.A. (v) Nil. (vi) Col—9. (vii) Irrigated. (viii) N.A. (ix) 11.13". (x) 23.3.1958.

2. TREATMENTS :

4 manurial treatments : M_0=Control, M_1=100 lb./ac. of N as A/S, M_2=M_1+100 lb./ac. of P_2O_5 as Super and M_3=M_2+100 lb./ac. of K_2O as Mur. Pot.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Sugarcane yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 19.39 tons/ac. (ii) 4.70 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	10.83	21.74	23.27	21.74

S.E./mean = 2.35 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(103).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To find out the best source of N for Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Rohtak. (iii) 7.3.1956. (iv) (a) N.A. (b) Planted in lines. (c) 80 mds./ac. (d) 1½′ between rows. (e) 1. (v) 9 tons/ac. of F.Y.M. applied on 2.3.1956. (vi) Col—29. (vii) Irrigated. (viii) N.A. (ix) 16.22″. (x) 21, 27, 28, 29.3.1957 and 2.4.1957.

2. TREATMENTS :

4 sources of 100 lb./ac. of N : S_0=Control, S_1=A/S, S_2=Urea and S_3=A/C.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/8 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Sugarcane yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 19.82 tons/ac. (ii) 2.20 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	15.06	22.04	21.09	21.09

S.E./mean = 1.56 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 58(115).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To compare different sources of N for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (iii) 23.3.1958. (iv) (a) N.A. (b) Planted in lines. (c) 80 mds./ac. (d) 2′ between rows. (e) 1. (v) 8 tons/ac. of F.Y.M. applied on 26.2.1958. (vi) Col—9. (vii) Irrigated. (viii) N.A. (ix) 28.49″. (x) 16, 19.1.1959.

2. TREATMENTS :

4 sources of 100 lb./ac. of N : S_0 Control, S_1=A/S, S_2=C/A/N and S_3=Urea.
20 lb./ac. of N applied after germination, 40 lb./ac. of N applied on 18.5.1958 and 40 lb./ac. of N on 20.6.1958.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/30 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Sugarcane yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 22.48 tons/ac. (ii) 1.15 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	18.23	21.06	23.44	27.20

S.E./mean = 0.47 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 59(111).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To find out the best source of N for Sugarcane crop.

1. BASAL CONDITIONS :

(i) Sugarcane—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (iii) 20.2.1959. (iv) (a) N.A. (b) Planted in lines. (c) 80 mds./ac. (d) 2' between rows. (e) 1. (v) 10 mds./ac. of compost applied on 20.2.1959. (vi) Col—9. (vii) Irrigated. (viii) N.A. (ix) 15.56". (x) 24, 27.1.1960.

2. TREATMENTS :

4 sources of 100 lb./ac. of N : S_0=Control, S_1=A/S, S_2=C/A/N and S_3=Urea.
N applied on 14.2.1959.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/32 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Sugarcane yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 21.01 tons/ac. (ii) 2.55 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	13.19	25.16	24.17	21.53

S.E./mean = 1.27 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 59(110).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To find out the best source of N for Sugarcane.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 59(111) on page 282.

5. RESULTS :

(i) 18.81 tons/ac. (ii) 3.75 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	15.87	17.85	22.70	18.81

S.E./mean 1.87 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 58(116).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To find out the best source and time of application of N for Sugarcane crop.

1. BASAL CONDITIONS :

(i) Sugarcane—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (iii) 24.3.1958. (iv) (a) N.A. (b) Planted in lines. (c) 80 mds./ac. (d) 2' between rows. (e) 1. (v) 8 tons/ac. of F.Y.M. applied on 6.3.1958. (vi) Col—9. (vii) Irrigated. (viii) N.A., (ix) 28.48". (x) 19, 24.1.1959.

2. TREATMENTS :

6 manurial treatments : M_0=Control, M_1=100 lb./ac. of N as A/N, before sowing (23.3.1958.), M_2=100 lb./ac. of N as A/N after germination (22.5.1958), M_3=100 lb /ac. of N as Urea before sowing, M_4=100 lb./ac. of N as Urea after germination and M_5=50 lb./ac. of N as Urea before sowing+50 lb./ac. of N as A/N after germination.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/30 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Sugarcane yield. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 28.72 tons/ac. (ii) 2.00 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	22.12	26.06	25.89	35.23	32.23	30.80

S.E./mean = 1.00 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 59(112).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To find out the best source and time of application of N for Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow. (c) Nil. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (iii) 20.2.1959. (iv) (a) N.A. (b) Planted in lines. (c) 80 mds/ac. (d) 2' between rows. (e) N.A. (v) 10 tons/ac. of compost. (vi) Col—9. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 16, 18.1.1960.

2. TREATMENTS :

6 manurial treatments : M_0=Control, M_1=100 lb./ac. of N as A/N before sowing, M_2=100 lb./ac. of N as A/N with 1st irrigation, M_3=100 lb./ac. of N as Urea before sowing, M_4=100 lb./ac. of N as Urea with 1st irrigation and M_5=50 lb./ac. of N as A/N with 1st irrigation+50 lb./ac. of N as Urea before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/30 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Sugarcane yield. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 14.38 tons/ac. (ii) 2.05 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	9.61	14.60	14.55	14.94	17.74	14.85

S.E./mean = 0.92 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 58(SFT).**

Centre :- Ambala (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Sugarcane to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) March—April. (vii) Irrigated. (viii) and (ix) N.A. (x) February—March.

2. TREATMENTS :

0 =Control (no manure).
n =60 lb./ac. of N as A/S.
p =40 lb./ac. of P_2O_5 as Super.
np =60 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super.
k =40 lb./ac. of K_2O as Mur. of Pot.
nk =60 lb./ac. of N as A/S+40 lb./ac. of K_2O as Mur. of Pot.
pk =40 lb./ac. of P_2O_5 as Super+40 lb./ac. of K_2O as Mur. of Pot.
npk =60 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super+40 lb./ac. of K_2O as Mur. of Pot.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one Revenue circle or *thana* in the one and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year 8 on a *kharf* cereal, 8 on cash crop, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of Phosphate application are being studied on type C trials in two out of the four zones in each district every year. The above experiments will be laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Sugarcane yield. (iv) (a) 1958—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) Nil.

5. RESULTS :

Treatment	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in tons/ac.	2.035	0.452	0.239	0.464	—0.037	—0.558	0.312	—0.764	0.610

Control yield = 16.027 tons/ac. and no. of trials = 6.

Crop :- Sugarcane. **Ref :- Pb. 59(SFT).**

Centre :- Ambala (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Sugarcane to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 284 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in tons/ac.	4.048	0.573	1.242	0.771	0.250	—0.323	—0.029	0.103	0.575

Control yield = 16.244 tons/ac. and no. of trials = 8.

Crop :- Sugarcane. **Ref :- Pb. 58(SFT).**

Centre :- Hoshiarpur (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Sugarcane to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Tarai and sub-montain. (iii) to (v) N.A. (vi) March—April, 1958. (vii) Irrigated. (viii) and (ix) N.A. (x) February—March, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 284 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in tons/ac.	4.680	2.593	1.594	0.702	0.184	—0.051	0.140	0.463	0.537

Control yield = 15.407 tons/ac. and no. of trials = 12.

Crop :- Sugarcane. **Ref :- Pb. 59(SFT).**

Centre :- Hoshiarpur (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Sugarcane to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Tarai and sub-montain. (iii) to (v) N.A. (vi) March—April, 1959. (vii) Irrigated. (viii) and (ix) N.A. (x) February—March, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 284 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in tons/ac.	8.754	3.196	1.433	0.458	0.298	0.522	—0.290	0.489	0.253

Control yield = 13.059 tons/ac. and no. of trials = 14.

Crop :- Sugarcane. **Ref :- Pb. 58(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Sugarcane to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 284 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in tons/ac.	2.913	1.477	0.830	0.323	—0.118	—0.279	0.235	0.669	0.300

Control yield = 19.153 tons/ac. and no. of trials = 11.

Crop :- Sugarcane. **Ref :- Pb. 59(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :— Type A—To study the response of Sugarcane to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 284 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in tons/ac.	5.620	2.395	1.087	0.341	—0.738	0.037	—0.566	0.268	0.317

Control yield = 17.717 tons/ac. and no. of trials = 23.

Crop :- Sugarcane. **Ref :- Pb. 59(SFT).**

Centre :- Karnal (c.f.). **Type :- 'M'.**

Object :— Type A—To study the response of Sugarcane to levels of N, P and K, applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 284 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in tons/ac.	1.693	1.859	1.205	0.304	0.478	0.389	—0.018	0.489	0.320

Control yield = 22.40 tons/ac and no. of trials = 13.

Crop :- Sugarcane. **Ref :- Pb. 58(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :— Type A—To study the response of Sugarcane to levels of N, P and K, applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 284 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in tons/ac.	4.739	0.547	0.628	0.860	0.878	—0.492	0.669	—0.779	0.860

Control yield = 26.497 tons/ac. and no. of trials = 6.

Crop :- Sugarcane. **Ref :- Pb. 59(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :— Type A—To study the response of Sugarcane to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 284 conducted at Ambala.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in tons/ac.	3.710	2.494	0.426	1.364	—0.044	—1.106	—1.205	—0.540	1.195

Control yield = 17.83 tons/ac. and no. of trials = 7.

Crop :- Sugarcane. **Ref :- Pb. 58(SFT)**

Centre :- Ambala (c.f.). **Type :- 'M'.**

Object :— Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) March—April. (vii) Irrigated. (viii) and (ix) N.A. (x) February—March.

2. TREATMENTS :

0 =Control (no manure).
n_1' =60 lb./ac. of N as Urea.
n_2' =120 lb./ac. of N as Urea.
n_1'' =60 lb./ac. of N as A/S/N.
n_2'' =120 lb./ac. of N as A/S/N.
n_1''' =60 lb./ac. of N as C/A/N.
n_2''' =120 lb./ac. of N as C/A/N.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one Revenue circle or *thana* in the one and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crop, 4 on a oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are being studied on type C trials in two out of the four zones in each district every year. The above experiments will be laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) N.A. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Sugarcane yield. (iv) (a) 1958—contd. (b) and (c) No. (v) As per design. (vi) and (vii) Nil.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield of sugarcane in tons/ac.	13.985	15.403	18.782	18.099	17.901	16.630	17.056

G.M. = 16.837 tons/ac. ; S.E./mean = 0.805 tons/ac. and no of trials = 5.

Crop :- Sugarcane. **Ref :- Pb. 59(SFT).**

Centre :- Ambala (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. , (ii) Alluvial. (iii) to (v) N.A. (vi) March—April, 1959. (vii) Irrigated. (viii) and (ix) N.A. (x) February—March, 1960.

2. TREATMENTS :

0 =Control (no manure).
n_1 = 60 lb./ac. of N as A/S.
n_2 =120 lb./ac. of N as A/S.
n_1' = 60 lb./ac. of N as Urea.
n_2' =120 lb./ac. of N as Urea.
n_1'' = 60 lb./ac. of N as A/S/N.
n_2'' =120 lb./ac. of N as A/S/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 287 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1''	n_2''
Av. yield of sugarcane in tons/ac.	10.741	15.326	17.427	14.282	14.106	12.857	18.206

G.M. = 14.706 tons/ac. ; S.E./mean = 1.322 tons/ac. and no. of trials = 5.

Crop :- Sugarcane. **Ref :- Pb. 58(SFT).**

Centre :- Hoshiarpur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Tarai and sub-montain. (iii) to (v) N.A. (vi) March—April, 1958. (vii) Irrigated. (viii) and (ix) N.A. (x) February—March, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 287 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield of sugarcane in tons/ac.	16.090	19.980	23.837	21.064	22.063	19.693	21.714

G.M. = 20.634 tons/ac. ; S.E./mean = 0.719 tons/ac. and no. of trials = 11.

Crop :- Sugarcane. **Ref :- Pb. 59(SFT).**

Centre .- Hoshiarpur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Tarai and sub-mountain. (iii) to (v) N.A. (vi) March—April, 1959. (vii) Irrigated. (viii) and (ix) N.A. (x) February—March, 1960.

2. TREATMENTS :

0 =Control (no manure).
n_1 = 60 lb./ac. of N as A/S.
n_2 =120 lb./ac. of N as A/S.
n_1' = 60 lb./ac. of N as Urea.
n_2' =120 lb./ac. of N as Urea.
n_1'''= 60 lb./ac. of N as C/A/N.
n_2'''=120 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 287 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield of sugarcane in tons/ac.	12.306	20.120	26.063	16.685	21.222	16.905	22.665

G.M. = 19.424 tons/ac. ; S.E./mean=0.467 tons/ac. and no. of trials = 5.

Crop :- Sugarcane. **Ref :- Pb. 58(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :— Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 287 conducted at Ambala.

5. RESULTS :

Treatment	n	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield of sugarcane in tons/ac.	19.796	22.871	25.406	24.223	26.126	23.749	26.148

G.M. = 24.046 tons/ac. ; S.E./mean = 0.429 tons/ac. and no. of trials = 14.

Crop :- Sugarcane. **Ref :- Pb. 59(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :— Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) March—April, 1959. (vii) Irrigated. (viii) and (ix) N.A. (x) Febuary—March, 1960.

2. TREATMENTS :

0 =Control (no manure).
n_1 =60 lb./ac. of N as A/S.
n_2 =120 lb /ac. of N as A/S.
n_1' =60 lb./ac. of N as Urea.
n_2' =120 lb./ac. of N as Urea.
n_1''' =60 lb./ac. of N as C/A/N.
n_2''' =120 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 287 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield of sugarcane in tons/ac.	20.395	25.657	28.716	25.160	28.135	25.439	29.076

G.M. = 26.084 tons/ac. ; S.E./mean = 0.568 tons/ac. and no. of trials = 21.

Crop :- Sugarcane. **Ref :- Pb. 58(SFT).**

Centre :- Karnal (c.f). **Type :- 'M'.**

Object :— Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 287 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield of sugarcane in tons/ac.	20.792	22.371	23.804	22.838	20.388	23.205	23.631

G.M. = 22.433 tons/ac. ; S.E./mean = 0.576 tons/ac. and no. of trials = 6.

Crop :- Sugarcane. **Ref :- Pb. 59(SFT).**

Centre :- Karnal (c.f.). **Type :- 'M'.**

Object :— Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) March—April, 1959. (vii) Irrigated. (viii) and (ix) N.A. (x) February—March, 1960.

2. TREATMENTS :

0 =Control (no manure).
n_1 =60 lb./ac. of N as A/S.
n_2 =120 lb./ac. of N as A/S.
n_1' =60 lb./ac. of N as Urea.
n_2' =120 lb./ac. of N as Urea.
n_1'' =60 lb./ac. of N as A/S/N.
n_2'' =120 lb./ac. of N as A/S/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 287 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1''	n_2''
Av. yield of sugarcane in tons/ac.	22.482	24.539	26.853	25.347	28.910	28.065	30.380

G.M. = 26.654 tons/ac. ; S.E./mean = 0.567 tons/ac. and no. of trials = 6.

Crop :- Sugarcane. **Ref :- Pb. 58(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 287 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield of sugarcane in tons/ac.	23.095	31.471	35.423	25.299	33.491	31.052	30.699

G.M. = 30.076 tons/ac. ; S.E./mean = 2.732 tons/ac. and no. of trials = 6.

Crop :- Sugarcane. **Ref :- Pb. 59(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) March—April, 1959. (vii) Irrigated. (viii) and (ix) N.A. (x) February—March, 1960.

2. TREATMENTS :

0 =Control (no manure).
n_1 = 60 lb./ac. of N as A/S.
n_2 =120 lb./ac. of N as A/S.
n_1' = 60 lb./ac. of N as Urea.
n_2' =120 lb./ac. of N as Urea.
n_1'''= 60 lb./ac. of N as C/A/N.
n_2'''=120 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 287 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield of sugarcane in tons/ac.	17.871	19.414	22.610	21.306	20.333	20.608	21.931

G.M. = 20.582 tons/ac. ; S.E./mean = 1.294 tons/ac. and no. of trials = 4.

Crop :- Sugarcane. **Ref :- Pb. 56(4).**

Site :- Tanda (Hoshiarpur, c.f.). **Type :- 'M'.**

Object :—To find out the effect of N and P on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) A/S. (ii) Sandy loam. (iii) Nil. (iv) CO—312 (improved). (v) (a) 5 to 6 ploughings and 6 applications of *sohaga*. (b) to (e) N.A. (vi) 31.3.1956. (vii) Irrigated. (viii) 3 to 4 hoeings. (ix) N.A. (x) March—April, 1957.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=75 and N_2=150 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=50 and P_2=100 lb./ac.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 3 replications. (iii) (a) 1/38 ac. (b) 1/40 ac. (iv) Yes.

4. GENERAL :

(i) Good. (ii) Moderate attack of Gurdaspur borer and fairly heavy attack of top borer. (iii) Yield of sugarcane. (iv) (a) to (c) N.A. (v) Jullundur. (vi) and (vii) Nil.

5. RESULTS :

(i) 21.29 tons/ac. (ii) 1.78 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	P_2	Mean
N_0	22.07	21.25	20.62	21.31
N_1	19.40	20.88	23.16	21.15
N_2	21.99	20.11	22.12	21.41
Mean	21.15	20.75	21.97	21.29

S.E. of any marginal mean = 0.59 tons/ac.
S.E. of body of table = 1.03 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(6).**

Site :- Desuya (Hoshiarpur, c.f.). **Type :- 'M'**

Object :—To find out the effect of N and P on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow. (c) Nil. (ii) Sandy. (iii) Nil. (iv) CO—312 (improved). (v) (a) 5 to 6 ploughings and 5 to 6 *sohaga*. (b) to (e) N.A. (vi) 30.3.1956. (vii) Irrigated. (viii) 3 to 4 hoeings. (ix) N.A. (x) April, 1957.

2. TREATMENTS :

Same as in expt. no. 56(4) on page 291.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 3 replications. (iii) (a) 1/71.2 ac. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Moderate attack of Gurdaspur borer and severe attack of top borer. (iii) Yield of sugarcane. (iv) (a) to (c) N.A. (v) Jullundur. (vi) and (vii) Nil.

5. RESULTS :

(i) 14.41 tons/ac. (ii) 2.83 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	P_2	Mean
N_0	13.19	12.85	14.03	13.36
N_1	15.45	14.66	13.10	14.40
N_2	15.94	17.36	13.13	15.48
Mean	14.86	14.96	13.42	14.41

S.E. of any marginal mean = 0.94 tons/ac.
S.E. of body of table = 1.64 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(5).**

Site :- Jullundur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To find out the effect of N and P on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Senji* fodder. (c) Nil. (ii) Sandy loam. (iii) Nil. (iv) Col—9 (improved). (v) (a) 5 to 6 ploughings and 5 to 6 *sohaga*. (b) to (e) N.A. (vi) 5.4.1956. (vii) Irrigated. (viii) 3 to 4 hoeings. (ix) N.A. (x) 1st week of Feb., 1 957.

2. TREATMENTS :

Same as in expt. no. 56(4) on page 291.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 4 replications. (iii) (a) 1/67 ac. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Moderate attack of stem borer and top borer. (iii) Yield of sugarcane. (iv) (a) to (c) N.A. (v) Hoshiarpur. (vi) and (vii) Nil.

5. RESULTS :

(i) 17.63 tons/ac. (ii) 1.04 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	P_2	Mean
N_0	15.91	14.73	15.64	15.43
N_1	17.92	17.45	18.77	18.05
N_2	19.01	19.78	19.45	19.41
Mean	17.61	17.32	17.95	17.63

S.E. of any marginal mean = 0.30 tons/ac.
S.E. of body of table = 0.52 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(10).**

Site :- Nawanshahar (Jullundur, c.f.). **Type :- 'M'.**

Object :—To find out the effect of N and P on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) Col—9 (improved). (v) (a) to (e) N.A (vi) March, 1956. (vii) Irrigated. (viii) 2 hoeings. (ix) N.A. (x) April, 1957.

2. TREATMENTS :

Same as in expt. no.56(4) on page 291.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 4 replications. (iii) (a) N.A. (b) 1/40 ac. (iv) Yes.

4. GENERAL :

(i) Fair. (ii) Heavy attack of stem and top borers. (iii) Germination and yield of sugarcane. (iv) (a) to (c) N.A. (v) Hoshiarpur. (vi) and (vii) Nil.

5. RESULTS :

(i) 11.91 tons/ac. (ii) 1.43 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	P_2	Mean
N_0	10.77	11.09	11.46	11.11
N_1	13.31	11.47	12.61	12 46
N_2	11.13	12.91	12.42	12.15
Mean	11.74	11.82	12.16	11.91

S.E. of any marginal mean = 0.41 tons/ac.
S.E. of body of table = 0.72 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(12).**

Site :- Nawanshahar (Jullundur, c.f.). **Type :- 'M'.**

Object :— To find out the effect of N and P on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N A. (b) Fodder. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) Col—9 (improved). (v) (a) to (e) N.A. (vi) March, 1956. (vii) Irrigated. (viii) 2 hoeings. (ix) N.A. (x) March, 1957.

2. TREATMENTS :

Same as in expt. no. 56(4) on page 291.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 4 replications. (iii) (a) N.A. (b) 1/40 ac. (iv) Yes.

4. GENERAL :

(i) Satisfacotry. (ii) Crop attacked by borers and pyr.lla. Control measures were adopted. (iii) Germination, tillerings and yield of sugarcane. (iv) (a) to (c) N.A. (v) Hoshiarpur. (vi) and (vii) Nil.

5. RESULTS :

(i) 15.10 tons/ac. (ii) 1.94 tons/ac. (iii) Main effect of P alone is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	P_2	Mean
N_0	16.09	14.78	15.34	15.40
N_1	15.16	12.67	15.13	14.32
N_2	17.70	14.91	14 06	15.56
Mean	16 32	14.12	14.84	15.10

S.E. of any marginal mean = 0.56 tons/ac.
S.E. of body of table = 0.97 tons/ac.

Crop :- Sugarcane **Ref :- Pb. 56(14).**

Site :- Phillaur (Jullundur, c.f.). **Type :- 'M'.**

Object :— To find out the effect of N and P on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (lii) 10 C.L./ac. of F.Y.M. (iv) CO—453 (improved). (v) (a) to (e) N.A. (vi) March, 1956. (vii) Irrigated. (viii) 1 hoeing. (ix) N.A. (x) March, 1957.

2. TREATMENTS :

Same as in expt. no. 56(4) on page 291.

ESIGN :

(i) and (ii) Fact. in R.B.D. with 4 replications. (iii) (a) N.A. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Germination, tillering and yield of sugarcane. (iv) (a) to (c) N.A. (v) Hoshiarpur. (vi) and (vii) Nil.

5. RESULTS :

(i) 27.10 tons/ac. (ii) 3.55 tons/ac. (iii) Main effect of N alone is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	P_2	Mean
N_0	24.77	25.83	24.33	24.98
N_1	26.58	26.85	25.87	26.43
N_2	29.18	30.02	30.43	29.88
Mean	26.84	27.57	26.88	27.10

S.E. of any marginal mean = 1.02 tons/ac.
S.E. of body of table = 1.77 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(7).**

Site :- Tanda (Hoshiarpur, c.f.). **Type :- 'M'.**

Object :— To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fodder. (c) Nil. (ii) Sandy loam. (iii) Nil. (iv) CO—453 (improved). (v) (a) 5 to 6 ploughings and 5 to 6 *sohaga*. (b) to (e) N.A. (vi) 6.4.1956. (vii) Irrigated. (viii) 3 to 4 hoeings. (ix) N.A. (x) Feb.—March, 1957.

2. TREATMENTS :

All combinations (1), (2) and (3)

(1) 2 levels of N as A/S : N_0=0 and N_1=50 lb./ac.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=50 lb./ac.

(3) 2 levels of K_2O as Pot. Sul. K_0=0 and K_1=50 lb./ac.

Manures applied at planting.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 3 replications. (iii) (a) and (b) 1/40 ac. (iv) Yes.

4. GENERAL :

(i) Good. (ii) Moderate attack of Gurdaspur borer and top borer. (iii) Sugarcane yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 21.93 tons/ac. (ii) 2.29 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	21.58	21.69	21.63	20.54	22.73
N_1	22.39	22.05	22.23	22.29	22.16
Mean	21.99	21.87	21.93	21.42	22.45
K_0	21.42	21.40			
K_1	22.56	22.33			

S.E. of any marginal mean = 0.06 tons/ac.
S.E. of body af any table = 0.93 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(155).**

Site :- Nawanshahar (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) CO—453 (medium). (v) (a) 8 ploughings and 4 *sohaga*. (b) to (e) N.A. (vi) March, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 3 replications. (iii) (a) N.A. (b) 1/30 ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Germination, tillering, sugarcane yield and juice analysis. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 32.67 tons/ac. (ii) 2.44 tons/ac. (iii) Main effect of N is highly significant and that of K is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	27.82	28.96	28.39	27.29	29.48
N_1	35.48	38.40	36.94	35.40	38.47
Mean	31.65	33.68	32.67	31.35	33.98
K_0	29.92	32.78			
K_1	33.38	34.57			

S.E. of any marginal mean = 0.70 tons/ac.
S.E. of body of any table = 0.99 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(144).**

Site :- Nawanshahar (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Maize. (c) Nil. (ii) Loam. (iii) 10 C.L./ac. of F.Y.M. (iv) CO—453 (medium). (v) (a) Ploughing and *sohaga* 10 times each. (b) to (e) N.A. (vi) March, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 4 replications. (iv) (a) N.A. (b) 1/45 ac. (iv) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Germination, tillering and sugarcane yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 36.23 tons/ac. (ii) 4.93 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	30.13	33.32	31.73	30.61	32.84
N_1	41.15	40.31	40.73	40.40	41.06
Mean	35.64	36.82	36.23	35.51	36.95
K_0	34.86	36.16			
K_1	36.43	37.47			

S.E. of any marginal mean = 1.23 tons/ac.
S.E. of body of any table = 1.74 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(143).**

Site :- Nawanshahar (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fodder. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of compost. (iv) CO—453 (medium). (v) (a) Ploughing and *sohaga* 8 times each. (b) to (e) N.A. (vi) March, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 4 replications. (iii) (a) N.A. (b) 1/40 ac. (iv) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Germination, tillering and sugarcane yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 38.41 tons/ac. (ii) 2.95 tons/ac. (iii) Main effect of N is highly significant. Interaction $N \times P \times K$ is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	33.98	34.95	34.47	34.34	34.60
N_1	42.47	42.20	42.34	43.16	41.51
Mean	38.23	38.58	38.41	38.75	38.06
K_0	38.67	38.82			
K_1	37.79	38.33			

S.E. of any marginal mean = 0.74 tons/ac.
S.E. of body of any table = 1.04 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(145).**

Site :- Nawanshahar (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Clay loam. (iii) 10 C.L./ac. of F.Y.M. (iv) CO—453 (medium). (v) (a) 8 ploughings and 9 *sohaga*. (b) to (e) N.A. (vi) March, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 4 replications. (iii) (a) N.A. (b) 1/50 ac. (iv) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Germination, tillering and sugarcane yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 33.44 tons/ac. (ii) 1.53 tons/ac. (iii) Main effect of N is highly significant and that of P is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	27.98	28.36	28.17	27.97	28.37
N_1	37.54	39.86	38.70	37.81	39.59
Mean	32.76	34.11	33.44	32.89	33.98
K_0	32.25	33.52			
K_1	33.27	34.70			

S.E. of any marginal mean = 0.38 tons/ac.
S.E. of body of any table = 0.54 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(146).**

Site :- Nawanshahar (Jullundur, c.f.). **Type :- 'M'.**

Object :— To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) Col—9. (v) (a) 8 ploughings and 13 *sohaga*. (b) to (e) N.A. (vi) March, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 3 replications. (iii) (a) N.A. (b) 1/40 ac. (iv) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Germination, tillering and sugarcane yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 19.19 tons/ac. (ii) 1.71 tons/ac. (iii) Main effect of N is highly significant. Main effect of K and interaction N×P×K are significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	17.20	16.91	17.06	15.71	18.41
N_1	21.04	21.59	21.32	21.02	21.61
Mean	19.12	19.25	19.19	18.37	20.01
K_0	18.39	18.33			
K_1	19.86	20.16			

S.E. of any marginal mean = 0.49 tons/ac.
S.E. of body of any table = 0.70 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(147).**

Site :- Nawanshahar (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Loam. (iii) 10 C.L./ac. of F.Y.M. (iv) CO—453 (medium). (v) (a) Ploughings and *sohaga* 8 times. (b) to (e) N.A. (vi) March, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 3 replications. (iii) (a) N.A. (b) 1/50 ac. (iv) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Germination, tillering and sugarcane yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 37.16 tons/ac. (ii) 2.70 tons/ac. (iii) Main effect of N alone is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	34.30	35.53	34.91	35.59	34.23
N_1	37.84	40.97	39.41	38.23	40.58
Mean	36.07	38.25	37.16	36.91	37.41
K_0	36.37	37.45			
K_1	35.77	39.04			

S.E. of any marginal mean = 0.78 tons/ac.
S.E. of body of any table = 1.10 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 55(39).**

Site :- Nawanshahar (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) 10 C.L./ac. of F.Y.M. (ii) Loam. (iii) 10 C.L./ac. of F.Y.M. (iv) Col—9 (improved). (v) (a) 6 ploughings and 12 *sohaga*. (b) to (e) N.A. (vi) March, 1955. (vii) Irrigated. (viii) 2 interculturings. (ix) N.A. (x) Feb., 1956.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) R.B.D. with 3 replications. (iii) (a) N.A (b) 1/40 ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Germination, tillering, height of sugarcane, juice analysis and yield of sugarcane. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 17.08 tons/ac. (ii) 3.53 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	15.69	16.35	16.02	15.36	16.68
N_1	16.84	19.43	18.14	17.02	19.25
Mean	16.26	17 89	17.08	16.19	17.96
K_0	15.48	16.88			
K_1	17.04	18.89			

S.E. of any marginal mean = 1.02 tons/ac.
S.E. of body of any table = 1.44 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 55(38).**

Site :- Nawanshahar (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) CO—312 (improved). (v) (a) 8 ploughings and 12 *sohàga*. (b) to (e) N.A. (vi) March, 1955. (vii) Irrigated. (viii) 3 interculturings. (ix) N.A. (x) March, 1956.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) R.B.D. with 4 replications. (iii) (a) N.A. (b) 1/40 ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Germination, tillering, height of sugarcane, yield of sugarcane and juice analysis. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 16.18 tons/ac. (ii) 2.29 tons/ac. (iii) Main effect of N alone is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	16.14	14.49	15.32	14.67	15.94
N_1	16.56	17.51	17.04	16.65	17.42
Mean	16.35	16.00	16.18	15.66	16.68
K_0	15.95	15.37			
K_1	16.76	16.62			

S.E. of any marginal mean = 0.57 tons/ac.
S.E. of body of any table = 0.81 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 55(37).**

Site :- Nawanshahar (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) CO—453 (improved). (v) (a) 6 ploughings and 18 *sohaga*. (b) to (e) N.A. (vi) 7.4.1955. (vii) Irrigated. (viii) and (ix) N.A. (x) Feb., 1956.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 3 replications. (iii) (a) N.A. (b) 1/48 ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Germination, tillering count, measurement of main-shoots, yield of sugarcane and juice analysis. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 25.50 tons/ac. (ii) 6.25 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	21.34	26.20	23.77	23.28	24.26
N_1	26.14	28.30	27.22	26.88	27.55
Mean	23.74	27.25	25.50	25.08	25.91
K_0	23.35	26.81			
K_1	24.12	27.68			

S.E. of any marginal mean = 1.80 tons/ac.
S.E. of body of any table = 2.55 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 55(36).**

Site :- Nawanshahar (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) 4 C.L./ac. of F.Y.M., (ii) Loamy soil. (iii) 10 C.L./ac. of F.Y.M. (iv) Col—9 (improved). (v) (a) 10 ploughings and 20 *sohaga*. (b) to (e) N.A. (vi) 3.4.1955. (vii) Irrigated. (viii) 2 interculturings. (ix) N.A. (x) Feb., 1956.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D with 4 replications. (iii) (a) N.A. (b) 1/40 ac. (iv) Yes.

4. GENERAL :

(i) Fair. (ii) Crop was heavily attacked by top-borer. (iii) Germination counts, tillering, height of sugarcane at different stages of plant growth, yield of sugarcane and juice analysis. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 10.54 tons/ac. (ii) 2.03 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	9.31	9.56	9.44	9.60	9.27
N_1	11.08	12.20	11.64	10.47	12.81
Mean	10.20	10.88	10.54	10.03	11.04
K_0	9.96	10.11			
K_1	10.43	11.64			

S.E. of any marginal mean = 0.51 tons/ac.
S.E. of body of any table = 0.71 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(8).**

Site :- Nawanshahar (Jullundur, c.f.). **Type :- 'M'**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. F.Y.M. (iv) Col—9 (improved) (v) (a) 2 hoeings and 1 blind hoeing. (b) to (e) N.A. (vi) March, 1956. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1957.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 255.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 4 replications. (iii) (a) N.A. (b) 1/43.2 ac. (iv) Yes.

4. GENERAL :

(i) Good. (ii) Slight attack of borers. (iii) Germination, tillering and sugarcane yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 13.30 tons/ac. (ii) 2.79 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	11.89	13.42	12.66	12.13	13.18
N_1	14.50	13.38	13.94	14.04	13.84
Mean	13.20	13.40	13.30	13.09	13.51
K_0	13.27	12.89			
K_1	13.12	13.90			

S.E. of any marginal mean = 0.70 tons/ac.
S.E. of body of any table = 0.99 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(9).**

Site :- Nawanshahar (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) Col—9 (improved). (v) (a) to (e) N.A. (vi) March, 1956. (vii) Irrigated. (viii) 3 hoeings. (ix) N.A. (x) March, 1957.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 4 replications. (iii) (a) N.A. (b) 1/50 ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of stem borer and top borers. (iii) Germination, tillering and yield of sugarcane. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 12.42 tons/ac. (ii) 1.81 tons/ac. (iii) Main effect of K alone is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	12.18	11.61	11.90	11.21	12.58
N_1	12.61	13.26	12.94	12.27	13.60
Mean	12.40	12.44	12.42	11.74	13.09
K_0	11.81	11.66			
K_1	12.98	13.20			

S.E. of any marginal mean = 0.45 tons/ac.
S.E. of body of any table = 0.64 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56 (11).**

Site :- Nawanshahar (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) Col—9 (improved). (v) (a) to (e) N.A. (vi) Feb.—March, 1956. (vii) Irrigated. (viii) 4 hoeings. (ix) N.A. (x) March, 1957.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 4 replications. (iii) (a) N.A. (b) 1/40 ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of stem and top borers and pyrilla ; chemical control measures were adopted. (iii) Germination, tillering and yield of sugarcane. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 16.69 tons/ac. (ii) 2.50 tons/ac. (iii) Main effect of K alone is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	16.14	16.14	16.14	15.29	16.98
N_1	17.79	16.70	17.25	15.79	18.70
Mean	16.97	16.42	16.69	15.54	17.84
K_0	15.91	15.16			
K_1	18.01	17.68			

S.E. of any marginal mean = 0.62 tons/ac.
S.E. of body of any table = 0.88 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(13).**

Site :- Nawanshahar (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fodder. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) Col—9 (improved). (v) (a) to (e) N.A. (vi) March, 1956. (vii) Irrigated. (viii) 2 hoeings. (ix) N.A. (x) March, 1957.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 4 replications. (iii) (a) N.A. (b) 1/50 ac. (iv) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Germination, tillering and yield of Sugarcane. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 16.45 tons/ac. (ii) 1.88 tons/ac. (iii) Main effect of N and interaction N×K are highly significant. Main effect of P and interaction N×P are significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	15.07	15.06	15.07	15.55	14.58
N_1	16.39	19.25	17.82	16.42	19.22
Mean	15.73	17.16	16.45	15.99	16.90
K_0	15.61	16.35			
K_1	15.84	17.95			

S.E. of any marginal mean = 0.47 tons/ac.
S.E. of body of any table = 0.66 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(148).**

Site :- Phillaur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) N.A. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) Col—9 (medium). (v) (a) to (e) N.A. (vi) April, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 4 replications. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Germination, tillering and sugarcane yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 31.33 tons/ac. (ii) 3.05 tons/ac. (iii) Main effect of N alone is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	29.48	30.25	29.87	30.19	29.54
N_1	32.28	33.28	32.78	32.20	33.36
Mean	30.88	31.77	31.33	31.20	31.45
K_0	30.28	32.11			
K_1	31.47	31.43			

S.E. of any marginal mean = 0.76 tons/ac.
S.E. of body of any table = 1.08 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(149).**

Site :- Phillaur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) N.A. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) Col—9 (medium). (v) (a) to (e) N.A. (vi) March, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 54(148) on page 305.

5. RESULTS :

(i) 24.29 tons/ac. (ii) 2.89 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	23.81	22.64	23.23	23.27	23.18
N_1	24.29	26.40	25.34	23.78	26.90
Mean	24.05	24.52	24.29	23.53	25.04
K_0	23.09	23.96			
K_1	25.01	25.08			

S.E. of any marginal mean = 0.72 tons/ac.
S.E. of body of any table = 1.02 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(150).**

Site :- Phillaur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) N.A. (ii) Sandy. (iii) 10 C.L./ac. of F.Y.M. (iv) CO—312 (medium). (v) (a) to (e) N.A. (vi) March, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 12 replications. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Germination, tillering and sugarcane yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 21.49 tons/ac. (ii) 1.52 tons/ac. (iii) Main effect of N is highly significant and of P is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	18.63	21.30	19.97	20.45	19.48
N_1	21.94	24.07	23.01	22.15	23.86
Mean	20.29	22.68	21.49	21.30	21.67
K_0	20.32	22.28			
K_1	20.26	23.08			

S.E. of any marginal mean = 0.54 tons/ac.
S.E. of body of any table = 0.76 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(151).**

Site :- Phillaur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) and (b) N.A. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) Col—9 (medium). (v) (a) to (e) N.A. (vi) March, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 54(148) on page 305.

5. RESULTS :

(i) 30.95 tons/ac. (ii) 1.70 tons/ac. (iii) Main effect of N and interaction N×P are highly significant. (iv) yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	9.85	27.82	28.84	28.42	29.25
N_1	31.66	34.43	33.05	32.27	33.82
Mean	30.76	31.13	30.95	30.35	31.54
K_0	30.28	30.41			
K_1	31.23	31.83			

S.E. of any marginal mean = 0.42 tons/ac.
S.E. of body of any table = 0.60 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(152).**

Site :- Phillaur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) and (b) N.A. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) CO—312 (medium). (v) (a) to (e) N.A. (vi) March, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS .

Same as in expt. no. 56(7) on page 295.

3. DESIGN and 4. GENERAL :

Saem as in expt. no. 54(150) on page 306.

5. RESULTS :

(i) 16.66 tons/ac. (ii) 1.91 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	15.01	16.20	15.60	15.82	15.38
N_1	16.70	18.71	17.71	17.21	18.20
Mean	15.86	17.46	16.66	16.52	16.79
K_0	15.32	17.71			
K_1	16.38	17.20			

S.E. of any marginal mean = 0.67 tons/ac.
S.E. of body of any table = 0.96 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(153).**

Site :- Phillaur (Jullundur, c.f.). **Type :- 'M'.**

Object :— To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) and (b) N.A. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) Col—9 (medium). (v) (a) to (e) N.A. (vi) March, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 54/148) on page 305.

5. RESULTS:

(i) 32.51 tons/ac. (ii) 2.96 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	30.83	33.10	31.97	31.31	32.62
N_1	32.46	33.62	33.04	31.68	34.39
Mean	31.65	33.36	32.51	31.50	33.51
K_0	30.26	32.74			
K_1	30.04	33.98			

S.E. of any marginal mean = 0.74 tons/ac.
S.E. of body of any table = 1.05 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(154).**

Site :- Phillaur (Jullundur, c.f.). **Type :- 'M'.**

Obeject :— To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) and (b) N.A. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) (a) Col—9 (medium). (v) (a) to (e) N.A. (vi) March, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 54(148) on page 305.

5. RESULTS :

(i) 31.95 tons/ac. (ii) 2.08 tons/ac. (iii) Main effects of N and K are highly significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	30.46	30.82	30.64	30.10	31.18
N_1	32.10	34.40	33.25	31.66	34.83
Mean	30.64	32.61	31.95	30.88	33.01
K_0	30.71	31.05			
K_1	31.84	34.16			

S.E. of any marginal mean = 0.52 tons/ac.
S.E. of body of any table = 0.73 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 55(42).**

Site :- Jandosingha (Jullundur, c.f.). **Type :- 'M'.**

Object :— To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Senji.* (c) Nil. (ii) Loamy sand. (iii) 10 C.L./ac. of F.Y.M. (iv) CO—312. (v) (a) 8 ploughings and 16 *sohaga.* (b) to (e) N.A. (vi) 22.3.1955. (vii) Irrigated. (viii) 2 interculturings. (ix) N.A. (x) March, 1956.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 3 replications. (iii) (a) N.A. (b) 1/33 ac. (iv) Yes.

4. GENERAL :

(i) Fair. (ii) Crop was attacked by top borer and pyrilla. (iii) Germination, tillering, yield of sugarcane and juice analysis. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 13.39 tons/ac. (ii) 1.58 tons/ac. (iii) Main effect of N alone is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	12.25	13.09	12.67	12.22	13.12
N_1	14.82	13.39	14.11	13.92	14.29
Mean	13.54	13.24	13.39	13.07	13.71
K_0	12·96	13.18			
K_1	14.11	13.30			

S.E. of any marginal mean = 0.46 tons/ac.
S.E. of body of any table = 0.64 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 55(47).**

Site :- Phillaur (Jullundur, c.f). **Type :- 'M'.**

Object :— To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS ,

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) CO—312 (improved). (v) (a) 8 ploughings and 12 *sohaga.* (b) to (e) N.A. (vi) March, 1955. (vii) Irrigated. (viii) 2 interculturings. (ix) N.A. (x) March, 1956.

2. TREATMENS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 4 replications. (iii) (a) N.A. (b) 1/40 ac. (iv) Yes.

4. GENERAL ;

(i) Satisfactory. (ii) Nil. (iii) Germination, tillering, sugarcane height, juice analysis and sugarcane yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 12 21 tons/ac. (ii) 2.46 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	11.99	11.84	11.92	11.96	11.87
N_1	13.87	11.12	12.50	12.66	12.33
Mean	12.93	11.48	12.21	12.31	12.10
K_0	12.20	12.41			
K_1	13.66	10.54			

S.E. of any marginal mean = 0.61 tons/ac.
S.E. of body of any table = 0.87 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 55(46).**

Site :- Phillaur (Jullundur, c.f.). **Type :- 'M'.**

Object :— To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fodder. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) CO—312 (improved). (v) (a) 10 ploughings and 12 *sohaga*. (b) to (c) N.A. (vi) March, 1955. (vii) Irrigated. (viii) 2 interculturings. (ix) N.A. (x) Feb., 1956.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 4 replications. (iii) (a) N.A. (b) 1/80 lb./ac. (iv) Yes.

4. GENERAL :

(i) Very poor. (ii) Severe attack of borers. (iii) Germination, tillering, height of sugarcane, sugarcane yield and juice analysis. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 6.79 tons/ac. (ii) 1.65 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	5.98	5.32	5.65	4.99	6.32
N_1	8.66	7.19	7.93	7.84	8.01
Mean	7.32	6.26	6.79	6.42	7.16
K_0	7.00	5.82			
K_1	7.63	6.69			

S.E. of any marginal mean = 0.41 tons/ac.
S.E. of body of any table = 0.58 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 55(41).**

Site :- Phillaur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) Col—9 (improved). (v) (a) 12 ploughings and 20 *sohaga*. (b) to (e) N.A. (vi) 8.4.1955. (vii) Irrigated. (viii) 2 interculturings. (ix) N.A. (x) March, 1956.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) R.B.D. with 4 replications. (iii) (a) N.A. (b) 1/40 ac. (iv) Yes.

4. GENERAL :

(i) Fair. (ii) Crop was heavily attacked by top borer. (iii) Germination, tillering, height of sugarcane, sugarcane yield and juice analysis. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 8.19 tons/ac. (ii) 1.96 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	7.88	7.98	7.93	7.54	8.32
N_1	8.53	8.39	8.46	8.36	8.56
Mean	8.20	8.18	8.19	7.95	8.44
K_0	7.84	8.07			
K_1	8.57	8.31			

S.E. of any marginal mean = 0.49 tons/ac.
S.E. of body of any table = 0.69 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 55(40).**

Site :- Phillaur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Loamy sand. (iii) 10 C.L./ac. of F.Y.M. (iv) Col—9 (improved). (v) (a) 12 ploughings and *sohaga* 20 times. (b) to (e) N.A. (vi) 24.3.1955. (vii) Irrigated. (viii) 4 interculturings. (ix) N.A. (x) Feb., 1956.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(41) above.

5. RESULTS :

(i) 16.16 tons/ac. (ii) 2.25 tons/ac. (iii) Main effect of N alone is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	16.15	14.49	15.32	14.67	15.97
N_1	16.56	17.44	17.00	16.65	17.35
Mean	16.35	15.96	16.16	15.66	16.66
K_0	15.95	15.38			
K_1	16.76	16.55			

S.E. of any marginal mean = 0.56 tons/ac.
S.E. of body of any table = 0.79 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(15).**

Site :- Phillaur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) CO—453 (improved). (v) (a) to (e) N.A. (vi) March, 1956. (vii) Irrigated. (viii) 1 hoeing. (ix) N.A. (x) March, 1957.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) R.B.D. with 3 replications. (iii) (a) N.A. (b) 1/40 ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Germination, tillering and yield of sugarcane. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 14.65 tons/ac. (ii) 1.65 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	12.62	13.34	12.98	12.92	13.03
N_1	16.64	15.97	16.31	15.54	17.08
Mean	14.63	14.66	14.65	14.23	15.06
K_0	14.30	14.18			
K_1	14.97	15.14			

S.E. of any marginal mean = 0.46 tons/ac.
S.E. of body of any table = 0.58 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 55(43).**

Site :- Jullundur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fodder. (c) Nil. (ii) Sandy. (iii) 10 C.L./ac. of F.Y.M. (iv) CO—312 (improved). (v (a) 6 ploughings and 10 *sohaga*. (b) to (e) N.A. (vi) 17.3.1955. (vii) Irrigated. (viii) 2 interculturings. (ix) N.A. (x) March, 1956.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 2 replications. (iii) (a) 1/44.25 ac. (b) 1/40 ac. (iv) Yes.

4. GENERAL :

(i) Fair. (ii) Crop was very heavily attacked by top borers. (iii) Germination, tillering counts, sugarcane yield and juice analysis. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 7.18 tons/ac. (ii) 1.51 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	6 89	7.20	7.05	6.52	7.58
N_1	7.89	6.75	7.32	6.18	8.46
Mean	7.39	6.97	7.18	6.35	8.02
K_0	6.63	6.08			
K_1	8.16	7.87			

S.E. of any marginal mean = 0.53 tons/ac.
S.E. of body of any table = 0.75 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 55(48).**

Site :- Jullundur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) CO—312 (improved). (v) (a) 9 ploughings and 12 *sohagas*. (b) to (e) N.A. (vi) March, 1955. (vii) Irrigated. (viii) 2 interculturings. (ix) N.A. (x) March, 1956.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 2 replications. (iii) (a) N.A. (b) 1/59 ac. (iv) Yes.

4. GENERAL :

(i) Poor. (ii) Crop was very heavily flooded by rains during October. (iii) Germination, tillering, yield of sugarcane and juice analysis. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 8.95 tons/ac. (ii) 1.36 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	8.44	8.52	8.48	8.57	8.38
N_1	9.82	8.99	9.41	9.25	9.56
Mean	9.13	8.76	8.95	8.91	8.97
K_0	9.63	8.20			
K_1	8.63	9.32			

S.E. of any marginal mean = 0.48 tons/ac.
S.E. of body of any table = 0.68 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 55(44).**

Site :- Jullundur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) CO—312 (medium). (v) 8 ploughings and 12 *sohaga*. (b) to (e) N.A. (vi) 24.3.1955. (vii) Irrigated. (viii) 1 interculture. (ix) N.A. (x) March, 1956.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 3 replications. (iii) (a) N.A. (b) 1/44.6 ac. (iv) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Germination, tillering, growth, sugarcane yield and juice analysis. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 16.06 tons/ac. (ii) 2.53 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	13.91	14.79	14.35	15.56	13.15
N_1	16.81	18.72	17.77	18.52	17.01
Mean	15.36	16.75	16.06	17.04	15.08
K_0	16.22	17.85			
K_1	14.49	15.67			

S.E. of any marginal mean = 0.73 tons/ac.
S.E. of body of any table = 1.03 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 55(45).**

Site :- Jullundur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Loamy sand. (iii) 10 C.L./ac. of F.Y. M. (iv) CO—312 (improved). (v) (a) 6 ploughings and 12 *sohaga*. (b) to (e) N.A. (vi) 24.3.1955. (vii) Irrigated. (viii) 2 interculturings. (ix) N.A. (x) Feb., 1956.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 4 replications. (iii) (a) N.A. (b) 1/56.5 ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Crop was attacked by top borer in the initial stage of growth. (iii) Germination, tillering, height of sugarcane, juice analysis and sugarcane yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 19.01 tons/ac. (ii) 1.63 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	17.30	17.83	17.57	17.33	17.80
N_1	20.10	20.83	20.46	20.23	20.69
Mean	18.70	19.33	19.01	18.78	19.24
K_0	18.25	19.31			
K_1	19.14	19.35			

S.E. of any marginal mean = 0.41 tons/ac.
S.E. of body of any table = 0.58 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(1).**

Site :- Jullundur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (iii) Nil. (iv) CO—312 (improved). (v) (a) 5 ploughings and 5 *sohaga*. (b) to (e) N.A. (vi) 12.4.1956. (vii) Irrigated. (viii) 3 to 4 hoeings. (ix) N.A. (x) March, 1957.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 3 replications. (iii) (a) and (b) 1/40 ac. (iv) and (v) N.A. (vi) and (vii) Nil.

4. GENERAL :

(i) Satisfactory. (ii) Heavy attack of top borer. (iii) Yield of sugarcane. (iv) to (vii) Nil.

5. RESULTS :

(i) 21.11 tons/ac. (ii) 3.63 tons/ac. (iii) Interaction P×K alone is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	21.58	19.22	20.41	19.78	21.03
N_1	21.52	22.08	21.80	21.95	21.64
Mean	21.55	20.65	21.11	20.87	21.34
K_0	23.38	18.34			
K_1	19.72	22.95			

S.E. of any marginal mean = 1.03 tons/ac.
S.E. of body of any table = 1.48 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(2).**

Site :- Jullundur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Senji*. (c) Nil. (ii) Sandy loam. (iii) Nil. (iv) CO—453 (medium). (v) (a) 5 to 6 ploughings and 6 *sohaga*. (b) to (e) N.A. (vi) 17.4.1956. (vii) Irrigated. (viii) 3 to 4 hoeings. (ix) N.A. (x) March, 1957.

2. TREATMENTS :

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 3 replications. (iii) (a) 1/50 ac. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Moderate attack of top-borer. (iii) Yield of sugarcane. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 16.20 tons/ac. (ii) 2.08 tons/ac. (iii) Main effect of N alone is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	16.41	13.59	15.00	15.58	14.42
N_1	17.23	17.54	17.39	17.61	17.17
Mean	16.82	15.57	16.20	16.60	15.80
K_0	16.59	16.59			
K_1	17.05	14.54			

S.E. of any marginal mean = 0.60 tons/ac.
S.E. of body of any table = 0.85 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(5).**

Site :- Jullundur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Senji.* (c) Nil. (ii) Sandy loam. (iii) Nil. (iv) CO—312 (improved). (v) (a) 5 to 6 ploughings and 5 to 6 *sohaga.* (b) to (e) N.A. (vi) 11.4.1956. (vii) Irrigated. (viii) 3 to 4 hoeings. (ix) N.A. (x) Second week of March, 1957.

2. TREATMENTS

Same as in expt. no. 56(7) on page 295.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 3 replications. (iii) (a) and (b) 1/60 ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Moderate attack of stem borer and top borer. (iii) Yield of sugarcane. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 15.34 tons/ac. (ii) 1.63 tons/ac. (iii) Main effect of N alone is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	14.70	14.35	14.53	14.21	14.84
N_1	16.59	15.70	16.16	15.49	16.82
Mean	15.65	15.03	15.34	14.85	15.83
K_0	14.89	14.81			
K_1	16.40	15.25			

S.E. of any marginal mean = 0.47 tons/ac.
S.E. of body of any table = 0.66 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(16).**

Site :- Phillaur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy loam. (iii) Nil. (iv) Col. 9 (improved). (v) (a) to (e) N.A. (vi) March, 1956. (vii) Irrigated. (viii) 3 hoeings. (ix) N.A. (x) March, 1957.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S : N_0 =0, N_1=100 and N_2=200 lb./ac.
(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=100 lb./ac.
(3) 2 levels of K_2O as Pot. Sul. : K_0=0 and K_1=100 lb./ac.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 4 replications. (iii) (a) N.A. (b) 1/40 ac. (iv) Yes.

4. GENERAL :

(i) Fair. (ii) Crop attacked by borers. (iii) Germination, tillering and yield of sugarcane. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 13.73 tons/ac. (ii) 1.47 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	12.34	12.38	12.36	12.72	12 00
N_1	13.33	14.32	13.83	13.73	13.92
N_2	14.75	15.30	15.00	14.75	15.29
Mean	13.47	14.00	13.73	13.73	13.74
K_0	13.66	13.81			
K_1	13.29	14.19			

S.E. of N marginal mean = 0.37 tons/ac.
S.E. of K or P marginal mean = 0.30 tons/ac.
S.E. of body of N×P or N×K table = 0.52 tons/ac.
S.E. of body of P×K table = 0.42 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(17).**

Site :- Phillaur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To find out the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS to 3. DESIGN :

Same as in expt. no. 56(16) on page 318.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Germination, tillering and yield of sugarcane. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 17.58 tons/ac. (ii) 1.95 tons/ac. (iii) Main effect of P is highly significant and interaction N×P is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	15.44	18.04	16.72	17.31	16.18
N_1	17.62	17.38	17.50	17.22	17.77
N_2	16.90	20.11	18.51	19.13	17.88
Mean	16.65	18.51	17.58	17.89	17.28
K_0	17.05	18.72			
K_1	16.25	18.30			

S.E. of N marginal mean = 0.49 tons/ac.
S.E. of P or K marginal mean = 0.40 tons/ac.
S.E. of body of N×P or N×K table = 0.69 tons/ac.
S.E. of body of P×K table = 0.56 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 56(18).**

Site :- Phillaur (Jullundur, c.f.). **Type :- 'M'.**

Object :—To find out the effect of N, P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) Sandy. (iii) Nil. (iv) Col—9 (improved). (v) (a) to (e) N.A. (vi) April, 1956. (vii) Irrigated. (viii) 1 hoeing. (ix) N.A. (x) April, 1957.

2. TREATMENTS :

Same as in expt. no. 56(16) on page 318.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. with 3 replications. (iii) (a) N.A. (b) 1/40 ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of stem and top borers. (iii) Germination, tillering and yield of sugarcane. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 18.13 tons/ac. (ii) 1.79 tons/ac. (iii) Main effect of N alone is significant. (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	16.83	17.65	17.24	17.31	17.17
N_1	17.60	17.90	17.75	18.12	17.38
N_2	19.64	19.15	19.40	19.14	19.65
Mean	18.02	18.23	18.13	18.19	18.07
K_0	18.27	18.12			
K_1	17.78	18.35			

S.E. of N marginal mean = 0.52 tons/ac.
S.E. of P or K marginal mean = 0.42 tons/ac.
S.E. of body of N×P or N×K table = 0.73 tons/ac.
S.E. of body of P×K table = 0.60 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 59(82).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'MV'.**

Object :—To study the effect of N applied in split doses as compared to the standard practice of pre-monsoon applications on two varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) Wheat—G.M.—Fallow—Sugarcane. (b) G.M. crop. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 6 ploughings and 6 *sohaga*. (b) Planted in lines. (c) 40,000 setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Blind hoeing and weeding after every irrigation during pre-monsoon period. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 manurial treatments : M_0=Control, M_1=100 lb./ac. of N (25 lb. at planting, 37½ lb. each in May and June), M_2=100 lb./ac. of N (25 lb. at planting and 15 lb. each month from May to Sept.) and M_3=200 lb./ac. of N (50 lb. at planting and 30 lb. each month from May to Sept).

(2) 2 varieties : V_1=Col—29 and V_2=CO—312.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 18.70 tons/ac. (ii) 1.95 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	M_0	M_1	M_2	M_3	Mean
V_1	15.93	18.06	19.94	19.96	18.47
V_2	18.48	18.92	19.18	19.12	18.93
Mean	17.21	18.49	19.56	19.54	18.70

S.E. of V marginal mean = 0.44 tons/ac.
S.E. of M marginal mean = 0.62 tons/ac.
S.E. of body of table = 0.87 tons/ac.

Crop :- Sugarcane *(Ratoon)*. **Ref :- Pb. 54(126).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'C'.**

Object :—To study the effect of different seed rate on Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Sugarcane (plant)—*Ratoon*. (b) Sugarcane. (c) 100 lb./ac. of N as A/S. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 8.3.1953. (iv) (a) to (e) N.A. (v) 100 lb./ac. of N as F.Y.M.+*168* lb./ac. of A/S by broadcast. (vi) Col—9 (medium). (vii) Irrigated. (viii) 1 hoeing and earthing up. (ix) 23.66″. (x) 10, 12.12.1954.

2. TREATMENTS :

3 seed rates : R_1=20000, R_2=30000 and R_3=40000 setts./ac. of 2 buds each.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 12′×105′. (b) 12′×90′ 9″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) No. of tillers and yield of sugarcane. (iv) (a) 1954—N.A. (b) Yes. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 23.84 tons/ac. (ii) 1.33 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	R_1	R_2	R_3
Av. yield	22.42	23.53	25.58

S.E./mean = 0.66 tons./ac.

Crop :- Sugarcane. **Ref :- Pb. 59(85).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'C'.**

Object :— To study the effect of flat planting V/S trench planting with different spacings and seed rate.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Senji*—Sugarcane. (b) *Senji*. (c) No. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 18, 23.3.1959. (iv) (a) 6 ploughings and 6 *sohaga* (b) to (d) As per treatment. (e) N.A. (v) Nil. (vi) CO—312. (vii) Irrigated. (viii) Blind hoeing and weeding after every irrigation during pre-monsoon period. (ix) and (x) N.A.

2. TREATMENTS :

7 cultural treatments : T_1=Trenches 4' apart with 30,000 two budded setts/ac., T_2=Trenches 4' apart with 15,000 two budded setts/ac., T_3=Trenches 3' apart with 30,000 two budded setts/ac. T_4=Trenches 3' apart with 15000 two budded setts/ac., T_5=Flat planting 2' apart 30,000 two budded setts/ac. without earthing, T_6=T_5 with earthing up and T_7=Trench planting 2' apart with 30,000 two budded setts/ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/20. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of Sugarcane. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 19.08 tons/ac. (ii) 2.93 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. yield	16.49	15.85	21.60	16.50	22.79	21.97	18.35

S.E./mean = 1.31 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 57(16).**

Site :- Agri. Res. Stn., Karnal. **Type :- 'C'.**

Object :— To find out the best spacing for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) March, 1957. (v) (a) to (e) N.A. (v) 222 lb./ac. of A/S applied on 4.6.1957. (vi) Col—9. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1958.

2. TREATMENTS :

3 spacings : S_1=1', S_2=2' and S_3=2½' apart double rows.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/16. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Sugarcane yield. (iv) (a) 1956—N.A. (expt. failed in 1956). (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 13.15 tons/ac. (ii) 1.96 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	S_1	S_2	S_3
Av. yield	12.48	11.78	15.18

S.E./mean = 1.16 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(134).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'CV'.**

Object :— To study t he effect of hoeings and sowing setts with and without trash on different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 22.3.1954. (iv) (a) 6 ploughings and 6 *sohaga*. (b) N.A. (c) 32,000 setts/ac. (d) and (e) N.A. (v) 200 lb./ac. of N as F.Y.M. (vi) As per treatments. (vii) Irrigated. (viii) As per treatments. (ix) 23.66". (x) 24, 25.5.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 varieties : V_1=CO—312 and V_2=Col—9.

(2) 2 levels of hoeings : H_0=No blind hoeing and H_1=Blind hoeing.

(3) 4 cultural treatments : T_1=Stripped sugarcane fresh, T_2=Setts with trash, T_3=Stripped sugarcane soaked in water and T_4=Stripped sugarcane soaked in 1% solution of D.D.T.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) and (b) 8'×32'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Not satisfactory. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1951—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 17.35 tons/ac. (ii) 7.30 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

	T_1	T_2	T_3	T_4	Mean	H_0	H_1
V_1	13.80	18.23	24.95	19.40	19.10	19.28	18.92
V_2	13.90	20.18	12.89	15.46	15.61	15.89	15.31
Mean	13 85	19.21	18.92	17.43	17.35	17.59	17.11
H_0	14.48	22.13	18.91	14.84			
H_1	13.22	16.28	18.93	20.02			

S.E. of T marginal mean = 2.11 tons/ac.
S.E. of H or V marginal mean = 1.49 tons/ac.
S.E. of body of T×V or T×H table = 2.98 tons/ac.
S.E. of body of V×H table = 2.11 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 57(95).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'CV'.**

Object :— To study the effect of soil moisture on different varieties of plant and ratoon Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 6 ploughings and 6 *sohaga*. (b) Flat planting. (c) 30,000 setts/ac. (b) 2' between rows. (e) N.A. (v) Nil (vi) As per treatments. (vii) Irrigated. (viii) Blind hoeing and weeding after every irrigation during premonsoon period. (ix) and (x) N.A.

TREATMENTS :

Main-plot treatments :

2 soil moisture : S_1=9.8% of moisture (optimum) and S_2=Dry soil 8.3% of moisture.

Sub-plot treatments :

9 varieties : V_1=CO—453 (plant), V_2=CO—453 (1st ratoon), V_3=CO—453 (2nd ratoon), V_4=CO—453 (3rd ratoon), V_5=CO—312 (plant), V_6=CO—312 (2nd ratoon), V_7=Col—9 (plant), V_8=Col—9 (1st ratoon) and V_9=Col—9 (3rd ratoon).

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Growth data, tillering, no. of sugarcane, thickness of sugarcane and yield of sugarcane. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 16.43 tons/ac. (ii) (a) 3 27 tons/ac. (b) 4.24 tons/ac. (iii) Main effect of S is significant and V is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	V_9	Mean
S_1	25.02	26.32	21.11	25.11	18.71	13.81	10.68	9.90	8.96	17.74
S_2	19.64	21.63	22.32	20.85	16.00	12.92	7.29	8.75	6.72	15.12
Mean	22.33	23.97	21.72	22.98	17.35	13.37	8.98	9.33	7.84	16.43

S.E. of difference of two

1. S marginal means = 0.77 tons/ac.
2. V marginal means = 2.12 tons/ac.
3. V means at the same level of S = 2.99 tons/ac.
4. S means at the same level of V = 2.93 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 57(94).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'CV'.**

Object :—To study the effect of keeping seed setts in sun on different varieties of Sugarcane.

1. BASAL CONDITIONS :

(a) Wheat—Cotton—*Senji*—Sugarcane. (b) *Senji*. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 6 ploughings and 6 *sohaga*. (b) Flat planting. (c) 30000 setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Blind hoeing and weeding after every irrigation during premonsoon period. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 vatieties : V_1=CO—453 and V_2=Col—9.

(2) 4 types of seed setts : T_1=Fresh setts, T_2=1 day old, T_3=2 days old and T_4=3 days old setts.

Seed setts are kept in sun for 1, 2 and 3 days in case of T_2, T_3 and T_4 treatments.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Growth data, tillering, no. of sugarcane, thickness of sugarcane and yield of sugarcane. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 10.85 tons/ac. (ii) 5.66 tons/ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	T_1	T_2	T_3	T_4	Mean
V_1	14.07	16.21	17.13	20.38	16.95
V_2	3.49	3.79	4.69	7.03	4.75
Mean	8.78	10.00	10.91	13.70	10.85

S.E. of V marginal mean = 1.41 tons/ac.
S.E. of T marginal mean = 1.00 tons/ac.
S.E. of body of table = 2.83 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 57(93).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'CV'.**

Object :—To study the effect of keeping seed setts in shade on different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 6 ploughings and 6 *sohaga*. (b) Flat planting. (c) 30,000 setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) CO—312. (vii) Irrigated. (viii) Blind hoeing and weeding after every irrigation during pre-monsoon period. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 varieties : V_1=CO—312, V_2=Col—9 and V_3=CO—453.

Sub-plot treatments :

3 types of seed : T_1=Fresh seed, T_2=One day old seed and T_3=Two days old seed.
Seed setts are kept in shade for 1 and 2 days in case of T_2 and T_3 treatments.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Growth data, tillering, no. of sugarcane, thickness of sugarcane and yield of sugarcane. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 18.42 tons/ac. (ii) (a) 2.55 tons/ac. (b) 3.26 tons/ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	T_1	T_2	T_3	Mean
V_1	24.33	23.49	23.45	23.76
V_2	10.11	6.82	5.84	7.59
V_3	26.37	23.97	21.41	23.92
Mean	20.27	18.09	16.90	18.42

S.E. of difference of two

1. V marginal means = 1.04 tons/ac.
2. T marginal means = 1.33 tons/ac.
3. T means at the same level of V = 2.31 tons/ac.
4. V means at the same level of T = 2.15 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(132).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'CM'.**

Object :—To study the effect of different sources and levels of N with different seed rates on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—Fodder—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 9, 10.4.1954. (iv) (a) 1 *raja*, 1 *desi* ploughing and 5 *sohaga*. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) CO—453 (late). (vii) Irrigated. (viii) 5 hoeings and 1 earthing up. (ix) 23.65". (x) 20, 26.3.1955.

2. TREATMENTS :

All combinations of (1), (2), and (3)

(1) 3 seed rates : R_1=25,000, R_2=30,000 and R_3=35,000 two budded setts/ac.

(2) 3 sources of N : S_1=*Mohwa* cake, S_2=C/N and S_3=A/S.

(3) 3 levels of N : N_0=0, N_1=100 and N_2=200 lb./ac.

Mohwa cake applied on 8.4.1954, A/S and C/N. on 14, 15.5.1954 and 14.7.1954.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 3. (iv) (a) 12'×105'. (b) 12'×90'9". (v) 14½' border on both sides. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Germination percentage, no. of tillers and yield of sugarcane. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 19.78 tons/ac. (ii) 2.76 tons/ac. (iii) Main effect of S, N and interaction S×N are highly significant and effect of R is significant. (iv) Av. yield of sugarcane in tons/ac.

	R_1	R_2	R_3	Mean	N_0	N_1	N_2
S_1	16.40	17.59	18.98	17.66	13.54	17.20	22.23
S_2	18.59	20.24	21.07	19.97	13.61	23.16	23.14
S_3	20.99	22.09	22.12	21.73	14.26	23.94	27.00
Mean	18.66	19.97	20.72	19.78	13.80	21.43	24.12
N_0	12.96	14.51	13.93				
N_1	21.22	21.28	21.80				
N_2	21.79	24.13	26.44				

S.E. of any marginal mean = 0.53 tons/ac.
S.E. of boby of any table = 0.92 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 57(86).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'CM'.**

Object :—To study the effect of different sources and levels of N with different seed rates on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 4.3.1957. (iv) (a) 6 ploughings and 6 *sohaga*. (b) Flat planting. (c) As per treatments. (d) 2' between rows. (e) N.A. (v) Nil. (vi) CO—453. (vii) Irrigated. (viii) Blind hoeing, weeding after every irrigation during pre-monsoon period. (ix) N.A. (x) 21, 23.2.1958.

2. TREATMENTS :

Same as in expt. no 54(132) on page 326.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 3. (iv) (a) 1/36 ac. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Growth data, tillering, no. of sugarcane, thickness of sugarcane and yield of sugarcane. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 29.13 tons/ac. (ii) 1.72 tons/ac. (iii) Main effect of S, N and interaction N×S are highly significant. (iv) Av. yield of sugarcane in tons/ac.

	R_1	R_2	R_3	Mean	N_0	N_1	N_2
S_1	26.94	27.84	26.84	27.21	25.10	27.67	28.75
S_2	28.73	28.68	30.46	29.28	25.44	30.95	31.47
S_3	30.12	31.68	30.91	30.90	25.26	32.91	34.54
Mean	28.59	29.40	29.40	29.13	25.27	30.54	31.58
N_0	23.84	25.87	26.10				
N_1	30.66	30.14	30.82				
N_2	31.27	32.19	31.29				

S.E. of any marginal mean = 0.33 tons/ac.
S.E. of body of any table = 0.57 tons/ac.

Crop :- Sugarcane. **Ref :- Pb 58(99).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'I'.**

Object :—To study the effect of frequency and depth of irrigation on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 6 ploughings and 6 *sohaga*. (b) Flat planting. (c) N.A. (d) 2' between rows. (e) N.A. (v) and (vi) N.A (vii) Irrigated as per treatments. (viii) Blind hoeing and weeding after every irrigation.

2. TREATMENTS :

All combinations of (1) and (2) + one extra treatments.
(1) 2 depths of irrigations : D_1=3" and D_2=5".
(2) No. of irrigations : I_1=5, I_2=7, I_3=9 and I_4=11 irrigations.
Extra treatments : E=3 irrigations at a depth of 5".

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 33.11 tons/ac. (ii) 2.04 tons/ac. (iii) Only 'E vs. others' is highly significant. (iv) Av. yield of sugarcane in tons/ac.

E_1 = 28.83 tons/ac.

	I_1	I_2	I_3	I_4	Mean
D_1	32.37	33.35	33.50	33.88	33.28
D_2	33.20	33.71	33.51	35.59	34.00
Mean	32.79	33.53	33.51	34.73	33.64

S.E. of D marginal mean = 0.51 tons/ac.
S.E. of I marginal mean = 0.72 tons/ac.
S.E. of body of table or E mean = 1.02 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(136).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'IV'.**

Object :—To study the effect of different intervals of irrigation in pre and post monsoon periods on different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—Fallow—Sugarcane. (b) Sugarcane. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 18.4.1954. (iv) (a) 1 *raia*, 3 *desi* ploughings and 3 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) and (vii) As per treatments. (viii) 1 blind hoeing and 3 horse hoeings. (ix) 23.65". (x) 31.12.1954.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 intervals of pre-monsoon irrigation : P_1=At 7, P_2=14 and P_3=21 days interval.

(2) 2 intervals of post monsoon irrigation : M_1=At 15 and M_2=30 days interval.

Sub-plot treatments :

6 varieties : V_1=CO—312 (late), V_2=CO—453 (late), V_3=Col—9 (medium), V_4=Col—29 (early), V_5=CO—617 (late) and V_6=Cok—30 (medium).

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 46'×12'. (b) 36'4"×12'. (v) 4'10" on either side. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Severe attack of stem borer. Picking of moths and egg clusters by hand was resorted to control the pest. (iii) Germination, tillering, juice analysis and sugarcane yield. (iv) (a) 1951—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 14.07 tons/ac. (ii) (a) 6.36 tons/ac. (b) 2.77 tons/ac. (iii) Main effect of V alone is significant. (iv) Av. yield of sugarcane in tons/ac.

	V_1	V_2	V_3	V_4	V_5	V_6	Mean	M_1	M_2
P_1	13.93	16.88	11.65	13.35	13.61	13.30	13.79	13.46	14.12
P_2	15.41	17.04	11.99	16.15	14.25	14.43	14.88	15.43	14.33
P_3	15.46	17.20	11.82	13.42	10.46	12.89	13.54	13.18	13.90
Mean	14.93	17.04	11.82	14.31	12.77	13.54	14.07	14.03	14.12
M_1	14.13	17.99	11.19	14.13	12.48	14.25			
M_2	15.74	16.10	12.46	14.50	13.07	12.83			

S.E. of difference of two

1.	M marginal means = 1.22 tons/ac.	5.	M means at the same level of V = 1.71 tons/ac.
2.	P marginal means = 1.50 tons/ac.	6.	V means at the same level of P = 1.60 tons/ac.
3.	V marginal means = 0.92 tons/ac.	7.	P means at the same level of V = 2.09 tons/ac.
4.	V means at the same level of M = 1.31 tons/ac.		S.E. of body of M×P table = 1.50 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 57(87).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'IV'.**

Object :—To study the effect of levels of irrigation on different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 17, 28.3.1957. (iv) (a) 6 Ploughings and 6 *sohaga*. (b) Flat planting. (c) 30,000 setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) and (vii) As per treatments. (viii) Blind hoeing and weeding after every irrigation during pre-monsoon period. (ix) 32.68". (x) 21, 25.1.1958.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 varieties : V_1=CQ—453, V_2=CO—312, V_3=Col—29 and V_4=CO.J—39.

(2) 3 intervals of irrigations : I_1=10 days interval during pre-monsoon period, I_2=3 irrigations before monsoon+trash mulching in May and I_3=1 irrigation before monsoon+trash mulching in May.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 1/36 ac. (b) 1/40 ac (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Growth data, tillering, no. of sugarcane, thickness of sugarcane and yield of sugarcane. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 29.91 tons/ac. (ii) 2.03 tons/ac. (iii) Main effects of V and I are highly significant. (iv) Av. yield of sugarcane in tons/ac.

	V_1	V_2	V_3	V_4	Mean
I_1	34.22	31.47	28.73	33.85	32.07
I_2	31.43	30.16	27.92	32.43	30.49
I_3	26.65	25.87	24.18	31.97	27.17
Mean	30.77	29.17	26.94	32.75	29.91

S.E. of V marginal mean = 0.59 tons/ac.
S.E. of I marginal mean = 0.51 tons/ac.
S.E. of body of V table = 1.02 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 58(93)**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'IV'.**

Object :—To study the effect of levels of irrigation on different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 6 ploughings and 6 *sohaga*. (b) Flat planting. (c) 30,000 setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) and (vii) As per treatments. (viii) Blind hoeing and weeding after every irrigation during pre-monsoon period. (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(87) on page 329.

5. RESULTS :

(i) 28.79 tons/ac. (ii) 2.91 tons/ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	V_1	V_2	V_3	V_4	Mean
I_1	24.84	27.45	29.17	34.48	28.99
I_2	24.54	28.48	30.38	36.61	30.00
I_3	22.97	27.19	26.53	32.88	27.39
Mean	24.12	27.71	28.69	34.66	28.79

S.E. of V marginal mean = 0.84 tons/ac.
S.E. of I marginal mean = 0.73 tons/ac.
S.E. of body of table = 1.45 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 59(83).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'IV'.**

Object :—To study the effect of levels of irrigation on different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 22, 23.3.1959. (iv) (a) 6 ploughings and 6 *sohaga*. (b) Flat planting. (c) 30,000 setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) and (vii) As per teeatments. (viii) Blind hoeing and weeding after every irrigation during pre-monsoon period. (ix) N.A. (x) 17.2.1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(87) on page 329.

5. RESULTS :

(i) 24.87 tons/ac. (ii) 2.46 tons/ac. (iii) Main effects of V and I are highly significant. (iv) Av. yield of sugarcane in tons/ac.

	V_1	V_2	V_3	V_4	Mean
I_1	25.39	24.97	23.42	29.76	25.89
I_2	28.52	25.09	23.12	26.59	25.83
I_3	21.23	23.57	20.92	25.79	22.88
Mean	25.05	24.54	22.49	27.38	24.87

S.E. of V marginal mean = 0.71 tons/ac.
S.E. of I marginal mean = 0.61 tons/ac.
S.E. of body of table = 1.23 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 59(84).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'IV'.**

Object :—To study the water requirements of two late varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 6 ploughings and 6 *sohaga*. (b) Flat planting. (c) 30,000 two budded setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) and (vii) As per treatments. (viii) Blind hoeing and weeding after every irrigation during pre-monsoon period. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

4 irrigation levels : C_1=20%, C_2=27%, C_3=34% and C_4=41% moisture levels maintained by irrigation.

Sub-plot treatments :

2 varieties : V_1=CO—312 and V_2=CO—453.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Growth data, tillering, no. of sugarcane, thickness and yield of sugarcane. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 21.98 tons/ac. (ii) (a) 2.85 tons/ac. (b) 3.35 tons/ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	C_1	C_2	C_3	C_4	Mean
V_1	16.09	20.08	19.33	18.12	18.41
V_2	26.72	26.28	26.07	23.19	25.57
Mean	21.41	23.18	22.70	20.66	21.99

S.E. of difference of two

1. C marginal means = 1.27 tons/ac.
2. V marginal means = 1.06 tons/ac.
3. V means at the same level of C = 2.12 tons/ac.
4. C means at the same level of V = 1.96 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(32).**

Site :- Sugarcane Sub-Stn., Gurdaspur. **Type :- 'IMV'.**

Object :—To study the effect of irrigation and levels of N on different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Sannhemp*—Sugarcane. (b) *Sannhemp*. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 9.4.1954. (iv) (a) 1 *hindustani* plough, 2 *desi* plough and 6 *sohaga*. (b) N.A. (c) 35,000 setts/ac. (d) 2' between rows. (e) N.A. (v) *Sannhemp* as G.M. burried on 19.8.1953. (vi) and (vii) As per treatments. (viii) 1 bar harrow, 1 earthing and 2 hoeings. (ix) 34.63". (x) 5.4.1955 to 28.5.1955.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N : N_0=0, N_1=100 and N_2=200 lb./ac.

(2) 2 levels of irrigation : I_1=Restricted and I_2=Liberal.

Sub-plot treatments :

4 varieties : V_1=CO—312 (early), V_2=Cok—30 (medium), V_3=Col—9 (medium) and V_4=Ccl—29 (early).

N is applied as F.Y.M. and A/S in 1 : 1 ratio. F.Y.M. applied on 13.3.1954 and A/S on 28.6.1954.

3. DESIGN :

Split-plot. (ii) (a) 6 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 72′×12′. (b) 60′ 6″×12′. (v) 5′ 9″ on either side of length. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) No. of sugarcane and yield of sugarcane. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 23.91 tons/ac. (ii) (a) 4.64 tons/ac. (b) 2.53 tons/ac. (iii) Main effects of N and V are highly significant and interaction V×N is significant. (iv) Av. yield of sugarcane in tons/ac.

	V_1	V_2	V_3	V_4	Mean	I_1	I_2
N_0	24.29	19.10	12.62	17.81	18.46	19.63	17.29
N_1	33.48	21.64	17.06	23.74	23.98	23.60	24.35
N_2	38.26	28.63	22.42	27.84	29.29	30.44	28.13
Mean	32.01	23.12	17.37	23.14	23.91	24.56	23.26
I_1	33.44	22.93	18.49	23.38			
I_2	30.59	23.31	16.25	22.89			

S.E. of difference of two

1. N marginal means = 1.16 tons/ac.
2. I marginal means = 0.95 tons/ac.
3. V marginal means = 0.73 tons/ac.
4. V means at the same level of I = 1.03 tons/ac.
5. I means at the same level of V = 1.59 tons/ac.
6. V means at the same level of N = 1.26 tons/ac.
7. N means at the same level of V = 1.30 tons/ac.

S.E. of body of N×I table = 1.16 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(137).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'D'.**

Object :—To study the effect of 2, 4—D free acid on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 18, 21.4.1954. (iv) (a) 7 ploughings and 1 *sohaga*. (b) N.A. (c) 30,000 setts/ac. (d) 1′ between rows. (e) N.A. (v) Nil. (vi) Col—9 (medium). (vii) Irrigated. (viii) 1 ridging. (ix) 23.65″. (x)30.4.1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 sett soaking treatments : S_1=2, 4—D free acid at 40 p.p.m. in water, S_2= 2, 4—D free acid at 20 p.p.m. in water, S_3=2, 4—D free acid at 10 p.p.m. in water and S_4= ordinary water.

(2) 3 durations : D_1=6, D_2=12 and D_3=24 hours.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) and (b) 8′×32′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Germination count and sugarcane yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 13.44 tons/ac. (ii) 2.59 tons/ac. (iii) Main effect of S alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	S_1	S_2	S_3	S_4	Mean
D_1	15.31	10.78	13.39	16.82	14.08
D_2	13.13	15.94	14.95	17.03	15.26
D_3	10.42	12.08	10.31	11.09	10.98
Mean	12.95	12.93	12.88	14.98	13.44

S.E. of S marginal mean = 0.86 tons/ac.
S.E. of D marginal mean = 0.75 tons/ac.
S.E. of body of table = 1.49 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(138).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'D'.**

Object :—To study the effect of different doses of B.H.C. in controlling the stem borer.

1. BASAL CONDITIONS :

(i) (a) Wheat—Fodder—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 12.3.1954. (iv) (a) 1 *raja* plough, 7 ploughing with tractor and 3 *sohaga*. (b) N.A. (c) 30,000 setts/ac. (d) 2' between rows. (e) N.A. (v) 50 lb./ac. of N as T.C. applied on 3.5.1953. (vi) CO—421 (late). (vii) Irrigated. (viii) 3 hoeings. (ix) 23.65". (x) 30.4.1955.

2. TREATMENTS :

Main-plot treatments :

3 times of application : T_1=One application in April, T_2=Two applications one each in April and May and T_3=Three applications one each in April, May and June.

Sub-plot treatments :

4 levels of B.H.C. : L_0=Control (no B.H.C.), L_1=1.5, L_2=2.0 and L_3=2.5 lb./ac.
B.H.C. applied on 22.4.1954, 26.5.1954 and 19.9.1954.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (iii) 4. (iv) (a) 1/54.45 ac. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Attack of stem borer. (iii) Percentage attacks of stemborer one month after each application and sugarcane yield. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 35.01 tons/ac. (ii) (a) 11.66 tons/ac. (b) 5.84 tons/ac. (iii) Main effect of L alone is significant. (iv) Av. yield of sugarcane in tons/ac.

	L_0	L_1	L_2	L_3	Mean
T_1	—	32.78	36.91	30.76	33.48
T_2	—	35.28	37.37	29.85	34.17
T_3	—	37.98	41.24	30.33	36.52
Mean	35.86	35.35	38.51	30.31	—

S.E. of difference of two

1. T marginal means = 4.76 tons/ac.
2. L marginal means = 2.38 tons/ac.
3. L means at the same level of T = 4.13 tons/ac.
4. T means at the same level of L = 5.45 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 57(92).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'D'.**

Object :—To study the effect of soaking setts in chemicals for different durations on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i, (a) Wheat—Cotton—*Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 6 ploughings and 6 *sohaga*. (b) Flat planting. (c) 30,000 setts/ac. (d, 2' between rows. (e, N.A. (v) Nil. (vi) Col.—9. (vii) Irrigated. (viii) Blind hoeing and weeding after every irrigation during pre-monsoon period. (ix) and (x) N.A.

2. TREATMENTS :

Main plot treatments :

2 soil moistures : S_1=Vatter soil of 9.8% of moisture and S_2=Dry soil of 8.3% of moisture.

Sub-plot treatments :

8 soaking treatments : T_0 Control (unsoaked setts), T_1=Soaking setts in water for 24 hours, T_2= Soaking setts in saturated lime solution for 24 hours, T_3=Soaking setts in lime Sol.+Magnesium sulphate for 24 hours, T_4=Soaking setts in lime Sol.+ C/N for 24 hours, T_5=Soaking setts in lime solution+Urea for 24 hours, T_6= Soaking setts in hot water at 52°c for 30 minutes and T_7=Dipping sett ends in 0.5% Acetone solution.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Growth data, tillering, no. of sugarcane, thickness of sugarcane and sugarcane yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 9.77 tons/ac. (ii) (a) 3.58 tons/ac. (b) 2.02 tons/ac. (iii) Main effect of T and interaction T×S are highly significant and effect of S is significant. (iv) Av. yield of sugarcane in tons/ac.

	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
S_1	9.28	9.85	10.74	12.92	12.35	12.82	11.88	10.68	11.32
S_2	7.82	9.67	9.38	8.08	11.62	11.72	1.77	5.58	8.21
Mean	8.55	9.76	10.06	10.50	11.99	12.27	6.82	7.83	9.77

S.E. of difference of two

1. S marginal means = 0.89 tons/ac.
2. T marginal means = 1.01 tons/ac.
3. T means at the same level of S = 1.43 tons/ac.
4. S means at the same level of T = 1.61 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 59(87).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'D'.**

Object :—To study the effect of different weedicides on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Maize fodder—Fallow—Sugarcane. (b) Maize fodder. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 4, 5.4.1959. (iv) (a) 5 ploughings and 5 *sohaga*. (b) Flat planting. (c) 30,000 setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Blind hoeing and weeding after every irrigation during pre-monsoon period. (ix) N.A. (x) 6.1.1960.

2. TREATMENTS :

7 weedicidal treatments : W_0=Control (no weedicide), W_1=Talwar pre-emergence spraying at 5 lb. in 100 gallons of water/ac., W_2=Karmex pre-emergence spraying at 5 lb. in 100 gallons of water/ac., W_3=Fernoxone pre-emergence spraying at 2½ lb. in 100 gallons of water/ac., W_4=Fernoxone post-emergence spraying at 2½ lb. in 100 gallons of water/ac., W_5=Fernoxone pre+post emergence spraying at 2½ lb. in 100 gallons of water/ac. in each time and W_6=Iso-cornox post emergence sprayings at 7½ lb. in 100 gallons of water/ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 1/72.6 ac. (b) 1/85 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of sugarcane, no. of sugarcane, thickness of sugarcane and growth data. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 20 30 tons/ac. (ii) 3.22 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	W_0	W_1	W_2	W_3	W_4	W_5	W_6
Av. yield	22.45	15.98	19.35	19.73	20.92	23.06	20.63

S.E./mean = 1.61 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 57(91).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'D'.**

Object :—To study the effect of soaking of sugarcane setts for different durations on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 6 ploughings and 6 *sohaga*. (b) Flat planting. (c) 30,000 setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) Col—9. (vii) Irrigated. (viii) Blind hoeing and weeding after every irrigation during pre-monsoon period. (ix) and (x) N.A.

2. TREATMENTS :

5 soaking treatments : T_0=Control (unsoaked), T_1=Soaking setts in water for 48 hours and changing water after every 24 hours, T_2=Soaking setts in water for 48 hours and not changing water, T_3=Soaking setts in water for 72 hours and changing water after 24 hours and T_4=Soaking setts in water for 72 hours and not changing water.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Growth data, tillering, no. of sugarcane, thickness of sugarcane and yield of sugarcane. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 10.70 tons/ac. (ii) 2.49 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	T_0	T_1	T_2	T_3	T_4
Av. yield	6.09	12.25	8.86	12.35	13.97

S.E./mean = 1.24 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 59(86).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'D'.**

Object :— To study the effect of setts dipped in different chemicals on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Maize fodder—Fallow—Sugarcane. (b) Maize fodder. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 4.4.1959. (iv) (a) 6 ploughings and 6 *sohaga*. (b) Flat planting. (c) 30,000 setts/ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Blind hoeing and weeding after every irrigation during pre-monsoon period. (ix) N.A. (x) 3.1.1960.

2. TREATMENTS :

7 soaking treatments : T_0=Control, T_1=Setts dipped in hot water for ½ hour, T_2=Setts dipped in hot water for ½ hour and dipped in 0.5% mercuric acetate solution, T_3=Setts dipped in 0.5% Mercuric acetate solution, T_4=Setts soaked in ordinary water for 24 hours, T_5=Setts soaked in ordinary water for 24 hours and dipped in 0.5% mercuric acetate solution and T_6=Setts dipped in 0.5% Acetone solution.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/151.25 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of suagrcane and germination percentage. (iv) (a)1958—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 17.20 tons/ac. (ii) 4.32 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	17.45	19.53	17.83	15.50	14.82	17.28	17.99

S.E./mean = 2.16 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(140).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'D'.**

Object :— To study the effect of endrine against top borer and its effect on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis. Jullundur. (iii) 13.3 1954. (iv) (a) 5 ploughings and 3 *sohaga*. (b) N.A. (c) 32,000 sett/ac. (d) 2' between rows. (e) N.A. (v) 50 lb./ac. of N as T.C. broadcast 3 months before sowing and then mixed with soil by ploughing. (vi) Col—9 (medium). (vii) Irrigated. (viii) 8 hoeings and one earthing up (ix)23.65". (x) 26.3.1955.

2. TREATMENTS :

4 insecticidal treatments : T_0=Control (no endrin), T_1=0.1% endrin sprayed against 3rd brood on 4.7.1954, T_2=0.1% endrin sprayed against 4th brood on 6.8.1954 and T_3=0.1% endrin sprayed againt 3rd and 4th brood on 4.7.1954 and 6.8.1254 respectively.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 12′×45′ 4½″. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. Crop in T_1 and T_3 plots lodged during Sept. (ii) Attack of top borer. (iii) Percentage of top borer attack and yield of sugarcane. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS .

(i) 31.78 tons/ac. (ii) 1.72 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	24.35.	34.89	28.43	39.43

S.E./mean = 6.86 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(141).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'D'.**

Object :—To find out the effect of dipping of setts in insecticidal solutions on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—Fodder—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 20.3.1954. (iv) (a) 6 ploughings and 2 *sohaga*. (b) N.A. (c) 30,000 setts/ac. (d) 2′ between rows. (e) N.A. (v) 50 lb./ac. of N as T.C. broadcast 3 months before sowing and mixed with soil by ploughing. (vi) CO—312 (late). (vii) Irrigated. (viii) 3 hoeings and 1 earthing up. (ix) 23.65″. (x) 29.4.1955.

2. TREATMENTS :

10 insecticidal treatments : T_0=Control, T_1=0.25% B.H.C., T_2=0.1% B.H.C., T_3=0.25% dieldrin, T_4=0.1% dieldrin, T_5=0.25% aldrin, T_6=0.1% aldrin, T_7=0.25% chlordane, T_8=0.1% chlordane and T_9=5% B.H.C. dust at 40 lb./ac. applied in furrows at the time of planting.

Setts dipped in above solutions in T_1 to T_8 before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 16′×24′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Incidence of termite. (iii) Germination and yield of sugarcane. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 24.53 tons/ac. (ii) 4.47 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9
Av. yield	21.88	23.41	22.29	30.39	25.60	23.68	26.12	23.83	24.32	23.78

S.E./mean = 2.23 tons/ac.

Crop :- Sugarcane. **Ref :- Pb. 54(142).**

Site :- Sugarcane Res. Stn., Jullundur. **Type :- 'D'.**

Object :—To find out the effect and economical control measures to check termite incidents to sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis. Jullundur. (iii) 11.10.1954. (iv) (a) 5 ploughings and 3 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) CO—312 (late). (vii) Irrigated. (viii) 3 hoeings and 1 earthing up. (ix) 55.96". (x) 12.4.1956.

2. TREATMENTS :

Same as in expt. no. 54(141) on page 337.
Treatments applied before planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 10'×24'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Incidence of termite observed. (iii) Germination, termite incidence and yield of sugarcane. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 21.40 tons/ac. (ii) 2.01 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9
Av. yield	9.01	21.23	20.09	15.21	20.82	29.17	28.26	23.17	27.55	19.53

S.E./mean = 1.00 tons/ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(173).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :— To study the direct, residual and cumulative effect of P applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Berseem*—Wheat. (b) and (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 7.28". (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and super, T_2 to T_{12} plots reeived B.D. at 50 lb./ac. of N. ½, 1 and 2 in the treatments indicate 25, 50 and 100 lb./ac. of super.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) As per treatments.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Cotton yield. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) Hansi and Jullundur. (vi) and (vii) Nil.

5. RESULTS :

(i) 1840 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of cotton in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield	1835	1592	1555	2049	2518

S.E.'s N.A.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 56(152).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :— To study the direct, residual and cumulative effect of P applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Berseem*—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 21.46″. (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and no super, T_2 to T_{12} plots received B.D. at 25 lb./ac. of N. ½, 1 and 2 in the treatments indicate 25, 50 and 100 lb./ac. of super.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(173) on page 338.

5. RESULTS :

(i) 1093 lb./ac. (ii) 203.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cotton in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	897	1043	1185	1317	954	1111	1070	1160	1251

S.E. of $(T_2+T_3+T_4+T_5)$ mean = 71.9 lb./ac.
S.E. of any other mean = 143.8 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 57(214).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Berseem*—Wheat. (b) N.A. (c) As per treatments. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 6.42″. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 56(152) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) As per rotation.

4. GENERAL :

(i) and (ii) N.A. (iii) (a) Yield of cotton. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1260 lb./ac. (ii) 67.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of cotton in lb./ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	922	1296	1275	1251	1292	1292	1267	1152	1325	1242	1506

S.E. of (T_2+T_3) mean = 33.6 lb./ac.
S.E. of any other mean = 47.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(170).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different Crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Toria*—Wheat. (b) and (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 7.28″. (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and no N, T_2 to T_{12} plots received B.D. at 50 lb./ac. of P_2O_5. ½, 1 and 2 in other treatments indicate 25, 50, and 100 lb./ac. of N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(173) on page 338.

5. RESULTS :

(i) 1807 lb./ac. (ii) and (iii) N.A. (vi) Av. yield of cotton in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	T_8+T_{11}	(T_9+T_{12})
Av. yield	1835	1596	1555	1843	2518

S.E. = N.A.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(149).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Toria*—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 21.46″. (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no. B.D. and no N. T_2 to T_{12} plots received B.D. at 25 lb./ac. of P_2O_5. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(173) on page 338.

5. RESULTS :

(i) 959 lb./ac. (ii) 151.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	773	928	815	979	996	1226	839	1127	1045

S.E. of $(T_2+T_3+T_4+T_5)$ mean = 53.6 lb./ac.
S.E. of any other mean = 107.3 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(178).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Toria*—Wheat. (b) N.A. (c) As per treatments. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 6.42". (x) N.A.

2. TREATMENTS :

Same as in expt. no. 56(149) on page 340.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(173) on page 338.

5. RESULTS :

(i) 1066 lb./ac. (ii) 210.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	963	802	1144	905	1259	1045	1168	938	1325	1086	1358

S E. of (T_2+T_3) mean = 105.2 lb./ac.
S.E. of any other mean = 148.8 lb./ac.

Crop : Cotton *(Kharif)*. **Ref :- Pb. 55(155).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of graded doses and time of application of N.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) May, 1955. (iv) and (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 7.28". (x) Nov., 1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 times of application of N : $T_1=\frac{1}{4}$ at sowing$+\frac{1}{4}$ at flowering, $T_2=\frac{1}{2}$ at thinning$+\frac{1}{2}$ at flowering, T_3=Full dose at thinning and T_4=Full dose at flowering.

(2) 7 levels of N : $N_0=0$, $N_1=25$, $N_2=50$, $N_3=75$, $N_4=100$, $N_5=125$ lb./ac. and $N_6=150$ lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 28. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8′×32.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) Hansi and Jullundur. (vi) and (vii) Nil.

5. RESULTS :

(i) 1409 lb./ac. (ii) 199.5 lb./ac. (iii) Main effect of T, N and 'control *vs.* others' are highly significant. (iv) Av. yield of *kapas* in lb /ac.

N_0 = 783 lb./ac.

	N_1	N_2	N_3	N_4	N_5	N_6	Mean
T_1	979	1621	1349	1325	1662	2436	1562
T_2	1300	1275	1325	1794	2148	2180	1670
T_3	1012	1234	1530	1695	1794	2082	1558
T_4	1152	1119	1317	1177	1530	1275	1262
Mean	1111	1312	1380	1498	1784	1993	1513

S.E. of T marginal mean = 57.6 lb./ac.
S.E. of N marginal mean or N_0 mean = 70.5 lb./ac.
S.E. of body of table = 141.1 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(137).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of graded doses and time of application of N.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) May, 1956. (iv) and (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 21.46". (x) Nov., 1956.

2. TREATMENTS :

Same as in expt. no. 55(155) on page 341.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 28. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8'×35'. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 55(155) on page 341.

5. RESULTS :

(i) 1212 lb./ac. (ii) 107.8 lb./ac. (iii) All effects excepting T are highly significant. (iv) Av. yield of *kapas* in lb./ac.

N_0 = 1096 lb./ac.

	N_1	N_2	N_3	N_4	N_5	N_6	Mean
T_1	1208	1308	1366	1168	1382	1210	1274
T_2	963	1193	1218	1201	1349	1292	1203
T_3	987	1037	1349	1218	1210	1259	1177
T_4	1234	1111	1267	1333	1423	1267	1272
Mean	1098	1162	1300	1230	1341	1257	1231

S.E. of N marginal mean or N_0 mean = 38.1 lb./ac.
S.E. of T marginal mean = 31.1 lb./ac.
S.E. of body of table = 76.2 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(163).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of graded doses and time of application of N.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) May, 1957. (iv) and (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 6.42″. (x) Nov., 1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(137) on page 342.

5. RESULTS :

(i) 1487 lb./ac. (ii) 403.8 lb./ac. (iii) Only 'control *vs.* others' is significant. (iv) Av. yield of *kapas* in lb./ac.

N_0 = 1160 lb./ac.

	N_1	N_2	N_3	N_4	N_5	N_6	Mean
T_1	1522	1629	1588	1292	1522	1481	1506
T_2	1234	1514	2008	1720	1629	1744	1642
T_3	1259	1489	1580	1465	1613	1769	1529
T_4	1127	1613	1621	1720	1325	1530	1489
Mean	1286	1561	1699	1549	1522	1631	1541

S.E. of N marginal mean or N_0 mean = 142.8 lb./ac.
S.E. of T marginal mean = 116.6 lb./ac.
S.E. of body of table = 285.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(191).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of graded doses and time of application of N.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) May, 1958. (iv) and (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 24.92″. (x) Nov., 1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(137) on page 342.

5. RESULTS :

(i) 671 lb./ac. (ii) 126.9 lb./ac. (iii) 'Control *vs.* others' is highly significant. N effect is significant. (iv) Av. yield of *kapas* in lb./ac.

5. RESULTS :

(i) 852 lb./ac. (ii) 244.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

N_0 = 736 lb./ac.

	N_1	N_2	N_3	N_4	N_5	N_6	Mean
T_1	715	830	775	1085	1110	975	915
T_2	835	880	990	810	1045	765	888
T_3	770	725	785	875	820	1135	852
T_4	910	670	1095	675	750	545	774
Mean	808	776	911	861	931	855	857

S.E. of N marginal mean or N_0 mean = 86.6 lb./ac.
S.E. of T marginal mean = 70.7 lb./ac.
S.E. of body of table = 173.1 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(175).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of hormones on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) May, 1957. (iv) and (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 6.42". (x) November, 1957.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.

(2) 3 spraying treatments : S_1=Spraying with ordinary water, S_2=Spraying with planofin solution at bud initiation stage and S_3=Spraying with planofin solution at bud initiation and flowering stages.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassids and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1819 lb./ac. (ii) 332.4 lb./ac. (iii) S effect alone is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
S_1	1613	1506	1506	1542
S_2	1967	1670	2000	1879
S_3	1950	2139	2016	2035
Mean	1843	1772	1841	1819

S.E. of any marginal mean = 110.8 lb./ac.
S.E. of body of table = 191.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(203).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of hormones on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam, (b) N.A. (iii) May, 1958. (iv) and (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 24.92". (x) Nov., 1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(175) on page 346.

4. GENERAL :

(i) Normal. (ii) Attack of jassids, cotton leaf roller, Pink boll worm and cotton bugs. (iii) Yield of *kapas*. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) Nil. (vi) Untimely heavy rains. (vii) Nil.

5. RESULTS :

(i) 593 lb./ac. (ii) 174.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
S_1	650	502	428	527
S_2	642	592	691	642
S_3	658	584	592	611
Mean	650	559	570	593

S.E. of any marginal mean = 58.1 lb./ac.
S.E. of body of table = 100.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(206).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of hormones on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) May, 1959. (iv) and (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 13.54". (x) Nov., 1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

(2) 3 spraying treatments : S_1=Ordinary spraying with water at bud initiation stage and flower initiation stage, S_2=Sprayings with Alpha Naphthalene acetic acid solution at bud initiation and one with ordinary water and S_3=One spraying at bud initiation and 2nd at flower initiation with Alpha Naphthalene acetic acid sol.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 6'×33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassids and cotton leaf roller, pink boll worm and bugs. (iii) Yield of *kapas*. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) Nil. (vi) Gusty winds, dust storms and heavy rains. (vii) Nil.

5. RESULTS :

(i) 1105 lb./ac. (ii) 442.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
S_1	1020	724	1053	932
S_2	1127	1382	913	1141
S_3	1662	765	1300	1242
Mean	1270	957	1089	1105

S.E. of any marginal mean = 147.6 lb./ac.
S.E. of body of table = 255.6 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(120).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of Alpha Naphthalene acetic acid in combination with N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 22.5.1959. (iv) (a) 3 plankings and 2 ploughings. (b) Dibbling. (c) 8 srs./ac. (d) 2′ × 1½′. (e) 3 to 5 seeds in one hole but one plant is retained after thinning. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 thinning. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

(2) 3 spraying treatments L_0=0, L_1=1 and L_2=2 sprayings of alpha naphthalene acetic acid.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 36′ × 10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) (a) Jullundur and Hansi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 594 lb./ac. (ii) 155.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
L_0	638	622	817	692
L_1	467	716	467	550
L_2	497	451	669	539
Mean	534	596	651	594

S.E. of any marginal mean = 63.6 lb./ac.
S.E. of body of table = 110.2 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(222).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :— To compare different sources of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) 13.5.1954. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1¼′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 sources of N : S_1=A/S, S_2=C/N, S_3=Urea and S_4=A/S+KNO_3.

(2) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 8′×46′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) N.A. (v) N.A. (vi) Nil.

5. RESULTS :

(i) 1682 lb./ac. (ii) 451.2 lb./ac. (iii) Only 'control *vs.* others' is highly significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 1226 lb./ac.

	S_1	S_2	S_3	S_4	Mean
N_1	1703	1744	1835	1917	1800
N_2	1802	2098	2353	1827	2020
Mean	1752	1921	2094	1872	1910

S.E. of N marginal mean or control mean = 130.3 lb./ac.
S.E. of S marginal mean = 184.2 lb./ac.
S.E. of body of table = 260.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(161).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :— To compare different inorganic fertilizers as sources of N.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×4/5′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 7.28″. (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)+2 control in each block

(1) 4 sources of N : S_1=C/N, S_2=A/S, S_3=Urea and S_4=A/S/N.

(2) 2 levels of N : N_1=50 and N_2=100 lb./ac.

(3 3 times of application : T_1=Early at thining, T_2=Late at flowering and T_3=Half ear ly and half late.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 14 plots/block and 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 8′×35′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) 1955—contd. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) N.A. (vi) N.A. (vii) Other two way tables are N.A.

5. RESULTS :

(i) 1578 lb./ac. (ii) 110.8 lb./ac. (iii) N and S effects are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 1004 lb./ac.

	S_1	S_2	S_3	S_4	Mean
N_1	1703	1374	1596	1481	1539
N_2	1958	1753	1777	1753	1810
Mean	1830	1564	1686	1617	1674

S.E. of S marginal mean = 26.1 lb./ac.
S.E. of N marginal mean = 18.5 lb./ac.
S.E. of body of table = 36.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(143).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :— To compare different nitrogenous fertilizers as sources of N.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1¼′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 21.46″. (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(161) on page 349.

5. RESULTS :

(i) 1116 lb./ac. (ii) 245.3 lb./ac. (iii) Only 'control *vs.* others' is highly significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 856 lb./ac.

	S_1	S_2	S_3	S_4	Mean
N_1	1193	1078	1160	1020	1113
N_2	1275	1136	1201	1210	1205
Mean	1234	1107	1181	1115	1159

S.E. of S marginal mean = 57.8 lb./ac.
S.E. of N marginal mean = 40.9 lb./ac.
S.E. of body of table = 81.8 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(169).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :— To compare the different inorganic nitrogenous fertilizers as sources of N.

1. BASASL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) May, 1957. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1¼′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(161) on page 349.

5. RESULTS :

(i) 1322 lb./ac. (ii) 226.6 lb./ac. (iii) S effect is significant. N effect and 'control *vs.* others' are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 815 lb./ac.

	S_1	S_2	S_3	S_4	Mean
N_1	1415	1185	1366	1210	1294
N_2	1679	1506	1440	1456	1520
Mean	1547	1346	1403	1333	1407

S.E. of S marginal mean = 53.4 lb./ac.
S.E. of N marginal mean = 37.8 lb./ac.
S.E. of body of table = 75.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(197).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To compare the different inorganic fertilizers as sources of N and their time of application.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1¼′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)+2 control plots in each block

(1) 6 sources of N : S_1=C/A/N, S_2=A/S, S_3=Urea, S_4=A/S/N, S_5=Nitrophoska green and S_6=Nitrophoska blue.

(2) 2 levels of N : N_1=50 and N_2=100 lb./ac.

(3) 3 times of application of N : T_1=½ at thinning+½ at flowering, T_2=Full dose at thinning and T_3=Full dose at flowering.

3. DESIGN :

(i) R.B.D. confd. (ii) (a) 20 plots/block ; 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 8′×35′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) N.A. (vi) N.A. (vii) Other two-way tables are not availble.

5. RESULTS :

(i) 560 lb./ac. (ii) 225.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 510 lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean
N_1	560	576	617	617	592	527	582
N_2	477	576	576	560	535	584	551
Mean	518	576	596	588	564	556	566

S.E. of S marginal mean = 53.1 lb./ac.
S.E. of N marginal mean = 30.7 lb./ac.
S.E. of body of table = 75.1 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 59(200).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To compare different nitrogenous fertilizers as sources of N in relation to time of application.

1. BASAL CONDITIONS:

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) May, 1959. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1¼′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 13.54″. (x) Nov., 1959.

2. TREATMENTS :

Same as in expt. no. 58(197) on page 351.

3. DESIGN :

(i) R.B.D. confd. (ii) (a) 20 plots/block and 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 6′×35′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1347 lb./ac. (ii) 343.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 1349 lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean	N_1	N_2
T_1	1415	1316	1234	1382	1275	1448	1345	1390	1300
T_2	1226	1407	1391	1160	1415	1292	1315	1316	1316
T_3	1267	1473	1473	1473	1168	1432	1381	1333	1430
Mean	1303	1399	1366	1338	1286	1391	1347	1346	1349
N_1	1218	1464	1234	1316	1283	1555			
N_2	1389	1315	1498	1362	1290	1226			

S.E. of S marginal mean = 80.9 lb./ac.
S.E. of T marginal mean = 57.2 lb./ac.
S.E. of N marginal mean = 46.7 lb./ac.
S.E. of body of S×T table = 140.0 lb./ac.
S.E. of body of S×N table = 114.4 lb./ac.
S.E. of body of N×T table = 80.9 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 59(119).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of N applied at different times on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 23.5.1959. (iv) (a) 3 ploughings and 3 plankings. (b) Dibbling. (c) 8 srs./ac. (d) and (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 5 waterings. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 58(197) on page 351.

3. DESIGN :

(i) R.B.D. (ii) (a) 36+2 control plots. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 48′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Cotton yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Jullundur and Hansi. (b) Nil. (vi) and (vii) N.A.

5. RESULTS :

(i) 716.5 lb./ac. (ii) 126.7 lb./ac. (iii) Only S×N interaction is significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 758.4 lb /ac.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean	T_1	T_2	T_3
N_1	648	795	644	698	676	832	715	710	725	712
N_2	735	704	780	720	686	651	713	677	697	764
Mean	691	749	712	709	681	742	714	693	711	738
T_1	753	706	610	645	677	770				
T_2	650	752	732	697	747	688				
T_3	671	790	793	785	621	767				

S.E. of N marginal mean = 21.1 lb./ac.
S.E. of T marginal mean = 25.9 lb./ac.
S.E. of S marginal mean = 36.6 lb./ac.
S.E. of body of N×S table = 51.7 lb./ac.
S.E. of body of N×T table = 36.6 lb./ac.
S.E. of body of T×S table = 63.3 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 55(158).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of N, P and K alone and in combination with F.Y.M.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1¼′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 7.28″. (x) N.A.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.
(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=50 and P_2=100 lb./ac.
(3) 3 levels of K_2O as Potash : K_0=0, K_1=50 and K_2=100 lb./ac.
(4) 3 levels of F.Y.M. : F_0=0, F_1=150 and F_2=300 mds./ac.

F.Y.M. and Super applied before sowing, A/S along the rows ½ at thinning+½ at flowering followed by irrigation. Potash was applied along the rows before first irrigation.

3. DESIGN :

(i) 3^4 confd. (ii) (a) 9 plots/block and 9 blocks/replications. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 6′×35′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassids and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) Hansi and Jullundur. (vi) Nil. (vii) Remaining two-way tables are not available in the records.

5. RESULTS :

(i) 2063 lb./ac. (ii) 161.3 lb./ac. (iii) Main effect of F and N are highly significant. (iv) Av.yield of *kapas* in lb./ac.

	N_0	N_1	N_2	K_0	K_1	K_2	P_0	P_1	P_2	Mean
F_0	1579	1868	2139	1860	1835	1891	1760	1876	1950	1862
F_1	1722	2090	2337	2049	1967	2133	1999	2066	2084	2050
F_2	1983	2222	2625	2246	2263	2321	2287	2230	2313	2277
Mean	1761	2060	2367	2052	2022	2115	2015	2057	2116	2063

S.E. of any marginal mean = 31.0 lb./ac.
S.E. of body of any table = 53.8 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref:- Pb. 56(140).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of N, P and K alone and in combination with F.Y.M.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′ × 1¼′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 21.46″. (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(158) on page 353.

5. RESULTS :

(i) 1348 lb./ac. (ii) 260.8 lb./ac. (iii) Main effect of F is highly significant and of N is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	K_0	K_1	K_2	P_0	P_1	P_2	Mean
F_0	1020	1103	1317	1119	1152	1169	1078	1193	1169	1147
F_1	1317	1391	1489	1390	1391	1416	1407	1391	1399	1399
F_2	1440	1473	1588	1522	1522	1457	1465	1530	1506	1500
Mean	1259	1322	1465	1344	1355	1347	1317	1371	1358	1348

S.E. of any marginal mean = 50.2 lb./ac.
S.E. of body of any table = 86.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb 57(166).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of N, P and K alone and in combination with F.Y.M.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 6.42″. (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(158) on page 353.

5. RESULTS :

(i) 1522 lb./ac. (ii) 219.2 lb./ac. (iii) F effect is significant and N effect is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_1	Mean
F_0	1111	1448	1728	1366	1382	1539	1465	1399	1424	1429
F_1	1226	1679	1679	1481	1555	1547	1440	1572	1572	1528
F_2	1349	1671	1808	1588	1613	1629	1695	1530	1605	1610
Mean	1229	1599	1738	1478	1517	1572	1533	1500	1534	1522

S.E. of any marginal mean = 42.2 lb./ac.
S.E. of body of any table = 73.1 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(194).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of N, P and K alone and in combination with F.Y.M.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) May, 1958. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1½′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated, (viii) 1 hoeing. (ix) 24.92″. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 55(158) on page 353.

