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AGRICULTURAL

FIELD

EXPERIMENTS

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MADHYA PRADESH

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FOREWORD

It is a well recognized fact that the level of agricultural production in India is one of the lowest in the world and it is only by the exploitation of scientific methods of agriculture that we can hope to increase our agricultural production to the level necessary for providing a reasonable standard of living to the country's population. Properly planned and conducted field experiments provide a reliable basis for propagating improved agricultural techniques among farmers. A number of research institutes and other experimental centres are functioning under the Central Ministry of Agriculture, the Commodity Committees and the State Governments, in which research on agricultural problems is going on. The need for an integrated account of the researches done in these organisations and institutions in the country has been felt for a long time, particularly in the context of planning. The absence of such a unified account has often led to duplication of work and delay in the utilisation of the results for practical farming. The Institute of Agricultural Research Statistics of the Indian Council of Agricultural Research has, therefore, rendered a most timely service by preparing a compendium of all agricultural field experiments conducted in India upto 1953 and similar compendia are under preparation by the Institute for subsequent years.

The present compendium contains critical summaries of results of experiments bearing on important agronomic factors such as the responses 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. I am sure that these results will be fully utilised by agricultural institutions, research workers, planners and extension organisations. The chief merit of the present publication is that it brings together in one place the results of experimentation carried out under diverse soil, climatic and agricultural conditions obtaining in India. Workers in one State can thus supplement data for their own area by results from other regions where conditions may be similar and thereby re-inforce their own conclusions. For the same reason I hope that this publication will be of use to workers in other countries also.

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 whole hearted 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 publication 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,
August 20, 1962.

PREFACE

A large number of agricultural field experiments on different problems is being conducted in the country by Central and State Governments, Research Institutes, Commodity Committees and other organisations engaged in agricultural research. In addition, a number of schemes involving field experimentation is sponsored by the Indian Council of Agricultural Research in different States. The absence of a unified record of the results of these various experiments has considerably handicapped planning of further research and development and has often led to duplication of efforts.

Vaidyanathan brought out in 1933 a useful catalogue of manurial experiments conducted in India till then. Considering that Vaidyanathan's work was confined to manurial experiments and the fact that an enormous increase has taken place in the number and scope of agronomic experiments in recent years in India, the Indian Council of Agricultural Research launched the scheme of National Index of Field Experiments in 1954. The object of the scheme was two-fold :

(i) the preparation of compendium of all the field experiments for the period 1935-53 and

(ii) the preparation of index cards for individual experiments from 1954 onwards.

Under the scheme, results of all agricultural field experiments other than purely varietal trials were to be consolidated. Subsequently at the time of the extension of the scheme in 1959 it was decided that the compendium would be prepared in the first instance for the period 1948-53 and a similar compendium would be prepared for the period 1954-59. The present series for the period 1948-53 has been prepared in pursuance of this decision.

The compendium 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 & Kashmir and Himachal Pradesh (12) Rajasthan (13) Uttar Pradesh (14) West Bengal and (15) all Central Institutes. In each volume back-ground information of the respective State regarding its physical features, soils, rainfall and climate, agricultural production and area under different crops is given. A map showing different regions of the State, soils and agricultural research farms is also included. The experiments reported in each volume have been arranged cropwise 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 given together (e.g., MV as Manurial-cum-Varietal). The results of an experiment are given along with other basic information such as rotation of crops followed, cultural practices adopted, etc.

For making maximum use of the experimental data all the important tables giving the average yields of various treatments along with the appropriate standard errors have been presented. No attempt has, however, been made to summarise the data of groups of experiments on any particular item and to draw any general conclusions. This will be done for the period 1948-59 while publishing the compendium for the period 1954-59.

This publication is the result of the co-operative endeavour of a large number of persons both at the Centre and in the States. I should particularly mention in this connection, guidance and help rendered in the formulation of the scheme by Dr. D.J. Finney F.R.S. of Aberdeen University, Scotland, during his stay at the Institute of Agricultural Research Statistics as an F.A.O. Statistical Expert in 1952-53.

At the Institute of Agricultural Research Statistics, the work under the scheme was carried out under the supervision and guidance of Shri T.P. Abraham, Assistant Statistical Adviser. Shri G.A. Kulkarni, Statistician, looked after the detailed working of the scheme. These officers have been largely responsible for the preparation of the manuscript of the compendium and it is a pleasure to thank them for the hard work they have put in for getting this compendium ready. Messrs O.P. Kathuria, B.V. Srikantiah, M.L. Sahni, B.P. Dyundi, S.D. Bal and P.K. Jain of the statistical staff of the Institute deserve special mention for their careful scrutiny of the data and preparation of the material for the compendium. Thanks are also due to Dr. Uttam Chand, Professor of Statistics, now with the Central Statistical Orgainsation, Shri K.S. Avadhany, Assistant Statistician, also now with the Central Statistical Organisation, and Shri K.C. Raut, Statistician in this office who were associated with the scheme in its initial stages.

The burden of collecting data from original records by visiting different research stations and the analysis of a large number of experiments, only the primary data for which had been recorded in the files, fell on the regional staff appointed by the Indian Council of Agricultural Research in different States. They deserve to be congratulated for the patient work they have put in. The State Departments of Agriculture, Central Institutes and Commodity Committees made data for the experiments conducted within their jurisdiction readily available. The Indian Council of Agricultural Research acknowledges this willing co-operation without which the consolidation of the results would not have been possible. Various State officers who helped the project by making the data accessible to the satistical staff of the project and worked as the regional supervisors for the scheme also deserve thanks by the Council for their active help. The list of names of the regional supervisors is given on the following page.

V.G. Panse

Statistical Adviser,

Institute of Agricultural Research Statistics.

(I.C.A.R.)

New Delhi,

August 16, 1962.

REGIONAL SUPERVISORS FOR THE NATIONAL INDEX OF FIELD EXPERIMENTS

	Region and headquaters	Regional Supervisors :
1.	Andhra Pradesh (Hyderabad)	Shri D.V.G. Krishnamoorthy, Deputy Director of Food Production, Andhra Pradesh. Shri Jagannath Rao, Joint Director of Agriculture (Research), Andhra Pradesh. Dr. Khadruddin Khan, Joint Director of Agriculture (Research), Andhra Pradesh. Dr. Wahiuddin, Headquarters Deputy Director of Agriculture (Research), Andhra Pradesh.
2.	Assam, Manipur and Tripura (Shillong)	Shri L.K. Handique, Director of Agriculture, Assam. Shri S. Majid, Director of Agriculture Assam. Dr. S.R. Barooha, Director of Agriculture, Assam.
3.	Bihar (Sabour)	Dr. R. Richaria, Principal, Agriculture College, Sabour. Shri R.S. Roy, Principal, Agriculture College, Sabour.
4.	Kerala (Trivandrum)	Shir N. Shankara Menon, Director of Agriculture, Kerala. Shri P.D. Nair, Director of Agriculture, Kerala.
5.	Madhya Pradesh (Gwalior)	Dr. T.R. Mehta, Principal, Agriculture College, Gwalior.
6.	Madras (Coimbatore)	Shri C.R. Sheshadri, Vice-Principal & Secretary, Research Council, Agriculture College, Coimbatore. Shri P.A. Venkateswaran, Vice-Principal & Secretary, Research Council, Agriculture College, Coimbatore. Late Shri M. Bhavani Sankara Rao, Vice.Principal & Secretary, Research Council, Agriculture College, Coimbatore. Shri T. Natarajan, Agronomist & Secretary, Research Council, Agriculture College, Coimbatore. Shri A.H. Sarma, Extension Specialist & Secretary, Research Council, Agriculture College, Coimbatore.
7.	Maharashtra & Gujarat (Former Bombay State)	Shri D.S. Ranga Rao, Statistician, Department of Agriculture, Poona.

Owing to transfers and other changes more than one Regional Supervisors have been shown against several states as these officers have acted as Regional Supervisors during different period from 1955 to 1962.

8.	Mysore (Bangalore)	Shri A. Anant Padmanabha Rau, State Statistician, Mysore State.
9.	Orissa (Bhubaneshwar)	Dr. U.N. Mohanty, Dy. Director of Agriculture (H.Q.), Orissa.
10.	Punjab, Jammu & Kashmir and Himachal Pradesh (Chandigarh)	Shri P.S. Sahota, Statistician, Department of Agriculture, Punjab.
11.	Rajasthan (Jaipur)	Shri H C. Kothari, Statistician, Department of Agriculture, Rajasthan.
12.	Uttar Pradesh (Lucknow)	Dr. K. Kishen, Chief Statistician to Govt. of U.P. Department of Agriculture, U.P.
13.	West Bengal (Calcutta)	Shri S.N. Mukherjee, Statistical Officer, Directorate of Agriculture, West Bengal. Dr. S. Basu, Statistical Officer, Directorate of Agriculture, West Bengal.

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

Crop :- 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 :-

A.P.	Andhra Pradesh	Mn.	Manipur
As.	Assam	Mh.	Maharashtra
Bh.	Bihar	Ms.	Mysore
Dl.	Delhi	M.P.	Madhya Pradesh
Gj.	Gujarat	Or.	Orissa
H.P.	Himachal Pradesh	Pb.	Punjab
J.K.	Jammu & Kashmir	Rj.	Rajasthan
K.	Kerala	Tr.	Tripura
M.	Madras	U.P.	Uttar Pradesh
		W.B.	West Bengal

Repetition of the experiment in other years is indicated in the same line against 'reference' by stating the year and serial number for each repetition side by side *e.g.* U.P. 53(19)/52(42)/51(20) etc.

Site :- Name of the Research Station is mentioned along with 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 Indian Agricultural Research Institute.

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.

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

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

Abbreviations used in the text of the experiments :-

ac.—acre.	C.L.—Cart load.
Ammo. Phos.—Ammonium Phosphate.	C.M.—Cattle Manure.
A/N—Ammonium Nitrate.	C/N—Chilean Nitrate.
A/S—Ammonium Sulphate.	C/S—Copper Sulphate.
B.D.—Basal Dressing.	F.M.—Fish Meal or Fish Manure.
B.M.—Bone Meal.	F.W.C.—Farm Waste Compost.

F.Y.M—Farm Yard Manure.
G.M.—Green Manure.
G.N.C.—Groundnut cake.
K.—Potash.
lb.—Pounds.
M.C.—Municipal Compost.
Mur. Pot.—Muriate of Potash.
N.—Nitrogen.
Nitro phos—Nitro Phosphate.
P.—Phosphate.
Pot. Sul.—Potassium Sulphate.
Super—Super Phosphate.
T.C.—Town compost.
Zn. Sul.—Zinc Sulphate.

BASAL CONDITIONS

Information under the above heading to be read against the following items :

A. For annual crops :

(i) (a) Crop rotation if any. (b) Previous crop. (c) Manuring of previous crops. (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 (State name of the season along with the month). (x) Date of harvest.

B. For 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 seedling 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 per hole. (vii) Irrigated or Unirrigated (viii) Post-sowing/planting cultural operations. (ix) Rainfall during crop season (x) Period of harvesting.

DESIGN

Information under this heading to be read against the following items :

A. For annual crops :

(i) Abbreviations for designs : 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 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

Information under this heading to be read against the following items :--

A. For 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. (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 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 along with reference. (vi) Abnormal occurrences, like heavy rains, frost, storm etc., if any. (vii) Any other important information.

GLOSSARY OF VERNACULAR NAMES OF CROPS

Sl. No.	Name of crops	Botanical name	Assamese	Bengali	Oriya	Telugu	Tamil	Malayalam	Kannada	Marathi	Gujarati	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.	*Jowar*	*Andropegon sorghum* Brot. *Sorghum vulgare* Pers.	——	Jowar	Juara	Jonna	Cholam	Cholam	Jola	Jowari ; Jondhla	Jowari ; Juar	Jowar Jaur	Jowar
4.	*Bajra*	*Pennisetum typhoides* stapf Ex Hubbard	——	Bajra	Bajra	Sajja	Kambu	Kambu	Sajje	Bajri	Bajri	Bajra	Bajra
5.	*Kodon* (Kodo millet)	*Paspalum scrobiculatum L.*	——	Kodo	Kodua	Arikelu ; Arika	Varagu	Varaku	Harka	Kodra	Kodra	Kodon	Kodra
6.	*Kutki* (Little millet)	*Panicum miliare L.*	——	——	Suan	Samalu	Samai	Sama	Same ; Save	Sava ; Halvivari	Gajro ; Kuri	Kutki ; Shavan	Swank
7.	Potato	*Solanum tuberosum L.*	Alooguti	Alu	Bilati Alu	Bangala dumpa	Uruzhai kilangu	Urala kizangu	Alu gedde	Batata	Aloo ; Batata	Aaloo	Alu
8.	*Tur* (Pigeon Pea)	*Cajanus cajan* Millsp	Arhar	Arhar	Harad	Kandulu	Thuvarai	Thuvaran payaru	Thogari	Tur	Tuver	Rahar ; Arhar	Arhar ; Harhar
9.	*Moong* (Green gram)	*Phaseolus aureus* Roxb.	Magumah	Sonamug	Mung	Pachapesalu	Pachaipayru; Pasipayaru	Cerupayaru; Payaru	Hesaru	Mug ; Chinamug	Mag	Moong	Moong
10.	*Masoor* (Lentil)	*Lens esculenta* Moench	Masuramah	Musuri	Masur	Chirusenaga	Masur paruppu	——	Masooru bele	Masur	Masur	Masur	Massar
11.	Gram	*Cicer arietinum L.*	Butmah	Chola	Boot	Senagalu	Kadalai ; Sundal Kadalai	Kadala	Kadale	Harbara	Chana	Chana	Chhole ; Chana
12.	Cotton	*Gossypium* spp.	Kapah	Karpas ; Tula	Kapa	Pratti	Parutti	Parutti	Hatti	Kapus	Kapas	Kapas	Kapah
13.	Sugarcane	*Saccharum officinarum L.*	Kuhiar	Akh	——	Cheruku	Karumbu	Karimbu	Kabbu	Oos	Sherdi	Ganna Kamad ; Naishakar	Kamad ; Ganna ; Eakh
14.	Linseed	*Linum usitatissimum L.*	Tisi	Tishi	Peshi	Avise	Alivithai	Cherucha navithu	Agase	Javas ; Alsi	Alsi	Alsi	Alsi
15.	Groundnut	*Arachis hypogaea L.*	China Badam	Cheena badam	China badam	Nelashanga	Nilakadalai	Nilakkadala	Kadale kayi	Bhuimug	Magafali	Mungphali	Mungfali

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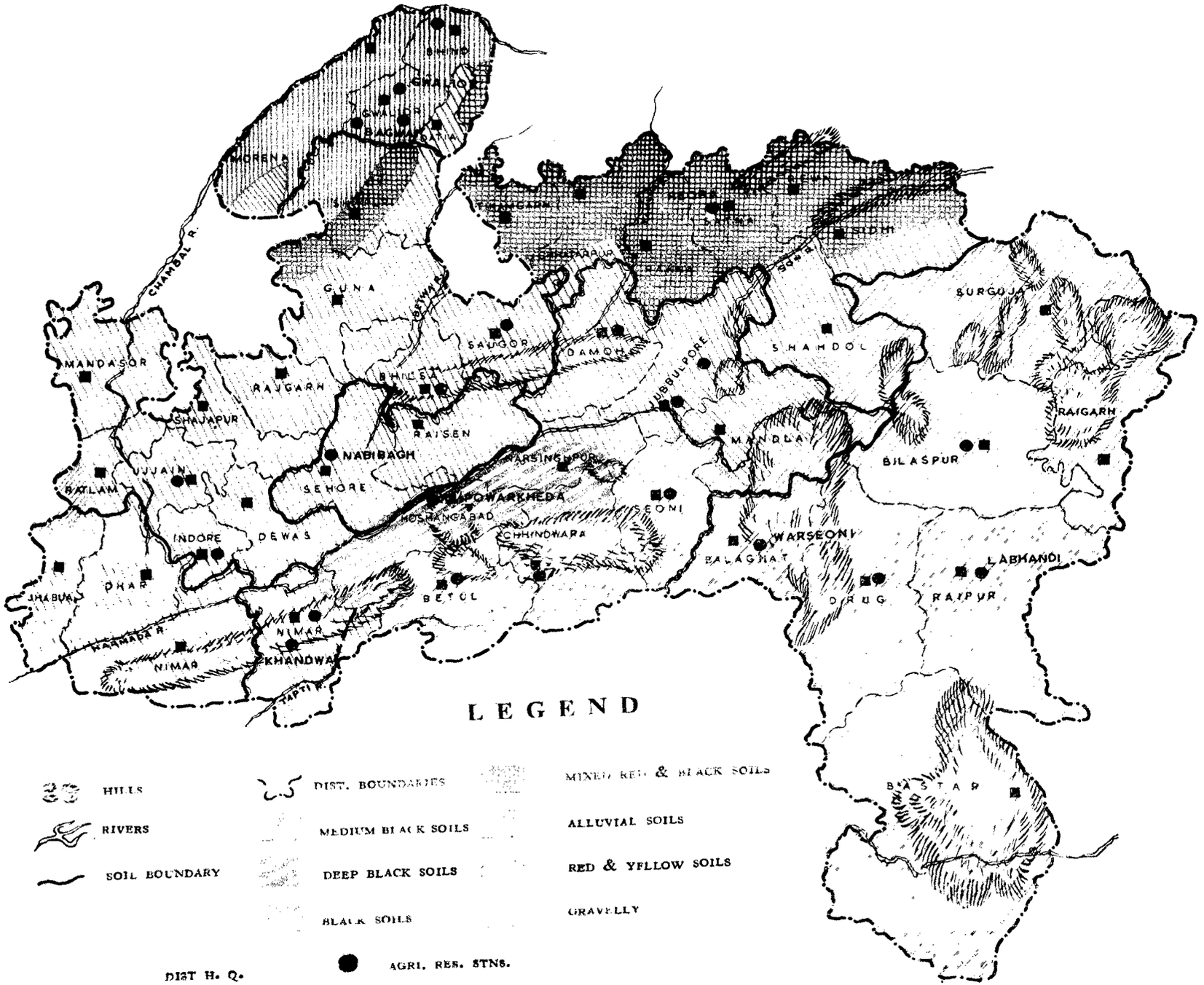
MAP OF MADHYA PRADESH SHOWING AGRO-CLIMATIC REGIONS, SOILS, AGRICULTURAL RESEARCH STATIONS ETC.



MADHYA PRADESH

1. GENERAL

The new State of Madhya Pradesh is formed of the Maha Koshal Unit of the former Madhya Pradesh State, the whole of the former states of Vindhya Pradesh and Bhopal, the whole of Madhya Bharat State excluding Sunel enclave of the Mandsaur district (which has gone to Rajasthan State) and the Sirnoj sub-division of Kotah district of Rajastan. It is divided into seven commissionaries viz., Gwalior, Indore, Bhopal, Jabalpore, Rewa, Bilaspur and Raipur with headquarters at the cities or towns with the same names.

The state is centrally situated between the latitudes 17°48′ N and 26°52′ N and between the longitudes 74°2′ E and 84°24′ E. It is divided into 43 districts for administrative purposes.

The total area of the state is about 109.6 million acres. Nearly 35% of the area of the state is cultivated (net area sown) and about 33.7% of the area is under food crops.

2. PHYSICAL FEATURES

The main physical features of the state are the Northern Region, the Malwa Plateau, the Narmada valley, the Satpura range and the Chattisgarh plains.

The **Northern Region** comprises of low lying areas around Gwalior and to the north-east of it, extending thence into Bundelkhand of which it includes the greater part till it meets the *Kymore* hills in *Bhagelkhand*. The area of the tract is about 18,370 sq. miles.

The **Plateau** takes in most of Malwa, the wide table land, with a mean elevation of 1,600 feet above the sea, and has an area of about 34,600 sq. miles. It includes all the country lying between the great Vindhayan barrier which forms the northern part of Narmada valley and the point just south of Gwalior.

The **Narmada Valley** is a long narrow strip along the Narmada, walled in by Vindhyas and the Satpuras to North and South, respectively and extending to a length of 200 miles from Jabalpur to Hemdia with an average width of 20 miles.

South of Narmada Valley, the **Satpuras stretch** across the state in the shape of a large triangle, its eastern face extending to 100 miles from Amarkantak to *Saietekdi* in Balaghat district and its sides running west wards for about 400 miles and meeting gradually in Nimar. The general elavation of Satpura range is 2,000 feet but several of its peaks rise to 3,500 feet, and few to more than 4,000 feet. The Satpuras form the west watershed of the plains lying north and south of them.

Extending along the eastern face of Satpura range lie the **Chattisgarh plains.** Except for a few undulations, the level of the plains is generally unbroken.

The Vindhyas and Satpuras are the two parallel mountain ranges running west to east through the middle of the state. The main rivers are the Chambal, Betwa, Sone, Narmada, Tapti, Mahanadi and Indravati.

3. SOIL TYPES

The main soil types found in Madhya Pradesh are alluvial, deep black, medium black, shallow or light black, mixed red and black, mixed red and yellow and *skaietal*, or gravelly.

The fertile alluvial soil well supplied with potash and lime but poor in phosphoric acid, nitrogen and humus, is capable of growing a variety of crops such as rice, wheat

and sugarcane. It is found in Morena, Bhind and Gwalior. The soil of Sheopur (Morena district) is black in colour, clay in texture, low in soluable salts, neutral in reaction and have a layer of calcium carbonate at a depth of two to four feet. The soil of Jora (Morena district) is yellowish brown and less clayey while that of Bhind is yellow in colour and lighter in texture. In Gohad (Bhind district) saline and alkaline patches have developed due to improper drainage.

The black soil occupies almost half of the state and mainly covers the area of Malwa Plateau, Narmada Valley and Satpura ridge. It varies in depths from a couple of feet to several feet and is usually loamy to clayey in texture. Lime concretion zone and free calcium carbonate are invariably present at different depths. Cracks develope in summer season and in deep clayey soil, they are even three to four feet deep. This soil is usually ill supplied with phosphate, nitrogen and organic matter but is generally sufficient in potash and lime and is suitable for cotton cultivation though other crops like *jowar*, wheat, sugarcane, groundnut etc. also grow well. This soil has three sub-types (a) deep black soil (b) medium black soil and (c) shallow black soil.

(a) The deep black soil covers major part of Narmada Valley and open and level portions of Vindhya and Satpura plateau especially the areas of Hoshangabad and Narsinhpur districts. This soil has been farther sub divided as black, dark brown, coarse brown, mixed and sandy. The black soil is very good for wheat and a variety of other crops, while others are somewhat poor. The clay percentage in these soils varies from 20 to 60.

(b) Medium black soil is the largest in the group of black soils and covers the major portion of Malwa plateau including districts of Sidhi, Shahdol, Jabalpur, Damoh, Sagar, East Nimar, Raisen and Sehore and Southern part of Shivpuri district. This soil is not very deep and is suitable for most of the crops especially wheat, cotton, sugarcane, *jowar*, groundnut, etc. The soil of Jabalpore, Sagar, Mandsaur and Shajpur districts contain 20 to 40 percent clay while in Bhilsa, Guna, Dhar, Ujjain and Dewas districts the percentage of clay varies from 30 to 55.

(c) Shallow black soil is primarily spread over the region of Satpura ridge and covers Seoni, Chhindwara and Betul districts. It consists of shallow loams having clay percentage of 15 to 30. The important types found are dark brown, clay and loamy rice soil, black soil and poor light hilly soil.

Mixed red and black soil is prevalent in eastern part of the Gird region and Rewa, Satna, Panna, Chattarpur, Tikamgarh and Datia districts and a part of Shivpuri district. The major characteristics of the red soil are light texture, absence of lime concretions and free carbonates. The commonest form of this soil is sandy clay and it differs greatly in depth and fertility and produces large varieties of crops under irrigation. It is generally deficient in nitrogen, phosphoric acid, organic matter and lime.

Red and yellow soil is found in the Chattisgarh plains and includes the Balaghat district and part of Raigarh, Surguja and Bastar districts. Mixed red and yellow soil occures in this area, which is mostly suited for rice crop. The soil is generally light and sandy, though the medium and heavy varieties are also found. Calcium is usually present in the exchangeable form and it is poor in phosphoric acid, humus and nitrogen.

In Durg, Bilaspur and Balaghat districts, deep clay soil with lime stones, yellow sandy soil and mixture of these two with a medium texture predominates. In Raipur district, red and stony poor soil is also found, while in Balaghat district dark alluvium covers the area round about the rivers.

Skeletal **or gravelly** *soil consists of stony uplands of the Vindhya and* Satpura ranges and covers part of Shahdol, Mandla, Surguja, Raigarh, Bastar and Jhabua districts. It usually grows inferior millets and oilseeds. Generally it is poor, though some patches of good black soil are also found where crops like rice, wheat etc. are grown.

4. CLIMATE AND RAINFALL

The climate of the state is dry in the north, cool and breezy in Malwa plateau and generally wet and humid in the eastern and southern parts.

A large part of Madhya Pradesh receives rainfall between 30 to 60 inches. It is only in Bastar, Surguja and Balaghat districts that the amount of rainfall exceeds 60 inches. The northern districts of Morena, Bhind, Gwalior and Datia form the dry zone receiving less than 30 inches of rainfall.

Seasonwise normal rainfall for different regions of the state is given in Table 1.

TABLE 1

Seasonwise Normal Rainfall in inches for regions of Madhya Pradesh

No.	Region	Monsoon 1st Jun. to 30th Sept.	Post-monsoon 1st Oct. to 31st Dec.	Winter 1st Jan. to 28th Feb.	Pre-monsoon 28th Feb. to 31st May.	Total for the year.
1	2	3	4	5	6	7
1.	Dry (Gwalior, Morena, Bhind and Datia).	30.00	0.75	—	0.51	31.26
2.	Middle (all districts excluding the dry and wet regions)	39.72	2.60	0.20	1.30	43.82
3.	Wet (Bastar, Surguja Raigarh and Balaghat)	56.06	3.77	0.33	2.53	62.69
	State (simple average)	41.93	2.38	0.17	1.45	45.93

5. IRRIGATION

The total area under wet cultivation *i.e.* net irrigated area is about 2 million acres or 2% of the total area of the state. The area figures irrigated by various sources are given below.

TABLE 2

Area irrigated by different sources (1956—57)

Source	Area (in lakh acres)	%
1. Canals	9.65	47.1
2. Wells	7.27	35.5
3. Tanks	2.70	13.2
4. Other sources	0.87	4.2
Total	20.49	100.0

Balaghat district has the largest irrigated area followed by Tikamgarh, Gwalior, Raipur, Chattarpur, Shivpuri, Bilaspur, Bhind, Durg, Mandsaur, Seoni and Betul. At other end are the districts of Vidisha (Bhilsa), Sehore, Rewa, Satna, Sidhi and Shahdol where little irrigation is practised.

Among the sources of irrigation, canals account for the largest share of irrigated area, although the contribution of wells is not much below than that of canals. Tanks and other sources hardly account for one-fifth of the total irrigated area in the state.

6. AGRICULTURAL PRODUCTION AND NORMAL CROPPING PATTERN

Madhya Pradesh is generally regarded to comprise of three crop zones, *viz.* rice, zone, wheat zone and *jowar* zone, the last one also being known as the cotton-*jowar* zone, because the major *jowar* growing districts also grow cotton.

Some of the districts are, however, major with regard to more than one crop. Thus districts of Panna, Satna, Rewa, Jabalpore and Seoni are major with regard to the areas of both rice and wheat. Similarly the districts of Morena, Bhind, Gwalior, Datia, Shivpuri and Guna are major from the view point of the area of both *jowar* and wheat.

The state can be distinctly divided into the following crop zones :—

Zone	*District included*
Rice zone	Sidhi, Sahdol, Surguja, Mandla, Bilaspur, Raigarh, Balaghat, Raipur and Bastar.
Wheat zone	Vidisha (Bhilsa), Sagar, Damoh, Sehore, Raisen, Hoshangabad and Narsinhpur.
Rice-wheat zone	Panna, Satna, Rewa, Jabalpore and Seoni.
Cotton-*jowar* zone	Mandsaur, Ratlam, Raigarh, Ujjain, Shajpur, Jhabua, Dhar, Indore, West Nimar and East Nimar.
Jowar-wheat zone	Morena, Bhind, Gwalior, Datia, Shivpuri, Guna, Tikamgarh, Chhatarpur, Betul and Chhindwara.

The table below gives the acreage under different crops, production and average yield per acre.

TABLE 3

Area, production and average yield/acre

Crop	*Area* (acres in lakh)		*Production* (lakh tons)	*Yield/acre* (lb./ac.)
1. Rice	96.2		32.64	760
2. *Jowar*	40.63		10.82	597
3. Wheat	80.09		17.03	476
4. *Bajra*	4.25		0.89	471
5. Maize	10.64		1.88	395
6. Barley	5.09		1.31	578
7. Gram	38.09	46.97	9.91	583
8. *Tur*	8.88		2.53	638
9. Groundnut	8.22	33.30	1.98	539
10. Sesamum	7.94		0.66	188
11. Linseed	17.14		1.30	170
12. Cotton	18.98		5.69 (bales)	353
13. Sugarcane	1.31		1.67 (*gur*)	--

7. CROP ROTATIONS

In northern and central regions of the state the wheat crop is usually rotated with a leguminous crop like *Udid*, *Moong* or Groundnut (early variety). In a two year rotation wheat is taken after *Jowar* or *Bajra* mixed with *Arhar* and rotated with gram. The following are the rotations followed.

1. Northern region :

(i) *Udid*/*Moong*/Groundnut (early variety)—Wheat.
(ii) *Jowar*/*Bajra* mixed with *Arhar* or rotated with gram—Wheat (2 years).
(iii) Rice—Pea+Gram manuring—Wheat (2 years).
(iv) Cotton+*Arhar* mixed—Fallow—Wheat (2 years).

2. Eastern region :

(i) Rice or Maize—Gram or Pea—Fallow—Wheat (2 years).
(ii) Rice—Wheat (under irigation).
(iii) *Arhar* mixed with *Til*—Fallow—Wheat (2 years).

3. Central Region :

(i) *Udid*/*Moong*/Groundnut/G.M./Fallow.—Wheat.

(ii) *Jowar* mixed with *Arhar* or rotated with gram or cotton mixed with *Arhar*— Fallow — Wheat (2 years).

(iii) Rice — Wheat alone or mixed with gram.

4. Southern Region :

(i) Groundnut—cotton mixed, or *Jowar* mixed with *Arhar* or *Jowar* rotated with gram or *Arhar* with cotton — Fallow — Wheat (2 years).

(ii) Rice—Wheat alone or mixed with gram.

(iii) Cotton in 1st year with fallow in 2nd year—Wheat.

8. AGRICULTURAL RESEARCH AND RESEARCH STATIONS

The agricultural research in the state consists of botanical research on various crops like wheat, rice, pulses, *jowar* and groundnut. The research on agronomic problems is carried out in all parts of the State. Research on wheat is concentrated at Powerkheda in wheat zone. The Institute of Plant Industry, Indore which represents cotton/*jowar* zone, now taken over by the State Government, carries out research mainly on cotton and wheat. Research on paddy is mainly carried out at Raipur-Labhandi farm, and also at Jabalpore-Adarthal farm, which fall in the rice zone and rice – wheat zone respectively. It may be mentioned here that in Madhya Pradesh State the research to evolve out better varieties of cotton and wheat has received much more attention than any other problems.

There were in all 20 research farms which reported the experiments for the period 1948-53. The central farm and Institute of Plant Industry, Indore, reported highest number of experiments. Out of 144 experiments (nearly $\frac{1}{3}$ of the total) reported from this farm there were 31 experiments on wheat and 59 on cotton. The next in order was Adarthal farm, Jabalpore which reported 52 experiments, out of which 24 were on paddy and 30 on wheat. Labhandi farm, Raipur also reported 47 experimants out of which 37 were on paddy. The farms at Powerkheda had 49 experiments out of which 38 experiments were on wheat. The table showing details of agricultural research station is attached.

9. EXPERIMENTS

There were in all 453 experiments available for the period 1948-53 distributed over various crops. The distribution of experiments according to crops and treatments tried is given in table 4 below.

TABLE 4.

Statement showing distribution of experiments according to crops and treatments tried

	M	MV	C	CV	CM	CMV	IM	D	DV	CD	Total
Paddy	80	~~Nil~~	12	2	6	—	—	—	—	—	100
Wheat	119	—	18	8	8	—	1	7	2	3	166
Jowar	24	—	—	—	4	1	—	2	—	—	31
Bajra	3	—	—	—	—	—	—	—	—	—	3
Other millet	—	—	6	—	—	—	—	—	—	—	6
Potato	12	—	5	—	—	—	—	—	—	—	17
Pulses	21	—	—	—	—	—	—	—	—	—	21
Cotton	41	5	4	1	2	3	—	10	~~6~~	—	66
Sugarcane	5	—	2	—	1	—	1	—	—	—	9
Oilseeds	13	2	1	—	3	—	—	1	—	—	20
Mixed Cropping	—	—	—	—	—	—	—	—	—	—	10
Rotational	—	—	—	—	—	—	—	—	—	—	4
	318	7	48	11	24	4	2	20	2	3	453

It may seen from the table that nearly 41% of the total number of experiments were on Wheat which is one of the principal food crops of Madhya Pradesh occupying nearly 8 million acres. Paddy which is also another important food crop occupying nearly 10 million acres has nearly half the number of experiments of that carried out on wheat.

Among the cash crops cotton has the highest number of experiments.

In most of the manurial experiments on wheat and paddy the treatments were usually Ammonium Sulphate, and Ammonium Sulphate + Groundnut cake mixed in equal ratio to supply nitrogen at the rate of 10 lb./ac. to 40 lb./ac., and also super phosphate to supply P_2O_5 at the same rate. There were few experiments at various places on wheat and paddy to compare the relative merits of Town Compost, Farm Yard Manure, Groundnut cake and Ammonium Sulphate applied to give 20 lb./ac. and 40 lb./ac. of nitrogen. In such experiments the direct effects as well as the residual effects on the succeeding cereal crop were studied. There were very few experiments having green manure treatments, on both the crops. Sodium nitrate and lime also formed treatments in a few cases. In experiments where treatments were factorical combinations of the levels of nitrogen and P_2O_5 the levels of N and P_2O_5, varied at the same rate *viz.* from 0 to 40 lb./ac.

The designs most popularly used were Randomised blocks and factorial in randomised blocks. There were as many as 124 factorial experiments in randomised blocks. The number of plots per block varied from 2 to as many as 24 in both types. The number of replications varied from 2 to 6. The net plot size was usually 1/40th of an acre.

The split-plot designs accounted for only 10% of the total. These designs were adopted in both manurial and cultural experiments, and also in manurial-cum-cultural and varietal-cum-manurial experiments. In manurial experiments green manures were in main-plots and the fertilizers like A/S and Super were in sub-plots. The number of replications in these designs were 4 to 6.

The experiments on cultivators' fields conducted under Stewart's scheme of the I.C.A.R. in Sehore district during 1953-54 on wheat are presented for different centres. The results of experiments conducted on cultivator's fields under T.C.M. trials are also given. The details of the T.C.M. trials are given in two reports published by I.C.A.R. (1955) on Paddy and Wheat.