3. DESIGN :

(i) 3^4 confd. (ii) (a) 9 plots/block and 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 6′×35½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of Jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b)No. (c) Nil. (v) (a) Hansi and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 644 lb /ac. (ii) 193.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	609	560	592	560	658	543	609	584	568	587
F_1	666	601	634	527	699	675	634	650	617	634
F_2	642	699	798	773	698	668	732	708	699	713
Mean	639	620	674	620	686	627	658	647	628	644

Other tables of means—N.A.

S.E. of any marginal mean = 37.3 lb./ac.
S.E. of body of any table = 64.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(197).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of N, P and K alone and in combination with F.Y.M.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) May, 1959. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1½′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 13.54″. (x) Nov., 1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 55(158) on page 353.

4. GENERAL :

(i) Normal. (ii) Attack of Jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1656 lb./ac. (ii) 283.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	1555	1629	1563	1753	1580	1414	1720	1595	1432	1582
F_1	1522	1662	1843	1588	1695	1744	1653	1662	1712	1676
F_2	1613	1769	1744	1662	1827	1637	1580	1777	1769	1709
Mean	1563	1687	1717	1668	1701	1598	1651	1678	1638	1656

Other tables of means—N.A.

S.E. of any marginal mean = 54.5 lb./ac.
S.E. of body of any table = 94.3 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(123).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :— To study the effect of N, P and K alone and in combination with F.Y.M.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 plankings and 5 ploughings. (b) Dibbling. (c) 8 srs/ac. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.
(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=50 and P_2=100 lb./ac.
(3) 3 levels of K_2O as Potash : K_0=0, K_1= 50 and K_2=100 lb./ac.
(4) 3 levels of F.Y.M. : F_0=0, F_1=150 and F_2=300 mds/ac.

3. DESIGN :

Same as in expt. no. 58(194) on page 355.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) (a) Jullundur and Hansi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 538 lb./ac. (ii) 127.8 lb./ac. (iii) F effect and F×P interaction are significant. (iv) Av. yield of *kapas* in lb./ac.

	F_0	F_1	F_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
N_0	502	570	538	482	570	558	573	535	502	537
N_1	453	511	584	494	552	502	523	514	511	516
N_2	502	520	657	587	587	505	564	555	561	560
Mean	486	534	593	521	570	522	553	535	525	538
K_0	505	540	614	552	576	532				
K_1	485	535	584	467	619	517				
K_2	467	526	582	543	514	517				
P_0	465	444	654							
P_1	546	584	578							
P_2	447	573	546							

S.E. of any marginal mean = 24.6 lb./ac.
S.E. of body of any table = 42.6 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(121).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :— To study the effect of N, P and K alone and in combination with F.Y.M.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 12.5.1959. (iv) (a) 5 ploughings and 3 plankings. (b) Dibbling. (c) 8 srs./ac. (d) 2′×1½′. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

Same as in expt. no. 58(123) on page 356.

3. DESIGN :

(i) 3^4 confd. (ii) (a) 9 plots/block and 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 38′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Jullundur and Hansi. (b) Nil. (vi) N.A. (vii) Nil.

5. RESULTS :

(i) 685 lb./ac. (ii) 182 6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	F_0	F_1	F_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
N_0	621	622	817	752	614	694	735	665	660	687
N_1	696	630	614	640	689	611	663	662	616	647
N_2	686	717	757	702	737	721	645	763	752	720
Mean	668	657	729	698	680	675	681	697	676	685
K_0	662	593	789	743	666	634				
K_1	712	707	670	648	747	694				
K_2	629	670	729	703	627	698				
P_0	702	603	789							
P_1	680	678	683							
P_2	621	689	716							

S E. of any marginal mean = 35.1 lb./ac.
S.E. of body of any table = 60.9 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 55(167).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :— To study the effect of trace elements on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1½′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 7.28″. (x) N.A.

2. TREATMENTS :

7 trace element treatments : T_0=Control, T_1=Molybdenum at 10 lb./ac., T_2= Boron at 20 lb./ac., T_3=Copper at 20 lb./ac., T_4= Iron at 50 lb./ac., T_5=Manganese at 20 lb./ac. and T_6=Zine at 20 lb./ac.

The salts of elements were powdered and mixed with earth and applied along the rows before 1st irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8′×35′. (v) N.A. (vi) Yes.

4. GENEAAL :

(i) N.A. (ii) Attack of jassid and cotton leaf ro ller. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) Nil. (v) (a) Hansi and Jullnudur. (b) N.A. (vi) N.A. (vii) Nil.

5. RESULTS :

(i, 891 lb./ac. (ii) 180.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	881	856	864	823	872	880	1061

S.E. mean = 90.3 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 54(214).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :— To study the effect of N and P and the time of application of N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) 14.4.1954. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1½′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All comibnations of (1) and (2)

(1) 6 levels of N : N_0=0, N_1=25, N_2=50, N_3=75, N_4=100 and N_5=125 lb./ac.

(2) 3 times of application of N : T_1=½ dose at sowing+½ at flowering, T_2=½ dose as thinning+½ at flowering and T_3=Full dose at flowering.

Sub-plot treatments :

2 levels of P_2O_5 : P_0=0 and P_1=50 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 18 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8′×42.5′. (v) N A. (v) Yes.

4. GENERAL :

(l) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) N.A. (vi) Nil. (vii) Remaining two-way table is not available in the records.

5. RESULTS :

(i) 1664 lb./ac. (ii) (a) 197.7 lb./ac. (b) 229.2 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	T_1	T_2	T_3	Mean	P_0	P_1
N_0	—	—	—	1018	996	1041
N_1	1498	1580	1548	1542	1613	1471
N_2	1646	1761	1744	1717	1714	1720
N_3	1827	1810	1695	1777	1874	1680
N_4	1794	2024	1893	1904	1884	1925
N_5	2041	2057	1975	2024	2040	2008
Mean	1761	1846	1771	—	1687	1641

S.E. of difference of two

1. N marginal means = 57.1 lb./ac.
2. T marginal means = 44.2 lb./ac.
3. P marginal meahs = 38.5 lb./ac.
4. P means at the same level of N = 93.6 lb./ac.
5. N means at the same level of P = 87.3 lb./ac.

S.E. of body of N×T table = 69.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(220).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of the time of application and the method of placement of A/S on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) 16.5.1954. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1¼′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 times of application of A/S : T_0=No application, T_1=Early at thinning, T_2=Late at flowering and T_3=½ at thinning+½ at flowering.

(2) 3 methods of application : M_1=Broadcast, M_2=Surface application along row and M_3=Drilled on one side of the row 2″ on the side and 2″ deep.

Level of A/S applied—N.A.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8′×42½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) Nil. (v) (a) Hansi. (b) N.A. (vi) N.A. (vii) Nil.

5. RESULTS :

(i) 1564 lb./ac. (ii) 201.3 lb./ac. (iii) Main effect of T alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	T_0	T_1	T_2	T_3	Mean
M_1	—	1637	1958	1753	1782
M_2	—	1580	1901	1670	1717
M_3	—	1646	1983	1539	1723
Mean	1034	1621	1947	1654	—

S.E. of T or M marginal mean = 58.1 lb./ac.
S.E. of body of M×T table = 100.6 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(124).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of different inorganic nitrogenous fertilizers as sources of N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 plankings and 5 ploughings. (b) Dibbling. (c) 8 srs./ac. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)+2 controls.

(1) 6 sources of N : S_1=C/A/N, S_2=A/S, S_3=Urea, S_4=A/S/N, S_5=Nitrophoska green and S_6= Nitrophoska blue.

(2) 2 levels of N : N_1=50 and N_2=100 lb./ac.

(3) 3 times of application of N : T_1=½ at thinning+½ at flowering, T_2=Full dose at thinning and T_3= Full dose at flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 38. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8′×35′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) (a) Jullundur and Hansi. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 525 lb./ac. (ii) 170.0 lb./ac. (iii) Only T effect is highly significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 470 lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean	T_1	T_2	T_3
N_1	517	537	590	570	578	483	546	581	468	589
N_2	438	535	537	515	490	550	511	481	405	647
Mean	478	536	564	542	534	517	528	531	436	618
T_1	415	565	588	545	508	565				
T_2	430	348	535	466	395	443				
T_3	588	695	568	615	700	543				

S.E. of S marginal mean = 49.1 lb./ac.
S.E. of N marginal mean = 28.3 lb./ac.
S.E. of T marginal mean = 34.7 lb./ac.
S.E. of body of N×S table = 69.4 lb./ac.
S.E. of body of S×T table = 85.0 lb./ac.
S.E. of body of N×T table = 49.1 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(119).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of different inorganic nitrogenons fertilizers as sources of N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 23.5.1959. (iv) (a) 3 ploughings and 3 plankings. (b) Dibbling. (c) 8 srs./ac. (d) and (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

Same as in expt. no. 58(124) on page 360.

3. DESIGN :

(i) R.B.D. (ii) (a) 38. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 48′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Jullundur and Hansi. (b) Nil. (vi) Nil. (vii) Control yield N.A.

5. RESULTS :

(i) N.A. (ii) 126.7 lb./ac. (iii) Only interaction S×N is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean	T_1	T_2	T_3
N_1	651	799	647	701	680	836	719	713	729	715
N_2	738	707	783	723	690	655	716	680	700	768
Mean	694	753	715	712	685	746	718	696	715	742
T_1	756	709	612	648	680	774				
T_2	653	756	736	700	750	692				
T_3	674	794	797	788	624	772				

S.E. of S marginal mean = 36.6 lb./ac.
S.E. of N marginal mean = 21.1 lb./ac.
S.E. of T marginal mean = 25.9 lb./ac.
S.E. of body of N×S table = 51.7 lb./ac.
S.E. of body of S×T table = 63.4 lb./ac.
S.E. of body of N×T table = 36.6 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(126).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the effect of N and spraying of planofix on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 25.4.1958. (iv) (a) 2 plankings and 2 ploughings. (b) Dibbling. (c) 8 srs./ac. (d) 2′×1½′. (e) 3 to 5 seeds in one hole but one plant is retained after thinning. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 thinning. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 spraying treatments : T_0=Control (spray twice with ordinary water), T_1=One spray with planofix and T_2=Two sprays with planofix.

(2) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) 40′×10′. (b) 35′×6′. (v) 2½′×2′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 567 lb./ac. (ii) 167.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
T_0	596	613	649	619
T_1	480	569	649	566
T_2	400	658	489	516
Mean	492	613	596	567

S.E. of any marginal mean = 55.8 lb./ac.
S.E. of body of table = 96.6 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(100).**

Site :- Dist. Demons. Farm, Ambala. **Type :- 'M'.**

Object :—To study the effect of different sources of N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Clayey. (b) N.A. (iii) 25.4.1955. (iv) (a) *Desi hal* 7 times and *sohaga* 4 times. (b) N.A. (c) 10 srs/ac. (d) and (e) N.A. (v) Nil. (vi) 320—F (medium). (vii) Irrigated. (viii) N.A. (ix) 30.49". (x) 18.10.1955, 5, 24.11.1955 and 4.1.1956.

2. TREATMENTS :

5 sources of 50 lb./ac. of N : S_0=Control (No N,) S_1=A/S, S_2=Urea S_3=A/N and S_4=C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 15'×72'6". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1256 lb./ac. (ii) 146.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4
Av. yield	1084	1262	1225	1270	1439

S.E./mean = 59.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(40).**

Site :- Dist. Demons. Farm, Ambala. **Type :- 'M'.**

Object :—To study the effect of different sources of N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) May, 1956. (iv) (a) 3 *desi hal* and 2 *sohaga* (b) to (e) N.A. (v) 20 lb./ac. of A/S applied on 18.8.1956. (vi) 320—F (medium). (vii) Irrigated. (viii) N.A. (ix) 29.16". (x) 7.10.1956, 10.11.1956.

2. TREATMENTS :

6 sources of 50 lb./ac. of N : S_0=Control, S_1=A/S, S_2=C/N. S_3=A/N, S_4=Urea and S_5=A/C.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 684 lb./ac. (ii) 125.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5
Av. yield	718	598	697	609	752	728

S.E./mean = 55.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(78).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'M'.**

Object :—To find out the suitable combination of N, P and K for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) Cotton. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) 3, 22.5 1958. (iv) (a) N A. (b) Sown by *pore*. (c) 8 srs./ac. (d) $2\frac{1}{2}' \times 1'$. (e) N.A. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 4 hoeings. (ix) 69.01". (x) 14, 17.11.1958, 21, 26, 12.1958 and 27.1.1959.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : N_0=0, N_1=60 and N_2=120 lb./ac.
(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=40 and P_2=80 lb./ac.
(3) 3 levels of K_2O as Potash : K_0=0, K_1=40 and K_2=80 lb./ac.

N applied with 1st irrigation on 31.7.1958.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) $66' \times 15'$. (b) $53.77' \times 10'$. (v) $6.12' \times 2.5'$. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1389 lb./ac. (ii) 150.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	1319	1317	1322	1319	1300	1332	1326
N_1	1347	1482	1448	1426	1517	1362	1398
N_2	1418	1468	1380	1422	1380	1458	1428
Mean	1361	1422	1383	1389	1399	1384	1384
K_0	1430	1468	1298				
K_1	1387	1397	1309				
K_2	1267	1402	1482				

S.E. of any marginal mean = 35.4 lb./ac.
S.E. of body of any table = 61.2 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 54(84).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'M'.**

Object :—To study the effect of N as A/S alone and in combination with organic manure on the yield of American Cotton.

1. BASAL CONDITIONS :

(i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 17.4.1954. (iv) (a) 4 ploughings and 2 *sohaga*. (b) N.A. (c) 8 to 10 srs/ac. (d) $2\frac{1}{2}' \times 1\frac{1}{4}'$. (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 2 hoeings and 1 weeding. (ix) 18.03". (x) 28.10.1954, 17.11.1954, 21.12.1954 and 31.1.1955.

2. TREATMENTS :

All combinations of (1) and (2) + a control

(1) 2 levels of N : N_1=50 and N_2=100 lb./ac.

(2) 3 sources of N : S_1=A/S, S_2=F.Y.M. and S_3=A/S+F.Y.M. in 1 : 1 ratio.

A/S applied as broadcast in two equal doses and F.Y.M. applied one month before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) $15' \times 59'$ for rep. 1, 2 and 3 and $15' \times 57'$ for rep. 4, 5 and 6. (b) $15' \times 36'3\frac{1}{2}"$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination poor. (ii) Slight attack of jassid and ball worm. (iii) Height and yield of *kapas* (iv) (a) 1954—contd. (b) No. (c) N.A. (v) (a) Rauni. (b) Nil. (vi) Expt. laid out with 6 replications, rep. 1 and 6 were discarded because of poor yield. (vii) Nil.

5. RESULTS :

(i) 1052 lb./ac. (ii) 153.4 lb./ac. (iii) Main effect of S alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 802 lb./ac.

	S_1	S_2	S_3	Mean
N_1	1139	844	1160	1048
N_2	1299	939	1181	1140
Mean	1219	892	1170	1094

S.E. of N marginal mean = 44.3 lb./ac.
S.E. of S marginal mean = 54.2 lb./ac.
S.E. of body of table or control mean = 76.7 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 55(10).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'M'.**

Object :—To study the effect of N as A/S alone and in combination with organic manure on the yield of American Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—Fallow—Cotton. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 14.5.1955. (iv) (a) 4 ploughings, 1 roller and 2 *sohaga*. (b) N.A. (c) 8 to 10 srs/ac. (d) Row to row $2\frac{1}{2}'$. (e) N.A. (y) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 2 hoeings and 2 thinnings. (ix) 17.00". (x) Picking from 15th Oct. to 15th Dec. 1955.

2. TREATMENTS :

Same as in expt. no. 54(84) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) $73 \times 12\frac{1}{2}'$. (b) $64\frac{1}{2}' \times 12\frac{1}{2}'$. (v) $6\frac{1}{2}$ on either side. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Slight attack of bollworm. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (b) No. (c) N.A. (v) (a) Rauni. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1879 lb./ac. (ii) 205.4 lb./ac. (iii) Main effect of S alone is significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 1666 lb./ac.

	S_1	S_2	S_3	Mean
N_1	1939	1795	1918	1884
N_2	2085	1773	1977	1945
Mean	2012	1784	1948	1915

S.E. of N marginal mean = 48.4 lb./ac.
S.E. of S marginal mean = 59.3 lb./ac.
S.E. of body of table or control mean = 83.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(14).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'M'.**

Object :—To study the residual effect of manure applied to previous crop cotton on the succeeding crop Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—Fallow—Cotton. (b) Cotton. (c) As per treatments. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 15.5.1955. (iv) (a) 5 ploughings and 3 *sohaga*. (b) N.A. (c) 8 to 10 srs./ac. (d) $2\frac{1}{2} \times 1\frac{1}{4}'$. (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 3 hoeings and 1 thinning. (ix) 17.00". (x) 19.10.1955, 1.11.1955, 13.12.1955 and 30.1.1956.

2. TREATMENTS :

Same as in expt. no. 54(84) on page 364.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/56 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Bollworm attack. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) N.A. (v) (a) Rauni. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1149 lb./ac. (ii) 140.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 1098 lb./ac.

	S_1	S_2	S_3	Mean
N_1	1127	1132	1120	1126
N_2	1111	1244	1215	1190
Mean	1119	1188	1168	1158

S.E. of N marginal mean = 40.4 lb./ac.
S.E. of S marginal mean = 49.5 lb./ac.
S.E. of body of table or control mean = 70.0 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 56(90).**

Site :- Cotton Res. Stn , Faridkot. **Type :- 'M'.**

Object :—To study the effect of varying doses of N in combination with F.Y.M.

1. BASAL CONDITIONS :

(i) (a) Cotton—Fallow—Cotton—Fallow. (b) and (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) 4.5.1956. (iv) (a) 3 ploughings. (b) N.A. (c) 10 srs/ac. (d) 2½′×1″. (e) N.A. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 3 *triphali* and 1 thinning. (ix) N.A. (x) 22.10.1956, 5.11.1956, 19.12.1956 and 24.1.1957.

2. TREATMENTS :

Same as in expt. no. 54(84) on page 364.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1950 lb./ac. (ii) 186.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 1918 lb./ac.

	S_1	S_2	S_3	Mean
N_1	2076	1870	2019	1988
N_2	1972	1932	1859	1921
Mean	2024	1901	1939	1955

S.E. of N marginal mean = 53.9 lb./ac.
S.E. of S marginal mean = 66.0 lb./ac.
S.E. of body of table or control mean = 93.3 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 56(91).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'M'.**

Object :—To study the effect of different levels and sources of N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) 16.5.1956. (iv) (a) 5 ploughings. (b) Sown by *pore*. (c) 10 srs./ac. (d) 2½′×1′. (e) N.A. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 3 *triphali* and thinning. (ix) N.A. (x) 4.11.1956, 21.11,1956 and 19.12.1956.

2. TREATMENTS :

All combinations of (1) and (2) +a control
(1) 3 sources of N : S_1=A/S, S_2=Urea and S_3=A/S/N.
(2) 2 levels of N : N_1=50 and N_2=75 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) Nil. (v) (a) to (vii) Nil.

5. RESULTS :

(i) 1451 lb./ac. (ii) 141.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 1336 lb./ac.

	S_1	S_2	S_3	Mean
N_1	1391	1506	1478	1458
N_2	1519	1449	1474	1481
Mean	1455	1478	1476	1470

S.E. of S marginal mean = 50.1 lb./ac.
S.E. of N marginal mean = 40.9 lb./ac.
S.E. of body of table or control mean = 70.8 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(54).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'M'.**

Object :—To study the effect of different manures on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) No. (b) Cotton. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) 9.6.1959. (iv) (a) N.A. (b) Sown by *pore*. (c) 14 srs/ac. (d) Row to row 2½'. (e) N.A. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 1 *triphali* and 2 thinnings. (ix) 32.13". (x) 25.11.1959, 17.12.1959 and 8.1.1960.

2. TREATMENTS :

4 manurial treatments : T_0=0, T_1=50 lb./ac. of N as A/S, T_2=50 lb./ac. of P_2O_5 as Nitro. Phos. green and T_3=50 lb./ac. of N as A/S+50 lb./ac. of P_2O_5 as Nitro. Phos. green+50 lb./ac. of K_2O.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 48'×20'. (b) 34.03'×16'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1090 lb./ac. (ii) 71.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	1083	1066	1081	1131

S.E./mean = 35.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(53).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—Cotton. (b) Cotton. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) 26, 27.5.1959. (iv) (a) N.A. (b) Sown by *pore*. (c) 10 srs./ac. (d) Row to row 2½'. (e) N.A. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 4 *triphali* and 1 thinning. (ix) 31.13". (x) 17, 19.11.1959, 16, 18.12.1959 and 11, 18.1.1960.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : N_0=0, N_1=60 and N_2=120 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=40 and P_2=80 lb./ac.

(3) 3 levels of K_2O as Pot. Sul. : K_0=0, K_1=40 and K_2=80 lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) N A. (b) 48′ 4.8″×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 888 lb./ac. (ii) 139.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	801	856	957	871	867	831	916
N_1	924	858	950	911	885	940	907
N_2	856	853	933	881	821	954	867
Mean	860	856	947	888	858	908	897
K_0	841	798	934				
K_1	819	880	1026				
K_2	921	889	880				

S.E. of any marginal mean = 32.9 lb./ac.
S.E. of body of any table = 57.0 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(11).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'M'.**

Object :—To find out the most economical dose of A/S for Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—Fallow—Cotton. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Faridkot. (iii) 12.5.1955. (iv) (a) 5 ploughings and 2 *sohaga*. (b) N.A. (c) 8 srs./ac. (d) Row to row 2½′. (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 1 hoeing and 2 thinnings. (ix) 17.00″. (x) 5.11.1955, 27.11.1955, 27.12.1955 and 19.1.1956.

2. TREATMENTS :

8 levels of N as A/S : N_0=0, N_1=20, N_2=40, N_3=60, N_4=80, N_5=100, N_6=120 and N_7=140 lb./ac.
N applied in two equal doses by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 71′×12½′. (b) 64½′×12½′. (v) 3¼′ on either side. (vi) Yes.

4. GENERAL :

(i) Fairly good. (ii) Slight attack of boll worm. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1900 lb./ac. (ii) 88.0 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2	N_3	N_4	N_5	N_6	N_7
Av. yield	1771	1873	1909	1933	1941	1964	1896	1915

S.E./mean = 35.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(73).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'M'.**

Object :—To study the effect of different sources and times of application of N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) Cotton—Cotton. (b) Cotton. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) 12, 22.4.1958. (iv) (a) 5 ploughings. (b) Sown by *pore*. (c) 10 srs./ac. (d) 2½′×1′. (e) N.A. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 3 hoeings, 3 *triphalis* and 2 thinnings. (ix) N.A. (x) 28.10.1958, 22.11.1958 and 4.1.1959.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 sources of N : S_1=A/S, S_2=Urea and S_3=A/S/N.

(2) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.

(3) 3 times of application : T_1=Full dose at 1st thinning, T_2=½ dose at 1st thinning+½ dose at flowering and T_3=Full dose at flowering.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 47′×14′. (b) 40′ 4″×10′. (v) 3′ 4″×2′. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cotton. (iv) (a) 1958—contd. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1285 lb./ac. (ii) 440.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of cotton in lb./ac.

N_0 = 1208 lb./ac.

	N_1	N_2	Mean	T_1	T_2	T_3
S_1	1335	1349	1342	1295	1354	1378
S_2	1287	1358	1323	1392	1274	1302
S_3	1372	1240	1306	1281	1375	1263
Mean	1331	1316	1324	1323	1334	1314
T_1	1388	1257				
T_2	1317	1351				
T_3	1289	1340				

S.E. of N marginal mean or N_0 mean = 103.7 lb./ac.
S.E. of S or T marginal mean = 127.0 lb./ac.
S.E. of body of N×S or N×T table = 179.7 lb./ac.
S.E. of body of S×T table = 220.0 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(55).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'M'.**

Object :—To study the effect of different sources and times of application of N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—Cotton. (b) Cotton. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) 25.5.1959. (iv) (a) N.A. (b) Sown by *pore*. (c) 10 srs./ac. (d) 2½' between rows. (e) N.A. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 2 *triphalis* and 2 thinnings. (ix) N.A. (x) 16, 17.11.1959, 18, 19.12.1959. and 18.1.1960.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58(73) on page 369.

GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of cotton. (iv) (a) 1958—contd. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 857 lb./ac. (ii) 120.8 lb./ac. (iii) Interaction S×N×T alone is highly significant. (iv) Av. yield of cotton in lb./ac.

N_0 = 859 lb./ac.

	N_1	N_2	Mean	T_1	T_2	T_3
S_1	875	926	900	922	854	925
S_2	887	840	864	918	856	812
S_3	799	806	803	863	837	718
Mean	854	857	856	901	849	818
T_1	896	906				
T_2	804	893				
T_3	862	773				

S.E. of N marginal mean or N_0 mean = 28.5 lb./ac.
S.E. of S or T marginal mean = 34.9 lb./ac.
S.E. of body of N×S or N×T table = 49.3 lb./ac.
S.E. of body of S×T table = 60.4 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(29).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the suitable dose of A/S for American Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Gurdaspur. (iii) 21.4.1956. (iv) (a) 7 ploughings. (b) Dibbling. (c) N.A. (d) 2'×1½'. (e) N.A. (v) Nil. (vi) 320—F (medium). (vii) Irrigated. (viii) 4 hoeings. (ix) 44.99". (x) 10.9.1956 to 27.10.1956.

2. TREATMENTS :

4 levels of N as A/S : N_0=0. N_1=25, N_2=50 and N_3=75 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 10'×90'9". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Crop was adversely affected by rains at the time of flowering. (ii) Attack of leaf roller was very severe. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) N.A. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 189 lb./ac. (ii) 29.68 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2	N_3
Av. yield	206	172	217	162

S.E./mean = 12.12 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(30).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To determine suitable dose of A/S desi Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Gurdaspur. (iii) 21.4.1956. (iv) (a) 7 ploughing. (b) Dibblings. (c) N.A. (d) $2\frac{1}{2}' \times 1\frac{1}{2}'$. (e) N.A. (v) Nil. (vi) 231—R (medium). (vii) Irrigated. (viii) 4 hoeings. (ix) 44.99". (x) 10.9 1956, 17.9.1956, 25.9.1956, 3.10.1956, 15.10.1956 and 27.10.1956.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(29) on page 370.

4. GENERAL :

(i) Crop was adversely affected by rains at the time of flowering. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) N.A. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 653 lb./ac. (ii) 58.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2	N_3
Av. yield	644	686	655	626

S.E./mean = 23.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(25).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the suitable source of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Gurdaspur, (iii) 20.4.1956. (iv) (a) 7 ploughings and 4 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) 320—F (medium). (vii) Irrigated. (viii) 3 hoeings. (ix) 44.99". (x) 16.10. 1956 to 15.11.1956.

2. TREATMENTS :

8 sources of 60 lb./ac. of N : S_0=Control, S_1=Nitro chalk, S_2=A/C, S_3=A/S, S_4=Urea, S_5=A/S/N, S_6=C/N and S_7=A/N.

Manures applied from 30.7.1956 to 3.8.1956.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) $72' \times 12'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1956—contd. (b) No. (c) N.A. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 218 lb./ac. (ii) 48.98 lb./ac. (iii) Treatment differences are significant, (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	248	238	217	209	126	251	217	240

S.E./mean = 24.49 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(60).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To compare the effects of different sources of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Berseem*—Cotton. (b) *Berseem*. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 5.5.1956. (iv) (a) 2 *desi*, 2 *raja* ploughings and 2 *sohaga*. (b) Sown by *kera*. (c) 10 srs./ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) H—14. (vii) Irrigated. (viii) 2 hoeings. (ix) 18.71". (x) 21.9.1956. 31.10.1956 and 3.11.1956.

2. TREATMENTS :

7 sources of 40 lb./ac. of N : S_0=0 (no manure), S_1=C/N, S_2=A/S, S_3=A/S/N, S_4=A/C, S_5=A/N and S_6=Urea.

A/S/N applied on 18.8.1956 and other fertilizers on 2.8.1956.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 15'×22'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1956—contd. (b) No. (c) Nil, (v) to (vii) Nil.

5. RESULTS :

(i) 1340 lb./ac. (ii) 97.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	1412	1426	1320	1286	1246	1283	1409

S.E./mean = 68.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(59).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To compare the effects of different sources of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Berseem*. (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 30.5.1957. (iv) (a) 2 *desi* ploughings and 4 *sohaga*. (b) Drilling. (c) 10 srs./ac. (d) 2' between rows. (e) 1. (v) Nil. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) 20.48. (x) 11.10.1957, 5.11.1957 and 19.11.1957.

2. TREATMENTS :

Same as in expt. no. 56(60) above.

Fertilizers applied on 7.8.1957.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 74′×18′ (b) 60½′×18′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fairly good. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 600 lb./ac. (ii) 112.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	672	658	566	531	571	568	636

S.E./mean = 56.0 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(51).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To study the effect of different sources of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Berseem*. (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 11.6.1958. (iv) (a) 2 *desi* ploughings and 3 *sohaga*. (b) Dibbling. (c) 10 srs./ac. (d) 18″×12″. (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 2 hoeings. (ix) 23.18″. (x) N.A.

2. TREATMENTS :

7 sources of 50 lb./ac. of N : S_0=0 (no manure) S_1=Urea, S_2=A/S, S_3=A/N, S_4=A/C, S_5=A/S/N and S_6=C/A/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 74′×18′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) D.D.T. sprayed against pests. (iii) Yield of *kapas*. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 646 lb./ac. (ii) 195.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	738	655	571	656	650	657	595

S.E./mean = 97.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(127).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To find out the best source of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 7.5.1959. (iv) (a) N.A. (b) Sown by *kera*. (c) 10 srs./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) H—14. (vii) Irrigated. (viii) 1 thinning. (ix) 10.50″. (x) N.A.

2. TREATMENTS :

8 sources of 50 lb./ac. of N : S_0=0 (no manure), S_1=A/S, S_2=C/A/N, S_3=C/N, S_4=A/N, S_5=A/C, S_6=A/S/N and S_7=Urea.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 75′×10′. (b) 66′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 870 lb./ac. (ii) 96.5 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	736	936	942	855	912	891	940

S.E./mean = 48.25 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(159).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :— To study the effect of N, P, K and F.Y.M. on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) 16.3″. (x) N.A.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 3 levels of F.Y.M. : F_0=0, F_1=150 and F_2=300 mds./ac.

(2) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

(3) 3 level of P_2O_2 as Super : P_0=0, P_1=50 and P_2=100 lb./ac.

(4) 3 levels of K_2O as Pot. Sul. : K_0=0, K_1=50 and K_2=100 lb./ac.

F.Y.M. and Super applied before sowing, A/S applied ½ at thinning and ½ flowering and K_2O applied before first irrigation.

3. DESIGN :

(i) 3^4 confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 8′×37.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) N.A. (vii) Raw data as well as remaining two way tables are not available in the records.

5. RESULTS :

(i) 1531 lb./ac. (ii) 109.9 lb./ac. (iii) Main effect of N and interaction K×F are highly significant and interaction P×F is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	K_0	K_1	K_2	P_0	P_1	P_2	Mean
F_0	1242	1547	1712	1621	1456	1424	1408	1571	1522	1500
F_1	1349	1613	1662	1456	1580	1588	1625	1486	1513	1541
F_2	1349	1646	1654	1522	1580	1547	1557	1529	1563	1550
Mean	1313	1602	1676	1533	1539	1520	1530	1529	1533	1531

S.E. of any marginal mean = 21.1 lb./ac.

S.E. of body of any table = 36.6 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 56(141).**

Site :- Cotton Res. Stn , Hansi. **Type :- 'M'.**

Object :—To study the effect of N, P, K and F.Y.M. on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) 18.5″. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 55(159) on page 374.

3. DESIGN :

(i) 3^4 confd. (ii) (a) 9 plots/block and 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 6′×32½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) N.A. (vii) Raw data as well as remaining two-way tables are not availble in the records.

5. RESULTS :

(i) 1379 lb./ac. (ii) 256.6 lb./ac. (iii) Main effect of F, N and P are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	K_0	K_1	K_2	P_0	P_1	P_2	Mean
F_0	897	1300	1571	1218	1333	1217	1045	1308	1415	1256
F_1	963	1448	1720	1333	1374	1424	1210	1456	1465	1377
F_2	1177	1621	1711	1530	1481	1498	1407	1506	1596	1503
Mean	1012	1456	1667	1360	1396	1380	1221	1423	1492	1379

S.E. of any marginal mean = 49.4 lb./ac.
S.E. of body of any table = 85.5 lb./ac.

Crop :- Cotton. **Ref :- Pb. 57(167).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of N, P, K and F.Y.M. on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) 14.3″. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 55(159) on page 374.

3. DESIGN :

(i) 3^4 confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 8′×35′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) N.A. (vii) Raw data as well as remaining two-way tables are not available in the records.

5. RESULTS :

(i) 720 lb./ac. (ii) 45.5 lb./ac. (iii) Main effect of F, N and P are highly significant. Interaction F×N is significant while F×P and F×K are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	444	765	856	633	716	716	658	658	749	688
F_1	510	765	856	716	716	699	716	732	683	710
F_2	584	782	922	749	823	716	749	790	749	763
Mean	513	771	878	699	752	710	708	727	727	720

S.E. of any marginal mean = 8.76 lb./ac.
S.E. of body of any table = 15.18 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(195).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of N, P, K and F.Y.M. on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) May, 1958. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) 25.9". (x) N.A.

2. TREATMENTS :

Same as in expt. no. 55(159) on page 374.

3. DESIGN :

(i) 3^4 confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 6'×35½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) Nil. (vii) Raw data as well as remaining two way tables are not available in the records.

5. RESULTS :

(i) 885 lb./ac. (ii) 155.2 lb./ac. (iii) Main effect of F and interaction F×P are significant and N effect is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	609	930	913	749	798	905	782	856	814	817
F_1	798	905	1086	880	1004	905	889	1012	888	930
F_2	839	938	946	1028	856	839	839	913	971	908
Mean	749	924	982	886	886	883	837	927	891	885

S.E. of any marginal mean = 29.9 lb./ac.
S.E. of body of any table = 51.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(198).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of N, P, K and F.Y.M. on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) 15.90″. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 55(159) on page 374.

3. DESIGN :

(i) 3^4 confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 8′×27½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) Nil. (vii) Raw data as well as remaining two way tables are not available in the records.

5. RESULTS :

(i) 1348 lb./ac. (ii) 243.4 lb./ac. (iii) Main effect of F is significant and N effect is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	946	1292	1440	1283	1070	1325	1366	1275	1037	1226
F_1	1070	1366	1645	1374	1267	1440	1391	1316	1374	1360
F_2	1226	1572	1571	1407	1555	1407	1465	1448	1456	1456
Mean	1081	1410	1552	1355	1297	1391	1407	1346	1289	1348

S.E. of any marginal mean = 46.84 lb./ac.
S.E. of body of any table = 81.13 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(215).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :— To study the effect of different times of application of graded doses of N with P on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) 10.5.1954. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinatios of (1) and (2)

(1) 6 levels of N : N_0=0, N_1=25, N_2=50, N_3=75, N_4=100 and N_5=125 lb./ac.

(2) 3 methods of application of N : T_1=½ at sowing+½ at flowering, T_2=½ at thinning+½ at flowering and T_3=Full dose at flowering.

Sub-plot treatments :

2 levels of P_2O_5 : P_0=0 and P_1=50 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 18 main-plots/block, 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8′×42.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—N.A. (b) No. (c) Nli. (v) (a) Abohar and Jullundur. (b) Nil. (vi) Nil. (vii) P×T table is not available.

5. RESULTS :

(i) 1121 lb./ac. (ii) (a) 247.2 lb./ac. (b) 71.5 lb./ac. (iii) Main effect of N is highly significant and interaction P×N is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	N_4	N_5	Mean
T_1	510	732	913	1415	1563	1761	1149
T_2	510	806	938	1325	1588	1629	1133
T_3	477	741	1037	1259	1349	1629	1082
Mean	499	760	963	1333	1500	1673	1121
P_0	480	755	1004	1320	1478	1692	1122
P_1	518	765	922	1346	1522	1654	1121

S.E. of difference of two

1. N marginal means = 71.3 lb./ac.
2. T marginal means = 50.6 lb./ac.
3. P marginal means = 11.9 lb./ac.
4. P means at the same level of N = 29.2 lb./ac.
5. N means at the same level of P = 74.2 lb./ac.

S.E. of body of N×T table = 87.4 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(156).**

***Site* :- Cotton Res. Stn., Hansi.** **Type :- 'M'.**

Object :— To study the effect of different times of application of graded doses of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) May, 1955. (iv) and (v) N.A. (vi) H—14. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 16.2". (x) Nov., 1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 times of application of N : $T_1=\frac{1}{2}$ at sowing+$\frac{1}{2}$ at flower ing, T_2=Full dose at thinning, $T_3=\frac{1}{2}$ at thinning+$\frac{1}{2}$ at flowering and T_4=Full dose at flowering.

(2) 7 levels of N : $N_0=0$, $N_1=25$, $N_2=50$, $N_3=75$, $N_4=100$, $N_5=125$ and $N_6=150$ lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 28. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 10'×27½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1175 lb./ac. (ii) 114.9 lb./ac. (iii) Main effect of T and N are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	N_4	N_5	N_6	Mean
T_1	—	1029	1144	1374	1226	1448	1275	1249
T_2	—	938	1300	1456	1440	1407	1399	1323
T_3	—	1028	1135	1308	1456	1539	1341	1301
T_4	—	930	1037	1160	1029	1185	1094	1073
Mean	804	981	1154	1325	1288	1395	1277	—

S.E. of N marginal mean = 40.6 lb./ac.
S.E. of T marginal mean = 33.2 lb./ac.
S.E. of body of table = 81.3 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(138).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :— To study the effect of different times of application of graded doses of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) May, 1956. (iv) and (v) N.A. (vi) H—14. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 18.5". (x) Nov., 1956.

2. TREATMENTS :

Same as in expt. no. 55(156) on page 378.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 28. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 6'×32½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1202 lb./ac. (ii) 159.0 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of *kapas*. in lb./ac.

	N_0	N_1	N_2	N_3	N_4	N_5	N_6	Mean
T_1	—	938	1226	1448	1242	1448	1473	1296
T_2	—	897	1127	1210	1242	1440	1481	1232
T_3	—	1226	1177	1415	1432	1333	1399	1330
T_4	—	1020	1103	1316	1275	1374	1316	1234
Mean	771	1020	1158	1347	1298	1399	1417	—

S.E. of T marginal mean = 45.9 lb./ac.
S.E. of N marginal mean = 56.2 lb./ac.
S.E. of body of table = 112.4 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(164).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :— To study the effect of different times of application of graded doses of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) May, 1957. (iv) and (v) N.A. (vi) H—14. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 14.3". (x) Nov., 1957.

2. TREATMENTS :

Same as in expt. no. 55(156) on page 378.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 28. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8'×27½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 549 lb./ac. (ii) 132.5 lb./ac. (iii) Main effect of N, T and interaction N×T are highly significant. (iv) Av. yield of *kapas* in lb /ac.

	N_0	N_1	N_2	N_3	N_4	N_5	N_6	Mean
T_1	—	255	765	732	683	913	806	693
T_2	—	601	469	527	387	691	527	533
T_3	—	296	387	601	494	675	609	510
T_4	—	436	634	601	494	666	724	592
Mean	354	397	564	615	514	736	666	—

S.E. of N marginal mean = 46.8 lb./ac.
S.E. of T marginal mean = 38.2 lb./ac.
S.E. of body of table = 93.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(192).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of different times of applications of graded doses of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) May, 1958. (iv) and (v) N.A. (vi) H—14. (vii) Irrigated. (viii) Hoeing and weedings. (ix) 25.9". (x) Nov., 1958.

2. TREATMENTS :

Same as in expt. no. 55(156) on page 378.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 28. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8'×27½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassids and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 644 lb./ac. (ii) 134.9 lb./ac. (iii) Main effect of T alone is highly significant .(iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	N_4	N_5	N_6	Mean
T_1	—	485	782	806	864	765	823	754
T_2	—	477	527	502	741	560	773	597
T_3	—	667	782	856	708	782	667	744
T_4	—	625	527	584	527	658	436	560
Mean	527	564	654	687	710	691	675	—

S.E. of N marginal mean = 47.7 lb./ac.
S.E. of T marginal mean = 38.9 lb./ac.
S.E. of body of table = 95.4 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(195).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of different times of application of graded doses of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) May, 1959. (iv) and (v) N.A. (vi) H—14. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 15.9". (x) Nov., 1959.

2. TREATMENTS :

Same as in expt. no. 55(156) on page 378.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 28. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8'×27½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1273 lb./ac. (ii) 297.7 lb./ac. (iii) None of the effets is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	N_4	N_5	N_6	Mean
T_1	—	1086	1415	1522	1242	1432	1242	1323
T_2	—	1218	1144	1308	1555	1300	1300	1304
T_3	—	1210	1234	1193	1568	1440	1440	1347
T_4	—	1160	1185	1136	1349	1588	1111	1255
Mean	1068	1168	1245	1290	1427	1440	1273	—

S.E. of N marginal mean = 105.2 lb./ac.
S.E. of T marginal mean = 85.9 lb./ac.
S.E. of body of table = 210.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(176).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object ;—To study the effect of application of N and hormone sprayings on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat –Cotton. (b) Wheat. (c) N.A. ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) May 1957. (iv) and (v) N.A. (vi 32)—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 14.3". (x November, 1957.

2. TREATMENTS :

All combinations of (1) and (2)

(1 3 levels of N : N_0 0, N_1 – 50 and N_2 100 lb./ac.

(2, 3 spraying treatments : H_1 =Spraying with ordinary water, H_2=Spraying with planofix solution at bud initiation stage and H_3=Spraying with planofix solution at bud initiation and flowering stage.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) Abohar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

i 597 lb./ac. (ii) 141.5' lb./ac. (iii) Only main effect of H is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
H_1	403	428	411	414
H_2	601	683	584	623
H_3	708	773	782	754
Mean	571	628	592	597

S.E. of any marginal mean = 47.2 lb./ac.
S.E. of body of table = 81.7 lb /ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(204).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of application of N and hormone sprayings on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine saddy loam. (b) Refer soil analysis, Hansi. (iii) May, 1958, (iv) and (v) N.A. (vi) H—14. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 25.8". (x) Nov., 1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(176) on page 381.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller ; pink boll worm and cotton bugs. (iii) Yield of *kapas*. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) Untimely heavy rains affected the crop adversely. (vii) Nil.

5. RESULTS :

(i) 715 lb./ac. (ii) 113.6 lb./ac. (iii) Main effect of H alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
H_1	560	485	560	535
H_2	757	773	749	760
H_3	954	798	798	850
Mean	757	685	702	715

S.E. of any marginal mean = 37.9 lb./ac.
S.E. of body of table = 65.6 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(207).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of application of N and hormone sprayings on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) May, 1959. (iv) and (v) N.A. (vi) H—14. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 15.9". (x) Nov., 1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.

(2) 3 sprayings with hormones : H_1=Sprayings with ordinary water at bud initiation stage and flowering stage. H_2=Spraying with Alpha Naphthalene acetic acid solution at bud initiation and one with ordinary water. H_3=One spraying at bud inititation and 2 nd at flower initiation with Alpha Naphthalene acetic acid solution.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 8×27½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid, cotton leaf roller, pink boll worm and cotton bugs. (iii) Yield of *kapas*. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) Gusty winds, dust storm and heavy rains affected the crop adversely. (vii) Nil.

5. RESULTS :

(i) 1177 lb./ac. (ii) 182.7 lb./ac. (iii) Only H effect is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
H_1	1037	946	814	932
H_2	1152	1144	1407	1234
H_3	1424	1382	1292	1366
Mean	1204	1157	1171	1177

S.E. of any marginal mean = 60.9 lb./ac.
S.E. of body of table = 105.5 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 59(212).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To compare the effects of application of N and P through spraying and soil fertilization on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) May, 1959. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) 15.9". (x) N A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 methods of application of manures : M_1—Spraying and M_2=Through soil.

(2) 3 levels of N : N_0 0, N_1—12.5 and N_2 -25 lb./ac.

(3) 3 levels of P_2O_5 : P_0 0, P_1 -5 and P_2=10 lb./ac.

3. DESIGN :

(i) Fact. in R.B D. (ii) (a) 18. (b) N.A. (iii) 3. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) Jullundur. (b) Nil. (vi) Heavy rains affected the crop adversely. (vii) Raw data as well as remaining two-way table is not available in the records.

5. RESULTS :

(i) 1048 lb./ac. (ii) 241.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
M_1	913	1012	1193	1039	1074	1041	1002
M_2	971	1061	1136	1056	1020	987	1160
Mean	942	1036	1165	1048	1047	1014	1081

S.E. of N or P marginal mean = 57.0 lb./ac.
S.E. of M marginal mean = 46.5 lb./ac.
S.E. of body of any table = 80.6 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 54(221).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the time of application and method of placement of A/S on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) 11.5.1954. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24"×18". (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 times of application of A/S : T_0=No application, T_1=Early at thinning, T_2 -Late at flowering, and T_3=½ at thinning+½ at flowering.

(2) 3 methods of application : M_1=Broadcast in the whole plot, M_2 -Surface application along rows only and M_3—Drilled on one side of row 2" on the side and 2" deep.

Level of A/S applied—N.A.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8'×42'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—only. (b) No. (c) Nil. (v) (a) Abohar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 982 lb./ac. (ii) 119.8 lb./ac. (iii) Main effect of T alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	T_0	T_1	T_2	T_3	Mean
M_1	—	1094	1004	1119	1072
M_2	—	1119	1070	1110	1100
M_3	—	1193	1061	1366	1207
Mean	547	1135	1045	1198	—

S.E. of T or M marginal mean = 34.6 lb./ac.
S.E. of body of table = 59.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(223).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To compare different sources of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) 24.4.1954. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)—

(1) 4 sources of N : S_1=A/S, S_2=C/N, S_3=Urea and S_4=A/S+KNO_3.
(2) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 8′×33′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of cotton. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1122 lb./ac. (ii) 184.4 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	S_4	Mean
N_0	—	—	—	—	913
N_1	1152	1185	1168	1292	1199
N_2	1308	1201	1218	1292	1255
Mean	1230	1193	1193	1292	—

S.E. of N marginal mean = 53.2 lb./ac.
S.E. of S marginal mean = 75.3 lb./ac.
S.E. of body of table = 106.5 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 55(162).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To compare different sources of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) 16.26″. (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3) +2 control plots in each block

(1) 4 sources of N : S_1=C/N, S_2=A/S, S_3=Urea and S_4=A/S/N.

(2) 2 levels of N : N_1=50 and N_2=100 lb./ac.

(3) 3 times of application of N : T_1=Early at thinning, T_2=Late at flowering and T_3=½ at thinning+½ at flowering.

3. DESIGN :

(i) Fact. confd. (ii) (a) 14 plots/block and 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 8′×28.75′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) N.A. (vii) Raw data as well as remaining two-way tables are not available in the records.

5. RESULTS :

(i) 1314 lb./ac. (ii) 107.0 lb./ac. (iii) 'Control *vs.* others' effect is highly significant. Interaction N×S is significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 1053 lb./ac.

	S_1	S_2	S_3	S_4	Mean
N_1	1382	1251	1325	1391	1337
N_2	1374	1399	1399	1333	1376
Mean	1378	1325	1362	1362	1357

S.E. of S marginal mean = 25.2 lb./ac.
S.E. of N marginal mean = 17.8 lb./ac.
S.E. of body of table = 35.7 lb./ac.
S.E. of control mean = 30.9 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 56(144).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To compare different sources of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) 18.50″. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 55(162) above.

3. DESIGN :

(i) Fact. confd. (ii) (a) 14 plots/block and 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 6′×32½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (lii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullunder. (b) Nil. (vi) N.A. (vii) Raw date as well as remaining two-way tables are not available in the records.

5. RESULTS :

(i) 1125 lb./ac. (ii) 109.5 lb./ac. (iii) N effect and 'control *vs.* others' are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 732 lb./ac.

	S_1	S_2	S_3	S_4	Mean
N_1	1177	1061	1094	1070	1100
N_2	1300	1292	1251	1284	1282
Mean	1238	1176	1172	1177	1191

S.E. of S marginal mean = 25.8 lb./ac.
S.E. of N marginal mean = 18.2 lb./ac.
S.E. of body of table = 36.5 lb./ac.
S.E. of control mean = 31.6 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(170).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To compare different sources of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Reffer soil analysis, Hansi. (iii) N.A. (iv) (a) 2 ploughings, (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 55(162) on page 386.

3. DESIGN :

(i) Fact. confd. (ii) (a) 14 plots/block and 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 8′×27′. (v) N.A. (vi) Yes.

5. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) N.A. (vii) Raw data as well as remaining two-way tables are not available in the records.

5. RESULTS :

(i) 547 lb./ac. (ii) 115.8 lb./ac. (iii) N effect is significant. S effect, 'control *vs.* others' and interaction S×N are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 346 lb./ac.

	S_1	S_2	S_3	S_4	Mean
N_1	609	543	518	518	547
N_2	716	444	592	708	615
Mean	662	494	555	613	581

S.E. of S marginal mean = 27.3 lb./ac.
S.E. of N marginal mean = 19.3 lb./ac.
S.E. of body of table = 38.6 lb./ac.
S.E. of control mean = 33.4 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(198).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To compare different sources of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24"×15". (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)+2 control plots in each block

(1) 6 sources of N : S_1=C'A/N, S_2=A/S, S_3=Urea, S_4=A/S/N, S_5=Nitro Phoska green and S_6= Nitro Phoska blue.

(2) 3 times of application of N : T_1=½ at thinning+½ at flowering, T_2=Full dose at thinning and T_3= Full dose at flowering.

(3) 2 levels of N : N_1=50 and N_2=100 lb./ac.

3. DESIGN :

(i) Fact. confd, (ii) (a) 20 plots/block and 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 8'×29½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (modified in 1958). (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) Nil. (vii) Raw data as well as remaining two-way tables are not available in the records.

5. RESULTS :

(i) 720 lb./ac. (ii) 237.8 lb./ac. (iii) Only 'control *vs.* others' is highly significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 387 lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean
N_1	716	683	683	650	782	790	717
N_2	716	848	601	856	889	872	797
Mean	716	766	642	753	836	831	757

S.E. of S marginal mean = 56.06 lb./ac.
S.E. of N marginal mean = 32.36 lb./ac.
S.E. of body of table = 79.27 lb./ac.
S.E. of control mean = 68.6 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(201).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :— To compare different sources of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) 15.90″. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 58(198) on page 388.

3. DESIGN :

(i) Fact. confd. (ii) (a) 20 plots/block and 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 10×32½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (modified in 1958). (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1303 lb./ac. (ii) 176.2 lb./ac. (iii) S and T effects and 'Control *vs.* others' are highly significant. N effect is significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 815 lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean	T_1	T_2	T_3
N_1	1243	1240	1213	1234	1498	1509	1323	1360	1373	1235
N_2	1268	1338	1385	1251	1580	1525	1391	1522	1432	1218
Mean	1256	1289	1299	1242	1539	1517	1357	1441	1403	1227
T_1	1333	1415	1324	1308	1580	1687				
T_2	1201	1267	1390	1316	1637	1605				
T_3	1234	1185	1184	1102	1399	1259				

S.E. of S marginal mean	= 41.5 lb./ac.
S E. of N marginal mean	= 24.0 lb./ae.
S.E. of T marginal mean	= 29.4 lb./ac.
S.E. of body of S×N table	= 58.7 lb./ac.
S.E. of body of S×T table	= 71.9 lb./ac.
S.E. of body of N×T table	= 41.5 lb./ac.
S.E. of control mean	= 50.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(168).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :— To study the effect of trace elements on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) 16.26″. (x) N.A.

2. TREATMENTS :

7 doses of trace elements : M_0=0, M_1=Sod. molybdate at 10 lb./ac., M_2=Borax at 20 lb./ac., M_3=C/S at 20 lb./ac., M_4=$FeSO_4$ at 50 lb./ac., M_5=$MnSO_4$ at 20 lb./ac. and M_6=$ZnSO_4$ at 20 lb./ac.

The chemicals were powdered and mixed with earth and applied along the rows before 1st irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8′×35′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1361 lb./ac. (ii) 129.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	1251	1382	1308	1317	1407	1415	1448

S.E./mean = 64.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(174).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :— To study the direct, residual and cumulative effect of P applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Berseem*—Wheat. (b) and (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 16.26". (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and no Super. T_2 to T_{12} plots received B.D. at 50 lb./ac. of N. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of super.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) As per treatments.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of cotton. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 812 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield	798	786	905	872	790

S.E.'s N.A.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(150).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :— To study the direct, residual and cumulative effect of P applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Berseem*—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 18.5". (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and no Super, T_2 to T_{12} plots received B.D. at 25 lb./ac. of N. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of Super.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(174) on page 390.

5. RESULTS :

(i) 1044 lb./ac. (ii) 99.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	741	708	658	749	1308	1860	1045	1498	1835

S.E. of $(T_2+T_3+T_4+T_5)$ mean = 35.0 lb./ac.
S.E. of any other mean = 70.0 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(215).**
Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object—To study the direct, residual and cumulative effect of P applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Berseem*—Wheat. (b) N.A. (c) As per treatments. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 14.29". (x) N.A.

2. TREATMENTS :

Same as in expt. no. 56(150) on page 390.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(174) on page 390.

5. RESULTS :

(i) 458 lb./ac. (ii) 71.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	403	395	403	387	560	535	551	379	494	494	494

S.E. of (T_2+T_3) mean = 35.8 lb./ac.
S.E. of any other mean = 50.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(171).**
Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) Cotton—*Toria*—Wheat. (b) and (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 16.26". (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}.
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and no N. T_2 to T_{12} plots received B.D. at 50 lb./ac. of P_2O_5. ½, 1, and 2 in other treatments indicate 25, 50 and 100 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) As per treatments.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Cotton yield and height of plants. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 716 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of cotton in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield .	560	666	683	745	930

S.E's = N.A.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(153).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Toria*—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) and (iv) N.A. (v) As per treatments. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 18.5". (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and no N. T_2 to T_{12} plots received B.D. at 25 lb./ac. of P_2O_5. ½, 1 and 2 in other treatments indicate 25, 50, and 100 lb./ac. of N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(171) on page 391.

5. RESULTS :

(i) 1260 lb./ac. (ii) 87.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of cotton in lb /ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	732	1154	1160	1432	1267	1374	1325	1530	1679

S.E. of $(T_2+T_3+T_4+T_5)$ mean = 31.0 lb./ac.
S.E. of any other mean = 62.1 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(179).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Toria*—Wheat. (b) N.A. (c) As per treatments. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 14.29". (x) N.A.

2. TREATMENTS :

Same as in expt. no. 56(153) on page 392.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(171) on page 391.

5. RESULTS :

(i) 315 lb./ac. (ii) 81.5 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of cotton in lb./ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	214	230	272	329	272	321	428	576	296	288	321

S.E. of (T_2+T_3) mean = 40.8 lb./ac.
S.E. of any other mean = 57.6 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(175).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) Cotton—*Berseem*—Wheat. (b) and (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 48.15". (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(174) on page 390.

5. RESULTS :

(i) 913 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of cotton in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield	946	909	946	893	913

S.E. 's.—N.A.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(154).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Berseem*—Wheat. (b) N.A. (c) As per treatments. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 36.02". (x) N.A.

2. TREATMENTS :

Same as in expt. no. 56(150) on page 390.

3. DESIGN and 4. GENERAL :

Same as in expt no. 55(174) on page 390.

5. RESULTS :

(i) 1196 lb./ac. (ii) 87.8 lb./ac. (iii) Treatment differences are highly significant. (iv) yield of *kapas* in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	1366	1245	1012	1333	954	1366	987	1078	1275

S.E. of $(T_2+T_3+T_4+T_5)$ mean = 31.0 lb./ac.
S.E. of any other mean = 62.1 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(181).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Berseem*—Wheat. (b) N.A. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 29.13". (x) N.A.

2. TREATMENTS :

Same as in expt. no. 56(150) on page 390.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(174) on page 390.

5. RESULTS :

(i) 654 lb./ac. (ii) 74.0 lb./ac. (iii) Treatment differences are not significant. (vi) Av. yield of *kapas* in lb./ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	691	605	634	601	806	617	708	666	634	584	691

S.E. of (T_2+T_3) mean = 37.0 lb./ac.
S.E. of any other mean = 52.3 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(172).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Toria*—Wheat. (b) and (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding (ix) 48.15". (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(171) on page 391.

5. RESULTS :

(i) 552 lb./ac. (ii) and (iii) NA. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield	683	592	485	494	461

S.E.'s—NA.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 56(151).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Toria*—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing and weedings. (ix) 36.02". (x) N.A.

2. TREATMENTS :

Same as in expt. no. 56(153) on page 392.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(171) on page 391.

5. RESULTS :

(i) 1117 lb./ac. (ii) 117.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	1127	1082	1160	1127	1226	1045	1251	1242	897

S.E. of $(T_2+T_3+T_4+T_5)$ meam = 41.5 lb./ac.
S.E. of any other mean = 82.9 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 57(180).**

Site :- Cotton Res. Stn., Jullundur. **Tppe :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Toria*—Wheat. (b) N.A. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing and weedings. (.x) 29.13". (x) N.A.

2. TREATMENTS :

Same as in expt. no. 56(153) on page 392.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(171) on page 391.

5. RESULTS :

(i) 569 lb./ac. (ii) 128.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	658	506	535	543	568	518	609	666	485	617	617

S.E. of (T_2+T_3) mean = 64.4 lb./ac.
S.E. of any other mean = 91.1 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 54(216).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of different times of application of graded doses of N with P on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 7.4.1954. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 6 levels of N : N_0=0, N_1=25, N_2=50, N_3=75, N_4=100 and N_5=125 lb./ac.

(2) 3 times of application of N : T_1=½ at sowing+½ at flowering, T_2=⅓ at thinning+½ at flowering and T_3=Full dose at flowering.

Sub-plot treatments :

2 levels of P_2O_5 : P_0=0 and P_1=50 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 18 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8′×30′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas.* (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) Nil. (vii) Remaining two way table is not available in the records.

5. RESULTS :

(i) 1417 lb./ac. (ii) (a) 517.6 lb./ac. (b) 163.6 lb./ac. (iii) Only interaction P×N is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	N_4	N_5	Mean
T_1	—	1308	1267	1827	1415	1514	1466
T_2	—	1275	1769	1539	1613	1720	1583
T_3	—	1341	1374	1349	1325	1407	1359
Mean	1155	1308	1470	1572	1451	1547	—
P_0	1166	1300	1465	1539	1462	1539	1412
P_1	1144	1317	1475	1605	1440	1555	1423

S.E. of difference of two

1. N marginal means = 149.5 lb./ac.
2. T marginal means = 115.7 lb./ac.
3. P marginal means = 27.3 lb./ac.
4. P means at the same level of N = 66.8 lb./ac.
5. N means at the same level of P = 156.7 lb./ac.

S.E. of body of N×T table = 183.0 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 55(157).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of different times of application of graded doses of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) May, 1955. (iv) and (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 48.15″. (v) Nov., 1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 times of application of N : T_1=½ at sowing+½ at flowering, T_2=Full dose at thinning, T_3=½ at thinning+½ at flowering and T_4=Full dose at flowering.

(2) 7 levels of N : N_0=0, N_1=25, N_2=50, N_3=75, N_4=100, N_5=125 and N_6=150 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 28. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8′×27½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 672 lb./ac. (ii) 98.2 lb./ac. (iii) Only T effect is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	N_4	N_5	N_6	Mean
T_1	—	773	642	856	839	683	716	752
T_2	—	609	642	617	699	699	732	666
T_3	—	691	798	716	494	634	675	668
T_4	—	650	535	527	584	634	617	591
Mean	687	681	654	679	654	662	685	—

S.E. of N marginal mean = 34.7 lb./ac.
S.E. of T marginal mean = 28.3 lb./ac.
S.E. of body of table = 69.4 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(139).**

Site :- Cotton Res. Stn., Jullundur. **Type :- M.**

Object :— To study the effect of different times of application of graded doses of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) to (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 36.02". (x) Nov., 1956.

2. TREATMENTS :

Same as in expt. no. 55(157) on page 396.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 28. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8′×26¼′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Hansi and Abohar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 774 lb./ac. (ii) 141.3 lb./ac. (iii) Only main effect of N is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	N_4	N_5	N_6	Mean
T_1	—	880	765	856	773	773	831	813
T_2	—	798	782	913	741	617	864	786
T_3	—	708	773	732	691	609	741	709
T_4	—	773	955	650	576	560	699	702
Mean	901	790	819	788	695	640	784	—

S.E. of N marginal mean	=	49.9 lb./ac.
S.E. of T marginal mean	=	40.8 lb./ac.
S.E. of body of table	=	99.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(165).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the effect of different times of application of graded doses of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) May, 1957. (iv) and (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 29.13". (x) Nov., 1957.

2. TREATMENTS :

Same as in expt. no. 55(157) on page 396.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 28. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8'×26½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 580 lb./ac. (ii) 95.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	N_4	N_5	N_6	Mean
T_1	—	518	675	724	658	502	527	601
T_2	—	568	485	584	666	518	510	555
T_3	—	411	560	617	634	634	584	573
T_4	—	691	625	584	560	568	683	618
Mean	541	547	586	627	629	556	576	—

S.E. of N marginal mean	=	33.9 lb./ac.
S.E. of T marginal mean	=	27.6 lb./ac.
S E. of body of table	=	67.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(193).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the effect of different times of application of graded doses of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam . (b) Refer soil analysis, Jullundur. (iii) May, 1958. (iv) and (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 36.18". (x) Nov., 1958.

2. TREATMENTS :

Same as in expt. no. 55(157) on page 396.

3. DESIGN .

(i) R.B.D. (ii) (a) 28. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8'×26½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) Heavy rains affected the crop. (vii) Nil.

5. RESULTS :

(i) 828 lb./ac. (ii) 131.7 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	N_4	N_5	N_6	Mean
T_1	—	1037	864	642	782	716	790	805
T_2	—	1029	880	708	732	815	642	801
T_3	—	864	946	724	741	609	683	761
T_4	—	856	699	856	970	889	683	819
Mean	1020	946	847	732	796	757	699	796

S.E. of N marginal mean = 46.6 lb./ac.
S.E. of T marginal mean = 38.0 lb./ac.
S.E. of body of table = 93.1 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(196).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the effect of different times of application of graded doses of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) May, 1959. (iv) and (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 31.77". (x) Nov., 1959.

2. TREATMENTS :

Same as in expt. no. 55(157) on page 396.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 28. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8'×26½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) Untimely rains affected the crop adversely. (vii) Nil.

5. RESULTS :

(i) 814 lb./ac. (ii) 120.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	N_4	N_5	N_6	Mean
T_1	—	889	757	732	831	749	773	789
T_2	—	815	699	889	897	913	741	826
T_3	—	848	790	864	806	699	732	790
T_4	—	864	831	741	815	790	790	805
Mean	889	854	769	806	837	788	759	802

S.E. of N marginal mean = 42.6 lb./ac.
S.E. of T marginal mean = 34.8 lb./ac.
S.E. of body of table = 85.1 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(177).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of application of N and spraying of hormones on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Jullundur. (iii) May, 1957. (iv) and (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 29.13". (x) November, 1957.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N_0=0, N_1 50 and N_2=100 lb. ac.

(2) 3 sprayings of hormones : H_1=Spraying with ordinary water, H_2=Spraying with planofix solution at bud initiation stage and H_3=Spraying with planofix solution at bud initiation and flowering stage.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 441 lb./ac. (ii) 70.8 lb./ac. (iii) Only interaction H×N is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
H_1	428	411	477	439
H_2	403	543	428	458
H_3	477	346	453	425
Mean	436	433	453	441

S.E. of any marginal mean = 23.6 lb./ac.
S E. of body of table = 40.8 lb./ac

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(205).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of application of N and spraying of hormones on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) May, 1958. (iv) and (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 36.18". (x) Nov., 1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(177) above.

4. GENERAL :

(i) Normal. (ii) Attack of jassid, cotton leaf roller, pink boll worm and cotton bugs. (iii) Yield of *kapas*. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) Untimely heavy rains affected the crop adversely. (vii) Nil.

5. RESULTS :

(i) 647 lb./ac. (ii) 110.3 lb./ac. (ii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
H_1	560	617	650	609
H_2	798	543	675	672
H_3	617	683	683	661
Mean	658	614	669	647

S.E. of any marginal mean = 36.8 lb./ac.
S.E. of body of table = 63.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(208).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of application of N and spraying of hormones on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) May, 1959. (iv) and (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 31.77". (x) Nov., 1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.

(2) 3 sprayings of hormones : H_1=Spraying with ordinary water at bud initiation stage and flowering stage, H_2=Spraying with Alpha Naphthalene acetic acid solution at bud initiation stage and one with ordinary water and H_3=One spraying at bud initiation and 2nd at flowering initiation with Alpha Naphthalene acetic acid solution.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 8'×26½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid, cotton leaf roller, pink boll worm and cotton bugs. (iii) Yield of *kapas* (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) Hansi and Abohar. (b) Nil. (vi) Gusty winds, dust storms and heavy rains affected the crop adversely. (vii) Nil.

5. RESULTS :

(i) 776 lb./ac. (ii) 75.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
H_1	741	724	699	721
H_2	839	741	815	798
H_3	806	839	782	809
Mean	795	768	765	776

S.E. of any marginal mean = 25.3 lb./ac.
S.E. of body of table = 43.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(224).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To compare different sources of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Jullundur. (iii) 6.5.1954. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 sources of N : S_1=A/S, S_2=C/N, S_3=Urea and S_4=A/S+KNO_3.

(2) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 8′×35′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1585 lb./ac (ii) 216.7 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	S_4	Mean
N_0	—	—	—	—	1275
N_1	1736	1679	1712	1687	1704
N_2	1670	1786	1893	1753	1776
Mean	1703	1735	1803	1720	—

S.E. of N marginal mean = 62.6 lb./ac.
S.E. of S marginal mean = 88.5 lb./ac.
S E. of body of table = 125.1 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(163).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To compare different sources of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis. Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 48.15″. (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)+2 control plots in each block

(1) 4 sources of N : S_1=C/N, S_2=A/S, S_3=Urea and S_4=A/S/N.

(2) 2 levels of N : N_1=50 and N_2=100 lb./ac.

(3) 3 times of application of N : T_1=Early at thinning, T_2=Late at flowering and T_3=½ at thinning+½ at flowering.

3. DESIGN :

(i) Fact. confd. (ii) (a) 14 plots/block ; 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 8′×27.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (modified in 1955). (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) N.A. (vii) Raw data as well as remaining two-way tables are not available in the records.

5. RESULTS :

(i) 795 lb./ac. (ii) 95.6 lb./ac. (iii) N effect and 'control *vs.* others' are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 864 lb./ac.

	S_1	S_2	S_3	S_4	Mean
N_1	773	831	823	864	823
N_2	716	782	765	708	743
Mean	744	806	794	786	—

S.E. of S marginal mean = 22.5 lb./ac.
S.E. of N marginal mean = 15.9 lb./ac.
S.E. of body of table = 31.9 lb./ac.
S.E. of control mean = 27.6 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(145).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To compare different sources of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 36.02′. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 55(163) on page 402.

3. DESIGN :

(i) Fact. confd. (ii) (a) 14 plots/block ; 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 8′×26¼′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) N.A. (vii) Raw data as well as remaining two-way tables are not available in the records.

5. RESULTS :

(i) 848 lb./ac. (ii) 128.4 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 913 lb./ac.

	S_1	S_2	S_3	S_4	Mean
N_1	880	889	889	864	880
N_2	716	872	732	856	794
Mean	798	880	810	860	837

S.E. of S marginal mean = 30.3 lb./ac.
S.E. of N marginal mean = 21.4 lb./ac.
S.E. of body of table = 42.8 lb./ac.
S.E. of control mean = 37.1 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 57(171).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To compare different sources of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 55(163) on page 402.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 56(145) on page 403.

5. RESULTS :

(i) 637 lb./ac. (ii) 173.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 592 lb./ac.

	S_1	S_2	S_3	S_4	Mean
N_1	658	650	625	625	640
N_2	625	683	625	667	650
Mean	642	666	625	646	645

S.E. of S marginal mean = 40.9 lb./ac.
S.E. of N marginal mean = 28.9 lb./ac.
S.E. of body of table = 57.9 lb./ac.
S.E. of control mean = 50.1 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 58(199).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To compare different sources of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)+2 control plots in each block

(i) 6 sources of N : S_1=C/A/N, S_2=A/S, S_3=Urea, S_4=A/S/N, S_5=Nitro phoska green and S_6=Nitro phoska blue.

(2) 2 levels of N : N_1=50 and N_2=100 lb./ac.

(3) 3 times of application of N : T_1=Full dose at thinning, T_2=Full dose at flowering and T_3=½ at thinning+½ at flowering.

3. DESIGN :

(i) Fact. confd. (ii) (a) 20 plots/block and 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 8′×26½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) N.A. (vii) Raw data as well as remaining two-way tables are not available in the records.

5. RESULTS :

(i) 727 lb./ac. (ii) 171.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 732 lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean
N_1	757	642	749	757	757	790	742
N_2	699	634	658	691	798	773	709
Mean	728	638	704	724	778	782	726

S.E. of S marginal mean = 40.3 lb./ac.
S.E. of N marginal mean = 23.3 lb./ac.
S.E. of body of table = 57.1 lb./ac.
S.E. of control mean = 49.4 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(202).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To compare different sources of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 31.77″. (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58(199) on page 404.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 748 lb./ac. (ii) 309.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 699 lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean	T_1	T_2	T_3
N_1	806	794	699	699	671	716	731	782	748	662
N_2	847	792	765	699	746	741	765	798	731	765
Mean	826	793	732	699	708	729	748	790	739	714
T_1	815	839	773	757	791	763				
T_2	864	831	691	708	675	667				
T_3	798	708	732	634	658	757				

S.E. of S marginal mean = 72.9 lb./ac.
S.E. of T marginal mean = 51.6 lb./ac.
S.E. of N marginal mean = 42.1 lb./ac.
S.E. of body of S × N table = 103.1 lb./ac.
S.E. of body of S × T table = 126.3 lb./ac.
S.E. of body of N × T table = 72.9 lb./ac.
S.E. of control mean = 89.3 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 55(160).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of N, P and K alone and in combination with F.Y.M. on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 48.15″. (x) N.A.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 3 levels of F.Y.M. : F_0=0, F_1=150 and F_2=300 mds./ac.
(2) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.
(3) 3 levels of P_2O_5 as Super : P_0=0, P_1=50 and P_2=100 lb./ac.
(4) 3 levels of K_2O as Potash : K_0=0, K_1=50 and K_2=100 lb./ac.

F.Y.M. and Super were applied before sowing. A/S was applied along the rows ½ at thinning and ½ at flowering followed by irrigation. Potash was applied along the rows before 1st irrigation.

3. DESIGN :

(i) 3⁴ confd. (ii) (a) 9 plots/block and 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 8′×27.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassids and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) N.A. (vii) Raw data as well as remaining two-way tables are not available in the records.

5. RESULTS :

(i) 432 lb./ac. (ii) 112.9 lb./ac. (iii) Main effect of F alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	K_0	K_1	K_2	P_0	P_1	P_2	Mean
F_0	387	370	362	370	354	395	403	337	379	373
F_1	477	411	379	462	369	436	362	436	469	422
F_2	568	485	453	543	453	510	469	477	560	502
Mean	477	422	398	458	392	447	411	417	469	432

S.E. of any marginal mean = 21.7 lb./ac.
S.E. of body of any table = 37.6 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 56(142).**

Site :- Cotton Res., Stn , Jullundur. **Type :- 'M'.**

Object :— To study the effect of N, P and K alone and in combination with F.Y.M. on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 24″×15″. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 36.02″. (x) N.A.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 3 levels of F.Y.M. : F_0=0, F_1=150 and F_2=300 mds./ac.
(2) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.
(3) 3 levels of P_2O_5 as Super : P_0=0, P_1=50 and P_2=100 lb./ac.
(4) 3 levels of K_2O as Potash : K_0=0, K_1=50 and K_2=100 lb./ac.

F Y.M. and Super were applied before sowing. A/S was applied along the rows ½ at thinning+½ at flowering followed by irrigation. Potash was applied along the rows before 1st irrigation.

3. DESIGN :

(i) (a) 3^4 confd. (ii) (a) 9 plots/block and 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 8′×26½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassids and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) N.A. (vii) Raw data as well as remaining two-way tables are not available in the records.

5. RESULTS :

(i) 891 lb./ac. (ii) 212.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	K_0	K_1	K_2	P_0	P_1	P_2	Mean
F_0	872	872	815	856	823	880	864	823	872	853
F_1	889	946	880	856	889	970	848	938	929	905
F_2	971	971	806	889	954	905	938	913	897	916
Mean	911	930	834	867	889	918	883	891	899	891

S.E. of any marginal mean = 40.8 lb./ac.
S.E. of body of any table = 70.8 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(168).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the effect of N, P and K alone and in combination with F.Y.M. on Cotton.

1. BASAL CONDITIONS.

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 29.14″. (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(142) on page 406.

5. RESULTS:

(i) 491 lb./ac. (ii) 140.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	469	527	444	452	494	494	486	436	518	480
F_1	510	494	477	494	494	493	518	494	469	494
F_2	469	560	469	486	535	477	494	510	494	499
Mean	483	527	463	477	508	488	499	480	494	491

S.E. of any marginal mean = 27.1 lb./ac.
S.E. of body of any table = 47.0 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 58(196).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the effect of N, P and K alone and in combination with F.Y.M. on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 36.18″. (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(142) on page 406.

5. RESULTS :

(i) 721 lb./ac. (ii) 99.6 lb./ac. (iii) F effect is significant. N effect is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	864	740	617	749	699	773	699	773	749	740
F_1	889	718	642	757	741	741	766	691	782	746
F_2	782	642	609	708	658	667	667	716	650	678
Mean	845	697	623	738	699	727	711	727	721	721

S.E. of any marginal mean = 19.2 lb./ac.
S.E. of body of any table = 33.2 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 59(199).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the effect of N, P and K alone and in combination with F.Y.M. on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) May, 1959. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) $2' \times 1\frac{1}{4}'$. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 31.77″. (x) Nov., 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(142) on page 406.

5. RESULTS :

(i) 769 lb./ac. (ii) 130.8 lb./ac. (iii) N effect alone is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	856	740	699	749	773	773	773	699	823	765
F_1	806	765	707	798	740	740	740	707	831	759
F_2	823	806	724	806	724	823	823	765	765	784
Mean	828	770	710	784	746	779	779	724	806	769

S.E. of any marginal mean = 25.2 lb./ac.
S.E. of body of any table = 43.6 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(213).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To compare the effect of N and P through spray and by soil application on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 31.77". (x) Nov., 1959.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 3 levels of N : N_0=0, N_1=12½ and N_2=25 lb./ac.
(2) 3 levels of P_2O_5 : P_0=0, P_1=5 and P_2=10 lb./ac.
(3) 2 methods of application of N : M_1=Spraying and M_2=Soil application.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 3. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassids and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) Hansi. (b) Nil. (vi) Heavy rains affected the crop adversely. (vii) Raw data as well as the remaining two-way table is not available in the records.

5. RESULTS :

(i) 772 lb./ac. (ii) 126.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	Mean
M_1	—	765	839	771	783	782	779
M_2	—	757	815	767	789	740	765
Mean	728	761	827	769	786	761	772

S.E. of N or P marginal mean = 29.8 lb./ac.
S.E. of M marginal mean of M×P table = 24.3 lb./ac.
S.E. of body of any table = 42.2 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 57(21).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To find out the best source of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) 82 lb./ac. of P_2O_5 as Super+123 lb./ac. of N as A/S. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 1.5.1957. (iv) (a) 1 *raja*, 2 *desi* ploughings and 3 *sohaga*. (b) N.A. (c) 6 srs./ac. (d) and (e) N.A. (v) N.A. (vi) R—231. (vii) Irrigated. (viii) 1 thinning and 2 hoeings. (ix) 34.09". (x) 25.10.1957 to 3.1.1958.

2. TREATMENTS :

8 sources of 50 lb./ac. of N : S_0=0, S_1=A/S, S_2=A/C, S_3=A/N, S_4=Nitro chalk, S_5=C/N, S_6=A/S/N and S_7=Urea.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10'×108.9'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 408 lb./ac. (ii) 87.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	220	481	585	303	471	476	382	346

S.E./mean = 43.9 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 58(20).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To find out the best source of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 10.5.1958. (iv) (a) 1 *raja*, 2 *desi* ploughings and 4 *sohaga*. (b) Broadcast. (c) 8 srs/ac. (d) and (e) N.A. (v) Nil. (vi) R—231. (vii) Irrigated. (viii) 3 interculturings. (ix) 36.56". (x) 25.9.1958. 7.10.1958. 14.10.1958. 4.11.1958 and 18.11.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(21) above.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 926 lb./ac. (ii) 98.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	826	901	920	1001	950	978	894	942

S.E./mean = 49.4 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(85).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To find out the best source of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 22.5.1955. (iv) (a) N.A. (b) Dibbling. (c) to (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 4 hoeings. (ix) 48.86″. (x) 17.11.1955 and 17.12.1955.

2. TREATMENTS :

5 sources of 40 lb./ac. of N : S_0=0, S_1=A/S, S_2=C/N, S_3=A/N and S_4=Urea.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 3. (iv) (a) 11′×107′. (b) 11′×99′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 412 lb./ac. (ii) 62.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4
Av. yield	391	374	446	449	398

S.E./mean = 36.2 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb.56(51).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To find out the best source of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Light loam. (b) Refer soil analysis, Julluudur. (iii) 19.5.1956. (iv) (a) 1 *raja*, 1 *desi* ploughing and 3 *sohaga*. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) N.A. (vi) 320—F (medium). (vii) Irrigated. (viii) 2 hoeings and 1 thinning. (ix) 36.56″. (x) 18.10.1956 to 26.12.1956.

2. TREATMENTS :

Same as in expt. no. 57(21) on page 410.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 93.88′×8′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Heavy attack of jassid, 4 sprayings with D.D.T. and 2 with agrocide. (iii) Yield per plot. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 384 lb./ac. (ii) 22.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	405	377	393	388	343	418	373	375

S.E./mean = 9.0 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(20).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To find out the best source of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Senji*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 23.4.1957. (iv) (a) 1 *raja* plough, 2 *desi* plough and 4 *sohaga*. (b) N.A. (c) 11 srs./ac. (d) and (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 thinning and hoeing. (ix) 35.21". (x) 9.10.1957 to 3.1.1958.

2. TREATMENTS :

Same as in expt. no. 57(21) on page 410.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10'×103.7'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Agrocin and D.D.T sprayed thrice against jassids. (iii) Yield of *kapas*. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 629 lb./ac. (ii) 55.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	587	630	632	690	667	608	628	587

S.E./mean = 27.8 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(22).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To find out the best source of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 16.5.1958. (iv) (a) 1 *raja*, 2 *desi* ploughings and 6 *sohaga*. (b) Sown by *kera*. (c) 9 srs./ac. (d) 2'×1½'. (e) 1. (v) N.A. (vi) 320—F (medium). (vii) Irrigated. (viii) Nil. (ix) 38.81". (x) 9.10.1958 to 3.12.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(21) on page 410.

4. GENERAL :

(i) N.A. (ii) 2 sprayings with D.D.T. and one with agrocide against jassids. (iii) Yield per plot. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 344 lb./ac. (ii) 38.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	373	371	346	337	299	349	344	335

S.E./mean = 19.2 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 59(7).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To find out the best source of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 1.5.1959. (iv) (a) 1 *raja* and 4 *desi* ploughings, 2 horse hoe and 5 *sohaga*. (b) Dibbling. (c) 8 srs./ac. (d) 2′×1½′. (e) 1. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 3 hoeings. (ix) 28.67″. (x) 1.10.1959 to 18.11.1959.

2. TREATMENTS :

8 sources of 50 lb./ac. of N : S_0=0, S_1=C/N, S_2=A/S, S_3=C/A/N, S_4=A/N, S_5=A/S/N, S_6=A/C and S_7=Urea.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10′×103.7′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) 3 sprayings of D.D.T. (iii) Yield of *kapas*. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 790 lb./ac. (ii) 121.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	804	739	909	830	780	758	746	757

S.E./mean = 60.6 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 55(80).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :— To studdy the effect of placement of fertilizer on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy loam to loam. (b) Refer soil analysis, Jullundur. (iii) 18.5.1955. (iv) (a) N.A. (b) Sown in lines. (c) 6 srs./ac. (d) 1½′×2′. (e) N.A. (v) F.Y.M. at 30 lb./ac. of N+Super at 30 lb./ac. of P_2O_5. (vi) 320—F (early). (vii) 3 hoeings and weedings. (ix) 48.86″. (x) 15.11.1955 to 16.12.1955.

2. TREATMENTS :

7 methods of application of N : M_1=By broadcast, M_2=⅓ at sowing+⅓ at growth+⅓before flowering by broadcast, M_3=½ at growth+½ before flowering by broadcast, M_4=By placement along lines at sowing time, M_5=⅓ at sowing+⅓ at growth+⅓ before flowering applied along lines, M_6=½ at growth+½ before flowering along lines and M_7=Before flowering.

N as A/S at 50 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) and (b) 95′×11.5′. (v) Nil. (v) Yes.

4 GENERAL :

(i) Normal. (ii) N.A. iii) Yield of *kapas*. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 706 lb./ac. (ii) 71.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac

Treatment	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Av. yield	692	751	688	752	673	691	698

S.E./mean = 35.6 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 56(50).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the effect of time of application of N on Cotton yield.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Julluudur. (iii) 17.5.1956. (iv) (a) 1 *raja*, 3 *desi* ploughings and 5 *sohoga*. (b) Sown in rows. (c) 9 srs /ac. (d) and (e) N A. (v) N.A. (vi) 320—F (medium). (vii) Irrigated. (viii) 2 hoeings and 1 weeding. (ix) 36 56". (x) 19.10.1956 to 26.12.1956.

2. TREATMENTS :

3 times of application of 60 lb./ac. of N as A/S : T_1=Full dose at growth, T_2=Full dose before flowering and T_3=½ at growth+½ before flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 107.3'×14'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Spraying with agrocide and D.D.T. (iii) Yield of *kapas*. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 553 lb./ac. (ii) 80.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	564	532	562

S.E./mean = 32.7 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 56(52).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the effect of time of application of N on Cotton yield.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 21.5.1956. (iv) (a) 1 *raja*, 3 *desi* ploughings and 3 *sohaga*. (b) N.A. (c) 9 srs./ac. (d) and (e) N.A. (v) N.A. (vi) 320—F (medium). (vii) Irrigated. (viii) Hoeings and thinnings. (ix) 36.56", (x) 17.10.1956 to 25.12.1956.

2. TREATMENTS :

Same as in expt. no. 56(50) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 106.75'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Attacked of jassids. Four sprayings with D.D.T. and two with agrocide. (iii) Yield of *kapas*. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 191 lb./ac. (ii) 27.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	211	147	215

S.E./mean = 11.1 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 56(53).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :— To compare the effects of A/S and A/C on the yield of cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Senji.* (b) Wheat. (c) N.A. (ii) (a) Sandy. (b) Refer soil analysis, Juliundur. (iii) 22.5.1956. (iv) (a) 1 *raja* ploughing, 2 *desi* ploughing and 3 *sohaga.* (b) Drilling. (c) 9 srs./ac. (d) and (e) N.A. (v) N.A. (vi) 320—F (medlum). (vii) Irrigated. (viii) Hoeings and thinnings. (ix) 36.55″. (x) 18.10.1956 to 25.12.1956.

2. TREATMENTS :

3 manurial treatments : N_0=0, N_1=50 lb./ac. of N as A/S and N_2=50 lb./ac. of N as A/C.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 106.75′×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Very heavy attack of jassids. 4 sprayings with D.D.T. and two with agrocide. (iii) Yield of *kapas.* (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5, RESULTS :

(i) 357 lb./ac. (ii) 34.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2
Av. yield	340	379	353

S.E./mean = 14.2 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 54(70).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of F.Y.M. and A/S on Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 16.5.1954. (iv) (a) 1 *raja* plough, 4 *desi hal* and 4 *sohaga.* (b) N.A. (c) 10 to 15 srs/ac. (d) and (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 2 hoeings, 2 weedings and 1 thinning. (ix) 19.9″. (x) 15.10.1954 to 29.11.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as F.Y.M. : F_0=0, F_1=32 and F_2=64 lb./ac.

(2) 3 levels of N as A/S : N_0=0, N_1=25 and N_2=50 lb./ac.

F.Y.M. applied before sowing and A/S in the 1st week of October.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 51.85′×14′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of *kapas.* (iv) (a) 1953—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Crop damaged by rain and storm. (vii) Nil.

5. RESULTS :

(i) 964 lb./ac. (ii) 202.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
F_0	851	973	963	929
F_1	940	991	1044	992
F_2	1009	961	944	971
Mean	933	975	984	964

S.E. of any marginal mean = 47.8 lb./ac.
S.E. of body of table = 82.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(79).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of different combination of manures on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 11.5.1955. (iv) (a) N.A. (b) Dibbling. (c) 6 srs./ac. (d) and (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 3 hoeings and gap-filling. (ix) 48.86". (x) 11.11.1955 to 23.11.1955.

2. TREATMENTS :

Same as in expt. no. 54(70) on page 415.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 9'×48.4'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1953—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 429 lb./ac. (ii) 98.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
F_0	444	416	457	439
F_1	401	343	414	386
F_2	399	431	556	462
Mean	415	397	476	429

S.E. of any marginal mean = 23.2 lb./ac.
S.E. of body of table = 40.2 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(81).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of different combinations of manures on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 19.5.1955. (iv) (a) N.A. (b) Dibbling. (c) 6 srs/ac. (d) and (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) N.A. (ix) 48.86". (x) 21.10.1955 to 21.12.1955.

2. TREATMENTS :

8 manurial treatments : T_0=0, T_1=30 lb./ac. of N as A/S, T_2=60 lb./ac. of N as A/S, T_3=T_1+30 lb./ac. of P_2O_5 as Super, T_4=T_2+30 lb./ac. of P_2O_5 as Super, T_5=T_2+60 lb./ac. of P_2O_5 as Super, T_6=60 lb./ac. of N as F.Y.M. and T_7=30 lb./ac. of N as F.Y.M.+30 lb./ac. of N as A/S.

A/S applied ⅓ at 1st irrigation+⅓at growth+⅓at flowering and Super applied by broadcast. F.Y.M. applied on 28.6.1955.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) and (b) 11′×72′. (v) Nil. (vi) Yes.

4. GENERAL :

(I) and (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1955—only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 268 lb./ac. (ii) 56.2 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of *kapas*.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. yield	242	330	262	248	245	199	287	331

S.E./mean = 25.1 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(23).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To find out the effect of different levels of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) 200 lb./ac. of A/S. (ii) (a) Heavy loam. (b) Refer soil analysis, Jullundur. (iii) 23.5.1957. (iv) (a) 1 *raja*, 1 *desi* ploughing, 2 horse hoe and 3 *sohaga*. (b) N.A. (c) 9 srs./ac. (d) and (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 thinning, 4 hoeings with cultivator and 1 weeding. (ix) 34.09". (x) 4.10.1957 to 16.12.1957.

2. TREATMENTS :

3 levels of N as A/S : N_0=0, N_1=60 and N_2=120 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 39.6′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) D.D.T. and agrocide sprayed against jassids. (iii) Yield of *kapas*. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1391 lb./ac. (ii) 252.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2
Av. yield	1674	1424	1075

S.E./mean = 145.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(22).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the residual effect of fertilizers applied to the previous crop of wheat and also to Cotton crop grown before wheat.

1. BASAL CONDITIONS :

(i) (a) Cotton—Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Heavy loam. (b) Refer soil analysis, Jullundur. (iii) 17.5.1957. (iv) (a) 1 *raja*, 1 *desi* ploughing, 2 *horse hoe* and 3 *sohaga*. (b) N.A. (c) 9 srs. ac. (d) and (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 thinning, 4 hoeings and 1 weeding. (ix) 34.09". (x) 4.10.1957 to 16.12.1957.

2. TREATMENTS:

Main-plot treatments :

3 levels of N as A/S : M_0=0, M_1=60 and M_2=120 lb./ac.

Main-plot treatments applied to cotton in *kharif* 1956.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=25 and N_2=50 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=20 and P_2=40 lb./ac.

Sub-plot treatments applied to wheat in *rabi* 1956.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 9 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 39.6′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Agrocide and D.D.T. sprayed twice against jassids. (iii) Yield of *kapas*. (iv) (a) 1957—N.A. (b) Yes. (c) Nil. (v) *to (vii)* Nil.

5. RESULTS :

(i) 128 lb./ac. (ii) (a) 13.4 lb./ac. (b) 27.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
M_0	116	129	146	130	121	146	124
M_1	123	118	126	122	121	129	116
M_2	134	140	122	132	130	130	135
Mean	124	129	131	128	124	135	125
P_0	127	120	126				
P_1	129	138	138				
P_2	116	129	130				

S.E. of difference of two

1. M marginal means = 3.6 lb./ac.
2. N or P marginal means = 7.5 lb./ac.
3. N or P means at the same level of M = 12.9 lb./ac.
4. M means at the same level of N or P = 7.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(21).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the residual effect of fertilizers applied to the previous crop of wheat and also to cotton crop grown before Wheat.

1. BASAL CONDITIONS :

(i) (a) Cotton—Wheat—Cotton. (b) Wheat. (c) As per treatments. (ii) (a) Heavy loam. (b) Refer soil analysis, Jullundur. (iii) 13.5.1958. (iv) (a) 1 *raja*, 2 *desi* ploughings and 5 *sohaga*. (b) Dibbling. (c) 9 srs./ac. (d) 2′×1½′. (e) 1. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) N.A. (ix) 38.81". (x) 10.10.1958 to 4.12.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(22) on page 417.
Main-plot treatments applied to cotton in *kharif* 1957 and sub-plot treatments applied to wheat crop in *rabi* 1957.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1957—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 401 lb./ac. (ii) (a) 104.9 lb./ac. (b) 48.7 lb./ac. (iii) Only M effect is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
M_0	415	426	409	417	443	420	387
M_1	318	347	355	340	340	338	343
M_2	432	473	439	448	437	442	465
Mean	388	415	401	401	407	400	398
P_0	385	418	417				
P_1	382	415	402				
P_2	398	413	384				

S.E. of difference of two

1. M marginal means = 28.5 lb./ac.
2. N or P marginal means = 13.2 lb./ac.
3. N or P means at the same level of M = 22.9 lb /ac.
4. M means at the same level of N or P = 34.1 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(91).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To study the effect of different combinations of F.Y.M., Toria Cake and A/S on Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 25.5.1954. (iv) (a) Ploughing. (b) N.A. (c) 8 to 10 srs./ac. (d) 2' between rows. (e) N.A. (v) Nil. (vi) F—216 (early). (vii) Irrigated. (viii) 2 hoeings. (ix) 21.90". (x) 18.9.1954 to 2.11.1954.

2. TREATMENTS :

7 manurial treatments : T_0=0, T_1=25 lb./ac. of N as A/S, T_2=25 lb./ac. of N as F.Y.M., T_3=25 lb./ac. of N as *Toria* cake, T_4=50 lb./ac. of N as A/S, T_5=25 lb./ac. of N as A/S+25 lb./ac. of N as F.Y.M. and T_6=25 lb./ac. of N as A/S+25 lb./ac. of N as *Toria* cake.

F.Y.M., *Toria* cake and ½ A/S applied before sowing and ½ A/S applied one week after sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 87'×20'. (b) 68'×16'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1154 lb./ac. (ii) 169.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapa* in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	1021	1192	1108	1188	1171	1214	1187

S.E./mean = 84.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(102).**

Site :- Cotton Res. Stn., Rauni. **Type :- 'M'.**

Object :—To study the effect of N as A/S alone and in combination with organic manure on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) 50 lb./ac. of N as A/S applied to previous maize crop. (ii) (a) Heavy loam. (b) N.A. (iii) 2.5.1954. (iv) (a) Ploughing. (b) N.A. (c) 8 to 10 srs./ac. (d) $2\frac{1}{2}' \times 1\frac{1}{2}'$. (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 3 hoeings. (ix) 21.90". (x) Middle of Oct. to middle of Dec., 1954.

2. TREATMENTS :

7 manurial treatments : T_0=0, T_1=50 lb./ac. of N as A/S, T_2=100 lb./ac. of N as A/S, T_3=50 lb./ac. of N as F.Y.M., T_4=100 lb./ac. of N as F.Y.M., T_5=25 lb./ac. of N as A/S+25 lb./ac. of N as F.Y.M. and T_6=50 lb./ac. of N as A/S+50 lb./ac. of N as F.Y.M.
F.Y.M. applied 20 days before sowing. A/S applied on 7.8.1954 by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 20'×45'. (b) 15'×36.3'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Jassids attack observed. (iii) Yield of *kapas*. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1212 lb./ac. (ii) 180.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	995	1389	1563	1085	980	1077	1396

S.E./mean = 90.0 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(22).**

Site :- Cotton Res. Stn., Rauni. **Type :- 'M'.**

Object :—To study the effect of N as A/S alone and in combination with organic manure on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 3.5.1955. (iv) (a) 6 ploughings, 4 *sohaga*. (b) N.A. (c) 8 srs./ac. (d) $2\frac{1}{2}' \times 1\frac{1}{2}'$. (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 3 hoeings. (ix) 33 80". (x) 15.10.1955 to 15.12. 1955.

2. TREATMENTS :

Same as in expt. no. 54(102) above.
F.Y.M. applied on 28.3.1955 and A/S in August 1955.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 15'×90'. (b) 10'×80.6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Slight attack of jassids. (iii) Yield of *kapas*. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 883 lb./ac. (ii) 61.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	714	988	1141	745	796	853	945

S.E./mean = 30.8 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(23).**

Site :- Cotton Res. Stn., Rauni. **Type :- 'M'.**

Object :—To find out the optimum level of A/S for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 60 lb./ac. of N as A/S. (ii) (a) Heavy loam. (b) N.A. (iii) 1.5.1955. (iv) (a) to (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 4 hoeings. (ix) 33.80". (x) 15.10.1955. to 15.12.1955.

2. TREATMENTS :

8 levels of N as A/S : N_0=0, N_1=20, N_2=40, N_3=60, N_4=80, N_5=100, N_6=120 and N_7=140 lb./ac. A/S applied by broadcast in two equal doses.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 15'×66'. (b) 15'×58.2'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Slight attack of jassids. (iii) Yield of *kapas*. (iv) (a) 1955 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1280 lb./ac. (ii) 136.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2	N_3	N_4	N_5	N_6	N_7
Av. yield	993	1168	1259	1264	1397	1442	1342	1378

S.E./mean = 68.2 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(162).**

Site :- Soil Sub-Stn , Rohtak. **Type :- 'M'.**

Object :—To find out the optimum time of application of manures to Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Berseem*. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Rohtak. (iii) 21.4.1954. (iv) (a) Ploughing and *sohaga*. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) 216—F. (vii) Irrigated. (viii) 1 thinning, 2 hoeings, 2 weedings and 1 gap-filling. (ix) 15.00". (x) 29.9.1954 to 30.10.1954.

2. TREATMENTS :

8 manurial treatments : T_0=0, T_1=40 lb./ac. of N as A/S at thinning, T_2=40 lb./ac. of N as C/N at thinning, T_3=40 lb./ac. of N as C/N at flowering, T_4=20 lb./ac. of N as A/S at thinning+20 lb./ac. of N as A/S at flowering, T_5=20 lb./ac. of N as C/N at thinning+20 lb./ac. of N as C/N at flowering, T_6=20 lb./ac. of N as A/S at thinning+20 lb./ac. of N as C/N at flowering and T_7=20 lb./ac. of N as C/N at thinning+20 lb./ac. of N as A/S at flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1954 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1407 lb./ac. (ii) 167.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. yield	1171	1664	1359	1117	1284	1654	1448	1559

S.E./mean = 118.2 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(133).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To find out the best source of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (iii) 29.4.1955. (iv) (a) N.A. (b) Sown by *pore*. (c) 10 srs./ac. (d) 2½' between rows. (e) 1 to 2. (v) Nil. (vi) H—14. (vii) Irrigated. (viii) Resowing on 20.5.1955 and 1 thinning. (ix) 15.79". (x) 20.9.1955 to 9.11.1955.

2. TREATMENTS :

4 sources of 50 lb./ac. of N : S_0=Control (no N), S_1=A/S, S_2=A/N and S_3=Urea.
Manures applied in two doses ½ at flowering + ½ at thinning.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/8 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1955—contd. with modifications. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1245 lb./ac. (ii) 128.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	987	1230	1355	1409

S.E./mean = 91.0 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(132).**

Site :- Soil-Sub Stn., Rohtak. **Type :- 'M'.**

Object :—To compare different nitrogenous fertilizers for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (iii) 29.4.1955. (iv) (a) N.A. (b) Sown by *pore*. (c) 10 srs./ac. (d) 2½' between rows. (e) 1 to 2. (v) Nil. (vi) H—14. (vii) Irrigated. (viii) Resowing on 22.5.1955 and 1 thinning. (ix) 15.79". (x) 20.9.1955, 10, 20, 29.10.1955 and 10.11.1955.

2. TREATMENTS :

4 sources of 50 lb./ac. of N : S_0=Control (no N), S_1=A/S, S_2=A/N and S_3=Urea.
Manures applied before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/8 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1955—contd. with modifications. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1289 lb./ac. (ii) 100.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	1062	1282	1500	1310

S.E./mean = 70.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(104).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To compare different nitrogenous fertilizers for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (iii) 5.5.1956. (iv) (a) N.A. (b) Sown by *pore*. (c) 9 srs./ac. (d) 2½′ between rows. (e) N.A. (v) Nil. (vi) H—14. (vii) Irrigated. (viii) N.A. (ix) 13.91″. (x) 12.9.1956 to 9.11.1956.

2. TREATMENTS :

4 sources of 50 lb./ac. of N : S_0=Control (no N), S_1=A/S, S_2=C/N and S_3=A/C.
N applied on 5.7.1956.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1955—contd. with modification. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1221 lb./ac. (ii) 103.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	1148	1309	1151	1274

S.E./mean = 51.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(46).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To compare different nitrogenous fertilizers for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Berseem*. (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Rohtak. (iii) 8.5.1956. (iv) (a) and (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) N.A. (vi) H—14 (early). (vii) Irrigated. (viii) N.A. (ix) 13.91″. (x) 12, 22.9.1956 ; 6, 10, 29.10.1956, and 9.11.1956.

2. TREATMENTS :

4 sources of 50 lb./ac. of N : S_0=Control (no N), S_1=A/S, S_2=A/N and S_3=Urea.
Manures applied before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1955—contd. with modifications. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1931 lb./ac. (ii) 187.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	1936	1921	1773	2094

S.E./mean = 132.2 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(105).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To compare different nitrogenous fertilizers for Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (iii) 15.5.1957. (iv) (a) N.A. (b) Sown by *pore*. (c) 10 srs./ac. (d) 2½' between rows. (e) N.A. (v) Nil. (vi) H—14. (vii) Irrigated. (viii) N.A. (ix) 10.54". (x) 19.9.1957. to 11.11.1957.

2. TREATMENTS :

4 sources of 60 lb./ac. of N : S_0=Control (no N), S_1=A/S/N, S_2=Urea and S_3=A/C.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Growth was checked due to cloudy weather and rains. (ii) Tikka and boll worm disease appeared. (iii) Yield of *kapas*. (iv) (a) 1955—contd. with modifications. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 408 lb./ac. (ii) 41.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	325	401	479	428

S.E./mean = 20.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(106).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To compare different nitrogenous fertilizers for Cotton.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(105) above.

5. RESULTS :

(i) 331 lb./ac. (ii) 31.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	261	337	402	325

S.E./mean = 15.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(117).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :— To compare different nitrogenous fertilizers for Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—Wheat—Cotton. (b) Wheat. (c) Nil. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (iii) 8.4.1958. (iv) (a) N.A. (b) Sown by *pore*. (c) 10 srs./ac. (d) 2½′ between rows. (e) N.A. (v) Nil. (vi) H—14. (vii) Irrigated. (viii) N.A. (ix) 24.26″. (x) 11.10.1958. to 22.11.1958.

2. TREATMENTS :

8 sources of 50 lb./ac. of N : S_0=Control (no N), S_1=A/S, S_2=A/C, S_3=C/A/N, S_4=Urea, S_5=A/S/N, S_6=A/N and S_7=Ammo. Phos.

Manures applied on 20.7.1958.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Flowering affected by heavy rains and jassid disease. (iii) Yield of *kapas*. (iv) (a) 1955—contd. with modifications. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 566 lb./ac. (ii) 54.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	451	571	586	628	612	567	607	510

S.E./mean = 38.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(118).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To compare different nitrogenous fertilizers for Cotton.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(117) above.

5. RESULTS :

(i) 463 lb./ac. (ii) 32.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	360	473	536	470	539	471	479	379

S.E./mean = 23.2 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 59(108).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To find out the effect of time of application of nitrogenous fertilizers on Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (iii) 3.6.1959. (iv) (a) N.A. (b) Sown by *pore*. (c) 10 srs./ac. (d) 2½′ between rows. (e) N.A. (v) Nil. (vi) H—14. (vii) Irrigated. (viii) N.A. (ix) 13.82″. (x) 19.9.1959 to 23.12.1959.

2. TREATMENTS :

4 methods of application of 60 lb./ac. of N as C/A/N : M_1=Before sowing, M_2—½ at thinning+½ at flowering, M_3=½ at sowing+½ at thinning and M_4=½ at sowing+½ at flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 945 lb./ac. (ii) 94.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	M_1	M_2	M_3	M_4
Av. yield	954	926	947	953

S.E./mean = 47.4 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 59(109).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To find out the effect of time of application of nitrogenous fertilizers on Cotton.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 59(108) above.

5. RESULTS :

(i) 1036 lb./ac. (ii) 79.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	M_1	M_2	M_3	M_4
Av. yield	990	1082	1030	1041

S.E./mean = 39.7 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 57(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type II—To study the cumulative, direct and residual effect of manures on Cotton.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat—Cotton—*Senji*. (b) Wheat. (c) As per treatments. (ii) Indus alluvium. (iii) 20.4.1957. (iv) (a) 5 cultivations, 1 hand hoeing and 2 intercultures. (b) Drilling with single row cotton drill. (c) 16 lb./ac. (d) 30″×12″. (e) N.A. (v) Nil. (vi) F—320 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 21″. (x) 3 pickings from 14.10.1957 to 26.11.1957.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 3 levels of N as A/S : N_0=0, N_1=30 and N_2=60 lb./ac.
(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=30 and P_2=60 lb./ac.
(3) 3 levels of K_2O as Pot. Sul. : K_0=0, K_1=30 and K_2=60 lb /ac.
(4) 3 levels of F.Y.M. : F_0=0, F_1=5,000 and F_2=10,000 lb./ac.

3. DESIGN :

(i) 3^4 fact. confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 27′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Thrips and jassid attack. D.D.T. sprayed. (iii) *Kapas* yield. (iv) (a) 1956—contd. (failed in 1956). (b) Yes. (c) N.A. (v) and (vi) Nil. (vii) Expt. analysed as a split-plot, taking N, P, K and F in main-plots and R, the phases, in sub-plots. The phases are : R_1=Manuring each crop in rotation, R_2=Manuring alternate crop starting with 1st and R_3=Manuring alternate crop starting with 2nd.

5. RESULTS :

(i) 1201 lb./ac. (ii) (a) 238.8 lb./ac. (b) 149.6 lb./ac. (iii) Main effect of R and interactions R×N and R×K are significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	F_0	F_1	F_2	Mean
R_1	1154	1258	1300	1209	1221	1281	1260	1260	1191	1193	1215	1303	1237
R_2	1162	1294	1341	1254	1274	1270	1312	1249	1237	1245	1284	1269	1266
R_3	1116	1116	1067	1096	1096	1108	1067	1068	1165	1031	1126	1143	1100
Mean	1144	1223	1236	1186	1197	1220	1213	1192	1198	1156	1208	1238	1201
F_0	1159	1124	1185	1128	1157	1183	1184	1120	1164				
F_1	1108	1242	1274	1212	1227	1185	1193	1255	1176				
F_2	1165	1302	1248	1218	1206	1291	1262	1200	1253				
K_0	1125	1233	1281	1197	1213	1229							
K_1	1110	1206	1260	1168	1202	1206							
K_2	1197	1230	1167	1193	1176	1225							
P_0	1153	1216	1189										
P_1	1137	1218	1236										
P_2	1142	1235	1283										

S.E. of difference of two

1. N, P, K or F marginal means = 37.5 lb./ac.
2. R marginal means = 23.5 lb./ac.
3. R means at the same level of N, P, K or F = 40.7 lb./ac.
4. N, P, K or F means at the same level of R = 50.1 lb./ac.

S.E. of body of N×P, N×K, N×F, P×K, P×F or K×F table = 46.0 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type II—To study the cumulative, direct and residual effect of manures on Cotton.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat—Cotton—*Senji*. (b) Wheat. (c) As per treatments. (ii) Indus alluvium. (iii) and (iv) N.A. (v) Nil. (vi) F—320 (medium). (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(MAE) type II on page 426.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1956—contd. (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

I. Cumulative effect

(i) 960 lb./ac. (ii) 112.5 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of *kapas* in lb /ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	769	870	1035	885	895	893	962	848	863	891
F_1	851	1032	1014	978	948	972	950	944	1004	966
F_2	933	1048	1092	947	1064	1061	972	1044	1056	1024
Mean	851	983	1047	937	969	975	961	945	974	960
K_0	896	938	1049	957	950	977				
K_1	811	970	1035	932	954	949				
K_2	846	1041	1036	922	1003	998				
P_0	849	946	1016							
P_1	858	1035	1014							
P_2	846	968	1111							

S.E. of any marginal mean = 21.7 lb./ac.
S.E. of body of any table = 37.5 lb./ac.

II. Residual effect

(i) 815 lb./ac. (ii) 105.7 lb./ac. (iii) Interaction N×K is highly significant. (iv) Av. yield of *kapas* in lb /ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	786	778	810	797	826	750	803	775	795	791
F_1	793	762	831	851	811	723	849	812	724	795
F_2	860	857	859	787	910	880	860	869	848	859
Mean	813	799	833	812	849	784	837	819	789	815
K_0	880	790	841	799	872	840				
K_1	809	775	873	830	820	807				
K_2	750	832	785	807	855	705				
P_0	825	801	810							
P_1	839	864	844							
P_2	775	732	845							

S.E. of any marginal mean = 20.3 lb./aa.
S.E. of body of any table = 35.2 lb./ac.

III. Direct effect

(i) 944 lb./ac. (ii) 121.8 lb./ac. (iii) Main effect of N is highly significant and effect of F is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	749	913	1016	919	875	885	942	924	813	893
F_1	821	901	1051	916	918	938	889	944	939	924
F_2	858	1051	1140	941	1028	1079	1000	1030	1018	1016
Mean	809	955	1069	925	940	967	944	966	923	944
K_0	808	956	1068	928	931	972				
K_1	836	965	1097	943	958	997				
K_2	783	944	1042	904	931	933				
P_0	748	958	1069							
P_1	843	937	1041							
P_2	836	970	1096							

S.E. of any marginal mean = 23.4 lb./ac.
S.E. of body of any table = 40.6 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(MAE).**

Site :- M.A.E. Centre, Nasirpur. **Type :- 'M'.**

Object :—Type II—To study the direct, residual and cumulative effect of manures on Cotton.

1. BASAL CONDITIONS :
(i) (a) Maize—Wheat—Cotton—*Senji*. (b) Wheat. (c) As per treatments. (ii) Indus alluvium. (iii) 4th week of April, 1959. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 weedings. (ix) 20″. (x) 2nd week of Nov., 1959.

2. TREATMENTS :
Same as in expt. no. 57(MAE) type II on page 426.

3. DESIGN :
(i) 3^4 fact. confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :
(i) Normal. (ii) Thrips and jassid attack—controlled. (iii) *Kapas* yield. (iv) (a) 1956—contd. (failed in in 1956). (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

I. Cumulative effect

(i) 1363 lb./ac. (ii) 166.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	1358	1275	1374	1341	1407	1260	1292	1358	1358	1336
F_1	1300	1317	1391	1366	1325	1317	1341	1234	1433	1336
F_2	1399	1489	1366	1432	1432	1390	1432	1382	1440	1418
Mean	1352	1360	1377	1380	1388	1322	1355	1325	1410	1363
K_0	1333	1341	1390	1358	1424	1283				
K_1	1242	1366	1367	1382	1275	1318				
K_2	1481	1373	1375	1400	1465	1365				
P_0	1391	1399	1350							
P_1	1407	1366	1390							
P_2	1258	1315	1392							

S.E. of any marginal mean = 32.1 lb./ac.
S.E. of body of any table = 55.6 lb./ac.

II. Residual effect

(i) 1187 lb./ac. (ii) 150.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	1200	1062	1218	1177	1193	1110	1119	1168	1193	1160
F_1	1177	1128	1217	1177	1201	1144	1168	1152	1202	1174
F_2	1259	1218	1201	1292	1226	1160	1160	1267	1251	1226
Mean	1212	1136	1212	1215	1207	1138	1149	1196	1215	1187
K_0	1152	1127	1168	1160	1127	1160				
K_1	1161	1160	1267	1259	1251	1078				
K_2	1323	1121	1201	1226	1243	1176				
P_0	1251	1201	1193							
P_1	1193	1160	1268							
P_2	1192	1047	1175							

S.E. of any marginal mean = 29.0 lb./ac.
S.E. of body of any table = 50.3 lb./ac.

III. Direct effect

i) 1319 lb. ac. (ii) 159.3 lb./ac. (iii) Interaction N × F is highly significant and main effect of N is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	1325	1267	1481	1300	1432	1342	1349	1374	1351	1358
F_1	1094	1325	1358	1333	1201	1243	1267	1251	1289	1259
F_2	1382	1317	1325	1374	1382	1267	1374	1325	1324	1341
Mean	1267	1303	1388	1336	1338	1284	1330	1317	1311	1319
K_0	1234	1325	1431	1325	1358	1307				
K_1	1218	1349	1384	1341	1308	1302				
K_2	1349	1235	1349	1342	1348	1243				
P_0	1251	1358	1399							
P_1	1317	1323	1374							
P_2	1233	1228	1391							

S.E. of any marginal mean = 30.7 lb./ac.
S.E. of body of any table = 53.1 lb./ac.