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS
MADHYA PRADESH STATE

Sr. No.	Name of the Station :— Location, year of establishment, tract it represents and major crops.	Soil type and soil analysis.	Normal rainfall in inches (monthwise).	Irrigation facilities.	No. of experiments.	General description of the topograph of the exptl. area.
1	2	3	4	5	6	7
1.	**Bagwai** :—Regional Res. Stn. Dist. Gird (Gwalior), 14 miles from Dabra central Rly. Stn. **Year of est.** :—1936. It represents canal irrigated tract having clayey loam soil. **Major crops** :—Paddy and Wheat.	(1) **Soil type** :—Clayey loam. (2) **Depth** :—*9"*. (3) **Colour** :—Medium black. (4) **Structure** :—N.A. (5) **Soil analysis** :— (i) **Chemical analysis** :— pH 7—8; Conductivity 0.2 to 0.7; N (per ac. basis) 110—125; P_2O_5 (per ac. basis) 17—28 K_2O (per ac. basis) 300—400; $CaCO_3$ % 1—5; Stone % 2—11; Org. Carbon % 0.3 to 0.6 (ii) **Mech. analysis** :—N.A.	June 1.96 July 10.76 Aug. 7.36 Sept. 8.75 Oct. 3.66 Nov. and Dec. Nil Jan. 1.34 Feb. — March 0.45 April — May 0.50 Total 34.78 (Av. of 4 years 1954—1959)	Canal irrigation since beginning of the Stn. No proper drainge system.	Paddy 9 Wheat 4 Sugarcane 2 Total 15	Practically all the farm land is levelled having a slight slope from nor h to south.
2.	**Betul** :—Govt. Seed and Dem. Farm. Dist. Betul ; 4 miles from Betul Rly. Stn. **Year of est.** :—1915-16. It represents Betul-Nimar tract. **Major crops** :—*Moong*, *Jowar*, Groundnut, Sugarcane (*kharif*) Wheat and Gram (*rabi*).	(1) **Soil type** :—Loamy. (2) **Depth** :—Deep heavy soils. (3) **Colour** :—Black. (4) **Structure** :—Coumb structure when dry. (5) **Soil analysis.** (i) **Chemical analysis** :—N—0.042 % to 0.0588 % ; P_2O_5—0.0303 % to 0.0644 %. (ii) **Mechanical analysis** :—N.A.	June 2.03 July 9.73 Aug. 12.54 Sept. 12.09 Oct. 1.63 Nov. 1.65 Dec. to April Nil May 0.20 Total 39.87 (figures for 1958—1959)	Canal irrigation since 1957. There is proper drainage system except at some places.	Wheat 8	Information not available.

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

MADHYA PRADESH (Contd.)

1	2	3	4	5	6	7
3.	**Bhilsa** :—Govt. Exptl. Farm. **Dist** : –Bhilsa 2 miles from Bhilsa Rly. Stn. **Year of est** :—1943. It represents Malwa plateau with deep clayey to higher black cotton soils. **Major crops** :—Wheat, *Jowar*, Gram and Paddy.	(1) **Soil type** :—Black cotton soil. (2) **Depth** :—4′—15′. (3) **Colour** :—Dark greyish black. (4) **Structure** :—Compact and heavy clay to clay loam, moist, tendency for heavy cracks in summer. (5) **Soil analysis** :— (i) **Chemical analysis** :—N.A. (ii) **Mechanical analysis** :—N.A.	June 4.27 July 17.13 Aug. 11.32 Sept. 6.18 Oct. 1.39 Nov. 0.12 Dec. 0.09 Jan. 0.49 Feb. — March 1.51 April 0.18 May — Total 42.58 (Av. of 3 years 1956—1958)	Nil. Lower portion of land is water logged.	Paddy 1 Wheat 2 Total 3	This piece of land has a general slope running from south to north with a total length of 2850 ft. River Betwa is running hardly at a miles distance to the Southern end of the boundary of the farm.
4.	**Bhopal** :– Central Agri. Res. Farm, Nabi Bagh. **Dist** :—Sehore.	**Soil type** :—Black Cotton. Other details N.A.	N.A.	N.A.	Paddy 1 Wheat 2 Total 3	N.A.
5.	**Bilaspur** :—Seed and Demonstration Farm. **Dist** :—Bilaspur, 4 miles from Bilaspur Rly. Stn. Year of est :—1918. **Major crops** :—Groundnut, Sugarcane, Paddy, fruits and misc. crops.	**Soil type** :—Sandy loam (*Matasi*). No other details available.	55″ (annual)	N.A.	Paddy 9 Sugarcane 4 Total 13	N.A.

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

MADHYA PRADESH (Contd.)

1	2	3	4	5	6	7
6.	**Chindwara** :—Govt. Exptl. Farm. **Dist** :—Chindwara, 3 miles from Chindwara Rly. Station. **Year of est.** : 1919. It represents Satpura division.	1. Soil types :—(i) *Setira* (ii) *Morund* and (iii) *Kali*. No other details available.	June 3.37 July 13.29 Aug. 15.70 Sept. 7.22 Oct. 3.10 Nov. 2.02 Dec. — Jan. 0.27 Feb. to March Nil April 0.84 May 1.46 Total 47.27	There are 3 electric pumps, 2 oil engines and one *Rahat*.	Paddy 1 Wheat 4 Potato 15 Total 20	The fields have a gradual slope.
7.	**Damoh** :—Govt. Seed and Demonstration Farm. **Dist** :—Damoh. 1 mile from Damoh Rly. Stn. **Year of est.** :—1916. **Major crops** :—Paddy, Peas, Wheat and Gram.	1. **Soil type** :—Loam (*Patarua* and *domatta*). No other details available.	Normal annual rainfall 61".	N.A.	Wheat 2 *Jowar* 1 Total 3	N.A.
8.	**Dindon** :—Govt. Seed and Demons. Form. **Dist** :—Mandla	N.A.	N.A.	N.A.	Paddy 1 Wheat 2 Millets 6 Total 9	N.A.

STATEMENT S IOWING DETAILS OF EXPERIMENTAL STATIONS

MADHYA PRADESH (Contd.)

1	2	3	4	5	6	7
9.	**Durg** :—Govt. Seed and Demonstration Farm. **Dist** :—Durg, 1 mile from Durg Rly. Station. **Year of est.** :—1917. **Major crops** :—Paddy, Sugarcane Wheat and Pulses.	(i) **Soil type** :—Sandy loam and loamy (*Bhata, Matasi* and *Kankar*). No other details available.	Normal anual rainfall 47".	N.A.	Paddy 11	N.A.
10.	**Gwalior** :—Central Res. Farm. **Dist** :—Gwalior, 1 mile from Gwalior Central Rly. Stn. **Year of est.** :—1916. It represents Indo-Gangetic alluvium, semi-arid. **Major crops** :— Wheat, Linseed, Potato, *Jowar*, Sesamum and Pulses.	(1) **Soil type** :—Alluvial. (2) **Depth** : - Fairly deep. (3) **Colour** :—Yellowish brown. (4) **Structure** :—Single grain to grannula. (5) **Soil anaysis** :—(i) **Chemical analysis** : Corbonate in surface layer: —; pH: —; Total soluble salts: —; Total N: — 1-5%; 6 5 to 7.5; below 0 1 %; 0.04 to 0.1% Avl. N %; Org. carbon %; Avl. P_2O_5 (lb./ac.) 0.004-0.015; 0.29-0.45; 20-120 (ii) **Mechanical analysis** :— Clay in surface horizon %: 11—22; Sand %: 13—20	June 4.81 July 10.74 Aug. 13.01 Sept. 7.84 Oct. 1.93 Nov. 0.11 Dec. 0 21 Jan. 1.06 Feb. 0.25 March 0.51 April 0.03 May 0.26 Total 40.76 Av. of ten years from 1948 57.	Well irrigation, since inception of the farm. Drainage system poor.	Wheat 15 *Jowar* 3 Oil seeds 2 Mixed Cropping 1 Total 21	N.A.

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

MADHYA PRADESH (Contd.)

1	2	3	4	5	6	7
11.	**Indore** :—(i) Central Experimental Farm, (ii) Institute of Plant Industry. **Dist** :—Indore. 5 miles from Indore Rly. Stn. (W. Rly.) **Year of est.** :—1941. It represents Malwa tract **Major crops** :—Wheat, Gram, Peas and Linseed, *Jowar*, *Tur*, Groundnut and Cotton.	(1) **Soil type** :—Black cotton. (2) **Depth** :—5′—6′. (3) **Colour** :—Black. (4) **Structure** :—Hard. (5) **Soil analysis** :—Not available. No details available for Institute of Plant Industry.	June 8.19 July 7.99 Aug. 14.56 Sept. 7.58 Oct. 0.83 Nov. 0.15 Dec. — Jan. 0.63 Feb. — March — April 0.01 May 0.09 Total 40.03	One well constructed in 1955-56. No proper drainage system.	Paddy 2 Wheat 31 *Jowar* 17 Potato 10 Cotton 59 Sugarcane 3 Oilseeds 15 Mixed Cropping 2 Rotational 3 Total 144	N.A.

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

MADHYA PRADESH (Contd.)

1	2	3	4	5	6	7
12.	**Jabalpore** :— Govt. Exptl. Farm. **Adarthal.** **Dist.** :—Jabalpore. 4 miles from Jabalpore Rly. Stn. **Year of est.** : – 1912. It represents light soil areas of Jabalpore.	(1) **Soil type** :— *Sehra* Kahar II (2) **Depth** : 1½′ 7½′ (3) **Colour** : Greyish Black (4) **Structure** :— N.A. N.A. (5) **Soil analysis** :— (i) **Chemical analysis** :—Not available. (ii) **Mechanical analysis** :—	June 5.57 July 17.77 Aug. 15.42 Sept. 8.36 Oct. 4.34 Nov. 1.19 Dec. 0.91 Jan. 0.81 Feb. 0.37 March 1.06 April 0.08 May 0.18 Total 56.78 Av. of 10 years (1949—1950 to 1958—1959).	Canal irrigation from Jabalpur tank since inception. There is surface drainage. The *Sehra* fields are heavily water logged in rainy seasons.	Paddy 24 Wheat 30 Pulses 7 Mixed Cropping 1 Total 52	The farm area has a slope towards North. The lay out of the individual fields and bunding, however has been so arranged that the individual fields are generally in level.

	Coarse sand	Fine sand	Silt	Fine silt
Sehra	22.59	37.57	17.77	7.93
Domatta	17.16	15.75	27.28	13.45
Kahar II	0.46	5.45	11.76	16.87

	Clay	Moisture	Loss on ignition	$CaCO_3$
Sehra	11.10	1.71	1.42	0.31
Domatta	19.67	3.25	3.00	0.11
Kahar II	51.20	6.37	6.92	0.92

13.	**Khandwa** :—Govt. Seed and Dem. Farm. **Dist.** :— Nimar (east.) 3 miles from Khandwa Rly. Stn. **Year of est.** : 1960. **Major crops** :—Cotton, Groundnut, Fruits and Misc. Crops.	(1) **Soil type** :—Black cotton (*Morand* No. 2)	Normal annual rainfall 30″	N.A.	*Jowar* 4 Cotton 5 Total 9	N.A.

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

MADHYA PRADESH (Contd.)

1	2	3	4	5	6	7
14.	**Powerkheda** :—Govt. Exptl. Farm. **Dist** :—Hoshangabad, 4 miles from Hoshangabad Rly. Station, 2 miles from Powerkheda Rly. Stn. **Year of est.** :—1903. It represents Narmada valley tract. **Major crops** :—Wheat, Gram, Linseed, *Tul, Til, Jowar* etc.	(1) **Soil type** :—(i) Maryar (ii) Morand I and (ii) Morand II. (2) **Depth** :—from a few feet to 20 feet. (3) **Colour** :—Black. (4) **Structure** :—N.A. (5) **Soil analysis** :—Refer next page.	June 5.0 July 17.0 Aug. 16.0 Sept. 9.0 Oct. 0.5 Nov. to May 2.0 Total 49.5 (Av. of 50 years ; 1903 to 1953).	Wells and *nallahs*, tube-wells already sunk. Facilities were made available from 1950 for irrigating wheat. No drainage system.	Wheat 37 *Jowar* 2 Pulses 2 Oilseeds 3 Mixed Cropping 4 Rotational 1 Total 49	Fairly levelled and well drained.
15.	**Raipur** :—Govt. Exptl. Farm, Labhandi. **Dist** :—Raipur. 6 miles from Raipur Rly. Station. **Year of est.** :—1903. **Major crops** :—Paddy, Gram, Wheat.	(1) **Soil type** :—Sandy loam, loam and clayey loam. No other details available.	Normal annual rainfall 52".	N.A.	Paddy 33 Wheat 14 Total 47	N.A.

STATEMENT SOWING DETAILS OF EXPERIMENTAL STATIONS

MADHYA PRADESH (Contd.)

SOIL ANALYSIS OF GOVT. EXPERIMENTAL FARM, POWERKHEDA

(i) Chemical analysis

I. Analysis of Hydrochloric acid extract :—

Depth in inches	Fe_2O_3 %	SiO_2 %	MnO_2 %	CaO %	MgO %	K_2O%	P_2O_5%	Loss of ignition %	CO_2 %	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0″—8″	6.64	0.05	0.11	2.89	1.92	0.37	0.05	2.13	0.74	101.34
8″—26″	6.54	0.04	0.11	3.27	2.19	6.66	0.05	2.16	1.63	101.00

II. Exchange capacity and exchangeable basis in M.E. per 100 gms. over dry soil :—

Depth in inches	Ca	Mg	K	Na	Total	Exchange capacity	Ca/Mg	Total soluble salt %	pH	Clay %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0″—8″	35.21	6.44	2.22	n. d.	43.87	41.99	5.46	0.0 28	7.83	44.60
8″—26″	32.57	6.09	2.98	n. d.	41.64	38.97	5.34	0.0796	7.80	45.60

III. Organic Carbon and Nitrogen :—

Depth in inches	Carbon %	Nitrogen %	C/N Ratio	Organic matter %
(1)	(2)	(3)	(4)	(5)
0″—8″	0.625	0.053	11.77	1.175
8″—26″	0.427	0.044	9.58	0.734

(ii) Mechanical analysis :—

Depth in inches	Coarse sand %	Fine sand %	Silt %	Clay %	Carbonates %	Total	Moisture %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
0″—8″	8.80	20.50	23.20	44.60	1.69	98.79	5.53
8″—26″	9.90	19.80	21.10	45.60	3.72	100.12	6.19

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

MADHYA PRADESH (Contd.)

1	2	3	4	5	6	7
16.	**Reora** :—State Mech. Farm. (Satna) **Dist** :—Satna, 7 miles from Satna Rly. Station. **Year of est.** :—1952. It represents paddy-wheat tract having mixed red and black soil. **Major crops** :—*Kharif* : Paddy, *Jowar*, *Arhar* and *Til*. *Rabi* : Wheat, Gram, and Linseed.	(1) **Soil type** :—Light black soil deficient in humus and nitrogen. No other details available.	June 2.01 July 15.19 Aug. 4.90 Sept. 9.05 Oct. 3.00 Nov. to Dec. Nil Jan. 1.06 Feb. 0.03 March to April Nil May 0.35 Total 35.59 Figures for period 1958—1959	Facilities available since 1953. There is proper drainage system.	Wheat 2	There is a general steep slope towards western side and also a slight slope towards southern portion. However, the fields under *Bandh* system are more or less plane and those unbunded are slopy.
17.	**Saugar** :—Govt. Seed and Dem. Farm. **Dist** :—Saugar, 3 miles from Saugar Rly. Stn. **Year of est.** :- 1916. It represents plateau of Vindhya range. **Major crops** :—Wheat, Gram, *Jowar* and Paddy.	(1) **Soil type** :—Black soils with *kankars*. (2) **Depth** :—1′ to 4′. (3) **Colour** :—Blackish grey. (4) **Soil analysis** :- Not available.	June 1.58 July 20.40 Aug. 14.57 Sept. 6.28 Oct. 6.57 Nov. to Dec. Nil Jan. 1.61 Feb. to May Nil **Total 51.01**	There are 3 oil engines since 1956. No drainage system.	Wheat 6 *Jowar* 3 *Bajra* 3 Pulses 2 Total 14	The whole farm area is lying with a slope of 1′ in 200′ in extension of one mile long strip. The land is susceptible to erosion.

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

MADHYA PRADESH (Contd.)

1	2	3	4	5	6	7
18.	**Seoni** :—Govt. Seed and Demontration Farm. **Dist** :—Seoni.	N.A.	N.A.	N.A.	Wheat 10 Mixed Cropping 1 Total 11	N.A.
19.	**Ujjain** :—Experimental Farm. **Dist** :—Ujjain. 3 miles from Ujjain Rly. Stn. **Year of est.** :—1916.It represents Malva plateau. **Major crops** :—*Jowar*, Cotton. Wheat and Gram.	(1) **Soil type** :—Black cotton soil. (2) **Depth** :—1′ to 10′. (3) **Colour** :—Black. (4) **Structure** :—Clayey. (5) **Soil analysis** :—Not available.	June 3.09 July 11.46 Aug. 12.30 Sept. 5.60 Oct. 2.47 Nov. 0.26 Dec. 0.10 Jan. 0.64 Feb. Nil March 0.24 April 0.10 May 0.30 Total 36.11 Av. of 3 years.	Nil. (Facilities likely from 1959).	Paddy 1 Wheat 5 Jowar 1 Cotton 2 Mixed Cropping 1 Total 10	Almost level.
20.	**Waraseoni** :—Govt. Seed and Dem. Farm. **Dist** : Balaghat. 2 miles from Waraseoni. **Year of est.** :—1917. **Major crops** :—Wheat, Gram, Sugarcane, Linseed, Paddy and Vegetables.	(1) **Soil type** :—Sandy loam and loamy (Silty Morand I and Morand II.) No other details available.	Normal annual rainfall 59′.	N.A.	Paddy 7 Wheat 2 Total 9	N.A.

Crop :- Paddy (*Kharif*). **Ref :- M.P. 53(54).**

Site :- Harsi Experimental Farm, Bagwai. **Type :- 'M'.**

Object :—To find out suitable method and time of application of A/S to Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Masoor*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 6 to 8.8.1953. (iv) (a) Two ploughings by *desi* plough. (b) to (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) *Bankura* No. 1. (medium). (vii) Irrigated. (viii) Nil. (ix) 19.89". (x) 7.12.1953.

2. TREATMENTS :

1. No manure.
2. 20 lb./ac. of N as A/S applied in plough furrows before letting in water for puddling.
3. 40 lb./ac. of N as A/S applied in plough furrows before letting in water for puddling.
4. 20 lb./ac. of N as A/S applied 30 days after transplanting.
5. 40 lb./ac. of N as A/S applied 30 days after transplanting.
6. 20 lb /ac. of N as A/S applied 60 days after transplanting.
7. 40 lb./ac. of N as A/S applied 60 days after transplanting.
8. 20 lb./ac. of N as A/S applied half 30 days after and the balance 60 days after transplanting.
9. 40 lb./ac. of N as A/S applied half 30 days after and the balance 60 days after transplanting.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 18'×76'. (b) 12'×70'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1953 to 1954. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 444.7 lb./ac.
(ii) 189.7 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	401.9	6.	494.2
2.	350.0	7.	397.0
3.	500.7	8.	572.0
4.	434.3	9.	469.9
5.	382.4		

S.E./mean =94.8 lb./ac.

Crop :- Paddy (*Kharif*). **Ref :- M.P. 52(57).**

Site :- Harsi Experimental Farm, Bagwai. **Type :- 'M'.**

Object : —To find out the effeet of manuring Paddy with A/S and Super in varying dozes.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 22.7.1952. (iv) (a) Ploughing by *chatanoga* plough and puddling. (b) and (c) N.A. (d) 9". (e) N.A. (v) Nil. (vi) *Bankura* No. 1. (medium). (vii) Irrigated. (viii) One weeding. (ix) 27.98". (x) 26, 27.11.1952.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 levels of P_2O_5 : P_0=0, P_1=40 and P_2=80 lb./ac.
(2) 4 levels of N : N_0=0, N_1=20, N_2=40 and N_3=60 lb./ac.

3. DESIGN :

(i) 3×4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 66'×15'. (b) 60'×9'. (v) 3' alround. (vi) Yes.

4. GENERAL :

(i) No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1952—1954. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2917 lb./ac.
(ii) 344.0 lb./ac.
(iii) N and P effects are highly significant while interaction NP is not significant.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	2000	2412	2 50	3350	2603
P_1	2410	2790	3175	3550	2981
P_2	2675	2970	3455	3575	3169
Mean	2361	2724	3093	3491	2917

S.E. of marginal mean of N = 99.2 lb./ac.
S.E. of marginal mean of P = 86.0 lb./ac.
S.E. of body of table =172.0 lb./ac.

Crop :-Paddy (*Kharif*). **Ref :-M.P. 53(108).**

Site :- Harsi Experimental Farm, Bagwai. **Type :-'M'.**

Object :– To find out the best combination of N and P for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram and Peas. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 30.7.1953 to 5.8.1953. (iv) (a) Puddling. (b) Transplanted. (c) N.A. (d) Row to row–9". (e) 4. (v) 10 to 15 C.L./ac. of F.Y.M. (vi) T.21 (medium). (vii) Irrigated. (viii) Weeding one. (ix) 19". (x) 1 to 3.2.1953.

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. of N.
(2) 4 levels of P_2O_5 as Super : P_0=0, P_1=20, P_2=30 and P_3=40 lb./ac. af P_2O_5.
A/S applied three weeks after transplantation. Super was put in the plots before mulching.

3. DESIGN :

(i) 4×4 Balanced Lattice. (ii) (a) 4 blocks/replication and 4 plots/block. (b) 264'×72'. (iii) 5. (iv) (a) 18'×66'. (b) 12'×60'. (v) 3' on each side and 3' on each end. (vi) N.A.

4. GENERAL :

(i) No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952–1954. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 2067 lb /ac.
(ii) 457 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb./ac. (Adjusted)

	P_0	P_1	P_2	P_3	Mean
N_0	1738	1872	1753	1870	1808
N_1	1875	1991	2050	2218	2033
N_2	1983	2066	2335	2300	2171
N_3	2098	2258	2155	2517	2257
Mean	1923	2047	2073	2226	2067

Crap :- Paddy. Ref :- M.P. 50(72).

Site :- Harsi Experimental Farm, Bagwai. Type :- 'M'.

Object :—To find out a suitable dose of manure for Paddy crop under irrigation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 3 and 4.8.1960. (iv) (a) Puddling. (b) Transplanted. (c) —. (d) 9″×6″. (e) 3 seedlings. (v) Nil. (vi) *Basmati*. (vii) Irrigated. (viii) One weeding. (ix) 22.48″. (x) 5 to 9.12.1950.

2. TREATMENTS :

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

(1) 3 sources of N : S_1=G.N.C, S_2=A/S and S_3=G.N.C. and A/S in the ratio of 1 : 1.

(2) 3 levels of N : N_1=20, N_2=40 and N_3=60 lb./ac.

Manurial doses were given at the time of transplanting

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) 150′×66′. (iii) 6. (iv) (a) 15′×66′. (b) 9′×60′. (v) Four rows on either side. (vi) Yes.

4. GENERAL :

(i) No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950—1951. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 621 lb./ac.

(ii) 113.9 lb./ac.

(iii) None the effects is significant.

(iv) Av. yield of grain in lb./ac.

Control=629 lb./ac.

	N_1	N_2	N_3	Mean
S_1	560	697	691	649
S_2	572	652	633	619
S_3	565	605	602	591
Mean	566	651	642	620

S.E. of any marginal mean =26.86 lb./ac.

S.E. of body of table =46.52 lb./ac.

Crop :- Paddy (*Kharif*). Ref :- M.P. 51(43)

Site :- Harsi Experimental Farm, Bagwai. Type :- 'M'.

Object :—To find out a suitable dose of manure for Paddy crop under irrigated conditions.

1. BASAL CONDITIONS.

(i) (a) N A. (b) Wheat. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 30.7.1951 to 3.8.1951. (iv) (a) One ploughing by *chatanoga* plough, 1 by *sabul* plough and 2 *bakharings* and bunding. (c) to (e) N.A. (v) 12 C.L. of Compost spread. (vi) *Basmati*. (vii) Irrigated. (viii) Weeding, puddling, transplanting and intercultivation. (ix) N.A. (x) 14.11.51 and 15.11.1951.

2. TREATMENTS :

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

(1) 3 sources of N : S_1=G.N.C., S_2=A/S and S_3=A/S and G.N.C. in 1 : 1 ratio.

(2) 3 levels of N : N_1=20, N_2=40 and N_3=60 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 15′×66′. (b) 9′×60′ (v) 3′ alround. (vi) Yes.

4. GENERAL :

(i) Ordinary. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1950-N.A. (b) N.A. (c) N.A. (v) (a) to (e) N.A. (vi) Rainfall was scanty. (vii) Nil.

5. RESULTS :

(i) 1354 lbs./ac.

(ii) 191.2 lb./ac.

(iii) All effects except interaction N×S are highly significant.

(iv) Av. yield of grain in lb./ac.

Control=1055 lb./ac.

	N_1	N_2	N_3	Mean
S_1	1280	1546	1751	1526
S_2	1102	1236	1490	1276
S_3	1284	1260	1536	1360
Mean	1222	1347	1592	1387

S.E. of any marginal mean=45.1 lb./ac.
S.E. of body of table =78.0 lb./ac.

Crop :-Paddy. **Ref :-M.P. 53(23).**

Site :-Govt. Agri. Res. Farm, Bhilsa. **Type :-'M'.**

Object : To find out suitable combination of fertilisers for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Heavy clay. (b) N.A. (iii) 9.7.1953. (iv) Harrowing and *bakharing*. (b) Seeds drilled. (c) 20 lb./ac. (d) 2" between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Two hand weedings in August and September. (ix) 40". (x) N.A.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as A/S.
3. 40 lb./ac N as A/S.
4. 20 lb./ac. of N as A/S+30 lb./ac. of P_2O_5 as Super.
5. 40 lb. of N as A/S+30 lb /ac. P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 58'×12'. (b) 54'×10'. (v) One row on both the sides and 2' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1954. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) One block was completely damaged by Helmirthosporium. In block II treatment 1 and 3 should be treated as missing because of similar damages.

5. RESULTS :

(i) 1213 lb./ac.

(ii) 15.97 lb./ac.

(iii) Treatments differ highly significantly.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	649
2.	1220
3.	1417
4.	1328
5.	1451

S.E. of difference of two

1. means neither of which involves a missing value =10.08 lb./ac.
2. means one of which involves a missing value =10.38 lb./ac.

S.E. of 1 *vs* 5 treatment means =11.28 lb./ac.

Crop :- Paddy. Ref :- M.P. 48(37).

Site :- Central Agri. Res. Farm, Nabibagh, Bhopal. Type :- 'M'.

Object :—To find out how far the black cotton soil of Bhopal is deficient in P and N for Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (ii.) 24.7.1948. (iv) (a) 6 ploughings, one *bakharing* and puddling. (b) Transplanted. (c) —. (d) 9″×9″. (e) N.A. (v) N.A. (vi) IP 24 (late). (vii) Unirrigated. (viii) One weeding. (ix) N.A. (x) 31.11.1948 and 1.12.1948.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : N_0=0 and N_1=54 lb./ac.

(2) 2 levels of Ammo. Phos. : P_0=0 and P_1=171.2 lb./ac.

Manures applied on 24.7.1948.

3. DESIGN :

(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Manured plots were dark in colour while unmanured were pale. In control some plants died. General growth is unsatisfactory as the plants were week and small in height. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 536.5 lb./ac.

(ii) 161.1 lb./ac.

(iii) Only interaction NP is significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	Mean
P_0	364.9	611.7	488.3
P_1	683.3	485.9	584.6
Mean	524.1	548.8	536.5

S.E. of any marginal mean =56.94 lb./ac.

S.E. of body of table =80.55 lb./ac.

Crop :-Paddy. Ref :-M.P. 49(40).

Site :-Govt. Seed and Demonstration Farm, Bilaspur. Type :-'M'.

Object :--To study the effect of T.C. on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) *Kachhar* (sandy). (b) N.A. (iii) N.A. (iv) (a) Ploughing and cross ploughing. (b) Transplanting. (c) to (e) N.A. (v) N.A. (vi) *Ajan* (medium). (vii) N.A (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
10. 40 lb./ac. of N as cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1948 to 1952. (b) No. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1513 lb./ac.
(ii) 235.2 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1661	6.	1474
2.	1554	7.	1474
3.	1401	8.	1621
4.	1581	9.	1301
5.	1547		

S.E./mean = 96.1 lb./ac.

Crop :- Paddy. Ref :- M.P. **50(36).**

Site :- Govt. Seed and Demonstration Farm, Bilaspur. Type :- 'M'.

Object :—To study the effect of T.C. on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) *Kachhar* (sandy). (b) N.A. (iii) N.A. (iv) (a) Ploughing and cross ploughing. (b) Transplanting. (c) to (e) N.A. (v) Nil. (vi) *Ajan* (medium). (vii) N.A (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1948 to 1952. (b) No. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) N.A. (vii) As there is no record, no reason for low yield against treatment No. 9 can be given.

5. RESULTS :

(i) 2799 lb./ac.
(ii) 628.0 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	2901	6.	2921
2.	2955	7.	3135
3.	2828	8.	2975
4.	2921	9.	1774
5.	2781		

S.E./mean =256.4 lb./ac.

Crop :- Paddy. Ref :- M.P. 51(61).

Site :- Govt. Seed and Demonstration Farm, Bilaspur. Type :- 'M'.

Object :—To study the effect of T.C. on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) *Kachhar* (sandy). (b) N.A. (iii) N.A. (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c)—. (d) to (e) N.A. (v) Nil. (vi) *Ajan* (medium). (vii) N.A. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
9. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1948 to 1952. (b) No. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1383 lb./ac.
(ii) 204.5 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1281	6.	1254
2.	1374	7.	1341
3.	1401	8.	1374
4.	1401	9.	1654
5.	1367		

S.E./mean = 83.6 lb./ac.

Crop :- Paddy. Ref :- M.P. 52(43).

Site :- Govt. Seed and Demonstration Farm, Bilaspur. Type :- 'M'.

Object :—To study the effect of T.C. on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) *Kachhar* (Sandy). (iii) N.A. (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c) —. (d) and (e) N.A. (v) Nil. (vi) *Ajan* (medium). (vii) N.A. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1948—1952. (b) No. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2181 lb./ac.
(ii) 246.7 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	2355	6.	2348
2.	1988	7.	2094
3.	2174	8.	2154
4.	2154	9.	2268
5.	2094		

S.E./mean = 100.4 lb./ac.

Crop :- Paddy. **Ref :- M.P. 49(45).**

Site :- Govt. Seed and Demonstration Farm, Bilaspur. **Type :- 'M'.**

Object :—To study the residual effect of T.C. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Kachhar* (sandy). (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) N.A. (v) Nil. (vi) *Ajan* (medium). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

Manures applied to paddy during 1948-49.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1949—1952. (b) No. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1707 lb./ac.
(ii) 152.0 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1627	6.	1581
2.	1727	7.	1761
3.	1761	8.	1708
4.	1681	9.	1788
5.	1728		

S.E./mean = 62.0 lb./ac.

Crop :- Paddy. **Ref :- M.P. 50(37).**

Site :- Govt. Seed and Demonstration Farm, Bilaspur. **Type :- 'M'.**

Object :—To study the residual effect of T.C. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Kachhar* (sandy). (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) N.A. (v) Nil. (vi) *Ajan* (medium). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

Manures applied to paddy during 1949-50.

3. DESIGN :
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :
(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1949—1952. (b) No. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 1707 lb./ac.
(ii) 509.2 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1561	6.	1514
2.	1921	7.	1974
3.	2014	8.	1734
4.	1801	9.	1054
5.	1794		

S.E./mean = 207.9 lb./ac.

Crop :- Paddy. **Ref.- M.P. 51(63).**

Site :- Govt. Seed and Demonstration Farm, Bilaspur. **Type :- 'M'.**

Object :—To study the residual effect of T.C. on Paddy.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Kachhar* (sandy). (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) N.A. (v) Nil. (vi) *Ajan* (medium). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

Manures applied to paddy during 1950-51.

3. DESIGN :
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :
(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1949—1952. (b) No. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 2640 lb./ac.
(ii) 362.8 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	2561	6.	2795
2.	2615	7.	2781
3.	2566	8.	2655
4.	2501	9.	2721
5.	2568		

S.E./mean = 148.1 lb./ac.

Crop :- Paddy. Ref :- M.P. 52(45).

Site :- Govt. Seed and Demonstration Farm, Bilaspur. Type :- 'M'.

Object :—To study the residual effect of T.C. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Kachhar* (sandy). (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanting. (c)—. (d) and (e) N.A. (v) Nil. (vi) *Ajan* (medium). (vii) Irrigated. (viii) Weeding (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb /ac. of N as cowdung.
5. 40 lb /ac. of N as cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1952 to 1954. (b) No. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1071 lb./ac.
(ii) 352.9 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	860	6.	934
2.	1007	7.	1194
3.	1334	8.	1174
4.	1094	9.	1221
5	820		

S.E./mean = 144.1 lb./ac.

Crop :- Paddy. Ref :- M.P. 52(46).

Site :- Govt. Seed and Demonstration Farm, Bilaspur. Type :- 'M'.

Object :—To compare the effect of A/S and A.S.N. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Kachhar*. (b) N.A. (iii) 8.9.1952. (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c)—. (d) and (e) N.A. (v) Nil. (vi) No. 30. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 9.12.1952.

2. TREATMENTS :

1. 40 lb./ac. of N as A/S.
2. 40 lb./ac. of N as A.S.N.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) and (b) 66' × 16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) No. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 260 lb./ac.
(ii) 17.75 lb./ac.
(iii) Treatments do not differ significantly.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	252
2.	268
S.E./mean	= 8.87 lb./ac.

Crop :- Paddy (*Kharif*). **Ref :- M.P. 51(78).**

Site :- Govt. Exptl. Farm, Chindwara. **Type :- 'M'.**

Object :—To find out suitable N manure for Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) N.A. (iii) 20.6.1951. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 26.10.195I.

2. TREATMENTS :

1. 20 lb./ac. of N as G.N.C.
2. 20 lb /ac. of N as cotton seed cake (decorticated).
3. 20 lb./ac. of N as cotton seed cake (undecorticated).
4. 20 lb./ac. of N as A/S.

Manures applied on 19.6.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 138′×33′. (iii) 5. (iv) (a) and (b) 33′×33′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1951—N.A. (b) and (c) N.A. (vi) Scanty rains affected the yield. The yield is too poor. (vii) Nil.

5. RESULTS :

(i) 190.5 lb./ac.
(ii) 38.2 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	182.0
2.	210.0
3.	186.0
4.	184.0
S.E./mean	=17.1 lb./ac.

Crop :- Paddy. **Ref :- M.P. 51(184).**

Site :- Govt. Seed and Demonstration Farm, Dindori. **Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) to (ix) N.A. (x) 2.10.1951.

2. TREATMENTS :

1. 20 lb./ac. of N as G.N.C.
2. 20 lb./ac. of N as decorticated cotton cake.
3. 20 lb./ac. of N as undecorticated cotton cake.
4. 20 lb./ac. of N as A/S.
5. Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 33'×33'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 839 lb./ac.
(ii) 241.6 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1096
2.	800
3.	756
4.	862
5.	680
S.E./mean	= 108.0 lb./ac.

Crop :- Paddy (*Kharif*). Ref :- M.P. 48(41).
Site :- Govt. Seed and Demonstration Farm, Durg. Type :- 'M'.

Object :—To study the effect of varying doses of green leaves as compared to cattle dung, G.N.C. and A/S.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kankar*. (b) N.A. (iii) 13.6.1948/29, 30.7.1948. (iv) (a) Ploughing and cross ploughing. (b) Transplanting. (c) —. (d) N.A. (e) N.A. (v) N.A. (vi) *Luchai* late). (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:

1. No manure.
2. 1 ton/ac. of G.L.
3. 2 ton/ac. of G.L.
4. 3 ton/ac. of G.L.
5. 20 C L./ac. of cattle dung.
6. 5 md/ac. of G.N.C.
7. 150 lb./ac. of A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) No. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1478 lb./ac.
(ii) 123.2 lb./ac.
(iii) Treatments differ highly significantly.
(v) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1274
2.	1487
3.	1447
4.	1601
5.	1541
6.	1321
7.	1674
S.E./mean	= 50.4 lb./ac.

Crop :- Paddy (*Kharif*). Ref :- M.P. 53(80).

Site :- Govt. Seed and Demonstration Farm, Durg. Type :- 'M'.

Object :—To study the effect of C/N on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) *Dorsa.* (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) N.A. (v) N.A. (vi) (C. 16 medium). (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of lime : L_0=0 and L_1=200 lb./ac.

(2) 5 levels of N as A/S : N_0=0. N_1=20 lb./ac. of N as A/S, N_2=40 lb./ac. of N as A/S, N_3=20 lb /ac. of N as C/N and N_4=40 lb./ac. of N as C/N.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1953—N.A. (b) No. (c) Nil. (v) (a) Raipur and Bilaspur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1950 lb./ac.

(ii) 304.4 lb./ac.

(iii) Only N effect is significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
L_0	1667	2138	2181	1818	1858	1932
L_1	1828	1808	2164	1954	2088	1968
Mean	1747	1973	2172	1886	1973	1950

S.E. of marginal mean of N = 87.9 lb./ac.
S.E. of marginal mean of L = 55.6 lb./ac.
S.E. of body of table = 124.3 lb./ac.

Crop :- Paddy (*Kharif*). Ref :- M.P. 49(52).

Site :- Govt. Seed and Demonstration Farm, Durg. Type :- 'M'.

Object :—To compare the effect of T.C. on Paddy with other manures.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Dorsa.* (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 20 lb./ac. of N as G.N.C.
7. 40 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) N.A.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949 to 1953. (b) No. (c) Nil. (v) (a) Raipur and Bilaspur. (b) N.A. (vi) Nil. (vii) Plot wise data—N.A.

5. RESULTS :

(i) 1341 lb./ac.
(ii) N.A.
(iii) N A.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1193	6.	1351
2.	1350	7.	1353
3.	1370	8.	1338
4.	1331	9.	1398
5.	1385		

S.E./mean =N.A.

Crop :- Paddy (*Kharif*). Ref :- M.P. **50(57).**
Site :- Govt. Seed and Demonstration Farm, Durg. Type :- 'M'.

Object :—To compare the effect of T.C. on Paddy with other manures.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Dorsa.* (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) *Baisan* (late). (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 20 lb./ac. of N as G.N.C.
7. 40 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Not properly randomised.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949 to 1953. (b) No. (c) Nil. (v) (a) Raipur (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2429 lb./ac.
(ii) 251.8 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	2321	6.	2461
2.	2361	7.	2535
3.	2428	8.	2408
4.	2415	9.	2481
5.	2448		

S.E./mean =102.8 lb./ac.

Crop :- Paddy (*Kharif*). Ref .- M.P. 51(76).

Site :- Govt. Seed and Demonstration Farm, Durg. Type :- 'M'.

Object :—To find the effect of T.C. on Paddy w.th other manures.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kankar* in 5 replications and *Dorsa* in one replication. (b) N.A. (iii) 27.8.1951. (iv) (a) N.A. (b) Transplantating. (c) —. (d) and (e) N.A. (v) N.A. (vi) X 116 (medium). (vii) Irrigated. (viii) Roughing on 18.10.1951. (ix) 39.14". (x) 21.11.1951.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 20 lb./ac. of N as G.N.C.
7. 40 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

5. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. Av. no. of tillers. (iv) (a) 1949–1953. (b) No. (c) Nil. (v) (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1550 lb./ac.
(ii) 254.6 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1411	6.	1621
2.	1494	7.	1887
3.	1554	8.	1381
4.	1474	9.	1574
5.	1521		

S.E./mean =103.9 lb./ac.

Crop :- Paddy (*Kharif*). Ref :- M.P. 52(66).

Site :- Govt. Seed and Demonstration Farm, Durg. Type :- 'M'.

Object :—To compare the effect of T.C. on Paddy with other manures.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kankar*. (b) N.A. (iii) 18.8.1952. (iv) (a) Ploughed thrice. Levelled by working *datari* and *koper*. (b) Transplanted. (c) —. (d) and (e) N.A. (v) N.A. (vi) X 116 (medium). (vii) Irrigated. (viii) 2 weedings on 22.9.1952 and 9.10.1552. (ix) N.A. (x) 21, 23.11.1952.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.

Manures applied at the time of puddling.

6. 20 lb./ac. of N as G.N.C.
7. 40 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) 297'×33'. (iii) 6. (iv) (a) and (b) 33'×33'. (v) Nil. (vi) No.

4. GENERAL :

(i) Satisfactory. (ii) Attack of rice bugs in the second week of September. Controlled immediately by spraying gammexane. (iii) Grain yield. (iv) (a) 1949—1953. (b) No. (c) Nil. (v) (a) Raipur, Bilaspur. (b) N.A. (vi) Nil. (vii) Randomisation not done properly.

5. RESULTS :

(i) 1527 lb./ac.
(ii) 240.5 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1364	6.	1581
2.	1431	7.	1661
3.	1544	8.	1581
4.	1447	9.	1567
5.	1564		

S.E./mean = 98.2 lb./ac.

Crop :- Paddy (*Kharif*). Ref :- M.P. 53(82).

Site :- Govt. Seed and Demonstration Farm, Durg. Type :- 'M'.

Object :—To compare the effect of T.C. on Paddy with that of other manures

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kankar*. (b) N.A. (iii) N.A. (iv) (a) Ploughed in both directions and levelled. (b) Transplanting. (c)—. (d) and (e) N.A. (v) N.A. (vi) X116 (medium). (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as T.C.
8. 40 lb./ac. of N as T.C.
4. 20 lb./ac of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 20 lb./ac. of N as G.N.C.
7. 40 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949 to 1953. (b) No. (c) Nil. (v) (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1546 lb./ac.
(ii) 217.3 lb./ac.
(iii) The treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1380	6.	1603
2.	1447	7.	1683
3.	1560	8.	1597
4.	1463	9.	1580
5.	1603		

S.E./mean = 88.7 lb./ac.

Crop :- Paddy (*Kharif*). Ref :- M.P. 51(77).

Site :- Govt. Seed and Demonstration Farm, Durg. Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) *Dorsa.* (b) N.A. (iii) 22.8.1951. (iv) (a) N.A. (b) Transplantation. (c)—. (d) and (e) N.A. (v) Nil. (vi) X-116. (vii) Irrigated. (vii.) N.A. (ix) N A. (x) 20.11.1951.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as G.N.C. applied at puddling.
3. 20 lb./ac. o N as decorticated cotton seed oil cake at puddling.
4. 20 lb./ac. of N as undecorticated cotton seed oil cake at pudding.
5. 20 lb./ac. of N as A/S applied after transplanting.

Treatments applied at the time of puddling.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 33′×33′ (v) Nil. (vi) Randomisation not done properly.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Av. height, av. no. of tillers, grain and straw yield. (iv) (a) 1951 to 1952. (b) No. (c) Nil. (v) (a) Raipur and Bilaspur. (b) N.A. (vi) Nil. (vii) Randomisation not done properly.

5. RESULTS :

(i) 2277 lb./ac.

(ii) 432.0 lb./ac.

(iii) Treatments are not significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2000
2.	2496
3.	2416
4.	2232
5.	2240
S.E./mean	=192.9 lb./ac.

Crop :-Paddy (*Kharif*). Ref :-M.P. 52(65).

Site :-Govt. Seed and Demonstration Farm, Durg. 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) *Matari* (b) N.A. (iii) 15.8.1952. (iv) (a) Ploughing thrice. Levelling by working *datari* and *koper.* (b) Transplanting. (c) —. (d) and (e) N.A. (v) N.A. (vi) X-166 (medium). (vii) Irrigated. (viii) One weeding on 20.9.1952. (ix) 45 88″. (x) 19.11.1952.

2. TREATMENTS:

1. Control.
2. 20 lb./ac. of N as G.N.C.
3. 20 lb /ac. of N as decorticated cotton seed cake.
4. 20 lb./ac. of N as undecorticated cotton seed cake.
5. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 33′×33′. (v) Nil. (vi) No.

4. GENERAL :

(i) Satisfactory. (ii) There was attack of rice bug in second week of October 1952 and was controlled by spraying of gammexane. (iii) Grain yield. (iv) (a) 1951–1952. (b) No. (c) Nil. (v) (a) Raipur. (b) N.A. (vi) Nil. (vii) Randomisation not done properly.

5. RESULTS :

(i) 2306 lb./ac.
(ii) 173.72 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2236
2.	2432
3.	2196
4.	2348
5.	2316
S.E./mean	=77.66 lb./ac.

Crpp :-Paddy. **Ref :-M.P. 52(8).**

Site :- Institute of Plant Industry, Indore. **Type :-'M'.**

Object :—To compare the efficacy of A/S and G.N.C. applied in graded doses with Super.

1. BASAL CONDITIONS :

(i) (a) No. (b) Sugarcane. (c) Organic manure (F compost) and mixture of A/S and G.N.C. (ii) (a) Black cotton soil. (b) —. (iii) 29.6.1952. (iv) (a) *Bakharing* twice. (b) N.A. (c) 30 lb./ac. (d) and (e) N.A. (v) Nil. (vi) *Barawari* 22 (medium). (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 31.11.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=15$ and $P_2=30$ lb./ac.

(2) 7 doses of N : $N_0=0$, $N_1=20$ lb./ac. of N as G.N.C, $N_2=40$ lb./ac. of N as G.N.C. $N_3=60$ lb./ac. of N as G.N.C., $N_4=20$ lb./ac. of N as A/S, $N_5=40$ lb./ac. of N as A/S and $N_6=60$ lb./ac. of N as A/S.

3. DESIGN :

(i) 7×3 Fact. in R.B.D. (ii) (a) 21. (b) N.A. (iii) 4. (iv) (a) 50′×9′4″. (b) 45′×4′4″. (v) 2½′ on either side. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—continuing. (b) No. (c) N.A. (v) (a) No, (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1037 lb./ac.
(ii) 196.1 lb./ac.
(iii) Only N effect is significant.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	N_5	N_6	Mean
P_0	761	1024	1153	1348	894	1218	1108	1072
P_1	693	1069	1108	1024	1050	1069	1218	1033
P_2	739	1050	894	1231	881	1089	1153	1005
Mean	731	1048	1052	1201	942	1125	1160	1037

S.E. of marginal mean of N =56.7 lb./ac.
S.E. of marginal mean of P =37.4 lb./ac.
S.E. of body of table =98.0 lb./ac.

Crop :- Paddy. **Ref :- M.P. 53(13).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To study the efficacy of A/S and G.N.C. applied in graded doses with Super.

1. BASAL CONDITIONS :

(i) (a) No. (b) Wheat. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) *Bakharing* twice (b) Drilled. (c) to (e) N.A. (v) Nil. (vi) *Basmati.* (vii) Irrigated. (viii) Hand weeding two t mes followed by interculture with *daura.* (ix) 31.93". (x) 3.11.1953.

2. TREATMENTS :

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

(1) 4 levels of N : N_0=0, N_1=?0. N_2=40 and N_3=60 lb./ac.

(2) 2 sources of N : S_1=A/S and S_2=G.N.C.

(2) 3 levels of P_2O_5 : P_0=0, P_1=15 and P_2=30 lb./ac.

3. DESIGN :

(i) 3×4×2 Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 3. (iv) (a) 55'×9'4". (b) 50'×4'8". (v) 2 rows on each side and 2½' at each end. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) Grain yield. (iv) (a) 1952—contd. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 860 lb./ac.

(ii) 183.8 lb./ac.

(iii) N effect is highly significant, S effect is significant while other effects are not significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean	S_1	S_2
P_0	630	778	965	1105	869	867	872
P_1	739	965	934	834	868	946	789
P_2	763	654	942	1019	844	914	774
Mean	711	799	947	986	860	909	812
S_1	—	835	1105	985	975		
S_2	—	762	788	986	845		

S.E. of marginal mean of N	=43.38 lb /ac.
S.E. of marginal mean of P	=37.57 lb /ac.
S.E. of marginal mean of S in N×S table	=35.41 lb /ac.
S.E. of marginal mean of S in P×S table	=30.67 lb./ac.
S.E. of body of table N×P	=75.15 lb./ac.
S.E. of body of table N×S	=61.34 lb./ac.
S.E. of body of table P×S	=53.12 lb./ac.

Crop :- Paddy. **Ref :- M.P. 51(31).**

Site :- Adhartal Farm, Jabalpore. **Type :- 'M'.**

Object :—To study the effect of blood meal in comparison with other manures on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Sehra* (light sandy). (b) Refer soil analysis, Jabalpore. (iii) 28.8.1951. (iv) (a) Cross ploughing and levelling. (b) Transplanted. (c) —. (d) and (e) N.A. (v) N.A. (vi) Paddy 17. (vii) Irrigated. (viii) One weeding. (ix) N.A. (x) 7.11.1951.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as Blood meal applied on 23.8.1951.
3. 20 lb./ac. of N as F.Y.M. applied on 23.8.1951.
4. 20 lb./ac. of N as G.N.C. applied on 23.8.1951.
5. 20 lb /ac. of N as A/S applied on 6.9.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 33'×33'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good in general. But crop suffered to some extent for want of rains in second half of September and October. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—1955. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Season was not favourable for the crop. (vii) Nil.

5. RESULTS :

(i) 1909 lb./ac.
(ii) 133.1 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1610
2.	2039
3.	2034
4.	2064
5.	1800
S.E./mean	= 66.6 lb./ac.

Crop :- Paddy (*Kharif*). Ref :- M.P. 52(31).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the effect of bloodmeal in comparison with other manures and fertilizers.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Sehra*. (b) Refer soil analysis, Jabalpore. (iii) 18.7.1952. (iv) (a) N.A. (b) Transplanting. (c)—. (d) and (e) N.A. (v) N.A. (vi) Paddy no. 17. (vii) N.A. (viii) N.A. (ix) N.A. (x) 13.10.1952.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as Bloodmeal applied on 7.7.1952.
3. 20 lb./ac. of N as F.Y.M. applied on 7.7.1952.
4. 20 lb./ac. of N as G.N.C. applied on 7.7.1952.
5. 20 lb./ac. of N as A/S applied on 29.7.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 to 1955. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1234 lb./ac.
(ii) 123.2 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1107
2.	1335
3.	1384
4.	1154
5.	1190
S.E./mean	= 61.6 lb./ac.

Crop :- Paddy. Ref :- M.P. 53(70).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the effect of bloodmeal in comparison with other manures and fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra*. (b) Refer soil analysis, Jabalpore. (iii) 20 7.1953. (iv) (a) Ploughing. (b) Transplanted. (c)—. (d) and (e) N.A. (v) N.A. (vi) Paddy no. 17. (vii) Irrigated. (viii) One weeding. (ix) 24.21". (x) 28.10.1953.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as bloodmeal.
3. 20 lb /ac. of N as F.Y.M.
4. 20 lb./ac. of N as G.N.C.
5. 20 lb./ac. of N as A/S.
6. 20 lb./ac. of N as Fertilizer mixture.

Manures applied on 17.7.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Average growth, early end of monsoon affected the good growth of the crop. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 to 1955. (b) Yes. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) Nil. (vii) In replication 1 randomisation is not satisfactory.

5. RESULTS :

(i) 2214 lb./ac.
(ii) 423 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2161
2.	2277
3.	2151
4.	1938
5.	2414
6.	2344
S.E./mean	=211.5 lb./ac.

Crop :- Paddy. Ref :- M.P. 51(33).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the effect of cotton seed cake on Paddy in comparison with G.N.C. and A/S.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) *Sehra* (light sandy). (b) Refer soil analysis, Jabalpore. (iii) 24-8-1951. (iv) (a) Ploughing. (b) transplanted. (c)—. (d) and (e) N.A. (v) N.A. (vi) Paddy 17. (vii) Irrigated. (viii) One weeding. (ix) N.A. (x) 25-11-1951.

3. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as decorticated cotton seed cake.
3. 20 lb./ac. of N as undecorticated cotton seed cake.
4. 20 lb./ac. of N as G N.C.
5. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 33'×33'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair in general. But the crop suffered to some extent for want of moisture in the soil. (ii) Nil. (iii) Weight of Grain and straw. (iv) (a) 1951 to 1953. (b) N.A. (c) N.A. (v) (a) and (b) N.A. (vi) Season was not favourable to the crop. (vii) Nil.

5. RESULTS :

(i) 904.3 lb./ac.
(ii) 196.7 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield.
1.	742.5
2.	951.0
3.	843.8
4.	1030.5
5.	953.9

S.E/mean = 88.0 lb./ac.

Crop :- Paddy. Ref :- M.P. 52(23).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object : - To study the effect of cotton cake in comparison with other manures and fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Sehra.* (b) Refer soil analysis, Jabalpore. (iii) 23.7.1952. (iv) (a) to (e) N.A. (v) N.A. (vi) Paddy *Chatri.* (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N decorticated cotton seed oil cake.
3. 20 lb./ac. of N as undecorticated cotton seed oil cake.
4. 20 lb./ac. of N as G.N.C.
5. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 33'×33'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory (tillering and growth was poor in plots without manure.) (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 to 1953. (b) N.A. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii Nil.

5. RESULTS :

(i) 1275 lb./ac.
(ii) 149.1 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1005
2.	1110
3.	1236
4.	1494
5.	1529

S.E/mean = 66.7 lb./ac.

Crop :- Paddy. Ref :- M.P. 53(65)

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the effect of cotton cake in comparison with other manures and fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) *Domatta* (Sandy loam). (b) Refer soil analysis, Jabalpore. (iii) 22.8.53. (iv) (a) Ploughing and levelling. (b) Transplanted. (c) —. (d) and (e) N.A. (v) N.A. (vi) *Chatri* (late). (vii) Irrigated. (viii) N.A. (ix) 24.2". (x) 28.11.53.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as decorticated cotton seed cake applied on 22.8.1953.
3. 20 lb./ac. of N as undecorticated cotton seed cake applied on 22.8.1953.
4. 20 lb /ac. of N as G.N.C. applied on 22.8.1953.
5. 20 lb./ac. of N as A/S applied on 6.10.1953

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) & (b) 33'×33'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Not good. Crop failed to grow well due to late rains and early cessation of rain. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 to 1953. (b) and (c) N.A. (v) (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1177 lb./ac.
(ii) 379.6 lb./ac.
(iii) Treatments do not differ significantly
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1544
2.	841
3.	1217
4.	1319
5.	962
S.E./mean	169.7 lb./ac.

Crop :- Paddy. Ref :- M.P. 51(39)

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the effect of N and P while applied alone and in combination on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) & (c) N.A. (ii) (a) *Sehra* (light sandy). (b) Refer soil analysis, Jabalpore. (iii) 10.8.1951. (iv) (a) Two ploughings and leveling. (b) Transplanted. (c) —. (d) & (e) N.A. (v) N.A. (vi) Paddy no. 17. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 12.11.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 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.
(2) 3 levels of N as A/S : $N_0=0$, $N_1=15$ and $N_2=30$ lb./ac.

3. DESIGN :

(i) 5×3 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) No. of tillers, grain and straw yield. (iv) (a) 1951 to 1953. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) Irrigation was insufficient. Weather was not favourable to the crop. (vii) Nil.

5. RESULTS :

(i) 2396 lb./ac.
(ii) 96.00 lb./ac.
(iii) All the effects are highly significant.
(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	1779	2058	2277	2317	2463	2179
N_1	2457	2627	2500	2742	2570	2579
N_2	2850	2163	2420	2333	2387	2431
Mean	2362	2283	2399	2473	2473	2396

S.E of marginal mean of N =24.8 lb./ac.
S.E. of marginal mean of P =32.0 lb./ac.
S.E. of body of table =55.4 lb./ac.

Crop :- Paddy (*Kharif*). Ref :- M.P. 52(30).
Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the effect of N and P while applied alone and in combination on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra.* (b) Refer soil analysis, Jabalpore. (iii) 2.8.1952. (iv) (a) to (e) N.A. (v) N.A. (vi) Paddy No. 17. (vii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 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.
(2) 3 levels of N as A/S : N_0=0, N_1=15 and N_2=30 lb./ac.

3. DESIGN

(i) 5×3 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 33′×16½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of bug noticed in all plots in general, the plots were dusted at a uniform rate by gammexane, damage caused was negligible and practically uniform in all plots. (iii) Grain and straw yield. (iv) (a) 1951 to 1953. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1355 lb./ac.
(ii) 104 lb./ac.
(iii) Only N and P effects are highly significant.
(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	1067	1147	1179	1227	1285	1181
N_1	1280	1190	1345	1438	1499	1350
N_2	1400	1482	1547	1592	1642	1533
Mean	1249	1273	1357	1419	1475	1355

S.E. of marginal mean of N =26.85 lb./ac.
S.E. of marginal mean of P =34.67 lb./ac.
S.E. of body of table =60.04 lb./ac.

Crop :- Paddy. Ref :- M.P. 53(67).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the effect of N and P applied alone and in combination.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra.* (b) Refer soil analysis, Jabalpore. (iii) 6.7.1953./ 18.8.1953.(iv) (a) Ploughing and levelling. (b) Transplanted. (c)—. (d) and (e) N.A. (v) N.A. (vi) Paddy No. 17 (early). (vii) Irrigated. (viii) Weeding. (ix) 24.21". (x) 6.11.1953.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 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.
(2) 3 levels of N as A/S : N_0=0, N_1=15 and N_2=30 lb./ac.

3. DESIGN :

(i) 3×5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) and (b) 33'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. The plots where higher doses of A/S were given showed vigorous growth and leaves were broad, deep and green in colour. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 to 1953. (b) Yes. (c) N.A. (v) (a) Raipur. (b) N A (vi) and (vii) Nil.

5. RESULTS :

(i) 1824 lb /ac.
(ii) 329.0 lb /ac.
(iii) Only P effect is significant.
(iv) Av. yield of grain in lb /ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	2159	1814	1673	1761	2160	1914
N_1	2010	1158	1660	1992	1807	1726
N_2	2006	1866	1720	1655	1918	1833
Mean	2058	1613	1684	1802	1962	1824

S.E. of marginal mean of N = 85.0 lb./ac.
S.E. of marginal mean of P =109.7 lb./ac.
S.E. of body of table =189.9 lb./ac.

Crop :- Paddy. Ref :- M.P. 50(22).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the effect of leaves as G.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Sehra.* (b) Refer soil analysis, Jabalpore. (iii) 1.8.1950. (iv) (a) Ploughing and puddling. (b) Transplanted. (c) —. (d) and (e) N.A. (v) N.A. (vi) *Sulta gurmatia.* (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 24.11.1950.

2. TREATMENTS :

All combinations of (1) and (2)+a control
(1) 3 levels of green leaves : L_1=1, L_2=2 and L_3=3 ton/ac.
(2) 2 sources of green leaves : S_1=*Pipal* and S_2=*Mahuva.*

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 24'×30¼'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1950—1953. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 1365 lb./ac.
(ii) 71.40 lb./ac.
(iii) L and 'control *vs* other treatments effects' are highly significant. Other effects are not significant.
(iv) Av. yield of grain in lb./ac.

Control = 1036 lb./ac,

	L_1	L_2	L_3	Mean
S_1	1244	1454	1620	1439
S_2	1291	1332	1579	1401
Mean	1268	1393	1600	1420

S.E. of marginal mean of L = 25.24 lb./ac.
S.E. of marginal mean of S = 20.61 lb./ac.
S.E. of body of table = 35.70 lb./ac.

Crop :- Paddy. **Ref :- M.P. 51(38).**

Site :- Adhartal Farm, Jabalpore. **Type :- 'M'.**

Object :—To find out the effect of leaves as G.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Sehra* (light sandy). (b) Refer soil analysis, Jabalpore. (iii) 28.8.1951. (iv) (a) 2 ploughings and levellings. (b) Transplanted. (c) —. (d) and (e) N.A. (v) N.A. (vi) *Sulta germatia.* (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 16, 17.11.1951.

2. TREATMENTS :

All combinations of (1) and (2) + a control
(1) 3 levels of green leaves : $L_1 = 1$, $L_2 = 2$ and $L_3 = 3$ ton./ac.
(2) 2 sources of green leaves : $S_1 = Pipal$ and $S_2 = Mahuva$.
Manures applied one month before transplanting.

3. DESIGN :

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

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1950—1953. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) As monsoon started late, transplanting was delayed. Scanty rains during rainy season were unfavourable to the crop. (vii) Nil.

5. RESULTS :

(i) 1374 lb./ac.
(ii) 210.4 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

Control = 1170 lb./ac.

	L_1	L_2	L_3	Mean
S_1	1329	1349	1526	1401
S_2	1379	1409	1455	1414
Mean	1354	1379	1491	1408

S.E. of marginal mean of L = 74.4 lb./ac.
S.E. of marginal mean of S = 60.7 lb./ac.
S.E. of body of table = 105.2 lb./ac

Crop :-Paddy (*Kharif*). Ref :-M.P. **52(34)**.

Site :-Adhartal Farm, Jabalpore. Type :-'M'.

Object :—To find out the effect of leaves as G.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Sehra.* (b) Refer soil analysis, Jabalpore. (iii) 7.8.1952. (iv) (a) N.A. (b) Transplanted. (c)—. (d) and (e) N.A. (v) N.A. (vi) *Sultu gurmatia* (late). (vii) to (x) N.A.

2. TREATMENTS :

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

(1) 3 levels of green leaf : L_1=1, L_2=2 and L_3=3 ton/ac.
(2) 2 sources of green leaf : S_1=*Pippal* and S_2=*Mahwa.*

3. DESIGN :

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

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1950 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) There was heavy rain of 17" for 12 hours on 25.8.1952. (vii) In plots with Tr 3 in repl. 1 and treatment no. 1 in repl. II nearly 20% of the area, has been washed away by rains on 25.8.1952 and similarly nearly 16% of area of plot with treatment 5 in repl. III and nearly 12½% of area in plot with treatment 6 in rep. IV has been washed away due to rains. Hence the yields of these plots were estimated by missing plot technique.

5. RESULTS :

(i) 1380 lb./ac.
(ii) 151.5 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
L_0S_1	1081
L_1S_1	1286
L_2S_1	1303
L_3S_1	1566
L_1S_2	1332
L_2S_2	1478
L_3S_2	1534

S.E. of difference of two means

1. none of them containing missing plot =107.1 lb./ac.
2. one of them having missing plot =119.1 lb./ac.
3. both having missing plots =135.5 lb tac.

Crop :-Paddy. Ref :-M P. **53(66)**.

Site :-Adhartal Farm, Jabalpore. Type :-'M'.

Object :—To find out the effect of leaves as G.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) *Domatta* (sandy loam). (b) Refer soil analysis, Jabalpore. (iii) 2.9.1953. (iv) (a) Ploughings and levelling. (b) Transplanted. (c) —. (d) and (e) N.A. (v) N.A. (vi) *Sultu gurmatia* (medium). (vii) Irrigated. (viii) N.A. (ix) 24 21". (x) 28.11.1953.

2. TREATMENTS :

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

(1) 3 levels of green leaf : L_1=1, L_2=2 and L_3=3 ton/ac.
(2) 2 sources of green leaf : S_1=*Pippal* and S_2=*Mahwa.*

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 33'×16.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1950 to 1953. (b) and (c) N.A. (v) (a) Raipur. **(b)** N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3433 lb./ac.
(ii) 429.2 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

Control =3432 lb./ac.

	L_1	L_2	L_3	Mean
S_1	3432	3307	3277	3339
S_2	3435	4005	3140	3527
Mean	3434	3656	3209	3433

S.E. of marginal mean of L =151.7 lb./ac.
S.E. of marginal mean of S =123.9 lb./ac.
S.E. of body of table =214.6 lb./ac.

Crop :- Paddy. Ref :- M.P. 49(59).
Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the residual effect of N applied during the previous year.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra.* (b) Refer soil analysis, Jabalpore. (iii) **13,** 14.8.1949. (iv) (a) 2 ploughings, puddling, levelling with *datari* and 3 *patera.* (b) Transplanted. (c)—. (d) Plant to plant 4". (e) N.A. (v) Nil. (vi) Paddy No. 17 (early). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 9.11.1949.

2. TREATMENTS :

1. Control.
2. T.C. at 20 lb./ac. of N.
3. T.C. at 40 lb./ac. of N.
4. F.Y.M. at 20 lb /ac. of N.
5. F.Y.M. at 40 lb /ac. of N.
6. G.N.C. at 10 lb./ac. of N
7. G.N.C. at 20 lb./ac. of N
8. A/S at 10 lb./ac. of N
9. A/S at 20 lb./ac. of N

Treatments applied to previous crop of paddy.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 66'×16.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1949=N.A. (b) No. (c) N.A. (v) (a) Raipur and Bilaspur. (b) N.A. (vi) Scanty rains in 2nd fortnight of July delayed transplantation, weeds dominated the crop. Monsoon ceased completely by second fortnight of September. The season was unfavourable to the crop. (vii) Nil.

5. RESULTS :

(i) 542.3 lb./ac.
(ii) 217.1 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb /ac.

Treatment	Av. yield	Treatment	Av. yield
1.	470.2	6.	687.0
2.	573.6	7.	570.3
3.	556.9	8.	514.2
4.	580.3	9.	467.8
5.	460.2		

S.E./mean =88.6 lb./ac.

Crop :- Paddy. Ref :- M.P. 50(23).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object : To study the residual effect of N (applied to previous Paddy crop) on the succeeding Paddy crop.

1. BASAL CONDITIONS :

(i) (a) N A. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra*. (b) Refer soil analysis, Jabalpore. (iii) 29.7.1950. (iv) (a) Ploughing and puddling. (b) Transplanted. (c)—. (d) and (e) N.A. (v) Nil. (vi) Paddy No. 17. (vii) Irrigated. (viii) One weeding. (ix) N.A. (x) 2.11.1950.

2. TREATMENTS :

1. Control.
2. T.C. at 20 lb./ac. of N.
3. T.C. at 40 lb./ac. of N.
4. F.Y.M. at 20 lb./ac. of N.
5. F.Y.M. at 40 lb./ac. of N.
6. G.N.C. at 10 lb./ac. of N
7. G.N.C. at 20 lb./ac. of N
8. A/S at 10 lb./ac. of N
9. A/S at 20 lb./ac. of N

Treatments applied to previous paddy crop.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66′×16.5′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good in general in the beginning but at later stage the growth of the crop was checked for want of moisture in the soil. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1949—N.A. (b) N.A. (vi) The season was most unfavourable to crop. (vii) Nil.

5. RESULTS :

(i) 1816 lb./ac.
(ii) 150.4 lb./ac.
(iii) Treatments differ highly significantly.
(v) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1534	6.	1781
2.	1694	7.	1848
3.	2008	8.	1661
4.	1868	9.	1901
5.	2048		

S.E./mean = 61.2 lb./ac.

Crop :- Paddy. Ref :-M.P. 51(36).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the residual effect of N (applied to previous paddy crop) on the succeeding Paddy crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra* (light sandy). (b) Refer soil analysis, Jabalpore. (iii) 11.8.1951. (iv) (a) Ploughing. (b) Transplanted. (c) —. (d) and (e) N.A. (v) Nil. (vi) Paddy No. 17. (vii) Irrigated. (viii) One weeding. (ix) N.A. (x) 9.11.1951.

2. TREATMENTS :

1. Control.
2. T.C. at 20 lb./ac. of N.
3. T.C. at 40 lb./ac. of N.
4. F.Y M. at 20 lb./ac. of N.
5. F.Y.M. at 40 lb./ac. of N.
6. G.N.C. at 10 lb./ac. of N.
7. G.N.C. at 20 lb./ac. of N.
8. A/S at 10 lb./ac. of N.
9. A/S at 20 lb./ac. of N.

Treatments applied to the previous crop.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 49.5′×22′. (v) No. (vi) Yes.

4. GENERAL :

(i) Fair and uniform. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1949 N.A. (b) No. (c) N.A (v) (a) and (b) N.A (vi) Season was unfavourable for the crop. (vii) Nil.

5. RESULTS :

(i) 1755 lb./ac.
(ii) 229.6 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1097	6.	1332
2.	1462	7.	1390
3.	1447	8.	1253
4.	1420	9.	1295
5.	1450		

S.E./mean =93 60 lb./ac.

Crop :- Paddy (*Kharif*). Ref :- M.P. 52(32).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :--To study the residual effect of N (applied to previous Paddy crop) on the succeeding Paddy crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra*. (b) Refer soil analysis, Jabalpur. (iii) 9,10.7.1952. (iv) (a) to (e) N.A. (v) N.A. (vi) Paddy No. 17. (vii) N.A. (viii) N.A. (ix) N.A. (x) 22 23.10.1952.

2. TREATMENTS :

1. Control.
2. T.C. at 20 lb./ac. of N.
3. T.C. at 40 lb /ac. of N.
4. F.Y.M. at 20 lb./ac. of N.
5. F.Y.M. at 40 lb./ac. of N.
6. G.N.C. at 10 lb./ac. of N
7. G.N.C. at 20 lb./ac. of N
8. A/S at 10 lb./ac. of N
9. A/S at 20 lb./ac. of N

Treatments applied to paddy crop during *kharif* 1951—1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) The crop was quite satisfactory in the beginning but later all the plots turned yellow due to continuous rains and cloudy weather in September. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1949—1952. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

RESULTS :

(i) 1440 lb./ac.
(ii) 176 3 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1205	6.	1493
2.	1350	7.	1607
3.	1602	8.	1244
4.	1568	9.	1281
5.	1607		

S.E./mean =71.96 lb./ac.

Crop :-Paddy. Ref :-M.P. 49(51).

Site :-Adhartal Farm, Jabalpore. Type :-'M'.

Object :—To study the comparative effect of T.C. as compared to other fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Sehra*. (b) Refer soil analysis, Jabalpore. (iii) 4, 5.8.1949. (iv) (a) 2 ploughings in July 1949, 1 ploughing by Meston plough, levelling by *datari* and puddling. (b) Transplanted. (c) —. (d) 4". (e) 2 to 3. (v) Nil. (vi) Paddy No. 17 (early). (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 3, 4.11.1949.