Crop :- Cotton **Ref :- Pb. 58 (SFT).**

Centre :- Ferozepur (c.f.). **Type :- 'M'.**

Object :— Type A—To study the response of Cotton to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) April-May. (vii) Irrigated. (viii) and (ix) N.A. (x) October to December.

2. TREATMENTS :

0 =Control (no manure)
n =40 lb./ac. of N as A/S.
p =20 lb./ac. of P_2O_5 as Super.
np =40 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
k =20 lb./ac. of K_2O as Mur. of Pot.
nk =40 lb./ac. of N as A/S+20 lb./ac. of K_2O as Mur. of Pot.
pk =20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. of Pot.
npk =40 lb./ac. of N as A/S+20 lb./ac. of P_2O_6 as Super+20 lb./ac. of K_2O as Mur. of Pot.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogenous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the some zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crops, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. Three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The above experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village (iii) (a) N.A. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Cotton yield. (iv) (a) 1958—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) Nil.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E
Av. response in lb./ac.	74	58	41	25.5	—25	—25	0	—8	21.4

Control yield = 469 lb./ac. and no. of trials = 6.

Crop :- Cotton. **Ref :- Pb. 59(SFT).**

Centre :- Ferozepur (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Cotton to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 430 conducted at Ferozepur.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	148	140	41	24.7	0	0	—16	8	13.2

Control yield = 675 lb./ac. and no. of trials = 13.

Crop :- Cotton. **Ref :- Pb. 59(SFT).**

Centre :- Hissar (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Cotton to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 430 conducted in Ferozepur.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	123	8	—8	54.3	16	—16	66	25	32.1

Control yield = 1004 lb./ac. and no. of trials = 4.

Crop :- Cotton. **Ref :- Pb. 59(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Cotton to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 430 conducted at Ferozepur.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	197	82	33	20.6	49	8	—16	—66	22.2

Control yield = 453 lb./ac. and no. of trials = 7.

Crop :- Cotton. **Ref :- Pb. 58(SFT).**

Centre :- Karnal (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Cotton to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 430 conducted at Ferozepur.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	115	82	74	17.3	—16	0	16	41	18.9

Control yield = 436 lb./ac. and no. of trials = 6.

Crop :- Cotton. **Ref :- Pb. 59(SFT).**

Centre :- Patiala (c.f.). **Type :- 'M'.**

Object :— Type A—To study the response of Cotton to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 430 conducted at Ferozepur.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	33	33	41	11.5	—8	—8	—16	49	19.7

Control yield = 897 lb./ac. and no. of trials = 8.

Crop :- Cotton. **Ref :- Pb. 58(SFT).**

Centre :- Patiala (c.f.). **Type :- 'M'.**

Object :— Type A—To study the response of Cotton to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 430 conducted at Ferozepur.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	140	33	—41	28.0	33	16	—16	82	38.7

Control yield = 880 lb./ac. and no. of trials = 4.

Crop :- Cotton. **Ref :- Pb. 58(SFT).**

Centre :- Sangrur. **Type :- 'M'.**

Object :— Type A— To study the response of Cotton to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 430 conducted at Ferozepur.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	82	91	58	29.6	—8	—16	8	16	19.7

Control yield = 790 lb./ac. and no. of trials = 6.

Crop :- Cotton. **Ref :- Pb. 59(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :— Type A—To study the response of Cotton to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 430 conducted at Ferozepur.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. respose in lb./ac.	99	82	66	19.7	0	33	8	—8	10.7

Control yield = 436 lb./ac. and no. of trials = 8.

Crop :- Cotton. **Ref :- Pb. 58(SFT).**

Centre :- Ambala (c.f.). **Type :- 'M'.**

Object :— Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) April—May. (vii) Irrigated. (viii) and (ix) N.A. (x) October to December.

2. TREATMENTS :

0 =Control (no manure).
n_1' =40 lb./ac. of N as Urea.
n_2' =80 lb./ac. of N as Urea.
n_1'' =40 lb./ac. of N as A/S/N.
n_2'' =80 lb./ac. of N as A/S/N.
n_1''' =40 lb./ac. of N as C/A/N.
n_2''' =80 lb./ac. of N as C/A/N.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on each crops, 4 on an oilseed crop and on 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The above experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones ar the rate of oue experiments per villages. (iii) (a) N.A. (b) 1/80 acre. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Cotton yield. (iv) (a) 1958—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) Nil.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield in lb./ac.	872	1243	1193	1366	1243	1111	1325

G.M. = 1193 lb./ac. ; S.E./mean = 44.8 lb./ac. and no. of trials = 5.

Crop :- Cotton. **Ref :- Pb. 58(SFT).**

Centre :- Ferozepur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page [433] conducted at Ambala.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield in lb./ac.	379	420	477	395	436	395	453

G.M. = 422 lb./ac. ; S.E./mean = 25.6 lb./ac. and no. of trials = 6.

Crop :- Cotton. **Ref :- Pb. 59(SFT).**

Centre :- Ferozepur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) April—May. (vii) Irrigated. (viii) and (ix) N.A. (x) October to December.

2. TREATMENTS :

0 =Control (no manure).
n_1 =40 lb./ac. of N as A/S.
n_2 =80 lb./ac. of N as A/S.
n_1' =40 lb./ac. of N as Urea.
n_2' =80 lb./ac. of N as Urea.
n_1'''=40 lb./ac. of N as C/A/N.
n_2'''=80 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 433 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n'''	n_2'''
Av. yield in lb./ac.	502	592	658	601	642	576	650

G.M. = 603 lb./ac. ; S.E./mean = 14.0 lb./ac. and no. of trials = 16.

Crop :- Cotton. **Ref :- Pb. 59(SFT).**

Centre :- Hissar (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) April—May. (vii) Irrigated. (viii) and (ix) N.A. (x) October to December.

2. TREATMENTS :

0 =Control (no manure).
n_1 =40 lb./ac. of N as A/S.
n_2 =80 lb./ac. of N as A/S.
n_1' =40 lb./ac. of N as Urea.
n_2' =80 lb./ac. of N as Urea.
n_1'''=40 lb./ac. of N as C/A/N.
n_2'''=80 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 433 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	848	996	1078	889	1012	938	1127

G.M. =984 lb./ac. ; S.E./mean = 13.4 lb./ac. and no.of trials = 7.

Crop :- Cotton. **Ref :- Pb. 59(SFT).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) April—May. (vii) Irrigated. (viii) and (ix) N.A. (x) October to December.

2. TREATMENTS:

0 =Control (no manure).
n_1 =40 lb./ac. of N as A/S.
n_2 =80 lb./ac. of N as A/S.
n_1' =40 lb./ac. of N as Urea.
n_2' =80 lb./ac. of N as Urea.
n_1'''=40 lb./ac. of N as C/A/N.
n_2'''=80 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 433 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	576	683	724	683	773	741	889

G.M. = 724 lb./ac. ; S.E./mean = 30.3 lb./ac. and no. trials = 6.

Crop :- Cotton. **Ref :- Pb. 58(SFT).**

Centre :- Karnal (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 433 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield in lb./ac.	362	527	584	518	601	543	592

G.M. = 532 lb./ac. ; S.E./mean = 23.9 lb./ac. and no. of trials = 7.

Crop :- Cotton. **Ref :- Pb. 58(SFT).**

Centre :- Patiala (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 433 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield in lb./ac.	773	897	971	889	864	930	905

G.M. = 890 lb./ac. ; S.E./mean = 25.0 lb./ac, and no. of trials = 4.

Crop :- Cotton. **Ref :- Pb. 59(SFT).**

Centre :- Patiala (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) April—May. (vii) Irrigated. (viii) and (ix) N.A. (x) Oct. to December.

2. TREATMENTS :

0 =Control (no manure).
n_1 =40 lb./ac. of N as A/S.
n_2 =80 lb /ac. of N as A/S.
n_1' =40 lb./ac. of N as Urea.
n_2' =80 lb./ac. of N as Urea.
n_1'''=40 lb./ac. of N as C/A/N.
n_2'''=80 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 433 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	708	765	889	773	856	757	831

G.M. = 797 lb./ac. ; S.E./mean = 19.8 lb./ac. and no. of trial = 8.

Crop :- Cotton. **Ref :- Pb. 58(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate to the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 433 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield in lb./ac.	872	1029	1168	987	1094	1119	1185

G.M. = 1065 lb./ac. ; S.E./mean = 43.6 lb./ac. and no. of trials = 6.

Crop :- Cotton. **Ref :- Pb. 59(SFT).**

Centre :- Sangrur (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) April—May. (vii) Irrigated. (viii) and (ix) N.A. (x) October to December.

2. TREATMENTS :

0 =Control (no manure).
n_1 =40 lb./ac. of N as A/S.
n_2 =80 lb./ac. of N as A/S.
n_1' =40 lb./ac. of N as Urea.
n_2' =80 lb./ac. of N as Urea.
n_1'''=40 lb./ac. of N as C/A/N.
n_2'''=80 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(SFT) type B on page 433 conducted at Ambala.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	494	576	675	560	675	510	560

G.M. = 579 lb./ac. ; S.E./mean = 16.3 lb./ac. and no. of trials = 7.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(227).**

Centre :- Ferozepur (c.f.). **Type :- 'M'.**

Object :—To find out the optimum dose of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Fine sandy loam. (iii) N.A. (iv) 320—F. (v) (a) Ploughings. (b) to (e) N.A. (vi) May, 1954. (vii) Irrigated. (viii) Weeding. (ix) 12.2". (x) Nov., 1954.

2. TREATMENTS :

6 levels of N as A/S : N_0=0, N_1=25, N_2=50, N_3=75, N_4=100 and N_5=125 lb./ac.

3. DESIGN :

(i) and (ii) The trial was conducted as R.B.D. in single replicate in 3 fields, each selected randomly from 3 villages. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (with changed treatments). (b) No. (c) Nil. (v) Hissar and Jullundur. (vi) and (vii) Nil.

5. RESULTS :

(i) 1682 lb./ac. (ii) 99.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2	N_3	N_4	N_5
Av. yield	1338	1580	1607	1821	1821	1925

S.E./mean = 57.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(163).**

Centre :- Ferozepur (c.f.). **Type :- 'M'.**

Object :—To find out the optimum dose of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (iii) N.A. (iv) 320—F. (v) (a) Ploughings. (b) to (e) N.A. (vi) May, 1956. (vii) Irrigated. (viii) Weedings. (ix) 21.4". (x) Nov., 1956.

2. TREATMENTS :

4 levels of N as A/S : N_0=0, N_1=50, N_2=100 and N_3=150 lb./ac.

3. DESIGN :

(i) and (ii) The trial was conducted as R.B.D. in single replicate in 9 fields, selected randomly, 2 each from 3 villages and 1 each from 3 villages. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (with changed treatments). (b) No. (c) Nil. (v) Hissar and Jullundur. (vi) and (vii) Nil.

5. RESULTS :

(i) 912 lb./ac. (ii) 116.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2	N_3
Av. yield	656	957	1001	1034

S.E./mean = 38.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(186).**

Centre :- Ferozepur (c.f.). **Type :- 'M'.**

Object :—To find out the optimum dose of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) Fine sandy loam. (iii) N.A. (iv) 320—F. (v) (a) Ploughings. (b) to (e) N.A. (vi) May, 1957. (vii) Irrigated. (viii) Weeding. (ix) 16.3". (x) Nov., 1957.

2. TREATMENTS :

Same as in expt. no. 56(163) on page 438.

3. DESIGN :

(i) and (ii) The trial was conducted as R.B.D. in single replicate in 7 fields, selected randomly, 1 each from 3 villages and 4 from 1 village. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

Same as in expt. no. 56(163) on page 438.

5. RESULTS :

(i) 1384 lb./ac. (ii) 120.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2	N_3
Av. yield	1013	1479	1554	1492

S.E./mean = 45.4 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(217).**

Centre :- Ferozepur (c.f.). **Type :- 'M'.**

Object :—To find out the optimum dose of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) Fine sandy loam. (iii) N.A. (iv) 320—F. (v) (a) Ploughings. (b) to (e) N.A. (vi) May, 1958. (vii) Irrigated. (viii) Weedings. (ix) 24.9". (x) Nov., 1958.

2. TREATMENTS :

Same as in expt. no. 56(163) on page 438.

3. DESIGN :

(i) and (ii) The trial was conducted as R.B.D. in single replicate in 8 fields, selected randomly, 2 each from 2 villages and 4 from 1 village. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (with changed treatments). (b) No. (c) Nil. (v) Hissar and Jullundur. (vi) Heavy rains during August and September affected the crop adversely. (vii) Nil.

5. RESULTS :

(i) 612 lb./ac. (ii) 64.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2	N_3
Av. yield	576	692	624	555

S.E./mean = 22.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(220).**

Centre :- Ferozepur (c.f.). **Type :- 'M'.**

Object :—To find out the optimum dose of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) Fine sandy loam. (iii) N.A. (iv) 320—F in 3 fields, L.S.S. in 2 fields and L.L. 54 in 1 field. (v) (a) Ploughings. (b) to (e) N.A. (vi) May, 1959. (vii) Irrigated. (viii) Weedings. (ix) 13.5". (x) Nov., 1959.

2. TREATMENTS :

Same as in expt. no. 56(163) on page 438.

3. DESIGN :

(I) and (ii) The trial was conducted as R.B.D. in single replicate in 6 fields, each selected randomly from 6 villages. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf rollor. (iii) Yield of *kapas*. (iv) 1954—contd. (with changed treatments). (b) No. (c) Nil. (v) Hissar and Jullundur. (vi) Untimely rains and cloudy weather caused shedding of buds and flowers. (vii) Nil.

5. RESULTS :

(i) 679 lb./ac. (ii) 60.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2	N_3
Av. yield	520	613	783	802

S.E./mean = 24.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(233).**

Centre :- Hissar (c.f.). **Type :- 'M'.**

Object :—To find out the optimum dose of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Fine sandy loam. (iii) N.A. (iv) H—14. (v) (a) Ploughings. (b) to (e) N.A. (vi) May, 1954. (vii) Irrigated. (viii) Weedings. (ix) 16.3". (x) Nov., 1954.

2. TREATMENTS :

6 levels of N as A/S : N_0=0, N_1=25, N_2=50, N_3=75, N_4=100 and N_5=125 lb./ac.

3. DESIGN :

(i) and (ii) The trial was conducted as R.B.D. in single replicate in 6 fields, each selected randomly from 6 villages. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (with changed treatments). (b) No. (c) Nil. (v) Ferozepur and Jullundur. (vi) and (vii) Nil.

5. RESULTS :

(i) 1251 lb./ac. (ii) 107.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2	N_3	N_4	N_5
Av. yield	815	994	1215	1359	1518	1607

S.E./mean = 43.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(170).**

Centre :- Hissar (c.f.). **Type :- 'M'.**

Object :—To find out the obtimum dose of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) Fine sandy loam. (iii) N.A. (iv) H—14. (v) (a) Ploughings. (b) to (e) N.A. (vi) May, 1956. (vii) Irrigated. (viii) Weedings. (ix) 18.5". (x) Nov., 1956.

2. TREATMENTS :

4 levels of N as A/S : N_0=0, N_1=50. N_2=100 and N_3=150 lb./ac.

3. DESIGN :

(i) and (ii) The trial was conducted as R.B.D. in single replicate in 7 fields, selected randomly, 2 each from 2 villages and 1 each from 3 villages. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Poor. (ii) Attack of jassid. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (with changed treatments). (b) No. (c) Nil. (v) Ferozepur and Jullundur. (vi) and (vii) Nil.

5. RESULTS :

(i) 948 lb./ac. (ii) 79.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2	N_3
Av. yield	803	958	1020	1011

S.E./mean = 30.2 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(197).**

Centre :- Hissar (c.f.). **Type :- 'M'.**

Object :—To find out the optimum dose of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow. (c) Nil. (ii) Fine sandy loam. (iii) N.A. (iv) H—14. (v) (a) Ploughings. (b) to (e) N.A. (iv) May, 1957. (vii) Irrigated. (viii) Weedings. (ix) 14.3". (x) Nov., 1957.

2. TREATMENTS :

Same as in expt. no. 56(170) above.

3. DESIGN :

(i) and (ii) The trial was conducted as R.B.D. in single replicate in 11 fields, selected randomly, 2 each from 2 villages and 1 each from 7 villages. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

Same as in expt. no. 56(170) above.

5. RESULTS :

(i) 820 lb./ac. (ii) 106.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2	N_3
Av. yield	659	830	827	964

S.E./mean = 32.0 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 58(225).**

Centre :- Hissar (c.f.). **Type :- 'M'.**

Object :—To find out the optimum dose of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) Fine sandy loam. (iii) N.A. (iv) H—14. (v) (a) Ploughings. (b) to (e) N.A. (vi) May, 1958. (vii) Irrigated. (viii) Weedings. (ix) 25.9". (x) Nov., 1958.

2. TREATMENTS :

Same as in expt. no. 56(170) on page 441.

3. DESIGN :

(i) and (ii) The trial was conducted as R.B.D. in single replicate in 8 fields, selected randomly 2 each from 2 villages and 1 each from4 villages. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Poor. (ii) Attack of jassid. (iii) *Kapas* yield. (iv) (a) 1954—contd. (with changed treatments). (b) No. (c) Nil. (v) Ferozepur and Jullundur. (vi) Heavy rains during August and September affected the crop adversely. (vii) Nil.

5. RESULTS :

(i) 539 lb./ac. (ii) 52.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2	N_3
Av. yield	510	542	547	556

S.E./mean = 18.6 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 59(228).**

Centre :- Hissar (c.f.). **Type :- 'M'.**

Object :—To find out the optimum dose of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Guara.* (c) N.A. (ii) Fine sandy loam. (iii) N.A. (iv) H—14. (v) (a) Ploughings. (b) to (e) N.A. (vi) May., 1959. (vii) Irrigated. (viii) Weedings. (ix) 17.3". (x) Nov., 1959.

2. TREATMENTS :

Sama as in expt. no. 56(170) on page 441.

3. DESIGN :

(i) and (ii) The trial was conducted as R.B.D. in single replicate in 8 fields, each selected randomly from 8 villages. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

Same as in expt. no. 58(225) above.

5. RESULTS :

(i) 1150 lb./ac. (ii) 122.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2	N_3
Av. yield	938	1098	1188	1375

S.E./mean = 43.3 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(237).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—To find out the optimum dose of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy loam. (iii) N.A. (iv) 320—F. (v) (a) Ploughings. (b) to (e) N.A. (vi) May, 1954. (vii) Irrigated. (viii) Weedings. (ix) 18.6". (x) Nov., 1954.

2. TREATMENTS :

6 levels of N as A/S : N_0=0, N_1=25, N_2=50, N_3=75, N_4=100 and N_5=125 lb./ac.

3. DESIGN :

(i) and (ii) The trial was conducted as R.B.D. in single replicate in 4 fields, each selected randomly from 4 villages. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassid. (iii) Yield of *kapas* (iv) (a) 1954—contd. (with changed treatments). (b) No. (c) Nil. (v) Ferozepur and Hissar. (vi) and (vii) Nil.

5. RESULTS :

(i) 1338 lb./ac. (ii) 136.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2	N_3	N_4	N_5
Av. yield	1051	1168	1343	1407	1592	1467

S.E./mean = 68.3 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(179).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—To find out the optimum dose of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sugarcane. (c) N.A. (ii) Sandy loam. (iii) N.A. (iv) 320—F. (v) (a) Ploughings. (b) to (e) N.A. (vi) May, 1956. (vii) Irrigated. (viii) Weedings. (ix) 36.0". (x) Nov., 1956.

2. TREATMENTS :

4 levels of N as A/S : N_0=0, N_1=50, N_2=100 and N_3=150 lb./ac.

3. DESIGN :

(i) and (ii) The trial was conducted as R.B.D. in single replicate in 9 fields, selected randomly, 2 each from 3 villages and 1 each from 3 villages. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

Same as in expt. no. 54(237) above.

5. RESULTS :

(i) 828 lb./ac. (ii) 76.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2	N_3
Av. yield	773	854	852	834

S.E./mean = 25.5 lb./ac.

Crop :- Cotton (*Kharif*). **Ref :- Pb. 57(208).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—To find out the optimum dose of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) Sandy loam. (iii) N.A. (iv) 320—F. (v) (a) Ploughings. (b) to (e) N.A. (vi) May, 1957. (vii) Irrigated. (viii) Weedings. (ix) 29.1". (x) Nov., 1957.

2. TREATMENTS :

Same as in expt. no. 56(179) on page 443.

3. DESIGN :

(i) and (ii) The trial was conducted as R.B.D. in single replicate in 11 fields, selected randomly, 4 from 1 village, 2 each from 2 villages and 1 each from 3 villages. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Poor. (ii) Attack of jassid. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (with changed treatments). (b) No. (c) Nil. (v) Ferozepur and Hissar. (vi) Crop lodged. (vii) Nil.

5. RESULTS :

(i) 369 lb./ac. (ii) 32.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas*

Treatment	N_0	N_1	N_2	N_3
Av. yield	339	366	384	388

S.E./mean = 9.9 lb./ac.

Crop :- Cotton (*Kharif*). **Ref :- Pb. 58(237).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—To find out the optimum dose of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Berseem*. (c) N.A. (ii) Sandy loam. (iii) N.A. (iv) 320—F. (v) (a) Ploughings. (b) to (e) N.A. (vi) May, 1958. (vii) Irrigated. (viii) Weedings. (ix) 36.2". (x) Nov., 1958.

2. TREATMENTS :

3 levels of N as A, S : N_0=0, N_1=50 and N_2=100 lb./ac.

3. DESIGN :

(i) and (ii) The trial was conducted as R.B.D. in single replicate in 12 fields, selected randomly, 3 from 1 village, 2 each from 4 villages and 1 from 1 village. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (with changed treatments). (b) No. (c) Nil. (v) Ferozepur and Hissar. (vi) Heavy rains during August and September affected the crop adversely. (vii) Nil.

5. RESULTS :

(i) 428 lb./ac. (ii) 51.8 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2
Av. yield	389	414	450

S.E./mean = 14.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(238).**

Centre :- Jullundur (c.f.). **Type :- 'M'.**

Object :—To find out the optimum dose of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) Sandy loam. (iii) N.A. (iv) 320—F. (v) (a) Ploughings. (b) to (e) N.A. (vi) May, 1959. (vii) Irrigated. (viii) Weedings. (ix) 31.8". (x) Nov., 1959.

2. TREATMENTS :

Same as in expt. no. 58(237) on page 444.

3. DESIGN :

(i) and (ii) The trial was conducted as R.B.D. in single replicate in 10 fields, selected randomly, 2 each from 4 villages and 1 each from 2 villages. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

Same as in expt. no. 58(237) on page 444.

5. RESULTS :

(i) 836 lb./ac. (il) 50.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	N_0	N_1	N_2
Av. yield	775	874	859

S.E./mean = 15.8 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(89).**

Centre :- Rohtak (c.f.). **Type :- 'M'.**

Object :—To compare different sources of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) Nil. (ii) Silty loam. (iii) Nil. (iv) H—14. (v) (a) to (e) N.A. (vi) May, 1956. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

4 sources of 50 lb./ac. of N : S_0=Control, S_1=A/S, S_2=A/N and S_3=Urea.

3. DESIGN :

(i) and (ii) The trial was conducted as R.B.D. in 2 fields, selected at random. (iii) (a) N.A. (b) 1/8 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) *Kapas* yield. (iv) to (vii) Nil.

5. RESULTS :

(i) 1245 lb./ac. (ii) 178.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	806	1267	1366	1540

S.E./mean = 125.9 lb./ac.

Crop :- Cotton. **Ref :- Pb. 54(48).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'MV'.**

Object :—To study the effect of different methods and time of application of A/S on different varieties of Cotton.

1. BASAL CONDITIONS :

(i) (a) Maize—*Senji*—Cotton. (b) *Senji.* (c) Nil. (ii) (a) Heavy to medium loam. (b) Refer soil analysis, Gurdaspur. (iii) 22.4.1954. (iv) (a) 2 ploughings and 4 *sohaga.* (b) N.A. (c) 6½ srs./ac. for V_1 and 8½ srs./ac. for V_2. (d) 9″×9″. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 1 hoeing. (ix) 28.04″. (x) 4 pickings : 9, 24.10.1954 ; 18.11.1954 and 16.12.1954 for V_1 and 5 pickings on 5, 14, 23.10.1954 ; 18.11.1954 and 16.12.1954 for V_2.

2. TREATMENTS :

Main-plot treatments :

7 times of application of 60 lb./ac. of N as A/S : T_0=Control (no application), T_1=Full dose drilled at sowing, T_2=Full dose by broadcast with 2nd irrigation, T_3=Full dose just before flowering, T_4=Half dose drilled at sowing+half dose by broadcast just before flowering T_5=Half by broadcast with 2nd irrigation+half just before flowering and T_6=½ drilled at sowing+½ by broadcast with 2nd irrigation+½ just before flowering.

Sub-plot treatments :

2 varieties : V_1=231—R and V_2=320—F (medium).

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 80.9′×8′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of *kapas.* (iv) (a) 1953—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1352 lb./ac. (ii) (a) 104.4 lb./ac. (b) 106.5 lb./ac. (iii) Main effects of T and V are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	T_0	T_1	T_2	T_3	T_4	T_5	T_6	Mean
V_1	1104	1224	1305	1412	1204	1405	1233	1270
V_2	1408	1300	1506	1497	1423	1567	1333	1433
Mean	1256	1262	1406	1455	1314	1486	1283	1352

S.E. of difference of two

1. T marginal means = 52.2 lb./ac.
2. V marginal means = 28.5 lb./ac.
3. V means at the same level of T = 75.3 lb./ac.
4. T means at the same level of V = 74.5 lb./ac.

Crop :- Cotton. **Ref :- Pb. 54(49).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'MV'.**

Object :—To study the effect of A/S on the yield of different varieties of Cotton.

1. BASAL CONDITIONS :

(i) (a) *Senji*—Cotton. (b) *Senji.* (c) Nil. (ii) (a) Light loam. (b) Refer soil analysis, Gurdaspur. (iii) 22.4.1954. (iv) (a) Hindustan plough once, *desi* plough twice and 2 harrowings. (b) N.A. (c) 6½ srs./ac. for V_1 and 8½ srs./ac. for V_2. (d) 9″×9″. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 1 hoeing, 2 thinnings and 1 ridging. (ix) 28.04″. (x) 5 pickings on 5, 13, 23.10.1954 ; 9.11.1954 and 16.12.1954 for V_1 and 4 pickings on 8, 25.10.1954 ; 18.11.1954 and 16.12.1954 for V_2.

2. TREATMENTS :

Main-plot treatments :

4 levels of N as A/S : N_0=0, N_1=25, N_2=50 and N_3=75 lb./ac.

Sub-plot treatments :

2 varieties : V_1=231—R and V_2=320—F (medium).

A/S applied by broadcast on 20.7.1954.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 80.9′×8′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of jassid and cotton leaf roller. D.D.T. sprayed on 26.7.1954. (iii) *Kapas* yield. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1195 lb./ac. (ii) (a) 84.6 lb./ac. (b) 140.6 lb./ac. (iii) Only V effect is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	Mean
V_1	1067	1093	1204	1176	1135
V_2	1255	1231	1255	1279	1255
Mean	1161	1162	1230	1228	1195

S.E. of difference of two

1. N marginal means = 42.3 lb./ac.
2. V marginal means = 49.7 lb./ac.
3. V means at the same level of N = 99.4 lb./ac.
4. N means at the same level of V = 82.4 lb./ac.

Crop :- Cotton (*Kharif*). **Ref :- Pb. 55(56).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'MV'.**

Object :—To study the effect of A/S on the yield of different varieties of Cotton.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Senji*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Gurdaspur. (iii) 6.5.1955. (iv) (a) 6 ploughings and 4 *sohaga*. (b) Dibbling. (c) 6 to 8 srs./ac. (d) 9″ between plants. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 hoeings. (ix) 55.94″. (x) 20, 30.9.1955 ; 18, 29.10.1955 ; 9.11.1955 and 1.12.1955.

2. TREATMENTS :

Main-plot treatments :

4 levels of N as A/S : N_0=0, N_1=25, N_2=50 and N_3=75 lb./ac.

Sub-plot treatments :

2 varieties : V_1=231—R (*desi*) and V_2=320—F (American).

½ dose of N applied on 20.6.1955 and ½ dose on 9.8.1955.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 72.6′×10′. (v) Nil. (vi) Yes.

4 GENERAL :

Same as in expt. no. 54(49) on page 446.

5. RESULTS:

(i) 582 lb./ac. (ii) (a) 80.8 lb./ac. (b) 128.1 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	Mean
V_1	449	589	606	657	575
V_2	554	527	671	608	590
Mean	502	558	638	632	582

S.E. of difference of two

1. N marginal means = 40.4 lb./ac.
2. V marginal means = 45.3 lb./ac.
3. V means at the same level of N = 90.6 lb./ac.
4. N means at the same level of V = 75.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(195).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'C'.**

Object :—To find out suitable spacing and number of plants per hill for Cotton.

1. BASAL CONDITIONS :

(i) (a) *Berseem*—Cotton. (b) *Berseem*. (c) Nil. (ii) (a) Light loam. (b) Refer soil analysis, Abohar. (iii) 25.5.1954. (iv) (a) One ploughing with furrow twing, 3 *desi hal* and 2 *sohaga*. (b) Dibbling. (c) N.A. (d) and (e) As per treatments. (v) 2 mds./ac. of A/S top dressed at flowering. (vi) 320—F (early). (vii) Irrigated. (viii) 1 hoeing. (ix) 12.82". (x) 13 to 17.1.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 spacings between rows : R_1=24" and R_2=30".
(2) 2 spacings between plants : P_1=18" and P_2=24".
(3) No. of plants per hill : H_1=1 and H_2=2 plants/hill.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) and (b) 44'×10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) *kapas* yield. (iv) (a) 1954 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2091 lb./ac. (ii) 162.3 lb./ac. (iii) Main effect of R alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	H_1	H_2	Mean	P_1	P_2
R_1	2167	2255	2211	2225	2196
R_2	1916	2027	1971	2059	1884
Mean	2041	2141	2091	2142	2040
P_1	2096	2188			
P_2	1987	2093			

S.E. of any marginal mean = 36.3 lb./ac.
S.E. of body of any table = 51.3 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(89).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'C'.**

Object :—To study the effect of inter-cropping on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Linseed. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 27.5.1954. (iv) (a) 4 ploughings and 2 *sohaga*. (b) N.A. (c) 6 srs./ac. (d) 2½' between rows. (e) N.A. (v) 6 tons/ac. of compost before sowing and 25 lb./ac. of N as A/S at flowering stage. (vi) 320—F (medium). (vii) Irrigated (viii) 5 hoeings. (ix) 18.03". (x) 8.11.1954, 5.12.1954 and 27.1.1955.

2. TREATMENTS :

4 inter-cropping treatments : T_1=Cotton alone, T_2=Cotton+*Moth*, T_3=Cotton+*Guara* and T_4=Cotton +*Tinda*.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 95'×15'. (b) 60½'×15'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Slight attack of jassids and boll worm. *Tinda* was totally damaged by insects. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 951 lb./ac. (iii) 156.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	T_2	T_3	T_4
Av. yield	1027	978	790	1009

S.E./mean = 64.0 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(13).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'C'.**

Object :—To study the effect of inter-cropping on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—Fallow. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Faridkot. (iii) 18.4.1955. (iv) (a) to (e) N.A. (v) 40 lb./ac. of N as A/S. (vi) 320—F (early). (vii) Irrigated. (viii) 2 hoeings with Lyalpur hoe and 2 thinnings. (ix) 17.00". (x) 3 pickings on 19.10.1955, 2.11.1955 and 19.11.1955.

2. TREATMENTS :

4 inter-cropping treatments : T_1=Cotton alone, T_2=Cotton+*Moth*, T_3=Cotton+*Guara* and T_4=Cotton+ *Futtan*.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 48' 6"×15'. (b) 40'4"×15'. (v) 4' 1" on either side of the plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Slight attack of boll worm. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1013 lb./ac. (ii) 207.8 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	T_2	T_3	T_4
Av. yield	1234	1060	899	858

S.E./mean = 84.8 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 54(83).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'C'.**

Object :—To determine the optimum sowing time and spacing for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Moong* for G.M. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 4 ploughings and 1 *sohaga*. (b) N.A. (c) 8 to 10 srs./ac. (d) As per treatments. (e) N.A. (v) 10 tons/ac. of compost and *moong* as G.M. ploughed in field. (vi) 320—F (early). (vii) Irrigated. (viii) 3 hoeings. (ix) 18.03". (x) 15.10.1954 to 15.12.1954.

2. TREATMENTS :

Main-plot treatments :

6 dates of sowing : D_1=1.4.1954, D_2=12.4.1954, D_3=24.4.1954, D_4=6.5.1954, D_5=18.5.1954 and D_6=30.5.1954.

Sub-plot treatments :

2 spacings : $S_1=2' \times 1\frac{1}{4}'$ and $S_2=2\frac{1}{2}' \times 2'$.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots replication and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 69'×15'. (b) 48'×15'. (v) 10.5' on either side. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Slight attack of jassids and boll worm. (iii) Yield of *kapas*. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) (a) Rauni. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1555 lb./ac. (ii) (a) 134.3 lb./ac. (b) 116.0 lb./ac. (iii) Main effect of D is highly significant and interaction D×S is significant. (iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	D_4	D_5	D_6	Mean
S_1	1490	1560	1620	1781	1455	1546	1575
S_2	1616	1550	1674	1676	1462	1235	1535
Mean	1553	1555	1647	1728	1428	1390	1555

S.E. of difference of two

1. D marginal means = 67.2 lb./ac.
2. S marginal means = 33.5 lb./ac.
3. S means at the same level of D = 82.0 lb./ac.
4. D means at the same level of S = 88.7 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 55(55).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'C'.**

Object :—To study the effect of spacing and date of sowing on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Gurdaspur. (iii) As per treatments. (iv) (a) 9 ploughings and 6 *sohaga*. (b) Dibbling. (c) N.A. (d) As per treatments. (e) N.A. (v) 10 C.L./ac. of F.Y.M.+164 lb./ac. of A/S. (vi) 320—F (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 55.94". (x) 19, 28.9.1955 ; 15, 27.10.1955 and 11, 30.11.1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 dates of sowing : D_1=25.4.1955, D_2=13.5.1955 and D_3=30.5.1955.

(2) 3 spacings between rows : S_1=2', $S_2=2\frac{1}{2}'$ and S_3=3'.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 30′×33′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Jassids and leaf roll attack. D.D.T. sprayed on 16.7.1955 and agrocide sprayed on 24.8.1955. (iii) *Kapas* yield. (iv) (a) 1955 only. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Heavy rains in the 1st week of Oct spoiled the leaf and bolls. (vii) Nil.

5. RESULTS :

(i) 568 lb./ac. (ii) 98.0 lb./ac. (iii) Main effects of D and S are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	Mean
S_1	968	666	269	634
S_2	861	648	215	575
S_3	761	563	158	494
Mean	863	626	214	568

S.E. of any marginal mean = 28.3 lb./ac.
S E. of body of table = 49.0 lb./ac.

Crop :- Cotton. **Ref :- Pb. 54(60).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'C'.**

Object :—To find out the optimum date of sowing for Cotton.

1. BASAL CONDITIONS :

(i) (a) Maize—*Senji*—Cotton. (b) *Senji*. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Gurdaspur. (iii) As per treatments. (iv) (a) 7 ploughings, 5 *sohaga* and 1 horse hoe. (b) Dibbling. (c) 11 srs./ac. (d) 2′×1′. (e) N.A. (v) 10 lb./ac. of N as A/S on 10.7.1954. (vi) 231—R (medium). (vii) Irrigated. (viii) 1 interculture with horse hoe, 1 hand hoe and 1 thinning. (ix) 27.98″. (x) 4.10.1954 to 15.12.1954.

2. TREATMENTS :

6 dates of sowing : D_1=1.4.1954, D_2=15.4.1954, D_3=1.5.1954, D_4=7.5.1954, D_5=15.5.1954 and D_6=1.6.1954

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) 1/49.9 ac. (b) 80′8″×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of white fly. D.D.T. spray at 2½ lb./ac. on 15.6.1954. (iii) *Kapas* yield. (iv) (a) 1952—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1248 lb./ac. (ii) 352.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	D_1	D_2	D_3	D_4	D_5	D_6
Av. yield	1125	1371	1304	1221	1405	1060

S.E./mean = 157.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(57).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'C'.**

Object :— To find out the optimum date of sowing for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Senji.* (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Gurdaspur. (iii) As per treatments. (iv) (a) 5 ploughings, 5 *sohaga* and 1 horse hoe. (b) Dibbling. (c) N.A. (d) 2′×1′. (e) N.A. (v) N.A. (vi) 231—R (medium). (vi) Irrigated. (viii) N.A. (ix) 61.0″. (x) 19, 29.9.1955, 21.10.1955, 7.11.1955 and 9.12.1955.

2. TREATMENTS :

6 dates of sowing : D_1=15.3.1955, D_2=1.4.1955, D_3=15.4.1955, D_4=1.5.1955, D_5=15.5.1955 and D_6=1.6.1955.

3. DESIGN :

(i) R.B.D. (ii) (a) 6 (b) N.A. (iii) 6. (iv) (a) and (b) 12′×75′7½″. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Serious attack by cotton wilt, aphids and jassids. (iii) *Kapas* yield. (iv) 1952—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 207 lb./ac. (ii) 60.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	D_1	D_2	D_3	D_4	D_5	D_6
Av. yield	132	238	257	242	225	150

S.E./mean = 24.7 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 55(77).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'C'.**

Object :— To study the effect of spacing on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 27, 28.4.1955. (iv) (a) N.A. (b) Dibbling. (c) 6 srs./ac. (d) As per treatments. (e) N.A. (v) 20 lb./ac. of N as A/S. (vi) 320—F (early). (vii) Irrigated. (viii) Gap-filling and 2 to 3 hoeings. (ix) 50.03″. (x) 17.10.1955, 18.11.1955 and 20.12.1955.

2. TREATMENTS :

3 spacings : S_1=2′×2′, S_2=2½′×2½′ and S_3=3′×3′.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 10. (iv) (a) 11′×105′. (b) 11′×99′. (v) 3′ on either side of plot. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Joka attack. 12 lb./ac. of sodium fluosilicate applied on 30.6.1955. (iii) *Kapas* yield. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1085 lb./ac. (ii) 81.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_1	S_2	S_3
Av. yield	1124	1086	1046

S.E./mean = 25.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(82).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'C'.**

Object :— To study the effect of spacing on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 22.5.1955. (iv) (a) N.A. (b) Dibbling. (c) 8 srs./ac. (d) As per treatments. (e) N.A. (v) 4 C.L./ac. of F.Y.M. and 50 lb./ac. of P_2O_5 before sowing in furrows ; 20 lb./ac. of N as A/S before sowing in furrows on 21.5.1955 and 20 lb./ac. of N as A/S at growth and at flowering stage on 25.7.1955. (vi) 320—F (early). (vii) Irrigated. (viii) 3 to 4 hoeings. (ix) 48.86". (x) 14.11.1955 and 17.12.1955.

2. TREATMENTS :

3 spacings between rows : S_1=2', S_2=2½' and S_3=3'.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) 11'×107'. (b) 11'×99'. (v) 4' on either side of plot. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 402 lb /ac. (ii) 103.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	S_1	S_2	S_3
Av. yield	442	379	384

S.E./mean = 46.2 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(8).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'C'.**

Object :— To study the effect of spacing and clipping on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 8.5.1959. (iv) (a) 1 *raja*, 2 *desi* ploughings, 1 horse hoe and 5 *sohaga*. (b) Dibbling. (c) 8 srs./ac. (d) As per treatments. (e) N.A. (v) 111 lb./ac. of C/A/N applied on 10.7.1959. (vi) 320—F. (vii) Irrigated. (viii) 6 hoeings. (ix) 28.69". (x) 16.10.1959 and 2, 19.11.1959.

2. TREATMENTS :

All combinations (1) and (2)

(1) 3 dates of clipping : D_0=No clipping, D_1=25.7.1959 and D_2=13.8.1959 and 25.7.1959.

(2) 2 spacings between rows : S_1=2' and S_2=3'.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 12'×100.8'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) 2½ lb./ac. agrocide sprayed on 29.7.1959, 1½ lb./ac. D.D.T. and 1½ lb./ac. agrocide sprayed on 1.9.1959, 2 lb./ac. D.D.T. and 2 lb./ac. agrocide on 11.9.1959, 1 lb./ac. D.D.T. and 1 lb./ac. agrocide on 16.9.1959. (iii) *Kapas* yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 499 lb./ac. (ii) 71.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	D_0	D_1	D_2	Mean
S_1	515	463	537	505
S_2	524	505	451	493
Mean	520	484	494	499

S.E. of D marginal mean = 25.3 lb./ac.
S.E. of S marginal mean = 20.7 lb./ac.
S.E. of body of D×S table = 35.8 lb./ac.

Crop :- Cotton. **Ref :- Pb. 54(166).**

Site :- Agri. Stn., Karnal. **Type :- 'C'.**

Object :—To find out the best date of sowing for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) As per treatments. (iv) (a) Ploughing and *sohaga*. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) 8 C.L./ac. of F.Y.M. (vi) F—216 (medium). (vii) Irrigated. (viii) 1 gapfilling, 2 hoeing and 1 weeding. (ix) 20.36″. (x) 31.8.1954, 6, 14, 22.9.1954 ; 4, 14 and 27.10.1954.

2. TREATMENTS :

7 dates of sowing : D_1=16.3.1954, D_2=31.3.1954, D_3=14.4.1954, D_4=2.5.1954, D_5=18.5.1954, D_6=31.5.1954, and D_7=11.6.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3. (iv) (a) 165′×10′ 10″. (b) 160′×10′ 10″. (v) 2½′ on either side of the plot. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1954—only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 403 lb./ac. (ii) 56.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	D_1	D_2	D_3	D_4	D_5	D_6	D_7
Av. yield	492	489	492	527	350	188	282

S.E./mean = 32.7 lb./ac.

Crop :- Cotton. **Ref :- Pb. 54(100).**

Site :- Cotton Res. Stn., Rauni. **Type :- 'C'.**

Object :—To find out the optimum sowing time and spacing for Cotton.

1. BASAL CONDITIONS:

(i) (a) Cotton—Fallow—Cotton. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatment. (iv) (a) 1 hindustani plough, 3 *desi* plough and 2 *sohaga*. (b) N.A. (c) 8 to 10 srs/ac. (d) and (e) N.A. (v) 30 lb./ac. of N as F.Y.M. (vi) 320—F (early). (vii) Irrigated. (viii) 3 hoeings. (ix) 21.90″. (x) Pickings from 15th Oct. to 15th Dec. 1954.

2. TREATMENTS :

Main plot treatments :

6 dates of sowing : D_1=30.3.1954, D_2=13.4.1954, D_3=25.4.1954. D_4=10.5.1954, D_5=25.5.1954 and D_6=1.6.1954.

Sub-plot treatments :

2 spacings : S_1=2′×1¼′ and S_2=2½′×1½′.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 55′×15′. (b) 44′ 6″×15′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good in the case of early sowing and poor in the case late of sowing. (ii) Jassids attack more in case of late sowing. (iii) *Kapas* yield. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1134 lb./ac. (ii) (a) 142.9 lb./ac. (b) 184.3 lb./ac. (iii) Main effect of D alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	D_4	D_5	D_6	Mean
S_1	1395	1403	1157	1084	1040	933	1169
S_2	1328	1299	1090	988	929	954	1098
Mean	1362	1351	1124	1036	985	944	1134

S.E. of different of two

1. D marginal means = 71.4 lb./ac.
2. S margiaal means = 53.2 lb./ac.
3. S means at the same level of D = 130.3 lb./ac.
4. D means at the same level of S = 116.6 lb./ac.

Crop :- Cotton. **Ref :- Pb. 54(163).**

Site :- Govt.Agri. Farm Rohtak. **Type :- 'C'.**

Object :—To find out the suitable date of sowing for Cotton.

1. BASAL CONDITIONS :

(ii) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Rohtak. (iii) As per treatments. (iv) (a) Ploughing and *sohaga*. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) 100 lb./ac. of N as F.Y.M. one month before sowing. (vi) 216—F. (vii) Irrigated. (viii) 2 hoeings and weedings. (ix) 15.0″. (x) 3, 11, 21.10.1954 and 4.11.1954.

2. TREATMENTS :

7 dates of sowing : D_1=17.3.1954, D_2=1.4.1954, D_3=15.4.1954, D_4=1.5.1954, D_5=27.5.1954, D_6=1.6.1954 and D_7=16 6.19 4.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/30 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1954—only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1419 lb./ac. (ii) 157.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	D_1	D_2	D_3	D_4	D_5	D_6	D_7
Av. yield	1389	1732	1539	1493	1269	1396	1255

S.E./mean = 78.6 lb./ac.

Crop :- Cotton *(Kharif)*· **Ref :- Pb. 56(131).**

Site :- Cotton Res. Stn , Abohar. **Type :- 'CM'.**

Object :—To study the effect of A/S on the yield of cotton grown in different rotations and residual response of Super applied to preceeding rotation crops.

1. BASAL CONDITIONS :

(i) (a) to (c) As per treatments. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1¼′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 21.5″. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

6 preceding crops : R_1=*Guara* (seed), R_1=Gram, R_3=*Berseem*. R_4=Wheat, R_5=Fallow and R_6=*Guara* (G. M.)

Sub-plot treatments :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : N_0=0, N_1=50, N_2=100 and N_3=150 lb./ac.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=50 lb./ac.

P_2O_5 applied to preceeding crops.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8′×23¾′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) *Kapas* yield. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) Nil. (vi) Nil. (vii) Other two-way table is not available in the records.

5. RESULTS :

(i) 1307 lb./ac. (ii) (a) 194.3 lb./ac. (b) 122.4 lb./ac. (iii) Main effect of N and ineteraction R×N are significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	P_0	P_1	Mean
R_1	1201	1605	1446	1440	1406	1440	1423
R_2	1245	1262	1237	1256	1192	1308	1250
R_3	1193	1177	1341	1253	1215	1267	1241
R_4	1086	1267	1316	1275	1201	1271	1236
R_5	1506	1302	1349	1275	1374	1342	1358
R_6	1291	1292	1399	1358	1323	1347	1335
Mean	1254	1318	1348	1310	1286	1329	1307

S.E. of difference of two

1. R marginal means = 68.7 lb./ac.
2. N marginal means = 35.3 lb./ac.
3. P marginal means = 25.0 lb./ac.
4. P means at the same level of R = 61.2 lb./ac.
5. R means at the same level of P = 81.2 lb./ac.
6. N means at the same level of R = 86.6 lb./ac.
7. R means at the same level of N = 101.6 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 57(157).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'CM'.**

Object :—To study the effect of A/S on the yield of Cotton grown in different rotations and residual response of Super applied to preceeding rotational crop.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 2 ploughings. (b) and (c) N.A. (d) 2′×1¼′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 56(131) on page 456.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8′×32½′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 56(131) on page 456.

5. RESULTS :

(i) 1494 lb./ac. (ii) (a) 253.3 lb./ac. (b) 304.2 lb./ac. (iii) Main effect of R is highly significant and main effect of N is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	P_0	P_1	Mea
R_1	1366	1662	1769	1795	1670	1626	1648
R_2	1168	1351	1629	1448	1325	1473	1399
R_3	1522	1456	1689	1605	1441	1695	1568
R_4	856	1012	1218	1290	1160	1028	1094
R_5	1555	1860	1685	1432	1646	1620	1633
R_6	1513	1893	1407	1687	1613	1637	1625
Mean	1330	1539	1566	1543	1476	1513	1494

S.E. of difference of two

1. R marginal means = 89.6 lb./ac.
2. N marginal means = 87.8 lb./ac.
3. P marginal means = 62.1 lb./ac.
4. P means at the same level of R = 152.1 lb./ac.
5. R means at the same level of P = 139.9 lb./ac.
6. N means at the same level of R = 215.1 lb./ac.
7. R means at the same level of N = 206.7 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 58(185).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'CM'.**

Object :—To study the effect of A/S on the yield of Cotton grown in different rotations and residual response of Super applied to preceeding rotational crop.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1¼′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weeding. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 56(131) on page 456.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8′×32½′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 56(131) on page 456.

5. RESULTS :

(i) 1109 lb./ac. (ii) (a) 143.0 lb./ac. (b) 146.1 lb./ac. (iii) Main effect of R alone is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	P_0	P_1	Mean
R_1	856	1234	1127	1111	1094	1070	1082
R_2	897	1037	1095	1267	1037	1111	1074
R_3	938	1127	1201	1178	1096	1126	1111
R_4	776	996	1012	1004	932	962	947
R_5	1210	1103	1251	1340	1210	1242	1226
R_6	1226	1193	1226	1207	1150	1276	1213
Mean	984	1115	1152	1185	1087	1131	1109

S.E. of difference of two

1. R marginal means = 50.6 lb./ac.
2. N marginal means = 42.2 lb./ac.
3. P marginal means = 29.8 lb./ac.
4. P means at the same level of R = 73.0 lb./ac.
5. R means at the same level of P = 72.3 lb./ac.
6. N means at the same level of R = 103.3 lb./ac.
7. R means at the same level of N = 102.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(120).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'CM'.**

Object :—To study the effect of A/S on the yield of Cotton grown in different rotations and residual effect of Super applied to preceeding crop.

1. BASAL CONDITIONS :

(i) (a) to (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 4 and 5.5.1958. (iv) (a) 4 ploughings and 2 plankings. (b) Dibbling. (c) 8 srs./ac. (d) and (e) N.A. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 2 hoeings. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 6 rotational crops : R_1=*Guara* seed, R_2=Gram, R_3=*Berseem*, R_4=Wheat, R_5=Fallow and R_6=*Guara* (G.M.).

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=50 lb./ac.

(3) 4 levels of N as A/S : N_0=0, N_1=50 and N_2=100 and N_3=150 lb./ac.

Super applied to preceeding crops.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 48. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 35′×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 646 lb./ac. (ii) 96.8 lb./ac. (iii) Only main effects of R and N are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	R_1	R_2	R_3	R_4	R_5	R_6	Mean	P_0	P_1
N_0	493	523	550	450	700	720	572	552	593
N_1	697	623	657	573	643	697	648	657	640
N_2	650	633	693	593	723	740	672	668	677
N_3	680	733	677	580	780	700	691	653	730
Mean	630	628	644	549	712	714	646	633	660
P_0	620	612	632	538	707	687			
P_1	640	645	657	560	717	742			

S.E. of R marginal mean = 24.2 lb./ac.
S.E. of N marginal mean = 19.7 lb./ac.
S.E. of P marginal mean = 13.9 lb./ac.
S.E of body of R×N table = 48.4 lb./ac.
S.E. of body of R×P table = 34.2 lb./ac.
S.E. of body of N×P table = 27.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(208).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'CM'.**

Object :—To study the effect of N and P on the yield of Cotton grown in different rotations.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) 16.5.1954. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) N.A. (x) Nov., 1954.

2. TREATMENTS :

Main-plot treatments :

6 crop rotations : R_1=*Guara* (seed), R_2=Gram, R_3=*Berseem*, R_4=Wheat, R_5=Fallow, and R_6=*Guara* (G.M.).

Sub-plot treatments :

2 levels of P_2O_5 : P_0=0 and P_1=50 lb./ac.

Sub-sub-plot treatments :

3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 2 sub-plots/main-plot ; 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassids and cotton leaf roller. (iii) Yield, height, internode numbers and length, boll numbers and weight, lint index, seed index and earliness index etc. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) N.A. (vi) Nil. (vii) Other two way tables are not available in records.

5. RESULTS:

(i) 1897 lb./ac. (ii) (a) 123.0 lb./ac. (b) 139.8 lb./ac. (c) 162.9 lb./ac. (iii) Main effect of N and R are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	R_1	R_2	R_3	R_4	R_5	R_6	Mean
N_0	1893	1654	1637	1210	1563	1407	1561
N_1	2156	1967	1884	1794	2123	1761	1948
N_2	2238	2230	2107	2098	2304	2115	2182
Mean	2096	1950	1876	1701	1997	1761	1897
P_0	2069	2024	1843	1664	1904	1786	1882
P_1	2123	1876	1909	1738	2090	1736	1912

S.E of difference of two

1. R marginal means = 50.2 lb./ac.
2. N marginal means = 47.0 lb./ac.
3. P marginal means = 32.9 lb./ac.
4. P means at the same level of R = 80.7 lb./ac.
5. R means at the same level of P = 76.0 lb./ac.
6. N means at the same level of R = 115.1 lb./ac.
7. R means at the same level of N = 106.6 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 55(151).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'CM'.**

Object :—To study the effect of N and P on the yield of Cotton grown in different rotations.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) Fine sandy loam and alkaline. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1¼′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 7.2″. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 54(208) on page 459.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8′×40′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 54(208) on page 459.

5. RESULTS :

(i) 1736 lb./ac. (ii) (a) 156.0 lb./ac. (b) 422.3 lb /ac. (c) 106.3 lb./ac. (iii) Main effect of R and N are highly significant and interaction N×R in significant. (iv) Av. yield of *kapas* in lb./ac.

	R_1	R_2	R_3	R_4	R_5	R_6	Mean
N_0	1720	1234	1275	1078	1621	1547	1413
N_1	1843	1596	1835	1506	2032½	1860	1779
N_2	2082	1843	2098	1777	2213	2002	2016
Mean	1882	1558	1736	1454	1955	1830	1736
P_0	1761	1454	1695	1391	1919	1810	1672
P_1	1999	1662	1777	1518	1991	1851	1800

S.E. of difference of two

1. R marginal means = 63.6 lb./ac.
2. N marginal means = 30.7 lb./ac.
3. P marginal means = 99.5 lb./ac.
4. P means at the same level of R = 243.8 lb./ac.
5. R means at the same level of P = 183.7 lb./ac.
6. N means at the same level of R = 75.1 lb./ac.
7. R means at the same level of N = 88.4 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb 55(152).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'CM'.**

Object :—To study the effect of sowing dates, spacings and N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) $2' \times 1\frac{1}{4}'$. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) One hoeing and weeding. (ix) 7.28". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 dates of sowing : D_1=28.4.1955, D_2=12.5.1955 and D_3=3.6.1955.
(2) 3 spacings between rows : $S_1=1\frac{1}{2}'$, $S_2=2'$ and $S_3=2\frac{1}{2}'$.
(3) 3 spacings between plants : $P_1=1'$, $P_2=1\frac{1}{2}'$ and $P_3=2'$.

Sub-plot treatments :

3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

3. DESIGN :

(i) Split-plot confd. (ii) (a) 27 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield, height, internode no. and length, boll no. and weight, lint index, seed index and earliness index etc. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) N.A. (vi) N.A. (vii) Other two way tables are not available in the records.

5. RESULTS :

(i) 1114 lb./ac. (ii) (a) 255.2 lb./ac. (b) 141.8 lb./ac. (iii) Main effects of D, S and N are highly significant and interaction N×S is significant. (iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	S_1	S_2	S_3	P_1	P_2	P_3	Mean
N_0	749	757	864	782	856	732	790	798	782	790
N_1	1061	1219	1275	1238	1292	1025	1211	1210	1135	1185
N_2	1251	1432	1415	1481	1415	1202	1382	1382	1333	136
Mean	1020	1136	1185	1167	1188	986	1128	1130	1083	1114

S.E. of difference of two

1. D, S or P marginal means = 49.1 lb./ac.
2. N marginal means = 27.3 lb./ac.
3. N means at the same level of D, S or P = 47.3 lb./ac.
4. D, S or P means at the same level of N = 62.5 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 56(134).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'CM'.**

Object :—To study the effect of sowing dates, spacings and N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeing and weeding. (ix) 21.8". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 dates of sowing : D_1=30.4.1956, D_2=16.5.1956 and D_3=2.6.1956.

(2) 3 spacings between rows : S_1=1½', S_2=2' and S_3=2½'.

(3) 3 spacings between plants : P_1=1', P_2=1½' and P_3=2'.

Sub-plot treatments :

3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(152) on page 461.

5. RESULTS :

(i) 963 lb./ac. (ii) (a) 213.7 lb./ac. (b) 172.3 lb./ac. (iii) Main effect of D and interaction N×P are highly significant. Interaction N×D is significant. (iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	S_1	S_2	S_3	P_1	P_2	P_3	Mean
N_0	938	839	716	798	790	905	946	782	765	831
N_1	1192	1020	749	987	938	1037	1013	930	1019	987
N_2	1323	1078	815	1045	1087	1086	967	1064	1187	1072
Mean	1151	979	760	943	938	1009	975	925	990	963

S.E. of difference of two

1. D, S or P marginal means = 41.1 lb./ac.
2. N marginal means = 33.2 lb./ac.
3. N means at the same level of D, S or P = 57.4 lb./ac.
4. D, S or P means at the same level of N = 62.4 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 58(121).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'CM'.**

Object :—To study the effect of N under different spacings and sowing dates on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 5 ploughings and 2 plankings. (b) Dibbling. (c) 8 srs./ac. (d) As per treatments. (e) 1. (v) Nil. (vi) American LL—54. (vii) Irrigated. (viii) 6 hoeings. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 dates of sowing : D_1=25.4.1958, D_2=13.5.1958 and D_3=2.6.1958.

(2) 3 spacings between rows : S_1=1½', S_2=2' and S_3=3'.

(3) 3 spacings between plants : L_1=1', L_2=1½' and L_3=2'.

Sub-plot treatments :

3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

Manures applied on 11.7.1958 and 19.8.1958.

3. DESIGN :

(i) Split-plot confd. (D_2S_2L is confd). (ii) (a) 9 main-plots/block, 3 blocks/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) and (b) 10′×45′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Cotton yield. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) (a) Jullunder and Hansi. (b) Nil. (vi) and (vii) N.A.

5. RESULTS :

(i) 172 lb./ac. (ii) (a) 93.2 lb./ac. (b) 32.7 lb./ac. (iii) Only D and N effects are significant. (iv) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	L_1	L_2	L_3	N_0	N_1	N_2	Mean
D_1	243	197	182	191	206	225	196	212	214	207
D_2	205	178	190	212	203	159	169	205	199	191
D_3	130	124	99	128	96	130	107	127	120	118
Mean	193	166	157	177	168	171	157	181	178	172
N_0	165	150	156	170	145	157				
N_1	214	176	154	184	176	184				
N_2	199	173	161	176	185	173				
L_1	185	182	163							
L_2	180	145	180							
L_3	214	171	128							

S.E. of difference of two

1. D, S or L marginal means = 24.2 lb./ac.
2. N marginal means = 8.9 lb./ac.
3. N means at the same level of D, S or L = 15.4 lb./ac.
4. D, S or L means at the same level of N = 28.3 lb./ac.

S.E. of the body of D×S, D×L or L×S table = 31.0 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(206).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'CM'.**

Object :—To study the effect of cultural treatments and N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) May, 1958. (iv) (a) As per treatments. (b) to (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) As per treatments. (ix) 29.1″. (x) N.A.

2. TREATMENTS:

All combinations of (1); (2) and (3)

(1) 3 methods of ploughing : M_0=No extra plough, M_1=Furrow turning plough (Hindustan plough) and M_2=*Desi hal* (Indigenous plough).

(2) 3 levels of hoeings : C_1=1, C_2=2 and C_3=3 hoeings.

(3) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.

Hoeings done with Lyallpur hoe.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassids and cotton leaf roller. (iii) Yield, height, internode nos. length, boll worm, lint Index, seed Index and earliness Index etc. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) Jullundur. (b) N.A. (vi) N.A. (vii) Other two way tables are not available in the records.

5. RESULTS :

(i) 591 lb./ac. (ii) 153.7 lb./ac. (iii) Main effects of M and N are significnat. (iv) Av. yield of *kapas* in lb./ac.

	M_0	M_1	M_2	C_1	C_2	C_3	Mean
N_0	576	453	502	527	420	584	510
N_1	650	543	535	543	568	617	576
N_2	790	625	642	732	634	691	686
Mean	672	540	560	601	541	631	591

S.E. of any marginal mean = 36.2 lb./ac.
S.E. of body of any table = 62.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(209).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'CM'.**

Object :—To study the effect of cultural treatments in combination with N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) May, 1959. (iv) (a) As per treatments. (b) and (c) N.A. (d) 2′×1½′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) Hoeings and weedings. (ix) 14″. (x) Nov., 1959.

2. TREATMENTS :

Same as in expt. no. 58(206) on page 463.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 6′×35′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of jassids and cotton leaf roller. (iii) *Kapas* yield. (iv) (a) 1954—contd. (b) No. (b) Nil. (v) (a) Hansi and Jullundur. (b) Nil. (vi) Unfavour weather. (vii) Other two way tables are not available in the records.

5. RESULTS :

(i) 1482 lb./ac. (ii) 493.5 lb./ac. (iii) None of the effects is significant. (iv) (a) Av. yield of *kapas* in lb./ac.

	M_0	M_1	M_2	C_1	C_2	C_3	Mean
N_0	1835	1555	1407	1555	1555	1687	1599
N_1	1653	1358	1259	1399	1563	1308	1423
N_2	1440	1292	1539	1423	1556	1292	1424
Mean	1643	1402	1402	1459	1558	1429	1482

S.E. of any marginal mean = 116.3 lb./ac.
S.E. of body of any table = 201.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(127).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'CM'.**

Object :—To study the effect of cultural treatments in combinations with N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 13.5.1958. (iv) (a) As per treatments. (b) Dibbling. (c) 8 srs./ac. (d) 2′ × 1½′. (e) 3 to 5. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) As per treatments. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 methods of ploughing : M_0=No ploughing, M_1=Furrow turning+normal plough and M_2=Ploughing with *desi hal*+normal plough.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of hoeings : C_1=1, C_2=2 and C_3=3 hoeings.

(2) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

Manurings done on 12.7.1958 and 26.8.1958.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) and (b) 10′ × 38′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) *kapas* yield. (iv) (a) 1955–1958. (b) No. (c) Nil. (v) (a) Jullundur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 303 lb./ac. (ii) (a) 171.1 lb./ac. (b) 65.9 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	C_1	C_2	C_3	Mean	N_0	N_1	N_2
M_0	327	302	319	316	260	329	359
M_1	265	253	309	276	233	270	324
M_2	332	273	344	316	290	278	381
Mean	308	276	324	303	261	292	355
N_0	268	216	300				
N_1	280	285	312				
N_2	376	327	361				

S.E. of difference of two

1. M marginal means = 57.0 lb./ac.
2. N or C marginal means = 22.0 lb./ac.
3. N or C means at the same level of M = 38.0 lb./ac.
4. M means at the same level of C or N = 64.9 lb./ac.

S.E. of body of N × C table = 26.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(211).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'CM'.**

Object :—To study the effect of different doses of A/S on American Cotton with variable spacings and sowing dates.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′ between rows. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 dates of sowing : D_1=5.5.1954, D_2=26.5.1954 and D_3=9.6.1954.

(2) 3 spacings between plants : S_1=1′, S_2=1½′ and S_3=2′.

Sub-plot treatments :

3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N A. (b) 10′×42′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) *Kapas* yield. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) N.A. (vi) Nil. (vii) Other two-way table is not available in the records.

5. RESULTS :

(i) 1647 lb./ac. (ii) (a) 339.9 lb./ac. (b) 149.6 lb./ac. (iii) Main effect of N is highly significant. Main effect of D and interaction N×D are significant. (iv) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	D_1	D_2	D_3	Mean
N_0	1259	1349	1300	1330	1358	1221	1303
N_1	1670	1786	1646	1819	1714	1570	1701
N_2	1934	2008	1868	2142	1950	1720	1937
Mean	1621	1714	1605	1764	1674	1504	1647

S.E. of difference of two

1. D or S marginal means = 80.1 lb./ac.
2. N marginal means = 35.3 lb./ac.
3. N means at the same level of D or S = 61.1 lb./ac.
4. D or S means at the same level of N = 94.3 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(75).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'CM'.**

Object :—To study the effect of previous crop and N on Cotton.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) 30.4.1958 and 1.5.1958. (iv) (a) N.A. (b) Sown by *pore*. (c) 10 srs./ac. (d) 2½′×1′. (e) N.A. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 2 *triphali*, 2 hoeings and 1 thinning. (ix) 69.01″. (x) 3, 5.11.1958 ; 27.11.1958. to 1.12.1958, 9.1.1959 and 22.1.1959.

2. TREATMENTS:

Main-plot treatments :

5 previous crops : C_1=Wheat, C_2=*Guara*, (G.M.). followed by wheat, C_3=*Guara* seed—fallow, C_4= Indian Rape and C_5=Cotton.

Sub-plot treatments :

2 levels of N as A/S : N_0=0 and N_1=50 lb./ac.

N applied on 11.8.1958.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 98′×22.5′. (b) 78.5′×18.5′. (v) 9.7′×2′. (vi) Yes

4. GENERAL :

(i) Good. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1196 lb./ac. (ii) (a) 132.5 lb./ac. (b) 651.6 lb./ac. (iii) Main effect of C is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	C_1	C_2	C_3	C_4	C_5	Mean
N_0	864	888	1146	1315	1134	1069
N_1	1182	1340	1261	1528	1299	1322
Mean	1023	1114	1204	1422	1216	1196

S.E. of difference of two

1. C marginal means = 66.2 lb./ac.
2. N marginal means = 206.0 lb./ac.
3. N means at the same level of C = 460.8 lb./ac.
4. C means at the same level of N = 332.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(56).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'CM'.**

Object :—To study the effect of previous crops and N on Cotton.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) 25.4.1959 and 5.5.1959. (iv) (a) N.A. (b) Sown by *pore*. (c) 10 srs./ac. (d) 2½′ between rows. (e) N.A. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 4 *triphali* and 1 thinning. (ix) 31.13″. (x) 21, 26, 28.11.1959, 26.12.1959 and 23.1.1960.

2. TREATMENTS :

Same as in expt. no. 58(75) on page 466.
N applied on 30 7.1959.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 18.5′×78.50′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 619 lb./ac. (ii) (a) 58.1 lb./ac. (b) 45.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	C_1	C_2	C_3	C_4	C_5	Mean
N_0	627	636	609	643	614	626
N_1	628	662	546	618	608	612
Mean	628	649	578	631	611	619

S.E. of difference of two

1. C marginal means = 29.0 lb./ac.
2. N marginal means = 14.4 lb./ac.
3. N means at the same level of C = 32.2 lb./ac.
4. C means at the same level of N = 36.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(74).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'CM'.**

Object :—To find out the best combination of date of sowing, spacing and level of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Cotton—Cotton. (b) Cotton. (c) N.A. (ii) (a) Clay. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 5 ploughings. (b) Sown by *pore*. (c) 10 srs./ac. (d) As per treatments. (e) Nil. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 3 *triphali* and thinning once. (ix) N.A. (x) 29, 30.10.1958, 24, 25, 27.10.1958 and 5, 6.1.1959.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 dates of sowing : D_1=5.4.1958, D_2=20.4.1958 and D_3=5.5.1958.
(2) 3 spacings : S_1=2′×1′, S_2=2½′×1′ and S_3=3′×1′.
(3) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

Half of A/S applied on 3.7.1958 and the other half on 16.8.1958.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 1/61.8 ac. (b) 1/81 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1448 lb./ac. (ii) 160.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	Mean	N_0	N_1	N_2
D_1	1424	1459	1490	1458	1359	1543	1471
D_2	1518	1389	1553	1487	1464	1434	1562
D_3	1407	1394	1400	1400	1290	1508	1403
Mean	1450	1414	1481	1448	1371	1495	1479
N_0	1340	1398	1376				
N_1	1538	1445	1503				
N_2	1473	1400	1564				

S.E. of any marginal mean = 37.8 lb./ac.
S.E. of body of any table = 65.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(87).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'CM'.**

Object :—To study the effect of N and P under different dates of sowing and spacings on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—Cotton. (b) Cotton (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 3 ploughings. (b) By *pore*. (c) 10 srs./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 2 *triphali* and 1 thinning. (ix) N.A. (x) 15.10.1956 to 23.1.1957.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 3 dates of sowing : D_0=19.4.1956, D_1=5, 6.5.1956 and D_2=26.5.1956.
(2) 3 spacings : $S_0=2\frac{1}{2}' \times 1'$, $S_1=2\frac{1}{2}' \times 1\frac{1}{2}'$ and $S_2=2\frac{1}{2}' \times 2\frac{1}{2}'$.
(3) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.
(4) 3 levels of P_2O_5 as Super : P_0=0, P_1=50 and P_2=100 lb./ac.

3. DESIGN :

(i) 3⁴ confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 1/99 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) *Kapas* yield. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1304 lb./ac. (ii) 240.9 lb./ac. (iii) D effect is highly significant and S effect is significant. (iv) Av. yield of *kapas* in lb./ac.

	S_0	S_1	S_2	N_0	N_1	N_2	P_0	P_1	P_2	Mean
D_0	1607	1744	1368	1537	1481	1700	1625	1508	1584	1573
D_1	1479	1423	1506	1447	1451	1510	1447	1409	1553	1469
D_2	986	850	744	848	880	881	919	812	878	870
Mean	1357	1349	1206	1277	1271	1364	1331	1243	1338	1304
P_0	1467	1256	1270	1253	1291	1448				
P_1	1304	1270	1154	1305	1216	1216				
P_2	1301	1520	1194	1274	1304	1437				
N_0	1256	1339	1237							
N_1	1425	1342	1044							
N_2	1390	1365	1336							

S.E. of any marginal mean = 46.4 lb./ac.
S.E. of body of any table = 80.3 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(49).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'CM'.**

Object :—To find out the best combination of date of sowing, spacing and level of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Cotton—Cotton. (b) Cotton. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) N.A. (b) Sown by *pore*. (c) 10 srs./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 2 *triphali* and 1 thinning. (ix) N.A. (x) 21, 22.10.1959, 23.11.1959 and 8, 9.1.1960.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 dates of sowing : D_1=5.4. 959, D_2=20.4.1959 and D_3=5.5.1959.

(2) 3 spacings : S_1=2′×1′, S_2=2½′×1′ and S_3=3′×1′.

(3) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(74) on page 468.

5. RESULTS :

(i) 1071 lb./ac. (ii) 150.2 lb./ac. (iii) Main effect of N is highly significant and those of D and S are significant. (iv) Av. yield of *kapas* in lb /ac.

	S_1	S_2	S_3	Mean	N_0	N_1	N_2
D_1	1174	1083	1135	1131	1057	1104	1232
D_2	1204	1058	1018	1093	1015	1137	1128
D_3	1041	1067	862	990	841	1057	1072
Mean	1140	1069	1005	1071	971	1099	1142
N_0	1016	980	915				
N_1	1256	1016	1025				
N_2	1256	1212	1076				

S.E. of any marginal mean = 35.4 lb./ac.
S.E. of body of any table = 61.3 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(86).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'CM'.**

Object :—To study the effect of N and P on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Rape. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 4 ploughings and *sohaga* once. (b) N.A. (c) 8 to 10 srs./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) L.S.S. (early). (vii) Irrigated. (viii) 4 hoeings with Lyallpur hoe. (ix) 18.03". (x) 5.11.1955, 5, 28.12.1955 and 5.2.1956.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 3 dates of sowing : D_1=1.5.1954, D_2=12.5.1954 and D_3=24.5.1954.

(2) 3 spacings : S_1=2½′×1′, S_2=2½×1½′ and S_3=2½′×2½′.

(3) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

(4) 5 levels of P_2O_5 : P_0=0, P_1=50 an[illegible] P_2=100 lb./ac.

3. DESIGN :

(i) 3⁴ confd. (ii) (a) 9 plots/block and 9 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 46′9"×10′. (b) 44′×10′. (v) 1′4½" on either side of the plot. (vi) Yes.

4 GENERAL :

(i) Good. (ii) Slight attack of jassid and boll worm. (iii) *Kapas* yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5 RESULTS :

(i) 1569 lb./ac. (ii) 333.1 lb./ac. (iii) Main effects of D and S are highly significant and N effect is significant. (iv) Av yield of *kapas* in lb./ac.

	S_1	S_2	S_3	N_0	N_1	N_2	P_0	P_1	P_2	Mean
D_1	1808	1755	1638	1636	1766	1799	1776	1689	1745	1734
D_2	1716	1614	1409	1511	1578	1650	1566	1586	1586	1580
D_3	1477	1350	1312	1318	1348	1513	1406	1336	1438	1393
Mean	1667	1586	1453	1488	1564	1654	1580	1537	1590	1569
P_0	1689	1587	1464	1504	1597	1638				
P_1	1549	1573	1489	1429	1496	1685				
P_2	1764	1599	1406	1532	1598	1638				
N_0	1567	1446	1452							
N_1	1732	1570	1390							
N_2	1703	1742	1517							

S.E. of any marginal mean = 45.3 lb./ac.
S.E. of body of any table = 78.5 lb./ac.

Crop :- Cotton (*Kharif*). **Ref :- Pb. 55(8).**
Site :- Cotton Res. Stn., Faridkot. **Type :- 'CM'.**

Object :- To study the effect of dates of sowing, spacings, N and P on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil (b) *Bajra* –*Moth* –Fodder. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis. Faridkot. (iii) As per treatments. (iv) (a) 4 ploughings and *sohaga* two times. (b) to (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 3 hoeings and 2 thinnings. (ix) 17.00". (x) 16.10.1955. 7, 25.11.1955 and 10 12 1955.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)
(1) 3 dates of sowing : D_1=15.4.1955, D_2=5.5.1955 and D_3=25.5.1955.
(2) 3 spacings : $S_1=2\frac{1}{2}' \times 1'$, $S_2=2\frac{1}{2}' \times 1\frac{1}{2}'$ and $S_3=2\frac{1}{2}' \times 2\frac{1}{2}'$.
(3) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.
(4) 3 levels of P_2O_5 as Super : P_0=0, P_1=50 and P_2=100 lb./ac.
Super drilled 5" deep in furrows before sowing and A/S applied at flowering.

3. DESIGN

(i) 3⁴ confd. (ii) (a) 9 plots/block and 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 45'9"×10'. (b) 44'×10'. (v) $10\frac{1}{2}$", on either side of the plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Slight attack of boll worm. (iii) *Kapas* yield. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1772 lb./ac. (ii) 234 lb./ac. (iii) Main effects of N, P and D are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	N_0	N_1	N_2	P_0	P_1	P_2	Mean
D_1	2079	1980	1971	1820	2031	2208	1988	1975	2066	2010
D_2	1999	1887	1727	1607	1968	2037	1832	1936	1846	1871
D_3	1507	1509	1290	1273	1468	1565	1486	1323	1497	1435
Mean	1862	1792	1663	1567	1812	1937	1769	1745	1803	1772
P_0	1973	1706	1627	1586	1825	1895				
P_1	1726	1847	1661	1500	1768	1966				
P_2	1887	1822	1700	1614	1844	1950				
N_0	1682	1544	1475							
N_1	1861	1794	1782							
N_2	2042	2037	1732							

S.E. of any marginal mean = 45.0 lb./ac.
S.E. of body of any table = 78.0 lb./ac.

Crop :- Cotton (*Kharif*). **Ref :- Pb. 54(85).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'CM'.**

Object :—To study the effect of date of sowing, spacing and time of application of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Fallow—Cotton. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 5 ploughings and one *sohaga*. (b) N.A. (c) 8 to 10 srs /ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) 320 –F (early). (vii) Irrigated. (viii) 4 hoeings and thinnings. (ix) 18.03". (x) 3 pickings on 12.11.1954, 23.12.1954 and 2.2.1955.

2. TREATMENTS :

Main-plot treatments :

2 dates of sowing : D_1=20.4.1954 and D_2=20.5.1954.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 spacings : $S_1=2\frac{1}{2}' \times 1\frac{1}{2}'$ and $S_2=2\frac{1}{2}' \times 2'$.

(2) 4 times of application of 50 lb./ac. of N as A/S : T_0=Control, $T_1=\frac{1}{4}$ at sowing+$\frac{1}{4}$ at thinning, $T_2=\frac{1}{2}$ at sowing+$\frac{1}{2}$ at flowering and T_3=Full dose at flowering.

3. DESIGN :

(i) split-plot. (ii) (a) 2 main-plots/replication and 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12'6"×54'. (b) 12'6"×48'5". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Slight attack of jassid and boll worm. (iii) No. of bolls, boll weight, height of plants and yield of *kapas* (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) Rauni. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1611 lb./ac. (ii) (a) 432.8 lb./ac. (b) 272.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	T_0	T_1	T_2	T_3	Mean	S_1	S_2
D_1	1468	1533	1588	1669	1564	1534	1595
D_2	1439	1760	1652	1779	1658	1680	1636
Mean	1454	1647	1620	1724	1611	1607	1616
S_1	1427	1710	1611	1679			
S_2	1481	1583	1629	1768			

S.E. of difference of two

1. D marginal means = 108.2 lb./ac.
2. T marginal means = 96.2 lb./ac.
3. S marginal means = 68.1 lb./ac.
4. S means at the same level of D = 96.2 lb./ac.
5. D means at the same level of S = 127.8 lb./ac.
6. T means at the same level of D = 136.1 lb./ac.
7. D means at the same level of T = 159.9 lb /ac.

S.E. of body of S × T table = 96.2 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(9).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'CM'.**

Object :—To study the effects of dates of sowing, spacings and time of application of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Bajra—Moth*—Fodder. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 5 ploughings and *sohaga* 2 times. (b) to (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 2 thinnings, 4 hoeings and 1 weeding. (ix) 17.00". (x) 4 pickings on 18.10.1955, 16.11.1955, 15.12.1955 and 27.1.1956.

2. TREATMENTS :

Main-plot treatments :

2 dates of sowing : D_1=20.4.1955 and D_2=20.5.1955.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 spacings : $S_1=2\frac{1}{2}' \times 1\frac{1}{2}'$ and $S_2=2\frac{1}{2}' \times 2'$.

(2) 6 times of application of 50 lb./ac. of N as A/S : T_0=Control (no application), $T_1=\frac{1}{2}$ at sowing+$\frac{1}{2}$ at thinning, $T_2=\frac{1}{2}$ at sowing+$\frac{1}{2}$ at flowering, $T_3=\frac{1}{2}$ at thinning+$\frac{1}{2}$ at flowering, T_4=Full dose at thinning and T_5=Full dose at flowering.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 12 sub-plots/main-plot. (b) N.L. (iii) 4. (iv) (a) 15'×48'6". (b) 15'×42'8". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Slight attack of boll worm. (iii) Yield of *kapas*. (iv) (a) 1944—contd. (b) No. (c) Nil. (v) (a) Rauni. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1911 lb./ac. (ii) (a) 381.5 lb./ac. (b) 189.9 lb./ac. (iii) Main effect of S alone is significant. (iv) Av. yield of *kapas* in lb./ac.

	T_0	T_1	T_2	T_3	T_4	T_5	Mean	S_1	S_2
D_1	1830	2086	1981	1981	2041	2011	1988	2002	1974
D_2	1733	1837	1866	1862	1800	1901	1833	1900	1766
Mean	1782	1962	1924	1922	1921	1956	1911	1951	1870
S_0	1788	2085	1924	1910	1953	2047			
S_1	1777	1839	1923	1935	1889	1865			

S.E. of difference of two

1. D marginal means	= 77.9 lb./ac.	5. D means at the same level of T	= 116.5 lb./ac.
2. S marginal means	= 38 8 lb./ac.	6. S means at the same level of D	= 54.8 lb /ac.
3. T marginal means	= 67.1 lb./ac.	7. D means at the same level of S	= 86 9 lb /ac.
4. T means at the same level of D	= 94.9 lb./ac.	S.E. of body of T×S table	= 67.1 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(88).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'CM'.**

Object :—To study the effectof dates of sowing, spacings and times of application of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—Cotton. (b) Cotton. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 4 ploughings. (b) Sown by *pore*. (c) 10 srs./ac. (d) As per treatments. (e) Nil. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 4 *triphali* and 2 thinnings. (ix) N.A. (x) 22, 23.10.1956, 20.11.1956 and 20.12.1956.

2. TREATMENTS :

Main-plot treatments :

2 dates of sowing : D_1=23.4.1956 and D_2=20.5.1956.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 spacings : S_1=2' × 1' and S_2=2½' × 1'.

(2) 6 times of applications of 50 lb./ac. of N as A/S : T_0=Control (no application), T_1=⅛ at sowing +⅛ at thinning, T_2=⅛ at sowing+⅛ at flowering, T_3=⅛ at thinning+⅛ at flowering, T_4=Full dose at thinning and T_5=Full dose at flowering.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main plots/replication and 12 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/96 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1954—cor td. (b) No. (c) Nil. (v) (a) Rauni. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1219 lb./ac. (ii) (a) 111.1 lb./ac. (b) 228.0 lb./ac. (iii) Main effect of D is highly significant and T effect is significant. (iv) Av. yield of *kapas* in lb./ac.

	T_0	T_1	T_2	T_3	T_4	T_5	Mean	S_1	S_2
D_1	1281	1458	1501	1432	1529	1470	1445	1498	1392
D_2	821	1001	1014	1048	1100	967	992	989	995
Mean	1051	1230	1258	1240	1315	1219	1219	1244	1194
S_1	1129	1267	1288	1276	1310	1191			
S_2	972	1193	1227	1203	1319	1247			

S.E. of difference of two

1. D marginal means	= 22.7 lb./ac.	5. D means at the same level of T	= 106.5 lb./ac.
2. S marginal means	= 46.6 lb./ac.	6. S means at the same level of D	= 65.8 lb /ac.
3. T marginal means	= 80.6 lb./ac.	7. D means at the same level of S	= 51.8 lb./ac.
4. T means at the same level of D	— 114.0 lb./ac.	S.E. of body of T×S table	= 80.6 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54 (209).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'CM'.**

Object :— To study the direct effect of A/S on the yield of Cotton grown in different rotations and the residual effect of super applied to the preceeding crops.

1. BASAL CONDITIONS :

(i) (a) to (c) As per treatments. (ii) (a) Fine sandy loam. (b) N.A. (iii) 9.5.1954. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) N.A. (x) Nov. 1954.

2. TREATMENTS :

Main-plot treatments :

6 crops grown in the previous season : R_1=*Guara* for seed, S_2=Gram, R_3=*Berseem*, R_4=Wheat, R_5=Fallow and R_6=*Guara* (G.M.).

Sub-plot treatments :

2 levels of P_2O_5 : P_0=0 and P_1=50 lb./ac.

Sub-sub-plot treatments :

3 levels of N as A S : N_0=0, N_1=50 and N_2=100 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication, 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A (iii) 2. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) N.A. (vi) Nil. (vii) Raw data as well as the remaining two-way table is not available in the records.

5. RESULTS :

(i) 979 lb./ac. (ii) (a) 233.6 lb./ac. (b) 215.4 lb./ac. (c) 62.1 lb..ac. (iii) Main effect of N and interaction N×R are highly significant and effect of R is significant. (iv) Av. yield of *kapas* in lb./ac.

	R_1	R_2	R_3	R_4	R_5	R_6	Mean
N_0	708	757	708	518	1111	453	709
N_1	1004	1163	916	773	1243	683	970
N_2	1349	1424	1177	1111	1455	1020	1256
Mean	1020	1116	944	801	1270	719	979
P_0	963	1113	880	798	1305	716	963
P_1	1078	1119	1008	804	1234	722	994

S.E. of difference of two

1. R marginal means = 95.4 lb./ac.
2. N marginal means = 17.9 lb./ac.
3. P marginal means = 50.8 lb./ac.
4. P means at the same level of R = 124.3 lb./ac.
5. R means at the same level of P = 129.7 lb./ac.
6. N means at the same level of R = 43.9 lb./ac.
7. R means at the same level of N = 101.8 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(150).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'CM'.**

Object :— To study the direct effect of A/S on the yield of Cotton grown in different rotations and the residual effect of super applied to thepreceeding crops.

1. BASAL CONDITIONS :

(i) (a) to (c) As per treatments. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1½′. (e) N.A. (v) N.A. (vi) 216—F. (vii) Irrigated. (viii) 1 hoeing and weedings. (ix) 16.3′. (x) N.A.

2 TREATMENTS :

Same as in expt. no. 54(209) on page 475.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication, 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot (b) N.A. (iii) 2. (iv) (a) N A. (b) 8′×40′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 54(209) on page 475.

5. RESULTS :

(i) 1259 lb /ac. (ii) (a) 134.8 lb./ac. (b) 134.1 lb /ac. (c) 55.2 lb./ac. (iii) Main effect of N and interaction N×R are highly significant. (iv) Av. yield of *kapas* in lb /ac.

	R_1	R_2	R_3	R_4	R_5	R_6	Mean
N_0	963	1111	897	806	1251	987	1003
N_1	1324	1448	1325	1152	1358	1333	1323
N_2	1424	1531	1522	1432	1399	1399	1451
Mean	1237	1363	1248	1130	1336	1240	1259
P_0	1259	1319	1188	1124	1323	1226	1240
P_1	1216	1407	1308	1136	1349	1254	1278

S.E. of difference of two

1. R marginal means = 55.0 lb./ac.
2. N marginal means = 15.9 lb./ac.
3. P marginal means = 31.6 lb./ac.
4. P means at the same level of R = 77.4 lb./ac.
5. R means at the same level of P = 77.6 lb /ac
6. N means at the same level of R = 39 0 lb./ac.
7. R means at the same level of N = 63.6 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(132).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'CM'.**

Object :— To study the direct effect of A/S on the yield of Cotton grown in different rotations and the residual effect of super applied to preceeding crops.

1. BASAL CONDITIONS :

(i) (a) to (c) As per treatments. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1½′. (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing and weeding (ix) 18.50″. (x) N.A.

2. TREATMENTS:

Main-plot treatments :

6 crops grown in previous season: R_1=*Guara* for seed, R_2=Gram, R_3=*Berseem*, R_4=Wheat, R_5=Fallow and R_6=*Guara* (G.M.).

Sub-plot treatments :

All combinations of (1) and (2)

(1) 4 levels of N : N_0=0, N_1=50, N_2=100 and R_3=150 lb./ac.

(2) 2 levels of P_2O_5 : P_0=0 and P_1=50 lb /ac.

P_2O_5 applied to the preceeding crop.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8′×32½′. (v) N.A. (vi) Yes.

4. GENERAL

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) N.A. (vi) Nil. (vii) Raw data as well as the remaining two-way table is not available in the records.

5. RESULTS:

(i) 1144 lb./ac. (ii) (a) 446.0 lb./ac. (b) 72.4 lb./ac. (iii) Main effect of N and interactions R×N and R×P are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	P_0	P_1	Mean
R_1	724	1144	1349	1275	1160	1086	1123
R_2	831	1106	1374	1473	1168	1224	1196
R_3	601	1029	1201	1201	848	1168	1008
R_4	485	815	1086	1300	954	889	922
R_5	930	1333	1300	1481	1251	1271	1261
R_6	930	1563	1456	1456	1374	1328	1351
Mean	750	1165	1294	1364	1126	1161	1144

S.E. of difference of two

1. R marginal means = 157.7 lb./ac.
2. N marginal means = 20.9 lb./ac.
3. P marginal means = 14.8 lb./ac.
4. P means at the same level of R = 36.2 lb./ac.
5. R means at the same level of P = 159.7 lb./ac.
6. N means at the same level of R = 51.2 lb./ac.
7. R means at the same level of N = 163.8 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(158).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'CM'.**

Object :—To study the direct effect of A/S on the yield of Cotton grown in different rotations and the residual effect of super applied to the preceeding crops.

1. BASAL CONDITIONS :

(i) (a) to (c) As per treatments. (ii) (a) Fine sandy loam. (b) N.A. (iii) May, 1957. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1½′. (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) N.A. (x) Nov., 1957.

2. TREATMENTS:

Same as in expt. no. 56(132) on page 476.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 16′×25′. (v) N.A. (vi) Yes.

4. GENERAL:

Same as in expt. no. 56(132) on page 476.

5. RESULTS :

(i) 334 lb./ac. (ii) (a) 67.7 lb./ac. (b) 75.1 lb./ac. (iii) Main effect of R is highly significant and N effect is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	P_0	P_1	Mean
R_1	214	313	411	485	383	329	356
R_2	173	304	370	469	321	337	329
R_3	222	370	494	527	387	420	404
R_4	181	280	337	483	320	320	320
R_5	181	255	329	403	290	294	292
R_6	162	272	370	400	314	288	301
Mean	189	299	385	461	336	331	334

S E. of difference of two

1. R marginal means = 23.9 lb./ac.
2. N marginal means = 21.7 lb./ac.
3. P marginal means = 15.3 lb./ac.
4. P means at the same level of R = 37.5 lb./ac.
5. R means at the same level of P = 35.7 lb./ac.
6. N means at the same level of R = 53.1 lb /ac.
7. R means at the same level of N = 51 8 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 53(186).**

Site :- Cotton Res. Stn , Hansi. **Type :- 'CM'.**

Object :—To study the direct effect of A/S on the yield of Cotton grown in different rotations and the residual effect of super applied to the preceeding crops.

1. BASAL CONDITIONS :

(i) (a) to (c) As per treatments. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1¼′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 56(132) on page 476.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8′×30′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 56(132) on page 476.

5. RESULTS :

(i) 598 lb./ac. (ii) (a) 125.6 lb./ac. (b) 130.3 lb./ac. (iii) Main effect of N is highly significant and effect of P and interaction R×N are significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	P_0	P_1	Mean
R_1	551	732	699	831	691	716	704
R_2	625	650	568	444	527	617	572
R_3	321	502	477	403	321	531	426
R_4	321	428	420	609	453	436	444
R_5	683	773	741	732	736	728	732
R_6	477	674	880	815	691	732	712
Mean	496	627	631	639	570	627	598

S.E. of difference of two

1. R marginal means = 44.4 lb./ac.
2. N marginal means = 37.6 lb./ac.
3. P marginal means = 26.6 lb./ac.
4. P means at the same level of R = 65.1 lb./ac.
5. R means at the same level of P = 63.9 lb./ac.
6. N means at the same level of R = 92.1 lb./ac.
7. R means at the same level of N = 91.3 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(212).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'CM'.**

Object :—To study the effect of different doses of A/S with variable spacings and sowing dates on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2' between rows. (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments:

All combinations of (1) and (2)

(1) 3 dates of sowing : D_1=3.4.1954, D_2=9.5.1954 and D_3=3.6.1954.

(2) 3 spacings between plants : S_1=1', S_2=1½' and S_3=2'.

Sub-plot treatments :

3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) N.A. (vi) Nil. (vii) Raw data as well as remaining two-way table is not available in the records.

5. RESULTS :

(i) 896 lb./ac. (ii) (a) 324.7 lb./ac. (b) 197.7 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	D_1	D_2	D_3	Mean
N_0	724	757	773	773	765	716	751
N_1	930	963	913	930	920	955	935
N_2	1053	987	963	1177	938	889	1001
Mean	902	902	883	960	874	853	896

S.E. of difference of two

1. D or S marginal means = 76.5 lb./ac.
2. N marginal means = 46.6 lb./ac.
3. N means at the same level of D or S = 80.7 lb./ac.
4. D or S means at the same level of N = 100.9 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 55(153).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'CM'.**

Object :—To study the effect of different doses of A/S with variable spacings and sowing dates on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) As per treatments (iv) (a) 2 ploughings. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 16.3". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 dates of sowing : D_1=6.5.1955, D_2=30.5.1955 and D_3=22.6.1955.

(2) 3 spacings between rows : $S_1=1\frac{1}{2}'$, $S_2=2'$ and $S_3=2\frac{1}{2}'$.

(3) 3 spacings between plants : $P_1=1'$, $P_2=1\frac{1}{2}'$ and $P_3=2'$.

Sub-plot treatments :

3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 27 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) N.A. (vi) Nil. (vii) Raw data as well as remaining two way tables are not available in the records.

5. RESULTS :

(i) 1005 lb./ac. (ii) (a) 166.0 lb./ac. (b) 126.6 lb./ac. (iii) Main effects of N, P and D are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	S_1	S_2	S_3	P_1	P_2	P_3	Mean
N_0	946	880	757	856	848	879	823	930	830	861
N_1	1185	1078	798	1045	979	1037	1028	1070	963	1020
N_2	1300	1251	848	1201	1053	1145	1193	1177	1029	1133
Mean	1144	1070	801	1034	960	1020	1015	1059	941	1005

S.E. of difference of two

1. D, S or P marginal means = 31.9 lb./ac.
2. N marginal means = 24.4 lb./ac.
3. N means at the same level of D, S or P = 42.2 lb./ac.
4. D, S or P means at the same level of N = 46.9 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 56(135).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'CM'.**

Object :—To study the effect of different doses of A/S with variable spacings and sowing dates on Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A (ii) (a) Fine sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) H—14. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 18.50". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 dates of sowing : D_1=23.4.1956, D_2=7.5.1956 and D_3=4.6.1956.

(2) 3 spacings between rows : $S_1=1\frac{1}{2}'$, $S_2=2'$ and $S_3=2\frac{1}{2}'$.

(3) 3 spacings between plants : $P_1=1'$, $P_2=1\frac{1}{2}'$ and $P_3=2'$.

Sub-plot treatments :

3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(153) on page 480.

5. RESULTS :

(i) 1062 lb./ac. (ii) (a) 419.1 lb./ac. (b) 205.0 lb./ac. (iii) Main effects of N and interaction N×D are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	S_1	S_2	S_3	P_1	P_2	P_3	Mean
N_0	683	691	667	675	716	650	609	675	757	680
N_1	1234	1177	1012	1160	1201	1062	1111	1078	1234	1141
N_2	1555	1358	1185	1399	1366	1333	1300	1358	1440	1366
Mean	1157	1075	955	1078	1094	1015	1007	1037	1144	1062

S.E. of difference of two

1. D, S or P marginal means = 80.7 lb./ac.
2. N marginal means = 39.4 lb./ac.
3. N means at the same level of D, S or P = 68.3 lb./ac.
4. D, S or P means at the same level of N = 98.0 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(48).**

Site :- Jullundur Agri. Farm, Jullundur. **Type :- 'CM'.**

Object :—To study the effect of date of sowing and A/S on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Senji*. (c) Nil. (ii) (a) Light loam. (b) Refer soil analysis, Jullundur. (iii) 4.5.1956 and 18.5.1956. (iv) (a) 1 *raja*, 3 *desi* ploughings and 6 *sohaga*. (b) N.A. (c) 4 to 5 srs./ac. (d) As per treatments. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) N.A. (ix) 36 56". (x) 18.10.1956 to 26.12.1956.

2. TREATMENTS :

Main-plot treatments :

2 dates of sowing : D_1=4.5.1956 and D_2=18.5.1956.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 spacing between rows : $S_1=2'$, $S_2=2\frac{1}{2}'$ and $S_3=3'$.

(2) 3 levels of N as A/S : $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 12'1"×30'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Spraying with D.D.T. and agrocide two times. (iii) *Kapas* yield. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 869 lb./ac. (ii) (a) 675.8 lb./ac. (b) 117.9 lb./ac. (iii) Main effect of N is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2	S_3
D_1	1193	1113	994	1100	1102	1118	1080
D_2	660	651	605	639	687	608	621
Mean	926	882	800	869	895	863	850
S_1	919	1029	739				
S_2	939	775	878				
S_3	924	844	785				

S.E. of difference of two

1. D marginal means = 184.0 lb./ac.
2. N or S marginal means = 39.9 lb./ac.
3. N or S means at the same level of D = 55.6 lb./ac.
4. D means at the same level of N or S = 189.5 lb./ac.

S.E. of body of N×S table = 48.1 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 54(69).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'CM'.**

Object :—To find out the best dose of N in relation to sowing date and spacings for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) *Raja* plough, 2 *desi hal* and 4 *sohaga*. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 2 hoeings, 2 weedings and 1 thinning. (ix) 19.9". (x) 13.10.1954 to 30.11.1954.

2. TREATMENTS :

Main-plot treatments :

2 dates of sowing : D_1=1st week of May, (1.5.1954) and D_2=3rd week of May (15.5.1954).

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 spacings between rows : S_1=2', S_2=2½' and S_3=3'.

(2) 4 levels of N as A/S : N_0=0, N_1=25, N_2=50 and N_3=75 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 12 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) 30'×12'1". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Raw data as well as remaining two-way table is not available in the records.

5. RESULTS :

(i) 1838 lb./ac. (ii) (a) 45.6 lb./ac. (b) 176.9 lb./ac. (iii) Main effect of N is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	Mean	S_1	S_2	S_3
D_1	1645	1847	1899	1945	1834	1875	1828	1799
D_2	1646	1818	1973	1931	1842	1902	1835	1790
Mean	1646	1833	1936	1938	1838	1889	1832	1795

S.E. of difference of two

1.	D marginal means	= 10.7 lb./ac.
2.	N marginal means	= 59.0 lb./ac.
3.	S marginal means	= 51.1 lb./ac.
4.	S means at the same level of D	= 72.2 lb./ac.
5.	D means at the same level of S	= 59.9 lb./ac.
6.	N means at the same level of D	= 83.4 lb./ac.
7.	D means at the same level of N	= 73.0 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(78).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'CM'.**

Object :—To find out the best dose of N in relation to sowing date and spacings for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Berseem.* (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) Dibbling. (c) 4 srs./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 3 hoeings and 1 thinning. (ix) 48.86". (x) 16, 30.11.1955 and 16.12.1955.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(69) on page 482.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 769 lb./ac. (ii) (a) 234.8 lb./ac. (b) 85.0 lb./ac. (iii) Main effects of N and S are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	Mean	S_1	S_2	S_3
D_1	951	895	825	831	876	962	896	769
D_2	717	646	636	645	661	733	624	626
Mean	834	771	732	738	769	848	760	698
S_1	949	875	835	733				
S_2	831	756	699	753				
S_3	723	681	658	728				

S.E. of difference of two

1.	D marginal means	= 64.8 lb./ac.
2.	N marginal means	= 28.3 lb./ac.
3.	S marginal means	= 24.5 lb./ac.
4.	S means at the same level of D	= 40.0 lb./ac.
5.	D means at the same level of S	= 62.2 lb./ac.
6.	N means at the same level of D	= 28.3 lb./ac.
7.	D means at the same level of N	= 65.3 lb./ac.
	S E. of body of N×S table	= 34.7 lb /ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(213).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'CM'.**

Object :—To study the effect of different doses of A/S with different spacings and sowing dates on Cotton.

1. BASAL CONDITIONS:

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′ between rows. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS:

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 dates of sowing : D_1=26.4.1954, D_2=17.5.1954 and D_3=3.6.1954.

(2) 3 spacings between plants : S_1=1′, S_2=1½′ and S_3=2′.

Sub-plot treatments :

3 levels of N as A/S ; N_0=0, N_1=50 and N_2=100 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8′×36′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of Jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) N.A. (vi) Nil. (vii) Raw data as well as remaining two-way table is not available in the records.

5. RESULTS :

(i) 1336 lb./ac. (ii) (a) 187.7 lb./ac. (b) 32.0 lb./ac. (iii) Main effects of N, D and interactions N×D and N×S are highly significant. S effect is significant. (iv) Av. yield of *kapas* in lb /ac.

	S_1	S_2	S_3	D_1	D_2	D_3	Mean
N_0	1020	963	996	897	1086	996	993
N_1	1514	1456	1325	1473	1481	1341	1432
N_2	1662	1563	1522	1268	1705	1764	1582
Mean	1399	1327	1281	1216	1424	1367	1336

S.E. of difference of two

1. D or S marginal means = 44.2 lb./ac.
2. N marginal means = 7.5 lb./ac.
3. N means at the same level of D or S = 13.1 lb./ac.
4. D or S means at the same level of N = 45.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(154).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'CM'.**

Object :—To study the effect of different doses of A/S with different spacings and sowing dates on Cotton.

1. BASAL CONDITIONS:

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 48.1″. (x) N.A.

2. TREATMENTS :

Main-plot treatments:

All combination of (1), (2) and (3)

(1) 3 dates of sowing : D_1=28.4.1955, D_2=16.5.1955 and D_3=2.6.1955.

(2) 3 spacings between rows : R_1=1½′, R_2=2′ and R_3=2½′.

(3) 3 spacings between plants : P_1=1′, P_2=1½′ and P_2=2′.

Sub-plot treatments :

3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 27 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) Yes.

4. GNERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield *kapas*. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) N.A. (vi) Nil. (vii) Raw data as well as remaining two-way tables are not available in the records.

5. RESULTS :

(i) 735 lb./ac. (ii) (a) 89.2 lb./ac. (b) 74.2 lb./ac. (iii) Main effects of D, N, R, P and interaction N×D are highly significant and interactions N×R and N×P are significant. (iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	R_1	R_2	R_3	P_1	P_2	P_3	Mean
N_0	1053	930	420	815	823	765	880	832	691	801
N_1	987	831	420	782	716	740	806	749	683	746
N_2	897	716	346	724	625	610	699	648	612	653
Mean	979	826	395	774	721	705	795	743	662	733

S.E. of difference of two

1. D, R or P marginal means = 17.2 lb./ac.
2. N marginal means = 14.3 lb./ac.
3. N means at the same level of D, R or P = 24.7 lb./ac.
4. D, R or P means at the same level of N = 26.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(210).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'CM'.**

Object :—To study the direct effect of A/S on the yield of Cotton grown in different rotations and the residual effect of super applied to the preceeding crops.

1. BASAL CONDITIONS :

(i) (a) to (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 16.5.1954. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

6 previous crops : R_1=*Guara* for seed, R_2=Gram, R_3=*Berseem*, R_4=Wheat, R_5=Fallow and R_6=*Guara* (G.M.).

Sub-plot treatments :

2 levels of P_2O_5 as Super : P_0=0 and P_1=50 lb./ac.

Sub-Sub plot treatments :

3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

Super applied to the preceeding crops.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block, 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 54(213) on page 483.

5. RESULTS :

(i) 1718 lb./ac. (ii) (a) 120.7 lb./ac. (b) 79.9 lb./ac. (c) 89.7 lb./ac. (iii) Main effect of N and interaction N×R are highly significant. Main effect of R is significant. (iv) Av. yield of *kapas* in lb./ac.

	R_1	R_2	R_3	R_4	R_5	R_6	Mean
N_0	1531	1522	1744	1292	1679	1185	1492
N_1	1777	1810	1942	1720	1876	1572	1783
N_2	1802	1753	2049	1851	1934	1884	1879
Mean	1703	1695	1912	1621	1830	1547	1718
P_0	1676	1679	1868	1656	1842	1580	1717
P_1	1730	1712	1956	1586	1818	1514	1719

S.E. of difference of two

1. R marginal means = 49.3 lb./ac.
2. N marginal means = 25.9 lb./ac.
3. P marginal means = 18.8 lb./ac.
4. P means at the same level of R = 46.1 lb./ac.
5. R means at the same level of P = 59.1 lb./ac.
6. N means at the same level of R = 63.4 lb./ac.
7. R means at the same level of N = 71.4 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(149).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'CM'.**

Object :—To study the direct effect of A/S on the yield of Cotton grown in different rotations and the residual effect of super applied to preceeding crops.

1. BASAL CONDITIONS :

(i) (a) to (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1½′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 48.15″. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 54(210) on page 485.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block, 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8′×35′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 54(213) on page 483.

5. RESULTS :

(i) 971 lb./ac. (ii) (a) 101.9 lb /ac. (d) 57.0 lb./ac. (c) 57.9 lb./ac. (iii) Main effect of R, N and interaction N×R are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	R_1	R_2	R_3	R_4	R_5	R_6	Mean
N_0	1078	913	1037	880	1243	1127	1046
N_1	913	839	831	963	1160	1012	953
N_2	848	864	897	823	1144	913	915
Mean	946	872	922	889	1182	1017	971
P_0	955	856	913	938	1220	1055	989
P_1	938	889	931	839	1144	979	953

S.E. of difference of two

1.	R marginal means	= 41.6 lb./ac.
2.	N marginal means	= 16.7 lb./ac.
3.	P marginal means	= 13.4 lb./ac.
4.	P means at the same level of R	= 32.9 lb./ac.
5.	R means at the same level of p	= 47.6 lb./ac.
6.	N means at the same level of R	= 40.9 lb./ac.
7.	R means at the same level of N	= 53.3 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(133).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'CM'.**

Object :— To study the effect of A/S on the yield of Cotton grown in different rotations and the residual effect of super applied to preceeding crops.

1. BASAL CONDITIONS :

(i) (a) to (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1¼′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) 36.02″. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

6 crops grown in previous season : R_1= *Guara* for seed, R_2=Gram, R_3=*Berseem*, R_4=Wheat, R_5= Fallow and R_6=*Guara* (G.M.).

Sub-plot treatments :

All combinations of (1) and (2),

(1) 4 levels of N as A/S : N_0=0, N_1=50, N_2=100 and N_3=150 lb./ac.

(2) 2 levels of P_2O_5 : P_0=0 and P_1=50 lb./ac.

P_2O_5 applied to previous crops.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block and 8 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 10′×26½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) N.A. (vi) Nil. (vii) Raw data as well as remaining two-way table is not available in the records.

5. RESULTS :

(i) 725 lb./ac. (ii) (a) 133.1 lb./ac. (b) 71.1 lb./ac. (iii) Main effects of R and P are significant. Effect of N is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	P_0	P_1	Mean	N_0	N_1	N_2	N_3
R_1	794	798	796	888	831	774	691
R_2	621	621	621	699	642	600	543
R_3	644	700	672	782	650	656	600
R_4	645	745	695	732	732	674	642
R_5	740	732	736	755	782	732	675
R_6	815	839	827	872	897	798	741
Mean	710	739	725	788	756	706	649

S.E. of difference of two

1. R marginal means = 47.1 lb./ac.
2. N marginal means = 20.5 lb./ac.
3. P marginal means = 14.5 lb./ac.
4. P means at the same level of R = 35.5 lb./ac.
5. R means at the same level of P = 53.3 lb./ac.
6. N means at the same level of R = 50.3 lp./ac.
7. R means at the same level of N = 64.1 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(157).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'CM'.**

Object :— To study the direct effect of A/S on the yield of Cotton grown in different rotations and the residual effect of super applied to the preceding crops.

1. BASAL CONDITIONS :

(i) (a) to (c) As per treatments. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1½′. (e) N A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(133) on page 487.

5. RESULTS :

(i) 423 lb./ac. (ii) (a) 116.8 lb./ac. (b) 122.5 lb./ac. (iii) In teraction P×R alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	P_0	P_1	Mean	N_0	N_1	N_2	N_3
R_1	494	444	469	486	469	444	477
R_2	336	386	361	296	388	380	380
R_3	433	411	422	380	444	444	420
R_4	395	371	383	277	385	460	410
R_5	440	400	420	396	461	436	387
R_6	508	462	485	410	483	578	469
Mean	434	412	423	374	438	457	424

S.E. of difference of two

1. R marginal means = 41.3 lb./ac.
2. N marginal means = 35.4 lb./ac.
3. P marginal means = 25.0 lb./ac.
4. P means at the same level of R = 61.2 lb./ac.
5. R means at the same level of P = 59.8 lb /ac.
6. N means at the same level of R = 86.6 lb./ac.
7. R means at the same level of N = 85.6 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(187).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'CM'.**

Object :— To study the direct effect of A/S on the yield of Cotton grown in different rotations and the residual effect of super applied to the preceeding crop.

1. BASAL CONDITIONS :

(i) (a) to (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1¼′. (e) N.A. (v) N.A. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(133) on page 487.

5. RESULTS :

(i) 620 lb./ac. (ii) (a) 91.7 lb./ac. (b) 306.2 lb./ac. (iii) Main effect of R alone is significant. (iv) Av. yield of *kapas* in lb./ac.

	P_1	P_1	Mean	N_0	N_1	N_2	N_3
R_1	568	600	584	633	658	568	477
R_2	660	570	615	773	576	568	543
R_3	500	532	516	604	470	510	480
R_4	576	616	596	615	615	620	534
R_5	674	716	695	823	608	749	600
R_6	708	724	716	734	792	712	626
Mean	614	626	620	697	620	621	543

S.E. of difference of two

1. R marginal means = 32.4 lb./ac.
2. N marginal means = 88.4 lb./ac.
3. P marginal means = 62.5 lb./ac.
4. P means at the same level of R = 153.1 lb./ac.
5. R means at the same level of P = 113.0 lb./ac.
6. N means at the same level of R = 216.5 lb./ac.
7. R means at the same level of N = 190.3 lb./ac.

Crop : Cotton *(Kharif).* **Ref :- Pb. 54(101).**

Site :- Cotton Res. Stn., Rauni. **Type :- 'CM'.**

Object :— To study the effect of N, time of sowing and spacings on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) 50 lb./ac. of N as A/S+10 C.L./ac. of F.Y.M. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) Ploughing. (b) N.A. (c) 8 to 10 srs./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 3 hoeings. (ix) 21.90″. (x) Middle of Oct. to Middle of Dec., 1954.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D_1=15.4.1954, D_2=5.5.1954 and D_3=25.5.1954.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

(2) 2 spacings : S_1=2′×1¼′ and S_2=2½′×1½′.

A/S applied on 30.7.1954.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/block and 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 90′×12′. (b) 77.8′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal in early sowing and poor in late sowing. (ii) Jassid attack. (iii) *Kapas* yield. (iv) (a) 1953—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1403 lb./ac. (ii) (a) 391.8 lb./ac. (b) 216.6 lb./ac. (iii) Main effect of N is highly significant and effect of S is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2
D_1	1218	1583	1809	1537	1586	1487
D_2	1087	1377	1577	1347	1352	1342
D_3	1217	1353	1408	1326	1465	1187
Mean	1174	1438	1598	1403	1468	1339
S_1	1173	1550	1680			
S_2	1175	1325	1516			

S.E. of difference of two

1. D marginal means = 113.1 lb./ac.
2. S marginal means = 51.1 lb./ac.
3. N marginal means = 62.5 lb./ac.
4. N means at the same level of D = 108 3 lb./ac.
5. D means at the same level of N = 143.5 lb./ac.
6. S means at the same level of D = 88.4 lb./ac.
7. D means at the same level of S = 129.2 lb./ac.

S.E. of body of N×S table = 62.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(20).**

Site :- Cotton Res. Stn., Rauni. **Type :- 'CM'.**

Object :—To study the effect of N, time of sowing and spacings on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Maize—Cotton—Maize. (b) Maize. (c) 50 lb./ac. of N as A/S. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) Ploughing. (b) Dibbling. (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 3 to 5 hoeings. (ix) 33.80". (x) 15 Oct. to 15 Dec., 1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 dates of sowing : D_1=15.4.1955, D_2=5.5.1955 and D_3=25.5.1955.
(2) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.
(3) 3 spacings : S_1=2′×1′, S_2=2½′×1¾′ and S_3=2½′×2½′.

A/S applied on 12.8.1955.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 10′×90′. (b) 10′×72.6′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Slight attack of jassid. (iii) *Kapas* yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Excess of rain spoiled the crop. (vii) Nil.

5. RESULTS :

(i) 1043 lb./ac. (ii) 231.8 lb./ac. (iii) Main effects of N, S and D are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	Mean	N_0	N_1	N_2
D_1	1408	1257	1086	1250	1098	1178	1476
D_2	1256	1261	1049	1189	1071	1256	1239
D_3	813	640	613	689	561	716	789
Mean	1159	1053	913	1043	910	1050	1168
N_0	1036	841	852				
N_1	1052	1100	987				
N_2	1378	1217	909				

S.E. of any marginal mean = 54.6 lb./ac.
S.E. of body of any table = 94.6 lb./ac.

Crop :- Cotton. **Ref :- Pb. 54(99).**

Site :- Cotton Res. Stn., Rauni. **Type :- 'CM'.**

Object :—To study the effect of N, P and spacings on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 28.5.1954. (iv) (a) Ploughings. (b) N.A. (c) 8 to 10 srs./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 4 hoeings. (ix) 21.90". (x) Middle of Oct. to middle of Dec., 1954.

2. TREATMENTS :

Main-plot treatments :

2 levels of P_2O_5 as Super : P_0=0 and P_1=50 lb./ac.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

(2) 2 spacings : $S_1=2\frac{1}{2}' \times 1\frac{1}{4}'$ and $S_2=2\frac{1}{2}' \times 2'$.

P_2O_5 applied before sowing and N on 25.7.1954 and 19.8.1954 in equal doses.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $12\frac{1}{2}' \times 60'$. (b) $12\frac{1}{2}' \times 46.4'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Jassid attack. (iii) Yield of *kapas*. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1137 lb./ac. (ii) (a) 445.3 lb./ac. (b) 228.4 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2
P_0	998	1125	1253	1125	1176	1074
P_1	995	1209	1242	1149	1154	1143
Mean	997	1167	1258	1137	1165	1109
S_1	972	1223	1301			
S_2	1021	1112	1194			

S.E. of difference of two

1.	P marginal means	= 128.5 lb./ac.
2.	N marginal means	= 80.7 lb./ac.
3.	S marginal means	= 65.9 lb./ac.
4.	S means at the same level of P	= 93.2 lb./ac.
5.	P means at the same level of S	= 144.4 lb./ac.
6.	N means at the same level of P	= 114.2 lb./ac.
7.	P means at the same level of N	= 158.7 lb./ac.
	S.E. of body of N×S table	= 80.7 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(21).**

Site :- Cotton Res. Stn., Rauni. **Type :- 'CM'.**

Object :—To study the effect of N, P and spacings on the yield of Cotton.

BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 27.4.1255. (iv) (a) Ploughing. (b) Dibbling. (c) N A. (d) As per treatments. (e) N.A. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 3 hoeings. (ix) 33.80". (x) 15.10.1955 to 15.12.1955.

TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=50 and P_2=100 lb./ac.

(3) 3 spacings : S_1=2½'×1', S_2=2½'×1¾' and S_3=2½'×2½'.

P_2O_5 applied before sowing and N on 13.8.1955.

DESIGN and 4. GENERAL :

Same as in expt. no. 55(20) on page 490.

RESULTS :

(i) 821 lb./ac. (ii) 113.4 lb./ac. (iii) Main effect of P, N and interactions N×P, S×N are highly significant and effect of S is significant. (iv) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	Mean	N_0	N_1	N_2
P_0	797	667	651	705	584	744	787
P_1	960	777	783	840	765	958	797
P_2	914	927	914	918	735	897	1122
Mean	890	790	783	821	695	866	902
N_0	685	652	747				
N_1	978	777	845				
N_2	1008	942	756				

S.E. of any marginal mean = 26.7 lb./ac.

S.E. of body of any table = 46.3 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(103).**

Site :- Cotton Res. Stn., Rauni. **Type :- 'CM'.**

Object :—To find out the best time of application of A/S in relation to sowing dates and spacings on Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) 50 lb./ac.of N as A/S. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) Ploughings. (b) N.A. (c) 8 to 10 srs./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 3 hoeings and 1 thinning. (ix) 21.90″. (x) From middle of Oct. to middle of Dec., 1954.

2. TREATMENTS :

Main-plot treatments :

2 dates of sowing : D_1=20.4.1954 and D_2=20.5.1954.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 spacings : $S_1=2\frac{1}{2}' \times 1\frac{1}{4}'$ and $S_2=2\frac{1}{2}' \times 2'$.

(2) 4 times of application of 50 lb./ac. of N as A/S : T_0=Control (no application), $T_1=\frac{1}{2}$ at sowing+$\frac{1}{2}$ at thinning, $T_2=\frac{1}{2}$ at sowing+$\frac{1}{2}$ at flowering and T_3= Full dose at flowering.

A/S applied on 20.4.1954, 20.5.1954, 6 6.1954 and 1.8.1954.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10′×80′. (b) 10′×67′11″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Jassid attack severe in the case of late sowing. (iii) Yield of *kapas*. (iv) 1954—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1563 lb./ac. (ii) (a) 315.1 lb./ac. (b) 127.7 lb./ac. (iii) Main effect of S alone is significant. (iv) Av. yield of *kapas* in lb /ac.

	T_0	T_1	T_2	T_3	S_1	S_2	Mean
D_1	1558	1607	1568	1623	1614	1564	1589
D_2	1496	1535	1588	1530	1578	1497	15 7
Mean	1527	1571	1578	1576	1596	1530	1563
S_1	1572	1648	1575	1585			
S_2	1478	1494	1582	1567			

S.E. of difference of two

1. D marginal means	= 78.8 lb./ac.	5. D means at the same level of T	= 96.2 lb./ac.
2. S marginal means	= 31.9 lb./ac.	6. S means at the same level of D	= 45.1 lb./ac.
3. T marginal means	= 45.1 lb./ac.	7. D means at the same level of S	= 84 9 lb./ac.
4. T means at the same level of D	= 63.8 lb./ac.	S.E. of body of T×S table	= 45 1 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(24).**

Site :- Cotton Res. Stn., Rauni. **Type :- 'CM'.**

Object :—To find out the optimum time of application of A/S in relation to sowing dates and spacings on Cotton.

1. BASAL CONDITIONS :

(i) (a) Maize—Cotton. (b) Maize. (c) 50 lb./ac. of N as A/S. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) Ploughing. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) 50 lb./ac. of N as A/S. (vi) (vii) Irrigated. (viii) 3 hoeings. (ix) 33.80″. (x) Picking from 15.10.1955 to 15.12.1955.

2. TREATMENTS :

Main-plot treatments :

2 dates of sowing : D_1=20.4.1955 and D_2=20.5.1955.

Sub-plot treatments :

(1) 6 times of application of 50 lb./ac. of N as A/S : To=Control, $T_1=\frac{1}{2}$ at sowing+$\frac{1}{2}$ at thinning, $T_2=\frac{1}{2}$ at sowing+$\frac{1}{2}$ at flowering, $T_3=\frac{1}{2}$ at thinning+$\frac{1}{2}$ at flowering, T_4=Full dose at thinning and T_5=Full dose at flowering.

Sub-sub-plot treatments :

2 spacings : $S_1=2\frac{1}{2}' \times 1\frac{1}{4}'$ and $S_2=2\frac{1}{2}' \times 2'$.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 6 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) 15′×60′. (b) 15′×48.4′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Slight attack of jassid. (iii) Yield of *kapas*. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Excess of rains have adverse effect on crop. (vii) Nil.

5. RESULTS :

(i) 1016 lb./ac. (ii) (a) 455.6 lb./ac. (b) 259.6 lb./ac. (c) 197.3 lb./ac. (iii) Main effect of D alone is significant. (iv) Av. yield of *kapas* in lb./ac.

	T_0	T_1	T_2	T_3	T_4	T_5	Mean	S_1	S_2
D_1	1245	1264	1254	1297	1150	1147	1226	1218	1234
D_2	829	792	738	858	786	832	806	816	796
Mean	1037	1028	996	1078	968	989	1016	1017	1015
S_1	1072	1024	1001	1088	946	973			
S_2	1002	1032	990	1067	990	1006			

S.E. of difference of two

1. D marginal means = 93.0 lb./ac.
2. T marginal means = 91.8 lb./ac.
3. S marginal means = 40.3 lb./ac.
4. T means at the same level of D = 129.8 lb./ac.
5. D means at the same level of T = 150.6 lb./ac.
6. S means at the same levels of T = 98.6 lb./ac.
7. T means at the same levels of S = 115.5 lb./ac.
8. S means at the same levels of D = 98.6 lb./ac.
9. D means at the same level of S = 101.3 lb./ac.

Crop C:- otton *(Kharif)*. **Ref :- Pb. 58(76).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'I'.**

Object :—To study the effect of irrigations applied at different times after 15th August.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) 27.4.1958. (iv) (a) N.A. (b) Sown by *pore*. (c) 8 srs./ac. (d) 2½′ between rows. (e) Nil. (v) 50 lb./ac. of N as A/S. (vi) 320—F. (vii) Irrigated. (viii) 6 *triphali*, 5 hoeings and 1 thinning. (ix) 69.01". (x) Pickings on 6.11.1958, 3.12.1958 and 6, 8.1.1959.

2. TREATMENTS :

7 irrigational treatments : T_1=2 irrigations on 15th August, and 15th Sept., T_2=2 irrigations on 30th August, and 30th Sept., T_3=3 irrigations on 15th August, 30th August and 15th Sept., T_4=3 irrigations on 15th August, 7th Sept., and 30th Sept., T_5=3 irrigations on 15th August, 15th Sept., 15th Oct., T_6=Irrigation on 15th Sept., and T_7=Irrigation on 30th Sept.

3. DESIGN ;

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 46′×15′. (b) 40.33′×10′. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1521 lb./ac. (ii) 181.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. yield	1639	1349	1543	1581	1389	1551	1599

S.E./mean = 74.1 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(50).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'I'.**

Object :—To study the effect of irrigation applied at different times after 15th August.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) 8, 9.4.1959. (iv) (a) N.A. (b) sown by *pore*. (c) 10 srs./ac. (d) 2½′×1′. (e) Nil. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) Nil. (ix) 32.13″. (x) Pickings on 22.10.1959, 24, 25.11.1959 and 9.1.1960.

2. TREATMENTS :

Same as in expt. no. 58(76) on page 494.

3. DESIGN :

R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 47′×12.5′. (b) 41.5′×12.5′. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1205 lb./ac. (ii) 78.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. yield	1102	1218	1223	1253	1204	1191	1247

S.E./mean = 39.4 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(128).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'IM'.**

Object :—To study the effect of N and different frequencies and depths of irrigation on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Abohar. (iii) 25.4.1958. (iv) (a) 5 ploughings and 3 plankings. (b) Dibbling. (c) 8 srs./ac. (d) and (e) N.A. (v) N.A. (vi) American. (vii) Irrigated. (viii) 2 hoeings. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 frequencies of irrigation : $I_1=5$, $I_2=6$ and $I_3=7$

(2) 2 depths of irrigation : $D_1=2''$ and $D_2=3''$.

Sub-plot treatments :

3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 10′×36′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Cotton yield. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) Jullundur and Hansi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 542 lb./ac. (ii) (a) 19.4 lb./ac. (b) 24.6 lb./ac. (iii) Only interacions I×D and I×D×N are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	I_1	I_2	I_3	Mean	N_0	N_1	N_2
D_1	501	514	594	536	533	523	553
D_2	657	508	480	548	580	477	588
Mean	579	511	537	542	556	500	570
N_0	584	515	571				
N_1	479	483	539				
N_2	675	535	501				

S.E. of difference of two

1. I marginal means = 6.4 lb./ac.
2. D marginal means = 5.3 lb./ac.
3. N marginal means = 8.2 lb./ac.
4. N means at the same level of I = 14.2 lb./ac.
5. I means at the same level of N = 13.3 lb./ac.
6. N means at the same level of D = 11.6 lb./ac.
7. D means at the same level of N = 10.8 lb./ac.

S.E. of body of I×D tabie = 6.4 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(122).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'IM'**

Object :—To study the effect of N and different frequencies and depths of irrigation on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Abohar. (iii) 24.5.1959. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 frequencies of irrigation : $I_1=5$, $I_2=6$ and $I_3=7$.

(2) 2 depths of irrigations : $D_1=2''$ and $D_2=3''$.

(3) 3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

3. DESIGN :

(i) Fact. in R.B D. (ii) (a) 18. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 36′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Cotton yield. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 926 lb./ac. (ii) 172.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	I_1	I_2	I_3
D_1	923	959	887	923	1032	876	861
D_2	949	897	939	928	1045	856	887
Mean	936	928	913	926	1037	866	874
I_1	1206	949	957				
I_2	848	770	980				
I_3	755	1066	801				

S.E. of D marginal mean = 57.6 lb./ac.
S.E. of I or N marginal mean = 70.6 lb./ac.
S.E. of body of I×D or N×D table = 99.8 lb./ac.
S.E. of body of N×I table = 122.2 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(85).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'IM'.**

Object :—To study the effect of N along with irrigation on Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) 2.5.1956. (iv) (a) 6 ploughings. (b) Sown by *pore*. (c) 10 srs./ac. (d) 2½′×1′. (e) N.A. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 1 thinning and 2 *triphali*. (ix) N.A. (x) Pickings on 15, 17.10.1956, 30.11.1956 and 22.1.1957.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 frequencies of irrigation : I_1=3 irrigations on 24.5.1956, 8.7.1956 and 13.9.1956, I_2=5 irrigations on 25.5.1956, 24.6.1956, 8.7.1956, 1 and 23.9.1956 and I_3=7 irrigations on 24.5.1956, 17.6.1956, 3, 29.7.1956, 29.8.1956, 13 and 28.9.1956.

(2) 4 levels of N as A/S : N_0=0, N_1=40, N_2=80 and N_3=120 lb./ac.

Half of A/S applied on 2.7.1956 and other half on 8.8.1956.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/51.4 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1956 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 983 lb./ac. (ii) 144.5 lb./ac. (iii) Main effect of I alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	Mean
I_1	905	712	943	1006	892
I_2	947	978	881	1071	969
I_3	1044	1071	1125	1107	1087
Mean	965	919	983	1061	983

S.E. of I marginal mean	= 36.1 lb./ac.
S.E. of N marginal mean	= 41.7 lb./ac.
S.E. of body of table	= 72.2 lb./ac.

Crop :- Cotton (*Kharif*). **Ref :- Pb. 58(77).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'IM'.**

Object :—To study the effect of different frequencies and intensities of irrigation and levels of N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) 7, 8 and 11.5.1958. (iv) (a) N.A. (b) Sown by *pore*. (c) 8 srs./ac. (d) $2\frac{1}{2}' \times 1'$. (e) Nil. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 4 *triphali*, 3 hoeings and 1 thinning. (ix) 69.01". (x) Pickings on 12, 14.11.1958, 24, 25.12.1958 and 17, 24.1.1959.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 frequencies of irrigation : $I_1=3$, $I_2=5$ and $I_3=7$ irrigations.

(2) 3 intensities of irrigation : $D_1=2"$, $D_2=3"$ and $D_3=4"$.

Sub-plot treatments :

3 levels of N as A/S : $N_0=0$, $N_1=60$ and $N_2=120$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) $46' \times 15'$. (b) $40.33' \times 10'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1425 lb./ac. (ii) (a) 258.0 lb./ac. (b) 151.9 lb./ac. (iii) Interaction N×I alone is significant. (iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	Mean	N_0	N_1	N_2
I_1	1348	1427	1407	1394	1378	1497	1308
I_2	1433	1538	1517	1496	1453	1456	1578
I_3	1376	1335	1447	1386	1325	1362	1470
Mean	1386	1433	1457	1425	1385	1438	1452
N_0	1285	1410	1461				
N_1	1449	1406	1461				
N_2	1424	1484	1449				

S.E. of difference of two

1. I or D marginal means	= 70.3 lb./ac.
2. N marginal means	= 41.4 lb./ac.
3. N means at the same level of I or D	= 71.6 lb./ac.
4. I or D means at the same level of N	= 91.3 lb./ac.
S.E. of body of I×D table	= 86.0 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(52).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'IM'.**

Object :—To study the effect of different frequencies, intensities of irrigation and levels of N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 24, 28, 29.4.1956 and 6.5.1959. (iv) (a) N.A. (b) Sown by *pore*. (c) 10 srs./ac. (d) $2\frac{1}{2}' \times 1'$. (e) Nil. (v) Nil. (vi) 320—F. (vii) Irrigated. (viii) 4 *triphali* and 1 thinning. (ix) 31.1". (x) Pickings on : 11, 12.11.1959, 24, 25.12.1959 and 19, 20.1.1960.

2. TREATMENTS :

Same as in expt. no. 58(77) on page 498.

N_1 applied on 5.8.1959 and N_2 applied in 2 equal doses on 9.7.1959 and 5.8.1959.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) $47.5' \times 12.5'$. (b) $44' \times 12.5'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil, (iii) *Kapas* yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 958 lb./ac. (ii) (a) 210.8 lb./ac. (b) 112.4 lb./ac. (iii) Main effect of I alone is significant. (iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	Mean	N_0	N_1	N_2
I_1	817	769	941	842	802	903	821
I_2	1041	958	1030	1010	1008	986	1036
I_3	970	1015	1082	1022	1005	1033	1029
Mean	943	914	1018	958	938	974	962
N_0	883	914	1018				
N_1	979	918	1026				
N_2	966	911	1009				

S.E. of difference of two

1. I or D marginal means	= 57.4 lb./ac.
2. N marginal means	= 30.6 lb /ac.
3. N means at the same level of I or D	= 53.0 lb./ac.
3. I or D means at the same level of N	= 71.8 lb./ac.
S.E. of body of I×D table	= 70.3 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(164).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'IMV'.**

Object :— To study the effect of N, P and irrigation on different varietes of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—Wheat. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Abohar. (iii) May. (iv) (a) 2 ploughings and plankings. (b) Dibbling. (c) 8 srs./ac. (d) $2' \times 1\frac{1}{4}'$. (e) One. (v) N.A. (vi) and (vii) As per treatments. (viii) 1 hoeing, weeding and thinning. (ix) N.A. (x) November.

2. TREATMENTS :

Main-plot treatments :

3 frequencies of irrigation : I_1=5, I_2=6 and I_3=7 irrigations.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 varieties : V_1=320—F. V_2=H—14 and V_3=L.S.S.

(2) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.

(3) 3 levels of P_2O_5 : P_0=0, P_1=50 and P_2=100 lb./ac.

3. DESIGN :

(i) Split-plot confd. (ii) (a) 3 main-plots/replication, 3 blocks/main-plot and 9 sub-plots/block. (b) N.A. *(iii)* 2. (iv) (a) N.A. (b) 6′×35′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) Nil. (vi) Nil. (vii) Raw data, remaing two way table and S.E.'s are not available in the records.

5. RESULTS :

(i) 1533 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
V_1	946	1637	1966	1516	1438	1539	1591
V_2	1086	1695	2032	1604	1645	1637	1530
V_3	1070	1580	1786	1479	1465	1489	1483
Mean	1034	1637	1928	1533	1516	1555	1528
I_1	938	1530	1794	1421			
I_2	1094	1719	1991	1601			
I_3	1070	1662	1999	1577			

S.E.'s—N.A.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(146).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'IMV'.**

Object :— To study the effect of N, P and irrigation on different varieties of Cotton.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 55(164) on page 499.

5. RESULTS :

(i) 1039 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
V_1	947	1020	1218	1062	1061	1053	1072
V_2	806	987	1209	1001	1020	996	987
V_3	782	1103	1265	1053	1037	1020	1103
Mean	845	1037	1234	1039	1039	1023	1054
I_1	864	1012	1325	1067			
I_2	798	1037	1144	993			
I_3	872	1061	1234	1056			

S.E.'s—N.A.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(172).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'IMV'.**

Object :— To study the effect of N, P and irrigation on different varieties of Cotton.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 55(164) on page 499.

5. RESULTS :

(i) 1203 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	I_1	I_2	I_3	Mean
V_1	987	1308	1382	1151	1226	1300	1201	1242	1234	1226
V_2	938	1399	1292	1136	1275	1218	1202	1267	1160	1210
V_3	905	1251	1366	1168	1186	1168	1218	1202	1102	1174
Mean	943	1319	1347	1152	1229	1229	1207	1237	1165	1203

S.E.'s—N.A.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(125).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'IMV'.**

Object :— To study the effect of N, P and irrigation on different varieties of Cotton.

1. BASAL CONDITIONS :

Same as in expt. no. 55(164) on page 499.

2. TREATMENTS :

Main-plot treatments :

3 frequencies of irrigation : $I_1=5$, $I_2=6$ and $I_3=7$ irrigations.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 varieties : V_1=320—F, V_2=LL—54 and V_3=L.S.S.

(2) 3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

(3) 3 levels of P_2O_5 : $P_0=0$, $P_1=50$ and $P_2=100$ lb./ac.

3. DESIGN :

(i) Split-plot confd. (ii) (a) 3 main-plots/replication, 9 sub-plots/block and 3 blocks/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 6′×35′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Cotton yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 675 lb./ac. (ii) (a) 104.2 lb./ac. (b) 131.2 lb./ac. (iii) Only main effects of V and N are highly significant and V×P interaction is significant. (iv) Av. yield of *kapas* in lb./ac.

	V_1	V_2	V_3	N_0	N_1	N_2	P_0	P_1	P_2	Mean
I_1	753	481	871	569	764	779	687	750	676	704
I_2	738	397	803	539	705	693	599	702	637	646
I_3	794	430	800	548	711	762	643	681	696	674
Mean	762	439	825	552	727	745	643	711	670	675
P_0	732	382	815	548	673	708				
P_1	747	438	948	604	761	767				
P_2	806	495	708	504	747	759				
N_0	616	347	693							
N_1	856	427	898							
N_2	812	542	880							

S.E. of difference of two

1. I marginal means = 20.1 lb./ac.
2. V, N or P marginal means = 25.2 lb./ac.
3. V, N or P means at the same level of I = 43.7 lb./ac.
4. I means at the same level of V, N or P = 40.9 lb./ac.

S.E. of body of V×N, V×P or N×P table = 30.9 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(203).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'IMV'.**

Object :—To study the effect of N, P and irrigation on different varieties on Cotton.

1. BASAL CONDITIONS :

Same as in expt. no. 55(164) on page 499..

2. TREATMENTS and DESIGN :

Same as in expt. no. 58(125) on page 501.

4. GENERAL :

(i) Normal. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) N.A. (vi) Heavy and untimely rains. (vii) The programme of watering as originally planned could not be followed due to heavy and untimely rains during Aug. and Sept. Raw data, remaining two-way tables and S.E.'s are not available in the records.

5. RESULTS :

(i) 1188 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	I_1	I_2	I_3	Mean
V_1	979	1045	1530	1111	1168	1275	1185	1201	1168	1185
V_2	889	1053	1473	1300	979	1136	1251	1119	1045	1138
V_3	996	1127	1596	1201	1201	1317	1341	1201	1177	1240
Mean	955	1075	1533	1204	1116	1243	1259	1174	1130	1188

S.E.'s—N.A.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(72).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'IMV'.**

Object :—To study the effect of irrigation and levels of N on different varieties of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) 5, 10.4.1958. (iv) (a) 5 ploughings. (b) Sown by *pore*. (c) 9 srs./ac. (d) $2\frac{1}{2}' \times 1'$. (e) Nil. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 1 hoeing and thinning. (ix) 69.01". (x) 24, 25.10.1958 ; 20, 21.11.1958. and 4, 5.1.1959.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 2 varieties : V_1=320—F and V_2=L.L.54.

(2) 3 frequencies of irrigation : I_1=3, I_2=5 and I_3=7 irrigations.

Sub-plot treatments :

4 levels of N as A/S : N_0=0, N_1=40, N_2=80 and N_3=120 lb./ac.

N applied on 10.7.1958 and 5.8.1958 in equal doses.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $12\frac{1}{2}' \times 52'$. (b) $12\frac{1}{2}' \times 48.4'$. (v) 1.8' on either sides of the plot. (vi) Yes.

4. GENERAL :

(i) Good. (b) Nil. (iii) Yield of *kapas*. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1122 lb./ac. (ii) (a) 356.7 lb./ac. (b) 153.4 lb./ac. (iii) Main effects of V and N and interaction N×I are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	Mean	I_1	I_2	I_3
V_1	1180	1356	1428	1431	1349	1405	1259	1346
V_2	831	881	890	981	896	845	940	902
Mean	1005	1119	1159	1206	1122	1125	1118	1124
I_1	1093	1053	1213	1141				
I_2	926	1107	1218	1218				
I_3	996	1195	1046	1259				

S.E. of differences of two

1. V marginal means = 72.8 lb./ac.
2. I marginal means = 89.2 lb./ac.
3. N marginal means = 54.2 lb./ac.
4. N means at the same level of V = 62.6 lb./ac.
5. V means at the same levels of N = 90.7 lb./ac.
6. N means at the same level of I = 76.7 lb./ac.
7. I means at the same level of N = 111.2 lb./ac.

S.E. of body of N×I table = 89.2 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(51).**

Site :- Cotton Res. Stn , Faridkot. **Type :- 'IMV'.**

Object :—To study the effect of irrigation and levels of N on different varieties of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) 1, 2.5.1959 20, 21.5.1959 and 9.6.1959. (iv) (a) 5 ploughings. (b) Sown by *pore*. (c) 10 srs./ac. (d) $2\frac{1}{2}' \times 1'$. (e) Nil. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 *tripholi* and 1 hoeing with *kasula*. (ix) 31.1". (x) 5 pickings on 30.10.1959, 3, 5.11.1959, 9.12.1959, 23 12.1959 and 20,22.1.1960.

2. *TREATMENTS :*

Same as in expt. no. 58(72) on page 503.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 48′×12.5′. (b) 43.60′×12.5′. (v) 2.2′ on either sides of the plot. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 977 lb./ac. (ii) (a) 186.1 lb./ac. (b) 89.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	Mean	I_1	I_2	I_3
V_1	949	965	969	937	955	974	949	942
V_2	1060	955	984	1000	1000	981	1069	949
Mean	1005	960	976	968	977	977	1009	946
I_1	1020	939	959	992				
I_2	1005	998	1000	1034				
I_3	990	942	970	879				

S.E. of difference of two

1. V marginal means = 38.0 lb./ac.
2. I marginal means = 46.5 lb./ac.
3. N marginal means = 31.8 lb./ac.
4. N means at the same level of V = 36.7 lb./ac.
5. V means at the same level of N = 49.5 lb./ac.
6. N means at the same leval of I = 44.9 lb./ac.
7. I means at the same level of N = 60.7 lb./ac.

S.E. of body of $V \times I$ table = 46.5 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(165).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'IMV'.**

Object :—To study the effect of N, P and irrigation on different varieties of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) May. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1¼′. (v) N.A. (vi) and (vii) As per treatments. (viii) 1 hoeings and weeding. (ix) N.A. (x) November.

2. TREATMENTS :

Main-plot treatments :

3 frequencies of irrigation : I_1=5, I_2=6 and I_3=7 irrigations.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 varieties : V_1=320—F, V_2=H—14 and V_3=L.S.S.

(2) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.

(3) 3 levels of P_2O_5 : P_0=0, P_1=50 and P_2=100 lb./ac.

3. DESIGN :

(i) Split-plot confd. (ii) (a) 3 main-plots/replication ; 3 sub-plots/block and 9 blocks/main-plot. (b) N.A. (iii) 2. (iv) N.A. (b) 8′×28.75′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) Nil. (vii) Raw data, remaining two-way tables and S.E.'s are not available in the records.

5. RESULTS :

(i) 1155 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
V_1	1004	1226	1144	1125	1094	1177	1103
V_2	1382	1530	1497	1470	1349	1414	1547
V_3	823	880	905	869	823	896	889
Mean	1070	1212	1182	1155	1089	1196	1180
I_1	1086	1193	1210	1163			
I_2	1037	1242	1103	1127			
I_3	1086	1201	1234	1174			

S.E.'s—N.A.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 56(147).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'IMV'.**

Object :—To study the effect of N, P and irrigation on different varieties of Cotton.

1. BASAL CONDITIONS and 2. TREATMENTS :

Same as in expt. 55(165) on page 504.

3. DESIGN :

(l) Split-plot confd. (ii) (a) 3 main-plots/replication ; 9 sub-plots/block and 3 blocks/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 6′×20′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 55(165) on page 504.

5. RESULTS :

(i) 717 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
V_1	494	699	847	680	576	757	708
V_2	642	1028	1259	976	806	1004	1119
V_3	354	510	617	494	461	502	518
Mean	497	746	908	717	614	754	782
I_1	469	650	856	658			
I_2	527	798	954	760			
I_3	494	790	913	732			

S.E.'s—N.A.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(173).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'IMV'.**

Object :—To study the effect of N, P and irrigation on different varieties of Cotton.

1. BASAL CONDITIONS and 2. TREATMENTS :

Same as in expt. no. 55(165) on page 504.

3. DESIGN :

(i) Split-plot confd. (ii) (a) 3 main-plots/replication, 3 blocks/main-plot and 9 sub-plots/block (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8′×27½′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 55(165) on page 504.

5. RESULTS :

(i) 665 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	I_1	I_2	I_3	Mean
V_1	461	699	839	691	658	650	708	650	641	666
V_2	403	716	897	675	674	667	675	690	651	672
V_3	420	675	872	642	650	675	667	642	658	656
Mean	428	697	869	669	661	664	683	661	650	665

S.E.'s — N.A.

Crop :- Cotton (*Kharif*). **Ref :- Pb. 58(201).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'IMV'.**

Object :—To study the effect of different levels of N, P and irrigation on different varieties of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Hansi. (iii) May. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1½′. (e) N.A. (v) N.A. (vi) and (vii) As per treatments. (viii) Hoeing and weeding. (ix) N.A. (x) November.

2. TREATMENTS :

Main-plot treatments :

3 frequencies of irrigation : I_1=3, I_2=4 and I_3=5 irrigations.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 varieties : V_1=320—F, V_1=L.L.—54 and V_3=L.S.S.

(2) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.

(3) 3 levels of P_2O_5 : P_0=0, P_1=50 and P_2=100 lb./ac.

3. DESIGN ;

(i) Split-plot confd. (ii) (a) 3 main-plots/replication ; 3 blocks/main-plot and 9 sub-plots/block. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8′×27½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) The programme of irrigation could not be followed due to heavy and continuous rains in August and September. Raw data, remaining two-way tables and S.E.'s are not available in the records.

5. RESULTS :

(i) 929 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	I_1	I_2	I_3	Mean
V_1	716	1045	1432	1037	1094	1062	1119	1103	971	1064
V_2	675	946	1333	880	1070	1004	987	1053	914	985
V_3	538	781	899	701	775	742	783	718	717	739
Mean	643	924	1221	873	980	936	963	958	867	929

S.E.'s — N.A.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(204).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'IMV'.**

Object :—To study the effect of different levels of N, P and irrigation on different varieties of Cotton.

1. BASAL CONDITIONS :

Same as in expt. no. 58(201) on page 506.

2. TREATMENTS :

Main-plot treatments :

3 frequencies of irrigation : I_1=3, I_2=4 and I_3=5 irrigations.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 varieties : V_1=216—F, V_2=H—14 and V_3=L.L.—54.
(2) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.
(3) 3 levels of P_2O_5 : P_0=0, P_1=50 and P_2=100 lb./ac.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(201) on page 506.

5. RESULTS :

(i) 793 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	I_1	I_2	I_3	Mean
V_1	765	1012	946	880	971	872	848	913	962	908
V_2	666	996	1061	798	979	946	913	938	872	908
V_3	417	805	464	499	524	663	598	548	540	562
Mean	616	938	824	726	825	827	786	800	791	793

S.E.'s — N.A.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 55(166).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'IMV'.**

Object :—To study the effect of N, P and irrigation on different varieties of Cotton.

1. BASAL CONDITIONS:

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) May. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 2′×1¼′. (e) N.A. (v) N.A. (vi) and (vii) As per treatments. (viii) 1 hoeing and weeding. (ix) N.A. (x) November.

2. TREATMENTS :

Main-plot treatments :

3 frequencies of irrigation : I_1=5, I_2=6 and I_3=7 irrigations.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 varieties : V_1=320—F, V_2=H—14 and V_3=L.S.S.

(2) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.

(3) 3 levels of P_2O_5 : P_0=0, P_1=50 and P_2=100 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 3 blocks/main-plot and 9 sub-plots/block. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8′×27.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) Nil. (vii) Raw data, remaining two-way tables and S. E.'s are not available in the records.

5. RESULTS :

(i) 835 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
V_1	954	897	889	913	889	922	928
V_2	831	930	905	889	938	815	914
V_3	757	683	666	702	716	691	699
Mean	847	837	820	835	843	809	847
I_1	864	847	815	842			
I_2	889	839	790	839			
I_3	788	825	855	823			

S.E.'s — N.A.

Crop :- Cotton (*Kharif*). **Ref :- Pb. 56(148).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'IMV'.**

Object :—To study the effect of N, P and irrigation on different varieties of Cotton.

1. BASAL CONDITIONS :

Same as in expt no. 55(166) on page 507.

2. TREATMENTS :

Main-plot treatments :

3 frequencies of irrigation : I_1=1, I_2=2 and I_3=3 irrigations.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 varieties : V_1 320—F, V_2=H—14 and V_3=L.S.S.

(2) 3 levels of N : N_0=0, N_1 50 and N_2=100 lb./ac.

(3) 3 levels of P_2O_5 : P_0=0, P_1 =50 and P_2=100 lb./ac.

3. DESIGN :

(i) Split-plot confd. (ii) (a) 3 main-plots/replication, 3 blocks/main-plot and 9 sub-plots/block. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8′×26½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) Nil. (vii) Raw data, remaining two-way tables and S.E.'s are not available in the records.

5. RESULTS :

(i) 760 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mea	P_0	P_1	P_2
V_1	806	782	757	782	740	798	808
V_2	839	938	905	894	880	848	954
V_3	658	584	568	603	609	576	625
Mean	768	768	743	760	743	741	796
I_1	765	798	765	776			
I_2	765	749	732	749			
I_3	773	757	732	754			

S.E.'s — N.A.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 57(174).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'IMV'.**

Object :—To study the effect of application of N, P and irrigation on different varieties of Cotton.

1. BASAL CONDITIONS :

Same as in expt. no. 55(166) on page 507.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(148) on page 508.

5. RESULTS :

(i) 495 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	I_1	I_2	I_3	Mean
V_1	486	543	576	527	535	543	535	560	510	535
V_2	403	403	428	411	428	395	403	420	411	411
V_3	486	584	551	518	543	560	518	543	560	540
Mean	458	510	518	485	502	499	485	508	494	495

S.E.'s — N.A.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 58(202).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'IMV'.**

Object :—To study the effect of N, P and irrigation on different varieties of Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) May. (iv) (a) 2 ploughings. (b) and (c) N.A (d) $2' \times 1\frac{1}{4}'$. (e) N.A. (v) N.A. (vi) and (vii) As per treatments. (viii) Hoeings and weedings. (ix) N.A. (x) November.

2. TREATMENTS :

Main-plot treatments :

3 frequences of irrigation : $I_1=3$, $I_2=4$ and $I_3=5$ irrigations.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 varieties : $V_1=320$—F, $V_2=$L.L.—54 and $V_3=$L.S.S.

(2) 3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

(3) 3 levels of P_2O_5 : $P_0=0$, $P_1=50$ and $P_2=100$ lb./ac.

3. DESIGN :

(i) Split-plot confd. (ii) (a) 3 main-plots/replication, 3 blocks/main-plot and 9 sub-plots/block. (b) N.A. (iii) 2. (iv) (a) N.A. (b) $8 \times 26\frac{1}{2}'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of jassid and cotton leaf roller. (iii) Yield of *kapas*. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) and (vii) The programme of irrigation as planned could not be followed due to heavy and continuous rains in August and September. Raw data, remaining two-way tables and S.E.'S. are not available in the records.

5. RESULTS :

(i) 815 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	I_1	I_2	I_3	Mean
V_1	996	987	864	954	930	963	979	946	922	949
V_2	996	1078	996	1045	972	1053	1119	955	996	1023
V_3	535	412	469	453	461	502	477	453	486	472
Mean	842	826	776	817	788	839	858	785	801	815

S.E.'s — N.A.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 59(205).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'IMV'.**

Object :—To study the effect of N, P and irrigation on different varieties of Cotton.

1. BASAL CONDITIONS :

Same as in expt. no. 58(202) on page 509.

2. TREATMENTS :

Main-plot treatments :

3 frequencies of irrigation : $I_1=3$, $I_2=4$ and $I_3=5$ irrigations.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 varieties : $V_1=320$—F, $V_2=$H—14 and $V_3=$L.L.—54.

(2) 3 levels of N as C/A/N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

(3) 3 levels of P_2O_5 : $P_0=0$, $P_1=50$ and $P_2=100$ lb./ac,

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(202) on page 509.

5. RESULTS ;

(i) 680 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	I_1	I_2	I_3	Mean
V_1	848	724	765	773	782	782	823	773	741	779
V_2	724	872	815	749	864	798	747	832	832	804
V_3	444	453	477	387	477	510	428	510	436	458
Mean	672	683	686	636	708	697	666	705	670	680

S.E.'S — N.A.

Crop :- Cotton *(Kharif)*. **Ref :- Pb 54(88).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'ICM'.**

Object :— To study the effect of irrigation, levels of N and spacing on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat—Cotton. (b) Wheat. (c) 1.5 md/ac. of A/S. (ii) (a) Loam. (b) Refer soil analysis, Faridkot (iii) 11.5.1954. (iv) (a) 4 ploughings and 2 *sohaga*. (b) N.A. (c) 10 srs./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) L.S.S. (E) (medium). (vii) Irrigated. (viii) 3 hoeings with Lyallpur hoe. (ix) 18.03". (x) 30.10.1954 to 31.1.1955.

2. TREATMENTS :

Main-plot treatments :

3 frequencies of irrigation : $I_1=3$, $I_2=5$ and $I_3=7$ irrigations.

Snb-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac.

(2) 2 spacings : $S_1=2\frac{1}{2}' \times 1\frac{1}{4}'$ and $S_2=2\frac{1}{2}' \times 2'$.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 6 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) 82′×10′. (b) 60.5′×10′. (v) N.A. (vi) Yes.

4. GENERAL .

(i) Good. (ii) Slight attack of jassids and boll worm. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1218 lb./ac. (ii) (a) 535.3 lb./ac. (b) 131.8 lb./ac. (iii) Main effects of N and S are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2
I_1	897	1113	1289	1100	1165	1034
I_2	1078	1282	1383	1248	1344	1151
I_3	1117	1303	1493	1306	1372	1240
Mean	1031	1233	1390	1218	1294	1142
S_1	1111	1313	1458			
S_2	950	1153	1322			

S.E. of difference of two

1.	I marginal means	= 138.1 lb./ac.	5.	I means at the same level of S	= 142.3 lb./ac.
2.	N marginal means	= 34.1 lb./ac.	6.	N means at the same level of I	= 58.9 lb./ac.
3.	S marginal means	= 27.8 lb./ac.	7.	I means at the same level of N	= 146.3 lb./ac.
4.	S means at the same level of I	= 48.1 lb./ac.		S.E. of body of N×S table	= 34.0 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 55(12).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'ICM'.**

Object :— To study the effect of irrigation, levels of N and spacings on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (b) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 15.5.1955. (iv) (a) 5 ploughings and 2 *sohaga*. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) 320—F (early). (vii) Irrigated. (viii) 2 hoeings, 2 thinnings and 1 weeding. (ix) 17.00". (x) N.A.

2. TREATMENTS :

Same as in expt. no. 54(88) on page 411.

A/S applied in two equal doses.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 56'6"×10'. (b) 51'10"×10'. (v) 2'4" on either side of the plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Slight attack of boll worm. (iii) Yield of *kapas*. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1942 lb./ac. (ii) (a) 354.4 lb./ac. (b) 255.6 lb./ac. (iii) Main effect of N and S are highly significant and that of I is significant. (iv) Av. yield of *kapas* lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2
I_1	1568	1656	1913	1712	1799	1625
I_2	1887	1944	2102	1978	2059	1895
I_3	1971	2089	2346	2135	2234	2037
Mean	1807	1896	2120	1942	2031	1852
S_1	1926	1973	2193			
S_2	1689	1819	2047			

S.E. of difference of two

1.	I marginal means	= 102.3 lb./ac.	5.	I means at the same level of S	= 126.1 lb./ac.
2.	N marginal means	= 73.8 lb./ac.	6.	N means at the same level of I	= 127.8 lb./ac.
3.	S marginal means	= 60.2 lb./ac.	7.	I means at the same level of N	= 146.1 lb./ac.
4.	S means at the same level of I	= 104.3 lb./ac.		S.E. of body of N×S table	= 73.8 lb./ac.

Crop :- Cotton *(Kharif).* **Ref :- Pb. 54(87).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'D'.**

Object :— To study the effect of soaking of seeds in nutrient solutions on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Indian rape. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 4.5.1954. (iv) (a) Ploughing and *sohaga*. (b) In lines. (c) N.A. (d) 2½″ apart. (e) N.A. (v) 6 tons/ac. of F.Y.M. before sowing and 40 lb./ac. of N as A/S at flowering stage. (vi) L.S.S. (early improved and medium). (vii) Irrigated. (viii) 3 hoeings with Lyallpur hoe. (ix) 18.03″. (x) Pickings on 6.11.1954, 13.12.1954 and 25.1.1955.

2. TREATMENTS :

2 sets of treatments :

Set 1 :

All combinations of (1) and (2)

(1) 2 acids for soaking for 4 hours : A_1=Tannic acid and A_2=Potassium ethyanthate.

(2) 4 concentrations : C_0=Nil, C_1=M/50, C_2=M/100 and C_3=M/200.

Set 2 :

7 soaking treatments in nutrient solutions for 4 hours : T_0=Control (2 plots), T_1=5% alcohal solution, T_2=2.5% alcohal solution, T_3=1.25% alcohal solution, T_4=M/10 A/S solution, T_5=M/20 A/S solutionand T_6=M/40 A/S solution.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 1/72.6 ac. (b) 43½′×12½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Slight attack of jassid and boll worm. (iii) Height and yield of *kapas*. (iv) (a) 1954 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

Set 1

(i) 1306 lb./ac. (ii) 146.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	C_0	C_1	C_2	C_3	Mean
A_1	—	1241	1429	1251	1307
A_2	—	1202	1321	1326	1283
Mean	1338	1224	1375	1289	—

S.E. of A marginal mean = 42.4 lb./ac.
S.E. of C marginal mean = 51.9 lb./ac.
S.E. of body of table = 73.4 lb./ac.

Set 2

(i) 1388 lb./ac. (ii) 246.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	1521	1287	1388	1172	1463	1262	1493

S.E. of T_0 mean = 87.0 lb./ac.
S.E./mean other than T_0 = 123.0 lb./ac.

Crop :- Cotton *(Kharif)*. **Ref :- Pb. 54(98).**

Site :- Cotton Res. Stn., Rauni. **Type :- 'D'.**

Object :— To study the effect of seed treatments on the yield of Cotton plants.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane—*Ratoon.* (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 23.5.1954. (iv) (a) Ploughing. (b) Dibbling. (c) 8 to 10 srs./ac. (d) 2½′×1½′. (e) N.A. (v) 60 lb./ac. of N as A/S at flowering stage. (vi) 216—F (early). (vii) Irrigated. (viii) 4 hoeings. (ix) 21.90″. (x) Pickings on 18.10.1954, 26.11.1954 and 5.1.1955.

2. TREATMENTS :

4 soaking treatments : T_0=Control (unsoaked seeds), T_1=Seeds treated with Perenox, T_2=Seeds treated with water and T_3=Seeds treated with molar solution of A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 12′×52′. (b) 12′×40½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Jassids attack observed. (iii) Height and yield of *kapas.* (iv) (a) 1953—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1115 lb./ac. (ii) 110.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	1085	1149	1070	1156

S.E./mean = 45.2 lb./ac.

Crop :- Tobacco *(Rabi).* **Ref :- Pb. 54(116).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :— To study the effect of fertilizers on the yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fallow—Wheat—Fodder. (b) Fodder. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 23.2.1954. (iv) (a) to (e) N.A. (v) Nil. (vi) N—Rustica T—26 (medium). (vii) Irrigated. (viii) 3 hoeings. (ix) 7.09″. (x) N.A.

2. TREATMENTS:

7 doses of fertilizers : D_0=Control, D_1=2, D_2=3 and D_3=4 lb./ac. of Borax, D_4=15, D_5=20 and D_6=25 lb./ac. of C/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 14′×9½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Dry leaf yield. (iv) (a) N.A. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1510 lb./ac. (ii) 377.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of tobacco in lb./ac.

Treatment	D_0	D_1	D_2	D_3	D_4	D_5	D_6
Av. yield	1311	1621	1732	1542	1079	1626	1658

S.E./mean = 188.9 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 55(126).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :— To compare the relative efficiency of N and P for Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanted. (c) 2 lb./ac. (e) 1 to 2. (v) Nil. (vi) N—Rustica. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

4 doses of N : $N_0=0$, $N_1=100$, $N_2=150$ and $N_3=200$ lb./ac.

Sub-plot treatments :

4 doses of P : $P_0=0$, $P_1=100$, $P_2=150$ and $P_3=200$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 22′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Green leaf yield. (iv) (a) 1953—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Full dose of P_2O_5 and 50% of N applied a week before planting and 50% of N half at pre and half at post flowering stages.

5. RESULTS :

(i) 24303 lb./ac. (ii) (a) 5156 lb./ac. (b) 2180 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of tobacco (green leaf) in lb./ac.

	P_0	P_1	P_2	P_3	Mean
N_0	16067	15725	15176	16116	15771
N_1	24130	24001	24055	26639	24706
N_2	25026	27387	26501	26748	26415
N_3	28619	30164	32381	30119	30321
Mean	23460	24319	24528	24905	24303

S.E. of difference of two

1. N marginal means = 1823 lb./ac.
2. P marginal means = 771 lb./ac.
3. P means at the same level of N = 1541 lb./ac.
4. N means at the same level of P = 2259 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 56(95).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :— To study the effect of different manures under different methods of application.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1956/15.3.1957. (iv) (a) N.A. (b) Transplanted. (c) 1 lb./ac. (d) 9″×1″. (e) 1 to 2. (v) 100 lb./ac. of N as A/S. (vi) N—Tobacum. (vii) Irrigated. (viii) N.A. (ix) 13.68″. (x) 8.6.1957 to 31.7.1957.

2. TREATMENTS :

Main-plot treatments :

2 methods of application : S_1=Soil application and S_2=Spray application.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of manures : M_0=No manure and M_1=50 lb./ac. of K_2O+50 lb./ac. of P_2O_5.

(2) 3 doses of trace elements : T_0=No trace element, T_1=3.5 lb./ac. of Sod. Borate+1.2 lb./ac. of Mn. Sul.+0.2 lb./ac. of C/S+0.4 lb./ac. of Zn. Sul.+0.1 lb./ac. of Ammo. Molybdate and T_2=51 lb./ac. of Sod. Borate+7 lb./ac. of Mn. Sul. C/S+7 lb./ac. of Zn. Sul.+40 lb./ac. of Ammo. Molybdate.

3. DESIGN :

(i) (a) Split-plot. (ii) (a) 2 main-plots/replication and 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 22′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Dry leaf yield. (iv) (a) 1956—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2386 lb./ac. (ii) (a) 412.2 lb./ac. (b) 360.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	T_0	T_1	T_2	Mean	S_1	S_2
M_0	2456	2508	2310	2425	2447	2403
M_1	2552	2138	2350	2347	2095	2598
Mean	2504	2323	2330	2386	2271	2500
S_1	2515	2094	2203			
S_2	2493	2552	2456			

S.E. of difference of two

1.	S marginal means	= 137.4 lb./ac.	5.	S means at the same level of M	=	182.4 lb./ac.
2.	M marginal means	= 120.0 lb./ac.	6.	T means at the same level of S	=	207.9 lb./ac.
3.	T marginal means	= 147.0 lb./ac.	7.	S means at the same level of T	=	218.4 lb./ac.
4.	M means at the same level of S	= 169.7 lb./ac.		S.E. of body of M×T table	=	147.0 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 57(78).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- M'.**

Object :— To see the effect of trace elements on the yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1957/15.3.1958. (iv) (a) N.A. (b) Transplanted. (c) 1 chhs/ac. (d) 9″×12″. (e) 1 to 2. (v) Nil. (vi) N—Tobacum. (vii) Irrigated. (viii) N.A. (ix) 5.89″. (x) 8.6.1958 to 31.7.1958.

2. TREATMENTS :

Main-plot treatments :

2 levels of manures : M_1=100 lb./ac. of N as A/S and M_2=100 lb./ac. of N as A/S+50 lb./ac. of P_2O_5+50 lb./ac. of K_2O.

Sub-plot treatments :

14 different applications of trace elements : T_0=Control, T_1=5 lb./ac. of $FeSO_4$, T_2=3 lb./ac. of $CuSO_4$, T_3=5 lb./ac. of $MnCl_2$, T_4=5 lb./ac. of $ZnSO_4$, T_5=5 lb./ac. of Boric acid, T_6=5 lb./ac. of $MgSO_4$, T_7=Mixture from T_1 to T_6, T_8=$FeSO_4$ 0.5%, T_9=$CuSO_4$ 0.01%, T_{10}=$MnCl_2$ 0.18%, T_{11}=$ZnSO_4$ 0.42%, T_{12}=Boric acid 0.29% and T_{13}=Mixture from T_8 to T_{12}.

Trace elements from T_2 to T_7 were applied to soil while from T_8 to T_{13} were sprayed.

3. DESIGN

(i) Split-plot. (ii) (a) 2 main-plots/replication, 14 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of green leaf of tobacco. (iv) (a) 1956—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 28296 lb./ac. (ii) (a) 5009 lb./ac. (b) 3956 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of tobacco (green leaf) in lb./ac.

	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}	T_{13}	Mean
M_0	24886	28874	25133	26141	29009	26006	26768	29501	28246	27507	28627	28627	27507	27619	27461
M_1	30486	30621	26499	28493	29009	27619	30733	29747	29859	28627	27507	26768	32614	29254	29131
Mean	27686	29747	25816	27317	29009	26812	28750	29624	29052	28067	28067	27697	30060	28436	28296

S.E. of difference of two

1. M marginal means = 946.6 lb./ac.
2. T marginal means = 1978.0 lb./ac.
3. T means at the same level of M = 2797.3 lb./ac.
4. M means at the same level of T = 2856.9 lb./ac.

Crop :- Tobacco (*Rabi*). **Ref :- Pb. 59(77).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To see the effect of different manures under different methods of application.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) N.A./22.2.1960. (iv) (a) N.A. (b) Transplanted. (c) 1 chhs./ac. (d) 1′×1′. (e) 1 to 2 (v) Nil. (vi) M. Tobacum. (vii) Irrigated. (viii) N.A. (ix) 7.86″. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 levels of manures : M_1=100 lb./ac. of N as A/S and M_2=50 lb./ac. of P_2O_5+50 lb./ac. of K_2O.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 9 different trace elements : T_0=No element, T_1=5 lb./ac. of $FeSO_4$, T_2=3 lb./ac. of C/S, T_3=5 lb./ac. of $MnCl_2$, T_4=5 lb./ac. of Zn. Sul., T_5=5 lb./ac. of Boric acid, T_6=5 lb./ac. of $MnSO_4$, T_7=5 lb./ac. of Mo and T_8=5 lb./ac. of mixture of T_1 to T_7.

(2) 2 methods of application of trace-elements : S_1=Soil application and S_2=Spray application.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 18 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 16′×4′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Dry leaf yield. (iv) (a) 1956—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2392 lb./ac. (ii) (a) 280.8 lb./ac. (b) 313.1 lb./ac. (iii) Only interaction S×T is significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	Mean	S_1	S_2
M_1	2506	2313	2196	2496	2364	2565	2268	2535	2476	2413	2410	2416
M_2	2332	2361	2440	2353	2316	2434	2319	2337	2451	2371	2312	2431
Mean	2419	2337	2318	2425	2340	2500	2293	2436	2464	2392	2361	2423
S_1	2253	2313	2322	2526	2187	2569	2266	2322	2493			
S_2	2586	2361	2314	2323	2493	2430	2320	2550	2434			

S.E. of difference of two

1. M marginal means = 41.9 lb./ac.
2. S marginal means = 46.7 lb./ac.
3. T marginal means = 99.0 lb./ac.
4. S means at the same level of M = 66.0 lb./ac.
5. M means at the same level of S = 62.7 lb./ac.
6. T means at the same level of M = 140.0 lb./ac.
7. M means at the same level of T = 138.5 lb./ac.

S.E. of body of S×T table = 99.0 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 54(106).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To find out best manurial formula for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fallow—Wheat—Fodder. (b) Fodder. (c) Nil. (ii) Heavy loam. (b) N.A. (iii) 2.3.1954. (iv) (a) to (c) N.A. (d) 1"×9". (e) N.A. (v) Nil. (vi) T—23 (early). (vii) Irrigated. (viii) 3 hoeings. (ix) 7.09". (x) 10.6.1954 and 11.6.1954.

2. TREATMENTS:

Main-plot treatments :

2 doses of F.Y.M. : F_0=0 and F_1=300 lb./ac.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of P_2O_5 as Super : P_0=0 and P_1=50 lb./ac.

(2) 4 doses of manures : M_0=Control, M_1=100 lb./ac. of N as A/S, M_2=100 lb./ac. of N as G.N.C. and M_3=50 lb./ac. of N as A/S+50 lb./ac. of N as G.N.C.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 22'×9½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of dry leaf. (iv) (a) 1952—1954. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1087 lb./ac. (ii) (a) 477.0 lb./ac. (b) 193.3 lb./ac. (iii) Main effect of M and interaction M×P are highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	M_0	M_1	M_2	M_3	Mean	P_0	P_1
F_0	686	1139	1026	1111	990	967	1013
F_1	890	1358	1247	1241	1184	1145	1224
Mean	788	1248	1136	1176	1087	1056	1118
P_0	751	1218	1112	1143			
P_1	825	1279	1161	1209			

S.E. of difference of two

1. F marginal means = 97.4 lb./ac.
2. P marginal means = 39.5 lb./ac.
3. M marginal means = 55.8 lb./ac.
4. P means at the same level of F = 55.8 lb./ac.
5. F means at the same level of P = 105.1 lb./ac.
6. M means at the same level of F = 78.9 lb./ac.
7. F means at the same level of M = 119.0 lb./ac.

S.E. of body of P×M table = 55.8 lb./ac.

Crop :- Tobacco. **Ref :- Pb. 54(110).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To study the effect of bulky manure, N, P_2O_5 and K_2O on the yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fallow—Wheat—Fodder. (b) Fodder. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 18.2.1954. (iv) (a) to (c) N.A. (d) 1′×6″. (e) N.A. (v) Nil. (vi) T—26 (early). (vii) Irrigated. (viii) 3 hoeings. (ix) 7.09″. (x) 15.5.1954.

2. TREATMENTS :

Main-plot treatments :

2 doses of F.Y.M. : F_0=0 and F_1=300 lb./ac.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 2 levels of N as A/S : N_0=0 and N_1=100 lb./ac.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=50 lb./ac.

(3) 2 levels of K_2O as Pot. Sul. : K_0=0 and K_1=50 lb./ac.

N, P_2O_5 and K_2O applied before planting on 13.2.1954. K_2O and N were broadcast and then ploughed in. P was put in furrows and covered with plank.

3. DESIGN :

(i) Split-plot confd. (NPK confd. in Rep. I, NP confd. in Rep. II, NK confd. in Rep. III and PK confd. in Rep. IV.). (ii) (a) 2 main-plots/replications, 4 sub-plots/block and 2 blocks/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 22′×9½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Plant height, no., length, breadth of leaves, green and dry weight. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1680 lb./ac. (ii) (a) 223.4 lb./ac. (b) 200.7 lb./ac. (iii) Only main effects of F and N are highly significant. (iv) Av. yield of dry tobacco in lb./ac.

	N_0	N_1	P_0	P_1	K_0	K_1	Mean
F_0	1242	1857	1531	1568	1528	1571	1550
F_1	1481	2140	1748	1873	1807	1814	1810
Mean	1362	1998	1639	1721	1668	1692	1680
K_0	1315	2021	1625	1711			
K_1	1409	1976	1654	1731			
P_0	1360	1918					
P_1	1363	2078					

S.E. of difference of two

1. F marginal means = 55.8 lb./ac.
2. N, P or K marginal means = 50.2 lb./ac.
3. N, P or K means at the same level of F = 71.0 lb./ac.
4. F means at the same level of N, P or K = 75.1 lb./ac.

S.E. of body of N×P, N×K or P×K table = 50.2 lb./ac.

Crop :- Tobacco. **Ref :- Pb. 54(111).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To find out the best manurial dose for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fallow—Wheat—Fodder. (b) Fodder. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 27.2.1954. (iv) (a) to (e) N.A. (v) Nil. (vi) T—26 (early). (vii) Irrigated. (viii) 3 hoeings. (ix) 7.09". (x) 23, 24 and 26.5.1954.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(106) on page 518.

5. RESULTS :

(i) 2123 lb./ac. (ii) (a) 391.9 lb./ac. (b) 349.9 lb./ac. (iii) Main effect of M and interaction M×P are highly significant. (iv) Av. yield of dry tobacco in lb./ac.

	M_0	M_1	M_2	M_3	Mean	P_0	P_1
F_0	1787	2334	2432	2308	2215	2174	2257
F_1	1517	2272	2266	2073	2032	2006	2058
Mean	1652	2303	2349	2190	2123	2090	2157
P_0	1509	2244	2327	2280			
P_1	1795	2362	2371	2101			

S.E. of difference of two

1. F marginal means = 80.0 lb./ac.
2. M marginal means = 101.0 lb./ac.
3. P marginal means = 71.4 lb./ac.
4. M means at the same level of F = 142.8 lb./ac.
5. F means at the same level of M = 147.3 lb./ac.
6. P means at the same level of F = 101.0 lb./ac.
7. F means at the same level of P = 107.2 lb./ac.

S.E. of body of M×P table = 101.0 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 59(73).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To study the effect of different manures on the yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) N.A./24.2.1960. (iv) (a) N.A. (b) Transplanted. (c) 1 chk/ac. (d) 9"×1". (e) 1 to 2. (v) Nil. (vi) N—Tobacum. (vii) Irrigated. (viii) N.A. (ix) 7.86". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 doses of F.Y.M. : F_0=0 and F_1=150 lb./ac.

***Sub-plot treatments* :**

All combinations of (1), (2) and (3)

(1) 2 doses of N as C/A/N : N_0=0 and N_1=100 lb./ac.

(2) 2 doses of P_2O_5 as Super : P_0=0 and P_1=50 lb./ac.

(3) 2 doses of K_2O as Pot. Sul. : K_0=0 and K_1=50 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 35'×14.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Dry leaf yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1820 lb./ac. (ii) (a) 283.7 lb./ac. (b) 255.8 lb./ac. (iii) Only main effect of K is highly significant. (iv) Av. yield of tobacco (dry) in lb /ac.

	N_0	N_1	P_0	P_1	K_0	K_1	Mean
F_0	1731	1866	1738	1859	1575	2022	1798
F_1	1826	1857	1801	1882	1717	1966	1841
Mean	1778	1861	1769	1870	1646	1994	1820
K_0	1593	1699	1617	1675			
K_1	1964	2024	1922	2066			
P_0	1704	1835					
P_1	1853	1888					

S.E. of difference of two

1. F marginal means = 70.9 lb./ac.
2. N, P or K marginal means = 63.9 lb./ac.
3. N, P or K means at the same level of F = 180.9 lb./ac.
4. F means at the same level of N, P or K = 95.5 lb./ac.

S.E. of body of N×P or N×K or P×K table = 63.9 lb./ac.

Crop :- Tobacco. **Ref :- Pb. 54(168).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To find out the best time of application of the fertilizer for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fallow—Wheat—Fodder. (b) Fodder. (c) Nil. (ii) Heavy loam. (b) N.A. (iii) 18.12.1954. (iv) (a) to (e) N.A. (v) 300 lb./ac. of N as F.Y.M. applied by broadcast on 13.2.1954. (vi) T—23 (early). (vii) Irrigated. (viii) 3 hoeings. (ix) 7.09". (x) 23.5.1954.

2. TREATMENTS :

5 times of application of 100 lb./ac. of N as A/S : T_0=Control (No nitrogen), T_1=Full dose at planting, $T_2=\frac{1}{2}$ dose at planting and $\frac{1}{2}$ dose at flowering, $T_3=\frac{1}{2}$ dose at planting+$\frac{1}{4}$ dose before flowering+$\frac{1}{4}$ dose after flowering and $T_4=\frac{1}{2}$ dose at planting+$\frac{1}{2}$ dose at post flowering time.

Manures applied by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 22'×9½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Height of plant, number, length and breadth of leaf green, and dry weight. (iv) (a) 1953—1954. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2049 lb./ac. (ii) 132.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tobacco (dry) in lb./ac

Treatment	T_0	T_1	T_2	T_3	T_4
Av. yield	1724	2121	2229	2023	2148

S.E./mean = 54.0 lb./ac.

Crop :- Tobacco. **Ref :- Pb. 54(112).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To find out the best time of application of the fertilizer for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fallow—Wheat—Fodder. (b) Fodder. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 13.2.1954. (iv) (a) to (e) N.A. (v) 300 lb./ac. of N as F.Y.M. applied by broadcast. (vi) T—208(medium). (vii) Irrigated. (viii) 3 hoeings. (ix) 7.09". (x) 23.5.1954.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(108) on page 521.

5. RESULTS :

(i) 2816 lb./ac. (ii) 274.7 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of tobacco (dry) in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4
Av. yield	2470	2814	2970	2959	2867

S.E./mean = 112.1 lb./ac.

Crop :- Tobacco. **Ref :- Pb. 54(113).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To find out suitable doses of N and P for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fallow—Wheat—Fodder. (b) Fodder. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 26.2.1954. (iv) (a) to (e) N.A. (v) 30 C.L./ac. of F.Y.M. (vi) 233 (medium). (vii) Irrigated. (viii) 3 hoeings. (ix) 7.09". (x) 10 and 24.6.1954.

2. TREATMENTS ;

Main-plot treatments :

4 doses of N as A/S : N_0=0, N_1=100, N_2=150 and N_3=200 lb./ac.

Sub-plot treatments :

4 doses of P_2O_5 as Super : P_0=0, P_1=100, P_2=150 and P_3=200 lb./ac

50% of N applied on 13 2.1954 by broadcast. Rest at flowering. Full dose of P_2O_5 in plough furrow.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 22'×9½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) Nil. (iii) Plant height, number, length and breadth of leaf, green and dry weight. (iv) (a) 1954—1956. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2004 lb./ac. (ii) (a) 309.2 lb./ac. (b) 265.5 lb./ac. (iii) Only main effects of N and P are highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	P_0	P_1	P_2	P_3	Mean
N_0	901	854	1142	1092	997
N_1	2134	2248	2311	2355	2262
N_2	2043	2348	2623	2609	2406
N_3	2214	2318	2401	2468	2350
Mean	1823	1942	2119	2131	2004

S.E. of differences of two

1. N marginal means = 109.3 lb./ac.
2. P marginal means = 93.9 lb./ac.
3. P means at the same level of N = 187.7 lb./ac.
4. N means at the same level of P = 195.9 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 55(124).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To find out suitable doses of N and P for Tobacco.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1955/15.3.1956. (iv) (a) N.A. (b) Transplanted. (c) 1 chk./ac. (d) 9″×1′. (e) 1 to 2. (v) Nil. (vi) N. Tobacum. (vii) Irrigated. (viii) N.A. (ix) 8 29″. (x) 8.6.1956 to 31.7.1956.

2. TREATMENTS :

Same as in expt. no. 54(113) on page 522.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) (b) 22′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 54(113) on page 522.

5. RESULTS :

(i) 27871 lb./ac. (ii) (a) 9777 lb./ac. (b) 3273 lb./ac. (iii) Only main effect of N is significant. (iv) Av. yield of tobacco (green leaf) in lb./ac.

	P_0	P_1	P_2	P_3	Mean
N_0	20863	17348	19671	20918	19700
N_1	29165	31491	29516	30416	30147
N_2	30961	28759	33060	32521	31325
N_3	29314	32709	28961	30268	30313
Mean	27576	27577	27802	28531	27871

S.E. of difference of two

1. N marginal means = 3456.0 lb./ac.
2. P marginal means = 1157.0 lb./ac.
3. P means at the same level of N = 2314.0 lb./ac.
4. N means at the same level of P = 3996.0 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 56(101).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To find out suitable doses of N and P for Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1956/15.3.1957. (iv) (a) N.A. (b) Transplanted. (c) 1 chk./ac. (d) 9″×1′. (e) 1 to 2. (v) Nil. (vi) N. Tobacum. (vii) Irrigated. (viii) N.A. (ix) 13.68″. (x) 8.6.1957 to 31.7.1957.

2. TREATMENTS :

Same as in expt. no. 54(113) on page 522.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 22′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 54(113) on page 522.

5. RESULTS :

(i) 2467 lb./ac. (ii) (a) 268.0 lb./ac. (b) 277.5 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	1914	2206	2580	2877	2394
P_1	2132	2552	2487	3118	2572
P_2	2106	2507	2660	2688	2490
P_3	2033	2352	2644	2614	2411
Mean	2046	2404	2593	2824	2467

S.E. of differences of two

1. N marginal means = 94.8 lb./ac.
2. P marginal means = 98.1 lb./ac.
3. P means at the same level of N = 196.2 lb./ac.
4. N means at the same level of P = 194.6 lb./ac.

Crop :- Tobacco. **Ref :- Pb. 54(115).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To find out the best method of application of fertilizer for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fellow—Wheat—Fodder. (b) Fodder. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 18.2.1954. (iv) (a) to (e) N.A. (v) 30 C.L./ac. of F.Y.M. (vi) T—238 (medium). (vii) Irrigated. (viii) 3 hoeings. (ix) 7.09″. (x) N.A.

2. TREATMENTS :

3 methods of application of 100 lb./ac. of N as A/S : M_1=Broadcast, harrow followed by *sohaga* a week before planting, M_2=Applied in plough furrow followed by *sohaga* a week before planting and M_3= 50% applied by broadcast a week before planting and 25% each applied before and after flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 22′×9½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Plant height, number, length and breadth of leaf, green and dry plant weight. (iv) (a) 1954—1957. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2182 lb./ac. (ii) 249.6 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of tobacco (dry) in lb./ac.

Treatment	M_1	M_2	M_3
Av. yield	1970	2490	2086

S.E./mean = 101.9 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 55(122).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To find out the best method of application of fertilizer for Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1955/15.3.1956. (iv) (a) N.A. (b) Transplanted. (c) 1 chk./ac. (d) 9″×1′. (e) 1 to 2. (v) Nil. (vi) N—Tobacum. (vii) Irrigeted. (viii) N.A. (ix) 8.29″. (x) 8.6.1956 to 31.7.1956.

2. TREATMENTS :

Same as in expt. no. 54(115) on page 524.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 22′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of green leaf. (iv) (a) 1954—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 19920 lb./ac. (ii) 1806.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av yield of tobacco (green leaf) in lb./ac.

Treatment	M_1	M_2	M_3
Av. yield	19459	21424	18877

S.E./mean = 808.2 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 55(127).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :— To find out the best method of application of fertilizer for Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1955/15.3.1956. (iv) (a) N.A. (b) Transplanted. (c) 2 chk./ac. (d) 1′×1′. (e) 1 to 2. (v) Nil. (vi) N—Rustica. (vii) Irrigated. (viii) N.A. (ix) 8.29″. (x) 8.6.1956 to 31.7.1956.

2. TREATMENTS :

Same as in expt. no. 54(115) on page 524.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 22′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1954—57. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 22579 lb./ac. (ii) 1783·0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of tobacco (green leaf) in lb./ac.

Treatment	M_1	M_2	M_3
Av. yield	21879	24057	21800

S.E./mean = 797.4 lb./ac.

Crop :- Tobacco *(Rabi)* **Ref :- Pb. 56(99).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To find out the best method of application of fertilizer for Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1956/15.3.1957. (iv) (a) N.A. (b) Transplanted. (c) 2 chks./ac. (d) 1′×1′. (e) 1 to 2. (v) Nil. (vi) N.—Rustica. (vii) Irrigated. (viii) N.A. (ix) 13.46". (x) 8.6 1957 to 31.7.1957.

2. TREATMENTS :

Same as in expt. no. 54(115) on page 524.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 22′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Dry leaf yield. (iv) (a) 1954—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3247 lb./ac. (ii) 254.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of tobacco (dry) in lb./ac.

Treatment	M_1	M_2	M_3
Av. yield	3230	3214	3297

S E./mean = 118.2 lb./ac.

Crop :- Tobacco. **Ref :- Pb. 57(74).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To find out the best method of application of fertilizer for Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1957/15.3.1958. (iv) (a) N.A. (b) Transplanted. (c) 1 chk./ac. (d) 9"×1′. (e) 1 to 2. (v) Nil. (vi) N.—Tobacum. (vii) Irrigated. (viii) N.A. (ix) 5.89". (x) 8.6.1958 to 31.7.1958.

2. TREATMENTS :

Same as in expt. no. 54(115) on page 524.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 21.97′×8.98′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Height of plant, length and breadth of leaf and dry yield. (iv) (a) 1954—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2403 lb./ac. (ii) 228.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of tobacco (dry) in lb./ac.

Treatment	M_1	M_2	M_3
Av. yield	2388	2420	2401

S.E./mean = 102.3 lb./ac.

Crop :- Tobacco. **Ref :- Pb. 55(123).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To compare the effect of different manures on the yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1955/15.3.1956. (iv) (a) N.A. (b) Transplanted. (c) 1 chk./ac. (d) 9″×1′. (e) 1 to 2. (v) Nil. (vi) N—Tobacum. (vii) Irrigated. (viii) N.A. (ix) 8.29″. (x) 8.6.1956 to 31.7.1956.

2. TREATMENTS:

5 manurial treatments : M_1=*Guara* G.M., M_2=*Sannhemp* G.M, M_3=*Dhaincha* G.M., M_4=300 lb./ac. of N as F.Y.M. and M_5=100 lb./ac. of N as A/S during crop period. 50% at planting and 25% each at pre and post flowering time.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36.3′×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) (a) 1955—1956. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 25526 lb./ac. (ii) 2892.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tobacco (green leaf) in lb./ac.

Treatment	M_1	M_2	M_3	M_4	M_5
Av. yield	26788	23846	22665	24783	29548

S.E./mean = 1180.6 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb 56(58).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To compare the effect of different manures on the yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—G.M—Fallow—Tobacco. (b) Fallow. (c) Nil. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1956/15.3.1957. (iv) (a) N.A. (b) Transplanted. (c) 1 chk./marla, seedling sufficient for one acre. (d) 9″×1′. (e) One to two. (v) Nil. (vi) N—Tobacum. (vii) Irrigated. (viii) N.A. (ix) 13.46″. (x) 8.6.1957 to 31.7.1957.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 55(123) above.

4. GENERAL :

(i) Fair. (ii) Mild attack of aphid. (iii) Yield of dry leaf. (iv) (a) 1955—1956. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 1818 lb./ac. (ii) 168.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

Treatment	M_1	M_2	M_3	M_4	M_5
Av. yield	1525	1599	1815	1952	2204

S.E./mean = 68.8 lb./ac.

Crop :- Tobacco *(Rabi).* **Ref :- Pb. 55(128).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :- To study the effect of different sources and doses of N for Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanted. (c) 1 chk./ac. (d) 9" × 1'. (e) 1 to 2. (v) Nil. (vi) N. Tobacum. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

5 sources of N : S_1=A/N, S_2=A/S, S_3=A/C, S_4=Urea and S_5=C/N.

Sub-plot treatments :

4 doses of N : N_0=0, N_1=50, N_2=75 and N_3=100 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 22' × 9½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Green leaf yield. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 32760 lb./ac. (ii) (a) 6971 lb./ac. (b) 4039 lb./ac. (iii) Main effect of N, "control *vs.* other" and interaction S × N are highly significant. (iv) Av. yield of tobacco (green leaf) in lb./ac.

Control = 23262 lb /ac.

	S_1	S_2	S_3	S_4	S_5	Mean
N_1	31460	29351	25850	29363	35211	30247
N_2	31952	32843	38775	28084	37061	33743
N_3	38558	33523	33614	33064	42192	36190
Mean	33990	31906	32746	30170	38155	33393

S.E. of difference of two

1. S marginal means = 2545 lb./ac.
2. N marginal means = 1142 lb./ac.
3. N means at the same level of S = 2554 lb./ac.
4. S means at the same level of N = 3291 lb./ac.

Crop :- Tobacco *(Rabi).* **Ref :- Pb. 56(96).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To study the effect of different sources and doses of N for Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1956/15.3.1957. (iv) (a) N.A. (b) Transplanted. (c) 2 chks./ac. (d) 1' × 1'. (e) 1 to 2. (v) Nil. (vi) N—Rustica. (vii) Irrigated. (viii) N.A. (ix) 13.68". (x) 8.6.1957 to 31.7.1957.

2. TREATMENTS :

Main-plot treatments :

7 sources of N : S_1=A/S, S_2=A/N, S_3=A/C, S_4=C/N, S_5=Urea, S_6=C/A/N and S_7=A/S/N.

Sub-plot treatments :

4 doses of N : N_0=0, N_1=50, N_2=75 and N_3=100 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 22' × 9'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of dry and green leaf. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2849 lb./ac. (ii) (a) 382.3 lb./ac. (b) 456.2 lb./ac. (iii) Only "control *vs.* others" is highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

Control = 2069 lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	S_7	Mean
N_1	2475	2803	2629	3084	2687	2845	2820	2763
N_2	3060	2893	2920	3085	2529	2981	2810	2897
N_3	3067	3019	3019	3275	2650	2900	3070	3000
Mean	2867	2905	2856	3148	2622	2909	2900	2887

S.E. of difference o. two

1. S marginal means = 139.6 lb./ac.
2. N marginal means = 109.0 lb./ac.
3. N means at the same level of S = 288.5 lb./ac.
4. S means at the same level of N = 273.8 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 57(75).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To study the effect of different sources and doses of N for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil, (b) and (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1957/15.3.1958. (iv) (a) N.A. (b) Transplanted. (c) 3 chks./ac. (d) 1′×1′. (e) 1 to 2. (v) Nil. (vi) N—Rustica. (vii) Irrigated. (viii) N.A. (ix) 5.89″. (x) 1.6.1958 to 31.7.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(96) on page 528.

5. RESULTS :

(i) 3244 lb./ac. (ii) (a) 629.5 lb./ac. (a) 488.0 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

Control = 2253 lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	S_7	Mean
N_1	3011	2855	2671	3023	2880	3444	2672	2937
N_2	3181	3356	3292	3358	3120	3887	3364	3365
N_3	3410	3156	3545	4484	3494	3768	3147	3572
Mean	3201	3122	3169	3622	3165	3700	3061	3291

S.E. of difference of two

1. S marginal means = 229.9 lb /ac.
2. N marginal means = 116.7 lb./ac.
3. N means at the same level of S = 308.6 lb./ac.
4. S means at the same level of N = 341.1 lb./ac.

Crop :- Tobacco. **Ref :- Pb. 58(85).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :— To study the effect of different sources and doses of N for Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanted. (c) 2 chks./ac. (d) 1′×1′. (e) 1 to 2. (v) Nil. (vi) N—Rustica. (vii) Irrigated. (viii) N.A. (ix) 7.74″. (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(96) on page 528.

5. RESULTS :

(i) 1996 lb./ac. (ii) (a) 291.1 lb./ac. (b) 337.4 lb./ac. (iii) Main effect of N and 'control *vs.* others' are highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

Control = 1469 lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	S_7	Mean
N_1	2016	1887	1636	1721	1544	1857	1830	1784
N_2	2086	2062	2141	2217	1763	2032	2184	2069
N_3	2171	2237	2142	2507	2055	2122	2229	2209
Mean	2091	2062	1973	2148	1787	2004	2081	2021

S.E. of difference of two

1. S marginal means = 106.3 lb./ac.
2. N marginal means = 80.7 lb./ac.
3. N means at the same level of S = 213.4 lb./ac.
4. S means at the same level of N = 204.1 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 56(100).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :— To study the effect of different sources and doses of N for Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1956/15.3.1957. (iv) (a) N.A. (b) Transplanted. (c) 1 chks./ac. (d) 9″×1′. (e) 1 to 2. (v) Nil. (vi) N—Tobacum. (vii) Irrigated. (viii) N.A. (ix) 13.68″. (x) 8.6.1957 to 31.7.1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(96) on page 528.

5. RESULTS :

(i) 2126 lb./ac. (ii) (a) 411.1 lb./ac. (b) 349.0 lb./ac. (iii) Only 'control *vs.* others' is highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

Control = 1509 lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	S_7	Mean
N_1	1853	1775	2144	2303	1872	2023	1999	1996
N_2	2178	1945	2136	2347	2081	2149	2323	2166
N_3	2385	2193	2064	2544	2259	2358	2321	2303
Mean	2139	1971	2115	2398	2071	2177	2215	2155

S.E. of difference of two

1. S marginal means = 150.1 lb./ac.
2. N marginal means = 83.4 lb /ac.
3. N means at the same level of S = 220.7 lb./ac.
4. S means at the same level of N = 234.5 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 57(80).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :— To study the effect of different sources and doses of N for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1957/15.3.1958. (iv) (a) N.A. (b) Transplanted. (c) 1 chk./ac. (d) 9″×1′. (e) 1 to 2. (v) Nil. (vii) N—Tobacum. (vii) Irrigated. (viii) N.A. (ix) 5.89″. (x) 8.6.1958 to 31.7.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(96) on page 528.

5. RESULTS :

(i) 28229 lb./ac. (ii) (a) 4352 lb./ac. (b) 6368 lb./ac. (iii) Main effect of N is significant and 'control *vs.* others' is highly significant. (iv) Av. yield of tobacco (green leaf) in lb./ac.

Control = 18323 lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	S_7	Mean
N_1	23677	25133	29344	26477	23901	24909	29389	26119
N_2	25424	27933	30531	31158	33040	30307	28336	29533
N_3	25424	33802	30106	31584	28784	36176	27283	30451
Mean	24842	28956	29994	29740	28575	30464	28336	28701

S.E. of difference of two

1. S marginal means = 1589 lb./ac.
2. N marginal means = 1522 lb./ac.
3. N means at the same level of S = 4027 lb./ac.
4. S means at the same level of N = 3652 lb./ac.

Crop :- Tobacco. **Ref :- Pb. 58(86).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :— To study the effect of different sources and doses of N for Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1958/15.3.1959. (iv) (a) N.A. (b) Transplanted. (c) 1 chk/ac. (d) 9″×1′. (e) 1 to 2. (v) Nil. (vi) N—Tobacum. (vii) Irrigated. (viii) and (ix) N.A. (x) 8.6.1959 to 31.7.1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(96) on page 528.

5. RESULTS :

(i) 1690 lb./ac. (ii) (a) 260.8 lb./ac. (b) 267.3 lb./ac. (iii) Main effects of S and N are highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

Control = 1146 lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	S_7	Mean
N_1	1412	1520	1684	1830	1527	1666	1584	1603
N_2	1938	2056	1806	2114	1871	1669	1992	1921
N_3	1872	2159	2040	2226	2000	2069	2274	2091
Mean	1741	1912	1843	2057	1799	1801	1950	1872

S.E. of difference of two

1. S marginal means = 82.5 lb./ac.
2. N marginal means = 63.9 lb./ac.
3. N means at the same level of S = 169.0 lb./ac.
4. S means at the same level of N = 118 8 lb./ac.

Crop :- Tobacco. **Ref :- Pb. 58(84).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To find out the best manure for snuff Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 12.12.1958. (iv) (a) N.A. (b) Transplanted. (c) 1 chk./ac. (d) 1′×1′. (e) 1 to 2. (v) Nil. (vi) 370—culture. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

5 doses of manures : M_0=0, M_1=50 lb./ac. of P_2O_5, M_2=50 lb./ac. of P_2O_5+50 lb./ac. of K_2O, M_3=100 lb./ac. of P_2O_5 and M_4=100 lb./ac. of P_2O_5+100 lb./ac of K_2O.

Sub-plot treatments :

3 doses of N as A/S : N_1=100, N_2=150 and N_3=200 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 8.13′×21.33′. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Dry leaf yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3726 lb./ac. (ii) (a) 477.0 lb./ac. (b) 334.4 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean
N_1	3192	3667	3450	3316	3603	3446
N_2	3760	3804	3654	3660	3891	3754
N_3	3958	3972	4099	3860	4001	3978
Mean	3637	3814	3734	3612	3832	3726

S.E. of difference of two

1. M marginal means = 174.2 lb./ac.
2. N marginal means = 94.6 lb./ac.
3. N means at the same level of M = 211.5 lb./ac.
4. M means at the same level of N = 245.3 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 59(71).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To find out the best manure for snuff Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 4.12.1959. (iv) (a) N.A. (b) Transplanted. (c) 1 chk./ac. (d) 9″×1′. (e) 1 to 2. (v) Nil. (vi) T—370. (vii) Irrigated. (viii) N.A. (ix) 7.86″. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 51(84) on page 532.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 24′×8′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Dry leaf yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 5306 lb./ac. (ii) (a) 737 lb./ac. (b) 3521 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean
N_1	5298	5128	4980	5282	5538	5245
N_2	5449	5337	5219	5432	5818	5451
N_3	5401	5013	5041	5147	5509	5222
Mean	5383	5159	5080	5287	5622	5306

S.E. of difference of two

1. M marginal means = 269.1 lb./ac.
2. N marginal means = 995.9 lb./ac.
3. N means at the same level of M = 2226.8 lb./ac.
4. M means at the same level of N = 1838.1 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 59(63).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To see the effect of methods of application of different manures on the yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Gram. (c) Nil. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1959/15.3.1960. (iv) (a) 5 ploughings and 6 *sohaga*. (b) Transplanting. (c) 2 chks./ac. (d) 1′×1′. (e) 1 to 2. (v) Nil. (vi) N—Rustica. (vii) Irrigated. (viii) N.A. (ix) 7.86″. (x) 8.6.1960 to 31.7.1960.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 sources of N at 50 lb./ac. : S_1=Urea, S_2=C/A/N and S_3=A/S.

(2) 3 methods of application : M_1=Bands ; M_2=Plough furrow and M_3=Broadcast.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 20′×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Height of the plant, length and breadth of leaves and dry leaf yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2159 lb./ac. (ii) 255.9 lb./ac. (iii) Main effects of S and M are highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	M_1	M_2	M_3	Mean
S_1	2183	2254	2293	2243
S_2	2110	2272	2455	2279
S_3	1858	1948	2060	1955
Mean	2050	2158	2269	2159

S.E. of any marginal mean = 60.3 lb./ac.
S.E. of body of table = 104.5 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 59(74).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :—To see the effect of different methods of application of manures on the yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1959/16.2.1960. (iv) (a) N.A. (b) Transplanted. (c) 1 chk./ac. (d) 9"×1'. (e) 1 to 2. (v) Nil. (vi) N. Tobacum. (vii) Irrigated. (viii) N.A. (ix 7.86". (x) 8.6.1959 to 31.7.1959.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 sources of N at 100 lb./ac. : S_1=Urea, S_2=C/A/N and S_3=A/S.
(2) 3 methods of application : M_1=Band, M_2=Plough furrow and M_3=Broadcast.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii, 6. (iv) (a) N.A. (b) 20'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Dry leaf yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1827 lb./ac. (ii) 319 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	M_1	M_2	M_3	Mean
S_1	1925	1704	2017	1882
S_2	1904	1718	1951	1858
S_3	1636	1722	1865	1741
Mean	1822	1715	1944	1827

S.E. of any marginal mean = 75.2 lb./ac.
S.E. of body of table = 130.2 lb./ac.

Crop :- Tobacco *(Kharif)*. **Ref :- Pb. 58(13).**

Site :- Tobacco Sub-Stn., Gurgaon. **Type :- 'M'.**

Object :—To study the effect of different types of manures for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) Mid. Feb., 1958. (iv) (a) 4 ploughings and 2 *sohaga*. (b) Transplanted. (c) N.A. (d) 1′×6″. (e) N.A. (v) Nil. (vi) T—238 (medium). (vii) 2 toppling, 2 suckings, 6 hoeings and 2 weedings. (ix) 1.97″. (x) Mid. June, 1958.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 G.M. : G_1=*Guara* and G_2=25 C.L./ac. of F.Y.M.

(2) 3 doses of N as A/S : N_1=100, N_2=150 and N_3=200 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 60′×7½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Leaves size, height of plant etc. and yield of dry leaf. (iv) (a) 1958—1959. (b) and (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 4901 lb./ac. (ii) 1236 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	N_1	N_2	N_3	Mean
G_1	5573	4990	4806	5123
G_2	4453	4574	5012	4680
Mean	5013	4782	4909	4901

S.E. of N marginal mean = 437.1 lb./ac.
S.E. of G marginal mean = 356.8 lb./ac.
S.E. of body of table = 618.0 lb./ac.

Crop :- Tobacco *(Kharif)*. **Ref :- Pb. 59(1).**

Site :- Tobacco Sub-Stn., Gurgaon. **Type :- 'M'.**

Object :—To study the effect of different types of manures for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) Mid. Feb., 1959. (iv) (a) 4 ploughings and 2 *sohaga*. (b) Transplanted. (c) N.A. (d) 1′×6″. (e) N.A. (v) Nil. (vi) T—238(medium). (vii) Irrigated. (viii) 2 toppling, 2 sucking and 6 hoeings. (ix) 2.35″. (x) Mid. June, 1959.

2. TREATMENTS :

Same as in expt. no. 58(13) above.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 30′×7½′. (v) Nil. (vi) Yes.

4. GENERAL :

Same as in expt. no. 58(13) above.

5. RESULTS :

(i) 5130 lb./ac. (ii) 418.2 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	N_1	N_2	N_3	Mean
G_1	4404	5179	6098	5226
G_2	4162	4985	5953	5033
Mean	4283	5082	6026	5130

S.E. of N marginal mean = 147.9 lb./ac.
S.E. of G marginal mean = 120.7 lb./ac.
S.E. of body of table = 209.1 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 57(81).**

Site :- Millet Sub-Stn., Gurgaon. **Type :- 'M'.**

Object :—To study the effect of different fertilizers along with different methods of application on the yield of Tobacco crop.

1. BASAL CONDITIONS :

(i) (a) Cotton—Tobacco—Wheat. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 1st week of December, 1957. (iv) (a) 2 *sohaga* and 4 *desi hal.* (b) By hand. (c) 2.5 ozs./ac. (d) $1\frac{1}{2}' \times 1\frac{3}{4}'$. (e) N.A. (v) Nil. (vi) C—302. (vii) Irrigated. (viii) 4 weedings. (ix) N.A. (x) Last week of May, 1958.

2. TREATMENTS :

Main-plot treatments :
All combinations of (1) and (2)
(1) 2 basal treatments : T_1=*Guara* G.M. and T_2=30 C.L./ac. of F.Y.M. applied $1\frac{1}{2}$ months before planting.
(2) 3 doses of N as A/S : N_1=100, N_2=150 and N_3=200 lb./ac.
Sub-plot treatments :
2 methods of application : M_1=Plough-furrow *sohaga* and M_2=Broadcast-*sohaga*.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/192 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Dry leaf yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) N.A. (vii) Nil.

5. RESULTS :

(i) 4860 lb./ac. (ii) (a) 1734 lb./ac. (b) 435 lb./ac. (iii) Main effect of M alone is highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	N_1	N_2	N_3	Mean	M_1	M_2
T_1	4766	4949	5527	5081	5362	4800
T_2	4416	4535	4970	4640	4827	4454
Mean	4591	4742	5248	4860	5094	4627
M_1	4956	4915	5411			
M_2	4226	4570	5086			

S.E. of difference of two

1. T marginal means = 500 lb./ac.
2. N marginal means = 613 lb./ac.
3. M marginal means = 125 lb./ac.
4. M means at the same level of T = 177 lb./ac.
5. T means at the same level of M = 516 lb /ac.
6. M means at the same level of N = 217 lb./ac.
7. N means at the same level of M = 632 lb./ac.

S.E. of body of N×T table = 613 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 59(80).**

Site :- Millet Sub-Stn., Gurgaon. **Type :- 'M'.**

Object :—To compare the effects of different sources of N on the yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Cotton—Tobacco—Wheat. (b) Cotton. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 1st week of Dec./1 to 15.2.1960. (iv) (a) 5 ploughings with *desi* plough and levelling twice by *sohaga*. (b) By hand. (c) ½ lb./ac. (d) 15″×9″. (e) N.A. (v) Nil. (vi) C—302. (vii) Irrigated. (viii) 4 weedings. (ix) N.A. (x) Last week of May, 1960.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of manures : M_1=*Guara* as G.M. and M_2=30 C.L./ac. of F.Y.M. before planting.

(2) 3 doses of N : N_1=100, N_2=150 and N_3=200 lb./ac.

Sub-plot treatments :

4 sources of N : S_1=A/S, S_2=C/A/N, S_3=C/N and S_4=Urea.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/160 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Dry leaf yield. (iv) (a) 1957—1960. (b) No. (c) Nil. (v) (a) Ferozepur. (b) Nil. (vi) and (vii) N.A.

5. RESULTS :

(i) 3600 lb./ac. (ii) (a) 528 lb./ac. (b) 715 lb./ac. (iii) Main effects of M and S are highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	S_1	S_2	S_3	S_4	Mean	N_1	N_2	N_3
M_1	3979	4000	3445	3787	3803	3392	3928	4088
M_2	3541	3840	2859	3349	3397	3208	3392	3592
Mean	3760	3920	3152	3568	3600	3300	3660	3840
N_1	3280	3440	3088	3392				
N_2	3808	3936	3440	3456				
N_3	4192	4384	2928	3856				

S.E. of difference of two

1. M marginal means = 96.4 lb./ac.
2. N marginal means = 118.1 lb./ac.
3. S marginal means = 184.6 lb./ac.
4. S means at the same level of M = 261.1 lb./ac.
5. M means at the same level of S = 347.6 lb./ac.
6. S means at the same level of N = 319.8 lb./ac.
7. N means at the same level of S = 301.0 lb./ac.

S.E. of body of M×N table = 118.1 lb./ac.

Crop :- Tobacco. **Ref :- Pb. 54(107).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'MV'.**

Object :—To study the effect of F.Y.M. and different sources of N on different varieties of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fallow—Wheat—Fodder. (b) Fodder. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 28.2.1954. (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings. (ix) 7.09″. (x) 24.6.1954.

2. TREATMENTS:

Main-plot treatments :

3 varieties : V_1=T—59, V_2=T—337/2 and V_3=T—21.

Sub-plot treatments :

3 levels of N as F.Y.M. : F_0=0 and F_1=300 lb./ac.

Sub-sub-plot treatments :

All combinations of (1) and (2)+one control (S_0N_0)

(1) 2 levels of N : N_1=100 and N_2=200 lb./ac.

(2) 2 sources of N : S_1=A/S and S_2=C/N.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 2 sub-plots/main-plot and 5 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) and (b) 22′×9½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Plant height, number, length and breadth of leaves, green and dry leaf yield. (iv) (a) 1952—1954. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1974 lb./ac. (ii) (a) 773.5 lb./ac. (b) 343.5 lb./ac. (c) 193.7 lb./ac. (iii) Main effects of S, N, interactions V×F×S, "control *vs.* others" and "F × control *vs.* others" are highly significant. Interactions V×S and F×N are significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	S_0N_0	S_1N_1	S_1N_2	S_2N_1	S_2N_2	Mean	V_1	V_2	V_3
F_0	980	1708	2150	1916	2437	1838	2044	1682	1789
F_1	1590	2028	2166	2208	2557	2110	2160	1862	2307
Mean	1285	1868	2158	2062	2497	1974	2102	1772	2048
V_1	1276	1899	2234	2361	2740				
V_2	1172	1796	1925	1691	2276				
V_3	1407	1909	2315	2134	2475				

S.E. of difference of two

1. V marginal means = 244.61 lb./ac.
2. F marginal means = 88.70 lb./ac.
3. SN marginal means = 79.08 lb./ac.
4. V means at the same level of F = 267.65 lb./ac.
5. F means at the same level of V = 153.62 lb./ac.
6. F means at the same level of SN = 133.69 lb./ac.
7. SN means at the same level of F = 111.85 lb./ac.
8. SN means at the same level of V = 136.98 lb./ac.
9. V means at the same level of SN = 273.58 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 59(68).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'MV'.**

Object :—To study the effect of different manures on different varieties of Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 15.12.1959. (iv) (a) N.A. (b) Transplanting. (c) 1 chk/ac. (d) 9″×1″. (e) 1 to 2. (v) 2 C.L./ac. of F.Y.M. and 20 lb./ac. of N as C/A/N. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.86″. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 doses of gypsum : G_0=0 and G_1=8 tons/ac.

Sub-plot treatments :

5 doses of P_2O_5 as Super : P_0=0, P_1=50, P_2=100, P_3=150 and P_4=200 lb./ac.

Sub-sub-plot treatments :

2 varieties : V_1=C—302 and V_2=T—238.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 5 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 20′×2′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. Dry leaf yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 561.8 lb /ac. (ii) (a) 154.0 lb./ac. (b) 109.3 lb./ac. (c) 196.7 lb./ac. (iii) Only main effects of P and V are highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean	V_1	V_2
G_0	526	516	644	625	534	569	393	745
G_1	505	501	607	553	609	555	339	771
Mean	515	508	625	589	571	562	366	758
V_1	310	360	406	370	384			
V_2	721	657	845	808	759			

S.E. of difference of two

1. G marginal means = 30.8 lb./ac.
2. P marginal means = 34.6 lb./ac.
3. V marginal means = 39.3 lb./ac.
4. P means at the same level of G = 48.9 lb./ac.
5. G means at the same level of P = 53.5 lb./ac.
6. V means at the same level of G = 55.6 lb./ac.
7. G means at the same level of V = 50.0 lb./ac.
8. V means at the same level of P = 88.0 lb./ac.
9. P means at the same level of V = 71.2 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 57(79).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'C'.**

Object :— To study the effect of piercing on Tobacco crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanted. (c) 2 chks/ac. (d) 1′×1′. (e) 1 to 2. (v) Nil. (vi) N—Rustica. (vii) Irrigated. (viii) N.A. (ix) 5.89″. (x) N.A.

2. TREATMENTS :

2 piercing treatments : P_0=No piercing and P_1=Piercing at the point of growth of the plant by 6″ long needle.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 22′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Dry leaves yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2712 lb./ac. (ii) 270.1 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of tobacco (dry) in lb./ac.

Treatment	P_0	P_1
Av. yield	2693	2732

S.E./mean = 95.5 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 58(87).**

Site :- Agri. Expt. Farm, Ferozepur. **Type :- 'C'.**

Object :— To find out the best spacing for planting snuff Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanted. (c) 1 chk/ac. (d) As per treatments. (e) 1 to 2. (v) 50 lb./ac. of P_2O_5+50 lb./ac of K_2O+50 lb./ac. of N was applied before planting. (vi) T—370. (vii) Irrigated. (viii) N.A. (ix) 7.74". (x) N.A.

2. TREATMENTS :

5 spacings : S_1=2.5'×2', S_2=2.5'×1.5' S_3=2'×2' S_4=2'×1.5' and S_5=1.5'×1.5'.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 30'×21'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Dry leaves yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3987 lb./ac. (ii) 303.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

Treatment	S_1	S_2	S_3	S_4	S_5
Av. yield	3498	3838	3971	4011	4619

S.E./mean = 135.3 lb./ac.

Crop :- Tobocco *(Rabi)*. **Ref :- Pb. 59(70).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'C'.**

Object :— To find out the best spacing for planting snuff Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 4.12.1959. (iv) (a) N.A. (b) Transplanted. (c) 1 chk./ac. (d) As per treatments. (e) 1 to 2. (v) 20 C.L./ac. of F.Y.M. and 200 lb /ac. of N during growth period. (vi) T—370. (vii) Irrigated. (viii) N.A. (ix) 7.86". (x) N.A.

2. TREATMENTS :

7 spacings : S_1=2½'×2', S_2=2½'×1½', S_3=2'×2', S_4=2'×1½', S_5=1½'×1½', S_6=2'×1' and S_7=2½'×1'.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 24'×20'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Dry leaf yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 5284 lb./ac. (ii) 366.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	6026	5944	5316	5141	4661	4857	5042

S.E./mean = 163.9 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 57(76).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CV'.**

Object :— To study the effect of piercing on suckers of different varieties of Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (d) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanted. (c) 1 chk./ac. (d) 9″×1″. (e) One. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 5.89″. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1=17 and V_2=59.

Sub-plot treatments :

2 piercing treatments : P_0=No piercing and P_1=Piercing by 6″ long needle at the point of growth of plant.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 22′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Dry leaf yield. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1843 lb./ac. (ii) (a) 174.3 lb./ac. (b) 161.1 lb./ac. (iii) Only P effect is significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	P_0	P_1	Mean
V_1	1994	1925	1960
V_2	1905	1547	1726
Mean	1950	1736	1843

S.E. of difference of two

1. V marginal means = 77.9 lb./ac.
2. P marginal means = 72.0 lb./ac.
3. P means at the same level of V = 101.9 lb./ac.
4. V means at the same level of P = 106.1 lb./ac.

Crop :- Toacco *(Rabi)*. **Ref :- Pb. 58(89).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CV'.**

Object :—To study the effect of piercing on the yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanted. (c) 2 chks/ac. (d) 1′×1′. (e) 1 to 2 seedlings. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.74″. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 varieties : V_1=59, V_2=59×165 and V_3=17.

Sub-plot treatments :

2 piercing treatments : P_0=No piercing and P_1=Piercing by 6″ long needle at the point of growth of plant.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 21.97′×8.98′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Dry leaf yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1916 lb./ac. (ii) (a) 340.0 lb./ac. (b) 232.0 lb./ac. (iii) Only V effect is significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	V_1	V_2	V_3	Mean
P_0	1551	2049	2078	1893
P_1	1738	2219	1859	1939
Mean	1645	2134	1968	1916

S.E. of difference of two

1. V marginal means = 152.1 lb./ac.
2. P marginal means = 84.7 lb./ac.
3. P means at the same level of V = 146.7 lb./ac.
4. V means at the same level of P = 184.1 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb, 59(76).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CV'.**

Object :—To reduce the suckering in Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1959/16.2.1960. (iv) (a) N.A. (b) Transplanted. (c) 1 chk./ac. (d) 9″×1′. (e) 1 to 2. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.86″. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 varieties : V_1=59, V_2=59×165, V_3=399×17 and V_4=17.

(2) 2 piercing treatments : P_0=No piercing and P_1=Piercing by 6″ long iron needle at the growth point of stalk.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 20′×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Dry leaf yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 294 lb./ac. (ii) 76.1 lb./ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	V_1	V_2	V_3	V_4	Mean
P_0	282	277	269	361	297
P_1	249	290	219	403	290
Mean	266	283	244	382	294

S.E. of P marginal mean = 15.5 lb./ac.
S.E. of V marginal mean = 22.0 lb./ac.
S.E. of body of table = 31.1 lb./ac.

Crop :- Tobacco *(Rabi).* **Ref :- Pb. 58(83).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CV'.**

Object :—To reduce the suckering in Tobacco crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanted. (c) 1 chk./ac. (d) 9″×1′. (e) 1 to 2. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.74″. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V_1=238 and V_2=218×192.

(2) 2 piercing treatments : P_0=No piercing and P_1=Piercing by a long needle at the growth point of stalk.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 22′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Dry leaf yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3439 lb./ac. (ii) 290.4 lb./ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	V_1	V_2	Mean
P_0	2934	4001	3468
P_1	2921	3901	3411
Mean	2928	3951	3439

S.E. of any marginal mean = 91.8 lb./ac.
S.E. of body of table = 129.9 lb./ac.

Crop :- Tobacco *(Rabi).* **Ref :- Pb. 59(64).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CV'.**

Object :—To reduce the suckering in Tobacco crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1959/27.2.1966. (iv) (a) N.A. (b) Transplanted. (c) 2 chks/ac. (d) 1′×1′. (e) 1 to 2. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.86″. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V_1=238 and V_2=218×192.

(2) 2 piercing treatments : P_0=No piercing and P_1=Piercing done at the flowering time by a long needle at the growth point to reduce the suckering.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 20′×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Green and dry leaves yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3356 lb./ac. (ii) 451.9 lb./ac. (iii) Main effect of P and interaction V×P are significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	V_1	V_2	Mean
P_0	3272	3958	3615
P_1	3259	2933	3096
Mean	3266	3445	3356

S.E. of any marginal mean = 130.5 lb./ac.
S.E. of body of table = 184.5 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 59(67).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CV'.**

Object :—To study the effect of direction of planting on defferent varieties of Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 4.12.1959/3.3.1960. (iv) (a) N.A. (b) Transplanted. (c) 2 chks./ac. (d) 1′×1′. (e) 1 to 2. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.86″. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

4 directions of planting : D_1=North, D_2=South, D_3=East and D_4=West.

Sub-plot treatments :

2 varieties : V_1=C—302 and V_2=T—238.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 20′×2′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of tobacco. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 745 lb./ac. (ii) (a) 168 2 lb /ac. (b) 188.6 lb./ac. (iii) Main effect of D is significant and main effect of V is highly significant. (lv) Av. yield of tobacco (dry) in lb./ac.

	D_1	D_2	D_3	D_4	Mean
V_1	677	533	505	795	628
V_2	889	841	762	956	862
Mean	783	687	634	876	745

S.E. of difference of two

1. D marginal means = 75.2 lb./ac.
2. V marginal means = 59.6 lb./ac.
3. V means at the same level of D = 119.3 lb./ac.
4. D means at the same level of V = 113.0 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 55(129).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CM'.**

Object :—To study the effect of bulky manure, P, N and different spacings on the yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Guara* and Fallow. (c) Nil. (ii) (a) Clay loam to sandy loam. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanting. (c) 1 chk./ac. (d) As per treatments. (e) 1 to 2. (v) Nil. (vi) N. *Tabaccum.* (vii) Irrigated. (viii) N.A. (ix) 8.29". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 2 bulky manures : B_1=*Guara* G.M. and B_2=30 C.L./ac. of F.Y.M.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.

Sub-plot treatments :

3 levels of N as A/S : N_1=50, N_2=100 and N_3=150 lb./ac.

Sub-Sub-plot treatments :

2 methods of application of main-plot treatments : M_1=In furrows followed by *sohaga* and M_2= Broadcast followed by *sohaga.*

Sub-Sub-Sub-plot treatments :

2 spacings : S_1=1'×4½" and S_2=1'×9".

F.Y.M. applied 1½ months before planting, Super applied 1 week before planting, N applied ½ before planting and ½ at flowering.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 3 sub-plots/main-plot ; 2 sub-sub-plots/sub-plot and 2 sub-sub-sub-plots/sub-sub-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 9'×11'. (v) N.A. (v) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 45119 lb./ac. (ii) (a) 14696.0 lb./ac. (b) 3807.2 lb./ac. (c) 7774.8 lb./ac. (d) 6476.8 lb./ac. (iii) Main effects of N, S, are highly significant. Interactions P×M and B×S are significant. (iv) Av. yield of Tobacco (green leaf) in lb./ac.

	M_1	M_2	N_1	N_2	N_3	P_0	P_1	S_1	S_2	Mean
B_1	45601	43756	35995	47160	50881	45368	43989	46575	42782	44678
B_2	45248	45874	40113	48031	48531	44439	46682	49078	42044	45561
Mean	45424	44815	38054	47595	49709	44904	45335	47826	42412	45119
S_1	48573	47081	39805	50050	53625	48305	47349			
S_2	42276	42549	36303	45141	45794	41503	43322			
P_0	46288	43520	37888	42894	48930					
P_1	44561	46110	38220	47297	50489					
N_1	37758	38350								
N_2	47556	47635								
N_3	50959	48460								

S.E. of difference of two

1. B or P marginal means = 1731.9 lb./ac.
2. N marginal means = 1992.9 lb./ac.
3. M marginal means = 924.0 lb./ac.
4. S marginal means = 763.3 lb./ac.
5. N means at the same level of B or P = 5636.8 lb./ac.
6. B or P means at the same level of N = 12405.8 lb./ac.
7. M means at the same level of B or P = 3165.1 lb /ac.
8. B or P means at the same level of M = 2543.8 lb./ac.
9. M means at the same level of N = 528.3 lb./ac.
10. N means at the same level of M = 3115.2 lb./ac.
11. S means at the same level B or P = 2644.0 lb./ac.
12. B or P means at the same level of S = 2495.3 lb./ac.
13. S means at the same level of N = 1322.1 lb./ac.
14. N means at the same level of S = 2927.8 lb./ac.
15. S means at the same level of M = 1079.4 lb./ac.
16. M means at the same level of S = 1679 6 lb./ac.

S.E. of body of B×P table = 1414.2 lb./ac.

Crop :- Tobacco. **Ref :- Pb. 56(97).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CM'.**

Object :—To study the effect of bulky manure, P, N and different spacings on the yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Guara* as G.M. (c) Nil. (ii) (a) Clay loam to sandy loam. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanting. (c) 1 chk. ac. (d) As per treatments. (e) 1 to 2. (v) Nil. (vi) N. *Tobaccum*. (vii) Irrigated. (viii) N.A. (ix) 13.68". (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 55(129) on page 545.

4. GENERAL :

(i) Fair. (ii) Nil. ((iii) Dry leaf yield. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2538 lb./ac. (ii) (a) 743.6 lb./ac. (b) 704.0 lb./ac. (c) 470.8 lb./ac. (d) 466.4 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	N_1	N_2	N_3	B_1	B_2	M_1	M_2	S_1	S_2	Mean
P_0	2302	2631	2742	2583	2534	2625	2492	2613	2504	2558
P_1	2120	2595	2842	2368	2670	2508	2530	2546	2493	2598
Mean	2211	2613	2792	2475	2602	2566	2511	2579	2498	2538
S_1	2203	2693	2842	2529	2630	2627	2532			
S_2	2219	2534	2742	2423	2574	2506	2491			
M_1	2233	2649	2817	2499	2633					
M_2	2189	2577	2767	2451	2570					
B_1	2147	2583	2695							
B_2	2275	2642	2888							

S.E. of difference of two

1. B or P marginal means	= 88.0 lb./ac.	10. N means at the same level of M	= 118.8 lb./ac.
2. N marginal means	= 202.4 lb./ac.	11. S means at the same level of B or P	= 189.2 lb./ac.
3. M marginal means	= 57.2 lb./ac.	12. B or P means at the same level of S	= 101.2 lb /ac.
4. S marginal means	= 52.8 lb./ac.	13. S means at the same level of N	= 52.8 lb./ac.
5. N means at the same level of B or P	= 286.0 lb./ac.	14. N means ar the same level of S	= 123.2 lb./ac.
6. B or P means at the same level of N	= 145.2 lb./ac.	15. S means at the same level of M	= 79.2 lb./ac.
7. M means at same level of B or P	= 193.6 lb./ac.	16. M means at the same level of S	= 78.1 lb./ac.
8. B or P means at the same level of M	= 105.6 lb./ac.	S.E. of body of B×P table	= 88.0 lb./ac.
9. M means at the same level of N	= 96.8 lb./ac.		

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 58(90).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CM'.**

Object :—To study the effect of N, P and spacing under different methods of placements.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Guara*—Fallow. (c) Nil. (ii) (a) Rich soil. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanted. (c) 1 chk. ac. (d) As per treatments. (e) 1 to 2. (v) Nil. (vi) N—*Tabacum*. (vii) Irrigated. (viii) N.A. (ix) 7.74". (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(129) on page 545.

5. RESULTS :

(i) 36396 lb./ac. (ii) (a) 12022 lb./ac. (b) 6335 lb./ac. (c) 1416 lb./ac. (d) 10851 lb./ac. (iii) Main effects of N, M, S and interactions B×N and main-plot×M are highly significant. (iv) Av. yield of tobacco (green leaf) in lb./ac.

	M_1	M_2	Mean	B_1	B_2	P_0	P_1
N_1	29075	29926	29500	29299	29702	29747	29254
N_2	37968	37811	37890	35728	40051	39267	36512
N_3	41440	42157	41798	44016	39581	42314	41283
Mean	36161	36631	36396	36348	36445	37109	35683
S_1	38483	38793	38638				
S_2	33840	34470	34155				

	P_0	P_1	Mean
B_1	37648	35011	36348
B_2	36535	36355	36445
Mean	37109	35683	36396

S.E. of difference of two

1. B or P marginal means = 1416.8 lb./ac.
2. N marginal means = 914.4 lb./ac.
3. M marginal means = 166.9 lb./ac.
4. S marginal means = 1280.0 lb./ac.
5. N means at the same level of B or P = 2110.1 lb./ac.
6. B or P means at the same level of N = 3534.7 lb./ac.
7. M means at the same level of N = 817.6 lb./ac.
8. N means at the same level of M = 2649.9 lb./ac.
9. S means at the same level of M = 6272.0 lb./ac.
10. M means at the same level of S = 4471.0 lb./ac.

S.E. of body of B×P table = 1416.8 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 56(94).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CM'.**

Object :—To study the effect of continuous cropping of Tobacco on its yield and quality.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) 300 lb./ac. of F.Y.M. for potato. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1956 to 15.2.1957/16.2.1957 to 15.3.1957. (iv) (a) N.A. (b) Transplanted. (c) 1 chk./ac. (d) 9″×1′. (e) One seedling. (v) Nil. (vi) N—Tabacum. (vii) Irrigated. (viii) N.A. (ix) 13.68″. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N as C/A/N : N_0=0 and N_1=100 lb./ac.

(2) 2 crop rotations : R_1=Tobacco—Fallow—Tobacco and R_2=Tobacco—Potato—Tobacco.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 30′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Green leaf yield. (iv) (a) 1956—1959. (b) Yes. (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 8240 lb./ac. (ii) 2091 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of tobacco green leaf) in lb./ac.

	R_1	R_2	Mean
N_0	5711	4646	5178
N_1	12100	10503	11302
Mean	8906	7574	8240

S.E. of any marginal mean = 853.6 lb./ac.
S.E. of body of table = 1207.3 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 57(77).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CM'.**

Objeet :— To study the effect of continuous cropping on the yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) 300 lb./ac. of F.Y.M. to potato. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1957 to 15.2.1958/16.2.1958 to 15.3.1958. (iv) (a) N.A. (b) Transplanting. (c) 1 chk./ac. (d) 9″×1′. (e) One. (v) Nil. (vi) N—*Tobacum*. (vii) Irrigated, (viii) N.A. (ix) 5.89″. (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as expt. no. 56(94) on page 547.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1956—1959. (b) Yes. (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 28801 lb./ac. (ii) 3095.7 lb /ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of tobacco (green leaf) in lb./ac.