2. TREATMENTS :

1. Control.
2. T.C. at 20 lb./ac. of N.
3. T.C. at 40 lb./ac. of N.
4. C.M. at 20 lb./ac. of N.
5. C.M. at 40 lb./ac. of N.
6. G.N.C. at 10 lb./ac. of N.
7. G.N.C. at 20 lb./ac. of N.
8. A/S at 10 lb./ac. of N.
9. A/S at 20 lb./ac. of N.

Treatments 2 to 7 applied on 24.7.1949 and treatments 8 and 9 applied on 29.8.1949.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 66'×32'. (b) 66'×16.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Weight of bundle and grain yield. (iv) (a) 1946=N.A. (b) No. (c) N.A. (v) (a) Raipur, Bilaspur. (b) N.A. (vi) Transplanting delayed on account of scanty rains in July. (vii) Nil.

5. RESULTS :

(i) 1723 lb./ac.
(ii) 280.5 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield.
1.	1564	6.	1739
2.	1592	7.	1838
3.	1789	8.	1656
4.	1744	9.	1844
5.	1739		

S.E./mean = 114.4 lb./ac.

Crop :-Paddy. Ref :-M.P. 50(21).

Site :-Adhartal Farm, Jabalpore. Type :-'M'.

Object :—To study the effect of T.C. in comparison with F.Y.M., G.N.C. and A/S on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Sehra* (light sandy). (b) Refer soil analysis, Jabalpore. (iii) 28.7.1950. (iv) (a) N.A. (b) Transplanted. (c) —. (d) and (e) N.A. (v) N.A. (vi) Paddy No. 17. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 28.10.1950.

2. TREATMENTS :

1. Control.
2. T.C. at 20 lb./ac. of N.
3. T.C. at 40 lb./ac. of N.
4. F.Y.M. at 20 lb./ac. of N.
5. F.Y.M. at 40 lb./ac. of N.
6. G.N.C. at 10 lb./ac. of N.
7. G.N.C. at 20 lb./ac. of N.
8. A/S at 10 lb./ac. of N.
9. A/S at 20 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 49.5'×22'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Growth and tillering retarded for want of sufficient water. (ii) N.A. (iii) Grain yield. (iv) (a) 1946=N.A. (b) N.A. (c) N.A. (v) (a) and (b) N.A. (vi) The season was most unfavourable to the crop. (vii) Nil.

5. RESULTS :

(i) 1148 lb./ac.
(ii) 108.0 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	887	6.	1061
2.	1014	7.	1107
3.	1294	8.	1181
4.	1149	9.	1383
5.	1254		

S.E./mean = 44.00 lb./ac.

Crop :- Paddy. **Ref :- M.P. 51(37).**

Site :- Adhartal Farm, Jabalpore. **Type :- 'M'.**

Object :—To study the effect of T.C. in comparison with F.Y.M., G.N.C. and A/S on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Sehra* (light sandy loam). (b) Refer soil analysis, Jabalpore. (iii) 14.8.1953. (iv) (a) Ploughing and puddling. (b) Transplanted. (c) to (e) N.A. (v) Nil (vi) Paddy No. 17. (vii) Irrigated. (viii) One weeding. (ix) N.A. (x) 5.11.1951.

2. TREATMENTS :

1. Control.
2. T.C. at 20 lb./ac. of N.
3. T.C. at 40 lb./ac. of N.
4. F.Y.M. at 20 lb./ac. of N.
5. F.Y.M. at 40 lb./ac. of N.
6. G.N.C. at 10 lb./ac. of N
7. G.N.C. at 20 lb./ac. of N
8. A/S at 10 lb./ac. of N
9. A/S at 20 lb./ac. of N

3. DESIGN :

(i) R.B.D (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66'×16.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Not satisfactory. Scanty rains checked the growth of the crop. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1946—N.A. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) Season was not favourable to the crop. (vii) Nil.

5. RESULTS :

(i) 1637 lb./ac.
(ii) 342.0 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1360	6.	1619
2.	1669	7.	1687
3.	1792	8.	1553
4.	1609	9.	1737
5.	1710		

S.E./mean = 139.2 lb./ac.

Crop :- Paddy. **Ref :- M.P. 53(71).**

Site :- Adhartal Farm, Jabalpore. **Type :- 'M'.**

Object :—To study the effect of C/N in comparison with A/S, with and without Lime, on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) *Sehra* (sandy). (b) Refer soil analysis, Jabalpore. (iii) 22.7.1953. (iv) (a) Ploughing. (b) Transplanted. (c) —. (d) and (e) N.A. (v) N.A. (vi) Paddy No. 17 (early). (vii) Irrigated. (viii) One weeding. (ix) 24.21". (x) 13 to 15.10.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of lime : L_0=0 and L_1=200 lb./ac.

(2) 5 manures : M_0=0, M_1=20 lb./ac. of N as A/S, M_2=40 lb./ac. of N as A/S, M_3=20 lb./ac. of N as C/N and M_4=40 lb./ac. of N as C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1953 to 1955. (b) Yes. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) Nil. (vii) The randomisation in replication I is not satisfactory.

5, RESULTS :

(i) 2845 lb./ac.

(ii) 349.7 lb./ac.

(iii) Only M effect is highly significant.

(iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean
L_0	2821	2862	3367	2375	2841	2853
L_1	2591	2935	3136	2780	2738	2836
Mean	2706	2899	3252	2578	2790	2845

S.E. of marginal mean of M = 100.9 lb./ac.
S.E. of marginal mean of L = 63.8 lb./ac.
S.E. of body of table = 142.5 lb./ac.

Crop :-Paddy. **Ref :-M.P. 50(44).**

Site :-Labhandi Farm, Raipur. **Type :-'M'.**

Object :—To find out the maximum potential yield of Paddy by the application of increasing doses of Ammo. Phos.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) *Matasi* soil. (b) N.A. (iii) 12.8.1950. (iv) (a) Ploughing and cross ploughing. (b) to (e) N.A. (v) N.A. (vi) No. 18. *Luchai* × *gurmatia* (late). (vii) Irrigated. (viii) Weeding. (ix) 38". (x) 29.11.1950.

2. TREATMENTS :

5 doses of N as Ammo. Phos. : N_0=0, N_1=100, N_2=200, N_3=300 and N_4=400 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 66' × 16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory, no lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) No. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2186 lb./ac.

(ii) 265.3 lb./ac.

(iii) Treatments differ highly significantly.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
N_0	1834
N_1	2108
N_2	2121
N_3	2448
N_4	2421
S.E./mean	±108.3 lb./ac.

Crop :-Paddy. **Ref :-M.P. 52(48).**

Site :-Labhandi Farm, Raipur. **Type :-'M'.**

Object :—To study the residual effect of manures applied to Paddy during 1951-52 on succeeding Paddy crop.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Dorsa.* (b) N.A. (iii) N.A. (iv) (a) Ploughing. (b) Sowing by *biasi* method. (c) to (e) N.A. (v) Nil. (vi) *Luchai* × *gurmatia* × Burma (very late). (vii) Irrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :
1. Control.
2. T.C. at 20 lb./ac. of N.
3. T.C. at 40 lb./ac. of N.
4. Cattledung at 20 lb./ac.
5. Cattledung at 40 lb./ac.
6. G.N.C. at 10 lb./ac.
7. G.N.C. at 20 lb./ac.
8. A/S at 10 lb./ac. of N.
9. A/S at 20 lb./ac. of N.
10. A/S at 20 lb./ac. of N+Super at 20 lb./ac. of P_2O_5.

Applied to previous crop of paddy.

3. DESIGN :
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :
(i) Good growth, no lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) No. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 1666 lb./ac.
(ii) 310.4 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1714	6.	1657
2.	1838	7.	1754
3.	1974	8.	1481
4.	1664	9.	1471
5.	1461	10.	1641
S.E./mean	± 126.7 lb./ac.		

Crop :- Paddy. **Ref :- M.P. 53(51).**

Site :- Labhandi Farm, Raipur. **Type :- 'M'.**

Object :—To find out the effect of N manures on Paddy.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) N.A. (iii) 22.8.1953. (iv) (a) Ploughing. (b) Transplanted. (c)—. (d) and (e) N.A. (v) Nil. (vi) Cross 116 × Burma × *Luchai* No. 18. (vii) Irrigated (viii) Weeding. (ix) N.A. (x) 28.11.1953.

2. TREATMENTS :
All combinations of (1) and (2)
(1) 2 levels of lime : L_0=0, L_1=200 lb./ac.
(2) 5 doses of N : N_0=0, N_1=20 lb./ac. of N as A/S, N_2=40 lb./ac. of N as A/S, N_3=20 lb./ac. of N as C/N and N_4=40 lb./ac. of N as C/N.

3. DESIGN:

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good, no lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) No. (b) and (c)—. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1994 lb./ac.
(ii) 315.3 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	N_4	Mean
L_0	1941	1981	1908	1914	2088	1966
L_1	2028	2201	2048	1914	1921	2022
Mean	1948	2091	1974	1914	2004	1994

S.E. of marginal mean of N = 91.0 lb./ac.
S.E. of marginal mean of L = 57.6 lb./ac.
S.E. of body of table =128.7 lb./ac.

Crop :- Paddy. **Ref :- M.P. 51(69).**
Site :- Labhandi Farm, Raipur. **Type :- 'M'.**

Object :—To ascertain the manurial value of Cotton seed oil cake.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Dorsa* soil. (b) N.A. (iii) 25.7.1951. (iv) (a) Ploughing by Meston plough follow by wooden *datari* and *koper* just before transplantation. (b) Transplanted. (c)—. (d) 4" apart. (e) N.A. (v) Nil. (vi) Cross No. 116×Burma 28 (medium). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 20.11.1951.

2. TREATMENTS :

1. No manure.
2. 20 lb./ac. of N as G.N.C.
3. 20 lb./ac. of N as as decorticated cotton seed oil cake.
4. 20 lb./ac. of N as undecorticated cotton seed oil cake.
5. 20 lb./ac. of N as A/S.

Manures applied on 25.7.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 66'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good growth. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1951—1952. (b) and (c)—. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2177 lb./ac.
(ii) 227.3 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1944
2.	2268
3.	2186
4.	2276
5.	2212

S.E./mean = 101.6 lb./ac.

Crop :-Paddy. Ref :-M.P. 52(51).

Site :-Labhandi Farm, Raipur. Type :-'M'.

Object :—To study the manurial value of A/S/N in comparison with A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi* soil. (b) N.A. (iii) 31.8.1952. (iv) (a) Ploughing. (b) Transplanted. (c) —. (d) and (e) N.A. (v) Nil. (vi) *Luchai* × *gurmatia* (late). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 30.11.1952.

2. TREATMENTS :

1. No manure.
2. 40 lb./ac. of N as A/S.
3. 40 lb./ac. of N as A/S/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 66' × 16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Severe attack of Aphids as a result of which fertilization was not proper. (iii) Grain yield. (iv) (a) No. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1221 lb./ac.
(ii) 124.9 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1216
2.	1280
3.	1168

S.E./mean = 56.0 lb./ac.

Crop :-Paddy. Ref :-M.P. 53(50)

Site :-Labhandi Farm, Raipur. Type :-'M'.

Object :—To ascertain the best combination of organic manures and artificial fertilisers for Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi* (b) N.A. (iii) 28.8.1953. (iv) (a) Ploughing. (b) Transplanted. (c) —. (d) and (e) N.A. (v) Nil. (vi) *Luchai* × *gurmatia* (late) (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 28.11.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 doses of manures : M_1=40 lb./ac. of N+40 lb./ac. of P_2O_5. M_2=60 lb./ac. of N+60 lb./ac. of P_2O_5 and M_3=80 lb./ac. of N+80 lb./ac. of P_2O_5.

(2) 4 ratios of A/S and F.Y.M. in N : R_1=4 : 0, R_2=3 : 1, R_3=1 : 1 and R_4=1 : 3.

P_2O_5 applied as Super.

3. DESIGN :

(i) 3×4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) No. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2354 lb./ac.
(ii) 255.3 lb./ac.
(iii) Main effect of M alone is significant.

(iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	Mean
R_1	2341	2421	2435	2399
R_2	2214	2595	2201	2337
R_3	2208	2401	2535	2381
R_4	2241	2481	2174	2299
Mean	2251	2475	2336	2354

S.E. of marginal mean of M = 52.1 lb./ac.
S.E. of marginal mean of R = 60.2 lb./ac.
S.E. of body of table =104.2 lb./ac.

Crop :- Paddy. **Ref :- M.P. 53(49).**

Site :- Labhandi Farm, Raipur. **Type :- 'M'.**

Object :—To ascertain the effect of mixture of oil cake and fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) N.A. (iii) 1.9.1953. (iv) (a) Ploughing. (b) Transplanted. (c) –. (d) and (e) N.A. (v) Nil. (vi) *Luchai×gurmatia* (No. 18) (late). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 29.11.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 doses of manures : M_1=40 lb./ac. of N+40 lb./ac. of P_2O_5, M_2=60 lb./ac. of N+60 lb./ac. of P_2O_5 and M_3=80 lb./ac. of N+80 lb./ac. of P_2O_5.

(2) 4 ratios of oil cake and A/S in N : R_1=0 : 4, R_2=3 : 1, R_3=1 : 1 and R_4=1 : 3.

P_2O_5 applied as Super.

3. DESIGN :

(i) 3×4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) No. (b) and (c)—. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2204 lb./ac.
(ii) 224.0 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	Mean
R_1	1974	2214	2314	2167
R_2	2221	2188	2308	2239
R_3	2154	2194	2294	2214
R_4	2108	2368	2108	2195
Mean	2114	2241	2256	2204

S.E. of marginal mean of M =45.6 lb./ac.
S.E. of marginal mean of R =53.1 lb./ac.
S.E. of body of table =91.3 lb./ac.

Crop :- Paddy. Ref :- M.P. 50(42.)

Site :- Labhandi Farm, Raipur. Type :- 'M'.

Object :—To find the effect of *Mahwa* cake on the yield of Paddy as compared to G.N.C.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi* soil. (b) N.A. (iii) 21.6.1950. (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c)—. (d) and (e) N.A. (v) N.A. (vi) *Sultu gurmatia* (early). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

(1) 2 sources of N : S_1=*Mahwa* cake and S_2=G.N.C.

(2) 2 levels of N : N_1=20 and N_2=40 lb./ac.

Manures applied on 3.9.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good growth. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) and (c)—. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2018 lb./ac.

(ii) 291.9 lb./ac.

(iii) Control *vs* others and N effects are highly significant. Other effects are not significant.

(iv) Av. yield of grain in lb./ac.

Control=1732 lb./ac.

	S_1	S_2	Mean
N_1	1900	1960	1930
N_2	2084	2412	2248
Mean	1992	2186	2089

S.E. of any marginal mean = 92.3 lb./ac.

S.E. of body of table =130.5 lb./ac.

Crop :- Paddy. Ref :- M.P. 51(65).

Site :- Labhandi Farm, Raipur. Type :- 'M'.

Object :—To find out the effect of deep application of fertilisers to Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi*. (b) N.A. (iii) 10.8.1951. (iv) (a) Ploughing. (b) Transplanted. (c)—. (d) and N.A. (v) F.Y.M. at 10 cwt./ac. (vi) *Luchai×gurmatia* (late). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 21.11.1951.

2. TREATMENTS :

1. No manure.
2. 20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super applied 3" deep.
3. 20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super applied at surface.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 67'×16'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2111 lb./ac.
(ii) 363.6 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1976
2.	2236
3.	2122

S.E./mean = 162.6 lb./ac.

Crop :- Paddy. **Ref :- M.P. 52(54).**

Site :- Labhandi Farm, Raipur. **Type :- 'M'.**

Object :—To ascertain the effect of deep application of fertilisers to transplanted Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) N.A. (iii) 27.8.1952. (iv) (a) Ploughing. (b) Transplanted. (c)—. (d) Usually 4″×4″. (e) N.A. (v) Nil. (vi) *Luchai* × Burma (late). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 30.11.1952.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N+20 lb./ac. of P_2O_5 applied 3″ deep.
3. 20 lb./ac. of N+20 lb./ac. of P_2O_5 applied on surface.

Manures applied on 26.8.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 16′×67′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 to 1952. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1923 lb./ac.
(ii) 196.1 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1455
2.	2243
3.	2072

S.E./mean = 87.7 lb./ac.

Crop :-Paddy. **Ref :-M.P. 53(48).**

Site :-Labhandi Farm, Raipur. **Type :-'M'.**

Object :—To ascertain the effect of deep placement of fertilisers on Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) N.A. (iii) 28.8.1953. (iv) (a) Ploughing. (b) Transplanted. (c) —. (d) and (e) N.A. (v) 10 cwt /ac. of F.Y.M. (vi) *Luchai* × *gurmatia* No. 18 (late) (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 29.11.1953.

2. TREATMENTS :

1. 20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super applied at surface.
2. 20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super applied 3" deep.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 5. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1951 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2424 lb./ac.
(ii) 372 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2328
2.	2520
S.E./mean	= 166.4 lb./ac.

Crop :-Paddy. **Ref :-M.P. 50(43).**

Site :-Labhandi Farm, Raipur. **Type :-'M'.**

Object :—To find out the effect of G.L. (*karanj* leaves) on Paddy.

1. BASAL CONDITIONS :

(i) (e) Nil. (b) Paddy. (c) N.A. (ii) (a) *Dorsa*. (b) N.A. (iii) 10.9.1950. (iv) (a) Field puddled with Meston and wooden *datari* followed by working of *kover* just before transplanting. (b) Transplanting. (c) —. (d) 4"—5". (e) N.A. (v) Nil. (vi) *Luchai* × *gurmatia* (late). (vii) Irrigated. (viii) Weeding. (ix) 38". (x) 29.11.1950.

2. TREATMENTS :

4 doses of G.L. : G_0=0, G_1=1, G_2=2 and G_3=3 ton./ac.
G.L. as *karanj* leaves buried just before planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 32'×13'-7". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good growth, no lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950 to 1952. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1380 lb./ac.
(ii) 309.7 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
G_0	1080
G_1	1300
G_2	1360
G_3	1780
S.E./mean	= 138.5 lb./ac.

Crop :-Paddy. **Ref :-M.P. 51(68).**

Site :-Labhandi Farm, Raipur. **Type :-'M'.**

Object :—To find out the effect of G.L. (*karanj* leaves) on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Dorsa* soil. (b) N.A. (iii) 23.7.1951. (iv) (a) Ploughing with Meston plough followed by *datari* and *koper* just a day before transplanting. (b) Transplanted. (c) —. (d) Between plants 4". (e) N.A. (v) N.A. (vi) Cross No. 116×Burma No. 11. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 18.11.1951.

2. TREATMENTS :

4 doses of G.L. : G_0=0, G_1=1, G_2=2, and G_3=3 ton/ac.
G.L. as *karanj* leaves.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 17½'×25' (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good growth, no lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950 to 1952. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2580 lb./ac.
(ii) 320.5 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
G_0	2420
G_1	2360
G_2	2660
G_3	2880
S.E./mean	=143.3 lb./ac.

Crop :-Paddy. **Ref :-M.P. 52(55).**

Site :-Labhandi Farm, Raipur. **Type :-'M'.**

Object :—To find the effect of G.L. (*karanj* leaves) on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Dorsa*. (b) N.A. (iii) 17.8.1952. (iv) (a) Ploughing. (b) Transplanted. (c) —. (d) 4"×4". (e) N.A. (v) N.A. (vi) *Luchai* No. 2 ×*gurmatia* (late)×Burma. (vii) Irrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

4 doses of G.L. : G_0=0, G_1=1, G_2=2 and G_3=3 ton./ac.
G.L. applied on 17.8.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 17½'×25'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1952. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3067 lb./ac.
(ii) 274.1 lb./ac.
(iii) Treatment differences are significant.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
G_0	2808
G_1	2987
G_2	3027
G_3	3445
S.E./mean	=122.6 lb./ac.

Crop :- Paddy. **Ref :- M.P. 48(28).**

Site :- Labhandi Farm, Raipur. **Type :- 'M'.**

Object :—To study the effect of manuring Paddy with T.C. and other manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi* (sandy loam). (b) N.A. (iii) N.A. (iv) (a) Ploughing (b) to (e) N A. (v) Nil. (vi) Cross 116 (medium). (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. No manure.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as Cowdung.
5. 40 lb./ac. of N as Cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66'×16.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1948 to 1950. (b) and (c) No. (v) (a) Bilaspur. (b) No. (vi) Nil. (vii) Plotwise yield data N.A.

5. RESULTS :

(i) 895 lb./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	676	6.	777
2.	773	7.	972
3.	1139	8.	768
4.	860	9.	934
5.	1154		
	S.E./mean	=N.A.	

Crop :- Paddy. **Ref :- M.P. 49(39).**

Site :- Labhandi Farm, Raipur. **Type :- 'M'.**

Object : To study the effect of T.C. and other fertilisers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi* (sandy loam). (b) N.A. (iii) N.A. (iv) (a) Ploughing. (b) to (e) N.A. (v) Nil (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:

1. No manure
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as Cowdung.
5. 40 lb./ac. of N as Cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66′×16.5′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1948 to 1950. (b) and (c) No. (v) (a) Bilaspur. (b) No. (vi) Nil. (vii) Plotwise yield data N.A.

5. RESULTS :

(i) 924 lb./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	741	6.	856
2.	774	7.	949
3.	1011	8.	934
4.	860	9.	1195
5.	994		

S.E./mean =N.A.

Crop :- Paddy. Ref :- M.P. 50(40).

Site :- Labhandi Farm, Raipur. Type :- 'M'.

Object :—To study the effect of T.C. on Paddy as compared to other manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) *Dorsa-Kankar.* (b) N.A. (iii) 13.7.1950. (iv) (a) Ploughing and cross ploughing. (b) Sown of by *biasi* method. (c) N.A. (d)—. (e) N.A. (v) Nil. (vi) Cross 116 (medium). (vii) Irrigated. (viii) Weeding. (ix) 38″. (x) 20.11.1950.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as Cattle dung.
5. 40 lb /ac. of N as Cattle dung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S
9. 20 lb./ac. of N as A/S.

Treatments 2 to 5 applied on 29.6.1950 and treatments 6 to 9 applied on 13.8.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 66′×16.5′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1950. (b) and (c) No. (v) (a) Bilaspur. (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1138 lb./ac.
(ii) 165.5 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	987	6.	1181
2.	1121	7.	1114
3.	1434	8.	1021
4.	994	9.	1207
5.	1181		

S.E./mean =67.6 lb./ac.

Crop :- Paddy. Ref :- M.P. 49(36).

Site :- Labhandi Farm, Raipur. Type :- 'M'.

Object :—To study the residual effect of T.C. and other fertilisers applied to Paddy during 1948—1949.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Matasi* (sandy loam). (b) N.A. (iii) N.A. (iv) (a) Ploughing. (b) to (e) N.A. (v) Nil. (vi) Cross 116 (medium). (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control.
2. T.C. at 20 lb./ac. of N.
3. T.C. at 40 lb /ac. of N.
4. Cattle dung at 20 lb./ac. of N.
5. Cattle dung at 40 lb./ac. of N.
6. G.N.C. at 10 lb /ac. of N.
7. G.N.C. at 20 lb./ac. of N.
8. A/S at 10 lb./ac. of N.
9. A/S at 20 lb./ac of N.

Applied to paddy during 1948—1949.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949 -1951. (b) and (c) No. (v) (a) Bilaspur. (b) No. (vi) Nil. (vii) Plot wise yield data N.A.

5. RESULTS :

(i) 507.7 lb./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	412	6.	537
2.	471	7.	567
3.	647	8.	423
4.	538	9.	370
5.	604		

S.E./mean =N.A.

Crop :- Paddy. Ref :- M.P. 50(41).

Site :- Labhandi Farm, Raipur. Type :- 'M'.

Object :— To study the residual effect of T.C. and other fertilizers applied to Paddy during 1949—1950.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Dorsa-Kankar*. (b) N.A. (iii) 15.7.1950. (iv) (a) Ploughing and cross ploughings. (b) Sown by *biasi* method. (c) N.A (d) —. (e) N.A. (v) Nil (vi) Cross 116 (medium). (vii) Irrigated. (viii) Weeding. (ix) 38". (x) 20.11.1950.

2. TREATMENTS :

1. Control.
2. T.C. at 20 lb./ac. of N.
3. T.C. at 40 lb./ac. of N.
4. Cattle dung at 20. lb./ac. of N.
5. Cattle dung at 40 lb /ac. of N.
6. G.N.C. at 10 lb./ac. of N.
7. G.N.C. at 20 lb./ac. of N.
8. A/S at 10 lb./ab. of N.
9. A/S at 20 lb./ac. of N.

Applied to paddy during 1949-50.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good growth ; no lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1949 to 1951. (b) No. (c) No. (v) (a) Bilaspur. (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 955.6 lb./ac.
(ii) 153.3 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatments	Av. yield
1.	960	6.	880
2.	1120	7.	1000
3.	1040	8.	960
4.	840	9.	880
5.	920		

S./E. mean =62.6 lb./ac.

Crop :- Paddy. **Ref :- M.P. 51(70).**

Site :- Labhandi Farm, Raipur. **Type :- 'M'.**

Object :—To study the residual effect of T.C. and other fertilizers applied to Paddy during 1950—51.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Dorsa* soil. (b) N.A. (iii) 17.6.1951. (iv) (a) Ploughing with meston plough to prepare seed bed just after monsoon. (b) Broadcast and mixed by peg harrow. (c) 100 lb./ac. (d) and (e) —. (v) N.A. (vi) Cross 116 (medinm). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 20.11.1951.

2. TREATMENTS :

1. No manure.
2. T.C. at 20 lb./ac. of N.
3. T.C. at 40 lb./ac. of N.
4. Cattle dung at 20 lb./ac. of N.
5. Cattle dung at 40 lb./ac. of N.
6. G.N.C. at 10 lb./ac. of N.
7. G.N.C. at 20 lb./ac. of N.
8. A/S at 10 lb./ac of N.
9. A/S at 20 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good growth. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949 to 1950. (b) No. (c) No. (v) (a) N.A. (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 812.6 lb./ac.
(ii) 201.4 lb./ac.
(iv) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	837.1	6.	867.1
2.	880.4	7.	690.3
3.	997.2	8.	763.7
4.	750.4	9.	693.7
5.	833.8		

S./E. mean =82.3 lb./ac.

Crop :- Paddy. **Ref :- M.P. 51(71).**

Site :- Labhandi Farm, Raipur. **Type :- 'M'.**

Object :—To study the effect of T.C. on Paddy as compared to other fertilisers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments except treatment No. 10. (ii) (a) *Dorsa*. (b) N.A. (iii) 17.6.1951. (iv) (a) Two ploughings with meston plough to prepare the seed bed just after break of monsoon. (b) Broadcast and mixed with peg harrow. (d) and (e) —. (v) Nil. (vi) Cross 116 (medium). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 20.11.1951.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as Cattle dung.
5. 40 lb./ac. of N as Cattle dung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.
10. Tr. 9+20 lb./ac. of P_2O_5 as Super.

Treatments 2 to 5 applied on 1.6.1951 and treatments 6 to 10 applied on 1.8.1951.

3. DESIGN

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good growth, no lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1951 to 1952. (b) Yes. (c) No. (v) (a) N.A. (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1223 lb./ac.
(ii) 187.1 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1147	6.	1087
2.	1244	7.	1414
3.	1407	8.	1251
4.	1027	9.	1254
5.	1101	10.	1301

S.E./mean =76.4 lb./ac.

Crop :- Paddy. **Ref :- M.P. 52(47)/51(71).**

Site :- Labhandi Farm, Raipur. **Type :- 'M'.**

Object : –To study the effect of T.C. on Paddy as compared to other manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Dorsa*. (b) N.A. (iii) 25.7.1952. (iv) (a) Ploughing. (b) Sown by *biasi* method. (c) to (e) N.A. (v) Nil. (vi) Cross 116 (*bhondu*×*parewa*) (medium). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as Cattle dung.
5. 40 lb./ac. of N as Cattle dung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.
10. Tr. 9+20 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good growth. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1951 to 1952. (b) Yes. (c) No. (v) (a) N.A. (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 768.4 lb./ac.
(ii) 234.2 lb./ac.
(iii) Treatments are not significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	587.0	6.	627.0
2.	900.5	7.	733.7
3.	973.8	8.	693.7
4.	607.0	9.	793.7
5.	760.4	10.	1007.2

S.E./mean =95.61 lb./ac.

Crop :- Paddy. **Ref :- M.P. 50(19).**

Site :- Central Res. Farm, Ujjain. **Type :- 'M'.**

Object :—To find out a suitable dose of manure for Paddy under rainfed conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Peas. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 16.7.1950. (iv) (a) *Bakharings*. (b) and (c) N.A. (d) 1½′ between two rows. (e) —. (v) F.Y.M. at 5 C.L./ac. was broadcasted at the time of last *bakharing*. (vi) C.F. Paddy (early). (vii) Unirrigated. (viii) One weeding and interculturing. Top dressing with A/S in fourth block. (ix) 36.78″. (x) 30.10.1950.

2. TREATMENTS :

1. No manure (control).
2. G.N.C. at 20 lb./ac. of N.
3. G.N.C. at 40 lb./ac. of N.
4. G.N.C. at 60 lb./ac. of N.
5. A/S at 20 lb./ac. of N.
6. A/S at 40 lb./ac. of N.
7. A/S at 60 lb./ac. of N.
8. G.N.C. and A/S in 1 : 1 ratio at 20 lb./ac. of N.
9. G.N.C. and A/S in 1 : 1 ratio at 40 lb./ac. of N.
10. G.N.C. and A/S in 1 : 1 ratio at 60 lb./ac. of N.
11. A/S at 20 lb./ac. of N+Super at 10 lb./ac. of P_2O_5.
12. A/S at 40 lb./ac. of N+Super at 10 lb./ac. of P_2O_5.
13. A/S at 20 lb./ac. of N+Super at 20 lb./ac. of P_2O_5.
14. A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P_2O_5.

3. DESIGN:

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) N.A. (iv) (a) 18′×66′. (b) 9′×60′. (v) 4.5′×3′. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950—1951. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1110 lb./ac.
(ii) 243.6 lb /ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb /ac.

Treatment	Av. yield	Treatment	Av. yield
1.	792	8.	1048
2.	1235	9.	1014
3.	1336	10.	1049
4.	1170	11.	1185
5.	911	12.	1084
6.	1130	13.	1256
7.	1094	14.	1235

S.E./mean =121.8 lb./ac.

Crop :- Paddy. Ref :- M.P. 53(77).

Site :- Govt. Seed and Demonstration Farm. Waraseoni. Type :- 'M'.

Object :—To find out the suitability of fertilizer mixture in comparison with A/S and oil cake.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) and (b) N.A. (iii) 19.7.1953. (iv) (a) One ploughing. (b) Transplanting. (c) —. (d) and (e) N.A. (v) N.A. (vi) *Luchai* × *gurmatia* × Burma (late). (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control.
2. Fertilizer mixture at 20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
3. 20 lb./ac. of N as G.N.C.
4. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 66′×16.5′. (v) Nil. (vi) N.A.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) N.A. (vi) N.A. (vii) Original yield data and analysis of variance table are not available. Results collected from annual report.

5. RESULTS :

(i) 3061 lb./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2530
2.	3405
3.	3075
4.	3235

Crop :- Paddy. Ref :- M.P. 53(91).

Site :- Govt. Seed and Demonstration Farm, Waraseoni. Type :- 'M'.

Object :—To study the effect of fertiliser mixture in comparision with G.N.C.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a), (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS :

1. 20 lb./ac. of N as A/S.
2. 20 lb./ac. of N as G.N.C.
3. 20 lb./ac. of N as fertilizer mixture.
4. Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 2974 lb./ac.
(ii) 222.7 lb./ac.
(iii) Treatments differ highly significantly.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	3235
2.	3075
3.	3045
4.	2530

S.E./mean = 111.3 lb./ac.

Crop :- Paddy. **Ref :- M.P. 51(82).**

Site :- Govt. Seed and Demonstration Farm, Waraseoni. Type :- 'M'.

Object :—To study the suitability of Cotton seed cake as a manure in comparison with G.N.C. and A/S.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 16.6.1951/6.9.1951. (iv) (a) to (e) N.A. (v) N.A. (vi) *Luchai.* (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) 2.12.1951.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as G.N.C.
3. 20 lb./ac. of N as Cotton seed cake.
4. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(I) Even growth. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1951-52. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2028 lb./ac.
(ii) 624.8 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1712
2.	2112
3.	2048
4.	2240

S.E./mean = 279.4 lb./ac.

Crop :- Paddy (*Kharif*). **Ref :- M.P. 50(64).**

Site :- Govt. Seed and Demonstration Farm, Waraseoni. Type :- 'M'.

Object :—To determine the fertilising value of *Mahwa* cake.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) to (b) N.A. (iil) 19.8.1950. (iv) (a) to (e) N.A. (v) N.A. (vi) *Luchai.* (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) 30.11.1950.

2. TREATMENTS :

1. Control (no manure).
2. *Mohwa* cake at 11.83 lb./ac. of N.
3. *Mohwa* cake at 23.66 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 33′×33′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack by *pachydiplosi cryzae* [due to unhealthy growth of crop. (iii) N.A. (iv) (a) 1950—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1731 lb./ac.
(ii) 415.5 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1912
2.	1848
3.	1432
S.E./mean	=185.8 lb./ac.

Crop :- Paddy (*Kharif*). **Ref :- M.P. 52(68).**

Site :- Govt. Seed and Demonstration Farm, Waraseoni. **Type :- 'M'.**

Object :—To find out the suitability of A/S/N and G.N.C. given on equal N basis.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 18.7.1952. (iv) (a) Ploughed and cross ploughed. (b) Transplanted. (c) —. (d) and (e) N.A. (v) N.A. (vi) *Luchai* × *Gurmatia* (late). (vii) Irrigated. (viii) N.A. (ix) 38.52". (x) 12, 13.12.1952.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as G.N.C.
3. 20 lb./ac. of N as A/S/N.
4. 20 lb./ac. of N as A/S.

Applied just before transplanting and after puddling.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 99'×11'. (v) Nil. (vi) N.A.

4. GENERAL :

(i) Not good. (ii) Incidence of *Badia*. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) The season was quite normal. (vii) In one replication the yield for treatment 1 has not been recorded and the same is estimated by missing plot technique and analysed. It appears that nitrate nitrogen in A/S/N was washed out and G.N.C. was not available and thus giving superiority to A/S.

5. RESULTS :

(i) 2664 lb./ac.
(ii) 265.6 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2536
2.	2639
3.	2659
4.	2824
S.E. of diff. of two means one containing the missing plot	=207.7 lb./ac.
S.E. of two means none of them containing missing plot value	=187.84 lb./ac.

Crop :- Paddy (*Kharif*). Ref :- M.P. 52(69).

Site :- Govt. Seed and Demonstration Farm, Waraseoni. Type :- 'M'.