	R_1	R_2	Mean
N_0	24640	23520	24080
N_1	33645	33398	33522
Mean	29142	28459	28801

S.E. of any marginal mean = 1263.8 lb./ac.
S.E. of body of table = 1787.4 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 58(88).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CM'.**

Object :— To study the effect of continuous cropping of Tobacco on its yield and quality.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) 300 lb./ac. of F.Y.M. to potato. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1958 to 15.2.1959/16.2.1959 to 15.3.1959. (iv) (a) N.A. (b) Transplanting. (c) 1 chk./ac. (d) 9″×1″. (e) 1 to 2. (vi) Nil. (vi) N—*Tobacum*. (vii) Irrigated. (viii) N.A. (ix) 7.74″. (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(94) on page 547.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1956—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) (a) 19469 lb./ac. (b) 2717.3 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of tobacco (green leaf) in lb./ac.

	R_1	R_2	Mean
N_0	17134	13165	15150
N_1	24732	22845	23788
Mean	20933	18005	19469

S.E. of any marginal mean = 1109.3 lb./ac.
S.E. of body of table = 1568.9 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 59(72).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CM'.**

Object :—To study the effect of continuous cropping of Tobacco on its yield and quality.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) 300 lb./ac. of F.Y.M. to potato. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1959 to 15.2.1960/16.2.1960 to 15.3.1960. (iv) (a) N.A. (b) Transplanting. (c) 1 chk./ac. (d) 9″×1′. (e) 1 to 2. (v) Nil. (vi) N. *Tobacum*. (vii) Irrigated. (viii) N.A. (ix) 7.86″. (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(94) on page 547.

4. GENERAL :

(i) Unsatisfactory growth due to rains at the curing time. (ii) N.A. (iii) Green leaves yield. (iv) (a) 1956—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 16358 lb./ac. (ii) 2228 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of green leaves in lb./ac.

	R_1	R_2	Mean
N_0	14665	13889	14277
N_1	18778	18100	18439
Mean	16722	15994	16358

S.E. of any marginal mean = 909.6 lb./ac.
S.E. of body of table = 1286.4 lb./ac.

Crop :- Tobacco *(Kharif)*. **Ref :- Pb. 54(109).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CMV'.**

Object :—To find out the manurial needs of Tobacco with the increase in plant number and advance in planting date.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fallow—Wheat—Fodder. (b) Fodder. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) 30 C.L./ac. of F.Y.M. from 10.2.1954 to 13.2.1954. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings. (ix) 7.04". (x) 10, 11 and 24.6.1954.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=100 and N_2=150 lb./ac.

(2) 3 spacings : S_1=1'×4½", S_2=1'×6" and S_3=1'×9".

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 varieties : V_1=T—21, V_2=T—23 and V_3=337/2.

(2) 3 dates of planting : D_1=15.2.1954, D_2=1.3.1954 and D_3=15.3.1954.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) and (b) 15'×7'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Plant length, length and breath of leaf, green and dry plants weight. (iv) (a) 1954—1956. (b) No. (c) N.A. (v) and (vi) Nil. (vii) Other tables—N.A.

5. RESULTS :

(i) 1478 lb./ac. (ii) (a) 487.6 lb./ac. (b) 225.4 lb./ac. (iii) Main effects of N, S, V and D are significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	V_1	V_2	V_3	Mean	D_1	D_2	D_3
N_0	1236	1029	991	1085	1139	901	1216
N_1	1886	1424	1477	1596	1656	1371	1760
N_2	1993	1667	1600	1753	1806	1530	1923
Mean	1705	1373	1356	1478	1534	1267	1633
S_1	1702	1413	1482	1532	1701	1294	1622
S_2	1849	1384	1291	1508	1576	1242	1705
S_3	1563	1323	1296	1394	1325	1286	1572

S.E. of difference of two

1. N or S marginal means = 93.8 lb./ac.
2. V or D marginal means = 43.4 lb./ac.
3. V or D means at the same level of N or S = 75.1 lb./ac.
4. N or S means at the same level of V or D = 112.1 lb./ac.

Crop :- Tobacco *(Kharif)*. **Ref :- Pb. 54(114).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CMV'.**

Object :—To find out the manurial needs of Tobacco with the increase in plant number and advance in planting date.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fallow—Wheat—Fodder. (b) Fodder. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) 30 C.L./ac. of F.Y.M. broadcast on 10.2.1954 to 13.2.1954. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings. (ix) 7.09". (x) 15.5.1955, 26.5.1955 and 10.6.1955.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 varieties : V_1=26, V_2=218 and V_3=238.

(2) 3 dates of planting : D_1=15.2.1954, D_2=1.3.1954 and D_3=15.3.1954.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=100 and N_2=150 lb./ac.

(2) 3 spacings : S_1=1'×4½", S_2=1'×6" and S_3=1'×9".

3. DESIGN and 4. GENERAL :

Same as in expt. no. 54(109) on page 550.

5. RESULTS :

(i) 1810 lb./ac. (ii) (a) 841.7 lb./ac. (b) 444.7 lb./ac. (iii) Main effects of V and N are highly significant. (iv) Av. yield of tobacco (dry) in lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2	S_3
V_1	682	1610	1854	1382	1505	1368	1273
V_2	1270	2740	2857	2289	2341	2360	2165
V_3	939	1993	2348	1760	1833	1741	1707
Mean	964	2114	2353	1810	1893	1823	1715
D_1	1023	2203	2302	1843	2002	1925	1602
D_2	834	2094	2446	1791	1818	1824	1732
D_3	1034	2046	2310	1797	1859	1720	1811

S.E. of difference of two

1. V or D marginal means = 162.0 lb./ac.
2. N or S marginal means = 85.6 lb./ac.
3. N or S means at the same level of V or D = 148.2 lb./ac.
4. V or D means at the same level of N or S = 202.2 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 55(125).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CMV'.**

Object :—To find out manurial needs of Tobacco crop with the increase in the number of plants and advance in the date of planting.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1955 to 15.2.1956./As per treatments. (iv) (a) N.A. (b) Transplanting. (c) 1 chk./ac. (d) As per treatments. (e) 1 to 2. (v) Nil. (vi) N—Tabacum. (vii) Irrigated. (viii) N.A. (ix) 8.29". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 varieties : V_1=T—21, V_2=T—337/2 and V_3=T—337/41.

(2) 3 dates of planting : D_1=15.2.1956, D_2=1.3.1956 and D_3=15.3.1956.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S N_0=0, N_1=100 and N_2=150 lb./ac.

(2) 3 spacings : S_1=1′×4½″, S_2=1′×6″ and S_3=1′×9″.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication and 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 15′×7′. (v) N.A. (vii) Yes.

4. GENERAL :

(i) Normal. (ii) Hail storm in March affected the crops adversely. (iii) Green leaf yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 21113 lb./ac. (ii) (a) 13760 lb./ac. (b) 6523 lb./ac. (iii) Main effect of N is highly significant and main effect of D is significant. (iv) Av. yield of tobacco (green leaf) in lb./ac.

	D_1	D_2	D_3	N_0	N_1	N_2	S_1	S_2	S_3	Mean
V_1	21302	26611	22870	14874	27597	28311	24461	22669	23653	23594
V_2	17763	25119	19488	12522	23834	27014	21123	22758	19488	21123
V_3	15187	27059	13619	12566	20227	23072	19869	19219	16778	18622
Mean	18084	26596	18659	13321	23886	26132	21818	21549	19973	21113
S_1	19018	28896	17539	14224	24931	26298				
S_2	18592	27037	19018	13216	24842	26588				
S_3	16643	23856	19421	12522	21885	25511				
N_0	10102	18234	11626							
N_1	19734	28963	22962							
N_2	24416	32591	21390							

S.E. of difference of two

1.	V or D marginal means	= 2648.1 lb./ac.
2.	N or S marginal means	= 1255.3 lb./ac.
3.	N or S means at the same level of V or D	= 2174.3 lb./ac.
4.	V or D means at the same level of N or S	= 3188.2 lb./ac.
	S.E. of body of V×D table	= 3243.3 lb./ac.
	S.E. of body of N×S table	= 1537.5 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 55(130).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CMV'.**

Object :—To find out the manurial needs of different varieties of Tobacco.

1. BASAL CONDITIONS :

(i) (a to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) 16.11.1955 to 15.2.1956/As per treatments. (iv) (a) N.A. (b) Transplanting. (c) 2 chks./ac. (d) As per treatments. (e) 1 to 2. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 8.29″. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 varieties : V_1=T—26, V_2=T—218 and V_3=T—238.

2) 3 dates of planting : D_1=15.2.1956, D_2=1.3.1956 and D_3=15.3.1956.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=100 and N_2=150 lb./ac.

(2) 3 spacings : S_1=1′×4½″, S_2=1′×6″ and S_3=1′×9″.

3. DESIGN :

Same as in expt. no. 55(125) on page 551.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 25559 lb./ac. (ii) (a) 5143 lb./ac. (b) 3266 lb./ac. (iii) Main effects of V, D, N, S and interaction S×N are highly significant. Interaction D×N is significant. (iv) Av. yield of tobacco (green leaf) in lb./ac.

	D_1	D_2	D_3	N_0	N_1	N_2	S_1	S_2	S_3	Mean
V_1	25491	20178	22863	17309	25318	25906	23854	22679	21999	22844
V_2	33281	31183	24615	23117	32416	33546	30573	30538	27968	29693
V_3	27496	23831	21089	18461	26620	27334	24832	24732	22852	24139
Mean	28756	25064	22856	19629	28118	28929	26420	25983	24273	25559
S_1	28475	26539	24246	20063	27738	31460				
S_2	30135	25329	22483	20201	29996	27749				
S_3	27657	23324	21838	18622	26620	27576				
N_0	21987	19832	17067							
N_1	30861	27738	25756							
N_2	33419	27623	25744							

S.E. of difference of two

1. V or D marginal means	= 989.9 lb./ac.
2. N or S marginal means	= 630.7 lb./ac.
3. N or S means at the same level of V or D	= 1089.0 lb./ac.
4. V or D means at the same level of N or S	= 2304.0 lb./ac.
S E. of body of V×D table	= 1212.4 lb./ac.
S E. of body of N×S table	= 770.0 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 59(66).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CMV'.**

Object :—To study the effect of manures and spacings on different varieties of Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) N.A./26.2.1960. (iv) (a) N.A. (b) Transplanted. (c) 2 chks./ac. (d) As per treatments. (e) 1 to 2. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.86″. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 levels of N as C/A/N : N_1=100, N_2=150 and N_3=200 lb./ac.

Sub-plot treatments :

4 spacings : S_1=1′×1′, S_2=1½′×1, S_3=1½′×1′ and S_4=2′×1′.

Sub-sub-plot treatments :

3 varieties : V_1=S—131, V_2=C—302 and V_3=T—238.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 4 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/1089 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Dry leaf yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2828 lb./ac. (ii) (a) 1010.0 lb./ac. (b) 538.0 lb./ac. (c) 687.0 lb./ac. (iii) Main effects of S and V are highly significant. (iv) Av. yield of tobacco in lb./ac.

	S_1	S_2	S_3	S_4	Mean	V_1	V_2	V_3
N_1	2974	2932	2648	2335	2722	2975	2794	2397
N_2	3043	3062	2659	2176	2735	3005	2618	2581
N_3	3367	3351	2779	2615	3028	3388	2895	2800
Mean	3128	3115	2695	2375	2828	3122	2769	2593
V_1	3641	3306	2918	2625				
V_2	2943	3014	2655	2467				
V_3	2800	3026	2513	2033				

S.E. of difference of two

1. N marginal means = 168.3 lb./ac.
2. S marginal means = 103.2 lb./ac.
3. V marginal means = 114.6 lb./ac.
4. S means at the same level of N = 196.0 lb./ac.
5. N means at the same level of S = 251.0 lb./ac.
6. V means at the same level of N = 217.0 lb./ac.
7. N means at the same level of V = 256 0 lb./ac.
8. V means at the same level of S = 251.0 lb./ac.
9. S means at the same level of V = 234 0 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 59(75).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CMV'.**

Object :— To study the effect of manures and spacings on different varieties of Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) Dec., 1959/1.2.1960. (iv) (a) N.A. (b) Transplanted. (c) 1 chks/ac. (d) As per treatments. (e) 1 to 2. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.86". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 levels of N : N_1=100, N_2=150 and N_3=200 lb./ac.

Sub-plot treatments :

4 spacings : S_1=1' × 1', S_2=1½' × 1', S_3=1½' × 1' and S_4=2' × 1'.

Sub-sub-plot treatments :

3 varieties : V_1=59 × 165, V_2=399 × 17 and V_3=17.

3. DESIGN :

Same as in expt. no. 59(66) on page 553.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of tobacco. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1976 lb./ac. (ii) (a) 304.1 lb./ac. (b) 571.6 lb./ac. (c) 403.6 lb./ac. (iii) Main effects of S and V are highly significant and interaction N × S is significant. (iv) Av. yield of tobacco in lb./ac.

	S_1	S_2	S_3	S_4	Mean	V_1	V_2	V_3
N_1	1948	2057	1912	1718	1909	1992	1683	2051
N_2	2075	2045	1912	1924	1989	2024	1851	2092
N_3	2033	2232	2009	1851	2031	2110	1833	2151
Mean	2019	2111	1944	1831	1976	2042	1789	2098
V_1	2045	2190	2081	1851				
V_2	1833	1984	1761	1579				
V_3	2178	2160	1990	2063				

S.E. of difference of two

1. N marginal means = 50.6 lb./ac.
2. S marginal means = 34.8 lb./ac.
3. V marginal means = 67.3 lb./ac.
4. S means at the same level of N = 190.5 lb./ac.
5. N means at the same level of S = 72.8 lb./ac.
6. V means at the same level of N = 116.5 lb./ac.
7. N means at the same level of V = 107.8 lb./ac.
8. V means at the same level of S = 134.5 lb./ac.
9. S means at the same level of V = 115.1 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 59(69).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'CMV'.**

Object :— To find out the most suitable variety for early or normal planting along with economical dose of N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) Transplanted. (c) 1 chks/ac. (d) 9″×1′. (e) 1 to 2. (v) 20 C.L./ac. of F.Y.M. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.86″. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 dates of planting : D_1=4.12.1959 and D_2=4.3.1960.

Sub-plot treatments :

3 levels of N as A/S : N_1=100, N_2=150 and N_3=200 lb./ac.

Sub-sub-plot treatments :

8 varieties : V_1=C - 320×T—192, V_2=T—131×T—192, V_3=T—192×T—238, V_4=C_2, V_5=C_6, V_6=S—131, V_7=T—238 and V_8=C—302.

3. DESIGN :

(i) Split-plot. (ii) 2 main-plots/replication ; 3 sub-plots/main-plot and 8 sub-sub-plots/sub-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 24′×2′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of green leaf. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 20263 lb./ac. (ii) (a) 13104 lb./ac. (b) 1151.4 lb./ac. (c) 2878.4 lb./ac. (iii) Main effects of D, M, V and interactions D×N and D×V are highly significant. (iv) Av. yield of tobacco (green leaf) in lb./ac.

	D_1	D_2	Mean	N_1	N_2	N_3
V_1	26723	15882	21302	20406	20787	22713
V_2	23408	16598	20003	18726	20653	20630
V_3	22086	13112	17599	15882	17584	19331
V_4	26186	15852	21019	21101	19869	22086
V_5	24304	14672	19488	19130	20339	18995
V_6	30278	13910	22094	22042	22579	21661
V_7	22288	11850	17069	15590	17472	18144
V_8	31049	16011	23535	22221	22557	25827
Mean	25790	14736	20263	19387	20230	21173
N_1	24303	14470				
N_2	25775	14684				
N_3	27293	15053				

S.E. of difference of two

1. *D marginal means* = 1691.7 lb./ac.
2. N marginal means = 182.1 lb./ac.
3. V marginal means = 743.2 lb./ac.
4. N means at the same level of D = 257.5 lb./ac.
5. D means at the same level of N = 1704.7 lb./ac.
6. V means at the same level of D = 1051.0 lb./ac.
7. D means at the same level of V = 1956.7 lb./ac.
8. V means at the same level of N = 1287.2 lb./ac.
9. N means at the same level of V = 1217.8 lb./ac.

Crop :- Tobacco *(Rabi)*. **Ref :- Pb. 59(65).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'D'.**

Object :— To study the effect of different chemicals on the supression of suckers.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Rich soil. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanted. (c) 2 chks/ac. (d) 1′×1′. (e) 1 to 2. (v) Nil. (vi) N—Rustica. (vii) Irrigated. (viii) N.A. (ix) 7.86″. (x) N.A.

2. TREATMENTS :

5 chemical treatments : C_0=Control, C_1=Coconut oil, C_2=Coconut oil emulsion 1 : 5, C_3=Mustard oil and C_4=Naptha acetic acid 2%.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 20′×2′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Tobacco yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 4840 lb./ac. (ii) 740 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of tobacco in lb./ac.

Treatment	C_0	C_1	C_2	C_3	C_4
Av. yield	4371	4758	4638	5022	5409

S.E./mean = 370 lb./ac.

Crop :- Groundnut *(Kharif).* **Ref :- Pb. 58(156).**

Site :- Soil Cons. Res. Demons. and Trg. Centre, Chandigarh. Type :- 'M'.

Object :—To study the residual effect of P on the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Wheat. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Chandigarh. (iii) 3.7.1958. (iv) (a) N.A. (b) Broadcast. (c) 60 to 80 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Weeding. (ix) 40.6". (x) Oct., 1958.

2. TREATMENTS :

2 levels of P_2O_5 : P_0=0 and P_1=25 lb./ac.

3. DESIGN :

(i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/120 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Pod yield, canopy development, number of pods/plant and height of plant. (iv) (a) 1957—1958. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 2840 lb./ac. (ii) 711.6 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of pod in lb./ac.

Treatment	P_0	P_1
Av. yield	2240	3440

S.E./mean = 410.8 lb./ac.

Crop :- Groundnut *(Kharif).* **Ref :- Pb. 57(133).**

Site :- Soil Cons. Res. Demons. and Trg. Centre, Chandigarh. Type :- 'M'.

Object :—To study the effect of P on Groundnut.

1. BASAL CONDITIONS :

(i) (a) Fallow—Groundnut—Wheat. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Chandigarh. (iii) N.A. (iv) (a) N.A. (b) Broadcast. (c) 6 to 8 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58(156) above.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) No. of pods/plant, height of plant and pod yield. (iv) (a) 1957—1958. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1016 lb./ac. (ii) 104.4 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of pod in lb./ac.

Treatment	P_0	P_1
Av. yield	867	1164

S.E./mean = 60.3 lb./ac.

Crop :- Groundnut *(Kharif).* **Ref :- Pb. 59(78).**

Site :- Oilseed Res. Stn., Gurgaon. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 11.7.1959. (iv) (a) 2 ploughings and passing *sohaga* once. (b) Dibbling. (c) 30 srs./ac. of kernel. (d) 1′×1′. (e) N.A. (v) Nil. (vi) Pb. No. 1. (vii) Unirrigated. (viii) 2 weedings. (ix) 23.24″. (x) Oct., 1959.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 levels of N : N_0=0 and N_1=25 lb./ac.

(2) 2 levels of P_2O_5 : P_0=0 and P_1=25 lb./ac.

(3) 3 levels of K_2O : K_0=0, K_1=12½ and K_2=25 lb./ac.

N as A/S, P_2O_5 as Super and K_2O as Pot. Sul. applied at the time of sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 63′×12′. (b) 54.75′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Pod rot ; no control measures taken. (iii) Yield of pod. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 958 lb./ac. (ii) 128.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of pod in lb./ac.

	N_0	N_1	Mean	K_0	K_1	K_2
P_0	923	978	951	928	935	990
P_1	948	983	966	975	998	925
Mean	936	981	958	951	966	958
K_0	925	978				
K_1	958	975				
K_2	925	990				

S.E. of N or P marginal mean = 26.2 lb./ac.
S.E. of K marginal mean = 32.1 lb./ac.
S.E. of body of N×P table = 37.1 lb./ac.
S.E. of body of K×P or K×N table = 45.4 lb./ac.

Crop :- Groundnut. **Ref :- Pb. 54(71).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of different levels of N and P on the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Wheat. (b) Wheat. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur. (iii) 26, 27.7.1954. (iv) (a) 2 *desi* ploughings and working *sohaga* twice. (b) N.A. (c) 10 srs /ac. (d and (e) N.A. (v) Nil. (vi) Pb. No. 1. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 18.22″. (x) Nov., 1954.

2. TREATMENTS :

7 manurial treatments : M_0=Control, M_1=25 lb./ac. of N, M_2=40 lb./ac. of N, M_3=25 lb./ac. of N+15 lb./ac. of P_2O_5, M_4=25 lb./ac. of P_2O_5, M_5=40 lb./ac. of P_2O_5 and M_6=40 lb./ac. N+20 lb./ac. of P_2O_5.

N as A/S, P_2O_5 as Super broadcast at sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 55′×4′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of pod. (iv) (a) 1954—only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 926 lb./ac. (ii) 345.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of pod in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	1012	751	872	1305	1031	859	655

S.E./mean = 172.6 lb./ac.

Crop :- Groundnut. **Ref :- Pb. 54(82).**

Site :- Jullundur. Agri. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the effect of different methods of application of N and P on Groundnut.

1. BASAL CONDITIONS :

(i) (a) Wheat—Groundnut. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 28.7.1954. (iv) (a) 4 *desi* ploughings, working *sohaga* 4 times and hoeing once. (b) N.A. (c) 5¼ srs./ac. (d) and (e) N.A. (v) Nil. (vi) Pb. No. 1. (vii) Irrigated. (viii) 1 hoeing. (ix) 4.81". (x) Dec., 1954.

2. TREATMENTS :

3 methods of placement of 25 lb./ac. of N+15 lb./ac. of P_2O_5 : M_1=Spreading by broadcast, M_2=By *kera* and M_3=By pocketing.

Treatments applied at sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (a) N.A. (iii) 6. (iv) (a) N.A. (b) 38,5'×4'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Stand of crop poor. (ii) Nil. (iii) Yield of pod. (iv) (a) 1954—only (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 901 lb./ac. (ii) 216.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of pod in lb./ac.

Treatment	M_1	M_2	M_3
Av. yield	739	994	970

S.E./mean = 88.4 lb./ac.

Crop :- Groundnut *(Kharif).* **Ref :- Pb. 55(83).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of different levels o N and P on Groundnut.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Wheat—Groundnut. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 9.7.1955. (iv) (a) to (e) N.A. (v) Nil. (vi) Pb. No. 1 (medium). (vii) Irrigated. (viii) N.A. (ix) 47.57". (x) 12, 13.12.1955.

2. TREATMENTS :

6 manurial treatments : M_0=Control, M_1=25 lb./ac. of N, M_2=40 lb./ac. of N, M_3=25 lb./ac. of N+12½ lb./ac. of P_2O_5, M_4=40 lb./ac. of N+25 lb./ac. of P_2O_5 and M_5=40 lb./ac. of N+25 lb./ac. of P_2O_5+25 lb./ac. of K_2O.

N applied as A/S, P_2O_5 as Super and K_2O as Pot. Sul.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 90′×11′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Pod yield. (iv) (a) 1954—1955 (with modification). (b) No. (c) Nil (v) to (vii) Nil.

5. RESULTS :

(i) 451 lb./ac (ii) 141.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of pod in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	441	546	469	382	427	441

S.E./mean = 70.5 lb./ac.

Crop :- Groundnut *(Kharif)*. **Ref :- Pb. 55(84).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the best source of N for Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 10.7.1955. (iv) (a) N.A. (b) Broadcast. (c) 10 srs./ac. of kernal. (d) and (e) N.A. (v) Nil. (vi) Pb. No. 1 (early) (vii) Irrigated. (viii) N.A. (ix) 47.57". (x) 14.12.1955.

2. TREATMENTS :

4 sources of 25 lb./ac. of N : S_0=Control, S_1=A/S, S_2=Urea and S_3=A/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 99′×11′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Pod yield. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 171 lb./ac. (ii) 40.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of pod in lb./ac

Treatment	S_0	S_1	S_2	S_3
Av. yield	158	183	174	170

S.E./mean = 20.5 lb./ac.

Crop :- Groundnut *(Kharif)*. **Ref :- Pb. 56(54).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of N from different sources on Groundnut crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullunder. (iii) 8.7.1956. (iv) a) Ploughing once with *raja* plough, twice with *desi* plough and working *sohaṇa* twice. (b) N.A. (c) 25 srs./ac. (d) and (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) 1 weeding and 1 hoeing. (ix) 33.25". (x) 24 to 27.11.1956.

2. TREATMENTS :

8 sources of N at 25 lb./ac. : S_0=Control, S_1=A/S, S_2=A/C, S_3=Urea, S_4=Nitro chalk, S_5=A/N, S_6=A/S/N and S_7=C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N A. (b) 18′×11′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of pod. (iv) to (vii) Nil.

5. RESULTS :

(i) 331 lb./ac. (ii) 76.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of pod in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	295	301	385	289	323	333	376	350

S.E./mean = 38.2 lb./ac.

Crop :- Groundnut *(Kharif)*. **Ref :- Pb. 58(92).**

Site :- Groundnut Exptl. Farm, Samrala. **Type :- 'M'.**

Object :—To study the effect of N, P and K alone and in combination on Groundnut.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Fallow—Groundnut. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Samrala. (iii) 12.7.1958. (iv) (a) 2 ploughings and working *sohaga* once. (b) Dibbling by *'khurpa'*. (c) 35 srs./ac. of kernel. (d) 12″×9″. (e) 1. (v) Nil. (vi) Pb. No. I (medium). (vii) Unirrigated. (viii) 2 hoeings and 1 weeding. (ix) 34.32″. (x) 6.11.1958.

2. TREATMENTS :

All combinations of (1), (2) and (3).

(1) 2 levels of N as A/S : N_0=0 and N_1=25 lb./ac.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=25 lb./ac.

(3) 3 levels of K_2O as Pot. Sul. : K_0=0, K_1=12½ and K_2=25 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 33′×12′. (b) 30′×10′. (v) 1½′×1′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of pod. (iv) (a) 1958—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1482 lb./ac. (ii) 119.9 lb./ac. (iii) None of the effects is significant. (lv) Av. yield of pod in lb./ac.

	N_0	N_1	Mean	K_0	K_1	K_2
P_0	1465	1465	1465	1407	1422	1517
P_1	1515	1483	1499	1521	1507	1468
Mean	1490	1474	1482	1464	1490	1492
K_0	1428	1500				
K_1	1524	1456				
K_2	1519	1465				

S.E. of N or P marginal means = 24.5 lb./ac.
S.E. of K marginal means = 30.0 lb./ac.
S.E. of body of N×P table = 34.6 lb./ac.
S.E. of body of P×K or N×K table = 42.4 lb./ac.

Crop :- Groundnut (*Kharif*). **Ref :- Pb. 59(81).**

Site :- Groundnut Exptl. Farm, Samrala. **Type :- 'M'.**

Object :—To study the effect of N, P and K alone and in combinations on Groundnut.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Fallow—Groundnut. (b) Fallow. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 8.7.1959. (iv) (a) 3 ploughings and working *sohaga* once. (b) Dibbling by '*Khurpa*'. (c) 35 srs./ac. of kernal. (d) 12″×9″. (e) 1. (v) Nil. (vi) Pb.—No. I (medium). (vii) Unirrigated. (viii) 2 hoeings and 1 weeding. (ix) 25.76″. (x)10.11.1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(92) on page 561.

5. RESULTS :

(i) 1365 lb./ac. (ii) 118.9 lb./ac. (iii) Effect of K and interaction N×P are highly significant. N effect is significant. (iv) Av. yield of pod in lb./ac.

	N_0	N_1	Mean	K_0	K_1	K_2
P_0	1334	1352	1343	1239	1405	1386
P_1	1478	1297	1388	1344	1332	1486
Mean	1406	1325	1365	1292	1369	1436

K_0	1288	1295
K_1	1409	1328
K_2	1521	1351

S.E. of N or P marginal mean = 24.3 lb./ac.
S.E. of K marginal mean = 29.7 lb./ac.
S.E. of body of N×P table = 34.3 lb./ac.
S.E. of body of N×K or P×K table = 42.0 lb./ac.

Crop :- Groundnut. **Ref :- Pb. 54(15).**

Site :- Groundnut Exptl. Farm, Samrala. **Type :- 'M'.**

Object :— To find out the optimum time of application of A/S and Super to Groundnut.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Fallow. (b) Groundnut. (c) No. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) 16.7.1954. (iv) (a) 2 ploughings. (b) Dibbling. (c) to (e) N.A. (v) Nil. (vi) Pb—No. I (improved, medium). (vii) Unirrigated. (viii) 2 hoeings and 2 weedings. (ix) 22.24″. (x) 23.11.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 times of application of 25 lb./ac. of N : N_0=Control (no application), N_1=Before sowing, N_2=At sowing and N_3=After sowing.

(2) 3 times of application of 25 lb./ac. of P_2O_5 : P_0=Control (no application), P_1=Before sowing and P_2=At sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 21′×13′. (b) 18′×9′. (v) 1½′×3′. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) No. (iii) Height, branches, no.of needles and yield of pod. (iv) (a) 1954—1956. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 3745 lb./ac. (ii) 225.0 lb./ac. (iii) Only N effect is significant. (iv) Av. yield of pod in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	3396	3853	3743	3709	3675
P_1	3842	3813	3807	3662	3781
P_2	3674	3969	3674	3795	3778
Mean	3637	3878	3741	3722	3745

S.E. of N marginal mean = 53.0 lb./ac.
S.E. of P marginal mean = 45.9 lb./ac.
S.E. of body of table = 91.8 lb./ac.

Crop :- Groundnut *(Kharif)*. **Ref :- Pb. 55(131).**

Site :- Groundnut Exptl. Farm, Samrala. **Type :- 'M'.**

Object :— To find out the best time of application of A/S and Super to Groundnut.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Fallow—Groundnut. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Samrala. (iii) 6.7.1955. (iv) (a) 3 ploughings and working *sohaga* once. (b) Dibbling by *khurpa*. (c) 35 srs./ac. of kernal. (d) 12″×9″. (e) 1. (v) Nil. (vi) Pb.—No. I (medium). (vii) Unirrigated. (viii) 2 hoeings and 1 weeding. (ix) 45.35″. (x) 6.11.1955.

2. TREATMENTS :

Same as in expt. no. 54(15) on page 562.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 11′×21′. (b) 9′×18′. (v) 1′×1½′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Heavy damage due to *tikka* disease. (iii) Yield of pod. (iv) (a) 1954—1957. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1496 lb./ac. (ii) 189.1 lb./ac. (iii) Only P effect and interaction N×P are highly significant. (iv) Av. yield of pod in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	1020	1435	1412	1533	1350
P_1	1591	1481	1579	1602	1563
P_2	1649	1493	1574	1579	1574
Mean	1420	1470	1522	1572	1496

S.E. of N marginal mean = 44.6 lb./ac.
S.E. of P marginal mean = 38.6 lb./ac.
S.E. of body of table = 77.2 lb./ac.

Crop :- Groundnut *(Kharif)*. **Ref :- Pb. 56(102).**

Site :- Groundnut Exptl. Farm, Samrala. **Type :- 'M'.**

Object :—To find out the best time of application of A/S and Super to Groundnut.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Fallow—Groundnut. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Samrala. (iii) 6.7.1956. (iv) (a) 3 ploughings and working once with *sohaga*. (b) Dibbling by *khurpa*. (c) 35 srs./ac. of kernal. (d) 12″×9″. (e) 1. (v) Nil. (vi) Pb.—No. 1 (medium). (vii) Unirrigated. (viii) 2 hoeings and 1 weeding. (ix) 33.42″. (x) 9.11.1956.

2. TREATMENTS :

Same as in expt. no. 54(15) on page 562.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 11′×21′. (b) 9′×18′. (v) 1′×1½′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) *Tikka* disease and excessive rain near maturity damaged the crop. Bordeaux mixture (2 : 2: 40) sprayed. (iii) Yield of pod. (iv) (a) 1954—1957. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1099 lb./ac. (ii) 160.6 lb./ac. (iii) Only interaction N×P is significant. (iv) Av. yield of pod in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	824	1176	1118	1026	1036
P_1	1118	1130	1026	1170	1111
P_2	1216	1141	1153	1084	1149
Mean	1053	1149	1099	1093	1099

S.E. of N marginal mean = 37.9 lb./ac.
S.E. of P marginal mean = 32.8 lb./ac.
S.E. of body of table = 65.5 lb./ac.

Crop :- Groundnut *(Kharif)*. **Ref :- Pb. 57(81).**

Site :- Groundnut Exptl. Farm, Samrala. **Type :- 'M'.**

Object :—To find out the best time of application of A/S and Super to Groundnut.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Fallow—Groundnut. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Samrala. (iii) 18.7.1957. (iv) (a) 3 ploughings and working with *sohaga* once. (b) Dibbling by *khurpa*. (c) 35 srs./ac. of kernal. (d) 9″×12″. (e) 1. (v) Nil. (vi) Pb.—No. 1 (medium). (vii) Unirrigated. (viii) 2 hoeings and 1 weeding. (ix) 24.14″. (x) 19.11.1957.

2. TREATMENTS :

Same as in expt. no. 54(15) on page 562.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 11′×21′. (b) 9′×18′. (v) 1′×1½′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Attack of *tikka* disease. Bordeaux mixture spraying at 2 : 2 : 40. (iii) Yield of pod. (iv) (a) 1954—1957. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 922 lb./ac. (ii) 148.2 lb./ac. (iii) Only N×P interaction is significant. (iv) Av. yield of pod in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	721	974	940	882	879
P_1	917	917	888	974	924
P_2	1049	865	911	1026	963
Mean	895	918	913	961	922

S.E. of N marginal mean = 34.9 lb./ac.
S.E. of P marginal mean = 30.3 lb./ac.
S.E. of body of table = 60.5 lb./ac.

Crop :- Groundnut *(Kharif).* **Ref :- Pb. 55(96).**

Site :- Groundnut Exptl. Farm, Samrala. **Type :- 'M'.**

Object :—To test the effect of application of A/S in conjunction with bordeaux mixture on Groundnut.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Fallow—Groundnut. (b) Fallow. (c) No. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) 1.7.1955. (iv) (a) 2 ploughings. (b) Dibbling. (c) to (e) N.A. (v) Nil. (vi) Pb.—No. 1 (improved, medium). (vii) Unirrigated. (viii) 2 hoeings and weedings. (ix) 45.35". (x) 7.11.1955.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 2 levels of N as A/S : N_0=0 and N_1=25 lb./ac.
(2) 3 levels of spraying with 2 : 2 : 40 bordeaux mixture : S_0=No spraying, S_1=1 spraying and S_2=2 sprayings.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 47.25'×11'. (b) 45.75'×9'. (v) ¾'×1'. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Heavy attack of *rikka* disease. Control measures : as per treatments. (iii) Yield of pod. (iv)(a) 1950—1955. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Crop yield was affected by heavy rains. (vii) Nil.

5. RESULTS :

(i) 1489 lb./ac. (ii) 181.2 lb./ac. (iii) N and S effects are highly significant. (iv) Av. yield of pod in lb./ac.

	S_0	S_1	S_2	Mean
N_0	1081	1213	1671	1322
N_1	1451	1548	1972	1657
Mean	1266	1381	1821	1489

S.E. of N marginal mean = 42.7 lb./ac.
S.E. of S marginal mean = 52.3 lb./ac.
S E. of body of table = 74.0 lb./ac.

Crop :- Groundnut *(Kharif).* **Ref :- Pb. 54(194).**

Site :- Groundnut Exptl. Farm, Samrala. **Type :- 'M'.**

Object :—To study the effect of different crop rotations and manures on Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Sandy soil. (b) Refer soil analysis, Samrala. (iii) 16.7.1954. (iv) (a) 2 ploughings. (b) Dibbling. (c) to (e) N.A. (v) Nil. (vi) No. 1 (improved, medium). (vii) Unirrigated. (viii) 2 hoeings and 2 weedings. (ix) 22.24". (x) 20.11.1954.

2. TREATMENTS :

Main-plot treatments :

4 rotations with their phases : R_1=Groundnut—Fallow—Groundnut—Fallow, R_2=Groundnut—Fallow—Fallow—Gram, R_3=Groundnut—Fallow—Fallow—*Raya* and R_4=Groundnut—Fallow—Fallow—Barley.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : N_0=0 and N_1=25 lb./ac.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=25 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots with 2 phases/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 36′×11′. (b) 34.5′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of pod. (iv) (a) and (b) No. (c) Nil. (v) and (vi) Nil. (vii) The experiment was laid out in a split-plot design with 4 rotations and their phases as main-plots and 4 manurial treatments in the sub-plots. But since the experiment was conducted for only one year the design turns out to be a simple R.B.D. with 4 manurial treatments and 20 replications.

5. RESULTS :

(i) 3350 lb./ac. (ii) 304.8 lb./ac. (iii) Main effect of N is significant and effect of P is highly significant. (iv) Av. yield of pod in lb./ac.

	P_0	P_1	Mean
N_0	3058	3441	3249
N_1	3413	3490	3451
Mean	3235	3465	3350

S.E. of any marginal mean = 48.2 lb./ac.
S.E. of body of table = 68.2 lb./ac.

Crop :- Groundnut *(Kharif).* **Ref :- Pb. 57(82).**

Site :- Groundnut Exptl. Farm, Samrala. **Type :- 'MV'.**

Object :—To study the effect of N on different varieties of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Fallow—Groundnut. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Samrala. (iii) 17.7.1957. (iv) (a) 3 ploughings and working once with *sohaga*. (b) Dibbling by *khurpa*. (c) 35 srs./ac. of kernal. (d) 12"×9". (e) 1. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 hoeings and 1 weeding. (ix) 24.14". (x) 12.11.1957.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 varieties of wheat : V_1=P.G. No. 1 (spreading), V_2=145/12(spreading), V_3=501/90(erect) and V_4=Philipine pink (erect).

(2) 4 levels of N as A/S : N_0=0, N_1=12½, N_2=25 and N_3=37½ lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 47.25′×12′. (b) 40.50′×9′. (v) 3.37′×1.5′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of pod. (iv) (a) 1957—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1346 lb./ac. (ii) 122.7 lb./ac. (iii) N and V effects are highly significant. (iv) Av. yield of pod in lb./ac.

	N_0	N_1	N_2	N_3	Mean
V_1	1122	1446	1427	1400	1349
V_2	1207	1535	1635	1516	1473
V_3	1088	1408	1416	1443	1339
V_4	1219	1346	1223	1107	1224
Mean	1159	1434	1426	1367	1346

S.E. of any marginal mean = 30.7 lb./ac.
S.E. of body of table = 61.3 lb./ac.

Crop :- Groundnut *(Kharif)*. **Ref :- Pb. 58(93).**

Site :- Groundnut Exptl. Farm, Samrala. **Type :- 'MV'.**

Object :—To study the effect of N on different varieties of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Fallow—Groundnut. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Samrala. (iii) 11.7.1958. (iv) (a) 3 ploughings and working once with *sohaga*. (b) Dibbling with *khurpa*. (c) 35 srs./ac. of kernel. (d) N.A. (e) 1. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 hoeings and weeding. (ix) 34.22". (x) 7.11.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(82) on page 566.

5. RESULTS :

(i) 1517 lb./ac. (ii) 166.0 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of pod in lb./ac.

	N_0	N_1	N_2	N_3	Mean
V_1	1219	1562	1678	1543	1500
V_2	1269	1670	1574	1886	1600
V_3	1265	1516	1705	1639	1531
V_4	1196	1547	1458	1543	1436
Mean	1237	1574	1604	1653	1517

S.E. of any marginal mean = 41.5 lb./ac.
S.E. of body of table = 83.0 lb./ac.

Crop :- Groundnut *(Kharif)*. **Ref :- Pb. 59(80).**

Site :- Groundnut Exptl. Farm, Samrala. **Type :- 'MV'.**

Object :—To study the effect of N on different varieties of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Fallow—Groundnut. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Samrala. (iii) 9.7.1959. (iv) (a) 3 ploughings and working with *sohaga* once. (b) Dibbling by *khurpa*. (c) 35 srs./ac. of kernel. (d) N.A. (e) 1. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 hoeings and 1 weeding. (ix) 25.76". (x) 11.11.1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(82) on page 566.

5. RESULTS :

(i) 1200 lb./ac. (ii) 143.8 lb./ac. (iii) Only N and V effects are highly significant. (iv) Av. yield of pod in lb./ac.

	N_0	N_1	N_2	N_3	Mean
V_1	910	1250	1288	1227	1169
V_2	949	1346	1481	1458	1309
V_3	1076	1381	1338	1342	1284
V_4	910	1034	1107	1095	1037
Mean	961	1253	1304	1281	1200

S.E. of any marginal mean = 36.0 lb./ac.
S.E. of body of table = 71.9 lb./ac.

Crop :- Groundnut. **Ref :- Pb. 54(16).**

Site :- Groundnut Exptl. Farm, Samrala. **Type :- 'CM'.**

Object :—To find out the optimum level of N and P for Groundnut under different spacings.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Fallow—Groundnut. (b) Fallow. (c) No. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) 15.7.1954. (iv) (a) 2 ploughings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) Pb.—No. I (improved, medium). (vii) Unirrigated. (viii) 2 hoeings and 2 weedings. (ix) 22.24". (x) 20.11.1954.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=25 and N_2=50 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=25 and P_2=50 lb./ac.

Sub-plot treatments :

3 row of spacings : S_1=9", S_2=18" and S_3=27".

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 54'×10'. (b) 45'×8'. (v) 4½'×1'. (vi) Yes.

4. GENERAL :

(i) Good. (b) No. (iii) Height, no. of branches, needles and yield of pod. (iv) (a) 1952—1954. (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2706 lb./ac. (ii) (a) 355.5 lb./ac. (b) 153.4 lb./ac. (iii) Main effects of N, P and S are highly significant. (iv) Av. yield of pod in lb./ac.

	P_0	P_1	P_2	Mean	S_1	S_2	S_3
N_0	2164	2701	2667	2511	2991	2455	2086
N_1	2645	2643	2905	2731	3220	2684	2289
N_2	2802	2889	2931	2874	3435	2851	2336
Mean	2537	2744	2834	2706	3215	2663	2237
S_1	3045	3261	3339				
S_2	2492	2704	2793				
S_3	2074	2266	2371				

S.E. of difference of two

1. N or P marginal means = 86.4 lb./ac.
2. S marginal means = 36.1 lb./ac.
3. S means at the same level of N or P = 62.6 lb./ac.
4. N or P means at the same level of S = 100.4 lb./ac.

S.E. of body of N×P table = 106.8 lb./ac.

Crop :- Groundnut. **Ref :- Pb. 54(14).**

Site :- Groundnut Exptl. Farm, Samrala. **Type :- 'D'.**

Object :—To find out the efficiency of Ceresan and Chlorodane for the control of collar-rot and white ants on Groundnut.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Fallow—Groundnut. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) 20.7.1954. (iv) (a) 2 ploughings. (b) Dibbling. (c) to (e) N.A. (v) Nil. (vi) Pb.—No. I (improved and medium). (vii) Unirrigated. (viii) 2 hoeings and 2 weedings. (ix) 22.24". (x) 4.12.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 seed treatments : S_0=Untreated and S_1=Seed treated with ceresan

(2) 2 soil treatments : C_0=Untreated and C_1=Soil treated with chlorodane.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 3. (iv) (a) 23.25'×6'. (b) 21.75'×6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of pod. (iv) (a) 1954—N.A. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2871 lb./ac. (ii) 179.3 lb./ac. (iii) C and S effects are highly significant. (iv) Av. yield of pod in lb./ac.

	S_0	S_1	Mean
C_0	2418	3027	2723
C_1	2814	3225	3020
Mean	2616	3126	2871

S.E. of any marginal mean = 73.2 lb./ac.

S.E. of body of table = 103.5 lb./ac.

Crop :- Groundnut. **Ref :- Pb. 54(54).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'DV'.**

Object :—To find out the effect of Chlorodane dust on the yield of different varieties of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Gurdaspur. (iii) 14, 15.7.1954. (iv) (a) 4 ploughings, working once with *sohaga* and roller. (b) N.A. (c) 15 srs./ac. (d) and (e) N.A. (v) 20 srs./ac. of A.S and 20 srs./ac. of super broadcast on 9.8.1954. (vi) As per treatments. (vii) Unirrigated. (viii) 4 hoeings. (ix) 27.28". (x) 21 to 23.12.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 medium varieties : V_1=Pb. No. 1 and V_2=Philipine Pink.

(2) 2 levels of chlorodane : C_0=Untreated and C_1=Soil treated with chlorodane.

Chlorodane applied at sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 54'×9'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) White ant attack followed by root rot and bud rot. (iii) Pod yield. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1072 lb./ac. (ii) 285.1 lb./ac. (iii) Only V effect is significant. (iv) Av. yield of pod in lb./ac.

	C_0	C_1	Mean
V_1	1281	1143	1212
V_2	893	970	932
Mean	1087	1056	1072

S.E. of any marginal mean = 82.3 lb./ac.

S.E. of body of table = 116.4 lb./ac.

Crop :- Groundnut *(Kharif)*. **Ref :- Pb. 55(2).**

Site :- Govt. Exptl. Farm, Samrala. **Type :- 'DV'.**

Object :—To find out the effect of Ceresan and Chlorodane for the control of collar-rot disease and white ants on different varieties of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Fallow—Groundnut. (b) Fallow. (c) No. (ii) (a) Heavy sandy. (b) Refer soil analysis, Samrala. (iii) 3.7.1955. (iv) (a) 2 ploughings. (b) Dibbling. (c) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 hoeings and 2 weedings. (ix) 45.35". (x) 5.11.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 varieties of groundnut : V_1=P.G. No. 1, V_2=Peanut and V_3 A.H. 32.

(2) 2 levels of ceresan : C_0=Untreated and C_1=Seed treated with ceresan.

(3) 2 levels of chlorodane : T_0=Untreated and T_1=Soil treated with chlorodane.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) 63.75'×8'. (b) 54.75'×8'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good in the beginning. Heavy rains seriously damaged the crop. (ii) *Tikka* disease appeared in a voilent form at maturity, but no control measures were adopted. (iii) Yield of pod. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1157 lb./ac. (ii) 181.2 lb./ac. (iii) Main effect of V is highly significant and main effect of C is significant. (iv) Av. yield of pod in lb./ac.

	V_1	V_2	V_3	Mean	T_0	T_1
C_0	1576	886	666	1043	986	1101
C_1	1789	1355	669	1271	1263	1280
Mean	1683	1120	667	1157	1124	1190
T_0	1598	1112	662			
T_1	1768	1129	673			

S.E. of C or T marginal mean = 42.7 lb./ac.
S.E. of V marginal mean = 52.3 lb./ac.
S.E. of body of C×V or V×T table = 74.0 lb./ac.
S.E. of body of C×T table = 60.4 lb./ac.

Crop :- Mustard. **Ref :- Pb. 55(4).**

Site :- Oil-Seed Res. Stn., Faridkot. **Type :- 'M'.**

Object :— To study the effect of N and P on Mustard.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 21.9.1955 but again sown on 12.10.1955. (iv) (a) 1 *hindustani* plough, 3 *desi* plough and 3 *sohaga*. (b) N.A. (c) 2½ srs./ac. (d) 1' between rows. (e) N.A. (v) Nil. (vi) Brown A (medium). (vii) Irrigated. (viii) 1 thinning. (ix) 5·75". (x) 13.3.1956.

2. TREATMENTS :

Main-plot treatments :

2 levels of P_2O_5 as Super : P_0=0 and P_1=25 lb./ac.

Sub-plot treatments :

3 levels of N : N_0=0, N_1=25 and N_2=50 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of aphis. 2 lb./ac. of B.H.C. dusted on 27.9.1955. (iii) Seed yield. (iv) (a) 1955—1956. (b) No. (c) N.A. (v) to (vii) Nil.

4. RESULTS :

(i) 541 lb./ac. (ii) (a) 92.0 lb./ac. (b) 151.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of seed in lb./ac.

	N_0	N_1	N_2	Mean
P_0	615	564	505	561
P_1	566	553	442	520
Mean	590	559	474	541

S.E. of difference of two

1. P marginal means = 37.5 lb./ac.
2. N marginal means = 75.6 lb./ac.
3. N means at the same level of P = 106.9 lb./ac.
4. P means at the same level of N = 95.0 lb./ac.

Crop :- Mustard. **Ref :- Pb. 54(6).**

Site .- Oil-Seed Res. Stn., Gurgaon. **Type :- 'M'.**

Object :— To study the effect of N and P on Mustard.

1. BASAL CONDITIONS :

(i) (a) Cereal—Fallow—Brown *Sarson*. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 15.10.1954. (iv) (a) 4 ploughings and 4 times levelling with *sohaga*. (b) to (e) N.A. (v) Nil. (vi) Brown. (vii, Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 10.78". (x) 20.3.1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of P_2O_5 as Super : P_0=0, P_1=25 and P_2=50 lb./ac.

(2) 4 levels of N as A/S : N_0=0, N_1=30, N_2=60 and N_3=90 lb./ac.

A/S and Super applied on 15.10.1954.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 5'×40'. (b) 3'×36'3". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Mild attack of aphis. 2 sprayings with agrocide. (iii) Plant height, no. of branches per plant no. of pods per plant, ienght of pod and seed yield. (iv) (a) 1952—contd. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2165 lb./ac. (ii) 230.9 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of seed in lb /ac.

	N_0	N_1	N_2	N_3	Mean
P_0	1663	1954	2396	2458	2118
P_1	1704	2063	2396	2563	2181
P_2	1683	2167	2321	2617	2197
Mean	1683	2061	2371	2546	2165

S.E. of P marginal mean = 47.2 lb./ac.
S.E. of N marginal mean = 54.4 lb./ac.
S.E. of body of table = 94.3 lb./ac.

Crop :- Mustard. **Ref :- Pb. 55(7).**

Site :- Oil-Seed Res. Stn., Faridkot. **Type :- 'C'.**

Object :— To find out optimum seed rate and best method of sowing for Mustard.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Castor and *rai*. (b) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 12.11.1955. (iv) (a) 7 ploughings and 3 *sohaga*. (b) to (d) As per treatments. (e) N.A. (v) Nil. (vi) Brown 'A' (vii) Irrigated. (viii) Nil. (ix) 5.75". (d) 18.3.1956.

2. TREATMENTS :

Main-plot treatments :

2 methods of sowing : M_1=Broadcast and M_2=Line sowing with a spacing of 1′ between rows.

Sub-plot treatments .

3 seed rates : S_1=2, S_2=2.5 and S_3=3 srs./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 48′ 5″×12′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack by aphis. B.H.C. dusted at 32 lb./ac. (iii) Seed yield. (iv) (a) 1955—contd. (b) No. (c) N.A. (v) and (vi) Nil. (vii) Expt. failed in 1956.

5. RESULTS :

(i) 109 lb./ac. (ii) (a) 53.6 lb./ac. (b) 31.6 lb./ac. (iii) Only S effect is highly significant. (iv) Av. yield of seed in lb./ac.

	S_1	S_2	S_3	Mean
M_1	157	117	119	131
M_2	116	77	70	88
Mean	137	97	94	109

S.E. of difference of two

1. M marginal means = 17.9 lb./ac.
2. S marginal means = 12.9 lb./ac.
3. S means at the same level of M = 18.2 lb./ac.
4. M means at the same level of S = 23.3 lb./ac.

Crop :- Mustard (*Rabi*). **Ref :- Pb. 57(107).**

Site :- Oilseed Res. Stn., Faridkot. **Type :- 'C'.**

Object :—To find out the optimum seed rate and best method of sowing for Mustard.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Faridkot. (iii) 11.10.1957. (iv) (a) 3 plankings and 5 ploughings. (b) to (d) As per treatments. (e) N.A. (v) Nil. (vi) Brown. (vii) Irrigated. (viii) Nil. (ix) Nil. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 methods of sowing : M_1=Broadcast and M_2=Line sowing with a spacing of 1′ between rows.

Sub-plot treatments :

3 seed rates : S_1=1.5, S_2=2 and S_3=2.5 srs./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/96 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Seed yield. (iv) (a) 1955—1957. (b) and (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 589 lb./ac. (ii) (a) 110.8 lb./ac. (b) 64.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of seed in lb./ac.

	S_1	S_2	S_3	Mean
M_1	639	625	554	606
M_2	585	573	561	573
Mean	612	599	557	589

S.E. of difference of two

1. M marginal means = 36.9 lb./ac.
2. S marginal means = 26.2 lb./ac.
3. S means at the same level of M = 37.0 lb./ac.
4. M means at the same level of S = 47.7 lb./ac.

Crop :- Mustard *(Rabi).* **Ref :- Pb. 54(4).**

Site :- Oilseed Res. Stn., Gurgaon. **Type :- 'C'.**

Object :—To study the effect of date of sowing and spacing on the yield of Mustard.

1. BASAL CONDITIONS :

(i) (a) Cereal—fallow—Mustard. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 1 *hindustani* plough, 3 *desi* ploughings and 4 levellings with *sohaga*. (b) N.A. (c) 2.5 srs./ac. (d) As per treatments. (e) N.A. (v) 30 lb./ac. of A/S on 11.12.1954 and 100 lb./ac. of A/S on 29.12.1954. (vi) Brown. (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 10.78". (x) 5.4.1955.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D_1=25th Sept., D_2=10th Oct. and D_3=25th Oct.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 spacings between rows : S_1=9", S_2=12" and S_3=15".

(2) 3 spacings between plants : R_1=3", R_2=6" and R_3=9".

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 9 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) [redacted]×30'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Mild attack of Aphis. Two sprayings with agrocide. (iii) Seed yield. (iv) (a) 1952—contd. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1503 lb./ac. (ii) (a) 762 lb./ac. (b) 213.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of seed in lb./ac.

	S_1	S_2	S_3	Mean	R_1	R_2	R_3
D_1	1762	1608	1703	1691	1850	1796	1427
D_2	1802	1696	1631	1710	1853	1766	1510
D_3	1209	1062	1056	1109	1139	1125	1063
Mean	1591	1455	1463	1503	1614	1562	1333
R_1	1717	1461	1664				
R_2	1629	1625	1433				
R_3	1427	1280	1293				

S.E. of difference of two

1.	D marginal means	= 160.6 lb./ac.
2.	S or R marginal means	= 45.1 lb./ac.
3.	S or R means at the same level of D	= 78.0 lb./ac.
4.	D means at the same level of S or R	= 172.8 lb./ac.
	S.E. of body of S×R table	= 55.2 lb./ac.

Crop :- Mustard *(Rabi).* **Ref :- Pb. 55(93).**

Site :- Oilseed Res. Stn., Gurgaon. **Type :- 'C'.**

Object :—To study the effect of date of sowing and spacing on the yield of Mustard.

1. BASAL CONDITIONS :

(i) (a) Cereal—Fallow—Mustard. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 4 ploughings and 4 *sohaga*. (b) Dibbling. (c) 2½ srs./ac. (d) As per treatments. (e) N.A. (v) N.A. (vi) Brown (medium). (vii) Irrigated. (viii) N.A. (ix) 4.53". (x) 9.3.1956.

2. TREATMENTS :

Same as in expt. no. 54(4) on page 574.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6′×30′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Seed yield. (iv) (a) 1952—contd. (b) and (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 600 lb./ac. (ii) (a) 300.8 lb./ac. (b) 131.4 lb./ac. (iii) Only main effect of D is highly significant. (iv) Av. yield of seed in lb./ac.

	S_1	S_2	S_3	Mean	R_1	R_2	R_3
D_1	883	771	734	796	813	791	784
D_2	696	729	758	728	706	750	727
D_3	331	252	244	276	384	246	197
Mean	637	584	579	600	634	596	569
R_1	658	597	648				
R_2	617	628	543				
R_3	635	527	546				

S.E. of difference of two

1.	D marginal means	= 70.9 lb./ac.
2.	S or R marginal means	= 31.0 lb./ac.
3.	S or R means at the same level of D	= 53.6 lb./ac.
4.	D means at the same level of S or R	= 83.3 lb./ac.
	S.E. of body of S×R table	= 37.9 lb./ac.

Crop :- Mustard *(Rabi).* **Ref :- Pb. 56(39).**

Site :- Oilseed Res. Stn., Gurgaon. **Type :- 'IM'.**

Object :—To study the effect of irrigation, N and P on the yield of Mustard.

1. BASAL CONDITIONS :

(i) (a) Cereal—Fallow—Mustard (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 22.10.1956. (iv) (a) 4 ploughings and 4 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) Brown (medium). (vii) As per treatments. (viii) N.A. (ix) 11.96". (x) 25.3.1957.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of irrigation : I_1=1, I_1=2 and I_3=4 irrigations,

(2) 4 levels of N as A/S : N_0=0, N_1=30, N_2=60 and N_3=90 lb./ac.

Sub-plot treatments :

3 levels of P_2O_5 as Super : P_0=0, P_1=25 and P_2=50 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 12 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6'×20'. (b) 4'×16.5'. (v) 1'×1.75'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Seed yield. (iv) (a) 1956—1958. (b) and (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 2096 lb /ac. (ii) (a) 349.5 lb./ac. (b) 291.7 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. y eld of seed in lb./ac.

	N_0	N_1	N_2	N_3	Mean	P_0	P_1	P_2
I_1	1499	1913	2119	2435	1992	1870	2095	2010
I_2	1949	1942	2262	2398	2138	2057	2221	2135
I_3	1889	1983	2288	2473	2158	2171	2181	2123
Mean	1779	1946	2223	2435	2096	2033	2166	2089
P_0	1733	1841	2255	2303				
P_1	1865	1970	2219	2609				
P_2	1739	2028	2195	2394				

S.E. of difference of two

1. I marginal means = 71.3 lb./ac.
2. N marginal means = 82.4 lb./ac.
3. P marginal means = 59.5 lb./ac.
4. P means at the same level of I = 103.1 lb./ac.
5. I means at the same level of P = 110.4 lb./ac.
6. P means at the same level of N = 119.1 lb./ac.
7. N means at the same level of P = 127.4 lb./ac.

S.E. of body of I×N table = 100.9 lb /ac.

Crop :- Mustard *(Rabi)*. **Ref :- Pb. 57(15).**

Site :- Oilseed Res. Stn., Gurgaon. **Type :- 'IM'.**

Object :—To study the effect of irrigation, N and P on the yield of Mustard.

1. BASAL CONDITIONS :

(i) (a) Cereal—Fallow—Mustard. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 9.10.1957. (iv) (a) to (e) N.A. (v) Nil. (vi) Brown (medium). (vii) As per treatments. (viii) N.A. (ix) 2.74". (x) 16.3.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(39) on page 575.

5. RESULTS :

(i) 891 lb./ac. (ii) (a) 159.7 lb./ac. (b) 113.8 lb./ac. (iii) Main effects of I and N and interaction I×N×P are highly significant. Interaction I×N is significant. (iv) Av. yield of seed in lb./ac.

	N_0	N_1	N_2	N_3	Mean	P_0	P_1	P_2
I_1	391	849	925	1011	794	791	771	820
I_2	392	949	1062	1354	939	933	951	933
I_3	502	942	1141	1176	940	876	987	956
Mean	428	913	1043	1180	891	867	903	903
P_0	408	894	1028	1138				
P_1	423	921	1011	1258				
P_2	453	925	1090	1145				

S.E. of difference of two

1. I marginal means = 32.6 lb./ac.
2. N marginal means = 37.6 lb./ac.
3. P marginal means = 23.2 lb./ac.
4. P means at the same level of I = 40.2 lb./ac.
5. I means at the same level of P = 46.3 lb./ac.
6. P means at the same level of N = 46.4 lb./ac.
7. N means at the same level of P = 53.4 lb./ac.

S.E. of body of N×I table = 46.1 lb./ac.

Crop :- Mustard *(Rabi)*. **Ref :- Pb. 58(11).**

Site :- Oilseed Res. Stn., Gurgaon. **Type :- 'IM'.**

Object :—To study the effect of irrigation, N and P on the yield of Mustard.

1. BASAL CONDITIONS :

(i) (a) Cereal—Fallow—Mustard. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 30.10.1958. (iv) (a) 4 ploughings and 5 *sohaga*. (b) Sown by *kera*. (c) 2½ srs./ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Brown (medium). (vii) As per treatments. (viii) N.A. (ix) 2.91". (x) 23.3.1959.

2. TREATMENTS :

Same as in expt. no. 56(39) on page 575.

3. DESIGN :

(i) Split-plot. (ii) (a) 12 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 6′×20′. (b) 4′×16.5′. (v) 1.0′×1.75′. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Aphis attack. (iii) Seed yield. (iv) (a) 1956—1958. (b) and (c) No. (v) and (vi) Nil. (vii) Other two-way table is not available in the records.

5. RESULTS :

(i) 553 lb./ac. (ii) (a) 181.6 lb./ac. (b) 111.1 lb./ac. (iii) Main effect of N and interaction N×I is significant. (iv) Av. yield of seed in lb./ac.

	I_1	I_2	I_3	Mean	N_0	N_1	N_2	N_3
P_0	517	512	546	525	270	511	626	693
P_1	572	629	536	579	268	559	685	804
P_2	528	533	601	554	227	584	667	738
Mean	539	558	561	553	255	551	659	745

S.E. of difference of two

1. I marginal means = 42.8 lb./ac.
2. N marginal means = 49.4 lb./ac.
3. P marginal means = 26.2 lb./ac.
4. P means at the same level of I = 45.3 lb./ac.
5. I means at the same level of P = 56.6 lb./ac.
6. P means at the same level of N = 52.4 lb./ac.
7. N means at the same level of P = 65.3 lb./ac.

Crop :- Mustard. **Ref :- Pb. 54(9).**

Site :- Oilseed Res. Stn., Faridkot. **Type :- 'IC'.**

Object :— To find out optimum time of sowing and frequency of irrigation for Mustard.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 25 lb./ac. of N as A/S. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 6 ploughings before sowing. Levelling was also done. (b) to (e) N.A. (v) Nil. (vi) Brown 'A' (medium). (vii) As per treatments. (viii) Thinning and weeding. (ix) 8.57". (x) 11 and 17.3.1955.

2. TREATMENTS :

Main-plot treatments :

5 dates of sowing : D_1=20 Sept., D_2=2nd Oct., D_3=14th Oct., D_4=26th Oct. and D_5=8th Nov.

Sub-plot treatments :

3 frequencies of irrigation : I_0=0, I_1=1 and I_2=2 irrigations.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/88.9 ac. (b) 1/96 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) There was an attack of locust and incidently plots sown on 20th Sept. were all eaten away. (iii) Height, no. of branches, no of pods per plant and yield. (iv) (a) 1953—contd. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) Nil. (vii) Due to the locust attack all plots sown on 20th Sept. were eaten away and hence no yield was obtained for those plots.

5. RESULTS :

(i) 1243 lb./ac. (ii) (a) 500.0 lb./ac. (b) 254 0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of seed in lb./ac.

	D_2	D_3	D_4	D_5	Mean
I_0	1290	1179	1225	693	1097
I_1	1574	1486	1202	842	1276
I_2	1794	1478	1287	870	1357
Mean	1553	1381	1238	802	1243

S.E. of difference of two

1. D marginal means = 204.1 lb./ac.
2. I marginal means = 89.8 lb./ac.
3. I means at the same level of D = 179.6 lb./ac.
4. D means at the same level of I = 251.4 lb./ac.

Crop :- Mustard. **Ref :- Pb. 55(6).**

Site :- Oilseed Res. Stn., Faridkot. **Type :- 'IC'.**

Object :— To find out optimum sowing date and frequency of irrigation for Mustard.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis. Faridkot. (iii) As per treatments. (iv) (a) 5 ploughings. (b) N.A. (c) 2½ srs./ac. (d) 1' between rows. (e) N.A. (v) Nil. (vi) Brown 'A'. (vii) As per treatments. (viii) 1 thinning. (ix) 5.75". (x) 21.2.1956, 8.3.1956 and 24.3.1956.

2. TREATMENTS :

Main-plot treatments :

4 dates of sowing : D_1=23.9.1955, D_2=12.10.1955, D_3=29.10.1955. and D_4=17.11.1955.

Sub-plot treatments :

3 frequencies of irrigation : I_0=0, I_1=1 and I_2=2 post sowing irrigations.

3. DESIGN :

(i) Split-plot. (ii) 4 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 44′×10′. (b) 40′4″×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Seed yield. (iv) (a) 1953—contd. (b) No. (c) N.A. (v) and (vi) Nil. (vii) Expt. failed in 1956.

5. RESULTS :

(i) 397 lb./ac. (ii) (a) 213.0 lb./ac. (b) 161.4 lb./ac. (iii) D effect is higly significant and I effect is significant. (iv) Av. yield of seed in lb./ac.

	D_1	D_2	D_3	D_4	Mean
I_0	463	621	55	29	292
I_1	739	644	194	69	412
I_2	842	902	54	147	486
Mean	681	723	101	82	397

S.E. of difference of two

1. D marginal means = 86.9 lb./ac.
2. I marginal means = 57.1 lb./ac.
3. I means at the same level of D = 114.1 lb./ac.
4. D means at the same level of I = 127.4 lb./ac.

Crop :- Toria. **Ref :- Pb. 55(176).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops including Toria.

1. BASAL CONDITIONS :

(i) (a) *Toria*—Wheat—Cotton. (b) and (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 7.4". (annual). (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots receive no B.D. and no N. T_2 to T_{12} plots received B.D. at 50 lb./ac. of P_2O_5. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) As per treatment rotation.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Seed yield. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) Nil. (vi) and (vii) N.A.

5. RESULTS :

(i) 299 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of seed in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield	329	308	230	239	341

S.E.'s — N.A.

Crop :- Toria. **Ref :- Pb. 56(180).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops including Toria.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Toria*—Wheat. (b) Cotton. (c) As per treatments. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 21.8" (annual). (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots receive no B.D. and no N. T_2 to T_{12} plots received B.D. at 25 lb./ac. of P_2O_5. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Seed yield. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) (a) Hansi and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 217 lb./ac. (ii) 36.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of seed in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	165	148	165	239	230	387	189	280	354

S.E. of $(T_2+T_3+T_4+T_5)$ mean = 12.9 lb./ac.
S.E. of any other mean = 25.9 lb./ac.

Crop :- Toria. **Ref :- Pb. 57(209).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops including Toria.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Toria*. (b) Cotton. (c) As per treatments. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 6.4" (annual). (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots receive no B.D. and no N. T_2 to T_{12} plots received B.D. at 25 lb./ac. of P_2O_5. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 56(180) above.

5. RESULTS :

(i) 106 lb./ac. (ii) 77.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of seed in lb./ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	74	66	58	99	49	82	66	222	99	197	189

S.E. of (T_2+T_3) mean $\cong$ 38.7 lb./ac.
S.E. of any other mean = 54.7 lb./ac.

Crop :- Toria. **Ref :- Pb. 55(5).**

Site :- Oilseed Res. Stn., Faridkot. **Type :- 'M'.**

Object :—To find out suitable time and method of application of N alone and in combination with P on Toria.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 23.9.1955. (iv) (a) 4 ploughings and working *sohaga* 3 times. (b) N.A. (c) 2.5 srs./ac. (d) 1' between rows. (e) N.A. (v) Nil. (vi) *Toria* selection 'A' (medium). (vii) Irrigated. (viii) 1 thinning. (ix) 5.75". (x) 9 to 11.2.1956.

2. TREATMENTS :

Main-plot treatments :

2 levels of P_2O_5 : P_0=0 and P_1=25 lb./ac.

Sub-plot treatments :

5 methods of application of 25 lb./ac. of N as A/S : M_0=Control (no application) M_1=Drilled before sowing, M_2=Broadcast before sowing, M_3=At 1st irrigation and M_4=½ broadcast before sowing +½ at 1st irrigation.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10'×58'. (b) 10'×54' 5½". (v) 21" on either side. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Seed yield. (iv) (a) 1955—contd. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 788 lb./ac. (ii) (a) 146.4 lb./ac. (b) 85.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of seed in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean
P_0	754	811	788	688	804	769
P_1	751	784	861	773	866	807
Mean	752	797	824	730	835	788

S.E. of difference of two
1. P marginal means = 46.3 lb./ac.
2. M marginal means = 42.8 lb./ac.
3. M means at the same level of P = 60.6 lb./ac.
4. P means at the same level of M = 71.3 lb./ac.

Crop :- Toria *(Rabi).* **Ref :- Pb. 56(119).**

Site :- Oilseed Res. Stn., Faridkot. **Type :- 'M'.**

Object :—To find out suitable time and method of application of N alone and in combination with P on Toria.

1. BASAL CONDITIONS :

(i) (a) Cotton. (b) and (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Faridkot. (iii) 2.9.1956. (iv) (a) 5 ploughings and 3 plankings. (b) Line sowing. (c) 2.5 srs./ac. (d) 1′ between rows. (e) N.A. (v) Nil. (vi) T.S. Faridkot. (vii) Irrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 55 (5) on page 581.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of seed. (iv) (a) 1955—1960. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1017 lb./ac. (ii) (a) 183.4 lb./ac. (b) 117.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of seed in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean
P_0	1064	985	1072	946	969	1007
P_1	995	1131	943	1087	979	1027
Mean	1029	1058	1008	1016	974	1017

S.E. of difference of two

1. P marginal means = 58.0 lb./ac.
2. M marginal means = 58.8 lb./ac.
3. M means at the same level of P = 83.1 lb./ac.
4. P means at the same level of M = 94.3 lb./ac.

Crop :- Toria *(Rabi)*. **Ref :- Pb. 57(109).**

Site :- Oilseed Res. Stn., Faridkot. **Type :- 'M'.**

Object :—To find out suitable time and method of application of N alone and in combination with P on Toria.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Faridkot. (iii) 10.9.1957. (iv) (a) 5 ploughings and 5 plankings. (b) Line sowing. (c) 2½ srs./ac. (d) 1′×½′. (e) N.A. (v) Nil. (vi) T.S.—Faridkot. (vii) Irrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 55(15) on page 581.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) No. (iii) Yield of seed. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 622 lb./ac. (ii) (a) 159.1 lb./ac. (b) 103.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of seed in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean
P_0	580	724	607	569	560	608
P_1	616	628	657	616	657	635
Mean	598	676	637	592	608	622

S.E. of difference of two

1. P marginal means = 50.3 lb./ac.
2. M marginal means = 51.8 lb./ac.
3. M means at the same level of P = 73.3 lb./ac.
4. P means at the same level of M = 82.6 lb./ac.

Crop :- Toria *(Rabi)*. **Ref :- Pb. 58(129).**

Site :- Oilseed Res. Stn , Faridkot. **Type :- 'M'.**

Object :—To find out the best method of application of nitrogenous fertilizers to Toria.

1. BASAL CONDITIONS :

(i) (a) Oilseed—Oilseed. (b) Oilseed. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Faridkot. (iii) 16.9.1958. (iv) (a) 5 ploughings and 3 plankings. (b) Line sowing. (c) 2½ srs./ac. (d) 1′×6″. (e) N.A. (v) Nil. (vi) T.S.—Faridkot. (vii) Irrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

6 methods of application of 25 lb./ac. of N : M_0=Control, M_1=Drilled before sowing, M_2=Broadcast before sowing, M_3=At 1st irrigation, M_4=½ broadcast before sowing+½ at 1st irrigation and M_5=½ drilled before sowing +½ at 1st irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/96 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of seed. (iv) (a) 1955—1960. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 768 lb./ac. (ii) 72.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of seed in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	756	782	790	766	789	723

S.E./mean = 29.5 lb./ac.

Crop :- Toria *(Rabi)*. **Ref :- Pb. 59(123).**

Site :- Oilseed Res. Stn., Faridkot. **Type :- 'M'.**

Object :—To find out the best method of application of nitrogenous fertilizers to Toria.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Faridkot. (iii) N.A. (iv) (a) 3 ploughings and 3 plankings. (b) Line sowing. (c) 2½ srs./ac. (d) 1′×6″. (e) N.A. (v) Nil. (vi) T.S.—Faridkot. (vii) Irrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 58(129) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/101 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of seed. (iv) (a) 1955—1960. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 905 lb./ac. (ii) 97.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of seed in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	807	861	912	934	947	971

S.E. mean = 39.9 lb./ac.

Crop :- Toria. **Ref :- Pb. 56(182).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops including Toria.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Toria*—Wheat. (b) Cotton. (c) As per treatments. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 18.8" (annual). (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots receive no. B.D. and no N. T_2 to T_{12} plots received B.D. at 25 lb./ac. of P_2O_5. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) As per treatment rotation.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Seed yield. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 261 lb./ac. (ii) 104.2 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of seed in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	132	165	148	247	296	337	461	313	535

S.E. of $(T_2+T_3+T_4+T_5)$ mean = 36.8 lb./ac.
S.E. of any other mean = 73.7 lb /ac.

Crop :- Toria. **Ref :- Pb. 55(178).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the direct, residual or cumulative effect of N applied in rotation to different crops including Toria.

1. BASAL CONDITIONS :

(i) (a) *Toria*—Wheat—Cotton. (b) and (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 16.5". (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and no N. T_2 to T_{12} plots received B.D. at 50 lb./ac. of P_2O_5. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) Yes. As per treatment rotations.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Seed yield. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) (a) Abohar and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 80 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of seed in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield	8	14	140	177	185

S.E.'s — N.A.

Crop :- Toria. **Ref :- Pb. 55(180).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the direct, residual and cumulative effect of N applied in rotation to different crops including Toria.

1. BASAL CONDITIONS :

(i) (a) *Toria*—Wheat—Cotton. (b) and (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 48.9". (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and no N, T_2 to T_{12} plots received B.D. at 50 lb./ac. of P_2O_5. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) Yes. As per treatment rotations.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Seed yield. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 315 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of seed in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield	107	158	296	625	590

S.E.'s — N.A.

Crop :- Toria. **Ref :- Pb. 56(184).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :— To study the direct, residual and cumulative effect of N applied in rotation to different crops including Toria.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Toria*—Wheat. (b) Cotton. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) 320—F. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 36.6". (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and no N. T_2 to T_{12} plots received B.D. at 25 lb./ac. of P_2O_5. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) Yes. As per treatment rotations.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Seed yield. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) (a) Abohar and Hansi. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 103 lb./ac. (ii) 35.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of seed in lb./ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	107	82	58	123	107	115	132	148	115

S.E. of $(T_2+T_3+T_4+T_5)$ mean = 12.4 lb./ac.
S.E. of any other mean = 24.8 lb./ac.

Crop :- Toria. **Ref :- Pb. 57(210).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of N applied in rotation to different crops *including Toria.*

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Toria.* (b) Cotton. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 29.6". (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and no N. T_2 to T_{12} plots received B.D. at 25 lb /ac. of P_2O_5. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 56(184) above.

5. RESULTS :

(i) 6 75 lb /ac. (ii) 41.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of seed in lb./ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	527	539	510	510	625	732	880	839	716	839	839

S.E. of (T_2+T_3) mean = 20.7 lb./ac.

S.E. of any other mean = 29.3 lb./ac.

Crop :- Toria. **Ref :- Pb. 54(8).**

Site :- Oilseed Res. Stn., Faridkot. **Type :- 'IC'.**

Object :—To find out optimum sowing time and level of irrigation for Toria crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) Cotton. (c) 50 to 100 lb./ac. of N as A/S. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 6 ploughings. (b) to (e) N.A. (v) Nil. (vi) Selection 'A' (medium). (vii) As per treatments. (viii) Thinning and weeding. (ix) 10.47". (x) 7.2.1955 to 4.3.1955.

2. TREATMENTS :

Main-plot treatments :

5 dates of sowing : D_1=25.8.1954, D_2=5.9.1954, D_3=15.9.1954, D_4=25.9.1954 and D_5=5.10.1954.

Sub-plot treatments :

3 frequencies of irrigation : I_0=0, I_1=1 and I_2=2 irrigations after sowing.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/75.6 ac. (b) 1/96 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Height, branches, pods per plant and yield of seed. (iv) (a) 1953—contd. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1007 lb./ac. (ii) (a) 333.4 lb./ac. (b) 194.5 lb./ac. (iii) Only I effect is highly significant. (iv) Av. yield of seed in lb /ac.

	D_1	D_2	D_3	D_4	D_5	Mean
I_0	589	980	835	835	889	825
I_1	910	1077	896	1154	1169	1041
I_2	802	1322	1132	1222	1302	1156
Mean	767	1126	954	1070	1120	1007

S.E. of difference of two

1. D marginal means = 136.1 lb./ac.
2. I marginal means = 61.5 lb./ac.
3. I means at the same level of D = 137.5 lb./ac.
4. D means at the same level of I = 176.5 lb./ac.

Crop :- Toria. **Ref :- Pb. 55(3).**

Site :- Oilseed Res. Stn., Faridkot. **Type :- 'ICM'.**

Object :—To study the effect of sowing date, irrigation, N and P on the yield of Toria.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) Ploughing followed by *sohaga*. (b) Sown by *kera*. (c) 2½ srs./ac. (d) 1′ between rows. (e) N.A. (v) Nil. (vi) *Toria* A. (vii) As per treatments. (viii) 1 thinning. (ix) 5.75″. (x) 11.1.1956, 17.1.1956 and 9.3.1956.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 3 dates of sowing : D_1=4.9.1955, D_2=22.9.1955 and D_3=14.10.1955.
(2) 3 frequencies of irrigation : I_1=1, I_2=2 and I_3=3 irrigations.
(3) 3 levels of N as A/S : N_0=0, N_1=25 and N_2=50 lb./ac.
(4) 3 levels of P_2O_5 as Super : P_0=0, P_1=25 and P_2=50 lb./ac.

3. DESIGN :

(i) 3⁴ confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 45′9″×10′. (b) 44′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) B.H.C. dusted on 7.9.1955 and 22.9.1955 against attack of aphis. (iii) Height/plant, pod/plant and yield of seed. (iv) (a) 1955—contd. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 724 lb./ac. (ii) 172.5 lb./ac. (iii) P effect is significant and D effect is highly significant. (iv) Av. yield of seed in lb./ac.

	I_1	I_2	I_3	P_0	P_1	P_2	N_0	N_1	N_2	Mean
D_1	1105	1076	1188	946	1172	1250	1066	1113	1190	1123
D_2	949	872	794	826	864	895	876	851	888	872
D_3	124	213	197	176	189	178	116	213	205	178
Mean	726	720	726	649	749	774	686	726	761	724
N_0	658	711	689	602	731	724				
N_1	724	676	777	634	776	768				
N_2	796	774	713	712	739	831				
P_0	607	684	657							
P_1	710	750	776							
P_2	865	717	746							

S.E. of any marginal mean = 33.2 lb./ac.
S.E. of body of any table = 57.5 lb./ac.

Crop :- Toria *(Rabi)*. **Ref :- Pb. 56(121).**

Site :- Oilseed Res. Stn., Faridkot. **Type :- 'ICM'.**

Object :—To study the effect of sowing date, irrigation, N and P on Toria.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Toria*. (b) Cotton. (c) N.A. (ii) (a) Sandy loamy. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 3 plankings and 4 ploughings. (b) Line sowing. (c) 2½ srs./ac. (d) 12″×6″. (e) Nil. (v) Nil. (vi) T.S.—Faridkot. (vii) As per treatments. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 3 dates of sowing : D_1=30.8.1956, D_2=15.9.1956 and D_1=30.9.1956.

(2) 3 frequencies of irrigation : I_1=1, I_2=2 and I_3=3 irrigations.

(3) 3 levels of N as A/S : N_0=0, N_1=25 and N_2=50 lb./ac.

(4) 3 levels of P_2O_5 as Super : P_0=0, P_1=25 and P_2=50 lb./ac.

3. DESIGN :

(i) 3^4 confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 1/99 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Seed yield. (iv) (a) 1955–1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 437 lb./ac. (ii) 190.8 lb./ac. (iii) Only D effect is highly significant. (iv) Av. yield of seed in lb./ac.

	I_1	I_2	I_3	N_0	N_1	N_2	P_0	P_1	P_2	Mean
D_1	561	631	616	555	580	673	617	605	587	603
D_2	537	682	747	656	687	622	787	634	544	655
D_3	39	69	50	36	70	52	52	59	48	53
Mean	379	461	471	416	446	449	485	433	393	437
P_0	448	498	509	442	489	525				
P_1	325	481	491	467	402	428				
P_2	363	404	412	338	447	395				
N_0	306	448	493							
N_1	428	506	402							
N_2	402	428	518							

S.E. of any marginal mean = 36.7 lb./ac.
S.E. of body of any table = 63.6 lb./ac.

Crop :- Toria *(Rabi)*. **Ref :- Pb. 57(108).**

Site :- Oilseed Res. Stn., Faridkot. **Type :- 'ICM'.**

Object :—To study the effect of sowing date, irrigation, N and P on the yield of Toria.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Toria*. (b) Cotton. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 3 plankings and 4 ploughings. (b) Line sowing. (c) 2½ srs./ac. (d) 12″×6″. (e) Nil. (v) Nil. (vi) T.S.—Faridkot. (vii) As per treatments. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 3 dates of sowing : D_1=30.8.1957, D_2=15.9.1957 and D_3=30.9.1957.

(2) 3 frequencies of irrigation : I_1=1, I_2=2 and I_3=3 irrigations.

(3) 3 levels of N as A/S : N_0=0, N_1=25 and N_2=50 lb./ac.

(4) 3 levels of P_2O_5 as Super : P_0=0, P_1=25 and P_2=50 lb./ac.

3. DESIGN :

(i) 3^4 confd. (ii) (a) 9 blocks/replication ; 9 plots/block. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 1/99 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Seed yield. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 796 lb./ac. (ii) 144.0 lb./ac. (iii) Main effects of D and I are highly significant. I×N interaction is significant. (iv) Av. yield of seed in lb./ac.

	I_1	I_2	I_3	N_0	N_1	N_2	P_0	P_1	P_2	Mean
D_1	607	856	962	786	817	822	772	846	808	809
D_2	843	972	1054	877	1025	966	904	954	1010	956
D_3	554	656	657	650	576	641	598	643	626	622
Mean	668	828	891	771	806	810	758	814	815	796
P_0	645	777	852	723	735	817				
P_1	666	906	870	771	844	828				
P_2	693	800	951	820	839	785				
N_0	687	768	858							
N_1	604	825	988							
N_2	713	890	827							

S.E. of any marginal mean = 27.7 lb./ac.
S.E. of body of any table = 48.0 lb./ac.

Crop :- Taramira *(Rabi)*. **Ref :- Pb. 58(131).**

Site :- Oilseed Res. Stn., Faridkot. **Type :- 'CV'.**

Object :—To find out the optimum sowing time for different varieties of Taramira.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 3 ploughings and 3 plankings. (b) Line sowing. (c) 2 srs./ac. (d) 12"×6". (e) N.A. (v) Nil, (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

4 dates of sowing : D_1=15th Sept., D_2=30th Sept., D_3=15th Oct. and D_4=30th Oct.

Sub-plot treatments :

4 varieties : V_1=A, V_2=F, V_3=G and V_4=Local.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/75 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Yield of seed. (iv) (a) 1958—1959. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 400 lb./ac. (ii) (a) 86.6 lb./ac. (b) 18.2 lb./ac. (iii) Only V effect and interaction D×V are highly significant. (iv) Av. yield of seed in lb./ac.

	V_1	V_2	V_3	V_4	Mean
D_1	372	392	410	354	382
D_2	439	428	442	382	423
D_3	403	439	415	36S	406
D_4	430	418	397	307	388
Mean	411	419	416	353	400

S.E. of difference of two

1. D marginal means = 30 6 lb /ac.
2. V marginal means = (4 lb./ac.
3. V means at the same level of D = 12 9 lb./ac.
4. D means at the same level of V = 32 6 lb./ac.

Crop :- Taramira *(Rabi)*. **Ref :- Pb. 59(126).**

Site :- Oilseed Res. Stn., Faridkot. **Type :- 'CV'.**

Object :—To find out the optimum sowing time for different varieties of Taramira.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 3 ploughings and 3 plankings. (b) Line sowing. (c) 2½ srs/ac. (d) 12″×6″. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. No. 58(131) on page 590.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/99 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of seed. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 947 lb./ac. (ii) (a) 237.1 lb./ac. (b) 110.3 lb./ac. (iii) Only D effect is highly significant. (iv) Av. yield of seed in lb./ac.

	V_1	V_2	V_3	V_4	Mean
D_1	817	888	714	688	777
D_2	1074	1127	1011	1034	1061
D_3	1174	1130	1053	1066	1106
D_4	853	828	856	843	845
Mean	980	993	909	908	947

S.E. of difference of two

1. D marginal means = 83.8 lb./ac.
2. V marginal means = 39.0 lb./ac.
3. V means at the same level of D = 78.0 lb./ac.
4. D means at the same level of V = 107.7 lb./ac.

Crop :- Castor *(Kharif).* **Ref :- Pb. 59(125).**

Site :- Oilseed Res. Stn., Faridkot. **Type :- 'M'.**

Object :—To find out the effect of different times of sowing and spacings on the yield of Castor.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 3 ploughings. (b) Line sowing. (c) 6 srs./ac. (d) As per treatments. (e) 1. (v) Nil. (vi) T.—3. (vii) Irrigated. (viii) 1 weeding. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D_1=1.7.1959, D_2=1.8.1959 and D_3=1.9.1959.

Sub-plot treatments :

4 spacings : $S_1=36''\times18''$, $S_2=36''\times24''$, $S_3=36''\times30''$ and $S_4=36''\times36''$.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/121 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Yield of castor. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) to (vii Nil.

5. RESULTS :

(i) 297 lb./ac. (ii) (a) 171.0 lb./ac. (b) 121.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of castor in lb./ac.

	S_1	S_2	S_3	S_4	Mean
D_1	340	444	330	308	355
D_2	369	282	289	274	304
D_3	270	227	237	194	232
Mean	326	318	285	259	297

S.E. of difference of two

1. D marginal means = 60.4 lb./ac
2. S marginal means = 49.6 lb./ac.
3. S means at the same level of D = 85.8 lb./ac.
4. D means at the same level of S = 95.8 lb./ac.

Crop :- Castor *(Kharif).* **Ref :- Pb. 58(91).**

Site :- Oilseed Res. Stn., Gurgaon. **Type :- 'CM'.**

Object :—To find out the effect of different spacings and levels of N for Castor.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fa'low. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 23.7.1958. (iv) (a) 3 ploughings. (b) Dibbling. (c) 10 srs./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) Cimmeron. (vii) Unirrigated. (viii) 4 weedings. (ix) N.A. (x) Dec., 1958 and April, 1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : N_0=0, N_1=30, N_2=60 and N_3=90 lb./ac.

(2) 3 spacings : $S_1=24''\times12''$, $S_2=30''\times15''$ and $S_3=36''\times18''$.

A/S applied at the time of sowing.

3. DESIGN :

(i) Fact. in R,B.D. (ii) (a) 12. (b) N,A. (iii) 4. (iv) (a) N.A. (b) 1/97 ac. (v) N.A. (vi) Yes

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of castor. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 547 lb./ac. (ii) 75.0 lb./ac. (iii) All effects are highly significant. (iv) Av. yield of castor in lb./ac.

	N_0	N_1	N_2	N_3	Mean
S_1	167	376	750	724	504
S_2	164	424	728	1137	613
S_3	101	418	909	655	523
Mean	146	406	796	839	547

S.E. of N marginal mean = 21.6 lb./ac.
S E. of S marginal mean = 18.8 lb./ac.
S.E. of body of table = 37.5 lb./ac.

Crop :- Castor. **Ref :- Pb. 59(79).**

Site :- Oilseed Res. Stn., Gurgaon. **Type :- 'CM'.**

Object :— To find out the effect of different spacings and levels of N for Castor.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 9.7.1959. (iv) (a) 3 ploughings. (b) Dibbling. (c) 10 srs./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) Cimmeron. (vii) Unirrigated. (viii) 3 to 4 weedings. (ix) N.A. (x) 19.12.1959 and 19.4.1960.

2. TREATMENTS :

Same as in expt. no. 58(91) on page 592.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/121. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of Castor semi-looper. Spraying of D.D.T. was done. (iii) Yield of Castor. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 499 lb./ac. (ii) 86.3 lb./ac. (iii) N effect is highly significant while interaction N × S is significant. (iv) Av. yield of castor in lb./ac.

	N_0	N_1	N_2	N_3	Mean
S_1	297	505	475	630	477
S_2	231	412	658	804	526
S_3	242	424	616	690	493
Mean	257	447	583	708	499

S.E. of N marginal mean = 24.9 lb./ac.
S.E. of S marginal mean = 21.6 lb./ac.
S.E. of body of table = 43.2 lb./ac.

Crop :- Raya *(Rabi)*. **Ref :- Pb. 55(94).**

Site :- Oilseed Res. Stn., Gurgaon. **Type :- 'M'.**

Object :— To find out the best method of application of N and P to Raya.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 21.10.1955. (iv) (a) N.A. (b) As per treatments. (c) 2½ srs./ac. (d) and (e) N.A. (v) Nil. (vi) Raya—L. 18. (vii) Irrigated. (viii) N.A. (ix) 4.53". (x) 19.3.1956.

2. TREATMENTS :

Main-plot treatments .

3 methods of application of 2 mds/ac. of Super : P_0=No Super, P_1=Broadcasted before sowing and P_2=Drilled before sowing.

Sub-plot treatments :

5 methods of application of 3 mds/ac. of A/S : N_0=No A/S, N_1=Drilled before sowing, N_2=Broadcast before sowing, N_3=Broadcast at 1st irrigation and M_4= ½ drilled at sowing+½ broadcast at 1st irrigation.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 5'×40'. (b) 3'×36½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Seed yield. (iv) (a) 1955—N.A. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 855 lb./ac. (ii) (a) 277.7 lb./ac. (b) 173.4 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of seed in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
P_0	564	776	817	953	919	806
P_1	497	831	822	883	995	806
P_2	623	980	914	1053	1194	953
Mean	561	862	851	963	1036	855

S.E. of difference of two

1. P marginal means = 71.7 lb./ac.
2. N marginal means = 57.8 lb./ac.
3. N means at the same level of P = 100.1 lb./ac.
4. P means at the same level of N = 114.7 lb./ac.

Crop :- Raya. **Ref :- Pb. 54(5).**

Site :- Oilseed Res. Stn., Gurgaon. **Type :- 'M'.**

Object :—To find out the optimum levels of N and P for Raya.

1. BASAL CONDITIONS :

(i) (a) Cereal—Fallow—Raya. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 15.10.1954. (iv) (a) 4 ploughings and levelling with *sohaga* 4 times. (b) N.A. (c) 2½ srs./ac. (d) and (e) N.A. (v) Nil. (vi) L.—18 (medium). (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 10.78". (x) 12.3.1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of P_2O_5 as Super : P_0=0, P_1=25 and P_2=50 lb./ac.

(2) 4 levels of N as A/S : N_0=0, N_1=30, N_2=60 and N_3=90 lb./ac.

A/S and Super applied on 15.10.1954.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 5′×40′. (b) 3′×36′3″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Height, no. of branches per pod and yield of seed. (iv) (a) 1952—contd. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2336 lb./ac. (ii) 320.6 lb./ac. (iii) All effects are highly significant. (iv) Av. yield of seed in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	1754	2229	2267	2612	2216
P_1	1858	2267	2550	2979	2413
P_2	1850	2108	2646	2912	2379
Mean	1821	2201	2487	2835	2336

S.E. of N marginal mean = 75.6 lb./ac.
S.E. of P marginal mean = 65.4 lb./ac.
S.E. of body of table = 130.9 lb./ac.

Crop :- Raya. **Ref :- Pb. 54(7).**

Site :- Oilseed Res. Stn., Gurgaon. **Type :- 'M'.**

Object :—To study the effect of placement and time of application of N and P on the yield of Raya.

1. BASAL CONDITIONS :

(i) (a) Cereal—Fallow—Raya. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 16.10.1954. (iv) (a) 4 ploughings (one with *hindustan* and three with *desi*) and 4 times levelling with *sohaga*. (b) N.A. (c) 2½ srs./ac. (d) and (e) N.A. (v) Nil. (vi) L—18 (medium). (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 10.78″. (x) 10.3.1955.

2. TREATMENTS :

Main-plot treatments :

5 methods of application of 50 lb./ac. of N as A/S : N_0=No Nitrogen, N_1=Early broadcasting, N_2=Early dibbling, N_3=Late broadcasting and N_4=½ early broadcasting+½ late broadcasting.

Sub-plot treatments :

3 metheds of application of 25 lb./ac. of P_2O_5 as Super : P_0=No P_2O_5, P_1=Broadcasted and P_2=Dibbled.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 5′×40′. (b) 3′×36′3″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Seed yield. (iv) (a) 1952—contd. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2724 lb./ac. (ii) (a) 473.5 lb./ac. (b) 306.6 lb./ac. (iii) N effect is highly significant and P effect is significant. (iv) Av. yield of seed in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
P_0	2142	2775	2575	2942	2767	2640
P_1	2346	2596	2687	2987	2746	2672
P_2	2317	2883	2821	3062	3212	2859
Mean	2268	2751	2694	2997	2908	2724

S.E. of difference of two

1. N marginal means = 157.8 lb./ac.
2. P marginal means = 79.2 lb./ac.
3. P means at the same level of N = 177.0 lb./ac.
4. N means at the same level of P = 214.0 lb./ac.

Crop :- Raya. **Ref :- Pb. 55(95).**

Site :- Oilseed Res. Stn., Gurgaon. **Type :- 'IM'.**

Object :—To study the effect of irrigation, N and P on the yield of Raya.

1. BASAL CONDITIONS :

(i) (a) Cereal—Fallow—*Raya*. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 23.10.1955. (iv) (a) to (e) N.A. (v) Nil. (vi) E—18 (medium). (vii) As per treatments. (viii) Thorough weeding and 2 hoeings. (ix) 4.53". (x) 20.3.1956.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 frequencies of irrigation : $I_1=1$, $I_2=2$ and $I_3=3$ irrigations.

(2) 4 levels of N as A/S : $N_0=0$, $N_1=30$, $N_2=60$ and $N_3=90$ lb./ac.

Sub-plot treatments :

3 levels of P_2O_5 as Super : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 12 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6'×20'. (b) 4'×16.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Seed yield. (iv) (a) 1955—1958. (b) and (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 609 lb./ac. (ii) (a) 21.3 lb./ac. (b) 17.2 lb./ac. (iii) Main effects of I and N and interaction N×I are highly significant. Main effect of P is significant. (iv) Av. yield of seed in in lb./ac.

	N_0	N_1	N_2	N_3	Mean	P_0	P_1	P_2
I_1	437	348	638	567	498	474	483	536
I_2	356	595	754	849	638	562	665	688
I_3	375	540	792	1055	690	626	719	726
Mean	389	494	728	824	609	554	622	650
P_0	394	421	663	739				
P_1	375	555	739	821				
P_2	399	507	782	911				

S.E. of difference of two

1. I marginal means = 4.3 lb./ac.
2. N marginal means = 5.0 lb./ac.
3. P marginal means = 3.5 lb./ac.
4. P means at the same level of N = 7.0 lb./ac.
5. N means at the same level of P = 7.6 lb./ac.
6. P means at the same level of I = 6.1 lb./ac.
7. I means at the same level of P = 6.6 lb./ac.

S.E. of body of I×N table = 6.1 lb./ac.

Crop :- Raya *(Rabi)*. **Ref :- Pb. 56(38).**

Site :- Oilseed Res. Stn., Gurgaon. **Type :- 'IM'.**

Object :—To study the effect of irrigation, N and P on the yield of Raya.

1. BASAL CONDITIONS :

(i) (a) Cereal—Fallow—*Raya*. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 22.10.1956. (iv) (a) to (e) N.A. (v) Nil. (vi) L—18 (medium). (vii) As per treatments. (viii) N.A. (ix) 11.96". (x) 27.3.1957.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 55(95) on page 596.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Seed yield. (iv) (a) 1955—1958. (b) and (c) No. (v) and (vi) Nil. (vii) Remaining two-way table is not available in the records.

5. RESULTS :

(i) 1244 lb./ac. (ii) (a) 274.5 lb./ac. (b) 193.2 lb./ac. (iii) Main effect of N and interaction N×P×I are highly significant. (iv) Av. yield of seed in lb./ac.

	N_0	N_1	N_2	N_3	I_1	I_2	I_3	Mean
P_0	1029	1101	1350	1567	1220	1276	1289	1262
P_1	1077	1058	1396	1344	1223	1220	1213	1219
P_2	994	1173	1377	1468	1301	1197	1261	1253
Mean	1033	1111	1374	1459	1248	1231	1254	1244

S.E. of difference of two

1. N marginal means = 64.7 lb./ac.
2. I marginal means = 56.0 lb./ac.
3. P marginal means = 39.4 lb./ac.
4. P means at the same level of N = 78.9 lb./ac.
5. N means at the same level of P = 91.3 lb./ac.
6. P means at the same level of I = 68.3 lb./ac.
7. I means at the same level of P = 79.1 lb./ac.

Crop :- Raya *(Rabi)*. **Ref :- Pb. 57(14).**

Site :- Oilseed Res. Stn., Gurgaon. **Type :- 'IM'.**

Object :—To study the effect of irrigation, N and P on the yield of Raya.

1. BASAL CONDITIONS :

(i) (a) Cereal—Fallow—*Raya*. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 10.10.1957. (iv) (a) 4 ploughings and 4 *ohaga*. (b) to (e) N.A. (v) Nil. (vi) L—18 (medium). (vii) As per treatments. (viii) N.A. (ix) 2.74". (x) 19.3.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 55(95) on page 596.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Seed yield. (iv) (a) 1955—1958. (b) and (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 992 lb./ac. (ii) (a) 184.1 lb./ac. (b) 112.9 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of seed in lb./ac.

	N_0	N_1	N_2	N_3	Mean	P_0	P_1	P_2
I_1	371	894	1378	1485	1032	1042	1028	1026
I_2	440	842	1189	1460	983	962	969	1018
I_3	316	869	1265	1399	962	969	959	959
Mean	376	868	1277	1448	992	991	985	1001
P_0	337	890	1261	1475				
P_1	368	865	1313	1395				
P_2	423	849	1258	1474				

S.E. of difference of two

1. I marginal means = 37.6 lb./ac.
2. N marginal means = 43.4 lb./ac.
3. P marginal means = 23.0 lb./ac.
4. P means at the same level of I = 39.9 lb./ac.
5. I means at the same level of P = 49.7 lb./ac.
6. P means at the same level of N = 46.1 lb./ac.
7. N means at the same level of P = 57.4 lb./ac.

S.E. of body of I×N table = 53.1 lb./ac.

Crop :- Raya *(Rabi)*. **Ref :- Pb. 58(12).**

Site :- Oilseed Res. Stn., Gurgaon. **Type :- 'IM'.**

Object :—To study the effect of irrigation, N and P on the yield of Raya.

1. BASAL CONDITIONS :

(i) (a) Cereal—Fallow—Raya. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 30.10.1958. (iv) (a) 4 ploughings and 4 *sohaga*. (b) Sown by *kera*. (c) N.A. (d) 12" between rows. (e) N.A. (v) Nil. (vi) R.L.—18 (medium). (vii) As per treatments. (viii) N.A. (ix) 2.91". (x) 7.4.1959.

2. TREATMENTS :

Same as in expt. no. 55(95) on page 596.

3. DESIGN :

(i) Split-plot. (ii) (a) 12 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 6'×20'. (b) 4'×16.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Attack of aphis. (iii) Seed yield. (iv) (a) 1955—1958. (b) and (c) No. (v) and (vi) Nil. (vii) Remaining two-way table is not available in the records.

5. RESULTS :

(i) 1377 lb./ac. (ii) (a) 341.9 lb./ac. (b) 166.7 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of seed in lb./ac.

	N_0	N_1	N_2	N_3	Mean	I_1	I_2	I_3
P_0	902	1398	1554	1728	1395	1378	1416	1392
P_1	967	1366	1526	1682	1385	1375	1402	1378
P_2	999	1292	1486	1622	1350	1385	1292	1373
Mean	956	1352	1522	1677	1377	1379	1370	1381

S.E. of difference of two

1. N marginal means = 93.0 lb./ac.
2. I marginal means = 80.6 lb./ac.
3. P marginal means = 39.3 lb./ac.
4. P means at the same level of N = 78.6 lb./ac,
5. N means at the same level of P = 113.0 lb./ac.
6. P means at the same level of I = 68.0 lb./ac.
7. I means at the same level of P = 97.9 lb./ac.

Crop :- Raya *(Rabi)*. **Ref :- Pb. 58(130).**

Site :- Oilseed Res. Stn., Faridkot. **Type :- 'CIM'.**

Object :—To study the effect of dates of sowing, irrigation and N on the yield of Raya.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Soil seed. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 3 plantings and 5 ploughings. (b) Line sowing. (c) 2½ seers/ac. (d) 1′×6″. (e) N.A. (v) Nil. (vi) F—55. (vii) As per treatments. (viii) Nil. (ix) 2½″ to 3″. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D_1=25th Sept., D_2=15th Oct. and D_3=5th Nov.

Sub-plot treatments :

3 frequencies of irrigation : I_0=0, I_1=1 and I_2=2 irrigations.

Sub-sub plot treatments :

3 levels of N as A/S : N_0=0, N_1=20 and N_2=40 lb./ac.

N drilled at the time of sowing.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/110 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Seed yield. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 910 lb./ac. (ii) (a) 252.4 lb./ac. (b) 103.0 lb./ac. (c) 167.4 lb./ac. (iii) Only D and I effects are highly significant. (iv) Av. yield of seed in lb./ac.

	I_0	I_1	I_2	Mean	N_0	N_1	N_2
D_1	725	771	767	754	705	768	790
D_2	897	1039	920	952	911	958	987
D_3	1024	1069	979	1024	1009	1016	1047
Mean	882	960	889	910	875	914	941
N_0	827	935	863				
N_1	886	989	867				
N_2	933	955	936				

S.E. of difference of two

1. D marginal means = 59.5 lb./ac.
2. I marginal means = 24.3 lb./ac.
3. N marginal means = 39.4 lb./ac.
4. I means at the same level of D = 42.0 lb./ac.
5. D means at the same level of I = 68.7 lb./ac.
6. N means at the same level of I = 68.3 lb./ac.
7. I means at the same level of N = 60.8 lb./ac.
8. N means at the same level of D = 68.3 lb./ac.
9. D means at the same level of N = 81.6 lb./ac.

Crop :- Raya *(Rabi)*. **Ref :- Pb. 59(124).**

Site :- Oilseed Res. Stn., Faridkot. **Type :- 'CIM'.**

Object :—To study the effect of sowing dates, irrigation and N on the yield of Raya.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Oilseed. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 3 ploughings and 3 plantings. (b) Line sowings. (c) 2½ srs /ac. (d) 12"×6". (e) N.A. (v) Nil. (vi) F—55. (vii) As per treatments. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 58(130) on page 599.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/121 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Seed yield. (iv) (a) 1958—1959. (b) No. (c) Nil. (v, to (vii) Nil.

5. RESULTS :

(i) 389 lb./ac. (ii) (a) 340.4 lb./ac. (b) 99.9 lb./ac. (c) 120.7 lb /ac. (iii) I and N effects are highly significant. D effect and D×I interaction are significant. (iv) Av. yield of seed in lb./ac.

	I_0	I_1	I_2	Mean	N_0	N_1	N_2
D_1	272	393	461	375	335	381	409
D_2	438	648	560	549	436	566	644
D_3	73	306	354	244	240	204	289
Mean	261	449	458	389	337	384	447
N_0	221	434	356				
N_1	292	407	453				
N_2	271	505	566				

S.E. of difference of two

1. D marginal means = 80.2 lb./ac.
2. I marginal means = 23.5 lb./ac.
3. N marginal means = 28.4 lb /ac.
4. I means at the same level of D = 40.8 lb./ac.
5. D means at the same level of I = 86.9 lb./ac.
6. N means at the same level of D = 49.3 lb./ac.
7. D means at the same level of N = 89.8 lb./ac.
8. N means at the same level of I = 49.3 lb./ac.
9. I means at the same level of N = 46.6 lb./ac.

Crop :- Bajra Fodder *(Kharif)*. **Ref :- Pb. 59(61).**

Site :- Agri. Exptl. Stn., Ferozepur. **Type :- 'M'.**

Object :—To study the effect of different methods and times of application of A/S on Bajra fodder.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Bajra*. (b) Wheat. (c) Nil. (ii) (a) Clay loam to sandy loam. (b) N.A. (iii) 10.7.1959. (iv) (a) 5 ploughings and 6 *sohaga*. (b) Sown by *kera*. (c) 3 srs./ac. (d) 12"×9". (e) N.A. (v) Nil. (vi) A—3. (vii) Irrigated. (viii) 3 hoeings. (ix) N.A. (x) 16.10.1959.

2. TREATMENTS :

8 manurial treatments : M_0=Control, M_1=40 lb./ac. of N by broadcast, M_2=40 lb./ac. of N dipped in plough furrow, M_3=20 lb./ac. of N by broadcast+20 lb./ac. of N at earing time, M_4=40 lb./ac. of N after thinning, M_5=40 lb./ac. of N at earing time, M_6=20 lb./ac. of N at pre-sowing stage+20 lb./ac. of N after thinning and M_7=20 lb./ac. of N at thinning+20 lb./ac. of N at earing.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 58′×11′. (b) 48.4′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 4669 lb./ac. (ii) 601.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Av. yield	3700	4417	4883	4367	5267	4800	5067	4850

S.E./mean = 245.6 lb./ac.

Crop :- Bajra Fodder *(Kharif)*. **Ref :- Pb. 59(59).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'M'.**

Object :— To find out the best source of N for Bajra fodder.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Gram. (c) Nil. (ii) (a) Rich loam. (b) N.A. (iii) 10.7.1959. (iv) (a) 5 ploughings and 6 *sohaga*. (b) Sown by *kera*. (c) 3 srs./ac. (d) 12″×9″. (e) N.A. (v) Nil. (vi) A—$\frac{1}{3}$. (vii) Irrigated. (viii) 3 hoeings and 1 thinning. (ix) N.A. (x) Oct. 1959.

2. TREATMENTS :

All combinations (1) and (2)+ a control

(1) 6 sources of N : S_1=A/N, S_2=A/S, S_3=C/N, S_4=*Kisan khad*, S_5=A/C and S_6=Urea.

(2) 2 levels of N : N_1=20 and N_2=40 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 6. (iv) (a) 63′×7′. (b) 58.8′×5′. (v) 2.1′×1′. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Fooder yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1573 lb./ac. (ii) 161.3 lb./ac. (iii) Main effect of N and interaction N×S are significant 'Control *vs.* others' effect is highly significant. (iv) Av. yield of fodder in lb./ac.

Control = 1270 lb /ac.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean
N_1	1652	1504	1553	1479	1353	1565	1518
N_2	1549	1450	1575	1594	1659	1777	1601
Mean	1600	1477	1564	1536	1506	1671	1559

S.E. of N marginal mean = 26.9 lb./ac.
S.E. of S marginal mean = 46.6 lb./ac.
S E. of body of table or control mean = 65.8 lb./ac.

Crop :- Bajra Fodder *(Kharif)*. **Ref :- Pb. 58(119).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :— To study the effect of N, P and K on Bajra fodder.

1. BASAL CONDITIONS :

(*i*) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (iii) 16.8.1958. (iv) (a) N.A. (b) Broadcast. (c) 3 srs./ac. (d) Nil. (e) N.A. (v) Nil. (vi) T—55. (vii) Irrigated. (viii) N.A. (*ix*) 16.04". (x) 13.12.1958.

2. TREATMENTS :

4 manurial treatments : M_0=Control, M_1=40 lb./ac. of N as C/A/N, M_2=M_1+20 lb./ac. of P_2O_5 as Super and M_3=M_2+20 lb./ac. of K_2O.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Fodder yield. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Heavy rain affected the crop. (vii) Nil.

5. RESULTS :

(i) 2721 lb./ac. (ii) 760.9 lb./ac. (iii) Treatment differences are not significant. (i v) Av. yield of fodder in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	2090	3464	2361	2970

S.E./mean = 380.5 lb./ac.

Crop :- Bajra Fodder *(Kharif).* **Ref :- Pb. 58(35).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To study the effect of N, P and K on Bajra fodder.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (*iii*) 15.8.1958. (*iv*) (a) N.A. (b) Sown by broadcast. (c) 3 srs./ac. (d) and (e) N.A. (v) Nil. (vi) T—55. (vii) Irrigated. (viii) N.A. (ix) 16.04". (x) 26.11.1958.

2. TREATMENTS :

4 manurial treatments : M_0=0, M_1=40 lb./ac. of N as A/S, M_2=M_1+20 lb./ac. of P_2O_5 as Super and M_3=M_2+20 lb /ac. of K_2O as Mur. Pot.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Fodder yield. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3635 lb./ac. (ii) 438.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	2699	3596	4040	4205

S.E./mean = 219.2 lb./ac.

Crop :- Bajra Fodder *(Kharif).* **Ref :- Pb. 54(105).**

Site :- Agri. Exptl. Farm, Ferozepur. **Type :- 'IM'.**

Object :—To study the effect of different levels of N and frequencies of irrigation on the yield of Bajra fodder

1. BASAL CONDITIONS :

(i) (a) *Bajra*—Wheat—Fallow—Gram. (b) Gram. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 9.7.1954. (iv) (a) 1 *raja hal*, 3 *desi hal* and plankings. (b) N.A. (c) 2.5 srs./ac. (d) 1' between rows. (e) N.A. (v) Nil. (vi) A—1/3 (late). (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 18.91". (x) 27.10.1954.

2. TREATMENTS :

Main-plot treatments :

4 levels of N as A/S : N_0=0, N_1=20, N_2=40 and N_3=60 lb./ac.

Sub-plot treatments :

3 frequencies of irrigation : I_1=1, I_2=2 and I_3=3 irrigations.

N applied on 9.7.1954 by *kera* behind plough furrows.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 18'×10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Growth, flowering and yield of fodder. (iv) (a) 1953—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1316 lb./ac. (ii) (a) 339.6 lb./ac. (b) 206.6 lb./ac. (c) None of the effects is significant. (iv) Av. yield of fodder in lb./ac.

	N_0	N_1	N_2	N_3	Mean
I_1	1322	1156	1369	1343	1298
I_2	1405	1156	1302	1473	1334
I_3	1296	1193	1447	1328	1316
Mean	1341	1168	1373	1381	1316

S.E. of difference of two

1. N marginal means = 113.2 lb./ac.
2. I marginal means = 59.6 lb./ac.
3. I means at the same level of N = 119.3 lb./ac.
4. N means at the same level of I = 149.3 lb./ac.

Crop :- Berseem. **Ref :- Pb. 55(182).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P applied in rotation to different crops including Berseem.

1. BASAL CONDITIONS :

(i) (a) *Berseem*—Wheat—Cotton. (b) and (c) N.A. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Abohar. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) and (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and no Super. T_2 to T_{12} plots received B.D. at 50 lb./ac. of N. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) As per treatments.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Fodder yield. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) (a) Abohar, Hansi and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 20.38 tons/ac. (ii) and (iii) N.A. (iv) Av. yield of *berseem* in tons/ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield	20.97	19.42	21.23	21.21	21.72

S.E./mean — N.A.

Crop :- Berseem. **Ref :- Pb. 56(186).**

Site :- Cotton. Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P applied in rotation to different crops including Berseem.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Berseem*—Wheat. (b) N.A. (c) As per treatments. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Abohar. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 21.4". (x) N.A.

2. TREATMENTS :

Year	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
1955	C	0	0	0	0	0	0	1	2	½	1	2
1956	C	0	0	0	0	1	2	0	0	½	1	2
1957	C	0	0	1	2	0	0	0	0	½	1	2

T_1 plots received no B.D. and Super. T_2 and T_{12} plots received B.D. at 25 lb./ac. of N. ½, 1 and 2 in other treatments indicate 25, 50 and 100 lb./ac. of Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) and (v) N.A. (vi) As per treatments.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Fodder yield. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) (a) Abohar, Hansi and Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 16.96 tons/ac. (ii) 0.11 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *berseem* in tons/ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	11.46	13.35	14.87	16.67	19.76	23.95	16.75	21.30	25.42

S.E. of $(T_2+T_3+T_4+T_5)$ mean = 0.04 tons/ac.
S.E. of any other mean = 0.08 tons/ac.

Crop :- Berseem **Ref :- Pb. 57(182).**

Site :- Cotton Res. Stn., Abohar. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P applied in rotation to different crops including Berseem.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Berseem*. (b) N.A. (c) As per treatments. (ii) (a) Fine sandy loam. (b) Refer soil analysis, Abohar. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 6.4". (x) N.A.

2. TREATMENTS to 4 GENERAL :

Same as in expt. no. 56(186) on page 604.

5. RESULTS :

(i) 17.96 tons/ac. (ii) 1.22 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *berseem* in tons/ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	17.19	17.02	22.40	15.10	15.98	13.85	17.59	22.07	17.12	21.34	18.84

S.E. of (T_2+T_3) mean = 0.61 tons/ac.
S.E. of any other mean = 0.86 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 51(45).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of inoculation of seed, N and P on Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 8 C.L./ac. of F.Y.M. applied on 3.7.1954. (ii) (a) Loamy soil. (b) Refer soil analysis, Gurdaspur. (iii) 30.12.1954. (iv) (a) 4 disc ploughings and 1 *sohaga*. (b) N.A. (c) 12 srs/ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 7.18". (x) 28.3.1955 to 12.6.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 3 levels of P_2O_5 as Super : P_0=0, P_1=25 and P_2=50 lb./ac.
(2) 2 levels of N as A/S : N_0=0 and N_1=25 lb./ac.
(3) 2 types of seed : I_0=Uninoculated and I_1=Inoculated seed.

3. DESIGN :

(i) Fact in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) and (b) 60′×9′1″. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of green fodder. (iv) (a) 1954 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 17.33 tons/ac. (ii) 2.75 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of green fodder in tons/ac.

	P_0	P_1	P_2	Mean	N_0	N_1
I_0	16.58	18.00	17.67	17.42	16.63	18.20
I_1	16.68	17.88	17.18	17.25	17.97	16.52
Mean	16.63	17.94	17.42	17.33	17.30	17.36
N_0	17.42	17.10	17.40			
N_1	15.86	18.78	17.45			

S.E. of P marginal mean = 0.69 tons/ac.
S.E. of N or I marginal mean = 0.56 tons/ac.
S.E. of body of N×P or P×I table = 0.97 tons/ac.
S.E. of body of I×N table = 0.79 tons/ac.

Crop :- Berseem. **Ref :- Pb. 54(38).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :— To study the effect of N and P on the yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Chari* fodder. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Gurdaspur. (iii) 27.10.1954. (iv) (a) 6 ploughings, 7 *sohaga* and 1 roller. (b) Broadcast. (c) 12 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 7.73". (x) 14.1.1955 to 20.1955, 23 to 26.3.1955, 28.4.1955 to 3.5.1955 and 6.6.1955 to 9.6.1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=50 and P_2=100 lb./ac,

Manures applied by broadcast at sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10'4½"×70'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of *berseem* fodder. (iv) (a) 1953—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 21.11 tons/ac. (ii) 1.98 tons/ac. (iii) N and P effects are highly significant. (iv) Av. yield of fodder in tons/ac.

	N_0	N_1	N_2	Mean
P_0	18.94	20.14	21.52	20.20
P_1	20.39	21.07	22.29	21.25
P_2	21.82	21.17	22.67	21.89
Mean	20.38	20.79	22.16	21.11

S.E. of any marginal mean = 0.57 tons/ac.
S.E. of body of table = 0.99 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 55(66).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :— To study the effect of N and P on the yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Gurdaspur. (iii) 21.10.1955. (iv) (a) 6 ploughings, 6 *sohaga* and 1 roller. (b) Broadcast. (c) 12 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 32.68". (x) 5.12.1955, 20.1.1956, 18.2.1956, 1.3.1956 and 8.5.1956.

2. TREATMENTS :

Same as in expt. no. 54(38) above.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 71'×13' 11½". (v) Nil. (vi Yes.

4. GENERAL :

(i) Germinations was poor and crop had to be resown in some plots. (iii) Attack of white ants. Gammexane applied. (iii) Yield of *berseem*. (iv) (a) 1953—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 26.69 tons/ac. (ii) 1.46 tons/ac. (iii) N effect is highly significant and P effect is significant. (iv) Av. yield of fodder in tons/ac.

	N_0	N_1	N_2	Mean
P_0	23.50	25.89	27.29	25.56
P_1	25.18	28.41	28.63	27.41
P_2	24.25	27.25	29.81	27.10
Mean	24.31	27.18	28.58	26.69

S.E. of any marginal mean = 0.42 tons/ac.
S.E. of body of table = 0.73 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 56(31).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :— To study the effect of N and P on the yield of Berseem.

1. BASAL CONDITION :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Gurdaspur. (iii) 28.10.1956. (iv) (a) 4 ploughings. (b) Broadcast. (c) to (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 8.83". (x) 18.12.1956, 5.2.1957, 18.3.1957 and 25.4.1957.

2. TREATMENTS :

Same as in expt. no. 54(38) on page 606.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 14'×61'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *berseem*. (iv) (a) 1953—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 25.19 tons/ac. (ii) 1.40 tons/ac. (iii) N and P effects are highly significant. (iv) Av. yield of fodder in tons/ac.

	N_0	N_1	N_2	Mean
P_0	22.36	24.74	26.55	24.55
P_1	22.21	26.04	25.91	24.72
P_2	22.43	27.60	28.85	26.29
Mean	22.33	26.13	27.10	25.19

S.E. of any marginal mean = 0.40 tons/ac.
S.E. of body of table = 0.70 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 57(47).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To find out the best combination of N and P for Berseem.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loam soil. (b) Refer soil analysis, Gurdaspur. (iii) 17.10.1957. (iv) (a) N.A. (b) Broadcast. (c) to (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) 1 gap-filling. (ix) 3.32". (x) 1.12.1958 and 31.1.1958.

2. TREATMENTS :

Same as in expt. no. 54(38) on page 606.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *berseem* fodder. (iv) (a) 1953—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 18.64 tons/ac. (ii) 1.92 tons/ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of fodder in lb./ac.

	N_0	$N_{1/2}$	N_2	Mean
P_0	15.38	18.57	19.60	17.85
P_1	17.84	18.28	20.68	18.93
P_2	17.91	19.47	20.04	19.14
Mean]	17.04	18.77	20.11	18.64

S.E. of any marginal mean = 0.55 tons/ac.
S.E. of body of table = 0.96 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 57(49).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of N, P and K with micro-nutrients on the yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Gurdaspur. (iii) 14.11.1957. (iv) (a) Nil. (b) Broadcast. (c) to (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 3.92". (x) 9.1.1958 and 11.3.1958.

2. TREATMENTS :

13 manurial treatments : M_0=Control (no manure), M_1=50 lb./ac. of N as A.C, M_2=50 lb./ac. of P_2O_5 as Super, $M_3=M_1+M_2$, $M_4=M_1+50$ lb./ac. of K_2O as Mur. Pot., $M_5=M_2+M_4$, $M_6=M_5+20$ lb./ac. of $ZnSO_4$, $M_7=M_5+50$ lb./ac. of $MnSO_4$, $M_8=M_5+10$ lb./ac. of $CuSO_4$, $M_9=M_5+10$ lb./ac. of $FeSO_4$, $M_{10}=M_5+2$ lb./ac. of Sod. molybdate, $M_{11}=M_5+10$ lb./ac. of Borax and $M_{12}=M_5+20$ lb./ac. of $ZnSO_5+50$ lb./ac. of $MnSO_4+10$ lb./ac. of $CuSO_4+10$ lb./ac. of $FeSO_4+2$ lb./ac. of Sod. molybdate+10 lb./ac. of Borax.

3. DESIGN :

(i) R.B.D. (ii) (a) 13, (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/80 ac. (v) NA. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *berseem* fodder. (iv) (a) 1957 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 21.58 tons/ac. (ii) 1.16 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	19.57	20.35	20.45	22.87	20.55	22.19	24.05

Treatment	M_7	M_8	M_9	M_{10}	M_{11}	M_{12}
Av. yield	23.31	23.26	21.40	20.77	21.45	20.38

S.E./mean = 0.67 tons/ac.

Crop :- Berseem. **Ref :- Pb. 57(50).**

Site :- Govt. Agri. Stn., Gurdaspur. **Type :- 'M'.**

Object :—To study the effect of N, P and K with micro-nutrients on the yield of Berseem.

1. BASAL CONDITIONS :

Same as in expt. no. 57(49) on page 608.

2. TREATMENTS :

13 manurial treatments : M_0=Control (no manure), M_1=100 lb./ac. of N as A/C, M_2=100 lb./ac. of P_2O_5 as Super, $M_3=M_1+M_2$, $M_4=M_1+100$ lb./ac. of K_2O as Mur. Pot., $M_5=M_2+M_4$, $M_6=M_5+20$ lb./ac. of $ZnSO_4$, $M_7=M_5+50$ lb./ac. of $MnSO_4$, $M_8=M_5+10$ lb./ac. of $CuSO_4$, $M_9=M_5+10$ lb./ac. of $FeSO_4$, $M_{10}=M_5+2$ lb./ac. of Sod. molybdate, $M_{11}=M_5+10$ lb./ac. of Borax and $M_{12}=M_5+20$ lb./ac. of $ZnSO_4+50$ lb./ac. of $MnSO_4+10$ lb./ac. of $CuSO_4+10$ lb./ac. of $FeSO_4+2$ lb./ac. of Sod. molybdate+10 lb./ac. of Borax.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 57(49) on page 608.

5. RESULTS :

(i) 23.05 tons/ac. (ii) 2.10 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	19.08	22.41	21.43	22.06	23.85	22.80	24.05

Treatment	M_7	M_8	M_9	M_{10}	M_{11}	M_{12}
Av. yield	23.51	24.71	24.98	23.17	24.71	22.87

S.E./mean = 1.21 tons/ac.

Crop :- Berseem. **Ref :- Pb. 55(184).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P applied in rotation to different crops including Berseem.

1. BASAL CONDITIONS :

(i) (a) *Berseem*—Wheat—Cotton. (b) and (c) N.A. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 16.3". (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(182) on page 603.

5. RESULTS :

(i) 11.89 tons/ac. (ii) and (iii) N.A. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield	8.71	10.43	12.16	14.78	14 86

S.E.'s—N.A.

Crop :- Berseem. **Ref :- Pb. 56(188)**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P applied in rotation to different crops including Berseem.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Berseem*—Wheat. (b) N.A. (c) As per treatments. (ii) (a) Fine sandy loam. (b) N A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 18.5". (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(186) on page 604.

5. RESULTS :

(i) 20.44 tons/ac. (ii) 0.34 tons/ac. (iii) Treatment differences are highly significan t. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	14.80	18.18	15.83	24.09	17.74	26.78	22.26	22.59	28.54

S.E. of $(T_2+T_3+T_4+T_5)$ mean = 0.12 tons/ac.
S.E. of any other mean = 0.24 tons./ac.

Crop :- Berseem. **Ref :- Pb. 57(183).**

Site :- Cotton Res. Stn., Hansi **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P applied in rotation to different crops including Berseem.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Berseem.* (b) N.A. (c) As per treatments. (ii) (a) Fine sandy loam. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 14.3". (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(186) on page 604.

5. RESULTS :

(i) 16.17 tons/ac. (ii) 3.22 tons/ac. (iii) Treatment dlfferences are not significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	13.30	12.28	16.23	16.53	15.46	18.33	17.34	17.23	15.10	19.47	20.56

S.E. of (T_2+T_3) mean = 1.61 tons/ac.
S.E. of any other mean = 2.28 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 59(138).**

Site :- Cotton Res. Stn., Hansi. **Type :- 'M'.**

Object :—To study the residual effect of different sources of N applied to previous Maize crop on Berseem.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize—*Berseem*. (b) Maize. (c) As per treatments. (ii) (a) Loamy soil. (b) N.A. (iii) 23.10.1959. (iv) (a) N.A. (b) Broadcast. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 3.57". (x) 25.2.1960 to 14.4.1960.

2. TREATMENTS :

8 sources of 50 lb./ac. of N : S_0=0 (no manure), S_1=C/N, S_2=A/S/N, S_3=A/N, S_4=A/C, S_5=A/S, S_6= Urea and S_7=C/A/N.

These treatments were applied to the previous maize crop.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30'3"×10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *berseem* fodder. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 31.02 tons/ac. (ii) 6.58 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	32.76	29.49	29.16	30.45	32.93	31.71	32.47	29.23

S.E./mean = 3.29 tons/ac.

Crop :- Berseem. **Ref :- Pb. 55(28).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To find out the best source and method of application of P on Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Chari*+*Guara* fodder. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 16.11.1955. (iv) (a) 9 *desi* ploughings, 3 *sohaga* and 1 horse hoe. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 4.79". (x) 27.1.1956, 20.3.1956, 20.4.1956 and 1.5.1956.

2. TREATMENTS :

All combinations of (1) and (2)+one control

(1) 2 sources of 80 lb./ac. of P_2O_5 : S_1=Super and S_2=Dicalcium Phos.

(2) 2 methods of application of P_2O_5 : M_1=Broadcast and M_2=Drilling.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 10'6"×72'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *berseem* fodder. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 27.10 tons/ac. (ii) 1.55 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Control = 27.30 tons/ac.

	M_1	M_2	Mean
S_1	28.27	26.93	27.60
S_2	25.96	27.05	26.50
Mean	27.12	26.99	27.05

S.E. of any marginal mean = 0.55 tons/ac.
S.E. of body of table or control mean = 0.78 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 56(72).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To find out the best source and method of application of P on Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 5.11.1956. (iv) (a) 11 *desi* ploughings, 5 *sohaga* and 1 roller. (b) Broadcast. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 3.57". (x) 24.1.1957 to 9.5.1957.

2. TREATMENTS :

Same as in expt. no. 55(28) on page 611.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 2. (iv) (a) N.A. (b) $10\frac{1}{2}' \times 72'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *berseem* fodder. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 25.80 tons/ac. (ii) 1.44 tons/ac. (iii) M effect and "control *vs.* others" are significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Control = 23.00 tons/ac.

	M_1	M_2	Mean
S_1	26.59	25.67	26.13
S_2	29.48	24.27	26.87
Mean	28.04	24.97	26.50

S.E. of any marginal mean = 0.72 tons/ac.
S.E. of body of table or control mean = 1.02 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 57(70).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To find out the best source and method of application of P on Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 28.11.1957. (iv) (a) 1 *raja*, 5 *desi* ploughings and 3 *sohaga*. (b) Broadcast. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 1.97″. (x) 24.4.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(28) on page 611.

5. RESULTS :

(i) 6.64 tons/ac. (ii) 0.70 tons/ac. (iii) Only "control *vs.* others" is highly significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Control = 5.45 tons/ac.

	M_1	M_2	Mean
S_1	6.81	7.55	7.18
S_2	6.78	6.61	6.70
Mean	6.80	7.08	6.94

S.E. of any marginal mean = 0.25 tons/ac.
S.E. of body of table or control mean = 0.35 tons/ac.

Crop :- Berseem. **Ref :- Pb. 55(29).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :— To study the effect of different methods of application of fertilizers on Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 16.11.1955. (iv) (a) 5 *desi* ploughings and 6 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 4.79″. (x) 24.1.1956, 18.3.1956, 15.4.1956 and 8.5.1956.

2. TREATMENTS :

5 manurial treatments : T_0=0, T_1=80 lb./ac. of P_2O_5 as Dicalcium Phos.+40 lb./ac. of N as A/S by broadcast, T_2=80 lb./ac. of P_2O_5 as Dicalcium Phos.+40 lb./ac. of N as A/S by placement, T_3=80 lb./ac. of P_2O_5 as Super+40 lb./ac. of N as A/S by broadcast and T_4=80 lb./ac. of P_2O_5 as Super+40 lb./ac. of N as A/S by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 10′6″×72′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *berseem* fodder. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 23.48 tons/ac. (ii) 0.92 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	T_0	T_1	T_2	T_3	T_4
Av. yield	21.72	24.68	24.68	24.17	23.92

S.E./mean = 0.46 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 56(71).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of different methods of application of fertilizers on Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 5.11.1956. (iv) (a) 11 *desi* ploughings, 5 *sohaga* and 1 roller. (b) Broadcast. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 3.57". (x) 21.1.1957 to 3.5.1957.

2. TREATMENTS :

5 manurial treatments : T_0=0, T_1=80 lb./ac of P_2O_5 as Super+40 lb./ac. of N as A/S by broadcast before sowing, T_2=80 lb./ac. of P_2O_5 as Super+40 lb./ac. of N as A/S drilled before sowing, T_3=80 lb./ac. of P_2O_5 as Dicalcium. Phos. broadcast after sowing+40 lb./ac. of N as A/S broadcast before sowing and T_4=80 lb./ac. of P_2O_5 as Dicalcium Phos. broadcast after sowing+40 lb./ac. of N as A/S drilled before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 10'6"×72'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *berseem* fodder. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (*vii*) Nil.

5. RESULTS :

(i) 34.66 tons/ac. (ii) 2.79 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	T_0	T_1	T_2	T_3	T_4
Av. yield	33.05	35.19	35.16	34.77	35.11

S.E./mean = 1.40 tons/ac.

Crop :- Berseem. **Ref :- Pb. 57(69).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the effect of different methods of application of fertilizers on Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 28.11.1957. (iv) (a) 1 *roja*, 5 *desi* ploughings and 3 *sohaga*. (b) Broadcast. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 1.97". (x) 24.4.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(71) above.

5. RESULTS :

(i) 8.38 tons/ac. (ii) 0.51 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	T_0	T_1	T_2	T_3	T_4
Av. yield	7.01	9.16	8.46	8.90	8.37

S.E./mean = 0.25 tons/ac.

Crop :- Berseem. **Ref :- Pb. 55(186).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P applied in rotation to different crops including Berseem.

1. BASAL CONDITIONS :

(i) (a) *Berseem*—Wheat—Cotton. (b) and (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 48.1". (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(182) on page 603.

5. RESULTS :

(i) 20.63 tons/ac. (ii) and (iii) N.A. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5+T_6+T_7)$	T_{10}	(T_8+T_{11})	(T_9+T_{12})
Av. yield	21.34	20.68	21.60	17.67	22.84

S.E.'s — N.A.

Crop :- Berseem. **Ref :- Pb. 56(190).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P applied in rotation to different crops including Berseem.

1. BASAL CONDITIONS :

(i) (a) Cotton— *Berseem*—Wheat. (b) N.A. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 36.0". (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(186) on page 604.

5. RESULTS :

(i) 27.71 tons/ac. (ii) 0.16 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	T_1	$(T_2+T_3+T_4+T_5)$	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	27.25	27.73	28.76	26.89	26.59	29.27	25.86	28.06	28.94

S.E. of $(T_2+T_3+T_4+T_5)$ mean = 0.06 tons/ac.

S.E. of any other mean = 0.11 tons/ac.

Crop :- Berseem. **Ref :- Pb. 57(216).**

Site :- Cotton Res. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the direct, residual and cumulative effect of P applied in rotation to different crops including Berseem.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton—*Berseem.* (b) N.A. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil anylysis, Jullundur. (iii) N.A. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 29.1". (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(186) on page 604.

5. RESULTS :

(i) 25.92 tons/ac. (ii) 3.73 tons/ac. (iii) Treatments differences are highly significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	T_1	(T_2+T_3)	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Av. yield	22.63	23.14	24.02	24.46	26.30	26.08	26.52	29.31	27.55	27.69	30.23

S.E. of (T_2+T_3) mean = 1.86 tons/ac.
S.E. of any other mean = 2.64 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 55(91).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of placement of fertilizer on the yield of Berseem fodder.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fodder. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 25.11.1955 (iv) (a) N.A. (b) Broadcast. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 3.09". (x) 9.2.1955, 30.3.1955 and 6.5.1955.

2. TREATMENTS :

All combinations of (1) and (2) + a control

(1) 2 methods of application of manures : M_1=Broadcast and M_2=Drilling.

(2) 2 manurial treatments : T_1=80 lb./ac. of P_2O_5 as Dicalcium Phos.+ 40 lb./ac. of N as A/S and T_2=80 lb./ac. of P_2O_5 as Super+40 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 51.5'×10.08'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of *berseem* fodder. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 14.97 tons/ac. (ii) 1.86 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Control = 14.04 tons/ac.

	M_1	M_2	Mean
T_1	15.07	15.82	15.44
T_2	14.99	14.95	14.97
Mean	15.03	15.38	15.20

S.E. of any marginal mean = 0.66 tons/ac.
S.E. of body of table or control mean = 0.93 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 55(86).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of inoculation of Berseem seed and application of N on the yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fodder. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 25.10.1955. (iv) (a) N.A. (b) Broadcast. (c) 10 srs/ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated (viii) Nil. (ix) 3.09". (x) 19.12.1955 to 5.5.1956.

2. TREATMENTS :

4 treatments : T_1=Seed of previous *berseem* crop was inoculated, T_2=Reinoculated seed and no manure, T_3=10 lb./ac. of N as A/S before sowing+10 lb./ac. of N as A/S after 1st cutting and T_4= 20 lb./ac. of P_2O_5 as Super+10 lb./ac. of N as A/S drilled before sowing+10 lb./ac. of N as A/S after 1st cutting.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 98'×9.26'. (v) No. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Fodder yield. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 20.30 tons/ac. (ii) 0.81 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	T_1	T_2	T_3	T_4
Av. yield	20.25	20.40	20.15	20.38

S.E./mean = 0.40 tons/ac.

Crop :- Berseem. **Ref :- Pb. 54(74).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of inoculation, N and P on the yield of Berseem fodder.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 29.10.1954. (iv) (a) 6 *desi hal and* 5 *sohaga.* (b) N.A. (c) 5 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 4.81". (x) 5 cuttings from 10.1.1955 to 31.5.1955.

2. TREATMENTS :

10 manurial treatments : T_1=Control (uninoculated seed), T_2=Inoculated *berseem* seed, T_3=100 lb./ac. of P_2O_5 as Super, T_4=200 lb./ac. of P_2O_5 as Super, T_5=50 lb./ac. of N as A/S, T_6=100 lb./ac. of N as A/S, T_7=T_3+T_5, T_8=T_3+T_6, T_9=T_4+T_5 and T_{10}=T_4+T_6.

Super and A/S applied at the time of sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 51.25'×8.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 30.41 tons/ac. (ii) 1.38 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}
Av. yield	29.78	29.06	31.34	31.59	30.81	29.55	31.27	31.24	28.97	30.46

S.E./mean = 0.69 tons/ac.

Crop :- Berseem *(Rabi).* **Ref :- Pb. 55(87).**

Site :- Jullundur Agri. Stn , Jullundur. **Type :- 'M'.**

Object :—To study the effect of inoculation, N and P on the yield of Berseem fodder.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 29.10.1955. (iv) (a) N.A. (b) Broadcast. (c) 10 srs./ac. (d) and (e) N.A. (v) 1½ mds./ac. of B.M.+20 srs./ac. of Super. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 3.09". (x) 5 cuttings from 27.12.1955 to 8.5.1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(74) on page 617.

5. RESULTS :

(i) 23.38 tons/ac. (ii) 1 67 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}
Av. yield	21.46	23.00	24.56	23.88	23.53	22.04	23.95	24.50	23.51	23.42

S.E./mean = 0.84 tons/ac.

Crop :- Berseem *(Rabi).* **Ref :- Pb. 54(73).**

Site :- Jullundur Agri. Stn., Jullundur. **Type :- 'M'.**

Object :—To study the effect of inoculation, N and P on the yield of Berseem fodder.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Senji.* (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Jullundur. (iii) 24.10.1954. (iv) (a) 4 *desi hal*, one disc and 4 *sohaga*. (b) N.A. (c) 5 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 4.81". (x) 5 cuttings from 22.12.2954 to 21.5.1954.

2. TREATMENTS :

4 treatments : T_1=Inoculated seed, T_2=Reinoculated seed, T_3=20 lb./ac. of N as A/S half drilled before sowing+half applied just after 1st cutting and T_4=10 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super drilled before sowing and 10 lb./ac. of N as A/S applied after 1st cutting.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 98'×9.2'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of green fodder. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 24.97 tons/ac. (ii) 0.71 tons/ac. (iii) Treatments differences are not significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	T_1	T_2	T_3	T_4
Av. yield	25.40	24.42	24.86	25.20

S.E./mean = 0.36 tons/ac.

Crop :- Berseem *(Rabi).* **Ref :- Pb. 54(95).**

Site :- Soil Sub-Stn., Rauni. **Type :- 'M'.**

Object :—To study the effect of different levels of Super on Berseem fodder.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 21.10.1954. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 4.24". (x) N.A.

2. TREATMENTS :

4 manurial treatments : M_0=0, M_1=200, M_2=400 and M_3=600 lb./ac. of Super.
Super drilled 3" to 4" deep on 20.10.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 51'×19'. (b) 45'4½"×16'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 15.84 tons/ac. (ii) 0.65 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	12.11	15.96	16.43	18.86

S.E./mean = 0.32 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 55(110).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of N and P alone and in combination on the yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Sirsa. (iii) 14.10.1955. (iv) (a) N.A. (b) Broadcast. (c) to (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) 1 gapfilling. (ix) 8.74". (x) 25.12.1955 to 4.4.1956.

2. TREATMENTS :

12 manurial treatments : M_0=0, M_1=50 lb./ac. of N, M_2=100 lb./ac. of N, M_3=50 lb./ac. of P_2O_5, M_4=100 lb./ac. of P_2O_5, M_5=150 lb./ac. of P_2O_5, M_6=200 lb./ac. of P_2O_5, M_7=M_2+M_3, M_8=M_2+M_4, M_9=M_2+M_5, M_{10}=M_2+M_6 and M_{11}=M_1+M_3.
N applied as A/S and P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 7'×62'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of *berseem* fodder. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 22.98 tons/ac. (ii) 2.88 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}	M_{11}
Av. yield	20.62	21.06	22.88	22.98	21.34	22.17	22.64	26.04	23.96	23.26	24.76	23.98

S.E./mean = 1.18 tons/ac.

Crop :- Berseem *(Rabi).* **Ref :- Pb. 55(112).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of N and P on the yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Heavy loam. (b) Refer soil analysis, Sirsa. (iii) 23.10.1955. (iv) (a) N.A. (b) Broadcast. (c) 15 srs./ac. (d) and (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 8.74". (x) 30.12.1955, 1.2.1956 and 10.3.1956.

2. TREATMENTS :

4 manurial treatments : M_0=Control, M_1=100 lb./ac. of N as A/S+200 lb./ac. of P_2O_5 as Super applied at sowing time by ground application, M_2=100 lb./ac. of N as A/S+200 lb./ac. of P_2O_5 as Super ½ at sowing+½ after each of the three cuttings by ground application and M_3=100 lb./ac. of N as A/S+200 lb./ac. of P_2O_5 as Super applied as in M_2, by spray method.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 9'×10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Seed yield. (iv) (a) 1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 643 lb./ac. (ii) 96.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *berseem* seed in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	643	695	591	643

S.E./mean = 39.4 lb./ac.

Crop :- Berseem *(Rabi).* **Ref :- Pb. 55(113).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of N and P on the yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 2.11.1955. (iv) (a) N.A. (b) Broadcast. (c) to (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 8.74". (x) 6.1.1956, 20.2.1956, 22.3.1956 and 10.4.1956.

2. TREATMENTS :

6 manurial treatments : M_0=Control, M_1=40 lb./ac. of N as A/S by broadcast, M_2=M_1+80 lb./ac. of P_2O_5 as Super by broadcast, M_3=M_1+80 lb./ac. of P_2O_5 as Dicalcium Phos. by broadcast, M_4=M_1+80 lb./ac. of P_2O_5 as Super by placement and M_5=M_1+80 lb./ac. of P_2O_5 as Dicalcium Phos. by placement.

Fertilizers applied at the time of sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 7½'×64'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Fodder yield. (iv) (a) 1955 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 25.36 tons/ac. (ii) 2.96 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	21.39	24.12	27.36	27.09	26.25	25.93

S.E./mean = 1.21 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 56(79).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of N and P on the yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Heavy loam. (b) Refer soil analysis, Sirsa. (iii) 23.10.1956. (iv) (a) N.A. (b) Broadcast. (c) 10 srs./ac. (d) and (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 7.17". (x) 7.1.1957 to 29.4.1957.

2. TREATMENTS :

6 manurial treatments : M_0=Control, M_1=40 lb./ac. of N as A/S, M_2=M_1+80 lb./ac. of P_2O_5 as Super by broadcast, M_3=M_1+80 lb./ac. of P_2O_5 as Dical. Phos. by drilling, M_4=M_1+80 lb./ac. of P_2O_5 as Super by drilling and M_5=M_1+80 lb./ac. of P_2O_5 as Dicalcium Phos. by broadcast.

A/S and Super applied on 22.10.1956 and Dical. Phos. on 7.1.1957.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 63'×6'11". (iv) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1956 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 32.68 tons/ac. (ii) 1.69 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	32.15	35.24	36.26	31.46	29.44	31.54

S.E./mean = 0.69 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 57(114).**

Site :- Fodder. Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of N and P on the yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 12.10.1957. (iv) (a) 1 *raja*, 2 *desi* ploughings and 2 *sohaga*. (b) Broadcast. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 1.01". (x) 21.12.1957 to 7.5.1958.

2. TREATMENTS :

Same as in expt. no. 56(79) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 32.91 tons/ac. (ii) 2.58 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	31.29	30.15	33.21	35.33	34.32	33.15

S.E./mean = 1.05 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 55(114).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :— To study the suitability of Super and Dicalcium Phos. for Berseem crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 2.11.1955. (iv) (a) N.A. (b) Broadcast. (c) 23 lb./ac. (d) and (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 1.97". (x) 9.1 1956 to 18.4.1956.

2. TREATMENTS :

All combinations of (1) and (2) and a control

(1) 2 sources of 80 lb./ac. of P_2O_5 : S_1=Super and S_2=Dicalcium Phos.

(2) 2 methods of application of P_2O_5 : M_1=Broadcast and M_2=Drilling.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 7½'×64'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 26.76 tons/ac. (ii) 1.55 tons/ac. (iii) S and 'control *vs.* others' are highly significant. (iv)Av. yield of *berseem* fodder in tons/ac.

Control = 24.21 tons/ac.

	M_1	M_2	Mean
S_1	28.47	28.67	28.57
S_2	26.72	25.75	26.24
Mean	27.60	27.21	27.40

S.E. of any marginal mean = 0.45 tons/ac.
S.E. of body of table or control mean = 0.63 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 56(80).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :— To study the suitability of Super and Dical. Phos. for Berseem crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Heavy loam soil. (b) Refer soil analysis, Sirsa. (iii) 23.10.1956. (iv) (a) N.A. (b) Broadcast. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 7.17". (x) 4.1.1957 to 20.3.1957.

2. TREATMENTS :

Same as in expt. no. 55(114) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 63′×7′8$\frac{1}{5}$″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 31.45 tons/ac. (ii) 1.90 tons/ac. (iii) Only 'control *vs.* Others' is highly significant. (iv) Av. yield of *berseem* fodder in lb./ac.

Control = 29.44 tons/ac.

	M_1	M_2	Mean
S_1	32.48	31.34	31.91
S_2	32.18	31.84	32.01
Mean	32.33	31.59	31.96

S.E. of any marginal mean = 0.55 tons/ac.
S.E. of body of table or control mean = 0.78 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 57(115).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :— To study the suitability of Super and Dical. Phos. for Berseem crop.

1. BASAL CODNITIONS :

(i) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 12.10.1957. (iv) (a) 1 *raja*, 2 *desi* ploughings and 2 *sohaga*. (b) Broadcast. (c) 10 srs./ac. (d) and (e) N.A. (v) 47 srs./ac. of A/S applied on 11.10.1957. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 1.00″. (x) 5 cuttings from 20.12.1957 to 24.12.1957.

2. TREATMENTS:

Same as in expt. no. 55(114) on page 622.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/90 ac. (v) N.A. (vi) Yes.

5. GENERAL :

(i) Good. (ii) Nil. (iii) Fodder yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 33.61 tons/ac. (ii) 5.12 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Control = 32.87 tons/ac.

	M_1	M_2	Mean
S_1	35.62	30.28	32.95
S_2	33.69	35.55	34.62
Mean	34.66	32.92	33.79

S.E. of any marginal mean = 1.48 tons/ac.
S.E. of body of table or control mean = 2.09 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 55(115).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :— To find out the effect of N, P and K on Berseem crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 17.10.1955. (iv) (a) N.A. (b) Broadcast. (c) 8 to 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 8.74". (x) 19.12.1955 to 31.3.1956.

2. TREATMENTS :

8 manurial treatments : T_0=Control, T_1=100 lb./ac. of N as A/S, T_2=100 lb./ac. of N as A/N, T_3=100 lb./ac. of N as A S/N, T_4=100 lb./ac. of N as C/N, T_5=168 lb./ac. of Pot. Sul., T_6=1000 lb./ac. of Gypsum and T_7=100 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 1/82.5 ac. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 27.25 tons/ac. (ii) 2.73 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. yield	21.09	30.25	31.67	26.84	33.17	23.42	24.05	27.54

S.E./mean = 1.36 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 56(78).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of N, P and K on Berseem crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 2.10.1956. (iv) (a) N.A. (b) Broadcast. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 7.17". (x) 11.12.1956 to 4.5.1957.

2. TREATMENTS :

Same as in expt. 55(115) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 12'×6.05'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Fodder yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 33.15 tons/ac. (ii) 3.14 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of *berseem* fodder in tons/ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. yield	31.57	31.59	34.52	33.67	34.10	32.32	30.56	36.86

S.E./mean = 1.57 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 57(111).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of N and P on Berseem crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 15.10.1957. (iv) (a) 1 *raja*, 3 *desi* ploughings, 2 *sohaga* and 1 roller. (b) Broadcast. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 1.01". (x) 26.12.1957 and 18.5.1958.

2. TREATMENTS :

Same as in expt. no. 55(115) on page 624.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 29.02 tons/ac. (ii) 2.75 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. yield	28.49	25.44	28.86	30.51	29.00	27.24	30.91	31.70

S.E./mean = 1.38 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 54(19).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of different times of application of fertilizers on seed yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam soil. (b) Refer soil analysis, Sirsa. (iii) 9.10.1954. (iv) (a) 1 *desi* and 1 *raja* ploughing. (b) N.A. (c) 12½ srs./ac. (d) and (e) N.A. (v) Nil. (vi) Mescarvi. (vii) Irrigated. (viii) Weeding after each cutting. (ix) 0.32". (x) 4.12.1954, 27.1.1955 and 4.3.1955.

2. TREATMENTS :

6 manurial treatments : T_0=Control, T_1=100 lb./ac. of P_2O_5 as Super at sowing, T_2=100 lb./ac. of P_2O_5 as Super, half at sowing and half after 3rd cutting, $T_3=T_2+25$ lb./ac. of N as A/S after 3rd cutting, T_4=100 lb./ac. of P_2O_5 as Super after 3rd cutting and $T_5=T_4+25$ lb./ac. of N as A/S after 3rd cutting.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 1/100 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. Lodging in the middle of April, 1955. (ii) Nil. (iii) Forage yield up to three cuttings and seed yield afterwards. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

Fodder

(i) 36.02 tons/ac. (ii) 0.96 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. yield	34.69	35.75	36.50	36.07	36.16	36.95

S.E./mean = 0.39 tons/ac.

Seed

(i) 1048 lb./ac. (ii) 125.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of seed in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. yield	983	1039	1078	1047	1088	1052

S.E./mean = 51.3 lb./ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 55(111).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of different times of application of fertilizers on seed yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 23.10.1955. (iv) (a) N.A. (b Broadcast. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 8.74". (x) 27.12.1955 to 10.3.1956.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(19) on page 625.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Seed yield. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Due to high temperature in April and May and low level of irrigation the seed yield was very low. (vii) Nil.

5. RESULTS :

(i) 472 lb./ac. (ii) 71.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of seed in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. yield	514	463	456	486	437	478

S.E./mean = 29.06 lb:/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 54(18).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of different combinations of N and P on Berseem crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 3.10.1954. (iv) (a) 2 ploughings with *desi hal* and 2 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) Mesearvi. (vii) Irrigated. (viii) Weeding done after each cutting. (ix) 0.32". (x) 6.12.1954 to 1.5.1955.

2. TREATMENTS :

12 manurial treatments : M_0=0, M_1=50 lb./ac. of N, M_2=100 lb./ac. of N, M_3=50 lb./ac. of P_2O_5, M_4= 100 lb./ac. of P_2O_5, M_5=150 lb./ac. of P_2O_5, M_6=200 lb./ac. of P_2O_5, $M_7=M_2+M_3$, $M_8=M_2+M_4$, $M_9=M_2+M_5$, $M_{10}=M_2+M_6$ and $M_{11}=M_1+M_3$.

N and P_2O_5 applied before sowing as A/S and Super respectively.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) 7'×62'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Height of crop was taken before each cutting upto 4th cutting and yield of fodder. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 33.66 tons/ac. (ii) 2.68 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}	M_{11}
Av. yield	29.20	33.92	35.33	29.45	34.74	32.26	34.69	34.12	35 56	34.55	35.69	34.38

S.E./mean = 1.09 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 54(20).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of different methods of application of N and P on Berseem crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Heavy loam soil. (b) Refer soil analysis. Sirsa. (iii) 9.10.1954. (iv) (a) 7 ploughings with *desi hal* and 1 ploughing with *raja* plough. (b) N.A. (c) 12 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Mescarvi. (vii) Irrigated. (viii) Weeding after each cutting. (ix) 0.32". (x) 19.5.1955.

2. TREATMENTS :

4 manurial treatments : T_0=Control, T_1=100 lb./ac. of N as A/S+200 lb./ac. of P_2O_5 applied at the time of sowing, T_2=100 lb./ac. of N as A/S+200 lb./ac. of P_2O_5 as Super applied in equal doses at sowing time and after each cutting by ground application and T_3=100 lb./ac. of N as A/S+200 lb./ac. of P_2O_5 as Super sprayed after each cutting.

T_2 applied on 9.10.1954, 6.12.1954, 30.1.1955 and 8.3.1955.
T_3 applied on 6.12.1954, 30.1.1955 and 8.3.1955.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 9'×10'. (v) Nil. (v)) Yes.

4. GENERAL :

(i) Normal. Lodged in the end of April. (ii) Nil. (iii) Height of green fodder at each cutting and weight of seed after 3rd cutting. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

Fodder

(i) 34.56 tons/ac. (ii) 6.12 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of fodder in tons/ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	30.52	33.86	40.23	33.63

S.E./mean = 2.50 tons/ac.

Seed

(i) 1270 lb./ac. (ii) 466.9 lb./ac. (iii) Treament differences are not significant. (iv) Av. yield of seed in lb./ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	1172	1400	1276	1234

S.E./mean = 190.6 lb./ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 58(136).**

Site :- Fodder Res Stn., Sirsa. **Type :- 'M'.**

Object :—To find out the best source of N and P for Berseem crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 17.10.1958. (iv) (a) 4 *desi*, 1 *raja* ploughing and 1 *sohaga*. (b) Broadcast. (c) 10 srs/ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 2.24". (x) 6.1.1959 to 27.4.1959.

2. TREATMENTS :

8 manurial treatments : T_0=Control, T_1=22 lb./ac. of N as C/A/N+44 lb./ac. of P_2O_5 as Super, T_2= 44 lb./ac. of N as C/A/N+44 lb./ac. of P_2O_5 as Super, T_3=22 lb./ac. of N as A/S +44 lb./ac. P_2O_5 as Super, M_4=44 lb./ac. of N as A/S+44 lb./ac. of P_2O_5 as Super, T_5 =22 lb./ac. of N as Urea+44 lb./ac. of P_2O_5 as Super, T_6=44 lb./ac. of N as Urea+44 lb./ac. of P_2O_5 as Super and T_7= 44 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/70 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 27.90 tons/ac. (ii) 1.90 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. yield	24.66	26.43	29.58	29.02	29.34	27.07	30.04	27.06

S.E./mean = 0.78 tons/ac.

Crop :- Berseem *(Rabi)*. **Ref :- Pb. 58(135).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of manures on fodder yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 9.10.1958. (iv) (a) 1 *raja*, 2 *desi* ploughings and 1 *sohaga*. (b) Broadcast. (c) 12.5 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 2.24". (x) 5 cutting from 3.12.1958 to 2.5.1959.

2. TREATMENTS :

10 manurial treatments : T_0=Control, T_1=22 lb./ac. of N as C/A/N, T_2=44 lb./ac. of N as C/A/N, T_3= 66 lb./ac. of N as C/A/N, T_4=22 lb./ac. of P_2O_5 as Super, T_5=44 lb./ac. of P_2O_5 as Super, T_6=66 lb./ac. of P_2O_5 as Super, T_7=T_1+T_5, T_8=T_2+T_5 and T_9= T_3+T_5.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 38.54 tons/ac. (ii) 2.79 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of fodder in tons/ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9
Av. yield	35.14	39.80	36.92	39.20	37.40	39.39	38.11	39.13	39.51	40.81

S.E./mean = 1.14 tons/ac.

Crop :- Berseem *(Rabi).* **Ref :- Pb. 59(139).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'C'.**

Object :—To study the effect of different rotations on Berseem crop.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 18.10.1959. (iv) (a) N.A. (b) Broadcast. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 3.57". (x) From 23.2.1959 to 12.4.1959.

2. TREATMENTS :

3 rotational treatments : R_1=Wheat—maize—*berseem*—paddy—*methi*, R_2=Wheat—maize—*berseem*—cotton and R_3=Wheat—*berseem*—*chari*—*guara*.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 198'×22'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *berseem*. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 6.49 tons/ac. (ii) 0.70 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/ac.

Treatment	R_1	R_2	R_3
Av. yield	4.94	7.14	7.39

S.E./mean = 0.35 tons/ac.

Crop :- Cowpea *(Kharif).* **Ref :- Pb.56(83).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'C'.**

Object—To find out the suitable time of sowing of Cowpea.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) As per treatments. (iv) (a) N.A. (b) Sown by *kera*. (c) 16 srs./ac. (d) 1' between rows. (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 17.52". (x) 10 pickings from 18.5.1955 to 27.9.1956.

2. TREATMENTS :

9 dates of sowing : D_1=19,23.3.1956, D_2=3.4.1956, D_3=29.4.1956, D_4=18.5.1956, D_5=25,5.1956, D_6=14.6.1956, D_7=23.6.1956, D_8=15.7.1956 and D_9=4.8.1956.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 64'×17'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 8.80 tons/ac. (ii) 1.13 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/ac.

Treatment	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8	D_9
Av. yield	6.46	8.34	13.49	12.54	12.93	10.23	9.15	3.51	2.59

S.E./mean = 0.56 tons/ac.

Crop :- Cowpea *(Kharif).* **Ref :- Pb. 57(112).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'C'.**

Object :—To find out the suitable time of sowing of Cowpea.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) As per treatments. (iv) (a) N.A. (b) Sown by *kera.* (c) 24 srs./ac. (d) 1' between rows. (e) N.A. (v) 16 C.L./ac. of F.Y.M. (vi) F.O.S.—1. (vii) Irrigated. (viii) N.A. (ix) 6.83". (x) 11.6.1957 to 22.9.1957.

2. TREATMENTS :

8 dates of sowing : D_1=4.4.1957, D_2=18.4.1957, D_3=14.5.1957, D_4=9.6.1957, D_5=20.6.1957, D_6=13.7.1957 D_7=19.7.1957 and D_8=7.8.1957.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL ;

(i) Poor. (ii) Nil. (iii) Fodder yield. (iv) (a) (iv) 1956—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3.77 tons/ac. (ii) 1.03 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of fodder in tons/ac.

Treatment	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8
Av. yield	4.10	3.82	3.61	5.62	2.93	2.52	3.72	3.83

S.E./mean = 0.51 tons/ac.

Crop :- Guara *(Kharif).* **Ref :- Pb. 57(130).**

Site :- Soil Cons. Res. Demons. and Trg. Centre, Chandigarh. **Type :-'M'.**

Object :—To study the effect of P on the yield of Guara crop.

1. BASAL CONDITIONS :

(i) (a) Fallow—*Guara*—Wheat. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Chandigarh. (iii) N.A. (iv) (a) N.A. (b) Broadcast. (c) 6 to 8 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Weedings. (ix) and (x) N.A.

2. TREATMENTS :

2 manurial treatments : P_0=0 and P_1=25 lb./ac. of P_2O_5.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/120 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Pod yield, cannopy development no. of pods, height of plant and straw yield. iv) (a) 1957—1958. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1.87 tons/ac. (ii) 0.26 tons/ac. (iii) Treatment difference is not significant. (iv) Av. yield of fodder in tons/ac.

Treatment	P_0	P_1
Av. yield	1.53	2.22

S.E./mean = 0.15 tons/ac.

Crop :- Guara *(Kharif)*. **Ref :- Pb. 58(171).**

Site :- Soil. Cons. Res. Demons. and Trg. Centre, Chandigarh. Type :- 'M'.

Object :—To study the effect of different levels of P on Guara crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Guara*. (b) Wheat. (c) Nil. (ii) Loamy soil. (b) Refer soil analysis, Chandigarh. (iii) 3.7.1958. (iv) (a) N.A. (b) Broadcast. (c) 6 to 8 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

5 levels of P_2O_5 : P_0=0, P_1=15, P_2=30, P_3=45 and P_4=60 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30′×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Cannopy development, height of plant and straw yield. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 557 lb./ac. (ii) 278.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *guara* seed in lb./ac.

Treatment	P_0	P_1	P_2	P_3	P_4
Av. yield	399	472	569	750	493

S.E./mean = 139.2 lb./ac.

Crop :- Guara. **Ref :- Pb. 54(25).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of P fertilizers on seed yield of Guara.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 2.8.1954. (iv) (a) 7 *desi hal*. (b) Sown by *kera*. (c) 10 srs./ac. (d) and (e) N.A. (v) 16 C.L./ac. of F.Y.M. (vi) No. 2. (medium). (vii) Irrigated. (viii) Weeding. (ix) 9.45″. (x) 22.12.1954.

2. TREATMENTS :

3 levels of P_2O_5 : P_0=0, P_1=30 and P_2=60 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 20′×66′. (v) Nil. (vi) Yes.

GENERAL :

(i) Satisfactory. (ii) Nil. (iii) *Guara* yield. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) to (vii) Nil.

RESULTS :

(i) 1497 lb./ac. (ii) 161.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *Guara* seed in lb./ac.

Treatment	P_0	P_1	P_2
Av. yield	1466	1521	1504

S.E./mean = 72.4 lb./ac.

Crop :- Jowar *(Kharif)*. **Ref :- Pb. 56(75).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To find out the most economical dose of N for Jowar.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 15.6.1956. (iv) (a) N.A. (b) Sown by *kera*. (c) 40 lb./ac. (d) 12" between rows. (e) N.A. (v) N.A. (vi) No. 263. (vii) Irrigated. (viii) N.A. (ix) 17.22". (x) 5.9.1956.

2. TREATMENTS :

5 levels of N as A/S : N_0=0, N_1=16, N_2=32, N_3=48 and N_4=64 lb./ac.
Fertilizer applied on 15.6. 1956.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 13.5'×64'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1.59 tons/ac. (ii) 0.17 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.

Treatment	N_0	N_1	N_2	N_3	N_4
Av. yield	1.49	1.57	1.65	1.60	1.64

S.E./mean = 0.07 tons/ac.

Crop :- Jowar *(Kharif)*. **Ref :- Pb. 57(110).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To find out the most economical dose of N for Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 1.8.1957. (iv) (a) 3 *desi* ploughings and passing *sohaga* 4 times. (b) Sown by *kera*. (c) 40 lb./ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) No. 263. (vii) Irrigated. (viii) N.A. (ix) 6.83". (x) 6 to 25.10.1957.

2. TREATMENTS :

Same as in expt. no. 56(75) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Fodder yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 15.19 tons/ac. (ii) 1.52 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of fodder in tons/ac.

Treatment	N_0	N_1	N_2	N_3	N_4
Av. yield	13.64	16.09	14.57	15.66	16.00

S.E./mean = 0.62 tons/ac.

Crop :- Jowar *(Kharif)*. **Ref :- Pb. 58(132).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To find out the most economical dose of N for Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 18.4.1958. (iv) (a) 3 *desi* ploughings and passing *sohaga* 4 times. (b) Sown by *kera*. (c) 40 lb./ac. (d) 1' between rows. (e) N.A. (v) Nil. (vi) 263. (vii) Irrigated. (viii) Nil. (ix) 22.37". (x) 26.6.1958 to 6.7.1958.

2. TREATMENTS :

Same as in expt. no. 56(75) on page 632.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 14.00 tons/ac. (ii) 1.10 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/ac.

Treatment	N_0	N_1	N_2	N_3	N_4
Av. Yield	11.45	13.33	14.02	15.02	16.15

S.E./mean = 0.45 tons/ac.

Crop :- Jowar *(Kharif)*. **Ref :- Pb. 54(22).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of manures on Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Lucerne. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 25.7.1954. (iv) (a) 6 ploughings. (b) Sown by *kera*. (c) 40 lb./ac. (d) and (e) N.A. (v) Nil. (vi) No.—263 (medium). (vii) Irrigated. (viii) 2 hoeings with *kaola*. (ix) 9.45". (x) 18.11.1954.

2. TREATMENTS :

12 manurial treatments : M_0=Control, M_1=25 lb./ac. of N, M_2=50 lb./ac. of N, M_3=100 lb./ac. of N, M_4=25 lb./ac. of P_2O_5, M_5=50 lb./ac. of P_2O_5, M_6=50 lb./ac. of N+25 lb /ac. of P_2O_5, M_7=50 lb./ac. of N+50 lb./ac. of P_2O_5, M_8=100 lb./ac. of N+25 lb./ac. of P_2O_5, M_9=100 lb./ac. of N+50 lb./ac. of P_2O_5, M_{10}=100 lb./ac. of N+25 lb./ac. of P_2O_5+25 lb./ac. of K_2O and M_{11}=100 lb./ac. of N+50 lb./ac. of P_2O_5 +25 lb./ac. of K_2O.

N as A/S, P_2O_5 as Super and K_2O as Pot. Sul. were applied just before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) and (b) $8\frac{1}{2}' \times 64'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1.34 tons/ac. (ii) 0.15 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}	M_{11}
Av. yield	1.42	1.35	1.34	1.30	1.33	1.38	1.44	1.35	1.11	1.38	1.39	1.32

S.E./mean = 0.08 tons/ac.

Crop :- Jowar *(Kharif).* **Ref :- Pb. 55(107).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of manures on Jowar.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 20.7.1955. (iv) (a) N.A. (b) Sown by *kera.* (c) 40 lb./ac. (d) 2′ between rows. (e) N.A. (v) N.A. (vi) No.—263. (vii) Irrigated. (viii) N.A. (ix) 15.07″. (x) 17.1.1956.

2. TREATMENTS :

Same as in expt. no. 54(22) on page 633.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 9′×132′. (b) 64′×8½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Heavy rains at flowering stage affected the crop. (vii) Nil.

5. RESULTS :

(i) 3.44 tons/ac. (ii) 0.41 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}	M_{11}
Av. yield	3.90	3.49	3.18	3.20	3.53	3.46	3.44	3.44	3.35	3.47	3.27	3.53

S.E./mean = 0.21 tons/ac.

Crop :- Jowar *(Kharif).* **Ref :- Pb. 56(74).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of manures on Jowar.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 17.7.1956. (iv) (a) N.A. (b) Sown by *kera.* (c) 40 lb./ac. (d) 2′ between rows. (e) Nil. (v) Nil. (vi) No.—263. (vii) Irrigated. (viii) N.A. (ix) 21.16″. (x) 17.11.1956.

2. TREATMENTS :

Same as in expt. no. 54(22) on page 633.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8.5′×64′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) *15.55* tons/ac. *(ii) 2.80* tons/ac. *(iii)* Treatment differences are not significant. *(iv)* Av. yield of fodder in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}	M_{11}
Av. yield	14.04	12.47	13.96	15.54	13.54	14.99	17.38	15.20	17.29	16.21	18.70	17.28

S.E./mean = 1.40 tons/ac.

Crop :- Jowar. **Ref :- Pb. 54(23).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :— To study the effect of manures on the fodder yield of Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cowpea. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 23.5.1954. (iv) (a) 2 *desi* ploughings and 2 *sohaga*. (b) Sown by *kera*. (c) 40 lb./ac. (d) and (e) N.A. (v) Nil. (vi) 263 (medium). (vii) Irrigated. (viii) Nil. (ix) 3.5". (x) 8 to 18.8.1954.

2. TREATMENTS :

11 manurial treatments : M_0=Control, M_1=50 lb./ac. of N, M_2=100 lb./ac. of N, M_3=150 lb./ac. of N, M_4=200 lb./ac. of N, M_5=50 lb./ac. of N+10 lb./ac. of P_2O_5, M_6=100 lb./ac. of N+20 lb./ac. of P_2O_5, M_7=150 lb./ac. of N+30 lb./ac. of P_2O_5, M_8=200 lb./ac. of N+40 lb./ac. of P_2O_5, M_9=200 lb./ac. of N+40 lb./ac. of P_2O_5+25 lb./ac. of K_2O and M_{10}=150 lb./ac. of N+30 lb./ac. of P_2O_5+25 lb./ac. of K_2O.

N as A/S, P_2O_5 as Super and K_2O as Pot. Sul. broadcast before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) and (b) $8\frac{1}{2}' \times 64'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Fodder yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 25.78 tons/ac. (ii) 1.84 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of fodder in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
Av. yield	22.76	26.07	25.68	25.94	26.29	24.54	24.69	25.92	26.89	28.33	26.51

S.E./mean = 0.92 tons/ac.

Crop :- Jowar *(Kharif)*. **Ref :- Pb. 55(106).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :— To study the effect of manures on the fodder yield of Jowar.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 13.6.1955. (iv) (a) N.A. (b) Sown by *kera*. (c) 40 lb./ac. (d) 1' between rows. (e) N.A. (v) Nil. (vi) No.—263. (vii) Irrigated. (viii) N.A. (ix) 9.86". (x) 25.8.1955 to 3.9.1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(23) above.

5. RESULTS :

(i) 27.38 tons/ac. (ii) 1.61 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of fodder in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
Av. yield	26.43	29.17	25.71	27.20	26.54	27.35	27.64	27.22	29.57	26.32	28.06

S.E./mean = 0.80 tons/ac.

Crop :- Jowar *(Kharif).* **Ref :- Pb. 56(73)**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object : – To study the effect of manures on the fodder yield of Jowar.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 15.6.1956. (iv) (a) N.A. (b) Sown by *kera.* (c) 40 lb./ac. (d) 1' between rows. (e) N.A. (v) Nil. (vi) No.—263. (vii) Irrigated. (viii) N.A. (ix) 17.22". (x) 28.8.1956 to 3.9.1956.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(23) on page 635.
Fertilizers applied on 15.6.1956.

4. GENERAL :

(i) Good. Crop lodged due to heavy rains. (ii) Nil. (iii) Fodder yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 15.23 tons/ac. (ii) 1.34 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
Av. yield	15.33	16.22	15.24	14.39	13.67	15.33	16.45	15.13	15.48	14.62	15.66

S.E./mean = 0.67 tons/ac.

Crop :- Jowar *(Kharif).* **Ref :- Pb. 55(108).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of different sources of N on Jowar.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 28.7.1955. (iv) (a) N.A. (b) Sown by *kera.* (c) 40 lb./ac. (d) 2' between rows. (e) N.A. (v) N.A. (vi) No—263. (vii) Irrigated. (viii) N.A. (ix) 15.07". (x) 17.1.1956.

2. TREATMENTS :

4 sources of 40 lb./ac. of N : S_0 =Control, S_1=A/S, S_2=A/N and S_3=Urea.
Fertilizers applied on 1.9.1955 by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Fodder yield. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Heavy rains affected the crop. (vii) Nil.

5. RESULTS :

(i) 0.91 tons/ac. (ii) 0.03 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	0.92	0.95	0.92	0.84

S.E./mean = 0.02 tons/ac.

Crop :- Jowar *(Kharif)*. **Ref :- Pb. 57(68).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To find out the best source of N for Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 30.7.1957. (iv) (a) and (b) N.A. (c) 20 srs./ac. (d) and (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 18.66". (x) 10.10.1957.

2. TREATMENTS :

7 sources of 40 lb /ac. of N : S_0=Control, S_1=A/S/N, S_2=A/N, S_3=A/C, S_4=A/S, S_5=C/N and S_6=Urea.

3. DESIGN :

(i) R.B D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 60½'×9'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 6.10 tons/ac. (ii) 0.77 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	6.04	6.83	5.69	6.19	6.20	5.49	6.24

S.E./mean = 0.39 tons/ac.

Crop :- Jowar *(Kharif)*. **Ref :- Pb. 58(60).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To find out the best source of N for Jowar crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 8.7.1958. (iv) (a) N.A. (b) Sown by *kera*. (c) 20 srs./ac. (d) and (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 23.18". (x) Sept., 1958.

2. TREATMENTS :

8 sources of 50 lb./ac. of N : S_0=Control, S_1=A/S/N, S_2=A/N, S_3=A/C, S_4=A/S, S_5=C/N, S_6=Urea and S_7=C/A/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 75'×9'8". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2.73 tons/ac. (ii) 0.65 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	2.28	3.09	2.59	2.88	3.25	2.00	3.16	2.61

S.E./mean = 0.38 tons/ac.

Crop :- Jowar *(Kharif)*. **Ref :- Pb. 59(132).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To find out the best source of N for Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 3.7.1959. (iv) (a) N.A. (b) Sown by *kera* (c) 20 srs./ac. (d) 1′ between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 1.1″. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 57(68) on page 637.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 66′×6′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 12.76 tons/ac. (ii) 1.01 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of fodder in tons/ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	11.49	13.44	13.26	13.01	12.75	13.26	12.12

S E./mean = 0.50 tons/ac.

Crop :- Jowar *(Kharif)*. **Ref :- Pb. 58(61).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the residual effect of N and P on Jowar.

1. BASAL CONDITIONS :

(i) (a) *Berseem—Jowar*. (b) *Berseem*. (c) As per treatments. (ii) (a) Loamy soil. (b) N.A. (iii) July, 1958. (iv) (a) N.A. (b) Sown by *kera*. (c) 20 srs./ac. (d) and (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 23.18″. (x) Sept., 1958.

2. TREATMENTS :

All combinations of (1) and (2) + one control

(1) 2 levels of manures : F_1=40 lb./ac. of N as A/S+80 lb./ac. of P_2O_5 as Dical. Phos. and F_2=40 lb./ac. of N as A/S+80 lb./ac. of P_2O_5 as Super.

(2) 2 methods of application : M_1=Broadcasting and M_2=Placement.

Treatments applied to previous *berseem* crop.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 72′×10½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1958—N.A. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Crop was affected by heavy rains. (vii) Nil.

5. RESULTS :

(i) 13.06 tons/ac. (ii) 0.80 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of fodder in tons/ac.

Control = 13.12 tons/ac.

	F_1	F_2	Mean
M_1	12.94	12.88	12.91
M_2	13.24	13.10	13.17
Mean	13.09	12.99	13.04

S.E. of any marginal mean = 0 28 tons/ac.
S.E. of body of table or control mean = 0.40 tons/ac.

Crop :- Jowar *(Kharif)*. **Ref :- Pb. 58(62).**

Site :- Govt. Agri. Stn., Hansi. **Type :- 'M'.**

Object :—To study the residual effect of P applied to previous crop on Jowar.

1. BASAL CONDITIONS :

(i) (a) *Jowar—Berseem.* (b) *Berseem.* (c) As per treatments. (ii) (a) Loamy soil. (b) N.A. (iii) 12.6.1958. (iv) (a) 3 *desi* ploughings and 1 *sohaga.* (b) Sown by *kera.* (c) 16 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 23.18″. (x) Aug., 1958.

2. TREATMENTS :

All combinations of (1) and (2) + one control
(1) 2 sources of 80 lb./ac. of P_2O_5 : F_1=Super and F_2=Dical. Phos.
(2) 2 methods of application : M_1=Broadcasting and M_2=Drilling.
Fertilizers applied to previous *berseem* crop.

3. DESIGN :

(i) R.B D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 72′×10½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1957—N.A. (b) Yes. (c) No. (v) (a) and (b) Nil. (vi) Crop was damaged by heavy rains. (vii) Nil.

5. RESULTS :

(i) 13.35 tons/ac. (ii) 0.87 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of fodder in tons/ac.

Control = 12.53 tons/ac

	F_1	F_2	Mean
M_1	13.59	13.56	13.57
M_2	13.39	13.72	13.56
Mean	13.49	13.64	13.56

S.E. of any marginal mean = 0.31 tons/ac.
S.E. of body of table or control mean = 0.43 tons/ac.

Crop :- Lucerne. **Ref :- Pb. 54(27).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'CM'.**

Object :—To study the effect of seed rate, spacing and manuring on the seed yield of Lucerne.

1. BASAL CONDITIONS :

(i) (a) N A. (b) *Jowar* and G.M. crops. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Sirsa. (iii) 15 11.1954. (iv, a) to (e) N.A. (v) Nil. (vi) No. 9. (vii) Irrigated. (viii) 3 hoeings. (ix) 0.54". (x) 8, 9.5.1955.

2. TREATMENTS :

Main-plot treatments :

5 manurial treatments : M_0 =0, M_1 =100 lb./ac. of P_2O_5 as Super, M_2 =M_1+50 lb./ac. of K_2O as Pot. Sul., M_3 =M_2+25 lb./ac. of N as A/S and M_4 =M_3+C/S at 24 lb./ac.+$MnSO_4$ at 48 lb./ac.+$ZnSO_4$ at 24 lb./ac. + Borax at 12 lb /ac.+Sod. molybdate at 6 lb./ac.

Sub-plot treatments :

3 spacings : S_1=Broadcast, S_2 =1½' between rows and S_3=2' between rows.

Sub-Sub-plot treatments :

3 seed rates : R_1 =2, R_2 =3 and R_3 =4 srs. ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots, block ; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of lucerne seed. (iv) (a) 1953—1954. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS ;

(i) 464 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of seed in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean	R_1	R_2	R_3
S_1	411	409	415	464	406	421	466	416	381
S_2	507	464	496	548	501	503	562	505	444
S_3	473	425	414	559	472	469	527	475	404
Mean	464	433	442	524	460	464	518	465	410
R_1	539	457	471	614	508				
R_2	487	421	450	509	460				
R_3	365	420	406	444	412				

S.E.s'—N A.

Crop :- Maize *(Kharif)*. **Ref :- Pb. 56(86).**

Site :- Cotton Res. Stn., Faridkot. **Type :- 'M'.**

Object :—To study the effect of varying doses of N in combination with F.Y.M.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Faridkot. (iii) 7.5.1956. (iv) (a) 4 ploughings. (b) Sown by *pore*. (c) 16 srs /ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 8 to 10.7.1956.

2. TREATMENTS :

All combinations of (1) and (2) + one control

(1) 3 sources of N : S_1=A/S, S_2=F.Y.M. and S_3=A/S+F.Y.M.

(2). 2 levels of N : N_1=50 and N_2=100 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1,49.13c. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1956 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 8.54 tons./ac. (ii) 1.38 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of fodder in tons/ac.

Control = 8.12 tons/ac.

	S_1	S_2	S_3	Mean
N_1	7.90	7.76	9.57	8.41
N_2	9.24	8.54	8.64	8.81
Mean	8.57	8.15	9.11	8.61

S.E. of S marginal mean = 0.40 tons/ac.
S.E. of N marginal mean = 0.33 tons/ac.
S.E. of body of table or control mean = 0.56 tons/ac.

Crop :- Oats *(Rabi)*. **Ref :- Pb. 55(141).**

Site :- Soil Sub-Stn., Rohtak. **Type :- 'M'.**

Object :—To find out the effect of different sources of N on Oats.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Silty loam. (b) Refer soil analysis, Rohtak. (iii) 19.11.1955. (iv) (a) N.A. (b) Sown by *kera*. (c) 32 srs/ac. (d) and (e) N.A. (v) 50 lb./ac. of mixture of A/S and Super applied on 19.11.1955. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 0.59". (x) 31.3.1956.

2. TREATMENTS :

6 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S, S_2=Urea, S_3=A/N, S_4=A/C and S_5=A/S/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/25 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 8.40 tons/ac. (ii) 0.96 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/ac.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5
Av. yield	2.20	9.27	9.68	9.52	10.45	9.28

S.E./mean = 0.48 tons/ac.

Crop :- Oats *(Rabi)*. **Ref :- Pb. 54(28).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To find out the best source of N for Oats crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cowpeas. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 29.10.1954. (iv) (a) 3 to 5 ploughings and 1 *sohaga*. (b) N.A. (c) 26 srs/ac. (d) and (e) N.A. (v) Nil. (vi) Weston 11 (medium). (vii) Irrigated. (viii) Nil. (ix) 0.75". (x) 1.3.1955 and 5.3.1955.

2. TREATMENTS :

3 sources of 40 lb./ac. of N : S_0=Control, S_1=A/S and S_2=Urea.
Fertilizers broadcast before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 11'×132'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1954—1956. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 14.87 tons/ac. (ii) 1.34 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of fodder in tons/ac.

Treatment	S_0	S_1	S_2
Av. yield	13.52	15.37	15.71

S.E./mean = 0.55 tons/ac.

Crop :- Oats *(Rabi)*. **Ref :- Pb. 55(116).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :— To find out the best source of N for Oats crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 25.10,1955. (iv) (a) N.A, (b) Sown by *kera*. (c) 26 srs/ac. (d) 1' between rows. (e) N.A. (v) N.A. (vi) Weston 11. (vii) Irrigated. (viii) N.A. (ix) 4.15". (x) 16,18.2.1956.

2. TREATMENTS :

Same as in expt. no. 54(28) on page 641.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 132'×13'. (b) 132'×11'. (v) 1' on either side of the plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Fodder yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (vii) Nil,

5. RESULTS :

(i) 16.65 tons/ac. (ii) 1.25 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/ac.

Treatment	S_0	S_1	S_2
Av. yield	13.78	18.12	18.05

S.E./mean = 0.51 tons/ac.

Crop :-Oats *(Rabi)*. **Ref :-Pb. 56(84).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To find out the best source of N for Oats crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 24.11.1956. (iv) (a) N.A. (b) Sown by *kera*. (c) 10 srs/ac. (d) 2′ between rows. (e) N.A. (v) N.A. (vi) Weston—11. (vii) Irrigated. (viii) N.A. (ix) 3.17″. (x) 13.5.1957.

2. TREATMENTS :

Same as in expt. no. 54 (28) on page 641.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 12′×132′. (v) N.A, (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of seed and straw. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1940 lb./ac. (ii) 274.5 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of seed in lb./ac.

Trearment	S_0	S_1	S_2
Av. yield	1645	2022	2154

S.E./mean = 112.1 lb./ac.

Crop :- Oats *(Rabi)*. **Ref :- Pb. 55(117).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :— To study the effect of manures applied to Oats crop grown in rotation with Lucerne.

1. BASAL CONDITIONS :

(i) (a) Lucerne—Oats. (b) Lucerne. (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 21.11.1955. (iv) (a) N.A. (b) Sown by *kera*. (c) 24 srs./ac. (d) 1′ between rows. (e) N.A. (v) N.A. (vi) Brunker—10. (vii) Irrigated. (viii) N.A. (ix) 3.57″. (x) 8.5.1956.

2. TREATMENTS :

4 manurial treatments : M_0=Control, M_1=25 lb./ac. of N as A/S, M_2=40 lb./ac. of N as A/S and M_3= M_2+25 lb./ac. of P_2O_5 as Super.

Manures applied at the time of sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 11′×132′. (b) 9′×132′. (v) 1′ on either side of the plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Fodder and seed yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2921 lb./ac. (ii) 218.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of seed in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	2927	2927	3002	2826

S.E./mean = 89.4 lb./ac.

Crop :- Oats *(Rabi)*. **Ref :- Pb.55 (119).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :— To study the effect of manures applied to Oats crop grown in rotation with Sudangrass.

1. BASAL CONDITIONS :

(i) (a) Sudangrass—Oats. (b) Sudangrass. (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 21.11.1955. (iv) (a) N.A. (b) Sown by *kera*. (c) 37 srs./ac. (d) 1′ between rows. (e) Nil. (v) N.A. (vi) Brunker—10. (vii) Irrigated. (viii) N.A. (ix) 3.57″. (x) 8.5.1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(117) on page 643.

5. RESULTS :

(i) 2016 lb./ac. (ii) 189.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of seed in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1118	2060	2563	2324

S.E./mean = 77.4 lb./ac.

Crop :- Oats *(Rabi)*. **Ref :- Pb. 56 (82).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :— To study the effect of manures applied to Oats crop grown in rotation with Sudangrass.

1. BASAL CONDITIONS :

(i) (a) Sudangrass—Oats. (b) Sudangrass. (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 20.11.1956. (iv) (a) N.A. (b) Sown by *kera*. (c) 24 srs./ac. (d) 2′ between rows. (e) N.A. (v) N.A. (vi) Brunker—10. (vii) Irrigated. (viii) N.A. (ix) 3.17″. (x) 13.5.1957.

2. TREATMENTS :

Same as in expt. no. 55(117) on page

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 12′×65′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Seed and fodder yield. (iv) (a) 1955—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1345 lb./ac. (ii) 107.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of seed in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	957	1360	1532	1532

S.E./mean = 43.8 lb./ac.

Crop :- Oats *(Rabi)*. **Ref :- Pb. 55(118).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of manures applied to Oats crop grown in rotation with Jowar.

1. BASAL CONDITIONS:

(i) (a) *Jowar*—Oats. (b) *Jowar*. (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 20.11.1955. (iv) (a) N.A. (b) Sown by *kera*. (c) 37 srs./ac. (d) 1′ between rows. (e) N.A. (v) N.A. (vi) Brunker—10. (vii) Irrigated. (viii) N.A. (ix) 3.57″. (x) 8.5.1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(117) on page 643.

5. RESULTS :

(i) 3191 lb./ac. (ii) 208.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of seed in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	2286	3303	3618	3555

S.E./mean = 85.0 lb./ac.

Crop :- Oats *(Rabi)*. **Ref :- Pb. 56(81).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of manures applied to Oats crop grown in rotation with Jowar.

1. BASAL CONDITIONS :

(i) (a) *Jawar*—Oats. (b) *Jowar*. (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 22.11.1956. (iv) (a) N.A. (b) Sown by *kera*. (c) 25 srs./ac. (d) 2' between rows. (e) N.A. (v) N.A. (vi) Brunkr—10. (vii) Irrigated. (viii) N.A. (ix) 3.17". (x) 13.5.1957.

2. TREATMENTS :

Same as in expt. no. 55(117) on page 643.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 12'×132'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Seed and fodder yield. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1459 lb./ac. (ii) 136.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of seed in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1706	1518	924	1688

S.E./mean = 55.8 lb./ac.

Crop :- Senji. **Ref :- Pb. 54(21).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of N and P alone and in combinations on Senji crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Oats. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Sirsa. (iii) 16.10.1954. (iv) (a) 6 ploughings with *desi hal*. (b) Ercadcast. (c) 20 srs./ac. (d) and (e) N.A. (v) Nil. (vi) Fos—1 (medium). (vii) Irrigated. (viii) Weeding. (ix) 0.32". (x) 17.2.1955 to 10.3.1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

(2) 4 levels of P_2O_5 as Super : P_0=0, P_1=50, P_2=100 and P_3=150 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) and (b) 8½'×64'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) The crop lodged badly in the end of January, 1955. (ii) Nil. (iii) Fodder yield. (iv) (a) 1952—1954. (b) No (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 15.09 tons/ac. (ii) 1.58 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of fodder in tons/ac.

	P_0	P_1	P_2	P_3	Mean
N_0	14.96	14.92	16.82	15.74	15.61
N_1	15.18	13.97	15.59	16.27	15.25
N_2	14.21	14.65	15.22	13.62	14.42
Mean	14.78	14.51	15.88	15.21	15.09

S.E. of P marginal mean = 0.46 tons/ac.
S.E. of N marginal mean = 0.39 tons/ac.
S.E. of body of table = 0.79 tons/ac.

Crop :- Sudangrass. **Ref :- Pb. 54(24).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of high level of fertilizers on grass yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cowpeas. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 22.3.1954. (iv) (a) 2 ploughings. (b) Sown by *kera*. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) 3.85". (x) 3 cuttings : 11.5.1954 to 2.6.1954, 6 7.1954 to 25.7.1954 and 25.8.1954 to 4.9.1954.

2. TREATMENTS

8 manurial treatments : M_0=0, M_1=125 lb./ac. of N as F.Y.M., M_2=250 lb./ac. of N as F.Y.M., M_3=M_1+125 lb./ac. of N as A/S, M_4=125 lb./ac. of N as A/S, M_5=M_4+62.5 lb./ac. of P_2O_5 as Super, M_6=250 lb./ac. of N as A/S and M_7=M_6+125 lb./ac. of P_2O_5 as Super.

Fertilizers applied on 22.3.1954 and F.Y.M on 8.3.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) $8\frac{1}{2}' \times 64'$. (v) No. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grass yield. (iv) (a) 1953—1955. (b) Nil. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 22.56 tons/ac. (ii) 2.40 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grass in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Av. yield	16.41	15.86	20.47	24.92	23.96	22.58	27.32	29.00

S.E./mean = 0.98 tons/ac.

Crop :- Sudangrass. **Ref :- Pb. 55(109).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To study the effect of high level of fertilizers on grass yield.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 28.4.1955. (iv) (a) N.A. (b) Sown by *kera*. (c) 10 srs./ac. (d) 1′ between rows. (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 9.86″. (x) 23.8.1955, 11.8.1955 and 14.9.1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(24) on page 646.

5. RESULTS :

(i) 32.87 tons/ac. (ii) 2.81 tons./ac. (iii) Treatment differences are higoly significant. (iv) Av. yield of grass in tons/ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Av. yield	26.07	27.88	28.86	35.14	33.47	34.71	37.24	39.58

S.E./mean = 1.15 tons/ac.

Crop :- Sudangrass. **Ref :- Pb. 56(76).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To find out the optimum level of N for forage yield of Sudangrass.

1. BASAL CONDITIONS :

(i) (a) Oats—Sudangrass—Oats. (b) Oats. (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa (iii) 3.4.1956. (iv) (a) N.A. (b) Sown by *kera*. (c) 10 srs./ac. (d) 1′ between rows. (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 17.22″. (x) 3 cuttings : 5 to 9.6.1956, 27, 28.7.1956 and 21 to 26 9.1956.

2. TREATMENTS :

5 levels of N as A/S : N_0=0, N_1=16, N_2=32, N_3=48 and N_4=64 lb./ac.
In N_2, N_3 and N_4 treatments half dose applied by broadcast on sowing and half dose 2 months after sowing.
In N_1 full dose applied by broadcast at sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 8½′×64′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grass yield. (iv) (a) 1956—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 16.98 tons/ac. (ii) 1.52 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grass in tons/ac.

Treatment	N_0	N_1	N_2	N_3	N_4
Av. yield	14.47	15.75	17.39	18.62	18.69

S.E./mean = 0.62 tons/ac.

Crop :- Sudangrass. **Ref :- Pb. 58(133).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To find out the optimum level of N for Sudangrass.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 18.4.1958. (iv) (a) 3 *desi* ploughs and 4 *sohaga*. (b) Sown by *kera*. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing. (ix) 22.37″. (x) 3 cuttings on 9.6.1954 to 20.6.1958, 22.8.1958 to 28.8.1958 and 8.10.1958 to 9.10.1958.

2. TREATMENTS to 4. GENERAL:

Same as in expt. no. 56(76) on page 647.

N applied on 18.4.1958.

5. RESULTS :

(i) 12.85 tons/ac. (ii) 1.02 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grass in tons/ac.

Treatment	N_0	N_1	N_2	N_3	N_4
Av. yield	10.54	12.18	13.27	13.78	14.49

S.E./mean = 0.42 tons/ac.

Crop :- Fodder *(Kharif).* **Ref :- Pb. 5(77).**

Site :- Fodder Res. Stn. Sirsa. **Type :- 'M'.**

Object :—To find out the effect of different levels of N on fodder crops.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 26.6.1956. (iv) (a) N.A. (b) Sown by *kera*. (c) As per treatments. (d) 12" between rows. (e) N.A. (v) 16 C.L. of F.Y.M. (vi) *Jowar* : 263, Maize and Cowpeas : local. (vii) Irrigated. (viii) N.A. (ix) 17.22". (x) 11, 18.9.1956.

2. TREATMENTS :

Main-plot treatments :

3 levels of N as A.S : N_0=0, N_1=25 and N_2=50 lb./ac.

Sub-plot treatments :

5 fodder crops : C_1=*Jowar* at 16 srs./ac.+cowpea at 8 srs./ac., C_2=Maize at 16 srs./ac.+Cowpea at 8 srs./ac., C_3=*Jowar* alone at 24 srs./ac., C_4=Maize alone at 24 srs./ac. and C_5=Cowpea alone at 16 srs./ac.

Manures applied at the time of sowing.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8½'×64'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Fodder yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 10.98 tons/ac. (ii) (a) 1.29 tons/ac. (b) 2.27 tons/ac. (iii) Main effect of C alone is highly significant. (iv) Av. yield of fodder in tons/ac.

	C_1	C_2	C_3	C_4	C_5	Mean
N_0	15.40	9.69	11.49	6.03	9.94	10.51
N_1	14.63	9.36	13.73	7.97	9.82	11.07
N_2	12.78	11.54	13.35	9.54	9.60	11.36
Mean	14.27	10.20	12.86	7.79	9.79	10.98

S.E. of difference of two

1. N marginal means = 0.41 tons/ac.
2. C marginal means = 0.93 tons/ac.
3. C means at the same level of N = 1.60 tons/ac.
4. N means at the same level of C = 1.49 tons/ac.

Crop :- Fodder *(Kharif).* **Ref :- Pb. 57(113).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To find out the effect of different lerels of N on fodder crops.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 30.5.1957. (iv) (a) N.A. (b) Sown by *kera.* (c) As per treatments. (d) 12″ between rows. (e) N A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 6.83″. (x) 1.8.1957 to 8.8.1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(77) on page 648.

5. RESULTS :

(i) 11.81 tons/ac. (ii) (a) 1.28 tons/ac. (b) 1.70 tons/ac. (iii) Main effect of C and interaction N×C are highly significant. (iv) Av. yield of fodder in tons/ac.

	C_1	C_2	C_3	C_4	C_5	Mean
N_0	14.36	10.54	8.78	14.09	7.64	11.08
N_1	14.58	11.37	11.08	14.62	8.61	12.05
N_2	14.36	11.57	11.59	15.63	8.32	12.30
Mean	14.44	11.16	10.48	14.78	8.19	11.81

S.E. of difference of two

1. N marginal means = 0.40 tons/ac.
2. C marginal means = 0.69 tons/ac.
3. C means at the same level of N = 1.20 tons/ac.
4. N means at the same level of C = 1.15 tons/ac.

Crop :- Fodder *(Kharif).* **Ref :- Pb. 58(134).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'M'.**

Object :—To find out the effect of different levels of N on fodder crops.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 4.6.1958. (iv) (a) N.A. (b) Sown by *kera.* (c) As per treatments. (d) 10″ between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 22.37″. (x) 6.8.1958 to 21.8.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(77) on page 648.

5. RESULTS :

(i) 11.30 tons/ac. (ii) (a) 2.11 tons/ac. (b) 1.70 tons/ac. (iii) All effects are highly significant. (iv) Av. yield of fodder in tons/ac.

	C_1	C_2	C_3	C_4	C_5	Mean
N_0	13.11	9.15	9.50	6.56	9.68	9.60
N_1	13.37	9.57	11.90	7.64	8.87	10.27
N_2	19.23	12.62	17.89	9.73	10.62	14.02
Mean	15.24	10.44	13.10	7.98	9.72	11.30

S.E. of difference of two

1. N marginal means = 0.67 tons/ac.
2. C marginal means = 0.69 tons/ac.
3. C means at the same level of N = 1.20 tons/ac.
4. N means at the same level of C = 1.26 tons/ac.

Crop :- Fodder *(Kharif).* **Ref :- Pb. 59(143).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'C'.**

Object :—To study the effect of fodder crops sown as mixed crops.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 22.4.1959. (iv) (a) N.A. (b) Sown by *kera*. (c) As per treatments. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 6.20". (x) Aug., 1959.

2. TREATMENTS :

7 mixed crop treatments : C_1=*Jowar* at 16 srs./ac.+cowpea at 8 srs./ac. in alternative rows, C_2=Maize at 16 srs./ac.+cowpea at 8 srs./ac. in alternative rows, C_3=Mixture of *jowar* at 16 srs./ac. and cowpea at 8 srs./ac., C_4=Mixture of maize at 16 srs./ac. and cowpea at 8 srs/ac., C_5=*Jowar* at 24 srs./ac., C_6=Maize at 24 srs./ac. and C_7=cowpea at 16 srs./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Fodder yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 15.21 tons/ac. (ii) 1.65 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/ac.

Treatment	C_1	C_2	C_3	C_4	C_5	C_6	C_7
Av. yield	17.62	13.48	18.86	12.61	18.90	12.41	12.57

S.E./mean = 0.67 lb./ac.

Crop :- Grass. **Ref :- Pb. 59(159).**

Site :- Soil Cons. Res. Demons. and Trg. Centre, Chandigarh. **Type :- 'C'.**

Object :—To study the effect of cultural treatments on the yield of Grass.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Grass. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Chandigarh. (iii) and (iv) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

4 cultural practices : T_0=0, T_1=Basin testing, T_2=Contom furrowing and T_3=Contom ridging.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/10 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) N.A. (iii) Yield of grass. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 4346 lb./ac. (ii) 620.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grass in lb./ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	3683	4482	4993	4226

S.E./mean = 310.2 lb./ac.

Crop :- Teosinte (Makchari). **Ref :- Pb. 54(26).**

Site :- Fodder Res. Stn., Sirsa. **Type :- 'C'.**

Object :—To find out the best spacing and seedrate for Teosinte seed crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Berseem.* (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 6.8.1954. (iv) (a) 2 ploughings and 2 *sohaga.* (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing with *ka·ola.* (ix) 9.45". (x) 15.12.1954.

2. TREATMENTS :

3 cultural treatments : T_1=12" spacing between rows and seedrate at 21 lb./ac., T_2=18" spacing between rows and seedrate at 14 lb./ac. and T_3=24" spacing between rows and seedrate at 10.5 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 3. (iv) (a) and (b) 36'×132'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Average height of tillers and seed yield. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. was originally laid out with 6 replications but the yield of only three replications is taken for analysis. The crop in other three replications was vitiated due to heavy lodging because of rains.

5. RESULTS :

(i) 1633 lb./ac. (ii) 144.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of seed in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	1792	1691	1415

S.E./mean = 83.5 lb./ac.

Crop :- Apple. **Ref :- Pb. 58(173).**

Site :- Hort. Res. Stn., Kulu. **Type :- 'C'.**

Object :—To study the effect of different methods of planting of Apple.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) Clay loam. (b) Refer soil analysis. Kulu. (iii) Tongue grafting. (iv) Baldwin. (v) 14.3.1951 with specing 22'×22'. (vi) 1 year old. (vii) Nil. (viii) 1 prunning, 15 hoeings and 15 weedings. (ix) Nil. (x) Irrigated. (xi) N.A. (xii) 1st week of Aug. to 3rd week of Sept.

2. TREATMENTS :

3 methods of planting : C_1=Roots, C_2=Seedlings and C_3=Suckers.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) 4. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of fruits. (iv) (a) 1951—contd. (b) N.A. (v) to (vii) Nil.'

5. RESULTS :

(i) 3.08 lb./tree. (ii) 5.34 lb./tree. (iii) Treatment differences are not significant. (iv) Av. yield of apple in lb./tree.

Treatment	C_1	C_2	C_3
Av. yield	1.54	5.27	2.44

S.E./mean = 2.67 lb./tree.

Crop :- Grape Fruit. **Ref :- Pb. 54(206).**

Site :- Fruit Res. Stn., Attari. **Type :- 'MV'.**

Object :—To study the effect of different fertilizers on different varities of Grape fruit.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) Clayey loam. (b) N.A. (iii) By budding. (iv) As per treatments. (v) Planted in 1941 with 18'×18' spacing. (vi) and (vii) N.A. (viii) 1 weeding. (ix) N.A. (x) Irrigated. (xi) and (xii) N.A.

2. TREATMENTS :

Main-plot treatments :

4 manurial treatments : M_1=A/S, M_2=A/S+Super, M_3=A/S+Potash and M_4=A/S+Super+Potash.

Snb-plot treatments :

4 varieties : V_1=Foster, V_2=Marsh seedless, V_3=Duncan and V_4=Poona budded.

N, P and K applied at 2.0, 2.06 and 2.42 lb./tree respectively.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 4 sub-plots/main-plots. (b) N.A. (iii) 4. (iv) 1. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of fruits. (iv) (a) 1951—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

(i) 130 fruits/tree. (ii) (a) 113 fruits/tree. (b) 71 fruits/tree. (iii) None of the effects is significant. (iv) Av. number of fruits/tree.

	V_1	V_2	V_3	V_4	Mean
M_1	152	119	86	91	112
M_2	187	179	109	205	170
M_3	186	70	171	133	140
M_4	76	171	93	53	98
Mean	150	135	115	121	130

S.E. of difference of two

1. M marginal means = 40 fruits/tree.
2. V marginal means = 25 fruits/tree.
3. V means at the same level of M = 50 fruits/tree.
4. M means at the same level of V = 59 fruits/tree.

Crop :- Grape Fruit. **Ref :- Pb. 55(145).**

Site :- Fruits Res. Stn., Attari. **Type :- 'MV'.**

Object :—To study the effect of different fertilizers on different varieties of Grape fruit.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 54(206) on page. 652.

5. RESULTS :

(i) 182 lb./tree. (ii) (a) 92.9 lb./tree. (b) 85.0 lb./tree. (iii) None of the effects is significant. (iv) Av. yield of fruits in lb./ac.

	V_1	V_2	V_3	V_4	Mean
M_1	131	169	194	177	168
M_2	187	105	239	261	198
M_3	141	134	178	149	151
M_4	206	207	193	243	212
Mean	166	154	201	208	182

S.E. of difference of two

1. M marginal means = 32.8 lb./tree.
2. V marginal means = 30.0 lb./tree.
3. V means at the same level of M = 60.1 lb./tree.
4. M mean at the same level of V = 61.5 lb./tree.

Crop :- Grape Fruit. **Ref Pb. 57(151).**

Site :- Fruit Res. Stn., Attari. **Type :- 'MV'.**

Object :—To study the effect of different fertilizers on differents varieties of Grape fruit.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 54(206) on page 652.

5. RESULTS :

(i) 326 fruits/tree. (ii) (a) 204 fruits/tree. (b) 160 fruits/tree. (iii) None of the effects is significant. (iv) Av. number of fruits/tree.

	V_1	V_2	V_3	V_4	Mean
M_1	368	326	338	434	367
M_2	428	463	292	182	341
M_3	176	223	331	449	295
M_4	314	368	166	362	303
Mean	322	345	282	357	326

S.E. of difference of two

1. M marginal means = 72 fruits/tree.
2. V marginal means = 57 fruits/tree.
3. V means at the same level of M = 113 fruits/tree.
4. M means at the same level of V = 121 fruits/tree.

Crop :- Grape Fruit. **Ref :- Pb. 59(185).**

Site :- Fruit Res. Stn., Attari. **Type :- 'MV'.**

Object :— To study the effect of different fertilizers on different varieties of Grape fruit.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 54(206) on page 652.

5. RESULTS :

(i) 92 fruits/tree. (ii) (a) 85 fruits/tree. (b) 80 fruits/tree. (iii) None of the effects is significant. (iv) Av. number of fruits/tree.

	V_1	V_2	V_3	V_4	Mean
M_1	199	73	90	131	123
M_2	137	36	102	39	79
M_3	72	43	144	99	90
M_4	34	76	46	138	74
Mean	111	57	96	102	92

S.E. of difference of two

1. M marginal means = 30 fruits/tree.
2. V marginal means = 28 fruits/tree.
3. V means at the same level of M = 56 fruits/tree.
4. M means at the same level of V = 57 fruits/tree.

Crop :- Malta. **Ref :- Pb. 54(205).**

Site :- Fruit Res. Stn., Attari. **Type :- 'MV'.**

Object :— To study the effect of N on different varieties of Malta.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) Clayey loam. (b) N.A. (iii) By budding. (iv) As per treatments. (v) Planted in 1941 with 18' × 18' spacing. (vi) and (vii) N.A. (viii) 1 weeding. (ix) N.A. (x) Irrigated. (xi) and (xii) N.A.

2. TREATMENTS :

Main-plot treatments :

4 sources of N : M_0=Control, M_1=F.Y.M., M_2=A/S and M_3=A/S+F.Y.M.

Sub-plot treatments :

5 varieties : V_1 -Pine apple, V_2 =Common, V_3=Hamlin, V_4=Blood red and V_5=Valencia (late). N applied at 3 lb./tree.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) 4. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of fruit. (iv) (a) 1951—contd. (b) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 265 fruits/tree. (ii) (a) 273 fruits/tree. (b) 152 fruits/tree. (iii) Main effect of V is highly significant. and effect of M is significant. (iv) Av. number of citrus fruits/tree.

	V_1	V_2	V_3	V_4	V_5	Mean
M_0	130	165	80	42	186	121
M_1	277	313	111	161	395	251
M_2	488	452	104	210	347	320
M_3	620	416	259	168	381	369
Mean	379	336	138	145	327	265

S.E. of difference of two

1. M marginal means = 70 fruits/tree.
2. V marginal means = 44 fruits/tree.
3. V means at the same level of M = 88 fruits/tree.
4. M means at the same level of V = 106 fruits/tree.

Crop :- Malta. **Ref :- Pb. 55(146).**

Site :- Fruit Res. Stn., Attari. **Type :- 'MV'.**

Object :-- To study the effect of N on different varieties of Malta.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 54(205) on page 654.

5. RESULTS :

(i) 219 fruits/tree. (ii) (a) 127 fruits/tree. (b) 65 fruits/tree. (iii) Main effects of V and M are highly significant. (iv) Av. number of citrus fruits/tree.

	V_1	V_2	V_3	V_4	V_5	Mean
M_0	152	122	130	137	116	131
M_1	182	115	233	156	178	173
M_2	327	228	384	262	233	287
M_3	329	205	323	202	364	285
Mean	247	167	267	189	223	219

S.E. of difference of two

1. M marginal means = 33 fruits/tree.
2. V marginal means = 19 fruits/tree.
3. V means at the same level of M = 37 fruits/tree.
4. M means at the same level of V = 47 fruits/tree.

Crop :- Malta. **Ref :- Pb. 59(187).**

Site :- Fruit Res. Stn., Attari. **Type :- 'MV'.**

Object :-- To study the effect of N on different vareities of Malta.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 54(205) on page 654.

5. RESULTS :

(i) 109 fruits/tree. (il) (a) 92 fruits/tree. (b) 57 fruits/tree. (iii) Main effect of V is highly significant and of M is significant. (iv) Av. number of citrus fruits/tree.

	V_1	V_2	V_3	V_4	V_5	Mean
M_0	83	61	86	75	59	73
M_1	77	66	157	102	52	91
M_2	129	96	169	153	40	117
M_3	165	159	208	167	85	157
Mean	113	95	155	124	59	109

S.E. difference of two

1. M marginal means = 24 fruits/tree.
2. V marginal means = 17 fruits/tree.
3. V means at the same level of M = 33 fruits/tree.
4. M means at the same level of V = 38 fruits/tree.

Crop :- Sweet lime. **Ref :- Pb. 54(207).**

Site :- Fruit Res. Stn., Attari. **Type :- 'M'.**

Object :—To study the effect of different G.M. crops on the yield of Citrus fruits.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) Clayey loam. (b) N.A. (iii) By budding. (iv) Citrus aurantifolia swingle. (v) Planted in 1941 with 18′×18′ spacing. (vi) 6 to 12 months. (vii) 60 lb./ac. of Super before sowing of *guara* and *senji*. (viii) 3 hoeings, 2 weedings and earthing up once. (ix) As per treatments. (x) Irrigated. (xi) and (xii) N.A.

2. TREATMENTS :

3 G.M. crops : G_0=Control, G_1=*Senji* and G_2=*Guara*.
Senji and *guara* grown in the plots and used as G.M.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) 3. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Girth, spread, height, juice analysis, and yield of fruits. (iv) (a) 1941—contd. (b) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2.85 lb./tree. (ii) 0.16 lb./tree (iii) Treatment differences are not significant. (iv) Av. yield of citrus in lb./tree.

Treatment	G_0	G_1	G_2
Av. yield	2.94	2.92	2.68

S.E./mean = 0.07 lb./tree.

Crop :- Sweet lime. **Ref :- Pb. 55(147).**

Site :- Fruit Res. Stn., Attari. **Type :- 'M'.**

Object :—To study the effect of different G.M. crops on the yield of Citrus fruits.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) Clayey soil. (b) N.A. (iii) By budding. (iv) *Citrus aurantifolia* Swingle. (v) Planted in 1941 with 18′×18′ spacing. (vi) 6 to 12 months. (vii) 60 lb./ac. of Super before sowing of *guara* and *senji*. (viii) 3 hoeings, 2 weedings and 1 earthing. (ix) As per treatments. (x) Irrigated. (xi) and (xii) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : N_0=0 and N_1=1 lb./tree.

(2) 3 G.M. crops : G_0=Control, G_1=*Senji* and G_2=*Guara*.

Senji and *guara* grown in the plots and used as G.M.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) 3. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Girth, spread, height, juice analysis and yield of fruits. (iv) (a) 1951—contd. (b) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 20 fruits/tree. (ii) 17 fruits/tree. (iii) Main effect of G alone is significant. (iv) Av. number of fruits/tree.

	G_0	G_1	G_2	Mean
N_0	11	33	23	22
N_1	7	32	18	19
Mean	9	32	20	20

S.E. of G marginal mean = 5 fruits/tree.
S.E. of N marginal mean = 4 fruits/tree.
S.E. of body of table = 8 fruits/tree.

Crop :- Sweet lime. **Ref :- Pb. 57(152).**

Site :- Fruit Res. Stn., Attari. **Type :- 'M'.**

Object :—To study the effect of different G.M. crops on the yield of Citrus fruits.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 55(147) on page 656.

5. RESULTS :

(i) 77 fruits/tree. (ii) 47 fruits/tree. (iii) Main effect of N is highly significant and effect of G is significant. (iv) Av. number of fruits/tree.

	G_0	G_1	G_2	Mean
N_0	21	73	23	40
N_1	98	144	101	114
Mean	60	109	62	77

S.E. of G marginal mean = 15 fruits/tree.
S.E. of N marginal mean = 12 fruits/tree.
S.E. of body of table = 21 fruits/tree.

Crop :- Sweet lime. **Ref :- Pb. 59(186).**

Site :- Fruit Res. Stn., Attari. **Type :- 'M'.**

Object :—To study the effect of different G.M. crops on the yield of Citrus fruits.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 55(147) on page 656.

5. RESULTS :

(i) 23.47 lb./tree. (ii) 7.25 lb./tree. (iii) Main effects of G, N and interaction G×N are highly significant. (iv) Av. yield of fruits in lb./tree.

	G_0	G_1	G_2	Mean
N_0	5.84	34.48	12.97	17.76
N_1	3.28	55.76	28.46	29.17
Mean	4.56	45.12	20.72	23.47

S.E. of G marginal mean = 2.29 lb./tree.
S.E. of N marginal mean = 1.87 lb./tree.
S.E. of body of table = 3.24 lb./tree.

Crop :- Tea. **Ref :- Pb. 54(12).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'M'.**

Object :—To find out the optimum level and time of application of fertilizers on Tea.

1. BASAL CONDITIONS :

(i) (a) 200 mds./ac. of F.Y.M. applied every third year. (ii) (a) Red clayey. (b) N.A. (iii) Grown in nursery and transplanted. (iv) China hybrid. (v) Planted in 1880 at 5′×5′ spacing. (vi) Two years. (vii) Nil. (viii) 3 hoeings. (ix) Nil. (x) Unirrigated. (xi) 137.2″. (xii) 7 pickings from 19.4.1954 to 15.10.1954.

2. TREATMENTS :

7 manurial treatments : M_0=Control, M_1=40 lb./ac. of N, M_2=80 lb./ac. of N, M_3=120 lb./ac. of N+50 lb./ac of P_2O_5, M_4=80 lb./ac. of N half applied in February and half in June, M_5= 120 lb./ac. of N, half applied in February and half in June and M_6=50 lb. ac. of P_2O_5.

N applied as A/S and P_2O_5 as Super N in treatments M_1, M_2 and M_3 applied in February.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) 1/60 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of tea leaves. (iv) (a) 1952—contd. (b) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 3928 lb./ac. (ii) 564.3 lb./ac. (iii) Treatment differences are highly signiicant. (iv) Av. yield of tea leaves in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	3060	3741	4035	4551	4040	4273	3794

S.E./mean = 230.4 lb./ac.

Crop :- Tea. **Ref :- Pb. 55(73).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'M'.**

Object :—To find out optimum level and time of application of fertilizers on Tea.

1. BASAL CONDITIONS :

(i) to (x) Same as in expt. no. 54(12) on page 658. (xi) 102.9". (xii) 6 pickings from 26.4.1955 to 29.10.1955.

2. TREATMENTS :

7 manurial treatments : M_0=Control, M_1=40 lb./ac. of N, M_2=80 lb./ac. of N, M_3=120 lb./ac. of N+50 lb./ac. of P_2O_5, M_4=80 lb./ac. N, half applied in March and half in June, M_5=120 lb./ac. of N, half applied in March and half in June and M_6=50 lb./ac. of P_2O_5.
N applied as A/S and P_2O_5 as Super. N in treatments M_1, M_2 and M_3 applied in March.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) 1/60 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of tea leaves. (iv) (a) 1952—contd. (b) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 4079 lb./ac. (ii) 691.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tea leaves in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Ay. yield	2826	3703	4355	5111	4236	4560	3764

S.E./mean = 282.2 lb./ac.

Crop :- Tea. **Ref :- Pb. 56(35).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'M'.**

Object :—To find out optimum level and time of application of fertilizers on Tea.

1. BASAL CONDITIONS :

(l) to (x) Same as in expt. no. 54(12) on page 658. (xi) 101.5'. (xii) 6 pickings from 20.4.1956 to 29.10.1956.

2. TREATMENTS to 4. GENERAL :
Same as in expt. no. 55(73) above.

5. RESULTS :

(i) 1980 lb./ac. (ii) 338.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tea leaves in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	1555	1615	2141	2660	2060	2221	1605

S.E /mean = 138.3 lb./ac.

Crop :- Tea. **Ref :- Pb. 57(11).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'M'.**

Object :—To find out the optimum level and time of application of fertilizers on Tea.

1. BASAL CONDITIONS :

(i) to (x) Same as in expt. no. 54(12) on page 658. (xi) 112.6". (xii) 6 pickings from 22.4.1957 to 28.10.1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no 55(73) on page 659.

5. RESULTS :

(i) 2362 lb./ac. (ii) 415.3 lb /ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tea leaves in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	1683	1830	2275	3855	2380	2773	1735

S.E./mean = 169.5 lb./ac.

Crop :-Tea. **Ref :- Pb. 58(16).**

Site :- Govt. Exptl. Tea Farm , Palampur. **Type :- 'M'.**

Object :—To find out optimum level and time of application of fertilizers on Tea.

1. BASAL CONDITIONS :

(i) to (x) Same as in expt. no. 54(12) on page 658. (xi) 81.2". (xii) April to Nov. 1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 55(73) on page 659.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Yield of tea leaves. (iv) (a) 1952—contd. (b) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2017 lb./ac. (ii) 594.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tea leaves in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	1748	1540	1834	2715	2391	2418	1470

S.E./mean = 242.7 lb./ac.

Crop :- Tea. **Ref :- Pb. 59(3).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'M'.**

Object :— To find out optimum level and time of application of fertilizers on Tea.

1. BASAL CONDITIONS :

(i) to (x) Same as in expt. no. 54(12) on page 658. (xi) 115.43". (xii) April to Nov. 1959.

2. TREATMENTS :

Same as in expt. no. 55(73) on page 659.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3. (iv) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of tea leaves. (iv) (a) 1952—contd. (b) N.A. (v) to (vii) Nil.

5, RESULTS :

(i) 2317 lb./ac. (ii) 304.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tea leaves in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	1560	1770	2520	3860	2508	2760	1240

S.E./mean = 175.6 lb./ac.

Crop :- Tea. **Ref :- Pb. 59(4).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'M'.**

Object :—To find out the best source of N for Tea.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) Red clayey. (b) N.A. (iii) Grown in nursery and transplanted. (iv) China hybrid. (v) 100 years old plantation. (vi) and (vii) N.A. (viii) and (ix) Nil. (x) Unirrigated. (xi) 115.40". (xii) April to Nov. 1959.

2. TREATMENTS :

2 sources of 80 lb./ac. of N : S_1=A/S and S_2=C/A/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 3. (iv) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of tea leaves. (iv) (a) 1959—N.A. (b) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2678 lb./ac. (ii) 400.1 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of tea leaves in lb./ac.

Treatment	S_1	S_2
Av. yield	2786	2570

S.E./mean = 231.0 lb./ac.

Crop :- Tea. **Ref :- Pb. 59(5).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'M'.**

Object :—To find out the best source of N for Tea.

1. BASAL CONDITIONS :

Same as in expt. no. 59(4) above.

2. TREATMENTS :

6 sources of 80 lb./ac. of N : S_1=A/S, S_2=Urea, S_3=Nitro. Phos., S_4=Ammo. Phos., S_5=A/N and S_6=A/S/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of tea leaves. (iv) (a) 1959—N.A. (b) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1991 lb./ac. (ii) 427.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of tea leaves in lb./ac.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	2542	1899	1935	1965	1988	1620

S.E./mean = 302.0 lb./ac.

Crop :- Tea. **Ref :- Pb. 59(6).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'M'.**

Object :—To find out the best source and optimum level of N for Tea.

1. BASAL CONDITIONS :

Same as in expt. no. 59(4) on page 661.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 2 sources of N : S_1=C/A/N and S_2=A/S.
(2) 2 levels of N : N_1=50 and N_2=100 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Yield of tea leaves. (iv) (a) 1959—N.A. (b) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1061 lb./ac. (ii) 274.9 lb./ac. (iii) None of the effects is significant. (vi) Av. yield of tea leaves in lb./ac.

	N_1	N_2	Mean
S_1	960	960	960
S_2	1245	1080	1162
Mean	1102	1020	1061

S.E. of any marginal mean = 97.2 lb./ac.
S.E. of body of table = 137.4 lb./ac.

Crop :- Tea. **Ref :- Pb. 54(10).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'C'.**

Object :— To find out optimum period of pruning of Tea bushes.

1. BASAL CONDITIONS :

(i) 2 mds./ac. of A/C+200 mds./ac. of F.Y.M. (ii) (a) Red clayey. (b) N.A. (iii) Grown in nursery and transplanted. (iv) China. (v) Planted in 1880 at 5′×5′ spacing. (vi) 2 years. (vii) Nil. (viii) As per treatments and 3 hoeings. (ix) Nil. (x) Unirrigated. (xi) 137.2″. (xii) 6 pickings from 26.4.1954 to 1.10.1954.

2. TREATMENTS :

4 dates of pruning of tea bushes : D_1=1st Nov., D_2=22nd Nov., D_3=15th Feb. and D_4=15th June.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) 1/60 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of tea leaves. (iv) (a) 1952—contd. (b) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2350 lb./ac. (ii) 429.2 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of tea leaves in lb./ac.

Treatment	D_1	D_2	D_3	D_4
Av. yield	2183	2176	2057	2983

S E./mean = 175.2 lb./ac.

Crop :- Tea. **Ref :- Pb. 55(74).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'C'.**

Object :— To find out optimum period of pruning of Tea bushes.

1. BASAL CONDITIONS :

(i) to (x) Same as in expt. no. 54(10) on page 662. (xi) 102.95″. (xii) 7 pickings from 23.4.1955 to 31.10.1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(10) on page 662.

5. RESULTS :

(i) 2328 lb./ac. (ii) 436.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of tea leaves in lb./ac.

Treatment	D_1	D_2	D_3	D_4
Av. yield	2285	2246	2230	2550

S E./mean = 178.2 lb./ac.

Crop :- Tea. **Ref :- Pb.56 (36).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'C'.**

Object :— To find out optimum period of pruning of Tea bushes.

1. BASAL CONDITIONS :

(i) to (x) Same as in expt. no. 54(10) on page 662. (xi) 107.52″. (x) 7 pickings from 26.4.1956 to 30.10.1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(10) on page 662.

5. RESULTS :

(i) 825 lb./ac. (ii) 194.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of tea leaves in lb./ac.

Treatment	D_1	D_2	D_3	D_4
Av. yield	788	880	733	898

S.E./mean = 79.3 lb./ac.

Crop :- Tea. **Ref :- Pb. 57(13).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'C'.**

Object :— To find out optimum period of pruning of Tea bushes.

1. BASAL CONDITIONS :

(i) to (x) Same as in expt. no. 54(10) on page 662. (xi) 112.6". (xii) 6 pickings from 6.5.1957 to 7.10.1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(10) on page 662.

5. RESULTS :

(i) 2031 lb./ac. (ii) 498.3 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of tea leaves in lb./ac.

Treatment	D_1	D_2	D_3	D_4
Av. yield	1840	1800	1875	2610

S.E./mean = 203.4 lb./ac.

Crop :- Tea. **Ref :- Pb. 58(15).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'C'.**

Object :—To find out the optimum period of pruning of Tea bushes.

1. BASAL CONDITIONS :

(i) to (x) Same as in expt. no. 54(10) on page 662. (xi) 81.2". (xii) April to Nov., 1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(10) on page 662.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Yield of tea leaves. (iv) (a) 1952—contd. (b) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 4106 lb./ac. (ii) 263.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tea leaves in lb./ac.

Treatment	D_1	D_2	D_3	D_4
Av. yield	2500	3075	2500	8350

S.E./mean = 107.4 lb./ac.

Crop :- Tea. **Ref :- Pb. 54(11).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'CM'.**

Object :—To find out optimum interval of pluckings, prunings and dose of N for Tea crop.

1. BASAL CONDITIONS :

(i) 2 mds./ac. of A.S. (ii) (a) Red clayey. (b) N.A. (iii) Grown in nursery and transplanted. (iv) China. (v) Planted in 1880 at 5'×5' spacing. (vi) 2 years. (vii) Nil. (viii) As per treatments and 3 hoeings. (ix) (x) Unirrigated. (xi) 137.2". (xii) 8 pickings from : 22.4.1954 to 29.10.1954.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 intervals of pruning : I_1=1, I_2=2 and I_3=3 years.

(2) 3 intervals of plucking : P_1=Weekly, P_2=Fortnightly and P_3=Monthly.

(3) 3 levels of N : N_1=40, N_2=80 and N_3=120 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) 1/60 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of tea leaves. (iv) (a) 1952—contd. (b) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 3128 lb./ac. (ii) 749.5 lb./ac. (iii) Main effect of N and P are highly significant. Interactions N×P and I×N are significant. (iv) Av. yield of tea leaves in lb./ac.

	I_1	I_2	I_3	Mean	P_1	P_2	P_3
N_1	2603	2668	2657	2643	2839	2474	2615
N_2	2870	3146	3170	3062	3496	2926	2764
N_3	3766	3523	3753	3681	3683	3657	3702
Mean	3080	3112	3193	3128	3339	3019	3027
P_1	3407	3109	3501				
P_2	2968	3146	2943				
P_3	2865	3081	3136				

S.E. of any marginal mean = 124.9 lb./ac.
S.E. of body of any table = 216.3 lb./ac.

Crop :- Tea. **Ref :- Pb. 55(75).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type:- 'CM'.**

Object :—To find out optimum interval of pluckings, prunings and dose of N for Tea crop.

1. BASAL CONDITIONS :

(i) to (x) Same as in expt. no. 54(11) on page 664. (xi) 102.95". (xii) April to Oct., 1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(11) on page 664.

5. RESULTS :

(i) 3645 lb./ac. (ii) 733.1 lb./ac. (iii) Main effect of N and interaction N×P are highly significant. (iv) Av. yield of tea leaves in lb./ac.

	I_1	I_2	I_3	Mean	P_1	P_2	P_3
N_1	2959	2962	2795	2905	3424	2813	2479
N_2	3401	3409	3574	3461	3701	3209	3474
N_3	4628	4512	4567	4569	4092	4742	4872
Mean	3663	3628	3645	3645	3739	3588	3608
P_1	3759	3613	3845				
P_2	3483	3796	3485				
P_3	3746	3474	3606				

S.E. of any marginal mean = 122.2 lb./ac.
S.E. of body of any table = 211.6 lb./ac.

Crop :- Tea. **Ref :- Pb. 56(37).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'CM'.**

Object :—To find out the optimum interval of pluckings, prunings and dose of N for Tea crop.

1. BASAL CONDITIONS :

(i) to (x) Same as in expt. no. 54(11) on page 664. (xi) 101.52". (xii) April to Oct., 1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(11) on page 664.

5. RESULTS :

(i) 1528 lb./ac (ii) 334.4 lb./ac. (iii) Main effect of N is highly significant and of I is significant. (iv) Av. yield of tea leaves in lb./ac.