Object :—To find out the best time for sowing sannhemp as G.M. for next Paddy crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sannhemp as G.M. (ii) (a) and (b) N.A. (iii) N.A. (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c)—. (d) and (e) N.A. (v) N.A. (vi) *Sultugurmatia* (late). (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Sannhemp sown on 17.3.1952.
2. Sannhemp sown on 3.4.1952.
3. Sannhemp sown on 16.4.1952.
4. Sannhemp sown on 1.5.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Incidence of *Badia*. (iii) Grain yield. (iv) (a) and (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) Season was not favourable for the crop. (vii) Raw data N.A.

5. RESULTS :

(i) 880.4 lb /ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	831.9
2.	795.6
3.	1148.1
4.	746.2
S.E./mean	= N.A.

Crop :- Paddy (*Kharif*). Ref :- M.P. 53(78).

Site :- Govt. Seed and Demonstration Farm, Waraseoni. Type :- 'M'.

Object :—To find the value of C/N in comparison with A/S on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 25, 26.7.1953. (iv) (a) Ploughing and cross ploughing. (b) Transplanting. (c)—. (d) and (e) N.A. (v) N.A. (vi) Cross 22. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of lime : L_0=0 and L_1=20 lb./ac.

(2) 5 levels of N : N_0=0, N_1=20 lb./ac. of N as A/S, N_2=40 lb./ac. of N as A/S, N_3=20 lb./ac. of N as C/N and N_4=40 lb./ac. of N as C/N.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) Raipur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3090 lb./ac.

(ii) 882.2 lb./ac.

(iii) None of the effects is significant.

(vi) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
L_0	2713	3139	2919	3026	3039	2967
L_1	2866	3339	2973	3952	2933	3213
Mean	2789	3239	2946	3489	2986	3090

S.E. of marginal mean of L = 161.1 lb./ac.
S.E. of marginal mean of N = 254.7 lb./ac.
S.E. of body of table = 360.2 lb./ac.

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

Site :- Harsi Experimental Farm, Bagwai. Type :- 'C'.

Object :--To find the optimum spacing and the number of seedlings per hole for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) Sannhemp as G.M. and dressing with A/S at 30 lb./ac. (ii) (a) Clay loam. (b) Refer soil analysis, Bagwai. (iii) 31.7.1952 to 2.8.1952. (iv) (a) Ploughing by *sabul* plough. Two puddlings after spreading compost and third puddling before transplanting. (b) Transplanting. (c) — (d) and (e) As per treatments. (v) A/S at 30 lb./ac. (vi) T. 21 (medium). (vii) Irrigated. (viii) One weeding. (ix) 27.98". (x) 25.11.1952.

2. TREATMENTS :

Main-plot treatments :

3 row spacings : R_1=6", R_2=9" and R_3=12".

Sub-plot treatments :

3 plants spacings : C_1=3", C_2=6" and C_3=9".

Sub-Sub-plot treatments :

No. of seedlings/hole : S_1=1, S_2=2, S_3=3, S_4=4, S_5=5 and S_6=6 seedlings/hole.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot ; 6 sub-sub-plots/sub-plot. (b) N.A. (iii) 6. (iv) (a) 24'×4', 24'×4½', 24'×5' for R_1, R_2 and R_3 spacings. (b) 20'×3'. (v) One row on each side and 2' at each end of sub-plot. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Slight attack of stem borer in all the plots. Loss is not much. (iii) Grain and straw yield. (iv) (a) 1952—1954. (b) N.A. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2390 lb./ac.

(ii) (a) 580.9 lb./ac.
(b) 410.7 lb./ac.
(c) 164.4 lb./ac.

(iii) S effect and interactions R×S, C×S and R×C×S are highly significant. Other effects are not significant.

(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean	C_1	C_2	C_3
S_1	2070	2165	2063	2099	2095	2145	2058
S_2	2303	2295	2234	2277	2393	2243	2197
S_3	2468	2366	2325	2386	2409	2368	2383
S_4	2486	2485	2531	2500	2566	2460	2475
S_5	2448	2668	2483	2533	2540	2468	2593
S_6	2577	2537	2524	2546	2549	2560	2529
Mean	2392	2419	2360	2390	2425	2374	2372
C_1	2391	2373	2512				
C_2	2377	2489	2256				
C_3	2409	2396	2313				

S.E. of difference of two

1. R marginal means = 79.1 lb./ac.
2. C marginal means = 55.8 lb./ac.
3. S marginal means = 31.6 lb./ac.
4. S means at the same level of R = 54.8 lb./ac.
5. R means at the same level of S = 93.6 lb./ac.
6. S means at the same level of C = 54.8 lb./ac.
7. C means at the same level of S = 74.9 lb./ac.
8. C means at the same level of R = 96.5 lb./ac.
9. R means at the same level of C =111.8 lb./ac.

Crop :- Paddy. **Ref :- M.P. 49(48).**

Site :- Harsi Experimental Farm, Bagwai. **Type :- 'C'.**

Object :—To find out suitable method of sowing Paddy with different spacings.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) Nil. (ii) (a) Clay Loam. (b) Refer soil analysis, Bagwai. (iii) N.A. (iv) (a) Ploughing by *sabul* plough, *patila,* ploughing by disc plough and puddling before sowing. (b) to (e) As per treatments (v) Nil. (vi) *Bansmati* (early). (vii) Irrigated. (viii) Weeding once. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+2 extra treatments

(1) 3 spacings :—C_1=6", C_2=9" and C_3=12".

(2) No. of seedlings/hole :—S_1=3, S_2=4, S_3=5 and S_4=6.

2 extra treatments are :—T_1=Broadcasting paddy at 30 sr./ac. and T_2=Broadcasting paddy at 40 sr./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 2. (iv) (a) and (b) 80'×18'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain and straw yield. (vi) (a) No. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2444 lb /ac.

(ii) 555.1 lb./ac.

(iii) Extra *vs* other treatments effect is highly significant. No other effect is significant.

(iv) Av. yield of grain in lb./ac.

T_1=1155 lb./ac.
T_2= 875 lb./ac.

	C_1	C_2	C_3	Mean
S_1	2415	3018	2756	2730
S_2	3062	24.7	2318	2616
S_3	2717	2782	3045	2848
S_4	2367	2528	2712	2536
Mean	2640	2699	2708	2682

S.E. of marginal mean of C =196.2 lb./ac.
S.E. of marginal mean of S =226.6 lb./ac.
S.E. of body of table =392.4 lb./ac.

Crop :- Paddy. **Ref :- M.P. 51(64).**

Site :- Labhandi Farm, Raipur. **Type :- 'C'.**

Object :—To study the effect of plant to plant spacing on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi*. (b) N.A. (iii) N.A. (iv) (a) Ploughing and cross ploughing with meston plough followed by *datari* and *koper* just before transplantation. (b) Transplanted. (c)—. (d) As per treatments. (e) N.A. (v) N.A. (vi) *Luchai*×*gurmania* No. 18 (late). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 25.12.1951.

2. TREATMENTS :

3 plant to plant spacings : S_1=4″, S_2=6″ and S_3=9″.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 9′×12′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) N.A. (iv) (a) 1951 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2633 lb./ac.
(ii) 1212 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
S_1	3380
S_2	2380
S_3	2140

S.E./mean = 542.4 lb./ac.

Crop :- Paddy. **Ref :- M.P. 52(50).**

Site :- Labhandi Farm, Raipur. **Type :- 'C'.**

Object :—To find out the effect of plant to plant spacing on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi* soil. (b) N.A. (iii) 27.8.1952. (iv) (a) Ploughing. (b) Transplanted. (c)—. (d) and (e) As per treatments. (v) N.A. (vi) *Luchai*×*gurmatia*×Burma. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 30.11.1952.

2. TREATMENTS :

1. 4″×4″ spacing with 1 seedling/hole.
2. 6″×6″ spacing with 2 seedlings/hole.
3. 9″×9″ spacing with 4 seedlings/hole.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) 9′×12′. (b) 9′×12′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3013 lb./ac.
(ii) 312.8 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	3440
2.	2520
3.	3080

S.E./mean = 139.9 lb./ac.

Crop :- Paddy. **Ref :- M.P. 53(47).**

Site :- Labhandi Farm, Raipur. **Type :- 'C'.**

Object :—To find out the effect of plant to plant spacing on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) *Matasi.* (b) N.A. (iii) 28.8.1953. (iv) (a) Ploughing. (b) Transplanted. (c)—. (d) and (e) As per treatments. (v) F.Y.M. at 8 C.L./ac. (vi) *Luchai×gurmatia* No. 18 (late). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 29.11.1953.

2. TREATMENTS :

1. 4″×4″ spacing with 1 seedling/hole.
2. 6″×6″ spacing with 2 seedlings/hole.
3. 9″×9″ spacing with 4 seedlings/hole.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 9′×12′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good and no lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2933 lb./ac.
(ii) 750.0 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2720
2.	2960
3.	3120

S.E./mean = 335.4 lb./ac.

Crop :- Paddy. Ref :- M.P. 51(66).

Site :- Labhandi Farm, Raipur. Type :- 'C'.

Object :—To compare the yield of Paddy sown by different cultural methods.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Dorsa* soil. (b) N.A. (iii) 26.6.1951/13.8.1951. (iv) (a) Ploughing and cross ploughing. (b) As per treatments. (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) *Gurmatia* (medium). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Seed drilled 9" apart.
2. Seed sown by *biasi* method.
3. Seedlings transplanted 4" to 6" apart.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 1/100 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1955. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 903 lb./ac.
(ii) 188.0 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1020
2.	950
3.	740

S.E./mean = 84.1 lb./ac.

Crop :- Paddy. Ref :- M.P. 52(49).

Site :- Labhandi Farm, Raipur. Type :- 'C'.

Object :—To compare the yield of Paddy sown by different cultural methods.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Dorsa* soil. (b) N.A. (iii) As per treatments. (iv) (a) Ploughing. (b) As per treatments. (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) *Gurmatia* (late). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 15.11.1952.

2. TREATMENTS :

1. Seed drilled 9" apart on 10.7.1952.
2. Seed broadcasted by *biasi* method on 10.7.1952.
3. Seedlings transplanted on 19.8.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 1/10 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good growth. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—1955. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Yield is poor.

5. RESULTS .

(i) 766 lb./ac.
(ii) 159.4 lb./ac.
(iii) Treatments are not significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	740
2.	776
3.	782

S.E./mean = 71.3 lb./ac.

Crop :- Paddy. **Ref :- M.P. 50(46).**

Site :- Labhandi Farm, Raipur. **Type :- 'C'.**

Object :—To compare the yield of Paddy sown by different cultural methods.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Dorsa* soil. (b) N.A. (iii) 17.7.1950. (iv) (a) Ploughing by *meston* plough and harrowing. (b) and (c) As per treatments. (d) 9" for drilling method. (e)—. (v) N.A. (vi) Cross 116 (medium). (vii) Irrigated. (viii) Weeding. (ix) 38". (x) 22.11.1950.

2. TREATMENTS :

1. *Biasi* method—seed rate at 100 lb./ac.
2. Drilling—seed rate at 80 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) and (b) 1/10 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) and (b) No. (c)—. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1529 lb./ac.
(ii) 57.68 lb /ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1468
2.	1590

S.E./mean = 28.84 lb./ac.

Crop :- Paddy. **Ref :- M.P. 50(47).**

Site :- Labhandi Farm, Raipur. **Type :- 'C'.**

Object :—To compare the yield of Paddy sown by different cultural methods.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi* soil. (b) N.A. (iii) 19.7.1950. (iv) (a) 2 ploughings by *meston* plough followed. by harrowing with peg tooth harrow. (b) and (c) As per teatments(d) 9" for drilling. (e) —. (v) N.A. (vi) Cross 116. (medium). (vii) Irrigated. (viii) Weeding. (ix) 38". (x) 23.11.1950.

2. TREATMENTS :

1. *Biasi* method with seed rate at 100 lb./ac.
2. Drilling with seed rate at 80 lb./ac.

3 DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) and (b) 1/10 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) —. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1344 lb./ac.
(ii) 354.7 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield.
1.	1420
2.	1268
S.E./mean	=177.4 lb./ac.

Crop :- Paddy. **Ref :- M.P. 53(46)**

Site :- Labhandi Farm, Raipur. **Type :- 'C'.**

Object :—To compare the yield of Paddy sown by different cultural methods.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) —. (iii) As per treatments. (iv) (a) Ploughing. (b) to (d) As per treatments. (e) N.A. (v) N.A. (vi) *Gurmatia.* (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) November 1953.

2. TREATMENTS :

1. Paddy sown by broadcast at 100 lb/ac. on 10.8.1953.
2. Paddy drilled 9" apart at 70 lb/ac. on 9.7.1953.
3. Paddy transplanted on 26.8.1953. (.....) spacing N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 1/10 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1955. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1069 lb./ac.
(ii) 247.7 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield.
1.	1034
2.	1028
3.	1146
S.E./mean	=110.8 lb./ac.

Crop :- Paddy. **Ref :- M.P. 53(90).**

Site :- Govt. Experimental Farm, Labhandi (Raipur). **Type :- 'C'.**

Object :—To study the economics of growing Paddy followed by *utera* as compared to Paddy alone followed by *Kuthwa.*

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) N.A. (iv) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Paddy followed by *utera.*
2. Paddy followed by *kuthwa.*

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) N.A. (vii) N.A.

5. RESULTS :

(i) 2228 lb./ac.
(ii) 131.7 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2152
2.	2304

S.E./mean = 58.9 lb./ac.

Crop :- Paddy. **Ref :- M.P. 53(89).**

Site .- Govt. Experimental Farm, Labhandi (Raipur). Type :- 'C'.

Object :—To study the economics of growing late Paddy alone as against medium Paddy followed by *Utera.*

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Late paddy alone.
2. Medium paddy followed by *Lakh.*
3. Medium paddy followed by *Urid.*
4. Medium paddy followed by Linseed.

3. DESIGN :

(i) L. sq. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) N.A. (vii) Yield data of *lakh, urid* and linseed are not available.

5. RESULTS :

(i) 2125 lb./ac.
(ii) 311.6 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2370
2.	2030
3.	2060
4.	2040

S.E./mean =155.8 lb./ac.

Crop :- Paddy. Ref :- M.P. 50(50).

Site :- Harsi Experimental Farm, Bagwai. Type :- 'CV'.

Object :—To find out suitable seed rate for broadcast Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) F.Y.M. at 15 C.L./ac. (ii) (a) Clay loam. (b) Refer soil analysis, Bagwai. (iii) 31.7.1950. (iv) (a) Twice ploughing by *desi* plough, *patela* and *bakharing*. (b) Seed broadcast. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) One weeding. (ix) 22.48". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 seed rates : R_1=20, R_2=30. R_3=40 and R_4=50 srs./ac.
(2) 2 varieties : V_1=*basmati* and V_2=*Bhadaya*.

3. DESIGN :

(i) 4×2 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 12'×66'. (b) 9'×60'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) *Bhadaya* variety lodged on 21.9.1950. (ii) Nil. (iii) Germination, health and yield of grain and straw. (iv) (a) 1950 to 1951. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1030 lb./ac.
(ii) 193.5 lb./ac.
(iii) Main effect of R alone is highly significant.
(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
V_1	850	909	1206	1210	1044
V_2	884	1070	1100	1015	1017
Mean	867	989	1153	1112	1030

S.E. of marginal mean of R =55.9 lb./ac.
S.E. of marginal mean of V =39.5 lb./ac.
S.E. of body of table =78.9 lb./ac.

Crop :- Paddy. Ref :- M.P. 51(73).

Site :- Harsi Experimental Farm, Bagwai. Type :- 'CV'.

Object : - To find out suitable seed rate for broadcasted Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) F.Y.M. at 15 C.L./ac. (ii) (a) Clay loam. (b) Refer soil analysis, Bagwai. (iii) 24.7.1951. (iv) (a) Once ploughing and once *bakharing*. (b) Broadcast. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) One weeding. (ix) 22.48". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 seed rates : R_1=20, R_2=30, R_3=40 and R_4=50 srs./ac.
(2) 2 varieties . V_1=*basmati* (early) and V_2=*bhadaya* (early).

3. DESIGN :

(i) 4×2 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 12'×66'. (b) 9'×60'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Ordinary. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950 to 1951. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1047 lb./ac.
(ii) 299.5 lb./ac.
(iii) Main effects of R and V are highly significant. Interaction is not significant.
(iv) Av. yield of grain in lb./ac.

	N_1	N_2	N_3	N_4	Mean
V_1	860	1203	1260	1539	1215
V_2	774	887	855	995	878
Mean	817	1045	1058	1267	1047

S.E. of marginal mean of R = 86.5 lb./ac.
S.E. of marginal mean of V = 61.1 lb./ac.
S E. of body of table =122.2 lb./ac.

Crop :- Paddy (*Kharif*). Ref :- M.P. 52(67).

Site :- Govt. Seed and Demonstration Farm, Durg. Type :- 'CM'.

Object :—To study the effect of N and P_2O_5 on different methods of Paddy cultivation.

1. BASAL CONDITIONS :
(i) (a) to (e) N.A. (ii) (a) *Materi.* (b) N.A. (iii) As per treatments. (iv) (a) 3 ploughings. (b) As per treatments. (c) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weedings were done twice in *biasi* and broadcast plots. (ix) 45.88". (x) 19, 20.11.1952.

2. TREATMENTS :
All combinations of (1), (2) and (3)
(1) 3 methods of sowing :—M_1=Transplanted, M_2=*Biasi* on 27.6.1952. and M_3=Broadcast on 28.6.1952.
(2) 3 levels of N as A/S :— N_0=0, N_1=15 and N_2=30 lb./ac.
(3) 3 levels of P_2O_5 as Super :—P_0=0, P_1=15 and P_2=30 lb./ac.

3. DESIGN :
(i) 3^3 confd. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 33'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :
(i) Good growth. (ii) Negligible attack of bugs. (iii) Weight of grain. (iv) (a) 1952 to 1954. (b) N.A. (c) Nil. (v) (a) Raipur. (b) N.A. (vi) Nil. (yii) Confounding is not done properly, therefore the experiment is analysed as R.B.D.

5. RESULTS :
(I) 2251 lb./ec.
(ii) 321.5 lb./ac.
(iii) Main effects of N and P and Interaction MNP are significant. Interactions MN, MP and NP are highly significant.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
M_1	2148	2094	2354	2199	2151	2341	2104
M_2	2121	2398	2354	2210	1994	2144	2491
M_3	2234	2605	2194	2345	2288	2211	2535
Mean	2168	2366	2220	2251	2144	2232	2377
P_0	1974	2334	2124				
P_1	2114	2188	2394				
P_2	2414	2575	2141				

S.E. of any marginal mean =53.6 lb./ac.
S.E. of body of any table =92.8 lb./ac.

Crop :- Paddy (*Kharif*). Ref :- M.P. **53(81)**.

Site :- Govt. Seed and Demonstration. Farm, Durg. Type :- 'CM'.

Object :- To find the effect of N and P_2O_5 applied with different methods of sowing Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) N.A. (iv) (a) N.A. (b) As per treatments. (c) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

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

(1) 3 methods of sowing :— M_1 = Transplanting, M_2 = *Biasi* and M_3 = Broadcasting.
(2) 3 levels of N as A/S :— N_0 = 0, N_1 = 15 and N_2 = 30 lb./ac.
(3) 3 levels of P_2O_5 as Super : — P_0 = 0, P_1 = 15 and P_2 = 30 lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) N.A.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Weight of grain. (iv) (a) 1952—N.A. (b) N.A. (c) Nil. (v) (a) Raipur. (b) N.A. (vi) Nil. (vii) Experiment is analysed as R.B.D. Fact. as the layout of the expt. is not available.

5. RESULTS :

(i) 2244 lb./ac.
(ii) 292.7 lb./ac.
(iii) Main effect of M is not significant. Other effects and interactions are highly significant.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
M_1	2138	2088	2355	2193	2154	2321	2104
M_2	2154	2394	2141	2230	2021	2204	2465
M_3	2178	2561	2191	2310	2271	2194	2465
Mean	2157	2348	2229	2244	2149	2240	2345
P_0	1998	2328	2121				
P_1	2121	2161	2438				
P_2	2351	2555	2128				

S.E. of any marginal mean = 48.8 lb./ac.
S.E. of body of table = 84.5 lb./ac.

Crop :- Paddy. Ref :- M.P. **53(69)**.

Site :- Adhartal Farm, Jabalpore. Type :- 'CM'.

Object :—To find out the effect of different doses of manures applied with different methods of sowing.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Sehra*. (b) Refer soil analysis, Jabalpore. (iii) 27.7.1953/4.8.1953. (iv) (a) ploughing and levelling. (b) Transplanted. (c) —. (d) and (e) As per treatments. (v) F.Y.M. at 10 C L /ac. applied on 25.6.1953. (vi) *Lucha*i, *Gurmatia*, Burma No. 2 (late). (vii) Irrigated. (viii) 2 weedings. (ix) 24.71". (x) 14.12.1953 to 19.12.1953.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 2 doses of manures : M_1=A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P_2O_5 and M_2=A/S at 60 lb./ac. of N+Super at 60 lb./ac. of P_2O_5.

(2) 2 times of application of manures : T_1=full at transplanting and T_2=half at transplanting and half one month after.

Sub-plot treatments :

5 spacings and number of seedlings/hole : S_1=4″×4″ with 1 seedling/hole, S_2=6″×9″ with 2 seedlings/hole, S_3=9″×9″ with 2 seedlings/hole, S_4=6″×9″with 4 seedlings/hole and S_5=9″×9″ with 4 seedlings/hole.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 66′×13′. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1953 to 1955. (b) Yes. (c) N.A. (v) (a) Betul and Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3559 lb./ac.

(ii) (a) 876.8 lb./ac.

(b) 704.8 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	S_4	S_5	Mean	T_1	T_2
M_1	3788	3747	3268	3250	3416	3494	3505	3484
M_2	3614	3521	4092	3223	3672	3624	3615	3633
Mean	3701	3634	3680	3237	3544	3559	3560	3553
S_1	4028	3534	3534	3016	3686			
S_2	3373	3734	3826	3457	3401			

S E. of difference of two

1. M or T marginal means = 160.1 lb./ac.
2. S marginal means = 203.5 lb./ac.
3. S means at the same level of M or T = 287.7 lb./ac.
4. M or T means at the same level of S = 303.1 lb./ac.

Crop :- Paddy (*Kharif*). Ref :- M.P. 52(33).

Site :- Adhartal Farm, Jabalpore. Type :- 'CM'.

Object :—To find the economic ratio of N to P_2O_5 for different methods of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Sehra*. (b) Refer soil analysis, Jabalpore. (iii) M_1 and M_2 on 1, 2.8.1952 and M_3 on 17.7.1952. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:

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

(1) 3 methods of cultivation : M_1=Transplanting, M_2=*machowa*, and M_3=Broadcasting.

(2) 3 levels of N as A/S : N_0=0, N_1=15 and N_2=30 lb./ac.

(3) 3 levels of P_2O_5 as Super : P_0=0, P_1=15 and P_2=30 lb./ac.

3. DESIGN :

(i) 3^3 partially confounded. (ii) (a) 9 (b) N.A. (iii) 4 (only two replications are taken for analysis). (iv) (a) N.A. (b) 33′×16½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Immediately after transplanting operation heavy showers were received which resulted in washing out of some of the transplanted plots of replication III and IV. So re-transplanting was done on 8.8.1952. (ii) Attack of rice bugs noticed in all plots. All the plots were dusted with gammexane mixture uniformly at 20 lb./ac. (iii) Grain and straw yield. (iv) (a) 1952—N.A. (b) and (c) N.A. (v) (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1156 lb./ac.

(ii) 158.2 lb./ac.

(iii) Main effects of M, N and P are highly significant. Component of MNP is significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	M_1	M_2	M_3
P_0	865	1117	1244	1075	1276	1015	934
P_1	921	1211	1270	1134	1286	1066	1048
P_2	1197	1139	1446	1260	1435	1200	1146
Mean	994	1155	1320	1156	1333	1094	1043
M_1	1187	1288	1523				
M_2	974	1130	1177				
M_3	821	1048	1259				

S.E. of any marginal mean = 37.3 lb./ac.

S.E. of body of table = 64.6 lb./ac.

Crop :- Paddy. Ref :- M.P. 53(68).

Site :- Adarthal Farm, Jabalpore. Type :- 'CM'.

Object :--To find the suitable ratio of N to P_2O_5 with different methods of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra*. (b) Refer soil analysis, Jabalpore. (iii) 9.7.1953 for M_3, 19.7.1953 for M_2 and 6.8.1953 for M_1 (iv) (a) Ploughing. (b) As per treatments. (c) to (e) N.A. (v) N.A. (vi) Paddy No. 17 (early). (vii) Irrigated. (viii) N.A. (ix) 24.21" (x) 27, 28.10.1953.

2. TREATMENTS :

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

(1) 3 methods of cultivation : M_1 = Transplanting, M_2 = *machowa* and M_3 = Broadcasting,

(2) 3 levels of N as A/S : N_0 = 0, N_1 = 15, and N_2 = 30 lb./ac.

(3) 3 levels of P_2O_5 as Super : P_0 = 0, P_1 = 15 and P_2 = 30 lb./ac.

3. DESIGN :

(i) 3^3 Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) Nil. (vii) The yield of plot with treatment $N_0P_0M_3$ is zero. But no reason is given for zero yield. The analysis is performed taking the yield as zero.

5. RESULTS :

(i) 934 lb./ac.

(ii) 265.6 lb./ac.

(iii) Main effects of M, N and interaction MNP are highly significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	M_1	M_2	M_3
P_0	725	929	1102	919	1353	789	614
P_1	801	991	1070	554	1552	833	478
P_2	668	978	1136	928	1449	776	559
Mean	732	966	1103	934	1451	799	550
M_1	1231	1435	1688				
M_2	542	884	970				
M_3	421	580	651				

S.E. of any marginal mean =44.3 lb./ac.
S.E. of body of any table =76.5 lb./ac.

Crop :- Paddy. **Ref :- M.P. 53(53).**

Site :- Labhandi Farm, Raipur. **Type :- 'CM'.**

Object : -To study the effect of manures and cultural operations on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Dorsa.* (b) N.A. (iii) 10 to 17.7.1953. (iv) (a) Ploughing. (b) Transplanted. (c) —. (d) and (e) As per treatments. (v) Nil. (vi) *Luchai, Gurmatia,* Burma No. 2. (vii) Irrigated. (viii) 1 weeding and 2 interculturings. (ix) N.A. (x) 29.11.1953.

2. TREATMENTS ;

Main-plot treatments :

All combinations of (1) and (2)

(1) 2 manures : M_1=A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P_2O_5 and M_2=A/S at 40 lb./ac. of N+Super at 60 lb./ac. of P_2O_5.

(2) 2 times of applications : T_1=Full at transplanting and T_2=Half at transplanting and half one month after.

Sub-plot treatments :

5 spacings and seedlings/hole : $S_1=4''\times4''$ with one seedling/hole, $S_2=9''\times6''$ with 2 seedlings/hole, $S_3=9''\times6''$ with 4 seedlings/hole, $S_4=9''\times9''$ with 2 seedlings/hole and $S_5=9''\times9''$ with 4 seedlings/hole.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1953—1955. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 4440 lb./ac.
(ii) (a) 788.1 lb./ac.
(b) 619.7 lb./ac.
(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	S_4	S_5	Mean	M_1	M_2
T_1	4480	4690	4360	4580	4620	4546	4420	4672
T_2	3940	4310	4400	4560	4460	4334	4332	4336
Mean	4210	4500	4380	4570	4540	4440	4376	4504
M_1	4120	4620	4320	4440	4380			
M_2	4300	4380	4440	4700	4700			

S.E. of difference of two

1. M or T marginal means = 176.2 lb./ac.
2. S marginal means = 219.1 lb./ac.
3. S means at the same level of M or T = 309.8 lb./ac.
4. M or T means at the same level of S = 328.4 lb./ac.

Crop :- Wheat. (*Rabi*). **Ref :- M.P.51(41).**

Site :- Harsi Exptl. Farm, Bagwai. **Type :- 'M'.**

Object :—To find the response of C/N to Wheat crop in comparison to A/S.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, Bagwai. (iii) 16.12.1951. (iv) (a) Ploughing by tractor. *Bakharing*. (b) Drilling. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) Pb. C-591 (late). (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 doses of lime :—L_0=0 and L_1=200 lb./ac.

(2) 5 doses of N : N_0=0, N_1=20 lb./ac. of N as A/S, N_2=40 lb./ac. of N as A/S, N_3=20 lb./ac. of N as C/N. and N_4=40 lb./ac. of N as C/N.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 2. (iv) (a) 18'×96'. (b) 12'×90'. (v) 3' alround. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951—N.A. (b) N.A. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) The experiment was laid out in three replications. The crop in replication III was completely damaged by cattle.

5. RESULTS :

(i) 840 lb./ac.
(ii) 116 lb./ac.
(iii) Interaction N×L alone is significant.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
L_0	935	815	935	907	575	833
L_1	790	900	622	890	1035	847
Mean	862	857	778	898	805	840

S.E. of marginal mean of N = 58.00 lb./ac.
S.E. of marginal mean of L = 36.68 lb./ac.
S.E. of body of table = 82.05 lb./ac.

Crop :- Wheat. (*Rabi*) **Ref :-M.P. 52(56).**

Site :- Harsi. Expt. Farm, Bagwai. **Type :- 'M'.**

Object :—To find out optimum combination of N and P_2O_5 for irrigated Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Bagwai. (iii) 1, 2, 3.12.1952. (iv) (a) Ploughing. (b) to (e) N.A. (v) N.A. (vi) Pb. C-591 (late) (vii) Irrigated. (viii) Nil. (ix) 2.91". (x) N.A.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 5 doses of N : N_0=0, N_1=10, N_2=20 N_3=30 and N_4=40 lb./ac.

(2) 2 doses of P_2O_5 : P_0=No P_2O_5 and P_1=P_2O_5 applied.

3. DESIGN :

(i) 5×2 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 96'×10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) to (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 311.3 lb./ac.

(i) 54.18 lb./ac.

(ii) N, P and their interaction N×P are all significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
P_0	291.0	244.7	296.7	301.3	301.3	287.03
P_1	336.2	284.3	391.3	275.7	390.2	335.62
Mean	313.6	264.5	344.01	288.5	345.7	311.3

S.E. of marginal mean of N =15.69 lb./ac.
S.E. of marginal mean of P = 9.90 lb./ac.
S.E. of body of table =22.12 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- M.P. 51(72).**

Site :- Harsi Exptl. Farm, Bagwai. **Type :- 'M'.**

Object :—To find out a suitable manurial dose for Wheat under irrigation with a view to obtain maximum yield.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy and *Rabi* vegetables. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Bagwai. (iii) 7 to 29.11.1951. (iv) (a) In one field, where paddy was grown in previous season *bakharing* twice, ploughing by *chatonoga*, planking once ; ploughing by *desi* plough. In the field where vegetable was grown, the field was ploughed by *chotanoga*, planking twice and ploughing by *desi* plough. (b) to (e) N.A. (v) Sannhamp as G.M. crop sown in previous season and buried in the soil before sowing of wheat. (vi) C. 591 (late). (vii) Irrigated. (viii) Nil. (ix) 3.91". (x) N.A.

2. TREATMENTS :

1. No manure
2. 20 lb./ac. of N.
3. 40 lb /ac. of N.
4. 60 lb./ac. of N.
5. 80 lb./ac. of N.
6. Treat. 2+20 lb./ac. of P_5O_5.
7. Treat. 2+40 lb./ac. of P_2O_5.
8. Treat. 2+60 lb./ac. of P_2O_5.
9. Treat. 3+40 lb./ac. of P_2O_5.
10. Treat. 3+60 lb./ac. of P_2O_5.
11. Treat. 3+80 lb./ac. of P_2O_5.

Source of N for treats. 2 to 8 is A/S while for 9 to 11 A/S and G.N.C. is 1 : 1 ratio Source of P_2O_5 is Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 18'×96'. (b) 12'×90'. (v) 3' alround. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950 to 1951. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1264 lb./ac.
(ii) 180.1 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	954	7.	1266
2.	1032	8.	1312
3.	1101	9.	1654
4.	1068	10.	1460
5.	1005	11	1668
6.	1191		

S.E./mean =73.5 lb./ac.

Crop :- Wheat. Ref :- M.P. **51(62).**

Site :- Govt. Seed and Demonstration Farm, Betul. Type :- 'M'.

Object :—To find out the comparative value of decorticated and undecorticated cotton seed cake in their effect on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Morand* II. (b) Refer soil analysis, Betul. (iii) 4.11.1951. (iv) (a) 2 *bakharings* given in October 1951. (b) Sown by *nari* plough. (c) to (e) N.A. (v) 20 C.L./ac. of F.Y.M. (vi) Hy. 65 (early). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 21 to 23.3.1952.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as G.N.C.
3. 20 lb./ac. of N as A/S.
4. 20 lb./ac. of N as cotton seed cake decorticated.
5. 20 lb./ac. of N as cotton seed cake undecorticated.

3. DESIGN :

(i) 5×5 L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 33'×33'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1952. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 852.8 lb./ac.
(ii) 70.12 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	784
2.	936
3.	864
4.	912
5.	768

S.E./mean =31.88 lb./ac.

Crop :- Wheat. **Ref. :- M.P. 52(44).**

Site :- Govt. Seed and Demonstration Farm, Betul. **Type :- 'M'.**

Object :—To find out the comparative value of decorticated and undecorticated cotton seed cake in their effect on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Morand II.* (b) Refer soil analysis, Betul. (iii) 30.10.1952. (iv) (a) to (e) N.A. (v) 20 C.L./ac. of F.Y.M. (vi) Hy. 65 (early). (vii) Irrigated. (viii) Nil. (ix) 18.30". (x) 18.3.1953.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N_2 as G.N.C.
3. 20 lb./ac. of N_2 as A/S.
4. 20 lb./ac. of N_2 as Cotton seed cake decorticated.
5. 20 lb./ac. of N_2 as Cotton seed cate undecorticated.

3. DESIGN :

(i) 5×5 L. sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 33'×33'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Nil. (ii) Nil. (iii) Grain. (iv) (a) 1951 to 1952. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1090 lb./ac.
(ii) 144.4 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treeatment	Av. yield
1.	1048
2.	1200
3.	1064
4.	1080
5.	1056
S.E./means	64.60 lb./ac.

Corp. :- Wheat. **Ref. :- M.P. 53(33)**

Site :- Govt. Seed and Demonstration Farm, Betul. **Type :- 'M'**

Object :—To study the effect of N in different forms applied alone and in combination with P.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) *Morand II.* (b) Refer soil analysis, Betul. (iii) 2.11.1953. (iv) (a) As per local practice. (b) to (e) N.A. (v) N.A. (vi) Hy. 65. (vii) Unirrigated. (viii) N.A. (ix) 32.63". (x) 3.4.1954.

2. TREATMENTS :

1. Control (no manure)
2. 15 lb./ac. of N as A/S.
3. 15 lb./ac. of N as G.N.C.
4. 15 lb./ac. of P_2O_5 as single super.
5. 15 lb./ac. of N as A/S+15 lb /ac. of P_2O_5 as single Super.
6. 15 lb./ac. of N as A/S+15 lb./ac. of P_2O_5 as single Super.
7. 7½ lb./ac. of N as A/S+7½ lb./ac. of N as G.N.C.+15 lb./ac. of P_2O_5 as single Super.

G.N.C. applied one month before sowing while A/S and Super applied at sowing time.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) 39'×39'. (b) 33'×33'. (v) 3' alround. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) No. (b) and (c) N.A. (v) (a) Betul, Powarkheda, and Adhartal. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 283 lb./ac.
(ii) 48.8 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	212
2.	288
3.	302
4.	262
5.	336
6.	302
7.	280
S.E./mean	= 21.6 lb./ac.

Crop :- Wheat. **Ref :- M.P. 53 (35).**

Site :- Govt. Seed and Demonstration Farm, Betul. Type :- 'M'.

Object :—To compare the effect of C/N and A/S on irrigated Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c)N.A.(ii) (a) *Moraud* II. (b) Refer soil analysis, Betul. (iii) 6.11.1953. (iv) (a) 4 *Bakharings* as per local practice. (b) to (e) N.A. (v) NA. (vi) Hy 65 (early). (vii) Irrigated. (viii) N.A. (ix) 32.63" (x) 25.3.1954.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 levels of N : N_0=0, N_1=15 and N_2=30 lb /ac.
(2) 2 sources of N : S_1=A/S and S_2=C/N.

3. DESIGN :

(i) 3×2 Fact in R. B. D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) No. (b) and (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 915 lb./ac.
(ii) 158.5 lb./ac.
(iii) S and "control *vs* others" effects are highly significant while other effects are not significant.
(iv) Av yield of grain in lb./ac.

Control =856 lb./ac.

	N_1	N_2	Mean
S_1	1280	1144	1212
S_2	640	712	676
Mean	960	928	944

S.E. of any marginal mean or control mean =50.15 lb./ac.
S.E. of body of table =70.93 lb./ac.

Crop :- Wheat. **Ref :- M.P. 53 (36).**

Site :- Govt. Seed and Demonstrations. Farm, Betul. Type :- 'M'

Object :—To determine the optimum dose of N and P for Wheat.

1. BASAL CONDITIONS :

(i) (a) NA. (b) Wheat. (c) 40. C. L./ac. of F. Y. M. (ii) (a) *Morand* II (b) Refer soil analysis, Betul. (iii) 6.11.1963. (iv) (a) 4 *bakharings* as per local practice. (b) Drilled. (c) to (e) N.A. (v) F. Y. M. at 40 C.L./ac. (vi) Hy. 65. (vii) Irrigated. (viii) N.A. (ix) 32.63." (x) 26.3.1954.

2. TREATMENTS :

All combinations of (1) and (2) except N_2P_4 which is replaced by fertilizer mixture. (f.m.)
(1) 3 levels of N : N_0=0, N_1=15 and N_2=30 lb/ac.
(2) 5 levels of P_2O_5 : P_0=0, P_1=15, P_2=30, P_3=45 and P_4=60 lb/ac.
Fertilizer mixture=20.lb/ac. of G.N.C.+2md/ac. of A/S+20. lb/ac. of P_2O_5.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) N.A.

4. GENERAL :

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

5. RESULTS :

(i) 682.7 lbs./ac.
(ii) 172.8 lbs./ac.
(iii) The treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
$N_0 P_0$	520.1	$N_1 P_3$	706.7
$N_0 P_1$	613.4	$N_1 P_4$	672.4
$N_0 P_2$	680.1	$N_2 P_0$	713.4
$N_0 P_3$	706.7	$N_2 P_1$	660.1
$N_0 P_4$	620.1	$N_2 P_2$	746.8
$N_1 P_0$	733.4	$N_2 P_3$	720.1
$N_1 P_1$	666.7	(f.m.)	713.4
$N_1 P_2$	766.8		

S.E./mean. = 100.0 lb./ac

Crop :- Wheat. **Ref :- M.P. 50(20).**

Site :- Govt. Agri. Res. Farm, Bhilsa. **Type :- 'M'.**

Object :—To find the effect of different doses of N and P_2O_5 singly and in combination.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Heavy clay. (b) N.A. (iii) 4.11.1950. (iv) (a) 4 *bakharings*. (b) Seeds drilled. (e) 25 seers/ac. (d) Rows 12" apart. (e) N.A. (v) No. (vi) *Jalalia* (local). (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control (no manure).
2. 10 lb./ac. of N.
3. 20 lb./ac. of N.
4. 30 lb./ac. of N.
5. 40 lb./ac. of N.
2. 10 lb./ac. of N+10 lb./ac. of P_2O_5.
7. 10 lb./ac. of N+20 lb./ac. of P_2O_5.
8. 10 lb./ac. of N+30 lb./ac. of P_2O_5.
9. 20 lb./ac. of N+20 lb./ac. of P_2O_5.
10. 20 lb./ac. of N+30 lb./ac. of P_2O_5
11. 20 lb./ac. of N+40 lb /ac. of P_2O_5

Source of N for treatments 2 to 8 is A/S while treatments 9 to 11 is mixture of A/S and G.N C. in 1 : 1 ratio. Source of P_2O_5 is Super. Manures drilled in 3 replications and mixed with the seed while in the other 3, manures drilled between rows just before or immediately after sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 16'×96'. (b) 12'×90'. (v) 3' alround. (vi) Yes.

4. GENERAL :

(i) Due to poor winter showers the yield was not good. (ii) N.A. (iii) Grain yield. (iv) 1950 to 1951. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) In three blocks the manures drilled between rows just before or immediately after sowing 3" deep. In the remaining 3 blocks the manures were drilled mixed with the seed.

5. RESULTS :

(i) 365.43 lb./ac.
(ii) 79.65 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	294.0	7.	313.7
2.	370.4	8.	338.1
3.	421.1	9.	353.6
4.	380.1	10.	340.5
5.	409.4	11.	366.2
6.	432.6		

S.E./mean =32.67 lb./ac.

Crop :- Wheat. Ref :- M.P. 51(8).

Site :- Govt. Agri. Res. Farm, Bhilsa. Type :- 'M'.

Object :—To find out suitable combination of N and P_2O_5 for Wheat under dry conditions.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Heavy clay. (b) N.A. (iii) 14.10.1951. (iv) (a) 6 *bakhartiyas*. (b) Seeds drilled. (c) 25 seers./ac. (d) Rows 1' apart. (e) N.A. (v) N.A. (vi) *Jalalia*. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 5.3.1952.

2. TREATMENTS :

1. Control (no manure).
2. 10 lb./ac. of N.
3. 20 lb./ac. of N.
4. 30 lb./ac. of N.
5. 40 lb./ac. of N.
6. 10 lb./ac. of N+10 lb./ac. of P_2O_5.
7. 10 lb./ac. of N+20 lb./ac. of P_2O_5.
8. 10 lb./ac. of N+30 lb./ac. of P_2O_5.
9. 20 lb./ac. of N+20 lb./ac. of P_2O_5.
10. 20 lb./ac. of N+30 lb./ac. of P_2O_5.
11. 20 lb./ac. of N+40 lb./ac. of P_2O_5.

Source of N for treatments 2 to 8 is A/S, while for treatments 9 to 11 is mixture of A/S and G.N.C. in 1 : 1 ratio. P_2O_5 applied as Super. Manures applied in 3 replications just after sowing and in 3 replications drilled with seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 3 for each time of application. (iv) (a) 10'×96'. (b) 12'×90'. (v) 2'×3'. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950 to 1951. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) The method of application of manures is different for different blocks. The experiment is treated as two seperate experiments depending on the method of application of manures.

5. RESULTS :

Manures drilled with seed.

(i) 130.2 lb./ac.
(ii) 34.28 lb./ac.
(iii) The treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	128.5	7.	160.5
2.	213.3	8.	126.7
3.	146.1	9.	80.6
4.	143.5	10.	102.4
5.	114.2	11.	57.9
6.	157.9		

S.E./mean =19.79 lb./ac.

Manures applied just after sowing.

(i) 174.93 lb./ac.
(ii) 50.01 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	275.7	7.	200.7
2.	138.6	8.	177.9
3.	172.2	9.	169.6
4.	157.9	10.	154.4
5.	116.7	11.	215.0
6.	147.7		

S.E./mean =28.87 lb./ac.

Crop :- Wheat. Ref :- M.P. 43(36).

Site :- Central Agri. Res. Farm, Nabi bagh, Bhopal. Type :- 'M'.

Object :—To study the effect of A/S and Super on Wheat.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 28.10.1948. (iv) (a) N.A. (b) Seeds drilled behind the plough. (c) 40 srs./ac. (d) and (e) N.A. (v) N.A. (vi) C-591. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 19.3.1949.

2. TREATMENTS :

1. Control (no manure).
2. A/S at 1 md./ac. drilled with seed.
3. Super at 1 md./ac. drilled with seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Manured plots gave pale yellow plants at germination. But after 3-4 days they came to the normal colour. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 545.23 lb./ac.
(ii) 58.35 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	591.2
2.	504.0
3.	542.6
S.E./mean	= 29.17 lb./ac.

Crop :- Wheat (*Rabi*). Ref :- M.P. 51(79).

Site :- Govt. Exptl. Farm, Chindwara. Type :- 'M'.

Object :—To compare the effect of cotton cake on Wheat with that of G.N.C. and A/S.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a), (b) N.A. (iii) 3.11.1951. (iv) (a) to (e) N.A. (v) N.A. (vi) Hy. 11-6 (early). (vii) N.A. (viii) N.A. (ix) N.A. (x) 24.3.1952.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as G.N.C.
3. 20 lb./ac. of N as decorticated cotton cake.
4. 20 lb./ac. of N as undecorticated cotton cake.
5. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a), (b) 1/40 ac. (v) Nil. (vi) No.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1951– N.A. (b) N.A. (c) Nil. (v) (a) Powarkheda. (b) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 654.4 lb./ac.
(ii) 56.8 lb./ac.
(iii) Treatments do not differ significantly.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	612
2.	688
3.	672
4.	648
5.	652
S.E./mean	=25.4 lb./ac.

Crop :-Wheat (*Rabi*). Ref :- M.P. 52(70).

Site :-Govt. Exptl. Farm, Chindwara. Type :- 'M'.

Object :—To compare the effect of C/N on Wheat with lime and A/S.

1. BASAL CONDITIONS :

(i) (a) to (e) N.A. (ii) (a) *Kabar*. (b) N.A. (iii) 7.11.1952. (iv) (a) to (e) N.A. (v) N.A. (vi) Hy 5-7-2 in 3 replications and Hy 65-4 in other 3 replications. (vii) to (ix) N.A. (x) 11.3.1953.

2. TREATMENTS :

1. No manure.
2. lime at 200 lb./ac.
3. 20 lb./ac. of N as A/S.
4. 40 lb./ac. of N as A/S.
5. 20 lb./ac. of N as C/N.
6. 40 lb./ac. of N as C/N.

Manures drilled with seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 6 (3 replications for each variety). (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) N.A.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1952—N.A. (b) N.A. (c) Nil. (v) (a) Raipur, Powerkheda. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

Variety Hy 5-7-2

(i) 394.5 lb./ac.
(ii) 58.88 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	476.4
2.	378.0
3.	504.8
4.	446.4
5.	359.7
6.	201.5
S.E./mean	=34.12 lb./ac.

Variety Hy 65-4

(i) 449.2 lb./ac.
(ii) 97.27 lb./ac.
(iii) Treatments are highly significant different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	409.9
2.	529.9
3.	608.0
4.	536.4
5.	384.8
6.	226.5
S.E./mean	=56.16 lb./ac.

Crop :-Wheat (*Rabi*). Ref :-M.P. 53(97).

Site :-Govt. Exptl. Farm, Chindwara. Type :- 'M'.

Object :—To study the effect of C/N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) to (iv) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N_0=0, N_1=15 and N_2=30 lb./ac.

(2) 2 sources of N : S_1=C/N and S_2=A/S.

3. DESIGN :

(i) 3×2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40 ac. (v) and (vi) N.A.

4. GENERAL :

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

5. RESULTS :

(i) 324 lb./ac.

(ii) 127.0 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

Control =350 lb./ac.

	S_1	S_2	Mean
N_1	333	392	363
N_2	197	345	271
Mean	265	369	317

S E. of any marginal mean =40.17 lb./ac.

S.E. of body of table =56.80 lb./ac.

Crop :- Wheat. Ref. M.P. 53 (30).

Site :-Govt Seed and Demonstration Farm, Damoh. Type :- 'M'.

Object :—To determine the effect of Sodium nitrate on Wheat.

1. BASAL CONDITIONS :

(i) (a) N A. (b) Wheat. (c) Nil. (ii) (a) *Kabar.* (b) N.A. (iii) 26.10.1953. (iv) (a) *Bakharing.* (b) Drilling. (c) 80 lb./ac. (d) and (e) N.A. (v) Nil. (vi) 11.6 (medium). (vii) Unirrigated. (viii) Nil. (ix) 2 83". (x) 3.4.1954.

2. TREATMENTS :

1. Control (two plots in each block).
2. 15 lb /ac. of N as A/S.
3. 30 lb./ac. of N as A/S.
4. 15 lb./ac. of N as C/N.
5. 30 lb /ac. of N as C/N.
6. 2 mds. of G.N.C.+$\frac{2}{3}$ md./ac. of A/S.

3. DESIGN :

(i) R.B D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) and (b) 50'-8"×2'-6". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) No. (b) and (c) Nil. (v) (a) Jabalpore. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 347.9 lb./ac.

(ii) 89.2 lb./ac.

(iii) Treatments differ highly significantly.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	336.1
2.	475.4
3.	470.9
4.	296.9
5.	162.4
6.	357.8

S.E./mean for treatments 2 to 6 = 39.9 lb./ac.
S.E./mean for treatment 1 = 28.21 lb./ac.

Crop :- Wheat. Ref :- M.P. 51(40).

Site :- Govt. Seed and Demonstration Farm, Damoh. Type :- 'M'.

Object :—To study the effect of cotton seed cake on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar*. (b) N.A. (iii) 21.10.1951. (iv) (a) 5 *bakharings*. (b) Seeds drilled. (c) to (e) N.A. (v) N.A. (vi) A-11. (vii) N.A. (viii) N.A. (ix) N.A. (x) 25.3.1952

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as G.N.C.
3. 20 lb./ac. of N as decorticated cotton seed cake.
4. 20 lb./ac. of N as A/S.
5. 20 lb./ac. of N as undecorticated cotton seed cake.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 33′ × 33′. (v) Nil. (vi) No.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) No. (v) (a) Jabalpore. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 409.5 lb./ac.
(ii) 22.64 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	389.0
2.	428.0
3.	400.5
4.	429.4
5.	400.5

S.E./mean = 10.1 lb./ac.

Crop :- Wheat (*Rabi*). Ref :- M.P. 53(84).

Site :- Govt. Seed and Demonstration Farm, Dindori. Type :- 'M'.

Object :—To compare the effect of different manures and fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) to (iv) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS :

1. No manure.
2. 20 lb./ac. of N as A/S.
3. 10 lb./ac. of N as G.N.C.+10 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
4. 20 lb./ac. of N as F.Y.M.
5. 10 lb./ac. of N as F.Y.M.+10 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) N.A.

4. GENERAL :

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

5. RESULTS :

(i) 700 lb./ac.
(ii) 23.96 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	660
2.	741
3.	698
4.	699
5.	682
6.	722
S.E./mean	=9.78 lb./ac.

Crop :- Wheat (*Rabi*). Ref :- M.P. 53(85).

Site :- Govt. Seed and Demonstration Farm, Dindori. Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) to (iv) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 levels of N : N_0=0, N_1=15, N_2=30 lb./ac.
(2) 2 sources of N : S_1=C/N and S_2=A/S.

3. DESIGN :

(i) 3×2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 66'×16½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) N.A. (vii) N.A.

5. RESULTS :

(i) 348 lb./ac.
(ii) 64.45 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

Control =332 lb./ac.

	S_1	S_2	Mean
N_1	329	351	340
N_2	367	361	364
Mean	348	356	352

S.E. of any marginal mean =18.60 lb./ac.
S.E. of body of table =26.31 lb./ac.

Crop :- Wheat (*Rabi*). Ref :- M.P. 52(64).

Site :- Central Res. Farm, Gwalior. Type :- 'M'.

Object :—To find out suitable combination of N and P_2O_5 for Wheat crop under irrigated condition .

1. BASAL CONDITIONS :

(i) N.A. (ii) N.A. (iii) N.A. (iv) N.A. (v) N.A. (vi) Pbc. 591. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of P_2O_5 as Super : P_0=0 and P_1=20 lb./ac.

(2) 5 levels of N as A/S : N_0=0, N_1=10, N_2=20, N_3=30 and N_4=40 lb./ac.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 18'×96'. (b) 12'×90'. (v) 3' alround. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1246 lb./ac.

(ii) 409.2 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	N_4	Mean
P_0	1372	1032	1108	1283	1372	1233
P_1	1200	1467	1269	1248	1113	1259
Mean	1286	1249	1188	1265	1242	1246

S.E. of N marginal means =118.1 lb /ac.
S.E. of P marginal means = 74.7 lb./ac.
S.E. of body of table =167.0 lb./ac.

Crop :- Wheat. Ref :- M.P. 50(58).

Site :- Central Res. Farm, Gwalior. Type :- 'M'.

Object :—To find out suitable manurial dose for Wheat under irrigation.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) Sannhemp for G.M. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 13.11.1950. (iv) (a) Disc harrowing, ploughing by *sabul* and *desi* plough. (b) Seeds drilled. (c) 80 lb./ac. (d) 12". (e) N.A. (v) Sannhemp as G.M. (vi) Pbc.— 591. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N.
3. 40 lb./ac. of N.
4. 60 lb./ac. of N.
5. 80 lb /ac. of N
6. 20 lb /ac. of N+20 lb./ac. of P_2O_5.
7. 20 lb./ac. of N+40 lb./ac. of P_2O_5.
8. 20 lb./ac. of N+60 lb./ac. of P_2O_5.
9. 40 lb./ac. of N+40 lb./ac. of P_2O_5.
10. 40 lb./ac. of N+60 lb./ac. of P_2O_5.
11. 40 lb./ac. of N+80 lb./ac. of P_2O_5.

Source of N for treatments 2 to 8 is A/S while for 9 to 11 is A/S and G.N.C. in equal ratios. P_2O_5 as Super. Manures applied on 10.4.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) 78'×132'. (iii) 6. (iv) (a) 78'×12'. (b) 72'×8'. (v) 3'×2'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Percentage germination and yield of wheat grain. (iv) (a) 1950 to 1951. (b) Nil. (c) N.A. (v) (a) Indore. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2485 lb./ac.
(ii) 403.2 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	2559	7.	2600
2.	2419	8.	2600
3.	2403	9.	2460
4.	2435	10.	2567
5.	2345	11.	2542
6.	2403		

S.E./mean =164.6 lb./ac.

Crop :- Wheat. Ref :- M.P. 51(51).

Site :- Central Res. Farm, Gwalior. Type :- 'M'.

Object :—To find out a suitable manurial dose for Wheat under irrigation with a view to obtain maximum out turn.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 6.12.1951, (iv) (a) *desi* ploughing and *patella*. (b) N.A. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) C-591 (medium). (vii) Irrigated. (viii) N.A. (ix) 2.12". (x) N.A.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N.
3. 40 lb./ac. of N.
4. 60 lb./ac. of N.
5. 80 lb./ac. of N.
6. 20 lb./ac. of N+20 lb./ac. of P_2O_5.
7. 20 lb./ac. of N+40 lb./ac. of P_2O_5.
8. 20 lb./ac. of N+60 lb./ac. of P_2O_5.
9. 40 lb./ac. of N+40 lb./ac. of P_2O_5.
10. 40 lb./ac. of N+60 lb./ac. of P_2O_5.
11. 40 lb./ac. of N+80 lb /ac. of P_2O_5.

Source of N for treatments 2 to 8 is A/S while for treatments 9 to 11 is A/S and G.N.C. in 1 : 1 ratio. P_2O_5 as Super. Manures applied in 3 replications before sowing and in 3 replications it is applied a month after sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 3 for each time of application of fertilizers. (iv) (a) 13'×96'. (b) 12'×90'. (v) 3' around. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1950-51—N.A. (b) to (c) N.A. (v) (a) Bagwai. (b) N.A. (vi) Crop was damaged to an extent of about 5% on an avarage by hails. (vii) Nil.

5. RESULTS :

Manured before sowing

(i) 349.03 lb./ac.
(ii) 48.85 lb./ac.
(iii) Treatments do not differ significantly.

Manured a month after sowing

(i) 374.38 lb./ac.
(ii) 63.20 lb./ac.
(iii) Treatments do not differ significantly.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	324.0
2.	380.8
3.	385.8
4.	360.7
5.	327.3
6.	329.0
7.	324.0
8.	344.0
9.	360.7
10.	359.0
11.	344.0
S.E./mean	=28.20 lb./ac.

(iv) Av. yield of grain in lb./ac

Treatment	Av. yield
1.	342.3
2.	400.8
3.	407.5
4.	349.0
5.	330.8
6.	4 0.8
7.	362.4
8.	364.1
9.	357.4
10.	412.5
11.	333.7
S.E./mean	=36.50 lb./ac.

Crop :- Wheat. Ref :- M P. 59(56).

Site :- Central Res. Farm, Gwalior. Type :- 'M'.

Object :—To find out suitable green manuring crop and compare it with F.Y.M. as a manure for Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat and G.M. crop. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 2.11.1950. (iv) (a) Ploughing, and discing. (b) Seeds drilled. (c) 40 seers/ac. (d) 12". (e) N.A. (v) G.M. crop sown on 2.8.1950 and ploughed in on 23.9.1950. (vi) Pb.C. 591. (vii) Irrigated. (viii) N.A. (ix) 1.81". (x) 4.4.1951.

2. TREATMENTS :

1. No manure.
2. *Udid* at 40 lb./ac.
3. *Moong* at 40 lb./ac.
4. *Guar* at 50 lb./ac.
5. Sannhemp at 80 lb./ac.
6. F.Y.M. at 10 C.L./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 84'×116'. (iii) 4. (iv) (a) 116'×14'. (b) 110'×8'. (v) 3' alround. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1954. (b) N.A. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1497 lb./ac.
(ii) 279.8 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1720
2.	1423
3.	1802
4.	1580
5.	1210
6.	1251
S.E./mean	=139.9 lb./ac.

Crop :- Wheat. Ref :- M.P. 51(45).

Site :- Central Res. Farm, Gwalior. Type :- 'M'.

Object :—To find out a suitable green manure for Wheat and compare it with F.Y.M.

1. BASAL CONDITIONS :

(a) N.A. (b) As per treatments. (c) N.A. (ii) (a) Sandy loam (b) Refer soil analysis, Gwalior. (iii) 15.11.1951. (iv) (a) *Desi* plough and *patella*. (b) N.A. (c) N.A. (d) 12". (e) N.A. (v) Nil. (vi) Pb. C-591. (vii) Irrigated. (viii) N.A. (ix) 2.12". (x) N.A.

2. TREATMENTS :

1. No manure.
2. *Udid* as G.M. at 40 lb./ac. seedrate broadcasted.
3. *Moong* as G.M. at 40 lb./ac. seedrate broadcasted.
4. *Guar* as G.M. at 50 lb./ac. seedrate broadeasted.
5. Sannhemp as G.M. at 80 lb./ac. seedrate broadcasted
6. F.Y.M. at 10 C.L./ac. given to wheat.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 14'×116'. (b) 8'×110'. (v) 3' alround. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1950 to 1954. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1583 lb./ac.
(ii) 129.0 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1491
2.	1658
3.	1646
4.	1565
5.	1609
6.	1528

S.E./mean =64.50 lb./ac.

Crop :- Wheat. Ref :- M.P. 52(51).

Site :- Central Res. Farm, Gwalior. Type :- 'M'.

Object :—To find out a suitable G.M. crop for Wheat and compare it with F.Y.M.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) As per treatments. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) N.A. (iv) (a) N.A. (b) Seeds drilled. (c) 40 seer/ac. (d) 12". (e) N.A. (v) Nil. (vi) Pb. C-591. (vii) N.A. (viii) N.A. (ix) 3.26". (x) N.A.

2. TREATMENTS :

1. No manure.
2. *Udid* as G.M., seedrate 40 lb./ac.
3. *Moong* as G.M., seedrate 40 lb./ac.
4. *Guar* as G.M., seedrate 60 lb./ac.
5. Soyabeans as G.M., seedrate 50 lb./ac.
6. Sannhemp, seedrate 80 lb./ac.
7. F.Y.M. at 10 C.L./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) 116'×84'. (iii) 4. (iv) (a) 116'×12'. (b) 110'×8'. (v) 3' alround. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1954. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Yield data and S.E.—N.A.

5. RESULTS :

(i) 1271 lb./ac.
(ii) N.A.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1019
2.	1411
3.	1279
4.	1428
5.	1372
6.	1174
7.	1212
S.E./mean	=N.A.

Crop :- Wheat. Ref :- M.P. 53(72).

Site :- Central Res. Farm, Gwalior. Type :- 'M'.

Object :—To find out suitable G.M. crop for Wheat.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) G.M. crops. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 29.12.1953. (iv) (a) *Bakharing*. (b) to (e) N.A. (v) N.A. (vi) C-591. (vii) Irrigated. (viii) N.A. (ix) 2.13". (x) N.A.

2. TREATMENTS :

1. No manure.
2. *Udid* at seed rate of 40 lb./ac.
3. *Moong* at seed rate of 40 lb./ac.
4. *Guar* at seed rate of 50 lb./ac.
5. Soyabeans at seed rate of 50 lb./ac.
6. Sannhemp at seed rate of 80 lb./ac.
7. F.Y.M. at 10 C.L./ac.

Green manure crop sown on 21.7.1953, buried in by ploughing on 15.9.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 108'×6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1954. (b) No. (c) N.A. (v) (a) Nil. (b) N.A. (vi) N.A. (vii) The yield is very poor.

5. RESULTS :

(i) 541 lb./ac.
(ii) 110.3 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	528
2.	584
3.	504
4.	620
5.	509
6.	571
7.	470
S.E./mean	= 55.13 lb./ac.

Crop :- Wheat. Ref :- M.P. 50(57).

Site :- Central Res. Farm, Gwalior. Type :- 'M'.

Object :—To find the optimum seedrate for sannhemp for green manuring, the response to G.M. being judged by the out turn of Wheat crop following G.M.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sannhemp for G.M. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 31.10.1950. (iv) (a) *Sabul* ploughing and discing. Sann was ploughed in on 23.9.1950. (b) Drilled. (c) 40 seers./ac. (d) 12". (e) N.A. (v) Nil. (vi) Pb. C-591, (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

6 seedrates of sannhemp : G_0=0, G_1=40, G_2=60, G_3=80, G_4=100 and G_5=120 lb./ac.
Sannhemp grown just before wheat sowing on 31.7.1950 to serve as green manuring.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 126'×108'. (iii) 4. (iv) (a) 126'×18'. (b) 120'×12'. (v) 3' alround. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Green weight of sannhemp added to the soil and grain yield. (iv) (a)1950 to 1952. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Yield data—N.A.

5. RESULTS :

(i) 2604 lb./ac.
(ii) 131.6 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
G_0	2559
G_1	2691
G_2	2559
G_3	2765
G_4	2501
G_5	2551

S.E./mean =65.8 lb./ac.

Crop :- Wheat. Ref :- M.P. 51(48).

Site :- Central Res. Farm, Gwalior. Type :- 'M'.

Object :—To find the optimum seedrate of Sannhemp for G.M, the response of G.M. to be measured by the out turn of subsequent crop of Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sannhemp for G.M. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 2.12.1951. (iv) (a) *Desi* ploughing and *patella*. (b) N.A. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) Pb. C-591 (medium). (vii) Irrigated. (viii) N.A. (ix) 2.12". (x) April 1952.

2. TREATMENTS :

6 seedrates of Sannhemp : G_0=0, G_1=40, G_2=60 G_3=80, G_4=100 and G_5=120 lb /ac.
Sannhemp grown just before wheat sowing on 31.7.1950 to serve as G.M.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 108'×126'. (iii) 4. (iv) (a) 18'×126'. (b) 12'×120'. (v) 3' alround. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1950 to 1952. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) 40% damage by hails.

5. RESULTS :

(i) 690.2 lb./ac.
(ii) 70.79 lb./ac.
(iii) Treatments do not differ significantly.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
G_0	648.3
G_1	688.0
G_2	669.1
G_3	699.3
G_4	720.1
G_5	716.3
S.E./mean	±35.39 lb./ac.

Crop :-Wheat. Ref :-M.P. 52(60).

Site :-Central Res. Farm, Gwalior. Type :-'M'.

Object :— To find out the optimum seedrate of sannhemp for G.M. the response of G.M. to be judged by the out turn of subsequent crop of Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sannhemp for G.M. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis. Gwalior. (iii) N.A. (iv) (a) N.A. (b) Seeds drilled. (c) N.A. (d) 12". (e) N.A. (v) N.A. (vi) Pb. C-591 (vii) to (x) N.A.

2. TREATMENTS :

6 seedrates of sannhemp : G_0=0, G_1=40, G_2=60, G_3=80, G_4=100 and G_5=120 lb./ac.
Sannhemp sown on 14.7.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 126'×108'. (iii) 4. (iv) (a) 126'×18'. (b) 120'×12'. (v) 3 rows on both sides and 3' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1952. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1883 lb./ac.
(ii) 287.1 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield.
G_0	2005
G_1	2110
G_2	1853
G_3	1660
G_4	1894
G_5	1773
S.E./mean	±143.5 lb./ac.

Crop :- Wheat (*Rabi*). Ref :- M.P. 53(74).

Site :- Central Res. Farm, Gwalior. Type :- 'M'.

Object :—To find out suitable seedrate for sannhemp for G.M. and the effect of application of P_2O_5 on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sannhemp for G.M. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 24.11.1953. (iv) (a) N.A. (b) Seeds drilled. (c) 80 lb./ac. (d) Rows 12" apart. (e) N.A. (v) N.A. (vi) C-591. (vii) Irrigated. (viii) N.A. (ix) 2.13". (x) 22.3.1954.

2. TREATMENTS :

Main-plot treatments :

6 levels of seedrate for sannhemp : G_0=0, G_1=40, O_2=60, G_3=80, G_4=100 and G_5=120 lb./ac.

Sub-plot treatments :

2 levels of P_2O_5 : P_0=0 and P_1=40 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 55′×12′. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) to (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
G_0	1176	P_0	1329
G_1	1403	P_1	1391
G_2	1409	G.M.	1360
G_3	1365	S.E./mean	=11.66 lb./ac.
G_4	1411	Significance	Not significant.
G_5	1396		
G.M.	1360		
S.E./mean	= 33.6 lb./ac.		
Significance	Not significant.		

Crop :- Wheat (*Rabi*). **Ref :- M.P. 53(56).**

Site :- Central Res. Farm, Gwalior. **Type :- 'M'.**

Object :—To find the effect of different doses of B.M. on the growth and yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (e) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 23.12.1953. (iv) (a) N.A. (b) Seeds drilled. (c) 80 lb./ac. (d) 12″. (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 2.13″. (x) 25.4.1954.

2. TREATMENTS :

4 levels of P_2O_5 : P_0=0, P_1=40, P_2=80 and P_3=120 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 75′×80′. (iii) 6. (iv) (a) 80′×18′. (b) 72′×12′. (v) 3′×4′. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 673.5 lb./ac.

(ii) 189.23 lb./ac.

(iii) Treatments do not differ significantly.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
P_0	762.0
P_1	620.5
P_2	606.2
P_3	705.2
S.E./mean	=77.11 lb./ac.

Crop :-Wheat. Ref :-M.P. 53(57).

Site :-Central Res. Farm, Gwalior. Type:- 'M'.

Object :—To find the best dose of fertilizers for irrigated Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 22.12.1953. (iv) (a) N.A. (b) Seeds drilled. (c) 40 seer/ac. (d) 12". (e) N.A. (v) N.A. (vi) NP 710 (medium). (vii) Irrigated. (viii) N.A. (ix) 2.13". (x) 3.4.1954.

2. TREATMENTS :

Main-plot treatments :

3 levels of P_2O_5 as Super : $P_0=0$, $P_1=30$ and $P_2=60$ lb./ac.

Sub-plot treatments :

2 times of application of A/S : T_1=A/S applied at the time of first irrigation and $T_2=\frac{1}{2}$ A/S applied at the time of first irrigation and $\frac{1}{2}$ at the stage of flowering.

Sub-sub-plot treatments :

5 doses of N as A/S : $N_0=0$, $N_1=20$, $N_2=40$, $N_3=60$ and $N_4=80$ lb./ac.

P_2O_5 applied on 21.12.1953.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block, 2 sub-plots/main-plot and 5 sub-sub plots/sub-plot. (b) 165'×84'. (iii) 3. (iv) (a) Main-plot : 165'×28', sub-plot : 165'×14' and sub-sub-plot 33'×14'. (b) Sub-sub-plot : 27'×10'. (v) 3'×2'. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield (iv) (a) 1953-1954. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 341.0 lb./ac.

(ii) (a) 313.9 lb./ac.
(b) 97.60 lb./ac.
(c) 94.06 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	N_4	Mean	T_1	T_2
M_1	174	258	289	215	235	234	228	240
M_2	346	302	389	406	437	376	414	338
M_3	443	376	484	396	362	412	430	395
Mean	321	312	387	339	345	341	357	324
T_1	302	327	414	380	363			
T_2	340	297	360	298	327			

S.E. of the difference of two

1. P marginal means	=81.06 lb /ac.
2. T marginal means	=20.58 lb./ac.
3. N marginal means	=31.35 lb./ac.
4. T means at the same level of P	=35.64 lb./ac.
5. P means at the same level of T	=84.88 lb /ac.
6. N means at the same level of P	=54.37 lb./ac.
7. P means at the same level of N	=94.54 lb./ac.
8. N means at the same level of T	=44.27 lb./ac.
9. T means at the same level of N	=44.69 lb./ac.

Crop :-Wheat. **Ref :-M.P. 51(46).**

Site :-Central Res. Farm, Gwalior. **Type :-'M'.**

Object :—To find out the response of Sodium Nitrate to Wheat crop in comparison to A/S.

1. BASAL CONDITIONS :

(i) N.A. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 20.11.1951. (iv) (a) *Sabul* and *desi* plough and *patella*. (b) N.A. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) Pb. C-591. (vii) Irrigated. (viii) N.A. (ix) 2.52". (x) 7.4.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 doses of lime : L_0=0 and L_1=200 lb./ac.

(2) 5 doses of N : N_0=0, N_1=20 lb./ac. of N as A/S, N_2=40 lb./ac. of N as A/S, N_3=20 lb./ac. of N as C/N and N_4=40 lb./ac. of N as C/N.

3. DESIGN :

(i) 5×2 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 18'×96'. (b) 12'×90'. (v) 3' around. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951-N.A. (b) and (c) N.A. (v) (a) Gwalior. Bagwai, Indore. (b) N.A. (vi) 60% damage due to hails. (vii) Nil.