	I_1	I_2	I_3	Mean	P_1	P_2	P_3
N_1	1507	1304	1159	1323	1339	1240	1389
N_2	1535	1475	1393	1468	1528	1454	1421
N_3	1929	1699	1759	1796	1648	1936	1803
Mean	1657	1492	1437	1529	1505	1543	1538
P_1	1768	1375	1371				
P_2	1579	1566	1485				
P_3	1623	1536	1454				

S.E. of any marginal mean = 55.7 lb./ac.
S.E. of body any table = 96.5 lb./ac.

Crop :- Tea. **Ref :- Pb. 57(12).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'CM'.**

Object :—To find out optimum interval of pluckings and prunings and dose of N for Tea crop.

1. BASAL CONDITIONS :

(i) to (x) Same as in expt. no. 54(11) on page 664. (xi) 112.6". (xii) April to Oct. 1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(11) on page 664.

5. RESULTS :

(i) 2181 lb./ac. (ii) 458.6 lb./ac. (iii) Main effect of N, P and interaction N×P are highly significant. (iv) Av. yield of tea leaves in lb./ac.

	I_1	I_2	I_3	Mean	P_1	P_2	P_3
N_1	1735	1783	1800	1773	1728	1975	1615
N_2	1868	1952	2125	1982	1925	2031	1988
N_3	2795	2644	2933	2791	2218	2966	3188
Mean	2133	2126	2286	2182	1957	2324	2264
P_1	1945	1775	2150				
P_2	2163	2405	2405				
P_3	2290	2198	2303				

S.E. of any marginal mean = 76.4 lb./ac.
S.E. of body of any table = 132.4 lb./ac.

Crop :- Tea. **Ref :- Pb. 58(14).**

Site :- Govt. Exptl. Tea Farm, Palampur. **Type :- 'CM'.**

Object :—To find out optimum interval of pluckings and prunings and doses of N for Tea crop.

1. BASAL CONDITIONS :

(i) to (x) Same as in expt. no. 54(11) on page 664. (xi) 81.2". (xii) April to Nov. 1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(11) on page 664.
N applied as A/S

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Yield of tea leaves. (iv) (a) 1952—contd. (b) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1741 lb./ac. (ii) 494.7 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of tea leaves in lb./ac.

	I_1	I_2	I_3	Mean	P_1	P_2	P_3
N_1	1768	1545	1285	1533	1649	1468	1481
N_2	1319	1574	1465	1453	1684	1324	1350
N_3	2328	2233	2148	2236	2132	2385	2194
Mean	1805	1784	1633	1741	1822	1726	1675
P_1	1940	1808	1718				
P_2	1723	1860	1594				
P_3	1753	1684	1588				

S.E. of any marginal mean = 82.4 lb./ac.
S.E. of body of any table = 142.8 lb./ac.

HIMACHAL PRADESH

Crop :- Paddy *(Kharif)*. **Ref :- H.P. 58(137-a).**

Site :- Cereal Multiplication Farm, Bhanota. **Type :- 'M'.**

Object :— To study the effect of N and P on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 30.6.1958. (iv) (a) to (c) N.A. (d) 9″×9″. (e) 2. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 9.10.1958.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N_0=0, N_1=25 and N_2=50 lb./ac.

(2) 3 levels of P_2O_5 : P_0=0, P_1=25 and P_2=50 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 9′×36′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2354 lb./ac. (ii) 236.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	2135	2217	2416	2256
P_1	2204	2472	2338	2338
P_2	2364	2528	2511	2468
Mean	2234	2406	2422	2354

S.E. of any marginal mean = 68.2 lb./ac.
S.E. of body of table = 118.2 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- H.P. 59(148).**

Site :- Agri. Res. Stn., Dhaulakuan. **Type :- 'M'.**

Object :— To study the residual effect of different crops on the succeeding crop of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Dhanlakuan. (iii) 13.7.1959. (iv) (a) to (c) N.A. (d) 9″×6″. (e) 2 plants/hill. (vi) T—21. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

9 rotational treatments : T_1=*Berseem*—Paddy, T_2=Wheat—Paddy, T_3=Wheat—Gram—Paddy, T_4=Wheat—Lentils—Paddy, T_5=Wheat—Peas—Paddy, T_6=Lentils—Paddy, T_7=Fallow—Paddy, T_8=Gram—Paddy and T_9=Peas—Paddy.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 38′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1612 lb./ac. (ii) 238.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9
Av. yield	1759	1719	1685	1646	1630	1614	1560	1494	1397

S.E./mean = 119.1 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- H P. 59(149).**

Site :- Agri. Res. Stn., Dhaulakuan. **Type :- 'M'.**

Object :— To study the residual effect of P through Berseem crop and direct effect on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) *Berseem* Paddy—*Berseem*. (b) *Berseem*. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Dhanlakuan. (iii) N.A. (iv) (a) to (c) N.A. (d) 9″×6″. (e) 2. (v) Nil. (vi) T—21. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments : (applied to *Berseem*)

All combinations of (1) and (2)

(1) 2 levels of N : N_0 = 0, and N_1 = 32 lb./ac.

(2) 2 levels of P_2O_5 : P_0 = 0 and P_1 = 50 lb./ac.

Sub-plot treatments : (applied to Paddy)

3 levels of N : N'_0 = 0, N'_1 = 20 and N'_2 = 40 lb./ac.

½ N applied at transplanting and ½ at flowering.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/103.7 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1241 lb./ac. (ii) (a) 231.8 lb./ac. (b) 165.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	Mean	N_0'	N_1'	N_2'
P_0	1217	1251	1234	1180	1191	1331
P_1	1217	1280	1248	1279	1248	1218
Mean	1217	1265	1241	1229	1219	1275
N'_0	1219	1238				
N'_1	1218	1220				
N'_2	1213	1337				

S.E. of difference of two

N or P marginal means	= 54.6 lb./ac.
N′ marginal means	= 47.6 lb./ac.
N′ means at the same level of N or P	= 67.4 lb./ac.
N or P means at the same level of N′	= 77.6 lb./ac.
S.E. of body of N×P table	= 54.6 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- H.P. 59(147)**

Site :- Agri. Res. Stn., Dhaulakuan. **Type :- 'CM'.**

Object :— To study the effect of digging, manuring and seedrate on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Dhanlakuan. (iii) 14.7.1959. (iv) (a) As per treatments. (b) and (c) N.A. (d) As per treatments. (e) 2. (v) Nil. (vi) C.H.—988. (vii) Irrigated. (viii) N.A. (ix) 68.6". (x) 9.10.1959.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of digging : D_1=1', D_2=2' and D_3=3'.

(2) 3 levels of manuring : M_1=Upto 4", M_2=Upto 8" and M_3=Upto 12".

(3) 3 levels of spacing : S_1=2"×2", S_2=4"×4" and S_3=6"×6".

F.Y.M. at 40 mds/ac.+N as A/S at 200 lb./ac.+P_2O_5 as Super at 100 lb./ac.+K_2O as Mur. Pot. at 50 lb./ac. was used for manuring.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 12'×6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3532 lb./ac. (ii) 739.2 lb./ac. (iii) None of the effect is significant. (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	Mean	S_1	S_2	S_3
D_1	3920	3472	3875	3756	3248	4278	3741
D_2	3517	3563	3338	3473	3116	3584	3718
D_3	2890	3606	3606	3367	3450	3226	3426
Mean	3442	3547	3606	3532	3271	3696	3628
S_1	3338	3318	3158				
S_2	3472	3741	3875				
S_3	3517	3582	3786				

S.E. of any marginal mean = 246.4 lb./ac.

S.E. of body of any table = 426.8 lb./ac.

Crop :- Paddy. **Ref :- H.P. 53(SFT).**

Centre :- Chamba (c.f.). **Type :- 'M'.**

Object :—Type—A—To study the response of Paddy to levels of N, P and K applied individually and in combinations :

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (v) N.A. (vi) June—July. (vii) Unirrigated. (viii) and (ix) N.A. (x) October.

2. TREATMENTS :

0 =Control (no manure).
n =20 lb./ac. of N as A/S.
p =20 lb./ac. of P_2O_5 as Super.
np =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
k =20 lb./ac. of K_2O as Mur. of Pot.
nk =20 lb./ac. of N as A/S+20 lb /ac. of K_2O as Mur. of Pot.
pk =20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. of Pot.
npk=20 lb./ac. of N as A/S+20 lb /ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. of Pot.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogenous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the some zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crops, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. Three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The above experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) N.A. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) N.A.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of grain in lb./ac.	230	255	148	24.7	—16	—8	66	—33	14 8

Control yield = 2049 lb./ac. and no. of trials = 5-

Crop :- Paddy. **Ref :- H.P. 59(SFT).**

Centre : Chamba (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Paddy to levels of N,P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 671 conducted at Chamba.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of grain in lb./ac.	181	148	214	34.6	0	49	8	—16	20.9

Control yield = 1168 lb./ac. and no. of trials = 4.

Crop :- Paddy. **Ref :- H.P. 58(SFT).**

Centre :- Mandi. **Type :- 'M'.**

Object :—Type A—To study the response of Paddy to levels of N, P and K applied individuelly and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 671 concluded at Chamba.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of grain in lb./ac.	58	49	0	8.2	8	0	16	8	9.9

Control yield = 1029 lb./ac. and no. of trials = 5.

Crop :- Paddy. **Ref :- H.P. 58(SFT).**

Centre :- Chamba (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different levels.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (x) N.A.

2. TREATMENTS :

0 =Control (no manure).
n_1' =20 lb./ac. of N as Urea,
n_2' =40 lb./ac. of N as Urea.
n_1'' =20 lb./ac. of N as A/S/N.
n_2'' =40 lb./ac. of N as A/S/N.
n_1'''=20 lb./ac. of N as C/A/N.
n_2'''=40 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 671 conducted at Chamba.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield of grain in lb./ac.	2139	2732	2510	2427	2329	2691	2781

G.M. = 2516 lb./ac., S.E./mean = 82.6 lb./ac. and no. of trials = 4.

Crop :- Paddy. **Ref :- H.P. 59(SFT).**

Centre :- Chamba (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different levels.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (x) N.A.

2. TREATMENTS :

0 =Control (no manure).
n_1' =20 lb./ac. of N as Urea.
n_2' =40 lb /ac. of N as Urea.
n_1'' =20 lb./ac. of N as A/S/N.
n_2'' =40 lb./ac. of N as A/S/N.
n_2''' =20 lb./ac. of N as C/A/N.
n_2''' =40 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in experiment no. 58(SFT) type A on page 671 conducted at Chamba.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield of grain in lb./ac.	1086	1193	1251	1300	1399	1456	1506

G.M. = 1313 lb./ac., S.E./mean = 23.3 lb./ac. and no. of trials=4.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 59(I79).**

Site :- Potato Devp. Stn., Ahla. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Wheat.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Potato. (c) N.A. (ii) (a) and (b) N.A. (iii) 17.10.1959. (iv) (a) and (b) N.A. (c) 82 lb./ac. (d) and (e) N.A. (v) Nil. (vi) N.P.—770, N.P.—809 and local. (vii) N.A. (viii) Weeding and hoeing done. (ix) N.A. (x) 27.6.1960.

2. TREATMENTS :

All combinations of (1), and (2) and (3)

(1) 3 levels of N as A/S : N_0=0, N_1=20 and N_2=40 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=16 and P_2=32 lb./ac.

(3) 3 levels of K_2O as Pot. Sul. : K_0=0, K_1=10 and K_2=20 lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block, 3 blocks/replication. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 10'×6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) and (vi) Nil. (vii) N×K table of means is not available.

5. RESULTS :

(i) 861 lb./ac. (ii) 414.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	K_0	K_1	K_2
P_0	809	659	1047	838	876	939	699
P_1	1027	840	1016	961	954	1182	747
P_2	757	726	866	783	690	783	876
Mean	864	742	976	861	840	968	774

S.E. of any marginal mean = 79.7 lb./ac.

S.E. of body of N×P or P×K table = 138.1 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 57(150).**

Site :- Seed Multiplication Farm, Anhar. **Type :- 'M'.**

Object :—To test the effect of improved F.Y.M. with and without fertilizers on Wheat.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Potato. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments : M_0=Control, M_1=200 mds./ac. of local F.Y.M., M_2=200 mds./ac. of improved F.Y.M., M_3=20 lb./ac. of N as A/S, M_4=20 lb./ac. of P_2O_5, $M_5=M_3+M_4$, $M_6=M_1+M_3+M_4$ and $M_7=M_2+M_3+M_4$.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 772 lb./ac. (ii) 169.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Av. yield	540	542	869	806	641	890	890	1001

S.E./mean = 69.2 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 59(152).**

Site :- Cereal Multiplication Farm, Bhanota. **Type :- 'M'.**

Object :—To find a suitable method of application of manures to Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loamy soil. (b) N.A. (iii) 3.12.1959. (iv) and (v) N.A. (vi) N.P.—829. (vii) Unirrigated. (viii) and (ix) N.A. (x) 16.5.1960.

2. TREATMENTS :

3 methods of application of fertilizers : M_0=(no application), M_1=Drilling and M_2=Broadcast.

3. DESIGN :

(i) R B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 20′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1526 lb./ac. (ii) 69.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2
Av. yield	1022	1872	1685

S.E./mean = 28.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 59(190).**

Site :- Seed Multiplication cum-Demons. Farm, Gangtoli Basa. Type :- 'M'.

Object :—To study the effect of improved F.Y.M. with and without fertilizers on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize—Wheat. (b) Maize. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 22, 23.10.1959. (iv) (a) 3 ploughings and 3 *sohagas* before sowing. (b) *Kera*. (c) 40 srs./ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) Ridley. (vii) Unirrigated. (viii) 2 weedings. (ix) 8.92″. (x) 22.5.1960.

2. TREATMENTS :

Same as in expt. no. 57(150) on page 674.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 1/100 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Below normal. (ii) N.A. (iii) Grain yield. (iv) (a) and (b) No. (c) Nil. (v) and (vi) N.A. (vii) Nil.

5. RESULTS :

(i) 573 lb./ac. (ii) 116.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Av. yield	448	459	572	677	456	595	690	690

S.E./mean = 47.6 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 59(181).**

Site :- Potato Devp. Stn., Kamrah. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Wheat.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Potato. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 15.11.1959. (iv) (a) and (b) N.A. (c) 40 srs./ac. (d) and (e) N.A. (v) Nil. (vi) N.P.—770, 809 and local. (vii) N.A. (viii) Weeding and hoeings done. (ix) N.A. (x) 26.6.1960.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : N_0=0, N_1=20 and N_2=40 lb./ac.

(2) 3 levels of P_2O_5 : P_0=0, P_1=20 and P_2=40 lb./ac.

(3) 3 levels of K_2O : K_0=0, K_1=20 and K_2=40 lb./ac.

Source of P_2O_5 and K_2O are N.A.

3. DESIGN :

(i) 3^3 Fact. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 3. (iv) (a) 10′×9′. (b) 10′×7½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1752 lb./ac. (ii) 702.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	1700	1642	1684	1675	1658	1784	1584
N_1	1804	1737	1823	1788	1617	1620	2126
N_2	1749	1620	2013	1794	1720	1888	1775
Mean	1751	1666	1840	1752	1665	1764	1828
K_0	1742	1575	1678				
K_1	1946	1572	1775				
K_2	1565	1852	2068				

S.E. of any marginal mean = 135.3 lb./ac.

S.E. of body of any table = 234.3 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 59(176).**

Site :- Potato Dev. Res. Stn., Khuradhan. **Type :- 'M'.**

Object :—To find out the effect of different levels of foliar sprays of urea on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Potato. (c) N.A. (ii) (a) and (b) N.A. (iii) 3.11.1959. (iv) (a) and (b) N.A. (c) 40 srs./ac. (d) and (e) N.A. (v) Nil. (vi) N.P.—770. (vii) N.A. (viii) Weeding and hoeing. (ix) N.A. (x) 2.6.1960.

2. TREATMENTS :

4 levels of foliar spray of Urea : F_0=0, F_1=20, F_2=30 and F_3=40 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 933 lb./ac. (ii) 95.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	F_0	F_1	F_2	F_3
Av. yield	730	879	1103	1018

S.E./mean = 47.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 57(122).**

Site :- Reg. Potato Devp. Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To find the relative efficiency of nitrogenous fertilizers with and without P_2O_5 and K_2O.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loam. (b) N.A. (iii) 2.11.1957. (iv) and (v) N.A. (vi) N.P.—770. (vii) Unirrigated. (viii) and (ix) N.A. (x) 26.6.1958.

2. TREATMENTS :

7 manurial treatments : M_0=Control, M_1=40 lb./ac. of N as A/S, M_2=40 lb./ac. of N as C/A/N, M_3=50 lb./ac. of P_2O_5 as Super+60 lb./ac. of K_2O as Pot. Sul., M_4=M_1+M_3, M_5=M_2+M_3 and M_6=50 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 22′×10½′. (b) 20′×9′. (v) 12″×9″. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) N.A. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1704 lb./ac. (ii) 371.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	1478	1897	1575	1583	1953	1726	1719

S.E./mean = 185.9 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- H.P. 59(155).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To find out the best dose of N and the method of its application.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loam. (b) N.A. (iii) 12.10.1959. (iv) (a) to (e) N.A. (v) 32 lb./ac. of P_2O_5 at sowing time. (vi) N.P.—770. (vii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 4 soil applications of N as A/S. : N_0=0, N_1=10, N_2=20, and N_3=30 lb./ac.

(2) 3 frequencies of spraying Urea sol. : S_0=No spraying, S_1=2 sprayings weekly of 1 per cent sol. and S_2=4 sprayings every 3rd day of 1 per cent. sol.

Spraying was given at 100 gal./ac. 1 per cent sucrose sol. was added to Urea sol. to facilitate absorption.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) N.A. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 663 lb./ac. (ii) 319.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
S_0	529	747	529	700	626
S_1	732	529	856	762	720
S_2	653	685	498	731	642
Mean	638	654	628	731	663

S.E. of S marginal mean = 79.8 lb./ac.
S.E. of N marginal mean = 92.1 lb./ac.
S.E. of body of table = 159.6 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- H.P. 59(154).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To study the best time of application of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loam. (b) N.A. (iii) 15.10.1959. (iv) (a) to (e) N.A. (v) 32 lb./ac. of P_2O_5 at sowing time. (vi) N.P.—770. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+Control.

(1) 3 levels of N : N_1=15, N_2=30 and N_3=45 lb./ac. of N.

(2) 4 times of application of N : T_1=At the time of sowing, T_2=After snow melting and T_3=½ at sowing+½ at snow melting.

Source of N is N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) N.A. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 852 lb./ac. (ii) 406.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 700 lb./ac.

	T_1	T_2	T_3	Mean
N_1	840	778	825	814
N_2	730	809	996	845
N_3	1167	622	1058	949
Mean	912	736	960	869

S.E. of any marginal mean = 117.4 lb./ac.
S.E. of body of table or control mean = 203.4 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 54(TCM).**

Centre :- Arki Solan (c.f.). **Type :- 'M'.**

Object :—Type I (i)—To study the effect of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy to clayey soil. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Unirrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

0 =Control.
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1' =20 lb./ac. of N as Urea.
n'_2 =40 lb./ac. of N as Urea.

3. DESIGN :

(i) R.B.D. with 5 plots/block. (ii) For layout of the experiments in each block, villages were selected at random and a list was prepared of the cultivators growing wheat crop in each selected village. From this list two cultivators were selected at random and one field each belonging to the selected cultivators was taken and in each selected field an unreplicated trial was laid out. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1955. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'
Av. yield	1029	1250	1307	1261	1320

G.M. = 1233 lb./ac. ; S.E./mean = 52.5 lb./ac. and no. of trials = 21.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 55(TCM).**

Centre :- Arki Solan (c.f.). **Type :- 'M'.**

Object :— Type I (i)—To study the effect of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy to clayey soil. (iii) to (v) N.A. (vi) Nov., 1955. (vii) Unirrigated. (viii) and (ix) N.A. (x) April, 1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type I (i) above.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'
Av. yield	644	727	817	752	805

G.M. = 749 lb./ac., S.E./mean = 17.7 lb./ac. and no. of trials = 42.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 54(TCM).**

Site :- Arki Solan (c.f.). **Type :- 'M'.**

Object :— Type II (i)—To study the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy to clayey soil. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Unirrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

0 =Control.
p_1 =20 lb./ac. of P_2O_5 as Super.
n_1p_1 =20 lb./ac. of N as A.S+20 lb /ac. of P_2O_5 as Super.
n_2p_1 =40 lb./ac. of N as A.S+20 lb./ac. of P_2O_5 as Super.
$n_1'p_1$ =20 lb./ac. of N as Urea+20 lb./ac. of P_2O_3 as Super.
$n_2'p_1$ =40 lb./ac. of N as Urea+20 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. with 6 plots/block. (ii) For layout of the experiments in each block, villages were selected at random and a list was prepared of the cultivators growing wheat crop in each selected village. From this list two cultivators were selected at random and one field each belonging to the selected cultivators was taken and in each selected field an unreplicated trial was laid out. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1955. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

Treatment	0	p_1	n_1p_1	n_2p_1	$n_1'p_1$	$n_2'p_1$
Av. yield	965	1083	1273	1354	1182	1257

G.M. = 1186 lb./ac., S.E./mean = 57.5 lb./ac. and no. of trials = 19.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 55(TCM).**

Centre :- Arki Solan (c.f.). **Type :- 'M'.**

Object :— Type II (i)—To study the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy to clayey soil. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Unirrigated. (viii) and (ix) N A. (x) April, 1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type II (i) above.

5. RESULTS :

Treatment	0	p_1	n_1p_1	n_2p_1	$n_1'p_1$	$n_2'p_1$
Av. yield	637	711	810	831	827	869

G.M. = 781 lb./ac., S.E./mean = 19.2 lb./ac. and no. of trials = 38.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 54(TCM).**

Centre :- Arki Solan (c.f.). **Type :- 'M'.**

Object :— Type III (ii)—To study the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy to clayey soil. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Unirrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

0 =Control.
n_1 =20 lb./ac. of N as A/S.
n_1p_1 =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
n_1p_2 =20 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super.
n_1p_1' =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as B.M.
n_1p_2' =20 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as B.M.

3. DESIGN :

(i) R B.D. with 6 plots/replication. (ii) For layout of the experiments in each block, villages were selected at random and a list was prepared of the cultivators growing wheat crop in each selected village. From this list two cultivators were selected at random and one field each belonging to the selected cultivators was taken and each selected field an unreplicated trial was laid out. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1955. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

Treatment	0	n_1	n_1p_1	n_1p_2	n_1p_1'	n_1p_2'
Av. yield	988	1167	1187	1229	1139	1331

G.M. = 1174 lb./ac., S.E./mean = 69.8 lb./ac. and no. of trials = 5.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 55(TCM).**

Centre :- Arki Solan (c.f.). **Type :- 'M'.**

Object :— Type III (ii)—To study the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy to clayey soil. (iii) to (v) N.A. (vi) Nov., 1955. (vii) Unirrigated. (viii) and (ix) N.A. (x) March, 1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type III (ii) above.

5. RESULTS :

Treatment	0	n_1	n_1p_1	n_1p_2	n_1p_1'	n_1p_2'
Av. yield	1187	1252	1213	1258	1337	1353

G.M. = 1267 lb./ac., S.E./mean = 92.2 lb./ac. and no. of trials = 7.

Crop :- Wheat *(Rabi)*. **Ref :- 54(TCM).**

Centre :- Arki Solan (c.f.). **Type :- 'M'.**

Object :—Type IV—To study the effect of N, P and K on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy to clayey soil. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Unirrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

0 =Control.
n_1 =20 lb./ac. of N as A/S.
n_1p_1 =20 lb./ac. of N as A/S.+20 lb./ac. of P_2O_5 as Super.
n_1p_2 =20 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super.
$n_1p_1k_1$=20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Pot. Sul.
$n_1p_1k_2$=20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super+40 lb./ac. of K_2O as Pot. Sul.

3. DESIGN :

(i) R.B.D. with 6 plots/replication. (ii) For layout of the experiments in each block, villages were selected at random and a list was prepared of the cultivators growing wheat crop in each selected village. From this list the cultivators were selected at random and one field each belonging to the selected cultivator was taken and in each selected field an unreplicated trial was laid out. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1955. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

Treatment	0	n_1	n_1p_1	n_1p_2	$n_1p_1k_1$	$n_1p_1k_2$
Av. yield	1061	1150	1257	1317	1524	1591

G.M. = 1317 lb./ac. ; S.E./mean = 40.2 lb./ac. ; and no. of trials = 12.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 55(TCM).**

Centre :- Arki Solan (c.f.). **Type :- 'M'.**

Object :—Type IV—To study the effect of N, P and K on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy to clayey soil. (iii) to (v) N.A. (vi) Nov., 1955. (vii) Unirrigated. (viii) and (ix) N.A (x) March, 1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type IV on page 681.

5. RESULTS :

Treatment	0	n_1	n_1p_1	n_1p_2	$n_1p_1k_1$	$n_1p_1k_2$
Av. yield	1266	1345	1416	1451	1447	1512

G.M. = 1406 lb./ac. ; S.E./mean = 37.9 lb./ac. ; and no. of trials = 9.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 54(TCM).**

Centre :- Arki Solan (c.f). **Type :- 'M'.**

Object :—Type I (i)—To study the effect of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy to clayey soil. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type I (i) on page 679.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'
Av. yield	1002	1301	1500	1238	1517

G.M. = 1312 lb./ac. ; S.E./mean = 82.9 lb./ac. and no. of trials = 10

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 55(TCM).**

Centre :- Arki Solan (c.f.). **Type :- 'M'.**

Object :—Type I (i) —To study the effect of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy to clayey soil. (iii) to (v) N.A. (vi) Nov., 1955. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type I (i) on page 679.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'
Av. yield	694	797	864	826	940

G.M. = 824 lb./ac. ; S.E./mean = 62.5 lb./ac. ; and no. of trials = 4.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 54(TCM).**

Centre :- Arki Solan (c.f.). **Type :- 'M'.**

Object :—Type II (i)—To study the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy to clayey soil. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type II (i) on page 680.

5. RESULTS :

Treatment	0	p_1	n_1p_1	n_2p_1	$n_1'p_1$	$n_2'p_1$
Av. yield	627	811	922	1113	834	924

G.M. = 872 lb./ac. ; S.E./mean = 77.2 lb./ac. and no. of trials = 10.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 54(TCM).**

Centre :- Arki Solan (c.f.). **Type :- 'M'.**

Object :—Type III (ii)—To study the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy to clayey soil. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type III (ii) on page 681.

5. RESULTS :

Treatment	0	n_1	n_1p_1	n_1p_2	n_1p_1'	n_1p_2'
Av. yield	1232	1301	1426	1521	1153	1556

G.M. = 1365 lb./ac. ; S.E./mean = 17.4 lb./ac. and no. of trials = 5.

Crop :- Wheat *(Rabi).* **Ref :- H.P. 55(TCM).**

Centre :- Arki Solan (c.f). **Type :- 'M'.**

Object :—Type III (ii)—To study the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy to clayey soil. (iii) to (v) N.A. (vi) Nov., 1955. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type III (ii) on page 681.

5. RESULTS :

Treatment	0	n_1	n_1p_1	n_1p_2	n_1p_1'	n_1p_2'
Av. yield	1094	1219	1230	1343	1496	1666

G.M. = 1341 lb./ac. ; S.E./mean = 170.3 lb./ac. and no. of trials = 5.

Crop :- Wheat *(Rabi).* **Ref :- H.P. 54(TCM).**

Centre :- Arki Solan (c.f.). **Type :- 'M'.**

Object :—Type IV—To study the effect of N, P and K on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy loam to clayey soil. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type IV on page 681.

5. RESULTS :

Treatment	0	n_1	n_1p_1	n_1p_2	$n_1p_1k_1$	$n_1p_1k_2$
Av. yield	1187	1440	1386	1433	1454	1593

G.M. = 1416 lb./ac. ; S.E./mean = 92.7 lb./ac. and no. of trials = 7.

Crop :- Wheat *(Rabi).* **Ref :- H.P. 55(TCM).**

Centre :- Arki Solan (c.f.). **Type :- 'M'.**

Object :—Type IV—To study the effect of N, P and K on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy to clayey soil. (iii) to (v) N.A. (vi) Nov., 1955. (vii) Irrigated. (viii) and (ix) N.A. (x) April, 1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type IV on page 681.

5. RESULTS :

Treatment	0	n_1	n_1p_1	n_1p_2	$n_1p_1k_1$	$n_1p_1k_2$
Av. yield	736	802	838	868	962	1053

G.M. = 876 lb./ac. ; S.E./mean = 92.2 lb./ac. and no. of trials = 4.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 57(SFT).**

Centre :- Chamba (c.f.). **Type :- 'M'.**

Object :—Type A—To study the responce of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (ii) to (v) N.A. (vi) October—November. (vii) Unirrigated. (viii) and (ix) N.A. (x) April—May.

2. TREATMENTS :

0 =Control (no manure).
n =20 lb./ac. of N as A/S.
p =20 lb./ac. of P_2O_5 as Super
np =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
k =20 lb./ac. of K_2O as Mur. of Pot.
nk =20 lb./ac. of N as A/S+20 lb./ac. of K_2O as Mur. Pot.
pk =20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. Pot.
npk=20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. Pot.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year. 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crops, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The above experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) N.A. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) N.A.

5. RESULTS :

Treatment	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of grain in lb./ac.	280	115	148	36.2	25	66	0	—99	36.2

No. of trials = 12.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 59(SFT).**

Centre :- Chamba (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A above conducted at Chamba.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of grain in lb./ac.	107	140	91	23.9	33	41	74	49	21.4

Control yield = 1029 lb./ac. and no. of trials = 16.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 58(SFT).**

Centre :- Mahasu (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 685 couducted at Chamba.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of grain in lb./ac.	255	181	99	23.9	—8	58	16	41	20.6

Control yield = 790 lb./ac. and no. of trials = 28.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 59(SFT).**

Centre :- Mahasu (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 685 conducted at Chamba.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of grain in lb./ac.	165	165	91	33 7	16	0	91	33	28.0

Control yield = 1218 lb./ac. and no. of trials = 27.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 58(SFT).**

Centre :- Mandi (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 685 conducted at Chamba.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of grain in lb./ac.	74	25	58	15.6	—16	—25	—25	25	23.9

Control yield = 560 lb./ac. and no. of trials = 14.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 59(SFT).**

Centre :- Mandi (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 685 conducted at Chamba.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of grain in lb./ac.	58	49	49	15.6	0	—8	—8	0	11.5

Control yield = 880 lb./ac. and no. of trials = 6.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 57(SFT).**

Site :- Chamba (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (v) N.A. (vi) October—November. (vii) Unirrigated. (viii) and (ix) N.A. (x) April—May.

2. TREATMENTS :

0 =Control (no manure).
n_1' =20 lb./ac. of N as Urea.
n_2' =40 lb./ac. of N as Urea.
n_1'' =20 lb./ac. of N as A/S/N.
n_2'' =40 lb /ac. of N as A/S/N.
n_1''' =20 lb./ac. of N as C/A/N.
n_2''' =40 lb./ac. of N as C/A/N.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogenous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on *rabi* cereal, 8 on cash crops, 4 on an oil-seed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The above experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village (iii) (a) N.A. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) N.A.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	790	1037	1275	1234	1218	1267	1317

G.M. = 1163 lb./ac., S.E./mean = 47.1 lb./ac. and no. of trials = 10.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 59(SFT).**

Centre :- Chamba (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (v) N.A. (vi) October-November. (vii) Unirrigated. (viii) and (ix) N.A. (x) April-May.

2. TREATMENTS :

0 =Control (no manure).
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1'' =20 lb./ac. of N as A/S/N.
n_2'' =40 lb./ac. of N as A/S/N.
n_1''' =20 lb./ac. of N as C/A/N.
n_2''' =40 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 57(SFT) type B on page 687 conducted at Chamba.

5. RESULTS :

Treatment	0	n_1	n_2	n_1''	n_2''	n_1'''	n_2'''
Av. yield of grain in lb./ac.	930	1029	1218	1070	1210	1094	1308

G.M. = 1123 lb./ac. ; S.E./mean = 29.7 lb./ac. and no of trials = 16.

Crop :- Wheat *(Rabi).* **Ref :- H.P. 58(SFT).**

Centre :- Chamba (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type B on page 687 conducted at Chamba.

5. RESULTS :

Treatment	0	n'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield of grain in lb./ac.	963	1103	1136	1275	1292	1333	1424

G.M. = 1218 lb./ac. ; S.E./mean = 38.4 lb./ac. and no. of trials = 4.

Crop :- Wheat *(Rabi).* **Ref :- H.P. 58(SFT).**

Centre :- Mahasu (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type B on page 687 conducted at Chamba.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield of grain in lb./ac.	848	913	1078	1037	1061	996	1127

G.M. = 1009 lb./ac. ; S.E./mean = 54.7 lb./ac. and no. of trials = 18.

Crop :- Wheat *(Rabi).* **Ref :- H.P. 59(SFT).**

Centre :- Mahasu (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (v) N.A. (vi) October-November. (vii) Unirrigated. (viii) and (ix) N.A. (x) April-May.

2. TREATMENTS :

0 =Control (no manure).
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1'' =20 lb./ac. of N as A/S/N.
n_2'' =40 lb./ac. of N as A/S/N.
n_1''' =20 lb./ac. of N as C/A/N.
n_2''' =40 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 57(SFT) type B on page 687 conducted at Chamba.

5. RESULTS :

Treatment	0	n_1	n_2	n_1''	n_2''	n_1'''	n_2'''.
Av. yield of grain in lb./ac.	1152	1193	1234	1226	1317	1399	1531

G.M. = 1293 lb./ac. ; S.E./mean = 52.4 lb./ac. and no. of trials = 26.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 58(SFT).**

Centre :- Mandi (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no 57(SFT) type B on page 687 conducted at Chamba.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield of grain in lb./ac.	551	609	667	658	675	667	675

G.M. = 643 lb./ac. ; S.E./mean = 68.1 lb./ac. and no. of trials = 13.

Crop :- Wheat *(Rabi)*. **Ref :- H. P. 59(SFT).**

Centre :- Mandi (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (v) N.A. (vi) October-November. (vii) Unirrigated. (viii) and (ix) N.A. (x) April-May.

2. TREATMENTS :

0 =Control (no mannre).
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1'' =20 lb./ac. of N as A/S/N.
n_2'' =40 lb./ac. of N as A/S/N.
n_1''' =20 lb./ac. of N as C/A/N.
n_2''' =40 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 57(SFT) type B on page 687 conducted at Chamba.

5. RESULTS :

Treatment	0	n_1	n_2	n_1''	n_2''	n_1'''	n_2'''
Av. yield of grain in lb./ac.	806	922	996	913	979	905	633

G.M. = 926 lb./ac. ; S.E./mean 10.5 lb./ac. and no. of trials = 8.

Crop :- Wheat *(Rabi)*. **Ref :- H.P. 59(153).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'MV'.**

Object :—To study the effect of N, P and K on the yield of different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) 14.10.1959. (iv) and (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 varieties : V_1=NP—770, V_2=NP—809 and V_3=Local.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 levels of N : N_0=0, N_1=20 and N_2=40 lb./ac.
(2) 3 levels of P_2O_5 : P_0=0, P_1=16 and P_2=32 lb./ac.
(3) 3 levels of K_2O : K_0=0, K_1=10 and K_2=20 lb./ac.

3. DESIGN :

(i) Split-plot confd. (N^2PK confd.). (ii) (a) 3 main-plots/replication ; 3 blocks/main-plot ; 9 sub-plots/block. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 10′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) to (viii) N.A.

5. RESULTS :

(i) 1115 lb./ac. (ii) (a) 952.2 lb./ac. (b) 437.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
V_1	920	989	1155	940	975	1148	947	1051	1065	1021
V_2	968	1086	982	767	1348	920	733	1238	1065	1012
V_3	1037	1417	1480	1445	1265	1224	1514	1258	1162	1311
Mean	975	1164	1206	1051	1196	1097	1065	1182	1097	1115
K_0	940	1113	1142	1169	823	1203				
K_1	1224	1148	1175	1072	1397	1079				
K_2	761	1231	1300	913	1369	1009				
P_0	975	892	1286							
P_1	1099	1321	1169							
P_2	850	1279	1162							

S.E. of difference of two

1. V marginal means = 259.2 lb./ac.
2. N or P or K marginal means = 119.1 lb./ac.
3. N or P or K means at the same level of V = 206.3 lb./ac.
4. V means at the same level of N or P or K = 309.1 lb./ac.

S.E. of body of N×P or N×K or P×K table = 145.8 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- H.P. 59(146).**

Site :- Cereal Multiplication Farm, Bhanota. **Type :- 'C'.**

Object :—To find out the optimum seed rate for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Maize. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 18.11.1959. (iv) (a) to (e) N.A. (v) A/S in two doses at 2 mds./ac.+Super in one dose at 1½ mds./ac. (vi) NP—792. (vii) Irrigated. (viii) 1 weeding. (ix) and (x) N.A.

2. TREATMENTS :

4 seed rates : R_1=24, R_2=30, R_3=36 and R_4=42 srs./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 20′×4½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 904 lb./ac. (ii) 188 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3	R_4
Av. yield	847	905	870	993

S.E./mean = 76.8 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- Pb. 59(180).**

Site :- Potato Devp. Stn., Kamrah. **Type :- 'C'.**

Object :—To study the best method of applying N to Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat—Potato. (b) Potato. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 10.11.1959. (iv) (a) to (e) N.A. (v) 32 lb./ac. of P_2O_5. (vi) NP—770. (vii) N.A. (viii) Weedings and hoeings. (ix) N.A. (x) 26.6.1960.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as soil application : N_0=0, N_1=10, N_2=20 and N_3=30 lb./ac.

(2) 3 no. of sprayings with 1% Urea Sol. : S_0=No spray, S_1=2 and S_2=4 sprayings.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 10′×9′. (b) 10′×7½′. (v) 9″ on either side. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2303 lb./ac. (ii) 673.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	S_0	S_1	S_2	Mean
N_0	2657	1902	3035	2531
N_1	2056	2309	2381	2249
N_2	2091	1902	2222	2072
N_3	2657	2091	2338	2362
Mean	2365	2051	2494	2303

S.E. of N marginal mean = 194.5 lb./ac.
S.E. of S marginal mean = 168.4 lb./ac.
S.E. of body of table = 336.9 lb./ac.

Crop :- Wheat. **Ref :- H.P. 59(156).**

Site :- Reg. Potato Devp. Stn., Shilaroo. **Type :- 'CMV'.**

Object :—To study the cultural schedule for improved wheat varieties of Mahasu with varying levels of N.

1. BASAL CONDITIONS :

(a) to (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) As per treatments. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) 32 lb /ac. of P_2O_5. (vi) As per treatments. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D_1=10.10.1959, D_2=24.10.1959 and D_3=7.11.1959.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 varieties : V_1=NP—770, V_2=NP—809 and V_3=Local.

(2) 3 seed rates : R_1=30, R_2=40 and R_3=50 srs./ac.

(3) 3 levels of N : N_0=0, N_1=20 and N_2=40 lb./ac.

3. DESIGN :

(i) Split-plot confd. (V^2RN confd.). (ii) (a) 3 main-plots/replication. ; 9 sub-plots/block and 3 blocks/main-plot. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 10′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (li) N.A. (iii) Grain yield. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 904 lb /ac. (ii) (a) 1263.8 lb./ac. (b) 338.5 lb./ac. (iii) Only main effect of V is significant. (iv) Av. yield of grain in lb./ac.

	V_1	V_2	V_3	R_1	R_2	R_3	N_0	N_1	N_2	Mean
D_1	761	1106	1238	989	1065	1051	913	1210	982	1035
D_2	837	1113	1099	1058	1051	940	906	1099	1044	1016
D_3	629	741	615	636	747	602	650	574	761	662
Mean	742	987	984	894	954	864	823	961	929	904
N_0	761	837	871	698	767	1003				
N_1	733	1148	1003	940	1023	920				
N_2	733	975	1079	1044	1072	670				
R_1	864	954	864							
R_2	795	1031	1037							
R_3	567	975	1051							

S.E. of difference of two

1. D marginal means = 344.0 lb./ac.
2. V or R or N marginal means = 92.1 lb./ac.
3. V or R or N means at the same level of D = 160.0 lb./ac.
4. D means at the same level of V or R or N = 368.0 lb./ac.

S.E. of body of V×R or V×N or R×N table = 113.0 lb./ac.

Crop :- Barley *(Rabi)*. **Ref :- H.P. 59(157).**

Centre :- Reg. Potato Devp. Stn., Shilaroo. **Type :- 'MV'.**

Object :—To find out the effect of N, P and K on the yield of different varieties of Barley.

1. BASAL CONDITIONS :

(i) to (ii) N.A. (iii) 16.10.1959. (iv) and (v) N.A. (vi) As per treatments. (vii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 varieties : V_1=B—70, V_2=NP—100 and V_3=Local.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 levels of N : N_0=0, N_1=20 and N_2=40 lb./ac.

(2) 3 levels of P_2O_5 : P_0=0, P_1=16 and P_2=32 lb./ac.

(3) 3 levels of K_2O : K_0=0, K_1=10 and K_2=20 lb./ac.

3. DESIGN :

(i) Split-plot confd. (ii) (a) 3 main-plots/replication, 3 blocks/main-plot and 9 sub-plots/block. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 10′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Barley yield. (iv) to (vii) Nil.

5. RESULTS :

(i) 1920 lb./ac. (ii) (a) 1222.8 lbs/ac. (b) 398.3 lb./ac. (iii) Main effect of V is significant. Interaction P×K is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	K_0	K_1	K_2	V_1	V_2	V_3	Mean
N_0	1884	1822	1773	1663	2056	1760	2050	2208	1221	1826
N_1	1904	1856	2291	2070	2098	1883	1973	2456	1622	2017
N_2	1842	2070	1843	1787	2029	1939	1815	2360	1580	1918
Mean	1877	1916	1969	1840	2061	1861	1946	2341	1474	1920
V_1	1994	1960	1884	1870	2174	1794				
V_2	2360	2242	2422	2270	2546	2208				
V_3	1276	1546	1601	1380	1463	1580				
K_0	1662	2098	1760							
K_1	2243	1932	2008							
K_2	1725	1718	2139							

S.E of difference of two

1. V marginal means = 332.2 lb./ac.
2. N or P or K marginal means = 325.5 lb./ac.
3. N or P or K means at the same level of V = 194.2 lb./ac.
4. V means at the same level of N or P or K = 366.5 lb./ac.

S.E. of body of N×P, N×K or P×K table = 132.5 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- H.P. 59(145).**

Site :- Cereal Multiplication Farm, Bhanota. **Type :- 'M'.**

Object :— To find out the most suitable dose of N, P and K for Maize.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (d) 1′×2′. (e) N.A. (v) Nil. (vi) U.S.—Hybrid. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 levels of N as A/S : N_0=0 and N_1=40 lb./ac.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=20 lb./ac.

(3) 2 levels of K_2O as Mur. Pot. : K_0=0 and K_1=40 lb./ac.

3. DESIGN :

(i) Fact. in R.B D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 12′×18′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2222 lb./ac. (ii) 406.7 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	Mean	K_0	K_1
P_0	1423	2840	2132	2146	2117
P_1	1633	2993	2313	2201	2425
Mean	1528	2917	2222	2174	2271
K_0	1424	2923			
K_1	1632	2910			

S.E. of any marginal mean = 83.0 lb./ac.
S.E. of body of table = 117.4 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- H.P. 59(143-a).**

Site :- Cereal Multiplication Farm, Bhanota. **Type :- 'M'.**

Object :— To find out the optimum ratio of N and P for Maize crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 1 to 13.7.1959. (iv) (a) to (c) N.A. (d) 2′×1′. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 1 weeding. (ix) and (x) N.A.

2. TREATMENTS :

All combinations (1) and (2)

(1) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.

(2) 3 levels of P_2O_5 : P_0=0, P_1=25 and P_2=50 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 12′×18′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 4048 lb./ac. (ii) 510.2 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	3275	4247	4630	4051
P_1	3285	4287	4724	4099
P_2	3540	4447	4317	4101
Mean	3367	4327	4557	4084

S.E. of any marginal mean = 120.3 lb./ac.
S.E. of body of table = 208.3 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- H.P. 59(178).**

Site :- Seed Multiplication Farm, Deoth. **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Maize.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) 6.6.1959. (iv) (a) to (e) N.A. (v) 200 mds./ac. of F.Y.M. (vi) U.S.—Hybrid. (vii) N.A. (viii) Weeding and hoeing. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 59(145) on page 693.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 9′×27′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of cobs and grain. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1975 lb./ac. (ii) 289.7 lb./ac. (iii) Main effect of N and interaction P×K are significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	Mean	K_0	K_1
P_0	1921	2117	2019	1763	2276
P_1	1709	2152	1930	1963	1898
Mean	1815	2135	1975	1863	2087
K_0	1736	1990			
K_1	1894	2279			

S.E. of any marginal mean = 83.6 lb./ac.
S.E. of body of any table = 118.3 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- H.P. 59(151).**

Site :- Cereal Seed Multiplication-cum-Demons. Farm, Parala. **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey loam. (b) N.A. (iii) 12 to 14.7.1959. (iv) (a) to (e) N.A. (v) 200 mds./ac. of F.Y.M. (vi) Local. (vii) Unirrigated. (viii) and (ix) N.A. (x) 23, 24.9.1959.

2. TREATMENTS :

Same as in expt. no. 59(145) on page 693.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 11′×33′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3840 lb./ac. (ii) 481.1 lb./ac. (iii) K effect is significant. N effect is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	Mean	K_0	K_1
P_0	3394	4360	3877	3731	4023
P_1	3229	4378	3804	3603	4004
Mean	3312	4369	3840	3667	4013
K_0	3113	4222			
K_1	3511	4515			

S.E. of any marginal mean = 98.2 lb./ac.
S.E. of body of any table = 138.9 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- H.P. 59(182).**

Site :- Crop and Vegetable Res. Stn., Solan. **Type :- 'M',**

Object :—To find out the best ratio of N and P for Maize crop.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 17.7.1959. (iv) (a) 4 ploughings. (b) and (c) N.A. (d) 2′×1′. (e) N.A. (v) 200 mds./ac. of F.Y.M. (vi) Yellow (local). (vii) Unirrigated. (viii) 3 hoeings and 1 earthing up. (ix) N.A. (x) Nov., 1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.
(2) 3 levels of P_2O_5 : P_0=0, P_1=25 and P_2=50 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 12′×8′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1964 lb./ac. (ii) 967.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	2304	2013	2086	2134
P_1	1794	1604	2423	1940
P_2	1677	2100	1677	1818
Mean	1925	1906	2062	1964

S.E. of any marginal mean = 322.4 lb./ac.
S.E. of body of table = 558.4 lb./ac.

Crop :- Maize *(Kharif)*. **Ref :- H.P. 59(SFT).**

Centre :- Chamba (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Maize to different levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (v) N.A. (vi) July, 1959. (vii) Unirrigated. (viii) and (ix) N.A. (x) September, 1959.

2. TREATMENTS :

0 =Control (no manure).
n =20 lb./ac. of N as A/S.
p =20 lb./ac. of P_2O_5 as Super.
np =20 lb. ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
k =20 lb./ac. of K_2O as Mur. Pot.
nk =20 lb./ac. of N as A/S+20 lb./ac. of K_2O as Mur. Pot.
pk =20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. Pot.
npk =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. Pot.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on each crops, 4 on an oilseed crop and on 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) 1/40 ac. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) N.A.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of grain in lb./ac.	165	82	33	43.6	33	91	8	—8	34.6.

Control yield = 831 lb./ac. and no. of trials = 7.

Crop :- Maize *(Kharif)*. **Ref :- H.P. 59(SFT).**

Centre :- Mahasu (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Maize to different levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 59(SFT) type A on page 697 conducted at Chamba.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of grain in lb./ac.	165	148	16	39.5	49	0	74	49	43.6

Control yield = 1020 lb./ac. and no. of trials = 18.

Crop :- Maize *(Kharif)*. **Ref :- H.P. 59(SFT).**

Centre :- Mandi (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Maize to different levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 59(SFT) type A on page 697 conducted at Chamba.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of grain in lb./ac.	477	214	165	83.1	—66	—123	99	288	70.8

Control yield = 1901 lb./ac. and no. of trials = 12.

Crop :- Maize *(Kharif)*. **Ref :- H.P. 59(SFT).**

Centre :- Chamba (c.f.). **Type :- 'M'.**

Object :—Type B —To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

0 =Control (no manure).
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1'' =20 lb./ac. of N as A/S/N.
n_2'' =40 lb./ac. of N as A/S/N.
n_1'''=20 lb./ac. of N as C/A/N.
n_2'''=40 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 59(SFT) type A on page 697 conducted at Chamba.

5. RESULTS :

Treatment	0	n_1	n_2	n_1''	n_2''	n_1'''	n_2'''
Av. yield of grain in lb./ac.	741	889	1029	872	987	897	1070

G.M. = 926 lb./ac. ; S.E./mean = 36.7 lb./ac. and no. of trials = 6.

Crop :- Maize *(Kharif)*. **Ref :- H.P. 59(SFT).**

Centre :- Mahasu (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

0 =Control (no manure).
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb /ac. of N as A/S.
n_1'' =20 lb./ac. of N as A/S/N.
n_2'' =40 lb./ac. of N as A/S/N.
n_1'''=20 lb./ac. of N as C/A/N.
n_1'''=40 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 59(SFT) type A on page 697 conducted at Chamba.

5. RESULTS :

Treatment	0	n_1	n_2	n_1''	n_2''	n_1'''	n_2'''
Av. yield of grain in lb./ac.	790	971	1152	1070	1152	1152	1415

G.M. = 1100 lb./ac. ; S.E./mean = 61.7 lb./ac. and no. of trials = 11.

Crop :- Maize *(Kharif).* **Ref :- H.P. 59(SFT).**

Centre :- Mandi (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (ix) N.A.

2. TREATMENTS :

0 =Control (no manure).
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1'' =20 lb./ac. of N as A/S/N.
n_2'' =40 lb./ac. of N as A/S/N.
n_1'''=20 lb./ac. of N as C/A/N.
n_2'''=40 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 59(SFT) type A on page 697 conducted at Chamba.

5. RESULTS :

Treatment	0	n_1	n_2	n_1''	n_2''	n_1'''	n_2'''
Av. yield of grain in lb./ac.	1308	1679	1950	1942	1967	2008	2049

G.M. = 1843 lb./ac. ; S.E./mean = 107.6 lb./ac. and no. of trials = 11.

Crop :- Maize *(Kharif).* **Ref :- H.P. 59(144).**

Site :- Cereal Multiplication Farm, Bhanota. **Type :- 'CM'.**

Object :—To study the effect of graded doses of N under different spacings.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 14.7.1959. (iv) (a) N.A. (b) Sown by *kera.* (c) N.A. (d) 1'×2'. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 spacings : $S_1=1\frac{1}{4}' \times 1'$, $S_2=1\frac{1}{2}' \times 1\frac{1}{2}'$ and $S_3=1\frac{1}{2}' \times 2'$.

(2) 3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 12'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2295 lb./ac. (ii) 567.2 lb./ac. (iii) N and S effects are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
S_1	1722	3512	4313	3182
S_2	1071	2592	2773	2145
S_3	950	1714	2010	1558
Mean	1248	2606	3032	2295

S.E. of any marginal mean = 133.7 lb./ac.
S.E. of body of table = 231.6 lb./ac.

Crop :- Maize *(Kharif).* **Ref :- H.P. 58(138).**

Site :- Cereal Multiplication Farm, Bhanota. **Type :- 'CM'.**

Object :—To study the effect of spacing, N and P on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 23.7.1958. (iv) (a) to (c) N.A. (d) 1'×2'. (e) N.A. (v) Nil. (vi) and (vii) N.A. (viii) 1 weeding. (ix) N.A. (x) 1.11.1958.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.

(2) 2 levels of P_2O_5 : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.

(3) 3 spacings : $S_1=1\frac{1}{2}' \times 1'$, $S_2=1\frac{1}{2}' \times 1\frac{1}{2}'$ and $S_3=1\frac{1}{2}' \times 2'$.

N as A/S applied in 2 doses ; P_2O_5 as Super at sowing time.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 3 blocks/replication, 9 plots/block. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 9'×30'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Cobs yield. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 340 lb./ac. (ii) 162.2 lb./ac. (iii) Only N effect is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2	S_3
P_0	221	325	342	296	292	344	252
P_1	344	401	330	358	369	349	356
P_2	287	363	451	367	444	327	330
Mean	284	363	374	340	368	340	313
S_1	302	366	437				
S_2	249	377	394				
S_3	301	346	292				

S.E. of any marginal mean = 27.0 lb./ac.
S.E. of body of any table = 46.8 lb./ac.

Crop :- Pea *(Rabi)*. **Ref :- H.P. 58(181).**

Site :- Crop and Veg. Res. Stn., Solan. **Type :- 'M'.**

Object :— To find out the optimum dose of N, P and K for Pea.

1. BASAL CONDITIONS :

(i) (a) Chillies—Peas. (b) Chillies. (c) 100 mds/ac. of F.Y.M. (ii) (a) Sandy loam. (b) N.A. (iii) 23.11.1958. (iv) (a) to (c) N.A. (d) 1½' between rows. (e) N.A. (v) 150 mds./ac. of F.Y.M. (vi) NP—29. (vii) Irrigated. (viii) 3 weedings and hoeings. (ix) 10". (x) April, 1958.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 2 levels of N : N_0=0 and N_1=40 lb./ac.
(2) 2 levels of P_2O_5 : P_0=0 and P_1=80 lb./ac.
(3) 2 levels of K_2O : K_0=0 and K_1=40 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 3'×22'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Spraying against aphis attack. (iii) Yield of peas. (iv) (a) 1958—contd. (b) No. (c) Nil (v) (a) Dhaulakuan. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 5.87 tons/ac. (ii) 0.91 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of peas in tons/ac.

	N_0	N_1	Mean	K_0	K_1
P_0	6.04	5.78	5.91	6.05	5.78
P_1	6.10	5.56	5.83	5.64	6.03
Mean	6.07	5.67	5.87	8.84	5.90
K_0	6.25	5.44			
K_1	5.90	5.91			

S.E. of any marginal mean = 0.32 tons/ac.
S.E. of body of any table = 0.46 tons/ac.

Crop :- Cabbage *(Rabi)*. **Ref :- H.P. 58(180).**

Site :- Crop and Veg. Res. Stn., Solan. **Type :- 'M'.**

Object :—To find out the optimum dose of N, P and K for Cabbage.

1. BASAL CONDITIONS :

(i) (a) Chillies—Cabbage. (b) Chillies. (c) 100 mds/ac. of F.Y.M. (ii) (a) Sandy loam. (b) N.A. (iii) 15.10.1958. (iv) (a) to (c) N.A. (d) 2′×2′. (e) N.A. (v) 150 mds./ac. of F.Y.M. (vi) Golden acre (vii) Irrigated. (viii) 3 weedings and hoeings. (ix) 10″. (x) Feb. to mid April, 1959.

2. TREATMENTS :

Same as in expt. no. 58(181) on page 701.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 2. (iv) (a) 6′×22′. (b) 4′×22′. (v) 1′ on either side. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Spraying against aphis attack. (iii) Yield of cabbage. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) Dhenlakuan. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 9.68 tons/ac. (ii) 3.50 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of cabbage.

	N_0	N_1	Mean	K_0	K_1
P_0	9.27	10.61	9.94	10.00	9.89
P_1	8.58	10.25	9.41	9.37	9.45
Mean	8.92	10.43	9.68	9.68	9.67
K_0	9.43	9.94			
K_1	8.42	10 92			

S.E. of any marginal mean = 1.24 tons/ac.
S.E. of body of any table = 1.75 tons/ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 59(168).**

Site :- Potato Devp. and Res. Stn., Ahla. **Type :- 'M'.**

Object :— To find out the effect of N with and without P on Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 25.4.1959. (iv) (a) to (c) N.A. (d) 1¼′×1′. (e) 11 tubers/row. (v) 150 mds./ac. of F.Y.M. (vi) Up-to-date. (vii) N.A. (viii) Weeding and hoeing. (ix) N.A. (x) 10.10.1959.

2. TREATMENTS

All combinations of (1) and (2)+two extra treatments

(1) 2 levels of P_2O_5 as Super : P_0=0 and P_1=100 lb./ac.

(2) 2 sources of 100 lb./ac of N : S_1=C/A/N and S_2=A/S.

Extra treatments : T_1=Control and T_2=100 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) 11′×10½′. (b) 11′×7′. (v) One row along length. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) to (vi) N.A. (vii) Yield data of extra treatments are N.A.

5. RESULTS :

(i) 14964 lb./ac. (ii) 5035 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of potato in lb./ac.

T_1 and T_2=N.A.

	P_0	P_1	Mean
S_1	13092	16728	14910
S_2	8728	21311	15019
Mean	10910	19019	14964

S.E. of any marginal mean = 2517 lb./ac.
S.E. of body of table = 3560 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 59(115).**

Site :- Potato Devp. and Res. Stn., Ahla. **Type :- 'M'.**

Object :— To find out the optimum doses of N, P and K for Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 24.7.1959. (iv) (a) to (c) N.A. (d) $1\frac{3}{4}' \times 1'$. (e) 11 tubers/row. (v) 150 mds./ac. of F.Y.M. (vi) Up-to-date. (vii) N.A. (viii) Weeding and hoeing. (ix) N.A. (x) 8 and 9.10.1959.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N : N_0=0, N_1=75 and N_2=150 lb./ac.
(2) 3 levels of P_2O_5 : P_0=0, P_1=75 and P_2=150 lb./ac.
(3) 3 levels of K_2O : K_0=0, K_1=75 and K_2=150 lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 3. (iv) (a) $11' \times 10\frac{1}{2}'$. (b) $11' \times 7'$. (v) One row along length. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 11218 lb./ac. (ii) 4245 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of potato in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	7629	6254	7346	7076	8124	6647	6458
N_1	11102	11841	11998	11647	11338	12336	11267
N_2	14033	14873	15887	14931	13451	15007	16335
Mean	10921	10989	11744	11218	10971	11330	11353
K_0	9751	10426	12736				
K_1	11204	10748	12037				
K_2	11809	11793	10458				

S.E. of any marginal mean = 817 lb./ac.
S.E. of body of any table = 1415 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 58(176).**

Site :- Potato Devp. and Res. Stn., Ahla. **Type :- 'M'.**

Object :—To find out the best source and dose of N for Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 12.4.1958. (iv) (a) to (c) N.A. (d) 1¾'×1'. (e) 11 tubers/row. (v) 150 mds./ac. of F.Y.M. (vi) Up-to-date. (vii) N.A. (viii) Weeding and earthing up. (ix) N.A. (x) 9.10.1958.

2. TREATMENTS :

All combinations of *(1)* and *(2)+one control*

(1) 2 levels of N : N_1=100 and N_2=200 lb./ac.

(2) 5 combinations of 3 sources of N : S_1=F.Y.M., S_2=G.N.C., S_3=F.Y.M.+G.N.C in 1 : 1 ratio, S_4=F.Y.M.+A/S in 1 : 1 ratio and S_5=G.N.C.+A/S in 1 : 1 ratio.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 11'×7'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 9567 lb./ac. (ii) 2857 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of potato in lb./ac.

Control = 7128 lb./ac.

	S_1	S_2	S_3	S_4	S_5	Mean
N_1	9601	10182	8655	8800	10328	9513
N_2	8581	9528	10837	11128	10473	10109
Mean	9091	9855	9746	9964	10400	9811

S.E. of S marginal mean = 1010 lb./ac.
S.E. of N marginal mean = 639 lb./ac.
S.E. of body of table or control mean = 1428 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 59(167).**

Site :- Potato Devp. and Res. Stn., Ahla. **Type :- 'M'.**

Object:—To find out the best source and dose of N for Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 24.4.1959. (iv) (a) to (c) N.A. (d) 1¾'×1'. (e) 11 tubers/row. (v) Nil. (vi) Up-to-date. (vii) N.A. (viii) Weeding and hoeing. (ix) N.A. (x) 10.10.1959.

2. TREATMENTS :

All combinations of (1) and (2) + one control

(1) 2 levels of N : N_1=100 and N_2=200 lb./ac.

(2) 3 combinations of 2 sources of N : S_1=F.Y.M., S_2=G.N.C. and S_3=F.Y.M.+G.N.C. in 1 : 1 ratio.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3. (iv) (a) 11′×10½′. (b) 11′×7′. (v) One row along length. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 13660 lb./ac. (ii) 3960 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of potato in lb./ac.

Control = 9601 lb./ac.

	S_1	S_2	S_3	Mean
N_1	11346	15226	14789	13787
N_2	15808	15686	13165	14886
Mean	13577	15456	13977	14337

S.E. of S marginal mean = 1617 lb./ac.
S.E. of N marginal mean = 1320 lb./ac.
S.E. of body of table or control mean = 2286 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 58(174).**

Site :- Potato Devp. and Res. Stn., Ahla. **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Potato crop.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 10.4.1958. (iv) (a) to (c) N.A. (d) 1¾′×1′. (e) 11 tubers/row. (v) 150 mds./ac. of F.Y.M. (vi) Up-to-date. (vii) N.A. (viii) Weeding and earthing up. (ix) N.A. (x) 7.10.1958.

2. TREATMENTS :

9 manurial treatments : M_0=Control, M_1=50 lb./ac. of N, M_2=100 lb./ac. of N, M_3=40 lb./ac. of P_2O_5, M_4=80 lb./ac. of P_2O_5, M_5=50 lb./ac. of K_2O, M_6=100 lb./ac. of K_2O, M_7=M_1+M_3+M_5 and M_8=M_2+M_4+M_6.

N applied as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 11′×7′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 13770 lb./ac. (ii) 6093 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of potato in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8
Av. yield	11564	17019	17237	13092	9382	12364	10619	13528	19129

S.E./mean = 3016 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 58(175).**

Site :- Potato Devp. and Res. Stn., Ahla. **Type :- 'M'.**

Object :—To study the effect of N with and without P on Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 11.4.1958. (iv) (a) to (c) N.A. (d) $1\frac{1}{4}' \times 1'$. (e) 11 tubers/row. (v) 150 mds./ac. of F.Y.M. (vi) Up-to-date. (vii) N.A. (viii) Weeding and earthing up. (ix) N.A. (x) 8.10.1958.

2. TREATMENTS :

All combinations of (1), (2) and (3)+two extra treatments

(1) 2 levels of N : N_1=50 and N_2=100 lb./ac.
(2) 2 levels of P_2O_5 : P_0=0 and P_1=100 lb./ac.
(3) 2 sources of N : S_1=A/S and S_2=C/A/N.

Extra treatments : T_0=Control and T_1=100 lb./ac. of P_2O_5.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $11' \times 7'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N. A. (vi) and (vii) Nil.

5. RESULTS :

(i) 10422 lb./ac. (ii) 2436 lb./ac. (iii) Main effect of P alone is significant. (iv) Av. yield of potato in lb./ac.

T_0 = 10473 lb./ac. and T_1 = 9382 lb./ac.

	S_1	S_2	Mean	P_0	P_1
N_1	10253	9421	9837	11200	8474
N_2	12329	10181	11255	12510	10000
Mean	11291	9801	10546	11855	9237
P_0	12582	11128			
P_1	10000	8474			

S.E. of any marginal mean = 609 lb./ac.
S.E. of body of any table = 861 lb./ac.
S.E. of T mean = 1218 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 59(174).**

Site :- Potato Devp. Stn., Bagpashog. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 11.4.1959. (iv) (a) 4 ploughings. (b) and (c) N.A. (d) $1\frac{1}{4}' \times 1'$. (e) 50 tubers/plot. (v) N.A. (vi) Up-to-date. (vii) Unirrigated. (viii) Weedings and hoeings. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : N_0=0, N_1=75 and N_2=150 lb./ac.
(2) 3 levels of P_2O_5 : P_0=0, P_1=75 and P_2=150 lb./ac.
(3) 3 levels of K_2O : K_0=0, K_1=75 and K_2=150 lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block and 3 blocks/replication (b) N.A. (iii) 3. (iv) (a) N.A. (b) 10′×8¾′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 7121 lb./ac. (ii) 2824 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of potato in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	6470	7338	7274	7027	7430	6527	7125
N_1	7701	8085	7637	7807	6662	8518	8241
N_2	5624	6698	7260	6527	5774	6669	7139
Mean	6598	7374	7390	7121	6622	7238	7502
K_0	6435	6144	7288				
K_1	7686	7551	6478				
K_2	5674	8426	8405				

S.E. of any marginal mean = 543 lb./ac.
S.E. of body of any table = 941 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 59(173).**
Site :- Potato Devp. Stn., Bagpashog. **Type :- 'M'.**

Object :—To find out the effect of N with and without P on Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 13.4.1959. (iv) (a) 4 ploughings. (b) and (c) N.A. (d) 12″ between tubes. (e) N.A. (v) 150 mds./ac. of F.Y.M. (vi) Up-to-date. (vii) N.A. (viii) Hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)+two extra treatments
(1) 2 levels of N : N_1=50 and N_2=100 lb./ac.
(2) 2 sources of N : S_1=A/S and S_2=C/A/N.
(3) 2 levels of P_2O_5 : P_0=0 and P_1=100 lb./ac.
Extra treatments : T_0=Control and T_1=100 lb./ac. of P_2O_5.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10′×8¾′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 8089 lb./ac. (ii) 3396 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of potato in lb./ac.

T_0 = 7490 lb./ac. and T_1 = 5925 lb./ac.

	P_0	P_1	Mean	S_1	S_2
N_1	8888	7754	8321	7746	8896
N_2	8799	8297	8548	7897	9199
Mean	8843	8025	8434	7821	9047
S_1	7945	7698			
S_2	9742	8353			

S.E. of any marginal mean = 849 lb./ac.
S.E. of body of any table = 1201 lb./ac.
S.E. of T mean = 1698 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 59(160).**

Site :- Potato Devp. Stn., Jogindernagar. **Type :- 'M'.**

Object :—To study the effect of N, P and K on Potato.

1. BASAL CONDITIONS :

(i) (a) Potato – Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 5.4.1959. (iv) (a) to (c) N.A. (d) 2′×1′. (e) 11 tubers/row. (v) 150 mds./ac. of F.Y.M. (vi) Craigs Defiance. (vii) N.A. (viii) 1 weeding and 1 hoeing. (ix) N.A. (x) 9.10.1959.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 3 levels of N : N_0=0, N_1=75 and N_2=150 lb./ac.
(2) 3 levels of P_2O_5 : P_0=0, P_1=75 and P_2=150 lb./ac.
(3) 3 levels of K_2O : K_0=0, K_1=75 and K_2=150 lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 3. (iv) (a) 11′×16′. (b) 11′×12′. (v) One row along length. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 11124 lb./ac. (ii) 4386 lb./ac. (iii) Main effects of N and P are highly significant. (iv) Av. yield of potato in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	5138	9390	11384	8637	8320	7669	9923
N_1	6406	14552	16648	12535	12350	13519	11737
N_2	6326	13774	16503	12201	11412	12473	12718
Mean	5957	12572	14845	11124	10694	11220	11459
K_0	6115	12265	13703				
K_1	5741	12341	15579				
K_2	6015	13109	15254				

S.E. of any marginal mean = 844 lb./ac.
S.E. of body of any table = 1462 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 59(161).**

Site :- Potato Devp. Stn., Jogindernagar. **Type :- 'M'.**

Object :—To find out the effect of N with and without P on Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 11.4.1959. (iv) (a) to (c) N.A. (d) 2′×1′. (e) 11 tubers/row. (v) 150 mds/ac. of F.Y.M. (vi) Craigs Defiance. (vii) N.A. (viii) 1 weeding and 1 hoeing. (ix) N.A. (x) 22.10.1959.

2. TREATMENTS :

All combinations of (1), (2) and (3)+2 extra treatments

(1) 2 levels of N : N_1=50 and N_2=100 lb./ac.

(2) 2 sources of N : S_1=A/S and S_2=C/A/N.

(3) 2 levels of P_2O_5 : P_0=0 and P_1=100 lb./ac.

Extra treatments : T_0=Control and T_1=100 lb./ac. of P_2O_5

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 11′×16′. (b) 11′×12′. (v) One row along length. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 11191 lb./ac. (ii) 2733 lb./ac. (iii) Main effects of P and "T_0 vs. others" are highly significant. (iv) Av. yield of potato in lb./ac.

T_0=6832 lb./ac and T_1=11491 lb./ac.

	S_1	S_2	Mean	P_0	P_1
N_1	10820	11367	11093	8814	13373
N_2	11401	13205	12303	7616	16990
Mean	11110	12286	11698	8215	15181
P_0	7952	8478			
P_1	14269	16094			

S.E. of any marginal mean = 683 lb./ac.
S.E. of body of any table = 966 lb./ac.
S.E. of T mean = 1366 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 57(149).**

Site :- Potato Devp. Stn., Kamrah. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat—Potato. (b) Wheat. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 3rd week of April, 1957. (iv) (a) to (c) N.A. (d) $1\frac{5}{9}′ \times \frac{3}{4}′$ (e) 45 tubers/row. (v) N.A. (vi) Up-to-date. (vii) N.A. (viii) 1 weeding and 1 hoeing. (ix) N.A. (x) Nov., 1957.

2. TREATMENTS :

6 manurial treatments : M_1=40 lb./ac. of P_2O_5 as Super+50 lb./ac. of K_2O as Pot. Sul., M_2=80 lb./ac. of P_2O_5 as Super+100 lb./ac. of K_2O as Pot. Sul., M_3=M_1+50 lb./ac. of N as A/S, M_4=M_1+50 lb./ac. of N as C/A/N, M_5=M_2+100 lb./ac. of N as A/S and M_6=M_2+100 lb./ac. of N as C/A/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) N.A. (b) 33′×11′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 14505 lb./ac. (ii) 2406 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of potato in lb./ac.

Treatment	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	8753	10276	14749	14431	20155	18669

S.E./mean = 1076 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 59(163).**

Site :- Potato Devp. Stn., Kamrah. **Type :- 'M'.**

Object :—To study the effect of different levels and sources of N on Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 21.4.1959. (iv) (a) to (c) N.A. (d) 2′×1′. (e) 11 tubers/row. (v) N.A. (vi) Up-to-date. (vii) N.A. (viii) Weeding and hoeing. (ix) N.A. (x) 23.11.1959.

2. TREATMENTS :

All combinations of (1) and (2)+one control

(1) 2 levels of N : N_1=100 and N_2=200 lb./ac.

(2) 3 combinations of 2 sources of N : S_1=F.Y.M., S_2=G.N.C. and S_3=F.Y.M.+G.N.C. in 1 : 1 ratio.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 11′×16′. (b) 11′×12′. (v) One row along length. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 8049 lb./ac. (ii) 2208 lb./ac. (iii) 'Control vs. others' alone is significant. (iv) Av. yield of potato in lb./ac.

Control = 5362 lb./ac.

	S_1	S_2	S_3	Mean
N_1	5940	9157	8332	7810
N_2	8580	8085	10890	9185
Mean	7260	8621	9611	8497

S.E. of S marginal mean = 781 lb./ac.
S.E. of N marginal mean = 637 lb./ac.
S.E. of body of table or control mean = 1104 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P.58(178).**

Site :- Potato Devp. Stn., Kamrah. **Type :- 'M'.**

Object :—To find out the effect of different levels and sources of N on Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 3rd week of April, 1958. (iv) (a) to (c) N.A. (d) $1\frac{3}{4}' \times 1'$. (e) N.A. (v) Nil. (vi) Up-to-date. (vii) N.A. (viii) 1 weeding and 1 hoeing. (ix) N.A. (x) 4.11.1958.

2. TREATMENTS :

6 manurial treatments : M_0=Control, M_1=100 lb./ac. of N as A/S, M_2=100 lb./ac. of N as G.N.C., M_3=50 lb./ac. of N as A/S+50 lb./ac. of N as G.N.C., M_4=200 lb./ac. of N as G.N.C. and M_5=100 lb./ac. of N as A/S+100 lb./ac. of N as G.N.C.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) $15.75' \times 11'$. (b) $12.25' \times 11'$. (v) One row along length. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 11434 lb./ac. (ii) 1374 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of potato in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	9697	11879	11879	10424	13495	11232

S.E./mean = 687 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 58(179).**

Site :- Potato Devp. Stn. Kamrah. **Type :- 'M'.**

Object :—To find out the optimum levels of N, P and K for Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 24.4.1958. (iv) to (vii) N.A. (viii) 1 weeding and 1 hoeing (ix) N.A. (x) 5.11.1958.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N : N_0=0, N_1=75 and N_2=150 lb./ac.

(2) 3 levels of P_2O_5 : P_0=0, P_1=75 and P_2=150 lb./ac.

(3) 3 levels of K_2O : K_0=0, K_1=75 and K_2=150 lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 3. (iv) (a) $8.75' \times 11'$. (b) $5.25' \times 11'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 12160 lb./ac. (ii) 2972 lb./ac. (iii) Main effect of N is highly significant and that of P is significant. (iv) Av. yield of potato in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	8966	11480	11564	10670	9888	10475	11648
N_1	12067	12905	16005	13659	12570	14916	13491
N_2	11648	12234	12570	12151	11480	12905	12067
Mean	10894	12206	13380	12160	11313	12765	12402
K_0	9804	12067	12067				
K_1	11732	12235	14329				
K_2	11145	12317	13743				

S.E. of any marginal mean = 572 lb./ac.
S.E. of body of any table = 991 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 59(162).**

Site :- Potato Devp. Stn., Kamrah. **Type :- 'M'.**

Object :— To find out the optimum levels of N, P and K for Potato.

1. BASAL CONDITIONS :

(i) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 19.4.1959. (iv) (a) to (c) N.A. (d) 2′×1′. (e) 11 tubers/row. (v) 150 mds./ac. of F.Y.M. (vi) Up-to-date. (vii) N.A. (viii) 1 weeding and 1 hoeing. (ix) N.A. (x) 26.11.1959.

2. TREATMENTS :

Same as in expt. no. 58(179) on page 711.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 3. (iv) (a) 11′×16′. (b) 11′×12′. (v) One row along length. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 9831 lb./ac. (ii) 2775 lb./ac. (iii) Main effects of N and P are significant. (iv) Av. yield of potato in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	7920	7957	9900	8592	9093	8690	7994
N_1	8214	11660	12761	10878	10854	11037	10744
N_2	9387	11367	9314	10023	9424	11074	9570
Mean	8507	10328	10658	9831	9790	10267	9436
K_0	9057	9974	10340				
K_1	9020	11954	9827				
K_2	7444	9057	11807				

S.E. of any marginal mean = 534 lb./ac.
S.E. of body of any table = 925 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 58(177).**

Site :- Potato Devp. Res. Stn., Kamrah. **Type :- 'M'.**

Object :—To find out the effect of different levels and sources of N with and without P on Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 23.4.1958. (iv) (a) to (c) N.A. (d) 1¼′×1′. (e) N.A. (v) Nil. (vi) Up-to-date. (vii) N.A. (viii) Weeding and hoeing. (ix) N.A. (x) 4.11.1958.

2. TREATMENTS :

All combinations of (1), (2) and (3)+2 extra treatments

(1) 2 levels of N : N_1=50 and N_2=100 lb./ac.
(2) 2 sources of N : S_1=A/S and S_2=C/A/N.
(3) 2 levels of P_2O_5 as Super : P_0=0 and P_1=100 lb./ac.

Extra treatments : T_0=Control and T_1=100 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 6′×15.75′. (b) 4′×15.75′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 11648 lb./ac. (ii) 3256 lb./ac. (iii) Main effect af P is highly significant and 'T_0 *vs.* others' is significant. (iv) Av. yield of potato in lb./ac.

T_0 = 7949 lb./ac. and T_1 = 13998 lb./ac.

	S_1	S_2	Mean	P_0	P_1
N_1	11406	11665	11535	9418	13653
N_2	12529	11664	12096	9418	14775
Mean	11967	11664	11816	9418	14214
P_0	9332	9504			
P_1	14603	13825			

S.E. of any marginal mean = 814 lb./ac.
S.E. of body of any table = 1151 lb./ac.
S.E. of T mean = 1628 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 59(164).**

Site :- Potato Devp. Stn., Kamrah. **Type :- 'M'.**

Object :—To find out the effect of different levels and sources of N with and without P on Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 23.4.1959. (iv) (a) to (c) N.A. (d) 2′×1′. (e) 11 tubers/row. (v) N.A. (vi) Up-to-date. (vii) N.A. (viii) 1 weeding and 1 hoeing. (ix) N.A. (x) 24.11.1959.

2. TREATMENTS :

Same as in expt. no. 58(177) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 11′×16′. (b) 11′×12′. (v) One row along length. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 8480 lb./ac. (ii) 2194 lb./ac. (iii) Main effect of P is significant, 'T_0+T_1 *vs.* others' is highly significant. (iv) Av. yield of potato in lb./ac.

T_0 = 5115 lb./ac. and T_1 = 6435 lb./ac.

	S_1	S_2	Mean	P_0	P_1
N_1	8414	10807	9610	8579	10642
N_2	8909	8497	8703	7919	9487
Mean	8661	9652	9156	8249	10064
P_0	7341	9157			
P_1	9982	10147			

S.E. of any marginal mean = 549 lb./ac.
S.E. of body of any table = 776 lb./ac.
S.E. of T mean = 1097 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 57(148).**

Site :- Potato Devp. Stn., Kamrah. **Type :- 'M'.**

Object :—To find out the best levels of N and P for Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat—Potato. (b) Wheat. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 3rd week of April, 1957. (iv) (a) to (c) N.A. (d) 1¾'×1'. (e) N.A. (v) N.A. (vi) Up-to-date. (vii) N.A. (viii) Weeding and hoeing. (ix) N.A. (x) Nov., 1957.

2. TREATMENTS :

All combinations of (1) and (2)+one control

(1) 2 sources of 60 lb. ac. of N : S_1=A/S and S_2=C.A/N.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=80 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 21'×11'. (b) 17.5'×9'. (v) 1.75'×1.0'. (vi) Yes.

5. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 20044 lb./ac. (ii) 459 lb./ac. (iii) All the effects are highly significant. (iv) Av. yield of potato in lb./ac.

Control = 15620 lb./ac.

	P_0	P_1	Mean
S_1	19364	23509	21436
S_2	18821	22909	20865
Mean	19092	23209	21150

S.E. of any marginal mean = 145 lb./ac.
S.E. of body of table or control mean = 205 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 59(171).**

Site :- Potato Devp. and Res. Stn., Kheradhar. **Type :- 'M'.**

Object :—To find out the effect of N with and without P on Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 14.5.1959. (iv) and (v) N.A. (vi) Up-to-date. (vii) N.A. (viii) Weeding and hoeing. (ix) N.A. (x) 8.11.1959.

2. TREATMENTS :

All combinations of (1), (2) and (3)+2 extra treatments

(1) 2 levels of N : N_1=50 and N_2=100 lb./ac.

(2) 2 sources of N : S_1=A/S and S_2=C/A/N.

(3) 2 levels of P_2O_5 as Super : P_0=0 and P_1=100 lb./ac.

Extra treatments : T_0=Control, and T_1=100 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3647 lb./ac. (ii) 333 lb./ac. (iii) Main effect of P and interaction N×P are highly significant. 'T_0 *vs.* others' is significant. (iv) Av. yield of potato in lb./ac.

T_0 = 2970 lb./ac. and T_1 = 3461 lb./ac.

	S_1	S_2	Mean	P_0	P_1
N_1	3684	3692	3688	3306	4070
N_2	3832	3810	3821	3110	4532
Mean	3758	3751	3754	3208	4301
P_0	3187	3229			
P_1	4329	4273			

S.E. of any marginal mean = 83.4 lb./ac.
S.E. of body of any table = 118.0 lb./ac.
S.E. of T mean = 166.5 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 58(134).**

Site :- Potato Devp. Stn., Khadrala. **Type :- 'M'.**

Object :— To find out the best combination of N, P and K for Potato.

1. BASAL CONDITIONS :

(i) to (iv) N.A. (v) 150 mds/ac. of F.Y.M. (vi) to (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as C/A/N : N_0=0, N_1=75 and N_2=150 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=75 and P_2=150 lb./ac.

(3) 3 levels of K_2O as Pot. Sul. : K_0=0, K_1=75 and K_2=150 lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 3. (iv) (a) $8\frac{3}{4}'' \times 8\frac{1}{2}''$. (b) $5\frac{1}{4}' \times 7\frac{1}{2}'$. (v) 1.75′×0.5′. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 10029 lb./ac. (ii) 4215 lb./ac. (iii) Main effect of N is highly significant and that of K is significant. (iv) Av. yield of potato in lb./ac.

	N_0	N_1	N_2	Mean	K_0	K_1	K_2
P_0	6756	9619	9446	8607	6229	9224	10368
P_1	7685	12417	12293	10798	9076	10837	12482
P_2	8492	11520	12030	10681	9117	10977	11948
Mean	7644	11185	11256	10029	8141	10346	11599
K_0	7488	8228	8706				
K_1	7554	11783	11701				
K_2	7891	13545	13362				

S.E. of any marginal mean = 811 lb./ac.
S.E. of body of any table = 1405 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 58(182).**

Site :- Potato Devp. Stn., Khadrala. **Type :- 'M'.**

Object :— To determine the optimum manurial requirement of Potato.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) April/May. (iv) and (v) N.A. (vi) Up-to-date. (vii) to (ix) N.A. (x) Sept.—Oct., 1958.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)
(1) 2 levels of F.Y.M. : F_0=0 and F_1=200 mds./ac.
(2) 2 levels of A/S: N_0=0 and N_1=4 mds./ac.
(3) 2 levels of Super : P_0=0 and P_1=6 mds./ac.
(4) 2 levels of Pot. Sul. : K_0=0 and K_1=3 mds./ac.

3. DESIGN :

(i) 2^4 confd. (ii) (a) 8 plots/block and 2 blocks/replication. (b) N.A. (iii) 3. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS .

(i) 15924 lb /ac. (ii) 9311 lb./ac. (iii) None of the effects is significant. (iv) Table of mean and differential responses in lb./ac.

Mean response	Differential response							
	F		N		P		K	
	—	+	—	+	—	+	—	+
F 2490	—	—	3252	1728	6040	—1060	2494	2486
N 1922	2683	1161	—	—	—1265	5109	980	2864
P 2900	6450	—650	—287	6087	—	—	288	5512
K 1674	1679	1669	733	2615	—938	4286	—	—

S.E. of mean response = 2688 lb./ac.
S.E. of differential response = 3801 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 58(148).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :— To study the effect of N and 2, 4—D hormone on Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loam. (b) N.A. (iii) 30.4.1958. (iv) (a) to (e) N.A. (v) 3 mds./ac. of Super and 1½ mds./ac. of Pot. Sul. at planting time (vi) Up-to-date. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+a control
(1) 4 levels of N : N_1=50, N_2=100, N_3=150 and N_4=200 lb./ac.
(2) 2 levels of hormone : N_0=0 and N_1=2, 4—D at 100 ppm.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 10½′×12′. (b) 7′×10′. (v) 1 75′×1.0′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Potato yield. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 12852 lb./ac. (ii) 2008 lb./ac. (iii) Only interaction N×H and 'control *vs.* others' are highly significant. (iv) Av. yield of potato in lb./ac.

Control = 7299 lb./ac.

	N_1	N_2	N_3	N_4	Mean
H_0	13528	17008	11314	12474	13581
H_1	12359	12211	14556	14918	13511
Mean	12943	14609	12935	13696	13546

S.E. of marginal mean of H = 502 lb./ac.
S.E. of marginal mean of N = 710 lb./ac.
S.E. of body of table = 1004 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 58(146).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :— To find out the best source and suitable time of application of K for Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loam. (b) N.A. (iii) 26.4.1958. (iv) (a) to (e) N.A. (v) 3 mds./ac. of A/S and Super each in furrows at planting time. (vi) Up-to-date. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)+one control
(1) 2 sources of K_2O : S_1=Mur. Pot. and S_2=Pot. Sul.
(2) 2 levels of K_2O : K_1=75 and K_2=150 lb./ac.
(3) 3 times of application : T_1=Full dose at planting, T_2=Full dose at earthing up and T_3=½ at planting +½ at earthing up.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) 10½'×12'. (b) 10'×7'. (v) 0.25'×2.5'. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) (a) N.A. (b) No. (c) Nll. (v) to (vii) Nil.

5. RESULTS :

(i) 12471 lb./ac. (ii) 1770 lb./ac. (iii) Main effects of T and 'control *vs.* others' are highly significant. Interaction S×K is significant. (iv) Av. yield of potato in lb./ac.

Control = 8409 lb./ac.

	K_1	K_2	Mean	T_1	T_2	T_3
S_1	12153	12791	12472	13487	9438	14490
S_2	14375	11917	13146	14046	11166	14227
Mean	13264	12354	12809	13766	10302	14358
T_1	14729	12804				
T_2	10557	10047				
T_3	14505	14212				

S.E. of S or K marginal mean = 417 lb./ac.
S.E. of T marginal mean = 511 lb./ac.
S.E. of body of T×K or T×S table = 723 lb./ac.
S.E. of body of S×K table = 590 lb..ac.
S.E. of control mean = 1022 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 54(204).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To study the effect of different sources of P on Potato.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow. (c) N.A, (ii) (a) Clayey to loamy. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (d) 1¾'×1'. (e) N.A. (v) N.A. (vi) Up-to-date (medium). (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

3 sources of 80. lb./ac. of P_2O_5 : S_0=0, S_1=Super and S_2=B.M.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 12'×8¾'. (b) 10'×5¼'. (v) 1.0'×1.75'. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Potato yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 13514 lb./ac. (ii) 1775 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of potato in lb./ac.

Treatment	S_0	S_1	S_2
Av. yield	11757	15784	13002

S.E/mean = 725 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 55(143).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To find out the bestsource of N for Potato.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow. (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) 29.4.1955. (iv) (a) to (c) N.A. (d) $1\frac{3}{4}' \times 1'$. (e) N.A. (v) 400 mds./ac. of F.Y.M. and 80 lb./ac. of P_2O_5. (vi) Up-to-date (medium). (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

4 sources of 40 lb./ac. of N : S_0=0, S_1=A/S, S_2=A/S/N and S_3=Urea.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) $12' \times 8\frac{3}{4}'$. (b) $10' \times 5\frac{1}{4}'$. (v) $1.0' \times 1.75'$. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 24530 lb./ac. (ii) 3416 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of potato in lb./ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	17868	28047	25358	26847

S.E./mean = 1208 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 54(202).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To find out the best time and method of application of fertilizers to Potato crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) Up-to-date (medium). (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+one control

(1) 3 times of application of fertilizer mixture : T_1=Full dose at planting, T_2=Full dose at earthing and T_3=$\frac{1}{2}$ dose at planting+$\frac{1}{2}$ at earthing.

(2) 3 methods of application of fertilizers : M_1=By broadcast. and M_2=In furrows and M_3=In bands.

Fertilizers mixture : 40 lb./ac. of N as A/S+80 lb./ac. of P_2O_5 as Super+20 lb./ac, of K_2O as Pot. Sul.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Potato yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 11278 lb./ac. (ii) 6991 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of potato in lb./ac.

Control = 12212 lb./ac.

	M_1	M_2	M_3	Mean
T_1	11573	13487	12906	12655
T_2	9226	11277	12159	10887
T_3	11945	1888	16105	9979
Mean	10915	8884	13723	11174

S.E. of any marginal mean = 2018 lb./ac.
S.E. of body of table or control mean = 3495 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 55(144).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To find out the best time and method of application of fertilizer to Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. . (ii) (a) Clayey to loamy. (b) N.A. (iii) 28.4.1955. (iv) (a) to (c) N.A. (d) $1\frac{1}{4}' \times 1'$. (e) N.A. (v) 400 mds./ac. of F.Y.M. (vi) Up-to-date (medium). (vii) Unirrigated. (viii) N.A. (ix) 55.41". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 methods of application of fertilizer mixture : M_1=In furrows, M_2=Side band placement and M_3= In furrows and side band placement.

Sub-plot treatments :

2 times of application of fertilizers : D_1=Full dose of fertilizer mixture applied at planting and D_2= Full dose of Super+$\frac{1}{2}$ A/S+$\frac{1}{2}$ Pot. Sul. applied at planting and $\frac{1}{2}$ A/S+$\frac{1}{2}$ Pot. Sul. applied at earthing.

Fertilizer mixture : 40 lb./ac. of N as A/S+80 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Pot. Sul.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) $12' \times 8\frac{3}{4}'$. (b) $10' \times 5\frac{1}{4}'$. (v) $1.0' \times 1.75'$. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) (a) 1955—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 26775 lb./ac. (ii) (a) 4916 lb./ac. (b) 3977 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of potato in lb./ac.

	M_1	M_2	M_3	Mean
D_1	27946	26032	26793	26924
D_2	26537	25007	28336	26627
Mean	27241	25519	27564	26775

S.E. of difference of two

1. M marginal means = 2198 lb./ac.
2. D marginal means = 1452 lb./ac.
3. D means at the same level of M = 2515 lb./ac.
4. M means at the same level of D = 2828 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 55(128).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To find out the best time and method of application of fertilizer to Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) 4.4.1956. (iv) (a) to (c) N.A. (d) $1\frac{3}{4}' \times \frac{3}{4}'$. (e) N.A. (v) 400 mds./ac. of F.Y.M. (vi) Up-to-date. (vii) Unirrigated. (viii) N.A. (ix) 51.31". (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(144) on page 720.

5. RESULTS :

(i) 16387 lb./ac. (ii) (a) 5512 lb./ac. (b) 3174 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of potato in lb./ac.

	M_1	M_2	M_3	Mean
D_1	17542	16928	16382	16951
D_2	16689	14197	16586	15824
Mean	17115	15562	16484	16387

S.E. of difference of two

1. M marginal means = 2465 lb./ac.
2. D marginal means = 1159 lb./ac.
3. D means at the same level of M = 2007 lb./ac.
4. M means at the same level of D = 2845 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 57(120).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To study the effect of N and P on the yield of Potato.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow. (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) 1.5.1957. (iv) (a) to (c) N.A. (d) $1\frac{3}{4}' \times 1'$. (e) N.A. (v) 400 mds./ac. of F.Y.M. (vi) Up-to-date (medium). (vii) Unirrigated. (viii) 1 earthing up. (ix) 54.85". (x) 2.10.1957.

2. TREATMENTS :

All combinations of (1), (2) and (3) + a control

(1) 2 levels of N : N_1=40 and N_2=80 lb./ac.
(2) 2 sources of N : S_1=A/S and S_2=C/A/N.
(3) 2 levels of P_2O_5 as Super : P_0=0 and P_1=80 lb./ac.

N and P_2O_5 applied at planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) $12' \times 8\frac{3}{4}'$. (b) $10' \times 5\frac{1}{4}'$. (v) 1.0' × 1.75'. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) 2 sprayings. (iii) Potato yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 18089 lb./ac. (ii) 3116 lb./ac. (iii) Only the main effect of P and 'control *vs.* others' are highly significant. (iv) Av. yield of potato in lb./ac.

Control = 12565 lb./ac.

	S_1	S_2	Mean	P_0	P_1
N_1	18132	18888	18510	16371	20650
N_2	19349	18753	19051	16120	21983
Mean	18740	18820	18780	16245	21316
P_0	15988	16502			
P_1	21493	21139			

S.E. of any marginal mean = 636 lb./ac.
S.E. of body of any table = 899 lb /ac.

Crop :- Potato *(Kharif).* **Ref H.P. :- 58(151).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To find out the effect of N and P on the yield of Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) and (iv) N.A. (v) 150 mds./ac. of F.Y.M. (vi) Up-to-date. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)+a control
(1) 2 levels of N : N_1=50 and N_2=100 lb./ac.
(2) 2 sources of N : S_1=A/S and S_2=C/A/N.
(3) 2 levels of P_2O_5 : P_0=0 and P_1=100 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) $10\frac{1}{2}' \times 12'$. (b) $7' \times 10'$. (v) $1.75' \times 1.0'$. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 9419 lb./ac. (ii) 2599 lb /ac. (iii) Only main effect of P is significant. (iv) Av. yield of potato in lb./ac.

Control = 7611 lb./ac.

	N_1	N_2	Mean	P_0	P_1
S_1	10063	9792	9927	9199	10656
S_2	8870	9858	9364	7545	11183
Mean	9466	9825	9645	8372	10919
P_0	8689	8056			
P_1	10244	11594			

S.E. of any marginal mean = 650 lb./ac.
S.E. of body of any table = 919 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 58(141).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To determine the optimum manurial requirements of Potato crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) May, 1958. (iv) and (v) N.A. (vi) Up-to-date. (vii) Unirrigated. (viii) and (ix) N.A. (x) Sept.—Oct., 1958.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 2 levels of F.Y.M. : F_0=0 and F_1=200 mds./ac.
(2) 2 levels of A/S : N_0=0 and N_1=4 mds./ac.
(3) 2 levels of Super : P_0=0 and P_1=6 mds./ac.
(4) 2 levels of Potash : K_0=0 and K_1=3 mds./ac.

3. DESIGN :

(i) 2^4 fact. (ii) (a) 8 plots/block and 2 blocks/replication. (b) N.A. (iii) 3. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Potato yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 11663 lb./ac. (ii) 4113 lb./ac. (iii) Main effect of P is highly significant and N effect is significant. (iv) Table of mean and differential responses in lb./ac.

Mean response		Differential response							
		F		N		P		K	
		—	+	—	+	—	+	—	+
F	1473	—	—	961	1985	2658	288	238	2708
N	2749	2237	3261	—	—	1013	4485	1588	3908
P	3275	4459	2091	1539	5011	—	—	2066	4484
K	1711	476	2946	551	2871	502	2920	—	—

S.E. of mean response = 1187 lb./ac.
S.E. of differential response = 1679 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 58(152).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To find out the suitable doses of N, P and K for Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) and (iv) N.A. (v) 150 mds./ac. of F.Y.M. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as C/A/N : N_0=0, N_1=75 and N_2=150 lb./ac.
(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=75 and P_2=150 lb./ac.
(3) 3 levels of K_2O as Pot. Sul. : K_0=0, K_1=75 and K_2=150 lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) N.A. (iv) (a) $10\frac{1}{2}' \times 12'$. (b) $7' \times 10'$. (v) $1.75' \times 1.0'$. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (vi) (a) N.A. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 12770 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of potato in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	10047	11495	13734	11759	10648	12466	12162
N_1	10903	14663	12326	12631	9998	13273	14622
N_2	10862	14943	15955	13920	11627	14359	15774
Mean	10604	13700	14005	12770	10758	13366	14186
K_0	9916	11034	11323				
K_1	11067	14696	14334				
K_2	10829	15371	16358				

S.E.'s — N.A.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 55(142).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To study the effect of N and P on the yield of Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) and (iv) N.A. (v) 400 mds./ac. of F.Y.M. (vi) Up-to-date (medium). (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N : N_0=0, N_1=40, N_2=40 and N_3=80 lb./ac.

(2) 4 levels of P_2O_5 : P_0=0, P_1=40, P_2=80 and P_3=120 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 12′×8¾′. (b) 10×5¼′. (v) 1.0′×1.75′. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Potato yield. (iv) (a) 1955—1956. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 22322 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of potato in lb./ac.

	P_0	P_1	P_2	P_3	Mean
N_0	17546	19842	20001	23247	20159
N_1	21654	20001	23754	19415	21206
N_2	26883	25206	20801	17898	22697
N_3	20055	27309	26775	26775	25228
Mean	21534	23089	22832	21834	22322

S.E.'s — N.A.

Crop :- Potato *(Kharif).* **Ref :- H.P. 56(127).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To study the effect of N and P on the yield of Potato.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 55(142) on page 724.

5. RESULTS :

(i) 17238 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of potato in lb./ac.

	P_0	P_1	P_2	P_3	Mean
N_0	14668	13921	14187	18452	15307
N_1	18092	16123	11393	17899	15877
N_2	17814	19661	19852	18833	19040
N_3	18562	18188	18775	19393	18729
Mean	17284	16973	16052	18644	17238

S.E.'s — N.A.

Crop :- Potato *(Kharif).* **Ref :- H.P. 57(119).**

Site :- Reg. Potato. Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To study the effect of different sources of N on Potato.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow. (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) 1.5.1957. (iv) (a) to (c) N.A. (d) $1\frac{3}{4}' \times 1'$. (e) N.A. (v) 400 mds./ac. of F.Y.M.+80 lb./ac. of P_2O_5 as Super. (vi) Up-to-date (medium). (vii) Unirrigated. (viii) 1 earthing up. (ix) N.A. (x) 4.10.1957.

2. TREATMENTS :

3 sources of 100 lb./ac. of N : S_0=0, S_1=C/A/N and S_2=A/S.
$\frac{1}{2}$ dose of N applied at planting and $\frac{1}{2}$ at first earthing up.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) $12' \times 8\frac{3}{4}'$. (b) $10 \times 5\frac{1}{4}'$. (v) $1.0' \times 1.75'$. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) 2 sprayings of copper fungicides. (iii) Potato yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 16446 lb./ac. (ii) 3152 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of potato in lb./ac.

Treatment	S_0	S_1	S_2
Av. yield	9035	19452	20851

S.E./mean = 1287 lb./ac.

Crop :- Potato *(Khorif).* **Ref :- H.P. 57(121).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To find out the best source of N for Potato.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow. (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) 1.5.1957. (iv) (a) to (c) N.A. (d) $1\frac{1}{2}' \times 1'$. (v) 400 mds/ac. of F.Y.M. (vi) Up-to-date (medium). (vii) Unirrigated. (viii) 1 earthing up. (ix) 54.85". (x) 7,8.10.1957.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 2 doses of fertilizers : D_1=100 lb./ac. of N+80 lb./ac. of P_2O_5+100 lb./ac. of K_2O, D_2=50 lb./ac. of N+40 lb./ac. of P_2O_5+50 lb./ac. of K_2O.

(2) 3 sources of N : S_0=0, S_1=A/S and S_2=C/A/N

P_2O_5 as Super and K_2O as Pot. Sul.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) $12' \times 8\frac{3}{4}'$. (b) $10' \times 5\frac{1}{4}'$. (v) $1.0' \times 1.75'$. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Potato yield. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 16723 lb./ac. (ii) 7142 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of potato in lb./ac.

Control = 12178 lb./ac.

	S_0	S_1	S_2	Mean
D_1	15017	21205	21913	19378
D_2	12293	17049	17412	15585
Mean	13655	19127	19662	17481

S.E. of D marginal mean = 1844 lb./ac.
S.E. of S marginal mean = 2258 lb./ac.
S.E. of body of table or control mean = 3194 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 58(143).**

Site :- Reg. Potato Devp. and Res Stn., Shilaroo. **Type :- 'M'.**

Object :—To find out the suitable time of application of N on Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) 25.4.1958. (iv) (a) to (e) N.A. (v) 3 mds./ac. of Super+$1\frac{1}{2}$ mds./ac. of Pot. Sul. applied in furrows at planting time. (vi) Up-to-date. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 3 levels of N as A/S N_1=50, N_2=100 and N_3=150 lb./ac.

(2) 3 times of application of N : T_1=Full dose at planting, T_2=Full dose at earthing up and $T_3=\frac{1}{2}$ at planting+$\frac{1}{2}$ at earthing up.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) $10\frac{1}{2}' \times 12'$. (b) $7' \times 10'$. (v) $1.75' \times 1.0'$. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 15316 lb./ac. (ii) 2465 lb./ac. (iii) Control *vs.* other's is highly significant and main effect of T is significant. (iv) Av. yield of potato in lb./ac.

Control = 8105 lb./ac.

	N_1	N_2	N_3	Mean
T_1	17296	18745	17370	17804
T_2	13511	14252	15544	14436
T_3	15140	16811	16383	16111
Mean	15316	16605	16432	16117

S.E. of any marginal mean = 821 lb./ac.
S.E. of body of table or control mean = 1423 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 58(145).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To find out the best time of application of K on Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) 25.4.1958. (iv) (a) to (e) N.A. (v) 3 mds./ac. of A/S+3 mds./ac. of Super in furrows before planting. (vi) Up-to-date. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 3 levels of K_2O as Pot. Sul. : K_1=50, K_2=100 and K_3=150 lb./ac.

(2) 3 times of application of K_2O : T_1=Full dose at planting, T_2=Full dose at earthing and T_3=$\frac{1}{2}$ at planting+$\frac{1}{2}$ at earthing.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(143) on page 726.

5. RESULTS :

(i) 13798 lb./ac. (ii) 3488 lb./ac. (iii) Only 'control *vs.* others' is significant. (iv) Av. yield of potato in lb./ac.

Control = 8434 lb./ac.

	K_1	K_2	K_3	Mean
T_1	15190	15140	15947	15426
T_2	11610	13865	11890	12450
T_3	13207	18671	14021	15300
Mean	13336	15892	13953	14394

S.E. of any marginal mean = 1163 lb./ac.
S.E. of body of table or control mean = 2014 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 58(144).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To find out the best time of application of P on Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) 25.4.1958. (iv) (a) to (e) N.A. (v) 3 mds./ac. of A/S+1½ mds./ac. of Pot. Sul. applied in furrows before planting. (vi) Up-to-date. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 3 levels of P_2O_5 as Super ; P_1=50, P_2=100 and P_3=150 lb./ac.

(2) 3 times of application : T_1=Full dose at planting. T_2=Full dose at earthing up and T_3=½ at planting+½ at earthing.

3. DESIGN and 4. GENERAL ;

Same as in expt. no. 58(143) on page 726.

5. RESULTS :

(i) 13949 lb./ac. (ii) 2804 lb./ac. (iii) Only 'control *vs.* others' is highly significant. (iv) Av. yield of Potato in lb./ac.

Control = 9224 lb./ac.

	P_1	P_2	P_3	Mean
T_1	16227	14861	14120	15069
T_2	11610	14351	14301	13421
T_3	14425	14169	16202	14932
Mean	14087	14460	14874	14474

S.E. of any marginal mean = 935 lb./ac.
S.E. of body of table or control mean = 1619 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 58(142).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'M'.**

Object :—To study the effect of foliar applications of A/S on Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) 2.5.1958. (iv) (a) to (e) N.A. (v) 125 mds./ac. of Pot. Sul. applied in furrows at planting. (vi) Up-to-date. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 3 concentrations : S_1=1%, S_2=2% and S_3=3% spray solution.

(2) 3 numbers of spraying : N_1=2, N_2=4 and N_3=6 sprays at an interval of one week.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) 10½′×12′. (b) 7′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 12250 lb./ac. (ii) 1860 lb./ac. (iii) Interaction N×S and 'control *vs.* others' are highly significant. (iv) Av. yield of potato in lb./ac.

Control = 7447 lb /ac.

	N_1	N_2	N_3	Mean
S_1	9965	11890	15486	12447
S_2	10113	12310	15371	12598
S_3	15791	12647	11487	13308
Mean	11956	12282	14115	12784

S.E. of any marginal mean = 537 lb./ac
S.E. of body of table or control mean = 930 lb./ac.

Crop :- Potato. **Ref :- H.P. 58(SFT).**

Centre :- Mahasu (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Potato to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (v) N.A. (vi) April—May 1958. (vii) Unirrigated. (viii) and (ix) N.A. (x) End of September, 1958.

2. TREATMENTS :

0 =Control (no manure).
n =50 lb./ac. of N as A/S.
p =25 lb./ac. of P_2O_5 as Super.
np =50 lb./ac. of N as A/S+25 lb./ac. of P_2O_5 as Super.
k =50 lb./ac. of K_2O as Mur. Pot.
nk =50 lb./ac. of N as A/S+50 lb./ac. of K_2O as Mur. Pot.
pk =25 lb./ac. of P_2O_5 as Super+50 lb./ac. of K_2O as Mur. Pot.
npk =50 lb./ac. of N as A/S+25 lb./ac. of P_2O_5 as Super+50 lb./ac. of K_2O as Mur. Pot.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homegeneous zones and one field assistant posted in eath zone. The field assistant conducts the trials in one Revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the same zone. Eaeh field assistant is required to conduct 31 trials in a year, 8 on *kharif* cereal, 8 on *rabi* cereal, 8 on each crops, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of Type B on crops other than the legumes. The three trials on legumes are of Type C. Residual effects of phosphate application are studied on Type C trials in the out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) 1/40 ac. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) (a) 1958—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) N.A.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of potato in tons/ac.	0.364	1.018	0.382	0.134	—0.261	—0.224	—0.143	0.169	0.166

Control yield = N.A. no. of trials = 6.

Crop :- Potato. **Ref :- H.P. 59(SFT).**

Centre :- Mahasu (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Potato to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type A on page 729 conducted in Mahasu.

5. RESULTS :

Effect	0	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of potato in tons/ac.	0.287	0.448	0.360	0.573	—0.180	—0.305	—0.202	0.522	0.323

Control yield = 2.131 tons/ac. and no. of trials = 3.

Crop :- Potato. **Ref :- H.P. 59(SFT).**

Centre :- Mahasu (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Hilly. (iii) to (v) N.A. (vi) April—May, 1959. (vii) Unirrigated. (viii) and (ix) N.A. (x) End of Sept., 1959.

2. TREATMENTS :

0 Control (no manure).
n_1 = 50 lb./ac of N as A/S.
n_2 = 100 lb./ac. of N as A/S.
n_1'' = 50 lb./ac of N as A/S/N.
n_2'' = 100 lb./ac. of N as A/S/N.
n_1''' = 50 lb./ac. of N as C/A/N.
n_2''' = 100 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt no. 58(SFT) type A on page 729 conducted at Mahasu.

5. RESULTS :

Treatment	0	n_1	n_2	n_1''	n_2''	n_1'''	n_2'''
Av. yield of potato in tons/ac.	1.701	1.436	1.679	1.877	1.539	1.693	1.400

G.M. = 1.618 tons/ac. ; S.E. = 0.156 tons/ac. and no. of trials = 4.

Crop :- Potato *(Kharif).* **Ref :- H.P. 59(169).**

Site :- Potato Devp. and Res. Stn., Ahla. **Type :- 'MV'.**

Object :— To find out the effect of N, P and K on different varieties of Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 10.5.1959. (iv) (a) to (c) N.A. (d) $1\frac{1}{2}' \times 1'$. (e) 5 tubers/row. (v) 150 mds./ac. of F.Y.M. (vi) As per treatments. (vii) Unirrigated. (viii) 1 weeding and 1 hoeing. (ix) N.A. (x) 11.10.1959.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 2 varieties of Potato : V_1=Up-to-date and V_2=Chamba kheera.
(2) 2 levels of N : N_0=0 and N_1=80 lb./ac.
(3) 2 levels of P_2O_5 : P_0=0 and P_1=80 lb./ac.
(4) 2 levels of K_2O : K_0=0 and K_1=80 lb./ac.

3. DESIGN :

(i) 2^4 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) N.A. (b) $5' \times 5\frac{1}{2}'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS ;

(i) 5986 lb./ac. (ii) 2705 lb./ac. (iii) Main effects of N, V and P are highly significant and interaction N×P is significant. (iv) Table of mean and differential responses in lb./ac.

Mean response		Differential response							
		V		N		P		K	
		V_1	V_2	—	+	—	+	—	+
V	—4078	—	—	—3516	—4640	—4035	—4121	—4743	—3413
N	4184	4746	3622	—	—	2471	5897	5703	2665
P	2890	2932	2848	1176	4604	—	—	3077	2703
K	—312	—978	354	1206	—1830	—125	—499	—	—

S.E. of mean response = 781 lb./ac.
S.E. of differential response = 1104 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 58(147).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'MV'.**

Object :— To find out the effect of K on different varieties of Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) 2.5.1958. (iv) (a) to (e) N.A. (v) 3 mds./ac. of A/S and Super each in furrows at the time of planting. (vi) As per treatments. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

5 varieties of Potato : V_1=Up-to-date, V_2=Magnum bonum, V_3=Craig's defiance, V_4=Hybrid—9 and V_5=Delaware.

Sub-plot treatments :

2 levels of K_2O : K_0=0 and K_1=100 lb./ac.

3. DESIGN :

(i) Split-plot (ii) (a) 5 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) $10\frac{1}{2}' \times 12'$. (b) $7' \times 10'$. (v) $1.75' \times 1.0'$. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 13554 lb./ac. (ii) (a) 5217 lb./ac. (b) 1733 lb./ac. (iii) Main effect of K is highly significant and that of V is significant. (iv) Av. yield of potato in lb./ac.

	V_1	V_2	V_3	V_4	V_5	Mean
K_0	11314	10755	12459	10039	14762	11866
K_1	14383	14169	17485	13223	16951	15242
Mean	12848	12462	14972	11631	15856	13554

S.E. of difference of two

1. V marginal means = 3012 lb./ac.
2. K marginal means = 633 lb./ac.
3. K means at the same level of V = 1415 lb./ac.
4. V means at the same level of K = 3174 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 59(172).**

Site :- Potato Devp. Stn , Bagpashog. **Type :- 'C'.**

Object :— To find out the suitable date of sowing for Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) As per treatments. (iv) (a) 4 ploughings. (b) and (c) N.A. (d) 16" between tuber. (e) 56 tubers/plot. (v) 150 mds./ac. of F.Y.M.+450 lb./ac. of Super+225 lb /ac. of A/S. (vi) Up-to-date. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) N.A. (x) Oct., 1959.

2. TREATMENTS :

5 dates of sowing : D_1=28.3.1959, D_2=5.4.1959, D_3=13.4.1959, D_4=21.4.1959 and D_5=29.4.1959.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 21'×10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N A. (iii) Potato yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 6668 lb./ac. (ii) 1734 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of potato in lb./ac.

Treatment	D_1	D_2	D_3	D_4	D_5
Av. yield	8854	7605	5949	7174	3756

S.E./mean = 867 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 58(183).**

Site :- Potato Devp. Stn , Khadrala. **Type :- 'C'.**

Object :— To find out a suitable relation between seed size and spacing for Potato.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) March, 1958. (iv) (a) to (e) N.A. (v) 200 mds./ac. of F.Y.M.+2 mds./ac. of A/S +3 mds./ac. of Super+1½ mds./ac. of Pot. Sul. (vi) Up-to-date. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

9 cultural treatments : T_1=1" seed 6" apart, T_2=1" seed 9" apart, T_3=1" seed 12" apart, T_4=1½" seed 9" apart, T_5=1½" seed 12" apart, T_6=1½" seed 18" apart, T_7=2" seed 9" apart, T_8=2" seed 12" apart and T_9=2" seed 18" apart.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 5¼'×7½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 14790 lb./ac. (ii) 2522 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of potato in lb./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9
Av. yield	14013	13865	13018	17601	14490	12532	17140	15733	14721

S.E./mean = 1261 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 59(170).**

Site :- Potato Devp. and Res. Stn., Kharadhar. **Type :- 'C'.**

Object :—To find out the suitable date of sowing for Potato.