5. RESULTS :

(i) 409.9 lb./ac.
(ii) 70.15 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	N_4	Mean
L_0	348.7	466.2	445.0	387.5	337.5	397.0
L_1	367.5	405.0	437.5	443.8	460.0	422.8
Mean	358.1	435.6	441.2	415.6	388.7	409.9

S.E. of marginal mean of N =24.80 lb./ac.
S.E. of marginal mean of L =15.69 lb./ac.
S.E. of body of table =35.07 lb./ac.

Crop :- Wheat. **Ref :- M.P. 51(34).**

Site :- Adhartal Farm, Jabalpore. **Type :- 'M'.**

Object :—To see the comparative effect of blood meal on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar*. (b) Refer soil analysis, Jabalpore. (iii) 23.10.1951. (iv) (a) *Bakharing*. (b) to (e) N.A. (v) N.A. (vi) A.O. 90 (medium). (vii) N.A. (viii) N.A. (ix) NA. (x) 9.4.1952.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as F.Y.M.
3. 20 lb./ac. of N as bloodmeal.
4. 20 lb./ac. of N as G.N.C.
5. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 1/40 ac. (b) 33'×16½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good in the beginning. Later crop suffered for want of moisture in the soil. Few patches in replication III due to whithering of plant. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1951 to 1955. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Season not favourable for the crop. Yield of wheat is poor.

5. RESULTS :

(i) 262.4 lb./ac.
(ii) 31.52 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	212.6
2.	252.2
3.	322.4
4.	212.6
5.	312.2

S.E./mean = 15.76 lb./ac.

Crop :- Wheat. Ref :- M.P. 52(24).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the effect of bloodmeal in comparison with other manures and fertilizers.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii (a) *Kabar*. (b) Refer soil analysis, Jabalpore. (iii) 30.10.1952. (iv) (a) and (b) N.A. (c) 80 lb /ac. (d) and (e) N.A. (v) N.A. (vi) A.O. 90 (medium). (vii) N.A. (viii) N.A. (ix) N.A. (x) 31.3.1953.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as F.Y.M.
3. 20 lb./ac. of N as bloodmeal.
4. 20 lb./ac. of N as G.N.C.
5. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 66′×16½′. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination fairly satisfactory. Crop was poor in some plots. (ii) N.A. (iii) Grain and straw yield. (v) (a) 1951 to1955. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 245.9 lb./ac.
(ii) 38.48 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	198.6
2.	207.4
3.	243.6
4.	267.4
5.	312.4

S.E./mean = 19.24 lb./ac.

Crop :- Wheat. Ref :- M.P. 53(60).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the effect of bloodmeal in comparison with other manures and fertilizers.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar* 2. (b) Refer soil analysis, Jabalpore. (iii) 29.10.1953. (iv) (a) *Bakharing*. (b) Drilled. (c) 80 lb./ac. (d) and (e) N.A. (v) N.A. (vi) A.O. 90 (medium) (vii) Unirrigated. (viii) N.A. (ix) 0 98". (x) 29.3.1954.

2. TREATMENTS :

1. Control (no manure)
2. 20 lb./ac. of N as F.Y.M.
3. 20 lb./ac. of N as Bloodmeal.
4. 20 lb./ac. of N as G.N.C.
5. 20 lb./ac of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) 5. (b) N.A. (iii) 4. (iv) (a) 66'×16½'. 1/80 (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and tillering fair. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 to 1955. (b) No. (c) N.A. (v) (a) Powarkheda, Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 216.7 lb./ac.
(ii) 88.40 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield.
1.	161.2
2.	228 8
3.	210.0
4.	268.8
5.	214.8
S.E./mean	=44.20 lb./ac.

———

Crop :- Wheat. Ref :- M.P. 48(39)

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object : —To compare the effect of T.C. in different doses with that of F.Y.M. and also to compare it with optimum does of G.N.C. and A/S.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar* 2. (b) Refer soil analysis, Jabalpore. (iii) 28, 29.10.1048. (iv) (a) *Bakharing* in summer. (b) Sown by *nari.* plough. (c) 100 lb./ac. (d) and (e) N.A. (v) Nil. (vi) A.O.90 (medium). (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 13.4.1949.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cattle dung.
5. 40 lb./ac. of N as cattle dung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 66'×16½'. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1951 to 1955. (b) No. (c) N.A. (v) (a) Powerkheda, Raipur, Bilaspur and Betul. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1863 lb./ac.
(ii) 460.56 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1797	6.	2022
2.	1682	7.	1973
3.	1687	8.	1894
4.	1763	9.	2105
5.	1843		

S.E./mean = 188.0 lb./ac.

Crop :- Wheat (*Rabi*). Ref :- M.P. 49(59).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the effect of T.C. on Wheat against other manures and fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer soil analysis, Jabalpore. (iii) 25. 26.11.1949. (iv) (a) *Bakharing* on 25.11.1949. (b) to (e) N.A. (v) Nil. (vi) A.O. 90. (vii) Unirrigated. (viii) N.A. (ix) N A. (x) 28.4.1950.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as F.Y.M.
5. 40 lb./ac. of N as F.Y.M.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1947 to 1951. (b) and (c) —. (v) (a) and (b) N.A (vi) and (vii) Nil.

5. RESULTS :

(i) 319.4 lb./ac.
(ii) 76.18 lb /ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	328.0	6.	321.6
2.	217.2	7.	355.6
3.	224.0	8.	361.6
4.	297.2	9.	408.8
5.	360.4		

S.E./mean =31.10 lb./ac.

Crop :- Wheat (*Rabi*). Ref :- M.P. 50(63).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the effect of T.C. on Wheat against other manures and fertilisers.

1. BASAL CONDITIONS :

(i) (a)Nil. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer soil analysis, Jabalpore. (iii) 3, 4.11.1950. (iv) (a) 2 *Bakharings*. (b) to (e) N.A. (v) Nil. (vi) A.O. 90. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 25.4.1951.

2. TREATMENTS :

1. Control.
2. 40 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as F.Y.M.
5. 40 lb./ac. of N as F.Y.M.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1947 to 1951. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 880 lb /ac.
(ii) 90.34 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	755	6.	823
2.	764	7.	997
3.	849	8.	941
4.	847	9.	1089
5.	857		
S.E./mean	= 36.9 lb./ac.		

Crop :- Wheat. **Ref : M. P. 51 (27)**

Site :- Adhartal Farm, Jabalpore. **Type : 'M'**

Object :—To find she value of T.C. in comparison with G. N. C., FYM and A/S on Wheat.

1. BASAL CONDITIONS.

(i) (a) to (e) N.A. (ii) (a) *Kabar.* (Heavy soil). (b) Soil analysis. Jabalpore. (iii) 9,10.11.1951. (iv) (a) *Bakharing.* (b) to (e) N.A. (v) Nil. (vi) A. O.90. (medium). (vii) N.A. (viii) One weeding. (ix) N.A. (x) 12.4.1952.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb /ac. of N as F.Y.M.
5. 40 lb./ac. of N as F.Y.M.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R. B. D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) 1/33. (b) 33′×16½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Crop growth in earlier stages-later for want of moisture in the soil the growth was checked. (ii) Nil. (iii) Grain and Straw yield. (iv) (a) 1947 to 1951. (v) Jabalpore, and Saugor. (vi) Season was most unfavourable for the crop. (vii) Nil.

5. RESULTS :

(i) 528 lb./ac.
(ii) 114.4 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av yield
1.	360.	6.	414.
2.	388.	7.	559.
3.	493.	8.	716.
4.	484.	9.	836.
5.	504.		
	S.E./mean	=46.64 lb./ac.	

Crop :- Wheat. Ref :- M.P. 49(60).

Site :- Adhartal Farm, Jabalpore. Type 'M'.

Object :—To study the residual effect of T.C. and other manures and fertilisers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a), (b) Refer soil analysis, Jabalpore. (iii) 14.11.49. (iv) (a) to (e) Nil. (v) Nil. (vi) A. O. 90. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 27.4.50.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. ot N as T.C.
4. 20 lb./ac. of N as F.Y.M.
5. 40 lb./ac. of N as F.Y.M.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb/ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

Manures applied to previous wheat crop.

3. DESIGN :

(i) R. B. D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) 66′×16½′. (b) 1/60 ac. (v) N.A. (vi) N.A.

4. GENERAL :

(i) Nil. (ii) Crop growth is very poor in general. (iii) Grain yield. (iv) (a) 1947-1951(b)and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii)Nil.

5. RESULTS :

(i) 190.7 lb /ac.
(ii) 50.7 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yiele
1.	200.4	6.	192.0
2.	204.0	7.	198.0
3.	199.2	8.	178.8
4.	198.6	9.	151.8
5.	193.2		
S.E./mean	=20.64 lb./ac.		

Crop :- Wheat. Ref :- M P. 51(32).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To see the residual effect of T.C. on Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) As per treatments. (ii) (a) *Kabar* (heavy soil). (b) Refer soil analysis, Jabalpore. (iii) 13, 14.11.1951. (iv) (a) *Bakharing*. (b) to (e) N.A. (v) Nil. (vi) A.O. 90 (medium). (vii) N.A. (viii) N.A. (ix) N.A. (x) 12,14.4.1952.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as F.Y.M.
5. 40 lb./ac. of N as F.Y.M.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

Treatments applied to previous crop wheat.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 80′×19′. (b) 66′×16½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Growth was good in the earlier stages. Later the growth was checked for want of moisture in the soil. Poor patches in all the plots due to death of plants by whithering was observed. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1947 to 1951. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) The season was most unfavourable for the crop. Yield of wheat is too poor. (vii) Nil.

5. RESULTS :

(i) 148.3 lb./ac.
(ii) 37.32 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	114.1	6.	173.7
2.	143.7	7.	185.8
3.	159.2	8.	129.6
4.	139.1	9.	125.4
5.	164.1		

S.E./mean = 15.24 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- M.P. 52(25).**

Site :- Adhartal Farm, Jabalpore. **Type :- 'M'.**

Object :—To study the comparative residual effect of different manures and fertilisers on Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) As per treatments. (ii) (a) *Kabar.* (b) Refer soil analysis, Jabalpore (iii) 3.11.1952. (iv) (a) and (b) N.A. (c) 80 lb./ac. (d) and (e) N.A. (v) N.A. (vi) A.O. 90 (medium). (vii) to (ix) N.A. (x) 20.3.1953.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as F.Y.M.
5. 40 lb./ac. of N as F.Y.M.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

Treatments applied to wheat crop during 1951—52.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 1/33 ac. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1949—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 136.51 lb./ac.
(ii) 17.68 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	119.6	6.	149.7
2.	125.4	7.	157.1
3.	157.6	8.	112.2
4.	127.9	9.	121.3
5.	157.9		

S.E./mean = 7.20 lb./ac.

Crop :- Wheat. **Ref :- M.P. 51(24).**

Site :- Adhartal Farm, Jabalpore. **Type :- 'M'.**

Object :—To see the residual effect of manures applied to gram on Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Gram. (c) As per treatments. (ii) (a) *Kabar.* (b) Refer soil analysis, Jabalpore. (iii) 24.10.1951. (iv) (a) *Bakharing.* (b) to (e) N.A. (v) Nil. (vi) to (ix) N.A. (x) 9.4.1952.

2. TREATMENTS :

5 doses of P_2O_5 as Super : $P_0=0$, $P_1=15$, $P_2=20$, $P_3=25$ and $P_4=30$ lb./ac.
Manures applied to gram crop grown in previous year.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor plants whithered due to lack of moisture in the soil. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1951—N.A. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 266.2 lb./ac.
(ii) 106.0 lb /ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb /ac.

Treatment	Av. yield
P_0	233.7
P_1	250.2
P_2	278.6
P_3	260.9
P_4	307.4
S.E./mean	±53.0 lb./ac.

Crop :- Wheat. Ref :- M.P. 52(28).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the residual effect of manures applied to gram on Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Gram. (c) As per treatments. (ii) (a) *Kabar*. (b) Refer soil analysis, Jabalpore. (iii) 23.10.1952. (iv) (a) and (b) N.A. (c) 80 lb./ac. (d) and (e) N.A. (v) N.A. (vi) A.O. 93 (medium). (vii) to (ix) N.A. (x) 3.4.1953.

2. TREATMENTS :

5 doses of P_2O_5 as Super : $P_0=0$, $P_1=15$, $P_2=20$, $P_3=25$ and $P_4=30$ lb./ac.
Manures applied to previous crop Gram.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951—N.A. (b) N.A. (c) N.A. (v) (a) and (b) N.A. (vi) Crop suffered for want of adequate moisture in the soil. (vii) N.A.

5. RESULTS :

(i) 214.9 lb./ac.
(ii) 20.0 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
P_0	193.1
P_1	205.0
P_2	202.5
P_3	226.9
P_4	246.9
S.E /mean	±10.0 lb./ac.

Crop :-Wheat (*Rabi*). Ref :-M.P. 51(35).

Site :-Adhartal Farm, Jabalpore. Type :-'M'.

Object :—To study the effect of cotton seedcake as compared to F.Y.M. G.N.C. and A/S on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar* (heavy soil). (b) Refer soil analysis, Jabalpore. (iii) 23.10.1951. (iv) (a) *Bakharing*. (b) to (e) N.A. (v) N.A. (vi) A.O. 90 (medium). (vii) N.A. (viii) Weeding. (ix) N.A. (x) 20.3.1952.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as decorticated cotton seed cake.
3. 20 lb./ac. of N as undecorticated cotton seed cake.
4. 20 lb./ac. of N as A/S.
5. 20 lb./ac. of N as G.N.C.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 1/40 ac. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) In the earlier stage the crop growth was good. But later the crop became poor due to whithering for want of moisture in the soil. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1951 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Season was not favourable for the crop. (vii) Nil.

5. RESULTS :

(i) 267.5 lb./ac.
(ii) 57.36 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	194.9
2.	237.8
3.	240.8
4.	378.9
5.	285.0
S.E./mean	= 25.60 lb./ac.

Crop :-Wheat (*Rabi*). Ref :-M.P. 52(26).

Site :-Adhartal Farm, Jabalpore. Type :-'M'.

Object :—To study the effect of cotton cake in comparison with other manures and fertilisers on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar*. (b) Refer soil analysis, Jabalpore. (iii) 30.10.1952. (iv) (a) and (b) N.A. (c) 80 lb./ac. (d) and (e) N.A. (v) N.A. (vi) A.O. 90 (medium). (vii) to (ix) N.A. (x) 21.3.1953.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as decorticated cotton cake.
3. 20 lb./ac. of N as undecorticated cotton cake.
4. 20 lb./ac. of N as A/S.
5. 20 lb./ac. of N as G.N.C.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 66'×16½'. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination not satisfactory Crop was poor in some plots. Crop whithered due to shortage of moisture in the soil. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted in 1953 was vitiated.

5. RESULTS :
   (i) 275.6 lb./ac.
   (ii) 30.72 lb./ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	212.8
2.	282.9
3.	275.8
4.	269.9
5.	336.0
S.E./mean	= 13.68 lb./ac.

Crop :- Wheat. **Ref :- M.P. 51(26).**

Site :- Adhartal Farm, Jabalpore. **Type :- 'M'.**

Object :—To determine the dosage and ratio of N and P on Wheat.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) (a) *Kabar*. (b) Refer soil analysis, Jabalpore. (iii) 24.10.1951. (iv) (a) *Bakharing*. (b) to (e) N.A. (v) Nil. (vi) A.O. 90 (medium). (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 9.4.1952.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 5 doses of P_2O_5 as Super : $P_0=0$, $P_1=15$, $P_2=30$, $P_3=45$ and $P_4=60$ lb./ac.
   (2) 3 doses of N as A/S : $N_0=0$, $N_1=15$ and $N_2=30$ lb./ac.

3. DESIGN :
   (i) 3×5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) and (b) 33′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Good in the beginning. The crop in general suffered by whithering due to lack of moisture in the soil. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1951—1956. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) Season was most unfavourable for the crop. (vii) Nil.

5. RESULTS :
   (i) 657.1 lb./ac.
   (ii) 84.80 lb./ac.
   (iii) N effect is highly significant. P effect is significant while interaction N×P is not significant.
   (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	493.1	531.5	539.8	575.0	609.9	549.9
N_1	593.4	656.6	660.1	681.4	685.2	655.3
N_2	750.0	673.4	713.2	830.0	863.0	765.9
Mean	612.2	620.5	637.7	695.5	719.4	657.1

S.E. of marginal mean of N =21.6 lb./ac.
S E. of marginal mean of P =28.3 lb./ac.
S.E. of body of table =48.8 lb./ac.

Crop :- Wheat. **Ref :- M.P. 52(29).**

Site :- Adhartal Farm, Jabalpore. **Type :- 'M'.**

Object :—To determine the dose and ratio of N and P on Wheat.

1. BASAL CONDITIONS :
   (i) (a) N.A. (b) As per treatments. (c) N.A. (ii) (a) *Kabar*. (b) Refer soil analysis, Jabalpore. (iii) 24.10.1952. (iv) (a) and (b) N.A. (c) 80 lb./ac. (d) N.A. (e) N.A. (v) N.A. (vi) A.O. 90 (medium). (vii) to (ix) N.A. (x) 30.3.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 5 doses of P_2O_5 as Super: P_0=0, P_1=15, P_2=30, P_3=45 and P_4=60 lb./ac.

(2) 3 doses of N as A/S : N_0=0, N_1=15 and N_2=30 lb./ac.

3. DESIGN :

(i) 3×5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) and (b) 33′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951–1956. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 319.6 lb./ac.

(ii) 35.44 lb./ac.

(iii) N and P effects are highly significant while interaction is not significant.

(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	218.2	244.8	269.9	275.0	309.9	263.6
N_1	256.6	313.4	324.8	343.5	351.8	318.0
N_2	295.0	328.3	386.4	399.8	476.6	377.2
Mean	256.6	295.5	327.1	339.4	379.4	319.6

S.E. of marginal mean of N = 9.12 lb./ac.

S.E. of marginal mean of P =11.81 lb./ac.

S.E. of body of table =20.40 lb./ac.

Crop :- Wheat **Ref :- M. P. 53(61)**

Site :- Adhartal Farm, Jabalpore. **Type :- 'M'.**

Object —To determine the dose and ratio of N and P on wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) As per treatments. (ii) (a) *Kabar 2.* Refer soil analysis, Jabalpore. (iii) 28.10.53. (iv) (a) *Bakharing.* (b) N.A. (c) 80 lb./ac. (d) aud (e) N.A. (v) N.A. (vi) A.O.90. (medium). (vii) Unirrigated (viii) N.A. (ix) 0. 98″. (x) 23.3.54.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 5 doses of P_2O_5 as Super : P_0=O, P_1=13, P_2=30, P_3=45 and P_4=60 lb /ac.

(2) 3 doses of N as A/S : N_0=0, N_1=15 and N_2=30 lb./ac.

3. DESIGN:

(i) 3×5 Fact. in R. B. D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 33′×16½′. (v) N.A. (vi) Yes.

6. GENERAL :

(i) Poor yield. (ii) N.A. (iii) Weight of grain and straw. (iv) (a) 1951 to 1956. (b) Yes. (c) N.A. (v) (a) Powarkheda. (b) N.A. (vi) and (vii) Nil.

RESULTS :

(i) 143.9 lb./ac.

(ii) 73.50 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	104.8	178.2	143.2	145.1	138.4	141.9
N_1	74.9	193.1	181.6	156.6	123.2	145 9
N_2	53.1	136.6	188.0	149.9	191.5	143.8
Mean	77.6	169.3	170.9	150.5	151.0	143.8

S.E. of P marginal mean = 24.50 lb./ac.
S.E. of N marginal mean = 18.98 lb./ac.
S.E. of body of table = 42.43 lb./ac.

Crop :-Wheat **Ref : M. P. 52 (22)**

Site : - Adhartal Farm, Jabalpore. **Type :- 'M'.**

Object :—To study the effect of C/N in comparison with A/S and in combination with lime.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) *Kabar*. (b) Refer soil analysis, Jabalpore. (iii) 5.11.1952. (iv) (a) and (b) N.A. (c) 80 lb./ac. (d) and (e)N.A. (v) N.A. (vi) A.O. 90 (medium) (vii) to (ix) N.A. (x) 2.4.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 doses of Lime :- L_0=0 and L_1=200 lb./ac.

(2) 5 doses of N : N_0=0, N_1=20 lb./ac. of N as A/S, N_2=40 lb./ac. of N as A/S, N_3=20 lb./ac. of N as C/N and N_4=40 lb./ac. of N as C/N.

3. DESIGN :

(i) 5×2 Fact. in R. B. D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal (few plants whithered for want of moisture). (ii) N.A. (iii) grain and straw. yield (iv) (a) 1952 to 1953. (b) and (c) N.A. (v) (a), (b) N.A. (vi) Nil. (vii) Expriment conducted in 1953 vitiated.

5. RESULTS :

(i) 395.6 lb./ac.

(ii) 33.40 lb./ac.

(iii) L, N effects and interaction L×N all are highly significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
L_0	300.2	423.9	470.6	433.1	493.1	424.2
L_1	365.6	361.9	371.8	357.7	378.5	367.1
Mean	332.9	392.9	421.2	395.4	435.8	395.6

S.E. of marginal mean of L = 6.30 lb./ac.
S.E. of marginal mean of N = 9.64 lb./ac.
S.E. of body of table. = 14.60 lb./ac.

Crop :-Wheat (*Rabi*). **Ref :-M.P. 48(16).**

Site :-Institute of Plant Industry, Indore. **Type :-'M'.**

Object :—To find the suitable combination of N and P for Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sann. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) *Bakharing*. (b) and (c) N.A. (d) 14". (e) N.A. (v) Green manured by Sann. (vi) *Malvi* EKD. (vii) N.A. (viii) *Dowra*, weeding etc. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as G.N.C. : 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. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 14'×35'. (b) 10'×30'4". (v) 2 rows on both the sides and 2 feet of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and and (vii) Nil.

5. RESULTS :

(i) 535.4 lb/ac.

(ii) 87.1 lb./ac.

(iii) N effect is significant, P effect is highly significant, while interaction N×P is not significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	427.8	427.8	523.6	459.7
P_1	481.7	604.4	573.0	553.0
P_2	550.5	592.4	637.3	593.4
Mean	486.7	541.5	578.0	

S.E. of any marginal mean =20.6 lb./ac.

S.E. of body of table =35.5 lb./ac.

Crop :-Wheat. **Ref :- M.P. 49(18),**

Site :-Institute of Plant Industry, Indore. **Type :- 'M'.**

Object : - To study the response of graded doses of N singly and in combination with different doses of P_2O_5.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.11.1949. (iv) (a) to (c) N.A. (d) 14". (e) N.A. (v) N.A. (vi) *Malvi* EKD (N.A.) (vii) N.A. (viii) Weeding. (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=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. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 10'×23'4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) The field in which the experiment is laid out was water logged.

5. RESULTS :

(i) 529.2 lb./ac.

(ii) 128.95 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	444.3	549.0	568.4	520.6
P_1	533.5	551.0	521.9	535.4
P_2	552.9	531.6	510.2	531.6
Mean	510.2	543.8	533.5	529.2

S.E. of any marginal mean = 30.34 lb./ac.

S.E. of body of table = 52.63 lb./ac.

Crop :- Wheat. **Ref :- M.P. 50(5).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To study the residual response of N and P_2O_5 singly and in combination on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 8.10.1950. (iv) (a) to (e) N.A. (v) N.A. (vi) *Malvi* E.K.D. 59. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) 14.3 1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : N_0=0 and N_1=20 lb./ac.

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

3. DESIGN :

(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 35'-8"×15'. (b) 30'-8"×10' (v) 2.5' alround. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) N.A. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 384.50 lb./ac.

(ii) 34.50 lb./ac.

(iii) All the effects are highly significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	Mean
P_0	316.5	396.4	356.4
P_1	417.1	408.2	412.6
Mean	366.8	402.3	384.2

S.E. of any marginal mean = 9.96 lb./ac.

S.E. of body of table = 14.08 lb./ac.

Crop :- Wheat. **Ref :- M.P. 52(3).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To study the effect of application of N and P applied alone and in combination on unirrigated Wheat.

5. BASAL CONDITIONS :

(i) (a) No (b) Groundnut. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 4.10.1952. (iv) (a) and (b) N.A. (c) 60 lb./ac. (d) Rows 14" apart. (e) N.A. (v) N.A. (vi) E.69. (vii) Unirrigated. (viii) N.A. (ix) 1.2". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=10 and N_2=20 lb./ac.

(2) 5 levels of P_2O_5 as Super : P_0=0, P_1=10, P_2=20, P_3=30 and P_4=40 lb./ac.

3. DESIGN :

(i) 3×5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 40'×16'-4". (b) 35'×11'-8". (v) 2.5' alround. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Slightly damaged by rats (iii) Grain yield. (iv) (a) 1951 to 1953. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 188.7 lb./ac.

(ii) 155.2 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	162.7	201.1	192.2	187.8	198.2	188.4
N_1	177.6	204.2	207.1	192.2	140.5	184.3
N_2	207.1	181.1	183.4	195.4	199.8	193.4
Mean	182.5	195.5	194.2	191.8	179.5	188.7

S.E. of P marginal means =51.73 lb./ac.

S.E. of N marginal means =40.10 lb./ac.

S.E. of body of table =89.60 lb./ac.

Crop :- Wheat. **Ref :- M.P. 53(9).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To find out the response of N and P singly and in combination on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 21.10.1953. (v) (a) *Bakharing* once. (b) Drilled. (c) 60 lb./ac. (d) Rows 14" apart. (e) N.A. (v) Nil. (vi) E. 69. (vi) Unirrigated. (viii) N.A. (ix) 2.57". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N_0=0, N_1=10 and N_2=20 lb./ac.

(2) 5 levels of P_2O_5 as Super : P_0=0, P_1=10, P_2=20, P_3=30 and P_4=40 lb./ac.

3. DESIGN :

(i) 3×5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 45'×12'. (b) 40'×7'. (v) 2½' on each side. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1953. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 467 lb./ac.
(ii) 85.73 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	467	452	496	467	508	478
N_1	501	544	459	435	486	485
N_2	430	471	450	418	423	438
Mean	466	489	468	440	472	467

S.E. of marginal mean of N = 19.17 lb./ac.
S.E. of marginal mean of P = 24.75 lb./ac
S.E. of body of table = 42.86 lb./ac.

Crop :- Wheat. **Ref :- M.P. 53(2).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To find out the response of wheat to different doses of N and P in combination.

1. BASAL CONDITIONS :

(i) (a) No. (b) Maize. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.11.1953. (iv) (a) *Bakhared* twice. (b) Drilled. (c) to (e) N.A. (v) No. (vi) E. 69. (vii) Irrigated. (viii) N.A. (ix) 2.57". (x) 25.3.1954.

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) 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) 3×5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 50'×9'4". (b) 45'×4'8". (v) 2 rows on each side of 2½' width. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1826 lb./ac.
(ii) 207.94 lb./ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	1656	1801	1597	1779	1643	1695
N_1	2103	1691	1967	1750	1792	1861
N_2	1986	1944	1886	1976	1824	1923
Mean	1915	1812	1817	1835	1753	1826

S.E. of marginal mean of N = 46.50 lb./ac.
S.E. of marginal mean of P = 60.03 lb./ac.
S.E. of body of table = 103.97 lb./ac.

Crop :- Wheat. **Ref : M. P. 48 (13).**

Site :- Institute of Plant Industry, Indore. **Type 'M'**

Object :—To find the response of Wheat to different combinations of N and P_2O_5.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil (b) N.A. (c) 60 lb./ac. (iii) N.A. (iv) (a) *Bakharing*. (b), (c) N.A. (v) N.A. (vi) C. 591 (medium). (vii) N.A. (viii) Weeding and hoeing. (ix)N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2).

1. 3 levels of N as G.N.C. : 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. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 10′×30′4″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and fodder yield (iv) (a) to (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 925.4 lb./ac.
(ii) 140.6 lb./ac.
(iii) Both N and P effects are significant while interaction N×P is not significant.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	788.4	812.3	887.1	829.3
P_1	821.3	926.0	1053.2	933.5
P_2	927.5	993.3	1119.0	1013.3
Mean	845.7	910.5	1019.8	925.4

S.E. of any marginal mean =33.2 lb./ac.
S.E. of the body of table =57.4 lb./ac.

Crop :- Wheat **Ref :- M.P. 49 (23)**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'**

Object :— To study the response of Wheat to the application of N and P singly and in combination.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 30.11.1949. (iv) (a) to (c) N.A. (d) 14″ (e) N.A. (v) N.A (vi) C 591. (vii) N.A. (viii) Weeding (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of and (1) and (2).

(1) 3 levels 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. DESIGN :

(i) 3×3 Fact in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 35′×14′. (b) 30′4″×10′. (v) Two rows on both the the sides and 2′ of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) grain and fodder yield. (iv) (a) to (c) N.A. (v) (a), (b) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 857.7 lb./ac.

(ii) 92.3 lb./ac.

(iii) N and P effects are highly significant, while interaction is not significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	693.0	859.5	849.0	800.5
P_1	852.0	897.0	904.5	884.5
P_2	858.0	871.5	934.5	888.0
Mean	801.0	876.0	896.0	857.7

S.E of any marginal mean =21.7 lb./ac.
S.E. of body of table =37.7 lb./ac.

Crop :- Wheat. Ref :- M.P. 50(4).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :- To study the response of N and P singly and in combination on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 16.10.1950. (v) (a) to (e) N.A. (v) N.A. (vi) C-591. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) 15.3.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : N_0=0 and N_1=20 lb./ac.

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

3. DESIGN :

(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 35'8"×15'. (b) 30'8"×10'. (c) 2½' alround. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) Grain yield. (iv) (a) N.A. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 508.7 lb./ac.

(ii) 68.99 lb./ac.

(iii) N effect alone is highly significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	Mean
P_0	449.5	536.1	502.8
P_1	485.1	544.2	514.6
Mean	467.3	550.2	508.7

S.E. of any marginal mean =20.24 lb./ac.
S.E. of body of table =28.16 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- M.P. 51(16).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To study the effect of N and P singly and in combination on the yield of unirrigated Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (iii) 2.10.1951. (iv) (a) *Bakharing*. (b) N.A. (c) 60 lb./ac. (d) 14". (e) N.A. (v) Nil. (vi) C.591 (medium). (vii) Unirrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=10$ and $N_2=20$ lb./ac.

(2) 5 levels of P_2O_5 as Super : $P_0=0$, $P_1=10$, $P_2=20$, $P_3=30$ and $P_4=40$ lb./ac.

3. DESIGN :

(i) 3×5 Fact. in R.B.D. (ii) (a) 5. (b) N.A. (iii) 3. (iv) (a) 14'×40'. (b) 9'-4"×35'. (v) Two rows on both sides and 2½' of each row at both ends. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 331.3 lb./ac.

(ii) 65.78 lb./ac.

(iii) Only N effect is significant.

(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	336.2	311.2	339.0	252.9	355.7	319.0
N_1	297.4	200.1	322.4	352.9	344.6	303.5
N_2	364.0	344.6	380.7	383.5	383.5	371.3
Mean	332.6	285.3	347.4	329.8	361.3	331.3

S.E. of marginal mean of N = 17.00 lb./ac.
S E. of marginal mean of P = 21.93 lb./ac.
S.E. of body of tal le = 37.98 lb./ac.

Crop :-Wheat (*Rabi*). **Ref :- M.P. 51(12).**

Site :-Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To study the effect of N and P singly and in combination on the yield of irrigated Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Sann as G.M. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) *Bakharing*. (b) N A. (c) 80 lb./ac. (d) and (e) N A. (v) N.A. (vi) C. 591 (medium). (vii) Irrigated. (viii) Weeding (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=15$ and $N_2=30$ lb./ac.

(2) 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) 3×5 Fact. in R.B.D. (ii) (a) 15. (b) 55'×140'. (iii) 3. (iv) (a) 55'×9'4". (b) 50'×4'6". (v) Two rows on both sides and 2½' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1113 lb./ac.
(ii) 343.8 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	951	907	1003	1241	1241	1069
N_1	1092	915	1527	947	874	1071
N_2	1636	1358	947	967	1092	1200
Mean	1226	1062	1159	1051	1069	1113

S.E. of marginal mean of N = 88.76 lb./ac.
S.E. of marginal mean of P = 114.50 lb./ac.
S.E. of body of table = 198.5 lb./ac.

Crop :-Wheat. Ref :- M.P. 52(2).

Site :-Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the effect of different green manuring crops on the yield of Wheat and their residual effect on *Jowar*.

1. BASAL CONDITIONS :

(i) (a) No. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 6 to 8.10.1952. (iv) (a) to (e) N.A. (v) G.M. sown on 18.6.1952. (vi) C. 591 (medium). (vii) Unirrigated (viii) N.A. (ix) N.A. (x) 7.3.1953.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.
(2) 11 kinds of G.M. : G_0=0 (no G.M.), G_1=*Dhaincha*, G_2=*Moong* T_1, G_3=*Moong Sindkhera*, G_4=Sannhemp, G_5=*Udid*, G_6=Cowpea, G_7=Soyabean, G_8=Sasbania, G_9=*Guara* and G_{10}=*Moong* (local).

3. DESIGN :

(i) 2×11 Fact. in R.B.D. (ii) (a) 22. (b) N.A. (iii) 4. (iv) (a) 60'×18'8". (b) 60'×14'. (v) 2'6" breadthwise. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1952–53. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 621.0 lb./ac.
(ii) 105.8 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	G_0	G_1	G_2	G_3	G_4	G_5	G_6	G_7	G_8	G_9	G_{10}	Mean
P_0	500.5	562.2	610.7	507.0	607.7	633.7	578.5	637.0	639.0	702.0	598.0	603.3
P_1	637.0	595.5	611.0	611.0	575.2	685.8	705.2	624.0	546.0	666.3	669.5	638.8
Mean	568.7	628.8	615.8	559.0	591.4	659.7	641.8	630.5	617.5	684.1	633.8	621.0

S.E. of marginal mean of P = 52.90 lb./ac.
S.E. of marginal mean of G = 37.37 lb./ac.
S.E. of body of table = 15.10 lb./ac.

Crop :- Wheat. Ref :- M.P. 53(15).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find the most suitable legume G.M. for Wheat under rainfed conditions.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 20.11.1953. (iv) (a) 3 *bakharings* (b) Drilled. (c) 60 lb./ac. (d) Rows 14" apart. (e) N.A. (v) No. (vi) E. 69. (vii) Unirrigated. (viii) N.A. (ix) 2.57". (x) 1.3.1954.

2. TREATMENTS :

Main-plot treatments :

2 times of application of P_2O_5 : T_1=5 weeks and T_2=7 weeks.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.

(2) 10 kinds of G.M. : G_0=No G.M., G_1=*Dhaincha*, G_2=*Moong* No. 1, G_3=*Moong of Sindhkhera*, G_4=Sannhemp, G_5=*Udid*, G_6=Cowpea, G_7=Soyabean, G_8=*Guar* and G_9=*Moong* local.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block and 20 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 85'×11'8". (b) 80'×7'. (v) 2' rows on each side and 2½' on each end. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1953. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 679 lb./ac.

(ii) (a) 238 8 lb./ac.

(b) 112.7 lb /ac.

(iii) Interaction P×T alone is significant.

(iv) Av. yield of grain in lb./ac.