1. BASAL CONDITIONS :

(i) (a) Potato—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) As per treatments. (iv) and (v) N.A. (vi) Up-to-date. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) N.A. (x) 7.11.1959.

2. TREATMENTS :

5 dates of sowing : D_1=31.3.1959, D_2=6.4.1959, D_3=13.4.1959, D_4=20.4.1959, and D_5=27.4.1959.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10′×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 4066 lb./ac. (ii) 1022 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of potato in lb./ac.

Treatment	D_1	D_2	D_3	D_4	D_5
Av. yield	7230	4904	2900	2942	2354

S.E./mean = 511 lb./ac.

Crop :- Potato *(Kharif)*. **Ref :- H.P. 58(59).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'C'.**

Object :—To find out the suitable relationship between seed size and spacing for Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) March, 1958. (iv) (a) to (e) N.A. (v) 200 mds./ac. of F.Y.M.+3 mds./ac. of Super+2 mds./ac. of A/S+1½ mds./ac. of Pot. Sul. before planting. (vi) Up-to-date. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

Same as in expt. no. 58(183) on page 732.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 7′×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 11947 lb./ac. (ii) 3113 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of potato in lb./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9
Av. yield	13149	12054	11388	14071	11166	10837	12219	11265	11372

S.E./mean = 1556 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 57(125).**

Site :- Reg. Devp. and Res. Stn., Shilaroo. **Type :- 'CV'.**

Object :—To find out the suitable date of planting for different varieties of Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loam. (b) N.A. (iii) As per treatments. (iv) (a) to (e) N.A. (v) 2 mds./ac. of A,S+3 mds./ac. of Super at planting. (vi) As per treatments. (vii) Unirrigated. (viii) 1 earthing up. (ix) N.A. (x) 8, 9, 10.10.1957.

2 TREATMENTS :

Main-plot treatments :

2 varieties : V_1=Up-to-date and V_2=*Delaware.*

Sub-plot treatments :

5 dates of sowing : D_1=9.4.1957, D_2=16.4.1957, D_3=23.4.1957, D_4=30.4.1957 and D_5=7.5.1957.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12′×10′. (b) 10′×7′. (v) 1.0′×1.5′. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 7435 lb./ac. (ii) (a) 4195 lb./ac. (b) 1514 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of potato in lb./ac.

	D_1	D_2	D_3	D_4	D_5	Mean
V_1	5941	5859	7142	5999	6418	6272
	7578	7422	10080	8097	9817	8599
Mean	6760	6640	8611	7048	8118	7435

S.E. of difference of two

1. V marginal means = 1327 lb./ac.
2. D marginal means = 757 lb./ac.
3. D means at the same level of V = 1071 lb./ac.
4. V means at the same level of D = 1636 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- H.P. 58(150).**

Site :- Reg. Potato Devp. and Res. Stn., Shilaroo. **Type :- 'CM'.**

Object :—To find out the suitable spacings and suitable doses of N for Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) 3.5.1958. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) 3 mds./ac. of Super+1½ mds./ac. of Pot. Sul. at planting in furrows. (vi) Up-to-date. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 spacings between tubers : S_1=6″, S_2=9″ and S_3=12″.

(2) 3 spacings between rows : R_1=12″, R_2=18″ and R_3=24″.

(3) 3 levels of N as A/S : N_0=0, N_1=100 and N_2=200 lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 12′×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Potato yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 8023 lb./ac. (ii) 1413 lb./ac. (iii) Main effect of N is highly significant. Main effect of S and interactions N×S and S×R are significant. (iv) Av. yield of potato in lb./ac.

	N_0	N_1	N_2	Mean	R_1	R_2	R_3
S_1	6056	7504	7480	7013	6114	6953	7973
S_2	6616	10063	9808	8829	9446	8903	8138
S_3	5118	8961	10598	8226	9249	8130	7298
Mean	5930	8843	9295	8023	8270	7995	7803
R_1	6459	8706	9644				
R_2	5974	8426	9586				
R_3	5357	9396	8656				

S.E. of any marginal mean = 330.0 lb./ac.
S.E. of body of any table = 576.8 lb./ac.

Crop :- Berseem (*Rabi*). **Ref :- H.P. 59(150).**

Site :- Agri. Res. Stn., Dhaulakuan. **Type :- 'M'.**

Object :—To study the effect of N and P on Berseem crop.

1. BASAL CONDITIONS :

(i) (a) Paddy—*Berseem*. (b) Paddy. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Dhaulakuan. (iii) Oct.—Nov., 1959. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments : (applied to *Berseem*)

All combinations of (1) and (2)

(1) 2 levels of N : N_0=0 and N_1=32 lb./ac.

(2) 2 levels of P_2O_5 : P_0=0 and P_1=50 lb./ac.

Sub-plot treatments : (applied to previous paddy crop)

3 levels of N as A/S : N_0'=0, N_1'=20 and N_2'=40 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/103.7 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 13.68 tons/ac. (ii) (a) 2.33 tons/ac. (b) 0.96 tons/ac. (iii) Only P effect is highly significant. (iv) Av. yield of fodder in tons/ac.

	N_0	N_1	Mean	N_0'	N_1'	N_2'
P_0	12.69	12.25	12.47	12.46	12.22	12.73
P_1	14.85	14.95	14.90	14.78	15.17	14.74
Mean	13.77	13.60	13.68	13.62	13.69	13.74
N_0'	13.81	13.43				
N_1'	13.79	13.60				
N_2'	13.70	13.77				

S.E. of difference of two

1. N or P marginal means = 0.55 tons/ac.
2. N′ marginal means = 0.28 tons/ac.
3. N′ means at the same level of Nor P = 0.39 tons/ac.
4. N or P means at the same level of N′ = 0.64 tons/ac.

S.E. of body of N×P table = 0.55 tons/ac.

Crop :- Apple. **Ref :- H.P. 55(148-a).**

Site :- Fruit Res. Stn., Mashobra. **Type :- 'M'.**

Object :—To study the effect of different doses of lime on the growth and yield of Apple.

1. BASAL CONDITIONS :

(i) Fallow land ; terraced in 1954. (ii) (a) Clay. (b) N.A. (iii) Collar grafting. (iv) Red delicious. (v) Autumn, 1955. 20′×20′ hexagonal system. (vi) 1 year. (vii) 1 md./tree. of F.Y.M. every year. (viii) Weeding, hoeing, manuring and pruning yearly. (ix) Nil. (x) Unirrigated. (xi) 60″. (xii) Trees had not started bearing.

2. TREATMENTS :

3 treatments : T_0=Control, T_1=2 lb./tree of lime every year and T_2=4 lb./tree of lime every year.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) 4. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of defoliating beetle and mildew. B.H.C. dust and sulphur sprays were given. (iii) Girth of tree. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) and (vi) Nil.

5. RESULTS :

(i) 3.88 cms/tree. (ii) 0.28 cms/tree. (iii) Treatment differences are not significant. (iv) Av. girth in cms/tree.

Treatment	T_0	T_1	T_2
Av. girth	3.81	3.99	3.83

S.E./mean = 0.11 cms/tree.

Crop :- Apple. **Ref :- H.P. 56(130-a).**

Site :- Reg. Fruit Res. Stn., Mashobra. **Type :- 'M'.**

Object :—To study the effect of different doses of lime on the growth and yield of Apple.

1. BASAL CONDITIONS :

(i) Fallow, but terraced in 1954. (ii) (a) Clay. (b) N.A. (iii) Collar grafting. (iv) Red delicious. (v) Autumn, 1955. 20′×20′ hexagonal system. (vi) 1 year. (vii) 1 md./tree of F.Y.M. (viii) Weeding, hoeing, manurring and pruning yearly. (ix) Nil. (x) Unirrigated. (xi) 60″. (xii) Trees had not started bearing.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(148-a) on page 736.

5. RESULTS :

(i) 7.33 cms/tree. (ii) 0 80 cms/tree. (iii) Treatment differences are not significant. (iv) Av. girth in cms/tree.

Treatment	T_0	T_1	T_2
Av. girth	7.16	7.69	7.14

S.E./mean = 0.33 cms/tree.

Crop :- Apple. **Ref :- H.P. 57(156-a).**

Site :- Reg. Fruit Res. Stn., Mashobra. **Type :- 'M'.**

Object :—To study the effect of different doses of lime on the growth and yield of Apple.

1. BASAL CONDITIONS :

(i) Fallow land ; terraced in 1954. (ii) (a) Clay. (b) N.A. (iii) Collar grafting. (iv) Red delicious. (v) Autumn, 1955. 20′×20′ hexagonal system. (vi) 1 year. (vii) 1 md./tree of F.Y.M. every year. (viii) Weeding, hoeing, manuring and pruning yearly. (ix) Nil. (x) Unirrigated. (xi) 60″. (xii) Trees had not started bearing.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(148-a) on page 736.

5. RESULTS :

(i) 9.36 cms/tree. (ii) 1.08 cms/tree. (iii) Treatment differences are not significant. (iv) Av. girth in cms/tree.

Treatment	T_0	T_1	T_2
Av. girth	9.18	9.46	9.45

S.E./mean = 0.44 cms/tree.

Crop :- Apple. **Ref :- H.P. 58(174-a).**

Site :- Reg. Fruit Res. Stn., Mashobra. **Type :- 'M'.**

Object :—To study the effect of different doses of lime on the growth and yield of Apple.

1. BASAL CONDITIONS :

(i) Fallow, terraced in 1954. (ii) (a) Clay. (b) N.A. (iii) Collar grafting. (iv) Red delicious. (v) Autumn, 1955. 20′×20′ hexagonal system. (vi) 1 year. (vii) 1 md./tree of F.Y.M. per year. (viii) Weeding, hoeing, manuring and pruning yearly. (ix) Nil. (x) Unirrigated. (xi) 60″. (xii) Trees have not started bearing.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(148-a) on page 736.

5. RESULTS :

(i) 12.11 cms./trees. (ii) 2.38 cms/trees. (iii) Treatment differences are not significant. (iv) Av. girth in cms/tree.

Treatment	T_0	T_1	T_2
Av. girth	11.83	11.96	12.54

S.E./mean = 0.97 cms/tree.

Crop :- Apple. **Ref :- H.P. 57(154-a).**

Site :- Reg. Fruit Res. Stn., Mashobra. **Type :- 'M'.**

Object :—To study the effect of N, P and K along with F.Y.M. on Apple.

1. BASAL CONDITIONS :

(i) Forest. (ii) (a) Clay. (b) N.A. (iii) Grafting. (iv) Red delicious. (v) 1957; 20′×20′ hexagonal system. (vi) 1 year old grafted plants. (vii) N.A. (viii) Weeding, pruning and hoeing. (ix) Nil. (x) Unirrigated. (xi) 60″. (xii) Trees have not started bearing.

2. TREATMENTS :

9 manurial treatments : T_0=Control, T_1=F.Y.M., T_2=F.Y.M.+C/N, T_3=F.Y.M.+Super, T_4=F.Y.M.+Pot. Sul., T_5=F.Y.M.+C/N+Super, T_6=F.Y.M.+C/N+Pot. Sul., T_7=F.Y.M.+Super+Pot. Sul. and T_8=F.Y.M.+C/N+Super+Pot. Sul.

Amount of the various fertilizers were applied according to I.C.A.R.—Schedule.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) 4. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Girth of trees. (iv) (a) 1957—contd. (b) No. (v) and (vi) Nil.

5. RESULTS :

(i) 1.006 cms/tree. (ii) 0.006 cms/tree. (iii) Treatment differences are not significant. (iv) Av. annual increase of girth in cms/tree.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8
Av. girth	1.005	1.002	1.008	1.005	1.010	1.008	1.005	1.005	1.005

S.E./mean = 0.003 cms/tree.

Crop :- Apple. **Ref :- H.P. 58(176-a).**

Site :- Reg. Fruit Res. Stn., Mashobra. **Type :- 'M'.**

Object :—To study the effect of N, P and K along with F.Y.M. on Apple.

1. BASAL CONDITIONS :

(i) Forest land. (ii) (a) Clay. (b) N.A. (iii) Grafting. (iv) Red delicious. (v) 1957, 20′ ×20′ hexagonal system. (vi) 1 year old grafted plants. (vii) N.A. (viii) Weeding, pruning and hoeing. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Trees have not started bearing.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(154-a) above.

5. RESULTS :

(i) 1.329 cms/tree. (ii) 0.131 cms/tree. (iii) Treatment differences are not significant. (iv) Av. increase in girth in cms/tree.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8
Av. increase in girth	1.260	1.555	1.345	1.258	1.280	1.260	1.315	1.380	1.312

S.E./mean = 0.065 cms/tree.

Crop :- Apple. **Ref :- H.P. 59(189-a).**

Site :- Reg. Fruit Res. Stn., Mashobra. **Type :- 'M'.**

Object :—To study the effect of N, P and K along with F.Y.M. on Apple.

1. BASAL CONDITIONS :

(i) Forest land. (ii) (a) Clay. (b) N.A. (iii) Grafting. (iv) Red delicious. (v) 1957. 20′×20′ hexagonal system. (vi) 1 year old grafted plants. (vii) N.A. (viii) Weeding, pruning and hoeing. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Trees had not started bearing.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(154-a) on page 738.

5. RESULTS :

(i) 5.582 cms/tree. (ii) 0.812 cms/tree. (iii) Treatment differences are not significant. (iv) Av. girth in cms/tree.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8
Av. girth	5.302	5.197	5.537	5.087	6.202	5.837	5.552	6.085	5.440

S.E./mean = 0.406 cms/tree.

Crop :- Apple. **Ref :- H.P. 57(155-a)**

Site :- Reg. Fruit Res. Stn., Mashobra. **Type :- 'C'.**

Object :—To compare the effect of different root study on three scion varieties.

1. BASAL CONDITIONS :

(i) Pine forest. (ii) (a) Clay. (b) N.A. (iii) Collar grafting. (iv) As per treatments. (v) 1957 ; 20′×20′ hexagonal system. (vi) 1 year. (vii) F.Y.M. as B.D. at planting. (viii) Hoeings, weedings, manuring and pruning. (ix) Nil. (x) Unirrigated. (xi) 60″. (xii) Trees had not started bearing.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 6 different root stocks : R_1=Red delicious, R_2=Golden delicious, R_3=Royal delicious, R_4=King of pippins, R_5=*Madhuban* and R_6=*Jhalti*.

(2) 3 scions : S_1=Red delicious, S_2=Golden delicious and S_3=Granny Smith.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) 4. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Girth of trees. (iv) (a) 1957—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

(i) 4.04 cms/tree. (ii) 0.57 cms/tree. (iii) Main effects of R and interaction R×S are highly significant. (iv) Av. grith in cms/tree.

	R_1	R_2	R_3	R_4	R_5	R_6	Mean
S_1	4.33	4.10	3.92	3.65	3.97	2.65	3.94
S_2	5.61	4.94	4.36	3.08	3.48	4.28	4.29
S_3	3.92	4.27	3.76	3.43	3.45	4.53	3.89
Mean:	4.62	4.44	4.01	3.39	3.63	4.15	4.04

S.E. of S marginal mean = 0.11 cms./tree.
S.E. of R marginal mean = 0.16 cms./tree.
S.E. of body of table = 0.28 cms./tree.

Crop :- Apple. **Ref :- H.P. 58(175-a).**

Site :- Reg. Fruit Res. Stn., Mashobra. **Type :- 'C'.**

Object :—To study the effect of six different root stocks on three scion varieties.

1. BASAL CONDITIONS :

(i) Pine forest ; cleared in 1956. (ii) (a) Clay. (b) N.A. (iii) Collar grafting. (iv) As per treatments. (v) 1957 ; 20′ × 20′ hexagonal system. (vi) 1 year. (vii) F.Y.M. as B.D. at the time of planting. (viii) Hoeings, weedings, manuring and pruning done every year. (ix) Nil. (x) Unirrigated. (xi) 60″. (xii) Trees had not started bearing.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(155-a) on page 739.

5. RESULTS :

(i) 6.28 cms./tree. (ii) 1.08 cms./tree. (iii) Only R effect is significant. (iv) Av. girth/tree in cms.

	R_1	R_2	R_3	R_4	R_5	R_6	Mean
S_1	6.48	7.10	6.06	6.27	6.47	6.28	6.44
S_2	7.98	6.30	6.64	4.77	5.98	6.46	6.35
S_3	6.43	6.57	6.22	5.09	5.15	6.78	6.04
Mean	6.96	6.66	6.31	5.38	5.87	6.51	6.28

S.E. of R marginal mean = 0.34 cms./tree.
S.E. of S marginal mean = 0.24 cms./tree.
S.E. of body of table = 0.59 cms./tree.

Crop :- Sweet Orange. **Ref :- H.P. 59(189-a).**

Site :- Fruit Res. Stn., Dhaulakuan. **Type :- 'C'.**

Object :—To find out the suitable root stock for Sweet Orange.

1. BASAL CONDITIONS :

(i) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) Budding. (iv) As per treatments. (v) Feb., 1958. (vi) 1 year. (vii) 20 srs. of F.Y.M. ; 4 ozs. of A/S+4 ozs. of Super per tree. (viii) Weedings. (ix) Gram. (x) Irrigated. (xi) N.A. (xii) Nil.

2. TREATMENTS :

Main-plot treatments :

3 varieties : V_1=Blood red, V_2=Valencia (late) and V_3=Pine apple.

Sub-plot treatments :

6 root stocks : R_1=*Malta*, R_2=*Galgal*, R_3=*Jamberi*, R_4=Sweet lime, R_5=*Jatti khatti*, R_6=*Karua Khata.*

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 6 sub-plot/main-plots. (b) N.A. (iii) 4. (iv) 4. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Girth, yield and chemical composition of the fruit. (iv) (a) 1958—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

(i) 4.4 cms./tree. (ii) (a) 1.36 cms./tree. (b) 0.93 cms./tree. (iii) R effect and R×V interaction are highly significant. (iv) Av. girth in cms./tree.

	R_1	R	R_3	R_4	R_5	R_6	Mean
V_1	3.8	3.5	4.8	5.1	4.7	4.1	4.3
V_2	2.2	3.7	5.1	4.5	2.3	5.4	3.9
V_3	3.4	3.9	6.5	4.8	5.2	5.7	4.9
Mean	3.1	3.7	5.5	4.8	4.1	5.1	4.4

S.E. of difference of two

1. V marginal means = 0.39 cms./tree.
2. R marginal means = 0.36 cms./tree.
3. R means at the same level of V = 0.65 cms./tree.
4. V means at the same level of R = 0.72 cms./tree.

JAMMU & KASHMIR

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 54(187).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'M'.**

Object :— To study the effect of F.Y.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) June, 1954. (iv) (a) N.A. (b) Transplanted. (c) N.A. (d) 9″×9″. (e) 3. (v) Nil. (vi) *Basmati*—370. (vii) Irrigated. (viii) 4 hoeings. (ix) N.A. (x) October, 1954.

2. TREATMENTS :

7 levels of F.Y.M. : F_0=0, F_1=50, F_2=100, F_3=150, F_4=200, F_5=250 and F_6=300 mds./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8½′×5½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 941 lb./ac. (ii) 324.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	F_0	F_1	F_2	F_3	F_4	F_5	F_6
Av. yield	719	868	839	959	988	1108	1108

S.E./mean = 162.4 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 54(185).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'M'.**

Object :— To study the effect of F.Y.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) June, 1954. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) 9″×9″. (e) 3. (v) Nil. (vi) China—1039 (early). (vii) Irrigated. (viii) 4 to 5 hoeings. (ix) N.A. (x) October, 1954.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(187) above.

5. RESULTS :

(i) 573 lb./ac. (ii) 151.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	F_0	F_1	F_2	F_3	F_4	F_5	F_6
Av. yield	539	539	539	509	599	628	658

S E./mean = 75.7 lb./ac.

Crop :- Paddy *(Kharif)* **Ref :- J.K. 58(194).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'M'.**

Object :— To study the effect of A/S and C/N on the yield of Paddy.

1. BASAL CONDITIONS :

(i) to (iii) N.A. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) 8" between rows. (e) 3. (v) N.A. (vi) Ch.—1039. (vii) Irrigated. (viii) and (ix) N.A. (x) 8.10.1958.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of lime : L_0=0 and L_1=200 lb./ac.

(2) 5 doses of manures : M_0=0, M_1=100 lb./ac. of A/S M_2=2 M_1, M_3=125 lb./ac. of C/N and M_4=2 M_3.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 4'×27'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) to (vii) Nil.

5. RESULTS :

(i) 2480 lb./ac. (ii) 329.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean
L_0	2437	2403	2385	2740	2463	2486
L_1	2601	2541	2290	2437	2498	2473
Mean	2519	2472	2338	2589	2480	2480

S.E. of L marginal mean = 60.2 lb./ac.
S.E. of M marginal mean = 95.1 lb./ac.
S.E. of body of table = 134.6 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 55(51).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'MV'.**

Object :— To study the effect of A/S and Super on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) June, 1955. (iv) (a) N.A. (b) Transplanted. (c) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings. (ix) N.A. (x) October, 1955.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1=China—1039 and V_2=*Basmati*—370.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=30 and N_2=60 lb./ac.

(2) 3 levels of P_2O_5 as Super : P_0=0, P_1=30 and P_2=60 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 40'×7'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1955—contd, (not conducted in 1956). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1749 lb./ac. (ii) (a) 146.6 lb./ac. (b) 238.3 lb./ac. (iii) Main effect of N is highly significant. P effect is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
V_1	1413	1880	2080	1791	1667	1680	2027
V_2	1547	1547	2027	1707	1547	1867	1707
Mean	1480	1713	2053	1749	1607	1773	1867
P_0	1240	1520	2060				
P_1	1480	1860	1980				
P_2	1720	1760	2120				

S.E. of difference of two

1. V marginal means = 48.9 lb./ac.
2. N or P marginal means = 97.3 lb./ac.
3. N or P means at the same level of V = 137.6 lb./ac.
4. V means at the same level of N or P = 122.5 lb./ac.

S.E. of body of N×P table = 119.1 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- J.K.57(5).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type 'MV'.**

Object :—To study the effect of A/S and Super on different varieties of Paddy.

1. BASAL CONDITIONS :

(l) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 27.6.1957. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings. (ix) N.A. (x) 11.10.1957.

2. TREATMENTS :

Same as in expt. no. 55(51) on page 744.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A (b) 30′×8′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 55(51) on page 744.

5. RESULTS :

(i) 1431 lb./ac. (ii) (a) 342.3 lb./ac. (b) 322.3 lb./ac. (iii) Main effects of N and P are significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
V_1	949	1338	1416	1234	1229	1260	1213
V_2	1525	1618	1742	1623	1291	1665	1929
Mean	1237	1478	1579	1431	1260	1462	1571
P_0	933	1213	1634				
P_1	1447	1353	1587				
P_2	1330	1867	1517				

S.E. of difference of two

1.	V marginal means	= 114.1 lb./ac.
2.	N or P marginal means	= 131.6 lb./ac.
3.	N or P means at the same level of V	= 186.1 lb./ac.
4.	V means at the same level of N or P	= 190.0 lb./ac.
	S.E. of body of N×P table	= 161.1 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- J.K. 58(3).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'MV'.**

Object :—To study the effect of A/S and Super on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) June, 1958. (iv) (a) N.A. (b) Transplanted. (c) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) October, 1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(51) on page 744.

5. RESULTS :

(i) 1044 lb./ac. (ii) (a) 523.8 lb./ac. (b) 269.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
V_1	1393	1380	1160	1311	1073	1520	1340
V_2	813	787	733	778	773	760	800
Mean	1103	1083	947	1044	923	1140	1070
P_0	1040	840	890				
P_1	1070	1430	920				
P_2	1200	980	1030				

S.E. of difference of two

1.	V marginal means	= 174.6 lb./ac.
2.	N or P marginal means	= 100.1 lb./ac.
3.	N or P means at the same level of V	= 155.8 lb./ac.
4.	V means at the same level of N or P	= 216.0 lb./ae.
	S.E. of body of N×P table	= 134.9 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- J.K. 54(183).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'MV'.**

Object :—To study the effect of application of A/S and F.Y.M. on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) June, 1954. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) 9" × 9". (e) 5. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) October, 1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V_1=China—1039 and V_2=*Basmati* —370.

(2) 4 manurial treatments : M_1=122 mds./ac. of F.Y.M., M_2=82 lb./ac. of A/S, M_3=164 lb./ac. of A/S and M_4=246 lb./ac. of A/S.

F.Y.M. applied before planting, ½ dose of A/S applied in July and ½ in August.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 24′×4′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—contd. (modified in 1955). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 793 lb /ac. (ii) 223.8 lb./ac. (iii) Main effects of V and M are highly significant. (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	M_4	Mean
V_1	554	919	963	1225	915
V_2	510	569	773	831	671
Mean	532	744	868	1028	793

S.E. of V marginal mean = 55.9 lb./ac.
S.E. of M marginal mean = 79.1 lb./ac.
S.E. of body of table = 111.9 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 55(53).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'MV'.**

Object :—To study the effect of A/S on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 19.6.1955. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 4 hoeings. (ix) N.A. (x) October, 1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V_1=China—1039 and V_2=*Basmati*—370.

(2) 4 levels of A/S : N_0=0, N_1=82, N_2=164 and N_3=246 lb./ac.

½ of A/S applied at 2nd hoeing and ½ at 4th hoeing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 38′×6′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—contd. (modified in 1955). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1050 lb./ac. (ii) 181.1 lb./ac. (iii) Main effect of N and interaction N×V are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
V_1	909	884	1228	983	1001
V_2	1032	786	1326	1253	1099
Mean	970	835	1277	1118	1050

S.E. of V marginal mean = 45.3 lb./ac.
S.E. of N marginal mean = 64.0 lb./ac.
S.E. of body of table = 90.5 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- J.K. 56(21).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'MV'.**

Object :—To study the effect of A/S on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 28.6.1956. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 4 hoeings. (ix) N.A. (x) 14.10.1956.

2. TREATMENTS :

Same as in expt. no. 55(53) on page 747.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 40'×7'. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 55(53) on. page 747.

5. RESULTS :

(i) 1885 lb./ac. (ii) 277.3 lb./ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
V_1	1640	1680	1680	1600	1650
V_2	1920	2320	2000	2240	2120
Mean	1780	2000	1840	1920	1885

S.E. of V marginal mean = 69.3 lb./ac.
S.E. of N marginal mean = 98.0 lb./ac.
S E. of body of table = 138.6 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- J.K. 57(2).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'MV'.**

Object :—To study the effect of A/S on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) June, 1957. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 4 hoeings. (ix) N.A. (x) 10.10.1957.

2. TREATMENTS :

Same as in expt. no. 55(53) on page 747.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8′×30′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 55(53) on page 747.

5. RESULTS :

(i) 1289 lb./ac. (ii) 372.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
V_1	1493	1330	1423	1423	1417
V_2	1213	1260	1283	887	1161
Mean	1353	1295	1353	1155	1289

S.E. of V marginal mean = 93.0 lb./ac.
S.E. of N marginal mean = 131.6 lb./ac.
S.E. of body of table = 186.1 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J K. 58(2).**
Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'MV'.**

Object :—To study the effect of A/S on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) June, 1958. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) 9″×9″. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 4 hoeings. (ix) N.A. (x) 16.10.1958.

2. TREATMENTS :

Same as in expt. no. 55(53) on page 747.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8′×30′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 55(53) on page 747.

5. RESULTS :

(i) 1225 lb./ac. (ii) 202.8 lb./ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
V_1	1225	1062	840	957	1021
V_2	1470	1482	1318	1447	1429
Mean	1348	1272	1079	1202	1225

S.E. of V marginal mean = 50.7 lb./ac.
S.E. of N marginal mean = 71.7 lb./ac.
S.E. of body of table = 101.4 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 55(52).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'MV'.**

Object :—To study the effect of levels of F.Y.M. on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) June, 1955. (iv) (a) N.A. (b) Transplanting. c) N.A. (d) 9″×9″. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) 13.10.1955.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 2 varieties : V_1=China—1039 and V_2=*Basmati*—370.
(2) 7 levels of F.Y.M. : F_0=0, F_1=50, F_2=100, F_3=150, F_4=200, F_5=250 and F_6=300 mds./ac.

3. DESIGN :

(i) Fact. in R.B D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 38′×7′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 812 lb./ac. (ii) 245.8 lb./ac. (iii) Main effect of V alone is significant. (iv) Av. yield of grain in lb./ac.

	F_0	F_1	F_2	F_3	F_4	F_5	F_6	Mean
V_1	632	674	758	758	842	758	674	728
V_2	884	1095	884	842	1011	632	926	896
Mean	758	885	821	800	927	695	800	812

S.E. of V marginal mean = 46.5 lb./ac.
S.E. of F marginal mean = 86.9 lb./ac.
S.E. of body of table = 122.9 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 56(22).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'MV'.**

Object :—To study the effect of levels of F.Y.M. on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 27.6.1956. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings. (ix) N.A. (x) 14.10.1956.

2. TREATMENTS :

Same as in expt. no. 55(52) above.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 40′×7′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 55(52) on page 750.

5. RESULTS :

(i) 1960 lb./ac. (ii) 360.4 lb./ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of grain in lb./ac.

	F_0	F_1	F_2	F_3	F_4	F_5	F_6	Mean
V_1	1600	1840	1720	1680	1620	2260	1600	1760
V_2	2200	2200	2240	1880	2120	2280	2200	2160
Mean	1900	2020	1980	1780	1870	2270	1900	1960

S.E. of V marginal mean = 68.1 lb./ac.
S.E. of F marginal mean = 127.4 lb./ac.
S.E. of body of table = 180.2 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 57(1).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'MV'.**

Object :—To study the effect of levels of F.Y.M. on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) June, 1957. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) 9″×9″. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings. (ix) N.A. (x) 13.10.1957.

2. TREATMENTS :

Same as in expt. no. 55(52) on page 750.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 25′×11′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 55(52) on page 750.

5. RESULTS :

(i) 1339 lb./ac. (ii) 278.6 lb./ac. (iii) Main effect of V is highly significant and F is significant. (iv) Av. yield of grain in lb./ac.

	F_0	F_1	F_2	F_3	F_4	F_5	F_6	Mean
V_1	1517	1497	1624	1477	1365	1344	1365	1456
V_2	1487	1599	1273	1140	1314	967	774	1222
Mean	1502	1548	1449	1309	1339	1156	1069	1339

S.E. of V marginal mean = 52.6 lb./ac.
S.E. of F marginal mean = 98.5 lb./ac.
S.E. of body of table = 139.3 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 58(4).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'MV'.**

Object :—To study the effect of levels of F.Y.M. on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) June, 1958. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 4 hoeings. (ix) N.A. (x) 19.10.1958.

2. TREATMENTS :

Same as in expt. no. 55(52) on page 750.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 25'×11'. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 55(52) on page 750.

5. RESULTS :

(i) 2518 lb./ac. (ii) 751.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	F_0	F_1	F_2	F_3	F_4	F_5	F_6	Mean
V_1	2444	1894	2342	2342	2403	2200	2872	2357
V_2	1818	2312	2648	3095	2373	3014	3503	2680
Mean	2131	2103	2495	2718	2388	2607	3187	2518

S.E. of V marginal mean = 142.0 lb./ac.
S.E. of F marginal mean = 265.6 lb./ac.
S.E. of body of table = 375.6 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 58(197).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'MV'.**

Object :—To study the effect of A/S on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) 26.4.1958/29.6.1958. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) Hoeings. (ix) N.A. (x) 9.10.1958.

2. TREATMENTS :

Main-plot treatments :
3 varieties : V_1=Ch—1039, V_2=*Begumi* and V_3=Lolanzan.

Sub-plot treatments :
4 doses of A/S : D_0=0, D_1=82, D_2=164 and D_3=246 lb./ac.
A/S applied in two equal doses at the time of 2nd and 4th hoeing.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 26'×6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2029 lb./ac. (ii) (a) 462 lb./ac. (b) 355 lb./ac. (iii) Only main effect of V is highly significant. (iv) Av. yield of grain in lb./ac.

	D_0	D_1	D_2	D_3	Mean
V_1	2430	2298	2483	2334	2386
V_2	1647	1567	1427	1515	1539
V_3	2281	2316	2037	2017	2162
Mean	2119	2060	1981	1955	2029

S.E. of difference of two

1. V marginal means = 163 lb./ac.
2. D marginal means = 177 lb./ac.
3. D means at the same level of V = 251 lb./ac.
4. V means at the same level of D = 272 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 58(195).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'MV'.**

Object :—To study the effect of N and P on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) N.A./28, 29.6.1958. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) 8.10.1958.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 varieties : V_1=Ch—1039, V_2=*Begumi* and V_3=Lolanzan.

(2) 3 levels of N as A/S : N_0=0, N_1=30 and N_2=60 lb./ac.

(3) 3 levels of P_2O_5 as Super : P_0=0, P_1=30 and P_2=60 lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 4′×27′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2030 lb./ac. (ii) 292.8 lb./ac. (iii) Only main effect of V is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	V_1	V_2	V_3
N_0	1934	2185	1995	2038	3117	1097	1900
N_1	1986	1779	2012	1926	2832	1114	1831
N_2	2167	2116	2098	2127	3307	1105	1969
Mean	2029	2027	2035	2030	3085	1105	1900
V_1	3048	3117	3091				
V_2	1105	1131	1079				
V_3	1934	1831	1934				

S.E. of any marginal mean = 69.0 lb./ac.

S.E. of body of any table = 119.5 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- J.K. 58(193).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'MV'.**

Object :—To study the effect of A/S and F.Y.M. on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) N.A./18 to 21.6.1958. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) 12″×8″. (e) 2. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) 8.10.1958.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 2 varieties : V_1=China—1039 and V_2=*Begumi.*

(2) 2 levels of F.Y.M. : F_1=125 and F_2=250 mds./ac.

(3) 2 types of F.Y.M. : T_1=Pitted and T_2=Exposed.

(4) 4 levels of N as A/S : N_0=0, N_1=20, N_2=40 and N_3=60 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 32. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 27′×6′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1811 lb./ac. (ii) 402 lb./ac. (iii) Only main effect of V is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	F_1	F_2	T_1	T_2	Mean
V_1	1867	2074	2143	2187	1949	2187	2174	1962	2068
V_2	1573	1314	1617	1711	1500	1608	1512	1595	1554
Mean	1720	1694	1880	1949	1724	1898	1843	1778	1811
T_1	1910	1590	1858	2014	1819	1867			
T_2	1530	1798	1901	1884	1629	1928			
F_1	1530	1694	1780	1893					
F_2	1911	1695	1980	2005					

S.E. of V, T or F marginal mean	=	71.1 lb./ac.
S.E. of N marginal mean	=	100.5 lb./ac.
S.E. of body of V×N, T×N or F×N table	=	142.1 lb./ac.
S.E. of body of V×F or V×T or F×T table	=	100.5 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- J.K. 58(191).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'MV'.**

Object :—To study the effect of F.Y.M. on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) N.A./13 to 15.6.1958. (iv) (a) N.A. (b) Transplanting. (c) and (d) N.A. (e) 1. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) 30.9.1958.

2. TREATMENTS :

All combinations (1) and (2)

(1) 3 varieties : V_1=Ch—1039, V_2=Begum and V_3=Lolanzan.

(2) 7 doses of F.Y.M. : F_0=0, F_1=50, F_2=100, F_3=150, F_4=200, F_5=250 and F_6=300 mds./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 21. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/358 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2495 lb./ac. (ii) 481.6 lb./ac. (iii) Only main effect of F is significant. (iv) Av. yield of grain in lb./ac.

	F_0	F_1	F_2	F_3	F_4	F_5	F_6	Mean
V_1	2117	2313	2301	2440	2497	2578	2532	2397
V_2	2404	2140	2681	2601	3084	2704	2589	2600
V_3	1818	2140	2117	2831	2739	3268	2509	2489
Mean	2113	2198	2366	2624	2773	2850	2543	2495

S.E. of V marginal mean = 91.0 lb./ac.
S.E. of F marginal mean = 139.0 lb./ac.
S.E. of body of table = 240.8 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 54(186).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'C'.**

Object :— To study the effect of different spacings and number of plants per hill on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) a) Loamy soil. (b) N.A. (iii) June, 1954. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) and (e) As per treatments. (v) Nil. (vi) China—1039 (medium). (vii) Irrigatad. (viii) 4 hoeings. (ix) N.A. (x) October, 1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 spacings between rows : $S_1=3''$, $S_2=6''$ and $S_3=9''$.

(2) 5 numbers of plants/hill : $P_1=2$, $P_2=3$, $P_3=4$, $P_4=5$ and $P_5=6$.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $6' \times 5\frac{1}{2}'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2472 lb./ac. (ii) 525.4 lb./ac. (iii) Main effect of P alone is significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	P_3	P_4	P_5	Mean
S_1	2631	2673	2715	1952	2292	2453
S_2	2079	3055	2885	2206	2334	2512
S_3	2036	2800	2164	2292	2970	2452
Mean	2249	2843	2588	2150	2532	2472

S.E. of P marginal mean = 152.0 lb./ac.
S.E. of S marginal mean = 117.7 lb./ac.
S.E. of body of table = 263.2 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 54(188).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'C'.**

Object :— To study the effect of different spacings and number of plants per hill on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) June, 1954. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) and (e) As per treatments. (v) Nil. (vi) *Basmati*—370 (medium). (vii) Irrigated. (viii) and (ix) N.A. (x) October, 1954.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(186) on page 755.

5. RESULTS :

(i) 2229 lb./ac. (ii) 552.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	P_3	P_4	P_5	Mean
S_1	2375	2249	1994	2757	2036	2282
S_2	2461	2673	2249	2588	2036	2401
S_3	1824	2376	2079	1443	2292	2003
Mean	2220	2433	2107	2263	2121	2229

S.E. of P marginal mean = 159.4 lb./ac.
S.E. of S marginal mean = 123.5 lb./ac.
S.E. of body of table = 276.1 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 55(50).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'CV'.**

Object :— To study the effect of hoeings on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 17.6.1955. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) 9″×9″. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) 10.10.1955.

2. TREATMENTS :

All combinations (1) and (2)

(1) 2 varieties : V_1=China—1039 and V_2=*Basmati*—370.

(2) 6 hoeings : H_0=0, H_1=1, H_2=2, H_3=3, H_4=4 and H_5=5 hoeings.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 35′×8′. (v) N.A. (vi) Yes.

4. GENERAL ;

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 922 lb./ac. (ii) 216.2 lb./ac. (iii) Main effect of V alone is significant. (iv) Av. yield of grain in lb./ac.

	H_0	H_1	H_2	H_3	H_4	H_5	Mean
V_1	921	780	840	720	880	1000	857
V_2	960	960	960	960	960	1120	987
Mean	940	870	900	840	920	1060	922

S.E. of V marginal mean = 44.1 lb./ac.
S.E. of H marginal mean = 76.4 lb./ac.
S.E. of body of table = 108.1 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 56(20).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'CV'.**

Object :— To study the effect of hoeings on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) End of June. (iv) (a) N.A. (b) Transplanting. (c) to (e) N A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) Mid of October.

2. TREATMENTS :

Same as in expt. no. 55(50) on page 756.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 40′×7′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 55(50) on page 756.

5. RESULTS :

(i) 1577 lb./ac. (ii) 281.2 lb./ac. (iii) Main effect of V is highly significant. (iv) Av. yield of grain in lb./ac.

	H_0	H_1	H_2	H_3	H_4	H_5	Mean
V_1	1720	1705	1640	1800	1480	1880	1704
V_2	1400	1460	1440	1480	1400	1520	1450
Mean	1560	1583	1540	1640	1440	1700	1577

S.E. of V marginal mean = 57.4 lb./ac.
S.E. of H marginal mean = 99.4 lb./ac.
S.E. of body of table = 140.6 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 57(3).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'CV'.**

Object :—To study the effect of hoeings on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 26.6.1957. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) 14.10.1957.

2. TREATMENTS :

Same as in expt. no. 55(50) on page 756.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 25′×7′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 55(50) on page 756.

5. RESULTS :

(i) 1704 lb./ac. (ii) 430.7 lb./ac. (iii) Main effect of V is highly significant and H is significant. (iv) Av. yield of grain in lb./ac.

	H_0	H_1	H_2	H_3	H_4	H_5	Mean
V_1	1824	2304	2080	1792	2208	1696	1984
V_2	944	1696	1648	1392	1568	1296	1424
Mean	1384	2000	1864	1592	1888	1496	1704

S.E. of V marginal mean = 87.9 lb./ac.
S.E. of H marginal mean = 152.3 lb./ac.
S.E. of body of table = 215.3 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- J.K. 58(1).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'CV'.**

Object :—To study the effect of hoeings on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) June, 1958. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) October, 1958.

2. TREATMENTS :

Same as in expt. no. 55(50) on page 756.

3. DESIGN ;

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 25′×7′. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 55(50) on page 756.

5. RESULTS :

(i) 2486 lb./ac. (ii) 694.8 lb./ac. (iii) Main effect of H is significant. (iv) Av. yield of grain in lb./ac.

	H_0	H_1	H_2	H_3	H_4	H_5	Mean
V_1	2944	2672	3184	2144	1888	2336	2528
V_2	2720	2240	2912	2208	2048	2528	2443
Mean	2832	2456	3048	2176	1968	2432	2486

S.E. of V marginal mean = 141.8 lb./ac.
S.E. of H marginal mean = 245.6 lb./ac.
S.E. of body of table = 347.4 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- J.K. 54(182).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'CV'.**

Object :—To study the effect of different methods of sowing on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) June, 1954. (iv) (a) N.A. (b) to (e) As per treatments. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) October, 1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V_1=China—1039 and V_2=*Basmati*—370.

(2) 3 methods of sowing : M_1=Broadcast at 30 srs./ac. M_2=Broadcast at 36 srs./ac. and M_3=Transplanting at 6″×6″ spacing and 5 plants/hill.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 8′×7′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1954 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1381 lb./ac. (ii) 353.0 lb./ac. (iii) Main effect of V is highly significant. (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	Mean
V_1	2067	2000	1800	1956
V_2	750	650	1017	806
Mean	1409	1325	1409	1381

S.E. of V marginal mean = 85.6 lb./ac.
S.E. of M marginal mean = 104.8 lb./ac.
S.E. of body of table = 148.2 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 54(184).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'CV'.**

Object :—To study the effect of weeding on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) June, 1954. (iv) (a) N.A. (b) Transplanted. (c) N.A. (d) 9″×9″. (e) 3 seedlings/hill. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) Nov., 1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V_1=China—1039 and V_2=*Basmati* 370.

(2) 2 levels of weeding : W_0=No weeding and W_1=Weeding.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 10′×7′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1954 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2007 lb./ac. (ii) 639.0 lb./ac. (iii) Main effect of W alone is highly significant. (iv) Av. yield of grain in lb./ac.

	V_1	V_2	Mean
W_0	2907	2027	2467
W_1	1520	1573	1547
Mean	2214	1800	2007

S.E. of any marginal mean = 184.5 lb./ac.
S.E. of body of table = 260.9 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 58(192).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'CV'.**

Object :—To study the effect of hoeings on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) N.A./16 to 18.6.1958. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) 8.10.1958.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 varieties : V_1=China-1039, V_2=Begum, and V_3=Lolanzan.
(2) 6 hoeings : H_0=0, H_1=1, H_2=2, H_3=3, H_4=4 and H_5=5 hoeings.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 27′×6½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) to (vii) Nil.

5. RESULTS :

(i) 1643 lb./ac. (ii) 246.0 lb./ac. (iii) Main effects of V and H are highly significant. (iv) Av. yield of grain in lb./ac.

	H_0	H_1	H_2	H_3	H_4	H_5	Mean
V_1	1316	1979	1771	1795	1731	1963	1759
V_2	1588	1835	1739	1508	1675	1604	1658
V_3	1213	1492	1588	1500	1660	1612	1511
Mean	1372	1769	1699	1601	1689	1726	1643

S.E. of V marginal mean = 50.2 lb./ac.
S.E. of H marginal mean = 71.0 lb./ac.
S.E. of body of table = 123.0 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 56(19).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'CMV'.**

Object :—To study the effect of cultural practices and F.Y.M. on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) June, 1956. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) and (e) As per treatments. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings. (ix) N.A. (x) October, 1956.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 2 varieties : V_1=China—1039 and V_2=*Basmati*—370.

(2) 3 levels of F.Y.M. : F_1=125, F_2=250 and F_3=375 mds./ac.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 5 spacings between plants : S_1=6″, S_2=8″ and S_3=10″.

(2) 3 seedlings/hill : H_1=2, H_2=4 and H_3=6 seedlings/hill.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 20′×5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2639 lb./ac. (ii) (a) 653.4 lb./ac. (b) 462.9 lb./ac. (iii) Main effects of V and S are highly significant. (iv) Av. yield of grain in lb./ac.

	V_1	V_2	S_1	S_2	S_3	H_1	H_2	H_3	Mean
F_1	2327	2838	2595	2446	2707	2334	2474	2940	2583
F_2	2371	2900	2474	2576	2856	2632	2576	2698	2635
F_3	2337	3062	2315	2852	2931	2693	2744	2660	2699
Mean	2345	2933	2461	2625	2831	2553	2598	2766	2639
H_1	2318	2788	2278	2618	2763				
H_2	2321	2875	2380	2502	2912				
H_3	2396	3136	2726	2754	2819				
S_1	1985	2937							
S_2	2399	2850							
S_3	2651	3012							

S.E. of differences of two

1. V marginal means = 125.7 lb./ac. 6. S or H means at the same level of F = 189.0 lb /ac.
2. F marginal means = 154.0 lb./ac. 7. F means at the same level of S or H = 218.0 lb./ac.
3. S or H marginal means = 109.1 lb./ac. S.E. of body of V×F table = 154 0 lb./ac.
4. S or H means at the same level of V = 154.3 lb./ac. S.E. of body of S×H table = 133.6 lb./ac.
5. V means at the same level of S or H = 178.0 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- J.K. 57(4).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'CVM'.**

Object :—To study the effect of cultural practices and F.Y.M. on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) and (e) As per treatments. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings. (ix) N.A. (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no 56(19) on. page 760.

5. RESULTS :

(i) 1399 lb./ac. (ii) (a) 655.2 lb./ac. (b) 611.6 lb./ac. (iii) Main effect of F is significant and that of S is highly significant. (iv) Av. yield of grain in lb./ac.

	V_1	V_2	S_1	S_2	S_3	H_1	H_2	H_3	Mean
F_1	1045	1145	1017	896	1372	1031	1050	1204	1095
F_2	1263	1605	1446	1195	1662	1316	1549	1437	1434
F_3	1481	1854	1802	1307	1895	1708	1568	1727	1668
Mean	1263	1535	1422	1133	1643	1352	1389	1456	1399
H_1	1385	1319	1330	971	1754				
H_2	1272	1506	1442	1157	1568				
H_3	1132	1780	1493	1269	1606				
S_1	1014	1829							
S_2	834	1431							
S_3	1942	1344							

S.E. of difference of two

1. V marginal means = 126.1 lb./ac.
2. F marginal means = 154.4 lb./ac.
3. S or H marginal means = 144.2 lb./ac.
4. S or H means at the same level of V = 203.9 lb./ac.
5. V means at the same level of S or H = 208.8 lb./ac.
6. S or H means at the same level of F = 249.7 lb./ac.
7. F means at the same level of S or H = 255.8 lb./ac.

S.E. of body of V×F table = 154.4 lb./ae.

S.E. of body of S×H table = 176.5 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- J.K. 58(5).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'CMV'.**

Object :—To study the effect of cultural practices and F.Y.M. on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) June, 1958. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) and (e) As per treatments. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings. (ix) N.A. (x) October, 1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(19) on page 760.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Remaining two-way tables are not available in the records.

5. RESULTS :

(i) 1710 lb./ac. (ii) (a) 640.7 lb./ac. (b) 451.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	Mean	H_1	H_2	H_3
V_1	1910	1593	1714	1739	1836	1739	1643
V_2	1493	1951	1596	1680	1509	1761	1770
Mean	1702	1772	1655	1710	1672	1750	1707
F_1	1680	1802	1526	1669	1605	1610	1792
F_2	1554	1816	1778	1716	1591	2016	1540
F_3	1872	1699	1662	1744	1820	1624	1788

S.E. of difference of two

1. V marginal means = 123.3 lb./ac.
2. F marginal means = 151.0 lb./ac.
3. S or H marginal means = 106.3 lb./ac.
4. S or H means at the same level of V = 150.3 lb./ac.
5. V means at the same level of S or H = 174.0 lb./ac.
6. S or H means at the same level of F = 184.1 lb./ac.
7. F means at the same level of S or H = 213.1 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- J.K. 58(196).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'CMV'.**

Object :—To study the effect of cultural practices and F.Y.M. on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) N.A./29, to 30.6.1958 and 1.7.1958. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) 9.10.1958.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 3 spacings between plants ; D_1=6″, D_2=8″ and D_3=10″.
(2) 3 seedlings/hlll : S_1=2, S_2=4 and S_3=6 seedlings/hill.
(3) 3 varieties : V_1=China 1039, V_2=*Begum* and V_3=Lolanzan.
(4) 3 levels of F.Y.M. : M_1=125, M_2=250 and M_3=375 mds./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 81. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 26×4½′ (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) to (vii) Nil.

5. RESULTS :

(i) 1970 lb./ac. (ii) 458.6 lb./ac. (iii) Only V effect is highly significant. (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	S_1	S_2	S_3	D_1	D_2	D_3	Mean
V_1	2649	2683	2686	2787	2644	2587	2577	2877	2564	2673
V_2	1611	1593	1640	1513	1651	1670	1694	1556	1585	1611
V_3	1577	1691	1614	1678	1622	1582	1582	1534	1766	1627
Mean	1942	1989	1980	1993	1972	1946	1951	1989	1971	1970
D_1	1928	1986	1939	1989	1944	1920				
D_2	2008	1944	2016	2037	1949	1981				
D_3	1891	2037	1986	1952	2023	1939				
S_1	1965	2037	1976							
S_2	1984	1912	2021							
S_3	1877	2018	1944							

S.E. of any marginal mean = 62.4 lb./ac.
S.E. of body of any table = 108.1 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- J.K. 54(179).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'M'.**

Object :—To study the effect of N, P and F.Y.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) November, 1954. (iv) (a) N.A. (b) Sown by kera. (c) 32 srs./ac. (d) 8" between rows. (e) N.A. (v) N.A. (vi) NP—4 (medium). (vii) Irrigated. (viii) Nil. (ix) Nil. (x) April, 1955.

2. TREATMENTS :

Main-plot treatments :

4 levels of F.Y.M. : F_0=0, F_1=50, F_2=100 and F_3=150 mds./ac.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 4 levels of A/S : A_0=0, A_1=100, A_2=200 and A_2=300 lb./ac.

(2) 4 levels of Super : S_0=0, S_1=100, S_2=200 and S_3=300 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 16 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 26′×4½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Remaining two-way table is not available in the records.

5. RESULTS :

(i) 1751 lb./ac. (ii) (a) 429.4 lb./ac. (b) 339.0 lb./ac. (iii) Main effects of A and S are highly significant. (iv) Av. yield of grain in lb /ac.

	A_0	A_1	A_2	A_3	Mean	S_0	S_1	S_2	S_3
F_0	1526	1717	1921	1986	1787	1638	1795	1789	1927
F_1	1526	1663	1621	1855	1666	1532	1513	1861	1759
F_2	1574	1598	1855	1693	1680	1490	1442	1741	2046
F_3	1687	1861	1963	1975	1871	1609	1903	1873	2100
Mean	1578	1710	1840	1877	1751	1567	1663	1816	1958

S.E. of difference of two

1. F marginal means = 107.3 lb./ac.
2. A or S marginal means = 84.7 lb./ac.
3. A or S means at the same level of F = 165.9 lb./ac.
4. F means at the same level of A or S = 181.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- J.K. 56(23).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'M'.**

Object :—To study the effect of N, P and F.Y.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 2.11.1956. (iv) (a) N.A. (b) Sown by *kera*. (c) 35 srs./ac. (d) 9" between rows. (e) N.A. (v) Nil. (vi) NP—4 (medium). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 28.4.1957.

2. TREATMENTS :

Main-plot treatments :

4 levels of F.Y.M. : F_0=0, F_1=50, F_2=100 and F_3=150 mds./ac.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 4 levels of A/S : A_0=0, A_1=100, A_2=200 and A_3=300 lb./ac.

(2) 4 levels of Super : S_0=0, S_1=100, S_2=200 and S_3=300 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 16 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) and (b) 30′×5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 689 lb./ac. (ii) (a) 165.0 lb./ac. (b) 192.6 lb./ac. (iii) Only main effect of F is significant. (iv) Av. yield of grain in lb./ac.

	A_0	A_1	A_2	A_3	Mean	S_0	S_1	S_2	S_3
F_0	579	693	628	672	643	534	639	695	702
F_1	520	614	735	581	612	677	560	586	625
F_2	644	660	756	625	671	574	681	656	775
F_3	779	803	854	877	828	835	756	863	859
Mean	631	692	743	689	689	655	659	700	740
S_0	609	658	707	646					
S_1	583	681	751	621					
S_2	544	674	777	805					
S_3	786	756	737	683					

S.E. of difference of two

1. F marginal means = 41.2 lb./ac.
2. A or S marginal means = 48.1 lb./ac.
3. A or S means at the same level of F = 96.3 lb./ac.
4. F means at the same level of A or S = 93.1 lb./ac.

S.E. of body of A×S table = 68.1 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- J.K. 57(6).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'M'.**

Object :—To study the effect of N, P and F.Y.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 5.11.1957. (iv) (a) N.A. (b) Sown by *kera*. (c) 35 srs./ac. (d) 9" between rows. (e) N.A. (v) Nil. (vi) NP—4 (medium). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 14.5.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(23) above.

5. RESULTS :

(i) 835 lb./ac. (ii) (a) 351.5 lb./ac. (b) 164.1 lb./ac. (iii) Interaction F×S alone is highly significant. (iv) Av. yield of grain in lb./ac.

	A_0	A_1	A_2	A_3	Mean	S_0	S_1	S_2	S_3
F_0	653	695	709	705	691	807	616	677	663
F_1	756	840	789	751	784	798	896	700	742
F_2	901	910	789	751	838	700	803	1041	807
F_3	1069	971	989	1087	1029	1209	1041	929	938
Mean	845	854	819	823	835	878	839	837	787
S_0	905	812	896	901					
S_1	831	873	845	807					
S_2	859	891	775	821					
S_3	784	840	761	765					

S.E. of difference of two

1. F marginal means = 87.9 lb./ac.
2. A or S marginal means = 41.0 lb./ac.
3. A or S means at the same level of F = 82.0 lb./ac.
4. F means at the same level of A or S = 113.0 lb./ac.

S.E. of body of A×S table = 58.0 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- J.K. 58(6).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'M'.**

Object :—To study the effect of N, P and F.Y.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) 9.11.1958. (iv) (a) N.A. (b) Sown by *kera*. (c) 35 srs./ac. (d) 9" between rows. (e) N.A. (v) Nil. (vi) NP—4 (medium). (vii) Irrigated. (viii) and (ix) N.A. (x) 11.5.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(23) on page 764.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Remaining two-way table is not available in the records.

5. RESULTS :

(i) 854 lb./ac. (ii) (a) 286.3 lb./ac. (b) 219.9 lb./ac. (iii) Main effect of F is highly significant. (iv) Av. yield of grain in lb./ac.

	A_0	A_1	A_2	A_3	Mean	S_0	S_1	S_2	S_3
F_0	691	742	723	849	751	639	812	672	882
F_1	924	826	1050	835	909	854	910	765	1106
F_2	798	709	784	691	745	644	760	859	719
F_3	933	1097	887	1120	1009	1022	961	980	1073
Mean	836	843	861	874	854	790	861	819	945

S.E. of difference of two

1. F marginal means = 71.6 lb./ac.
2. A or S marginal means = 55.0 lb./ac.
3. A or S means at the same level of F = 109.9 lb./ac.
4. F means at the same level of A or S = 119.1 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- J.K. 54(181).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'M'.**

Object :— To study the effect of different times of application of A/S on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) November, 1954. (iv) (a) N.A. (b) Sown by *kera*. (c) 30 srs./ac. (d) 8″ between rows. (e) N.A. (v) Nil. (vi) N.P.—4 (medium). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) May, 1955.

2. TREATMENTS :

5 times of application of N : T_1=Full dose in autumn, T_2=Full dose in spring, $T_3=\frac{1}{2}$ in autumn+$\frac{1}{2}$ in spring, $T_4=\frac{3}{4}$ in autumn+$\frac{1}{4}$ in spring and $T_5=\frac{1}{4}$ in autumn+$\frac{3}{4}$ in spring.

N as A/S applied at 40 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 30′×5′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Nil. (ii) N.A. (iii) Yield of grain. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 880 lb./ac. (ii) 173.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3	T_4	T_5
Av. yield	933	834	859	865	909

S.E./mean = 70.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- J.K. 54(180).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'M'.**

Object :— To study the effect of N through different sources on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) November, 1954. (iv) (a) N.A. (b) Sown by *kera*. (c) 30 srs./ac. (d) 8″ to 9″ between rows. (e) N.A. (v) Nil. (vi) N.P.—4 (medium). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) May, 1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 5 levels of N : N_1=20, N_2=40, N_3=60, N_4=80 and N_5=100 lb./ac.

(2) 2 sources of N : S_1=A/S and S_2=C/N.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 30′×5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Nil. (ii) N.A. (iii) Yield of grain. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1903 lb./ac. (ii) 317.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_1	N_2	N_3	N_4	N_5	Mean
S_1	1643	1568	2128	1886	1960	1837
S_2	1932	1951	1886	1867	2203	1968
Mean	1788	1760	2007	1877	2082	1903

S.E. of S marginal mean = 71.0 lb./ac.
S.E. of N marginal mean = 112.2 lb./ac.
S.E. of body of table = 158.7 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- J.K. 54(176).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'M'.**

Object :— To study the effect of A/S, C/N and F.Y.M. on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) November, 1954. (iv) (a) N.A. (b) Broadcast. (c) 32 srs./ac. (d) and (e) N.A. (v) Nil. (vi) N.P.—4 (medium). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) May, 1955.

2. TREATMENTS :

11 manurial treatments : M_0=Control (no manure), M_1=100 lb./ac. of N as F.Y.M., M_2=2 M_1, M_3=40 lb./ac. of N as A/S, M_4=2 M_3, M_5=40 lb./ac. of N as C/N, M_6=2 M_5, M_7=50 lb./ac. of N as F.Y.M.+20 lb./ac. of N as A/S, M_8=2 M_7, M_9=50 lb./ac. of N as F.Y.M.+20 lb./ac. of N as C/N and M_{10}=2 M_9.

F.Y.M. applied at the time of sowing and A/S and C/N on 25.1.1955.

3. DESIGN :

(i) R B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) and (b) 30′×5′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 638 lb./ac. (ii) 215.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
Av. yield	616	1195	681	560	467	765	616	513	607	439	560

S.E./mean = 107.7 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- J K. 54(177).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'MV'.**

Object :— To study the effect of manures on different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) November, 1954. (iv) (a) 5 ploughings and 4 leveling. (b) Sown by *kera*. (c) 32 srs./ac. (d) 8″ to 9″ between rows. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) May, 1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 varieties : V_1=C—591, V_2=N.P.—745 and V_3=N.P.—4.

(2) 5 levels of manuring : M_0=Control, M_1=100 lb./ac. of N as F.Y.M., M_2=M_1+30 lb./ac. of N as A/S. M_3=M_1+45 lb./ac. of N as A/S and M_4=M_1+60 lb./ac. of N as A/S.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) and (b) 20′×5′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1250 lb./ac. (ii) 300.2 lb./ac. (iii) Main effect of V and M are highly significant. (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean
V_1	1092	1400	1708	1806	1722	1546
V_2	854	1022	882	1456	1036	1050
V_3	1008	952	1190	1540	1078	1154
Mean	985	1125	1260	1601	1279	1250

S.E. of M marginal mean = 86.7 lb./ac.
S.E. of V marginal mean = 67.1 lb./ac.
S.E. of body of table = 150.1 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- J.K. 54(189).**

Site :- Agri. Farm, Gramwala. **Type :- 'CV'.**

Object :—To study the effect of different dates of sowing on different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) As per treatments. (iv) (a) 7 ploughings and 4 *sohaga*. (b) In lines behind the plough. (c) 32 srs./ac. (d) 8″ between rows. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) and (ix) N.A. (x) April, 1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 9 dates of sowing : D_1=20.10.1954, D_2=27.10.1954, D_3=3.11.1954, D_4=10.11.1954, D_5=17.11.1954, D_6=25.11.1954, D_7=2.12.1954, D_8=9.12.1954 and D_9=16.12.1954.

(2) 2 varieties : V_1=NP—4 and V_2=C—591.

3. DESIGN :

(i) R.B.D. (ii) (a) 18. (b) N.A. (iii) 1. (iv) (a) and (b) 20′×4′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) and (vi) Nil. (vii) The number of replications being one, V×D interaction is taken as error.

5. RESULTS :

(i) 188 lb./ac. (ii) 115.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8	D_9	Mean
V_1	28	245	175	175	140	210	210	175	280	182
V_2	35	35	245	175	245	455	175	350	28	194
Mean	31	140	210	175	192	332	192	262	154	188

S.E. of D marginal mean = 81.8 lb./ac.
S.E. of V marginal mean = 38.6 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- J.K. 55(54).**

Site :- Agri. Farm, Gramwala. **Type :- 'CV'.**

Object :—To study the effect of different dates of sowing on different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) Sown by *pore*. (c) 32 srs./ac. (d) 8" between rows. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) and (ix) N.A. (x) 26.4.1956.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 7 dates of sowing : D_1=29.10.1955, D_2=5.11.1955, D_3=12.11.1955, D_4=19.11.1955, D_5=26.11.1955, D_6=3.12.1955 and D_7=10.12.1955.

(2) 2 varieties : V_1=NP—4 and V_2=C—591.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 14. (b) N.A. (iii) 1. (iv) (a) and (b) 20'×4'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) and (vi) Nil. (vii) The number of replications being one, V × D interaction is taken as error.

5. RESULTS :

(i) 442 lb./ac. (ii) 37.3 lb./ac. (iii) Effect of V alone is significant. (iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	D_4	D_5	D_6	D_7	Mean
V_1	490	490	490	560	385	490	385	470
V_2	420	455	420	420	420	420	350	415
Mean	455	472	455	490	402	455	367	442

S.E. of D marginal mean = 26.4 lb./ac.
S.E. of V marginal mean = 14.1 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- J.K. 56(24).**

Site :- Agri. Farm, Gramwala. **Type :- 'CV'.**

Object :—To study the effect of different dates of sowing on different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) Sown by *pore*. (c) 32 srs./ac. (d) 8″ between rows. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) and (ix) N.A. (x) 9.5.1957.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 7 dates of sowing : D_1=28.10.1956, D_2=4.11.1956, D_3=11.11.1956, D_4=18.11.1956, D_5=25.11.1956, D_6=2.12.1956 and D_7=9.12.1956.

(2) 2 varieties : V_1=NP—4 and V_2=C—591.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(54) on page 770.

5. RESULTS :

(i) 430 lb./ac. (ii) 19.8 lb./ac. (iii) Effect of D is highly significant and effect of V is significant. (iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	D_4	D_5	D_6	D_7	Mean
V_1	315	350	385	420	455	490	525	420
V_2	350	350	385	420	455	525	595	440
Mean	332	350	385	420	455	507	560	430

S.E. of D marginal mean = 14.0 lb./ac.
S.E. of V marginal mean = 7.5 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- J.K. 57(8).**

Site :- Agri. Farm, Gramwala. **Type :- 'CV'.**

Object :—To study the effect of different dates of sowing on different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) Sown by *pore*. (c) 32 srs./ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) and (ix) N.A. (x) 1.5.1958.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 10 dates of sowing : D_1=28.10.1957, D_2=4.11.1957, D_3=11.11.1957, D_4=18.11.1957, D_5=25.11.1957, D_6=2.12.1957, D_7=9.12.1957, D_8=16.12.1957, D_9=23.12.1957 and D_{10}=30.12.1957.

(2) 2 varieties : V_1=NP—4 and V_2=C—591.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 1. (iv) (a) and (b) 20′×5′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) and (vi) Nil. (vii) The number of replications being one, V×D interaction is taken as error.

5. RESULTS :

(i) 311 lb./ac. (ii) 72.4 lb./ac. (iii) Effect of D alone is highly significant. (iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8	D_9	D_{10}	Mean
V_1	672	504	252	616	476	364	84	56	28	17	307
V_2	616	560	532	560	420	308	84	28	28	17	315
Mean	644	532	392	588	448	336	84	42	28	17	311

S.E. of D marginal mean = 51 2 lb./ac.
S.E. of V marginal mean = 22.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- J.K. 57(7).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type : 'CV'.**

Object :—To study the effect of different dates of sowing on different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) As per treatments. (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) 16.5.1958.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 11 dates of sowing : D_1=22.10.1957, D_2=29.10.1957, D_3=5.11.1957, D_4=12.11.1957, D_5=19.11.1957, D_6=26.11.1957, D_7=3.12.1957, D_8=10.12.1957, D_9=17.12.1957, D_{10}=24.12.1957, and D_{11}=31.12.1957.

(2) 2 varieties : V_1=NP—4 and V_2=C—591.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 22. (b) N.A. (iii) 1. (iv) (a) N A. (b) 25′×4′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) and (vi) Nil. (vii) The number of replications being one, V×D interaction is taken as error.

5. RESULTS :

(i) 1049 lb./ac. (ii) 66.1 lb./ac. (ii) Effect of D alone is highly significant. (iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8	D_9	D_{10}	D_{11}	Mean
V_1	1064	1120	1344	1568	1459	896	1008	896	784	756	700	1054
V_2	1120	1120	1229	1400	1457	1008	1008	952	896	700	588	1044
Mean	1092	1120	1287	1484	1458	952	1008	924	840	728	644	1049

S.E. of D marginal mean = 46.7 lb./ac.
S.E. of V marginal mean = 19.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- J.K. 54(175).**

Site :- Central Prov. Agri. Res. Farm, Jammu. **Type :- 'CV'.**

Object :—To find out the optimum seed rate for different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Maize. (c) Nil. (ii) (a) Loamy soil. (b) N.A. (iii) November, 1954. (iv) (a) N.A. (b) By broadcast. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nii. (ix) N.A. (x) May, 1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 7 seed rates : R_1=20, R_2=24, R_3=28, R_4=32, R_5=36, R_6=40 and R_7=44 srs./ac.

(2) 2 varieties : V_1=NP—4 and V_2=C—591.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) and (b) 40′×4′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1076 lb./ac. (ii) 174.0 lb./ac. (iii) Effect of R alone is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	R_5	R_6	R_7	Mean
V_1	770	1094	1076	980	1146	1059	1138	1038
V_2	1146	1155	1181	875	1059	1181	1208	1115
Mean	958	1124	1129	928	1103	1120	1173	1076

S.E. of R marginal mean = 61.5 lb./ac.
S.E. of V marginal mean = 32.9 lb./ac.
S.E. of body of table = 87.0 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- J.K. 57(10).**

Site :- Agri. Farm, Kawa. **Type :- 'CV'.**

Object :—To study the effect of different dates of sowing on different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey soil. (b) N.A. (iii) As per treatments. (iv) (a) 3 ploughings. (b) Sown by *kera*. (c) 32 srs./ac. (d) 9″ between rows. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) 24.4.1958.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 10 dates of sowing : D_1=17.10.1957, D_2=24.10.1957, D_3=31.10.1957, D_4=7.11.1957, D_5=14.11.1957 D_6=21.11.1957, D_7=28.11.1957, D_8=5.12.1957 D_9=12.12.1957 and D_{10}= 19.12.1957.

(2) 2 varieties : V_1=NP—4 and V_2=C—591.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 30′×4½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) and (vi) Nil. (vii) The number of replications being one, V×D interaction is taken as error.

5. RESULTS :

(i) 873 lb./ac. (ii) 211.7 lb./ac. (iii) Effect of D alone is highly significant. (iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8	D_9	D_{10}	Mean
V_1	996	1701	1659	1493	1493	767	767	62	187	124	925
V_2	622	1265	1327	1224	1099	996	705	456	207	311	821
Mean	809	1483	1493	1359	1296	881	736	259	197	217	873

S.E. of D marginal mean = 149.7 lb./ac.
S.E. of V marginal mean = 66.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- J.K. 58(10).**

Site :- Agri. Farm, Kawa. **Type :- 'CV'.**

Object :—To study the effect of different dates of sowing on different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey soil. (b) N.A. (iii) As per treatments. (iv) (a) 2 ploughings. (b) N.A. (c) 32 srs./ac. (d) 9" between rows. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) 7.4.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 11 dates of sowing : D_1=7.10.1958, D_2=14.10.1958, D_3=21.10.1958, D_4=28.10.1958, D_5=4.11.1958, D_6=11.11.1958, D_7=18.11.1958, D_8=25.11.1958, D_9=2.12.1958 D_{10}=9.12.1958 and D_{11}=17.12.1958.

(2) 2 varieties : V_1=NP—4 and V_2=C—591.

3. DESIGN :

(i) Fact. in R.B D. (ii) (a) 22. (b) N.A. (iii). 1. (iv) (a) N.A. (b) 15′×4½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) and (vi) Nil. (vii) The number of replications beings one, V × D interaction is taken as error.

5. RESULTS :

(i) 313 lb./ac. (ii) 155.2 lb./ac. (iii) Effect of D alone is significant. (iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8	D_9	D_{10}	D_{11}	Mean
V_1	664	498	166	249	332	249	83	124	166	83	83	245
V_2	498	996	664	581	332	332	166	290	83	124	124	381
Mean	581	747	415	415	332	290	124	207	124	104	104	313

S.E. of D marginal mean = 109.7 lb./ac.
S.E. of V marginal mean = 46.8 lb./ac.

Crop :- Potato **Ref :- J.K. 58(199).**

Site :- Potato Res. Sub- Stn., Gulmarg. **Type :- 'M'.**

Object :—To study the effect of N and P on the yield of Potato.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) June, 1958. (iv) to (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) Oct., 1958.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N : N_0=0, N_1=50, N_2=100 and N_3=150 lb./ac.

(2) 3 levels of P_2O_5 : P_0=0, P_1=75 and P_2=150 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 16′×9′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Potato yield. (iv) (a) 1958—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 31277 lb./ac. (ii) 3881 lb./ac. (iii) Only N effect is significant. (iv) Av. yield of potato in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	28132	32141	33804	30477	31138
P_1	26998	30174	32065	32594	30458
P_2	29872	31611	35166	32292	32235
Mean	28334	31309	33678	31788	31277

S.E. of N marginal mean = 1120 lb./ac.
S.E. of P marginal mean = 970 lb./ac.
S.E. of body of table = 1940 lb./ac.

Crop :- Potato. **Ref :- J.K. 59(196).**

Site :- Potato Res. Sub-Stn., Gulmarg. **Type :- 'M'.**

Object :—To study the effect of N and P on the yield of Potato.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) 30.5.1959. (iv) to (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) Oct., 1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N : N_0=0, N_1=50, N_2=100 and N_2=150 lb./ac.
(2) 3 levels of P_2O_5 : P_0=0, P_1=80 and P_2=160 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 16′×7′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Potato yield. (iv) (a) 1959—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 12884 lb./ac. (ii) 4151 lb /ac. (iii) None of the effects is significant. (iv) Av. yield of potato in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	10307	11376	8945	13783	11103
P_1	14050	10707	14974	16068	13950
P_2	13588	10088	13807	16918	13600
Mean	12648	10724	12575	15590	12884

S.E. of N marginal mean = 1198 lb./ac.
S.E. of P marginal mean = 1038 lb./ac.
S.E. of body of table = 2076 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- J.K. 57(159).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'M'.**

Object :—To study the effect of thiourea on the yield of Potato.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) 1.8.1957. (iv) to (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 17.12.1957.

2. TREATMENTS :

4 manurial treatments : T_0=Not treated (old seed), T_1=Treated with 1% thiourea (fresh seed), T_2=Treated with 1.5% thiourea (fresh seed) and T_3=Treated with 2% thiourea (fresh seed).

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 24'×9'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Potato yield. (iv) (a) 1957—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 883.0 lb./ac. (ii) 134.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of potato in lb./ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	1466	278	950	838

S.E./mean = 67.0 lb./ac.

Crop :- Potato *(Kharif).* **Ref :- J.K. 57(160).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'M'.**

Object :—To study the effect of N and bulky manures on the yield of Potato.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) 18.4.1957. (iv) to (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 18.8.1957.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A.S : N_0=0, N_1=50 and N_2=100 lb./ac.

(2) 5 bulky manures : M_0=0, M_1=100 mds./ac. of Dal weed, M_2=2 M_1, M_3=100 mds./ac. of F.Y.M. and M_4=2 M_3.

Sub-plot treatments :

2 times of application of fertilizers : T_1=One month before planting and T_2=One month after planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 15 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/454 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Potato yield. (iv) (a) 1957—contd. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 6744 lb./ac. (ii) (a) 2728 lb./ac. (b) 3080 lb./ac. (iii) Only N and T effects are highly significant. (iv) Av. yield of potato in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean	N_0	N_1	N_2
T_1	5324	5900	6226	6894	5547	5978	4264	6330	7340
T_2	6883	7297	7954	7051	8370	7511	5544	8119	8870
Mean	6104	6598	7090	6972	6959	6744	4904	7224	8105
N_0	3731	4590	5047	5584	5568				
N_1	6777	6912	7753	8267	6412				
N_2	7803	8293	8469	7065	8896				

S.E. of difference of two

1. M marginal means = 787 lb./ac.
2. N marginal means = 610 lb./ac.
3. T marginal means = 562 lb./ac.
4. T means at the same level of M = 1257 lb./ac.
5. T means at the same level of N = 974 lb./ac.
6. M means at the same level of T = 1188 lb./ac.
7. N means at the same level of T = 920 lb./ac.

Crop :- Potato. **Ref :- J K. 58(198).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'M'.**

Object :—To study the effect of N and bulky manures on the yield of Potato.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) 15.4.1958. (iv) to (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 30.7.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(160) on page 776.

5. RESULTS :

(i) 19209 lb./ac. (ii) (a) 1503 lb./ac. (b) 4649 lb./ac., (iii) Main effects of N and M and N×M interaction are highly significant. (iv) Av. yield of potato in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean	N_0	N_1	N_2
T_1	17474	19503	20099	20685	19295	19411	14077	21329	22828
T_2	18534	18841	20014	18922	18723	19007	15552	19934	21534
Mean	18004	19172	20057	19803	19009	19209	14814	20632	22181
N_0	11584	14287	18430	13762	16010				
N_1	20061	21012	21934	20742	19408				
N_2	22366	22218	19806	24906	21608				

S.E. of difference of two

1. M marginal means = 434 lb./ac.
2. N marginal means = 336 lb./ac.
3. T marginal means = 849 lb./ac.
4. T means at the same level of M = 1898 lb./ac.
5. T means at the same level of N = 1470 lb./ac.
6. M means at the same level of T = 1410 lb./ac.
7. N means at the same level of T = 1092 lb./ac.

Crop :- Potato. **Ref :- J.K. 59(195).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'M'.**

Object :—To study the effect of N and bulky manure applied at different times on the yield of Potato.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) 1.4.1959. (iv) to (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 3.8.1959.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 5 bulky manures : M_0=0, M_1=100 mds./ac. of Dal weed, M_2=2 M_1, M_3=100 mds./ac. of F.Y.M. and M_4=2 M_3.

(2) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

Sub-plot treatments :

2 times of application of A/S : T_1=Before planting and T_2=After planting in two equal doses at fortnightly intervals.

3. DESIGN :

(i) Split-plot. (ii) (a) 15 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10½′×7′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Potato yield. (iv) (a) 1957—contd. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 840 lb./ac. (ii) (a) 703 lb /ac. (b) 443 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of potato in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean	N_0	N_1	N_2
T_1	666	1109	862	981	811	886	922	829	908
T_2	807	919	839	805	605	795	655	901	829
Mean	737	1014	851	893	708	840	788	865	868
N_0	610	855	962	851	662				
N_1	985	1037	850	602	852				
N_2	616	1149	740	1226	611				

S.E. of difference of two

1. M marginal means = 203 lb./ac.
2. N marginal means = 157 lb./ac.
3. T marginal means = 81 lb./ac.
4. T means at the same level of M = 181 lb./ac.
5. T means at the same level of N = 140 lb./ac.
6. M means at the same level of T = 296 lb./ac.
7. N means at the same level of T = 186 lb /ac.

Crop :- Onion. **Ref :- J.K. 57(163).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'C'.**

Object :—To study the effect of different dates of sowing and transplanting on the yield of Onion.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) As per treatments. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 1.8.1958.

2. TREATMENTS :

4 cultural treatments : T_1=Sown on 15.9.1957 and transplanted on 29.12.1957, T_2=Sown on 25.9.1957 and transplanted on 28.2.1958, T_3=Sown on 5.10.1957 and transplanted on 31.3.1958 and T_4=Sown on 15.10.1957 and transplanted on 31.3.1958.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 24′×7½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Onion yield. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 13635 lb./ac. (ii) 1460 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of onion in lb./ac.

Treatment	T_1	T_2	T_3	T_4
Av. yield	21699	11908	11011	9922

S.E/mean = 842.9 lb./ac.

Crop :- Onion. **Ref :- J.K. 58(202).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'C'**

Object :—To study the effect of different times of sowing and transplanting on the yield of Onion.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) As per treatments. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) July, 1959.

2. TREATMENTS :

All combinations of (1) and (2)+1 extra treatment

(1) 3 dates of sowing in nursery : D_1=1.9.1958, D_2=16.9.1958 and D_3=1.10.1958.

(2) 2 times of transplanting : T_1=December and T_2=March.

Extra treatment (E)=Sown on 16.10.1958 and transplanted in March, 1959.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 5.25′×15′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Onion yield. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 29238 lb./ac. (ii) 14377 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of onion in lb./ac.

E = 29351 lb./ac.

	D_1	D_2	D_3	Mean
T_1	29455	34986	33673	32705
T_2	26032	23993	27173	25733
Mean	27744	29490	30423	29219

S.E. of D marginal mean = 5083 lb./ac.
S.E. of T marginal mean = 4150 lb./ac.
S.E. of body of table or E mean = 7188 lb./ac.

Crop :- Onion. **Ref :- J.K. 59(199).**

Site :- Prov. Agri. Farm Shalimar. **Type :- 'C'.**

Object :—To study the effect of different dates of sowing and transplanting on the yield of Onion.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) As per treatments. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 30.7.1960.

2. TREATMENTS :

All combinations of (1) and (2) + two extra treatments

(1) 3 dates of sowing in nursery : D_1=1.9.1959, D_2=16.9.1959 and D_3=1.10.1959.

(2) 2 times of transplanting in the field : T_1=Winter (December) and T_2=Spring (March)

Extra treatments : E_1=Sown on 16.10.1959 and transplanted in spring. E_2=Direct sowing in the field in spring.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 12′×5¼′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Onion yield. (iv) (a) 1959—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 17014 lb./ac. (ii) 1836 lb./ac. (iii) Main effect of D, D×T interaction, 'extra treatments *vs* other' are highly significant. (iv) Av. yield of onion in lb./ac.

E_1 = 8945 lb./ac. and E_2 = 754 lb./ac.

	D_1	D_2	D_3	Mean
T_1	27052	23529	13892	21491
T_2	18064	20570	23303	20646
Mean	22558	22050	18598	21068

S E. of T marginal mean = 530 lb./ac.
S.E. of D marginal mean = 649 lb./ac.
S.E. of E mean or body of table = 918 lb./ac.

Crop :- Onion. **Ref :- J.K. 57(162).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'CM'.**

Object :—To study the effect of N under different spacings on the yield of Onion.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) 27.3.1957. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 10.8.1957.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N : N_0=0, N_1=16, N_2=32 and N_3=48 lb./ac.

(2) 3 spacings : S_1=9″×3″, S_2=9″×6″ and S_3=9″×9″.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 7⅓′×27′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Onion yield. (iv) (a) 1957—contd. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 5547 lb./ac. (ii) 1067 lb./ac. (iii) Main effects of N and S are highly significant. (iv) Av. yield of onion in lb./ac.

	N_0	N_1	N_2	N_3	Mean
S_1	5163	6346	6668	7959	6534
S_2	4992	5324	5808	6292	5604
S_3	3764	4410	4894	4948	4504
Mean	4640	5360	5790	6400	5547

S.E. of N marginal mean = 308.0 lb./ac.
S.E. of S marginal mean = 266.8 lb./ac.
S.E. of body of table = 533.5 lb./ac.

Crop :- Onion. **Ref :- J.K. 58(201).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'CM'.**

Object :— To study the effect of N under different spacings on the yield of Onion.

1. BASAL CONDITONS :

(i) and (ii) N.A. (iii) 15.2.1958. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 27.8.1958.

2. TREATMENTS :

Same as in expt. no. 57(162) on page 780.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/320 ac. (v) N.A. (vi) Yes.

4. GENERAL :

Same as in expt. no. 57(162) on page 780.

5. RESULTS :

(i) 13146 lb./ac. (ii) 589.6 lb./ac. (iii) All main effects and N×S interaction are highly significant. (iv) Av. yield of onion in lb./ac.

	N_0	N_1	N_2	N_3	Mean
S_1	10160	16320	12440	16480	13850
S_2	10840	13680	15880	12030	13108
S_3	11360	12920	11800	13840	12480
Mean	10787	14307	13373	14117	13146

S.E. of N marginal mean = 170.2 lb./ac.
S.E. of S marginal mean = 147.4 lb./ac.
S.E. of body of table = 294.8 lb./ac.

Crop :- Onion. **Ref :- J.K. 59(194).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'CM'.**

Object :— To study the effect of N under different spacings on the yield of Onion.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) 3.3.1959. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 26.7.1960.

2. TREATMENTS :

All combinations (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=48 and N_2=96 lb./ac.

(2) 3 spacings : S_1=9″×3″, S_2=9″×6″ and S_3=9″×9″.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 24′×6′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Onion yield. (iv) (a) 1959—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i. 11637 lb./ac. (ii) 2589 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of onion in lb./ac.

	S_1	S_2	S_3	Mean
N_0	10167	8621	8621	9136
N_1	13461	9529	9756	10915
N_2	15012	16184	13386	14861
Mean	12880	11445	10588	11637

S.E. of any marginal mean = 747.5 lb./ac.

S.E. of body of table = 1294.7 lb./ac.

Crop :- Onion. **Ref :- J.K. 59(198).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'CM'.**

Object :— To study the effect of N under different spacings on the yield of Onion.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) 20.12.1959. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 2.8.1960.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N_0=0, N_1=48 and N_2=96 lb./ac.

(2) 3 spacings : S_1=9″×3″, S_2=9″×6″ and S_3=9″×9″.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6½′×13′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Onion yield. (iv) (a) 1959—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 53304 lb./ac. (ii) 2832 lb./ac. (iii) Main effects of N, S and interaction N×S are highly significant. (iv) Av. yield of onion in lb./ac.

	S_1	S_2	S_3	Mean
N_0	56309	40952	43120	46794
N_1	77007	57088	46293	60129
N_2	67214	51132	40618	52988
Mean	66843	49724	43343	53304

S.E. of any marginal mean = 818 lb./ac.
S.E. of body of table = 1416 lb./ac.

Crop :- Sugarbeet. **Ref :- J.K. 57(164).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'MV'.**

Object :—To study the effect of N on the yield of different varieties of Sugarbeet.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) 10.8.1957. (iv) (a) 4 ploughings, 2 clod breakings and 2 ladderings. (b) to (e) N.A (v) 30 mds./bed of F.Y.M. (vi) As per treatments. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=147 and N_2=394 lb./ac.

(2) 10 varieties : V_1=Klainwanzleben 946, V_2=Klainwanzleben N, V_3=Klainwanzleben 996, V_4=Klainwanzleben ZZ, V_5=Klainwanzleben Z, V_6=Klainwanzleben coreospora resitente, V_7=Klainwanzleben E, V_8=Henderson, V_9=White farm and V_{10}=White vilmoria.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 30. (b) N.A. (iii) 4. (iv) (a) 13′×53½′. (b) 1/313.20 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of sugarbeet. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1901 lb./ac. (ii) 98.5 lb./ac. (iii) Main effects of N, V and interaction N×V are highly significant. (iv) Av. yield of sugarbeet in lb./ac.

	V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	V_9	V_{10}	Mean
N_0	1158	2416	2013	1691	2537	1832	2295	1289	1530	1895	1865
N_1	2255	2154	2336	1973	2054	1732	2114	2114	2456	1691	2088
N_2	2295	1570	1651	1651	2175	1611	1772	1631	2175	966	1750
Mean	1903	2047	2000	1772	2255	1725	2060	1678	2054	1517	1901

S.E. of N marginal mean = 15.6 lb./ac.
S.E. of V marginal mean = 28.4 lb./ac.
S.E. of body of table = 49.3 lb./ac.

Crop :- Sugarbeet. **Ref :- J.K. 58(203).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'MV'.**

Object :—To study the effect of N on the yield of different varieties of Sugarbeet.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) 23.7.1958. (iv) (a) and (b) N.A. (c) 6 chks of seed of each variety, seed/bed=2½ tolas. (d) and (e) N.A. (v) 30 mds./bed of F.Y.M. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) 5.12.1958.

2. TREATMENTS :

Same as in expt. no. 57(164) on page 783.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 30. (b) N.A. (iii) 4. (iv) (a) 14′×45′. (b) 7/726 ac. (v) 1 row length wise. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of sugarbeet. (iv) 1957—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 609 lb./ac. (ii) 98 lb./ac. (iii) Main effects of N, V are interaction N×V and highly significant. (iv) Av. yield of sugarbeet in lb./ac.

	V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	V_9	V_{10}	Mean
N_0	403	517	693	573	663	580	620	450	527	460	549
N_1	683	700	693	543	673	610	660	473	577	507	612
N_2	863	750	643	660	750	653	660	560	563	553	666
Mean	6 0	656	676	592	695	614	647	494	556	507	609

S.E. of N marginal mean = 15.5 lb./ac.
S.E. of V marginal mean = 28.3 lb./ac.
S.E. of body of table = 49.0 lb./ac.

Crop :- Sugarbeet. **Ref :- J.K. 59(200).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'MV'.**

Object :—To study the effect of N on the yield of different varieties of Sugarbeet.

1. BASAL CONDITIONS :

(i) and (ii) Nil. (iii) 27.7.1959. (iv) (a) 4 ploughings and 1 clod breaking. (b) *Desi* tangroo in lines. (c) 2 tolas/strip of each variety and total seed rate of each variety sown=2 chks and 2 tolas. (d) Line to line 9″. (e) N.A. (v) 80 mds./ac. of Dalweed. (vi) As per treatments. (vii) Irrigated. (viii) 2 hoeings. (ix) N.A. (x) 20.12.1959.

2. TREATMENTS :

Same as in expt. no. 57(164) on page 783.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 30. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 37½′×14½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Sugarbeet yield. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 9514 lb./ac. (ii) 479 lb./ac. (iii) Main effects of N, V and interaction N×V are highly significant. (iv) Av. yield of sugarbeet in lb./ac.

	V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	V_9	V_{10}	Mean
N_0	6798	5459	7107	5768	7416	5665	6180	5047	5356	4944	5974
N_1	10197	9682	10300	9888	10506	9476	9888	6901	7004	7004	9085
N_2	14523	14214	14523	12463	14214	12875	14008	12360	13596	12051	13483
Mean	10506	9785	10643	9373	10712	9338	10025	8103	8652	8000	9514

S.E. of V marginal mean = 19.6 lb./ac.
S.E. of N marginal mean = 10.7 lb./ac.
S.E. of body of table = 33.9 lb./ac.

Crop :- Knol-khol. **Ref :- J.K. 57(161).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'CMV'.**

Object :— To study the effect of different spacings and manures on the yield of different varieties of Knol-khol.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) Aug., 1957. (iv) (a) to (c) N.A. (d) As per treatments. (e) 1. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) 15.12.1957.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1), (2) and (3)

(1) 2 varieties : V_1=King of Marbet and V_2=White vienna.
(2) 3 levels of F.Y.M. : F_0=0, F_1=100 and F_2=200 mds./ac.
(3) 3 levels of N as A/S : N_0=0, N_1=50 and N_2=100 lb./ac.

Sub-plot treatments :

4 spacings : S_1=12″×3″, S_2=12″×6″, S_3=12″×9″ and S_4=12″×12″.

3. DESIGN :

(I) Split-plot. (ii) (a) 18 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 6′×6′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of knobs and leaves. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 23449 lb./ac. (ii) (a) 7427 lb./ac. (b) 3761 lb./ac. (iii) Only main effects of V, N, S and interaction N×S are highly significant. (iv) Av. yield of knol-khol in lb./ac.

	F_0	F_1	F_2	N_0	N_1	N_2	S_1	S_2	S_3	S_4	Mean
V_1	25486	24167	26486	20360	25041	30737	27697	25455	24872	23494	25380
V_2	22074	22382	20103	16511	21931	26116	23997	22486	20749	18845	21519
Mean	23780	23274	23294	18435	23486	28426	25847	23970	22810	21169	23449
S_1	25712	26150	25680	19562	25310	32670					
S_2	24150	23050	24711	17377	25460	29078					
S_3	23259	23091	22082	18923	23057	26452					
S_4	21998	20805	20704	17881	20116	25511					
N_0	18730	18427	18150								
N_1	23847	24251	22360								
N_2	28763	27144	29373								

S.E. of difference of two

1. V marginal means = 1011 lb./ac.
2. F or N marginal means = 1238 lb./ac.
3. S marginal means = 724 lb./ac.
4. S means at the same level of V = 1023 lb./ac.
5. S means at the same level of F or N = 1254 lb./ac.
6. V means at the same level of S = 1344 lb./ac.
7. F or N means at the same level of S = 1388 lb./ac.

S.E. of the body of F×N table = 1516 lb./ac.

S.E. of body of F×V or N×V table = 1238 lb./ac.

Crop :- Knol-khol. **Ref :- J.K. 58(200).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'CMV'.**

Object :— To study the effect of N and Super under different spacings on the yield of different varieties of Knol-khol.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) Sept., 1958. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) Oct., 1959.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1=King of Marbet and V_2=White vienna.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 3 levels of P_2O_5 as Super : P_0=0, P_1=75 and P_2=150 lb./ac.

(2) 3 levels of N as A/S : N_0=0, N_1=75 and N_2=150 lb./ac.

(3) 3 spacings : S_1=12″×4″, S_2=12″×8″ and S_3=12″×12″.

3. DESIGN :

(i) Split-plot confd. (P^2 N S completely confd. (ii) (a) 2 main-plots/replication, 9 sub-plots/block and 3 blocks/main-plot. (b) N.A. (iii) 3. (iv) (a) 9′×8′. (b) 7′×6′. (v) 1′×1′. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Knol-khol yield. (iv) (a) 1958—confd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 32794 lb./ac. (ii) (a) 26250 lb./ac. (b) 5901 lb./ac. (iii) N and S effects are highly significant. (iv) Av. yield of knol-khol in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	S_1	S_2	S_3	Mean
V_1	31596	35151	39396	37429	34039	34675	41324	34496	30326	35381
V_2	26786	31173	32664	31157	29434	30031	33101	30717	26804	30208
Mean	29191	33162	36030	34293	31736	32353	37212	32607	28564	32794
S_1	33177	36468	41993	39983	35378	36277				
S_2	29251	33252	35317	33511	32163	32146				
S_3	25145	29766	30780	29386	27669	28637				
P_0	30377	35258	37245							
P_1	28271	32716	34222							
P_2	28925	31512	36623							

S.E. of difference of two

1. V marignal means = 4124 lb./ac.
2. N, P or S marginal means = 1136 lb./ac.
3. N, P or S means at the same level of V = 1606 lb./ac.
4. V means at the same level of N, P or S = 4328 lb./ac.

S.E. of body of N×P, N×S or P×S table = 1391 lb./ac.

Crop :- Knol-khol. **Ref :- J.K. 59(193).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'CMV'.**

Object :— To study the effect of N and Super under different spacings on the yield of different varieties of Knol-khol.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) Aug., 1959. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) June, 1960.

2. TREATMENTS :

Same as in expt. no. 58(200) on page 786.

3. DESIGN :

(i) Split-plot confd. (P^2 NS completely confd. (ii) (a) 2 main-plots/replication, 9 sub-plots/block and 3 blocks/main-plot. (b) N.A. (iii) 3. (iv) (a) $8' \times 8'$. (b) $6' \times 6'$. (v) $1' \times 1'$. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Knol-khol yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 24627 lb./ac. (ii) (a) 1156 lb./ac. (b) 4138 lb./ac. (iii) Main effects of N, S and interaction N×S are highly significant and P×S and P×N×S interactions are significant. (iv) Av. yield of knol-khol in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	S_1	S_2	S_3	Mean
V_1	21696	28065	32508	26172	28104	27992	29068	28496	24704	27423
V_2	14845	21847	28805	21265	22295	21937	21758	23696	20043	21832
Mean	18270	24956	30656	23718	25199	24964	25412	26096	22374	24627
S_1	17158	25544	33535	25124	27586	23528				
S_2	20326	27326	30637	25175	25948	27166				
S_3	17327	21998	27796	20856	22066	24200				
P_0	18049	22637	30468							
P_1	18368	27057	30174							
P_2	18393	25175	31326							

S.E. of difference of two

1. V marginal means = 1819 lb./ac.
2. P, N or S marginal means = 796 lb./ac.
3. P, N or S means at the same level of V = 1126 lb./ac.
4. V means at the same level of P or N or S = 2038 lb./ac.

S.E. of body of any of P×N, P×S or N×S table = 975 lb./ac.

Crop :- Cauliflower. **Ref :- J.K. 59(197).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'CM'.**

Object :— To study the effect of N, P and micro-nutrients under different dates of sowing on the yield of Cauliflower.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) As per treatments. (iv) (a) to (c) N.A. (d) $2' \times 2'$. (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) Aug., 1960.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 dates of sowing : D_1=5.8.1959, D_2=15.8.1959 and D_3=25.8.1959.

(2) 3 levels of fertilizer : F_0=0, F_1=100 lb./ac. of N and F_2=100 lb./ac. of N+80 lb./ac. of P_2O_5 as Super.

(3) 3 micro-nutrients : M_0=0, M_1=Molybdenum and M_2=Molybdenum+Boron.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 16′×14′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cauliflower. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1631 cauliflower/ac. (ii) 792 cauliflower/ac. (iii) Only D effect is highly significant. (iv) Av. no. of cauliflower/ac.

	F_0	F_1	F_2	Mean	M_0	M_1	M_2
D_1	357	292	615	421	227	227	810
D_2	1718	2820	3079	2539	2042	2949	2625
D_3	2236	1847	1718	1934	1653	1783	2366
Mean	1437	1653	1804	1631	1307	1653	1934
M_0	1199	1005	1718				
M_1	1394	2042	1523				
M_2	1718	1912	2172				

S.E. of any marginal mean = 264 cauliflower/ac.
S.E. of body of any table = 457 cauliflower/ac.

Crop :- Saffron. **Ref :- J.K. 54(103).**

Site :- Prov. Agri. Farm Shalimar. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for the maximum yield of Saffron.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) and (b) N.A. (iii) Dibbling (transplanting). (iv) Local. (v) 27.10.1953, Dibbling, 6″×3″. (vi) N.A. (vii) Nil. (vi i) 4 hoeings. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Oct. and Nov. 1954.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 level of F.Y.M. : F_0=0, F_1=75 and F_2=150 mds/ac.

(2) 3 level of A/S : N_0=0, N_1=1½ and N_2=3 mds/ac.

(3) 3 level of super : P_0=0, P_1=1½ and P_2=3 mds/ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) Plot size : 1/580 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) No. of flowers picked. (iv) (a) 1954—contd. (b) Nil. (v) to (vi) Nil.

5. RESULTS :

(i) 5693 flowers/ac. (ii) 1611 flowers/ac. (iii) Only N effect is highly significant. (iv) Av. no. of flowers/ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
F_0	3963	5027	6767	5252	5027	4833	5897
F_1	4833	5027	7443	5768	5703	5607	5993
F_2	4833	5993	7347	6058	4833	6187	7153
Mean	4543	5349	7186	5693	5188	5542	6348
P_0	5027	4737	5800				
P_1	4253	5220	7153				
P_2	4350	6090	8603				

S.E. of any marginal mean = 380 flowers/ac.
S.E. of body of any table = 658 flowers/ac.

Crop :- Saffron. **Ref :- J.K. 55(149).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for the maximum yield of Saffron.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) and (b) N.A. (iii) Dibbling (transplanting). (iv) Local. (v) 27.10.1953. Dibbling, 6″×3″. (vi) N.A. (vii) Nil. (viii) 4 hoeings. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Oct. and Nov. 1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(208) on page 788.

5. RESULTS :

(i) 23447 flowers/ac. (ii) 3823 flowers/ac. (iii) Main effect of N and interaction F×N×P are highly significant. Interactions F×N, F×P and N×P are significant. (iv) Av. no. of flowers/ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
F_0	18270	23103	25810	22394	21073	22137	23973
F_1	22040	24650	22137	22942	23587	25713	19527
F_2	21653	23587	29773	25004	22137	25617	27260
Mean	20654	23780	25907	23447	22266	24489	23587
P_0	19720	21073	26003				
P_1	19913	24553	29000				
P_2	22330	25713	22717				

S.E. of any marginal mean = 901 flowers/ac.
S.E. of body of any table = 1561 flowers/ac.

Crop :- Saffron. **Ref :- J.K. 56(131).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for the maximum yield of Saffron.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) and (b) N.A. (iii) Dibbling (transplanting). (iv) Local. (v) 27.10.1953, Dibbling, 6″×3″. (vi) N.A. (vii) Nil. (viii) 4 hoeings. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Oct. and Nov. 1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(208) on page 788.

5. RESULTS :

(i) 29677 flowers/ac. (ii) 5574 flowers/ac. (iii) Only main effect of N is highly significant and P effect is significant. (iv) Av. no. of flowers/ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
F_0	23490	29000	30933	27808	24940	27840	30643
F_1	27067	31513	33640	30740	30450	31223	30547
F_2	25423	29193	36830	30482	26003	30740	34703
Mean	25327	29902	33801	29677	27131	29934	31964
P_0	24360	24940	32093				
P_1	24263	30450	35090				
P_2	27357	34317	34220				

S.E. of any marginal mean = 1314 flowers/ac.
S.E. of body of any table = 2276 flowers/ac.

Crop :- Saffron. **Ref :- J.K. 57(157).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for the maximum yield of Saffron.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) and (b) N.A. (iii) Dibbling (transplanting). (iv) Local. (v) 27.10.1953. Dibbling 6″×3″. (vi) N.A. (vii) Nil. (viii) 4 hoeings. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Oct. and Nov. 1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(208) on page 788.

5. RESULTS :

(i) 6133 flowers/ac. (ii) 1877 flowers/ac. (iii) Main effect of N is significant. Main effect of P, interactions N×P, N×F, P×F and N×P×F are highly significant. (iv) Av. no.of flowers/ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
F_0	7057	3480	6863	5800	4930	9570	2900
F_1	6283	11503	2997	6928	10923	3383	6477
F_2	6477	5413	5123	5671	5800	7153	4060
Mean	6606	6799	4994	6133	7218	6702	4479
P_0	7443	9473	4737				
P_1	6767	8023	5316				
P_2	5607	2900	4930				

S.E. of any marginal mean = 442 flowers/ac.
S.E. of body of any table = 766 flowers/ac.

Crop :- Saffron. **Ref :- J.K. 54(209).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'C'.**

Object :—To study the effect of different spacings on the yield of Saffron.

1. BASAL CONDITIONS:

(i) and (ii) N.A. (iii) Dibbling (transplanting). (iv) Local. (v) 27.10.1953. Dibbling. As per treatments. (vi) N.A. (vii) Nil. (viii) 4 hoeings. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Oct. and Nov. 1954.

2. TREATMENTS :

9 spacing : $S_1=3''\times3''$, $S_2=3''\times6''$, $S_3=3''\times9''$, $S_4=3''\times12''$, $S_5=6''\times6''$, $S_6=6''\times9''$, $S_7=6''\times12''$, $S_8=9''\times9''$ and $S_9=9''\times12''$.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 2. (iv) 1/580 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) No. of flowers picked. (iv) (a) 1954—contd. (b) Nil (v) and (vi) Nil.

5. RESULTS :

(i) 12277 flowers/ac. (ii) 1647 flowers/ac. (iii) Treatment differences are highly significant. (iv) Av. no. of flowers/ac.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9
Av. number	19430	18560	14790	10150	9280	10150	8120	10730	9280

S.E./mean = 1165 flowers/ac.

Crop :- Saffron. **Ref :- J.K. 55(150).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'C'.**

Object :—To study the effect of different spacings on the yield of Saffron.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) and (b) N.A. (iii) Dibbling (transplanting). (iv) Local. (v) 27.10.1953. Dibbling, as per treatments. (vi) N.A. (vii) Nil. (viii) 4 hoeings. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Oct. and Nov. 1955.

2. TREATMENTS to 4. GENELAL :

Same as in expt. no. 54(209) above.

5. RESULTS :

(i) 22974 flowers/ac. (ii) 2096 flowers/ac. (iii) Treatment differences are highly significant. (iv) Av. no. of flowers/ac.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9
Av. number	39730	28710	21460	22330	15080	23490	21460	19430	15080

S.E./mean = 1482 flowers/ac.

Crop :- Saffron. **Ref :- J.K. 56(132).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'C'.**

Object :—To study the effect of different spacings on the yield of Saffron.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) Dibbling (transplanting). (iv) Local. (v) 27.10.1953. Dibbling, as per treatments. (vi) N.A. (vii) Nil. (viii) 4 hoeings. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Oct. and Nov., 1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(209) on page 791.

5. RESULTS :

(i) 37958 flowers/ac. (ii) 8133 flowers/ac. (iii) Treatment differences are significant. (iv) Av. no. of flowers/ac.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9
Av. number	59450	54810	44370	35670	23780	38860	28710	32190	23780

S.E. mean = 5752 flowers/ac.

Crop :- Saffron. **Ref :- J.K. 57(158).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'C'.**

Object :—To study the effect of different spacings on the yield of Saffron.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) Dibbling (transplanting). (iv) Local. (v) 27.10.1953. Dibbling, as per treatments. (vi) N.A. (vii) Nil. (viii) 4 hoeings. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Oct. and Nov., 1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(209) on page 791.

5. RESULTS :

(i) 4866 flowers/ac. (ii) 1104 flowers/ac. (iii) Treatment differences are highly significant. (iv) Av. no. of flowers/ac.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9
Av. number	580	5800	9860	4350	2610	6670	7830	3480	2610

S.E./mean = 781 flowers/ac.

Crop :- Saffron. **Ref :- J.K. 58(189).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'C'.**

Object :—To study the effect of different spacings on the yield of Saffron.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) Dibbling (transplanting). (iv) Local. (v) 1.9.1958. Dibbling, as per treatments. (vi) N.A. (vii) Nil. (viii) 4 hoeings. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Oct. and Nov., 1958.

2. TREATMENTS :

Same as in expt. no. 54(209) on page 791.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 2. (iv) 1/871 ac. (v) Nil. (vi) Yes.

4. GENERAL :

Same as in expt. no. 54(209) on page 791.

5. RESULTS :

(i) 6194 flowers/ac. (ii) 1115 flowers/ac. (iii) Treatment differences are highly significant. (iv) Av. no. of flowers/ac.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9
Av. number	6532	2613	11323	9146	8274	3048	2613	3485	8710

S.E./mean = 788 flowers/ac.

Crop :- Saffron. **Ref :- J.K. 59(192).**

Site :- Prov. Agri. Farm, Shalimar. **Type :- 'C'.**

Object :—To study the effect of different spacings on the yield of Saffron.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) Dibbling (transplanting). (iv) Local. (v) 1.9.1958. Dibbling, as per treatments. (vi) N.A. (vii) Nil. (viii) 4 hoeings. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Oct. and Nov., 1959.

2. TREATMENTS :

Same as in expt. no. 54(209) on page 791.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 2. (iv) 1/871 ac. (v) Nil. (vi) Yes.

4. GENERAL :

Same as in expt. no. 54(209) on page 791.

5. RESULTS :

(i) 3000 flowers/ac. (ii) 2115 flowers/ac. (iii) Treatment differences are not significant. (iv) Av. no. of flowers/ac.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9
Av. number	3484	1742	5226	3920	3920	1306	1742	1742	3920

S.E./mean = 1495 flowers/ac.

DELHI

Crop :- Wheat *(Rabi)*. **Ref :- D. 57(SFT).**

Centre :- Delhi (c.f.). **Type :- 'M'.**

Object :— Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November. (vii) Irrigated. (viii) and (ix) N.A. (x) April-May.

2. TREATMENTS :

0 =Control (no manure).
n =20 lb./ac. of N as A/S.
p =20 lb./ac. of P_2O_5 as Super.
np =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
k =20 lb./ac. of K_2O as Mur. Pot.
nk =20 lb./ac./ac. of N as A/S+20 lb./ac. of K_2O as Mur. Pot.
pk =20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. Pot.
npk =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. Pot.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crops, 4 on oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and other of half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The above experiments are laid out is randomly located fields in randomaly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) N.A. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) N.A.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of grain in lb./ac.	156	99	—8	17.3	—33	—82	—16	—8	17.3

No. of trials = 16.

Crop :- Wheat *(Rabi)*. **Ref :- D. 58(SFT).**

Centre :- Delhi (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K, applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type A above.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of grain in lb./ac.	132	140	140	29.6	66	66	8	—41	25.5

No. of trials = 18.

Crop :- Wheat *(Rabi)*. **Ref :- D. 59(SFT).**

Centre :- Delhi (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Wheat to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. D. 57(SFT) type A on page 795.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of grain in lb./ac.	263	140	140	22.2	—8	—16	—8	33	16.5

Control yield = 1514 lb./ac. and no. of trials = 20.

Crop :- Wheat *(Rabi)*. **Ref :- D. 57(SFT).**

Centre :- Delhi (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October—November. (vii) Irrigated. (viii) and (ix) N.A. (x) April—May 1958.

2. TREATMENTS :

0 =Control (no manure).
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1' =20 lb./ac. of N as Urea.
n_2' =40 lb./ac. of N as Urea.
n_1'''=20 lb./ac. of N as C/A/N.
n_2'''=40 lb./ac. of N as C/A/N.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogenous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crops, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The above experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) N.A. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) N.A.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield in lb./ac.	1152	1382	1424	1456	1547	1300	1341

G.M. = 1372 lb./ac. ; S.E./mean = 20.4 lb./ac. and no. of trials = 15.

Crop :- Wheat *(Rabi)*. **Ref :- D. 58(SFT).**

Centre :- Delhi (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 57(SFT) type B on page 796.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield of grain in lb./ac.	1810	1777	2008	1893	2131	1868	2057

G.M. = 1935 lb./ac. ; S.E./mean = 43.1 lb./ac. and no. of trials = 21.

Crop :- Wheat *(Rabi)*. **Ref :- D. 59(SFT).**

Centre :- Delhi (c.f.). **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. D. 57(SFT) type B on page 796.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield of grain in lb./ac.	1144	1448	1629	1440	1613	1424	1596

G.M. = 1471 lb./ac. ; S.E./mean = 30.3 lb./ac. and no. of trials = 16.

Crop :- Gram *(Rabi)*. **Ref :- D. 57(SFT).**

Centre :- Delhi (c.f.). **Type :- 'M'.**

Object—Type C :—To compare the response of Gram to alternative sources and levels of phosphate.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (v) N.A. (vi) October-November. (vii) Irrigated. (viii) and (ix) N.A. (x) April.

2. TREATMENTS :

0 =Control (no manure).
p_1 =20 lb./ac. of P_2O_5 as Super.
p_2 =40 lb./ac. of P_2O_5 as Super.
p_1' =20 lb./ac. of P_2O_5 as Dicalcium phosphate.
p_2' =40 lb./ac. of P_2O_5 as Dicalcium phosphate.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or *thana* in the zone and the circle/*thana* is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year; 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crops, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The above experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) N.A. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) N.A. (v) As per design No. (vi) and (vii) N.A.

5. RESULTS :

Treatments	0	p_1	p_2	p_1'	p_2'
Av. yield	987	1160	1218	1177	1267

G.M. = 1162 lb./ac. ; S.E./mean = 18.6 lb./ac. and no. of trials = 12.

Crop :- Gram *(Rabi)*. **Ref :- D. 58(SFT).**

Centre :- Delhi (c.f.). **Type :- 'M'.**

Object—Type C :—To compare the response of Gram to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. D. 57(SFT) type C on page 797.

5. RESULTS :

Treatment	0	p_1	p_2	p'_1	p'_2
Av. yield of grain in lb./ac.	1160	1325	1432	1267	1349

G.M.=1307 lb./ac. ; S.E./mean=25.0 lb./ac. and no. of trials=11.

Crop :- Sugarcane. **Ref :- D. (58)SFT.**

Centre :- Delhi (c.f.). **Type :- 'M'.**

Object :—Type A—To study the response of Sugarcane to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

0 =Control (no manure).
n =60 lb./ac. of N as A/S.
p =40 lb./ac. of P_2O_5 as Super.
np =60 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super.
k =40 lb./ac. of K_2O as Mur. Pot.
nk =60 lb./ac. of N as A/S+40 lb./ac. of K_2O as Mur. Pot.
pk =40 lb./ac. of P_2O_5 as Super+40 lb./ac. of K_2O as Mur. Pot.
npk=60 lb./ac. of N as A/S+40 lb./ac. P_2O_5 as Super+40 lb./ac. of K_2O as Mur. Pot.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or *thana* in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crops, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The above experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) N.A. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Cane yield. (iv) (a) No. (b) and (c) N.A. (v) As per design (vi) and (vii) N.A.

5. RESULTS :

Effect.	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response of cane in tons/ac.	1.921	1.407	1.315	0.214	—0.151	—0.375	—0.015	0.364	0.249

No. of trials = 12.

Crop :- Sugarcane. **Ref :- D. 58(SFT).**

Centre :- Delhi (c.f.) **Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

0 =Control (no manure).
n_1 =60 lb./ac. of N as A/S.
n_2 =120 lb./ac. of N as A/S.
n'_1 =60 lb./ac. of N as Urea.
n'_2 =120 lb./ac. of N as Urea.
n'''_1 =60 lb./ac. of N as C/A/N.
n'''_2 =120 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. D. 58(SFT) type A on page 798.

5. RESULTS :

Treatment	0	n_1	n_2	n'_1	n'_2	n'''_1	n'''_2
Av. yield of cane in tons/ac.	12.993	15.752	17.614	15.884	16.880	15.568	17.376

G.M=16.010 tons/ac. ; S.E./mean=0.370 tons/ac. and no of triels=10.