	G_0	G_1	G_2	G_3	G_4	G_5	G_6	G_7	G_8	G_9	Mean	P_0	P_1
T_1	792	737	697	793	771	660	692	700	697	598	714	697	731
T_2	592	681	597	606	655	671	686	664	640	640	643	646	640
Mean	692	709	647	702	713	665	689	682	668	619	679	672	686
P_0	671	661	642	722	713	671	675	677	689	596			
P_1	714	757	652	681	714	660	704	687	647	642			

S.E. of difference of two

1. T marginal means =37.8 lb./ac.
2. P marginal means =17.8 lb./ac.
3. G marginal means =39.8 lb /ac.
4. P means at the same level of T =25.2 lb./ac.
5. T means at the same level of P =41.8 lb./ac.
6. G means at the same level of T =56.4 lb./ac.
7. T means at the same level of G =65.4 lb./ac.
8. means in the body of P×G table =56.4 lb./ac.

Crop :- Wheat. Ref :- M.P. 53(10).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the response due to different levels of N in combination with mulching practices.

1. BASAL CONDITIONS :

(i) (a) No. (b) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 22.10.1953. (iv) (a) *Bakhared* three. (b) Drilled. (c) 60 lb./ac. (d) 14". (e) N.A. (v) Nil. (vi) E. 69. (vii) Irrigated. (viii) N.A. (ix) 2'57". (x) 25.3.1954.

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 sources of N : S_1=A/S and S_2=C/N.

(3) 2 levels of mulching : M_0=No mulching and M_1=Mulching.

3. DESIGN :

(i) 2×2×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 40'×14'. (b) 35'×9'. (v) 2' all round. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 600 lb./ac.

(ii) 83.3 lb./ac.

(iii) Only M effect is highly significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2
M_0	564	565	569	566	557	575
M_1	620	650	632	634	657	611
Mean	592	608	601	600	607	593
S_1	—	614	588			
S_2	—	602	614			

S.E. of N marginal means	=20.8 lb./ac.
S.E. of M marginal means	=17.0 lb./ac.
S.E. of S marginal mean in S×N table	=20.8 lb./ac.
S.E. of S marginal mean in S×M table	=17.0 lb./ac.
S.E. of body of M×N table	=29.5 lb./ac.
S.E. of body of M×S table	=24.0 lb./ac.
S.E. of body of S×N table	=29.5 lb./ac.

Crop :- Wheat. Ref :- M.P. 53(13).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find the effect of G.M. (sann) on *kharif* catch crop of legumes on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) Cotton. (c) N.A. (ii) Black cotton soil. (b) N.A. (iii) 15.10.1950. (iv) (a) to (c) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) 14.5.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.

(2) 4 kinds of G.M. : G_0=0, G_1=Sann at 80 lb./ac., G_2=*Moong* and G_3=*Udid*.

3. DESIGN :

(i) 2×4 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 60′×18′-8″. (b) 55′×15′. (v) 2.5′×1′-10″. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 380.2 lb./ac.
(ii) 65.88 lb./ac.
(iii) Interaction P×G alone is significant.
(iv) Av. yield of grain in lb./ac.

	G_0	G_1	G_2	G_3	Mean
P_0	386.4	375.3	366.5	388.6	379.2
P_1	426.1	324.5	443.8	324.5	379.7
Mean	406.2	349.9	405.1	356.5	379.4

S.E. of marginal mean of P =13.44 lb./ac.
S.E. of marginal mean of G =19.02 lb./ac.
S.E. of body of table =26.89 lb./ac.

Crop :- Wheat (*Rabi*). Ref :- M.P. 49(2).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :- To find out the effect of G.M. on Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) *Bakharing*. (b) and (c) N A. (d) 14″. (e) N.A. (v) to (vii) N A. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 2 levels of P_2O_5 : P_0=0 and P_1=40 lb./ac.
(2) 2 levels of G.M. : G_0=0 (no G.M.) and G_1=Green manuring with sann (80 lb. of sann seed).

3. DESIGN :

(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 18′-8″×60′. (b) 14′×55′. (v) 2 rows on both sides and 2½ feet of each row. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 445.7 lb./ac.
(ii) 76.36 lb./ac.
(iii) Only G effect is significant.
(iv) Av. yield of grain in lb./ac.

	G_0	G_1	Mean
P_0	374.8	465.0	419.9
P_1	432.5	510.3	471.4
Mean	403.7	487.7	445.7

S.E. of any marginal mean =22.01 lb./ac.
S.E. of body of table =31.11 lb./ac.

Crop :-Wheat. Ref :-M.P. 52(11).

Site :-Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study how the soaking of the seed in different nutrient solutions of varying concentrations and timings effect the two phases of plant life.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 15.10.1952. (iv) (a) *Bakharad* twice. (b) N.A. (c) 60 lb./ac. (d) and (e) N.A. (v) Nil. (vi) C. 591 (medium). (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) 4.3.1953.

2. TREATMENTS :

All combinations of (1), (2) and (3)+8 plots for sowing of dry seeds = D_1 and extra treatments W_1, W_2, W_3 and W_4.

(1) 4 soaking periods : S_1=2, S_2=4, S_3=6 and S_4=8 hours.

(2) 2 chemicals of soaking : C_1=A/S and C_2=P_2O_5.

(3) 4 concentrations of molar solution : M_1=0.25, M_2=0.50, M_3=0.75 and M_4=1.00.

4 extra treatments are soaking of seeds in water : W_1=for 2 hours, W_2=for 4 hours, W_3=6 hours and W_4=8 hours.

3. DESIGN :

(i) R.B.D. (ii) (a) 44. (b) N.A. (iii) 2. (iv) (a) 25'×11'-8". (b) 20'×6'-8". (v) 2' on each side. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1953. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 430 lb./ac.

(ii) 132.7 lb /ac.

(iii) S effect and interaction S×C are significant. Other effects are not significant.

(iv) Av. yield of grain in lb./ac.

D_1=472, W_1=419, W_2=684, W_3=429 and W_4=398.

	M_1	M_2	M_3	M_4	Mean	C_1	C_2
S_1	414	485	444	531	468	412	475
S_2	454	403	495	500	463	498	429
S_3	434	322	337	362	364	345	383
S_4	362	225	342	496	356	308	345
Mean	416	359	405	472	413	418	408
C_1	373	339	498	462			
C_2	459	378	311	482			

S.E. of S or M marginal means	±33.17 lb /ac.
S.E. of C marginal means	±23.46 lb./ac.
S.E. of body of tables S×C or M×C	±46.92 lb./ac.
S.E. of body of table S×M	±66.35 lb./ac.
S.E. of D_1 mean	±33.17 lb./ac.
S.E. of any of W means	±93.83 lb./ac.

Crop :-Wheat. Ref :- M.P. 53(18).

Site :-Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the effect of soaking Wheat seeds in nutrient solutions of different concentrations for different periods of sowing.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 24.10.1953. (iv) (a) *Bakhared* thrice. (b) Drilled. (c) 60 lb./ac. (d) 14" apart. (e) N.A. (v) N.A. (vi) E.K. 69 (early). (vii) Unirrigated. (viii) N.A. (ix) 2.57". (x) 6.3.1954.

2. TREATMENTS :

All combinations of (1), (2) and (3)+3 extra treatments.

(1) 2 soaking periods : S_1=4 and S_2=8 hours.

(2) 2 soaking chemicals : C_1=A/S and C_2=Ammo. Phos.

(3) 3 concentrations : M_1=0.1, M_2=0.2 and M_3=0.3.

3 extra treatment are : E_1=Dry seed sown (4 plots), E_2=soaked in water for 4 hours (2 plots) and E_3=soaked in water for 8 hours (2 plots).

3. DESIGN :

(i) R.B.D. (ii) (a) 20. (b) N.A. (iii) 4. (iv) (a) 50'×11'8". (b) 45'×7'. (v) 2'6"×2'4". (vi) Yes.

4. GENERAL :

(i) N.A. (ii) No. (iii) Grain yield. (iv) (a) 1949 to 1953. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 538 lb./ac.

(ii) N.A.

(iii) N.A.

(iv) Av. yield of grain in lb./ac.

E_1=532, E_2=502 and E_3=578

	M_1	M_2	M_3	Mean	S_1	S_2
C_1	559	578	538	558	558	558
C_2	563	535	460	519	510	529
Mean	561	557	499	539		
S_1	559	525	578	534		
S_2	563	588	480	544		
			S.E.'s	N.A.		

Crop :- Wheat. Ref :- M.P. 51(58).

Site :- Govt. Experimental Farm, Powerkheda. Type :- 'M'.

Object :- To see the effect of application of F.Y.M. with and without A/S.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powerkheda. (iii) 20.10.1951. (iv) (a) *Bakharing*. (b) N.A. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) Hy. 11-6 (medium). (vii) Unirrigated. (viii) N.A. (ix) 2.24". (x) N.A.

2. TREATMENTS :

1. 10 C.L./ac. of F.Y.M.
2. 10 C.L. of F.Y.M.+A/S at 5 lb./ac. of N.

F.Y.M. applied on 12.9.1951. and A/S applied on 15.9.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 16½′×33′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) Yield is too poor. Unfavourable weather condition for the crop. (vii) Nil.

5. RESULTS :

(i) 208.3 lb./ac.
(ii) 54.74 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	180.8
2.	235.8

S.E./mean = 22.37 lb./ac.

Crop :- Wheat. **Ref :- M.P. 53(38).**

Site :- Govt. Experimental Farm, Powarkheda. **Type :- 'M'.**

Object :—To study the effect of adding F.Y.M. alone and in combination with A/S on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) Wheat. (c) 15 lb./ac. of N and 15 lb./ac. of P_2O_5 through fertilizer mixture. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 4.11.1953. (iv) (a) *Bakharing*. (b) Sown with *nari* plough. (c) 80. lb./ac. (d) 1′. (e) N.A. (v) Nil. (vi) Hy. 11. improved (medium). (vii) Unirrigated. (viii) Nil. (ix) 1.25″. (x) 3.4.1954.

2. TREATMENTS :

1. F.Y.M. alone at 10 C.L./ac.
2. F.Y.M. at 10 C.L./ac.+5 lb./ac. of N as A/S drilled with the seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) and (b) 16½′×33′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 410.4 lb./ac.
(ii) 85.60 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	441.0
2.	379.8

S.E./mean = 42.88 lb./ac.

Crop :- Wheat. **Ref :- M.P. 53(55).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'N'.**

Object :- To determine the dosage and ratio of N to P_2O_5 for Wheat under irrigated conditions.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*Mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 29. 21.10.1951. (iv) (a) *Bakharing*. (b) N.A. (c) 80 lb./ac. (d) 12″. (e) N.A. (v) N.A. (vi) Hy. 11 (medium). (vii) Irrigated. (viii) Nil. (ix) 2.24″. (x) 23.4.1952.

2. 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) 5 levels of P_2O_5 as Super : P_0=0, P_1=30, P_2=60, P_3=90 and P_4=120 lb./ac.

3. DESIGN :

(i) 3×5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 18½'×66'. (b) 16½'×66'. (v) One row on both the sides. (vi) No.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1951—1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1338 lb./ac.

(ii) 183.4 lb./ac.

(iii) Only N effect is significant.

(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	1390	1270	1410	1317	1570	1391
N_1	1453	1510	1215	1380	1433	1398
N_2	1131	1466	1203	1175	1149	1225
Mean	1325	1415	1276	1291	1384	1338

S.E. of marginal mean of N = 47.4 lb./ac.
S.E. of marginal mean of P = 61.1 lb./ac.
S.E. of body of table =105.9 lb./ac.

Crop :- Wheat. **Ref :- M.P. 53(41).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'M'.**

Object :—To determine the effect of N and P applied alone and in combination.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam, (*Mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 20 11.1953. (iv) (a) *Bakharings*. (b) Sown with *nari* plough. (c) 80 lb./ac. (d) Lines 1' apart. (e) N.A. (v) Nil. (vi) Hy. 11. Improved (medium). (vii) Irrigated. (viii) Nil. (ix) 1.25". (x) 21.4.1954.

2. 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) 5 levels of P_2O_5 as Super : P_0=0, P_1=30, P_2=60, P_3=90 and P_4=120 lb./ac.

Both N and P_2O_5 drilled along with the seed.

3. DESIGN :

(i) 3×5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) and (b) 16½'×33'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—1953. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1066 lb./ac.

(ii) 260.0 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	607	977	1190	940	1360	1015
N_1	793	1303	1260	1170	917	1089
N_2	1178	1040	1210	873	1167	1094
Mean	859	1107	1220	994	1148	1066

S.E. of marginal mean of N = 67.2 lb./ac.
S.E. of marginal mean of P = 86.7 lb./ac.
S.E. of body of table = 150.1 lb./ac.

Crop :- Wheat. Ref :- M.P. 51(54)

Site :- Govt. Exptl. Farm, Powarkheda. Type :- 'M'.

Object :—To determine the dosage and ratio of N to P for Wheat under irrigated conditions.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 18/19.11.1951. (iv) (a) *Bakharing*. (b) Sown by *nari* plough. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) A-125 (local). (vii) Irrigated. (viii) Nil. (ix) 2.24". (x) N.A.

2. 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) 5 Levels of P_2O_5 as Super : P_0=0, P_1=30, P_2=60, P_3=90 and P_4=120 lb./ac.

3. DESIGN :

(i) 3×5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 18½'×66'. (b) 16½'×66'. (v) One row on both sides. (vi) No.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1410 lb./ac.
(ii) 320.4 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	887	1367	1427	1493	1347	1304
N_1	1300	1307	1567	1740	1827	1548
N_2	1387	1380	1240	1393	1493	1379
Mean	1191	1351	1411	1542	1556	1410

S E. of marginal mean of N = 82.7 lb./ac.
S.E. of marginal mean of P = 106.8 lb./ac.
S.E. of body of table = 185.0 lb./ac.

Crop :- Wheat. **Ref :- :- M.P. 52(40).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'M'.**

Object :—To determine the dosage and ratio of N to P_2O_5 for Wheat under irrigated conditions.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 13.11.1952. (iv) (a) *Bakharing*. (b) Drilling. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) 0.15". (x) N.A.

2. 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) 5 levels of P_2O_5 as Super : $P_0=0$, $P_1=30$, $P_2=60$, $P_3=90$ and $P_4=120$ lb./ac.

3. DESIGN :

(i) 3×5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 18½'×33'. (b) 16½'×33'. (v) One line on both sides. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 512.4 lb./ac.

(ii) 113.3 lb./ac.

(iii) Main effect of N alone is highly significant.

(v) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	431.5	362.3	337.4	278.1	282.5	338 3
N_1	529.1	591.6	618.1	602.4	593.2	586.9
N_2	544.6	654.1	573.9	708.9	578.1	611.9
Mean	501.7	536·0	509.8	529.8	484.6	

S.E. of marginal mean of N =29.2 lb./ac.

S.E. of marginal mean of P =37.8 lb./ac.

S.E. of body of table =65.4 lb./ac.

Crop :- Wheat **Ref :- M. P. 51 (56).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'M'.**

Object :—To determine the dosage and ratio of N to P under dry conditions.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*Mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 28, 29.10.1951 (iv) (a) *Bakharing*. (b) N.A. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) Hy 11—6 (medium). (vii) Unirrigated. (viii) Nil. (ix) 2.24". (x) N.A.

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) 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) 3×5 Fact in R. B. D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 18½'×66'. (b) 16½'×66'. (v) One row on the both sides (vi) Randomisation not done properly.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) No. (c) N.A. (v) (a),(b) N.A. (vi) Nil. (vii) The field where the expt. is laid out is of poor fertility.

5. RESULTS :

(i) 639 lb./ac.
(ii) 96.98 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	641	631	715	622	570	636
N_1	712	613	633	650	702	662
N_2	727	672	581	537	581	620
Mean	693	639	643	603	618	639

S.E. of marginal mean of N = 25.04 lb./ac.
S.E. of marginal mean of P = 32.33 lb./ac.
S.E. of body of table = 55.99 lb./ac.

Crop :- Wheat **Ref :- M. P. 52 (39)**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :-'M'**

Object :—To determine the dosage and ratio of N to P for Wheat under dry conditions.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*Mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 9.11.1952 (iv) (a) *Eakharing*. (b) Drilled.(c) 80 lb /ac. (d) 12". (e) N.A. (v) N.A. (vi) Hy 11-6 (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.15". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2).
(1) 3 levels of N as A/S : N_0=0, N_1=15 and N_3=30 lb./ac.
(2) 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) 3×5 Fact. in R. B. D. (a) 15. (b) N.A. (iii) 3. (iv) (a), (b) 16½'×33'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Weight of grain in each plot and weight of 1000 grains. (iv) (a) 1951 to 1953 (b) No. (c) N.A (v) (a),(b) N.A. (vi) and (vii) Nil.

5. RESULTS.

(i) 404.6 lb./ac.
(ii) 46.72 lb./ac.
(iii) Only P effect is highly significant.
(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	335.6	448.3	386.6	381 5	394.8	389.4
N_1	409.1	419.9	379.1	462.4	389.1	411.9
N_2	324.0	425.8	395.0	470.7	447.3	412.6
Mean	356.3	431.3	386.9	438.2	410.4	404.6

S.E. of marginal mean of N = 12.04 lb./ac.
S.E. of marginal mean of P = 15.57 lb./ac.
S.E. of body of table = 26.96 lb./ac.

Crop :- Wheat. **Ref :- M.P. 53(43).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'M'.**

Object :—To determine the doses and ratio of N to P which give highest yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 10 lb./ac. of N as A/S+10 lb./ac. of P_2O_5 as Single Super. (ii) (a) Clay loam, *Mariyar*. (b) Refer soil analysis, Powarkheda. (iii) 4.11.1953. (iv) (a) *Bakharing*. (b) N.A. (c) 80 lb./ac. (d) Rows 1' apart. (e) N.A. (v) No. (vi) Hy. 11 improved (medium). (vii) Unirrigated. (viii) No. (ix) 1.25". (x) 14.4.1954.

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) 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) 3×5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) and (b) 16½'×33'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 349.4 lb./ac.
(ii) 76.00 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	336.6	353.1	376.6	333.4	363.2	352.6
N_1	335.0	448.1	303.2	313.1	353.1	350.5
N_2	408.3	359.8	323.2	349.9	284.8	345.2
Mean	360.0	387.0	334.3	332.1	333.7	

S.E. of marginal mean of N =19.64 lb./ac.
S.E. of marginal mean of P =25.33 lb./ac.
S.E. of body of table =43.88 lb./ac.

Crop :- Wheat. **Ref :- M.P. 48(23).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'M'.**

Object :—To study the residual effect of the manures applied to Wheat during 1947-48 upon subsequent Wheat and Gram crops.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) As per treatments. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) N.A. (iv) (a) *Bakharing*. (b) to (e) N.A. (v) N.A. (vi) A. 115 (local). (vii) to (x) N.A.

2. TREATMENTS :

1. Control (no manure).
2. 10 C.L./ac. of T.C. applied before sowing.
3. 20 C.L./ac. of T.C. applied before sowing.
4. 10 C.L./ac of F.Y.M. applied before sowing.
5. 20 C.L./ac. of F.Y.M. applied before sowing.
6. 4 md /ac. of G.N.C. applied before sowing.
7. 120 lb./ac. of A/S drilled with seed.

Treatments applied to wheat crop during 1947-48.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 16½'×66'. (v) Nil. (vi) N.A.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and *bhusa* yield. (iv) (a) 1948-1949. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 572.2 lb./ac.
(ii) 43.56 lb /ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield.
1.	508
2.	560
3.	616
4.	581
5.	642
6.	577
7.	521

S.E./mean = 17.76 lb /ac.

Crop :- Wheat. **Ref :- M.P. 49(31).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'M'.**

Object :—To study the residual effect of the manures applied to Wheat during 1947-48 upon the subsequent Wheat and Gram crops.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Clay loam (*Mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 24, 25.10.1949. (iv) (a) *Bakharing*. (b) Drilling. (c) 100 lb./ac. (d) N.A. (e) N.A. (v) N.A. (vi) A. 115 (local). (vii) to (ix) N.A. (x) 25.3.1950.

2. TREATMENTS :

1. Control (no manure).
2. 10 C.L./ac. of T.C. applied before sowing.
3. 20 C.L./ac. of T.C. applied before sowing.
4. 10 C.L./ac. of F.Y.M. applied before sowing.
5. 20 C.L./ac. of F.Y.M. applied before sowing.
6. 4 md./ac. of G.N.C. applied before sowing.
7. 120 lb./ac. of A/S drilled with seed.

Treatments applied to wheat crop during 1947-48.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 16½'×66'. (v) Nil. (vi) N.A.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1948—1949. (b) Yes. (c) N.A. (v) (a) N.A. (b) N.A. (vi) Nil. (vii) The yield is too poor.

5. RESULTS :

(i) 301.5 lb./ac.
(ii) 43.82 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	298.0
2.	275.6
3.	286.7
4.	308.5
5.	341.8
6.	313.9
7.	286.4

S.E./mean =17.76 lb./ac.

Crop :- Wheat. Ref :-M.P. 48(35).

Site :- Govt. Exptl. Farm, Powarkheda. Type :- 'M'.

Object :—To see the residual effect of nitrogenous manures applied during the years 1919-1930 to Wheat taken in subsequent years.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam (*Mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 24.10.1948. (iv) (a) *Bakharing* and ploughing. (b) Drilling. (c) 80 lb./ac. (d) 12". (e) —. (v) Nil. (vi) A. 115 (local). (vii) to (x) N.A.

2. TREATMENTS :

1. No manure.
2. 100 md./ac. of F.Y.M. in the beginning of rains every year.
3. 100 md./ac. of Urine earth at the last *bakharing* every year.
4. 6 md./ac. of Castor cake at the last *bakharing* every year.
5. 6 md./ac. of Castor cake drilled with seed every year.
6. 1½ md./ac. of C/N every year.

Applied during years 1919-1930.

3 DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) and (b) 33'×132'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1931—1949. (b) Yes. (c) N.A. (v) (a) Nil. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 304.1 lb./ac.
(ii) 16.12 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	277.2
2.	348.1
3.	299.4
4.	292.2
5.	294.7
6.	313.1

S.E./mean =11.37 lb./ac.

Crop :- Wheat. Ref :- M.P. 49(46).

Site :- Govt. Experimental Farm, Powarkheda. Type :- 'M'.

Object :—To see the residual effect of nitrogenous manures applied during the years 1919—1930 to Wheat taken in subsequent years.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam (*Mariyar*). (b) Refer soil analysis, Powarkheda. (iii) N.A. (iv) (a) *Bakharing* and ploughing. (b) Drilling. (c) N.A. (d) 12". (e) – (v) Nil. (vi) A-115 (medium). (vii) to (x) N.A.

2. TREATMENTS :

1. No manure.
2. 100 md./ac. of F.Y.M. in the begining of rains every year.
3. 100 md./ac of Urine earth at the last *bakharing* every year.
4. 6 md /ac. of Castor cake at the last *bakharing* every year.
5. 6 md./ac. of Castor cake drilled with seed every year.
6. 1½ md / ac. of C/N every year.

Applied during years 1919—1930.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) and (b) 33'×132'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1931 to 1949. (b) Yes. (c) N.A. (v) (a) Nil. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 173.8 lb./ac.
(ii) 20.67 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	153.1
2.	220.9
3.	175.6
4.	161.5
5.	165.3
6.	166.5
S.E./mean	= 14.61 lb./ac.

Crop :- Wheat. **Ref :- M.P. 51(57).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'M'.**

Object :—To see the effect of application of powdered G.N.C. applied at different timings.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 20.10.1951. (iv) (a) *bakharing*. (b) N.A. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) Hy. 11-6 (medium). (vii) Unirrigated (viii) Nil. (ix) 2.24" (x) N.A.

2. TREATMENTS :

1. 2 md./ac. of G.N.C. powder applied 3—4 weeks before sowing.
2. 2 md /ac. of G.N.C. powder applied on 15.10.1951 at the time of seed-bed preparation.
3. 2 md./ac. of G.N.C. powder mixed with seed and sown.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) (a) and (b) 16.5'×33'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) to (c) No. (v) (a) and (b) N.A. (vi) Nil. (vii) Yield is too poor due to unfavourable weather condition.

5. RESULTS :

(i) 140.3 lb./ac.
(ii) 39.96 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	164.9
2.	149.3
3.	106.8
S.E./mean	= 19.98 lb./ac.

Crop:- Wheat. **Ref :- M.P. 53(42).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'M'.**

Object :—To study the effect of N and P applied alone and in combination.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) 10 lb./ac. of N as A/S+10 lb./ac. of P_2O_5 as Super. (ii) (a) Clay loam, (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 4.11.1953. (iv) (a) *Bakharings*. (b) Seed sown with *nari* plough (c) 80 lb./ac. (d) Rows 1' apart. (e) N.A. (v) Nil. (vi) Hy. 11. improved (medium). (vii) Unirrigated. (viii) Nil. (ix) 1.25". (x) 12.4.1954.

2. TREATMENTS :

1. Control (no manure).
2. 15 lb./ac. of N as A/S.
3. 15 lb./ac. of N as G.N.C.
4. 15 lb./ac. of P_2O_5 as Super.
5. 15 lb./ac. of N as A/S+15 lb./ac. of P_2O_5 as Super.
6. 15 lb./ac. of N as G.N.C.+15 lb./ac. of P_2O_5 as Super.
7. 7½ lb./ac. of N as A/S+7½ lb./ac. of N as G.N.C.+7½ lb./ac. of P_2O_5 as Super.

3. DESIGN:

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) and (b) 33′×33′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) Grain yield. (iv) (a) 1953—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 509.2 lb./ac.
(ii) 86.80 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	451.9
2.	549.9
3.	464.4
4.	593.4
5.	543.8
6.	476.4
7.	484.3

S.E./mean =38.80 lb./ac.

Crop :- Wheat. **Ref :- M.P. 53(40).**

Site :-Govt. Exptl. Farm, Powarkheda **Type :- 'M'.**

Object :—To study the effect of different doses and sources of N.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 10 lb./ac. of N as A/S+10 lb./ac. of P_2O_5 as Super. (ii) (a) Clay loam, (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 4.11.1953. (iv) (a) *Bakharing*. (b) Sown by *nari* plough. (c) 80 lb./ac. (d) Rows 1′ apart. (e) N.A. (v) Nil. (vi) Hy. 11. improved (medium). (vi.) Unirrigated. (viii) Nil. (ix) 1.25″. (x) 14.4.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N_0=0, N_1=15 and N_2=30 lb./ac.
(2) 2 sources of N : S_1=A/S and S_2=C/N.

3. DESIGN :

(i) 2×3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) and (b) 11′×99′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) 1953 N.A. (b) No. (v) (a) and (b) N.A. (vi and (vii) Nil.

5. RESULTS :

(i) 520.9 lb./ac.
(ii) 92.10 lb./ac.
(iii) Control *vs.* treated, N and S effects are significant. Others are not significant.

(iv) Av. yield of grain lb./ac.

Control mean =549.7 lb./ac.

	S_1	S_2	Mean
N_1	609.0	478.0	543.5
N_2	549.9	389.0	469.4
Mean	579.4	433.5	506.4

S.E. of any marginal mean or control mean =29.16 lb./ac.
S E. of body of table =41.23 lb./ac.

Crop :- Wheat. **Ref :- M P. 50(23).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'M'.**

Object :—To study the residual effect of P manures applied to previous leguminous crop gram on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) to (c) As per treatments. (ii) (a) Clay loam (*Mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 17.10.1950. (iv) (a) *bakharing*. (b) N.A (c) 80 lb./ac. (d) 12". (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Nil. (ix) 2.11". (x) 26.3.1951.

2. TREATMENTS :

1. Wheat after wheat.
2. Wheat after gram.
3. Wheat after gram+15 lb./ac. of P_2O_5 as B.M.
4. Wheat after gram+15 lb./ac. of P_2O_5 as Ammo. Phos.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 11'×99'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1952. (b) Yes. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5, RESULTS :

(i) 609.5 lb./ac.
(ii) 78.20 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	549.3
2.	630.2
3.	635.2
4.	623.1
S.E./mean	=31.92 lb./ac.

Crop :- Wheat. **Ref :- M.P. 51(59).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'M'.**

Object :—To study the residual effect of P manures applied to previous leguminous crop gram on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) to (c) As per treatments. (ii) (a) Clay loam (*Mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 2, 3.11.1951. (iv) (a) *bakharing*. (b) N.A. (c) 80 lb./ac. (d) 12". (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Nil. (ix) 2.24". (x) N.A.

2. TREATMENTS :

1. Wheat after wheat.
2. Wheat after gram.
3. Wheat after gram ; gram manured with B.M. at 15 lb./ac. of P_2O_5.
4. Wheat after gram ; gram manured with Ammo. Phos. at 15 lb./ac. of P_2O_5.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 11'×99'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1952. (b) Yes. (c) N.A. (v) (a) to (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 342.5 lb./ac.
(ii) 57.48 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	327.2
2.	371.4
3.	369.8
4.	301.4
S.E./mean	= 23.60 lb./ac.

Crop :- Wheat. **Ref :- M.P. 52(41).**

Site :- Govt Exptl. Farm, Powarkheda. **Type :- 'M'.**

Object :—To study the effect of legume gram crop with and without P on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) and (c) As per treatments. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 3.11.1952. (iv) (a) *Bakharing*. (b) Drilling. (c) 80 lb./ac. (d) 12". (e) N.A. (v) Nil. (vi) A-115 (local). (vii) Unirrigated. (viii) Nil. (ix) 0.15". (x) N.A.

2. TREATMENTS :

1 Wheat after wheat.
2. Wheat after gram.
3. Wheat after gram+Ammo. Phos. at 15 lb./ac. of P_2O_5.
4. Wheat after gram+B.M. at 15 lb./ac. of P_2O_5.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 11'×99'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good germination in all plots. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1952. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 204.6 lb./ac.
(ii) 44.92 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	219.2
2.	224.0
3.	175.0
4.	199.3
S.E./mean	= 18.36 lb /ac.

Crop :- Wheat. **Ref :- M.P. 48(22)**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'M'.**

Object :—To study the effect of different doses of T.C. with that of F.Y.M., G.N.C. and A/S on wheat and to study its residual effect on subsequent Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (ii) 26, 27.10 1948. (iv) (a) *Bakharing*. (b) Sown by *nari*. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) A-115 (local). (vii) N.A. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as T.C. applied before monsoon.
3. 40 lb./ac. of N as T.C. applied before monsoon.
4. 20 lb./ac of N as F.Y.M. applied before monsoon.
5. 40 lb./ac. of N as F.Y.M. applied before monsoon.
6. 10 lb./ac. of N as G.N.C. applied at the beginning of September.
7. 20 lb./ac. of N as G.N.C. applied at the beginning of September.
8. 10 lb./ac. of N as A/S drilled with seed.
9. 20 lb./ac. of N as A/S drilled with seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 11'×99'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1948 to 1950. (b) Yes. (c) N.A. (v) (a) Jabalpore. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 833.2 lb./ac.
(ii) 75.12 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	735.7	6.	847.0
2.	752.8	7.	982.1
3.	757.0	8.	888.2
4.	742.0	9.	947.9
5.	846.2		

S.E./mean = 30.60 lb./ac.

Crop :- Wheat. **Ref :- M.P. 49 (30).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'M'.**

Object :—To study the residual effect of T. C. and other fertilizers applied to wheat during 1948-49 on the succeeding Wheat crop in the year 1949-50.

1. BASAL CONDITIONS :

(i) (a) N. A. (b) Wheat. (c) As per treatments. (ii) Clay loam (*Mariyar*). Refer soil analysis, Powarkheda. (iii) 26.10.1949. (iv) (a) *Bakharing*. (b) Sown by plough. (c)80 lb./ac. (d) 12". (e) N.A. (v) Nil. (vi) A 115 (Local). (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 25.3.1950.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of T.C. applied before monsoon.
3. 40 lb /ac. of T.C. applied before monsoon.
4. 20 lb /ac. of F.Y.M. applied before monsoon.
5. 40 lb./ac. of F.Y.M. applied before monsoon.
6. 10 lb.ac. of G.N.C. applied at the beginning of September.
7. 20 lb./ac. of G.N.C. applied at the beginning of September.
8. 10 lb./ac. as A/S drilled with seed.
9. 20 lb./ac. as A/S drilled with seed.

3. DESIGN :

(i) R. B. D (ii) 9. (b) N.A. (iii) 6. (iv) (a), (b) 11′×99′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Grain yield. (iv) (a) 1948 to 1950. (b) Yes. (c) N.A. (v) (a) Jabalpore. (b) N. A. (vi) and (vii) Nil.

5. RESULTS :

(i) 340.8 lb./ac.
(ii) 56.44 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	328.9	6.	371.8
2.	334.3	7.	347.6
3.	298.9	8.	325.9
4.	357.3	9.	326.8
5.	375.6		

S.E./mean =23.04 lb./ac.

Crop :- Wheat. **Ref : M. P. 52 (38).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'M'.**

Object :- To study the effect of C/N, A/S and lime on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*Mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 31.10.1952 and 1.1.1952. (iv) a) *Bakharing*. (b) N.A. (c) 80 lb./ac. (d) 12″. (e) N.A. (v) N.A. (vi) Hy 11·6 (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.15″. (x) 11.4. 1953.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 5 manures :- M_0=No manure, M_1=20 lb./ac. of N as A/S, M_2=40 lb./ac. of N as A/S, M_3=30 lb./ac. of N asC/N and M_4=40 lb./ac. of N as C/N.
(2) 2 levels of lime :-L_0=and L_1=200 lb./ac.

3. DESIGN :

(i) 2×5 Fact in R. B. D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a), (b) 18½′×66′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Grain yield. (v) (a) 1952 to 1953. (b) No. (c) N.A. (v) (a) (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 305.6 lb./ac
(ii) 57.73 lb./ac.
(iii) Both L and M effects are highly significant while interaction L×M is not significant.
(iv) Av. yield of grain lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean
L_0	379.7	357.8	370.7	294.5	240.6	328.7
L_1	302.7	334.7	336.9	272.2	165.8	282.5
Mean	341.2	346.2	353.3	283.3	203.2	305.6

S.E. of marginal mean of M =16.66 lb./ac.
S.E. of marginal mean of L =10.54 lb./ac.
S.E. of body of table =23.57 lb./ac.

Crop :- Wheat. Ref :- M.P. 48(23).

Site :- Labhandi Farm, Raipur. Type :- 'M'.

Object :—To assess the comparative effect of T.C. A/S, cowdung and G.N.C. on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Heavy loam (*kanhar*). (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) Nil. (vi) A 115 (Local). (vii) to (ix) N.A. (x) N.A.

2. TREATMENTS :

1. No manure.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66' x 16.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1943—1952. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Plot wise data N.A.

5. RESULTS :

(i) 356 lb./ac.
(ii), (iii) N.A.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	223	6.	387
2.	342	7.	434
3.	363	8.	354
4.	283	9.	374
5.	443		

S.E. mean = N.A.

Crop :- Wheat. Ref :- M.P. 49(38).

Site :- Labhandi Farm, Raipur. Type :- 'M'.

Object :—To see the effect of T.C. on Wheat as compared to other manures.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Heavy loam (*kanhar*). (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) N.A. (vi) A. 115 (local). (vii) to (x) N.A.

2. TREATMENTS :

1. No manure.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66' x 16.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1948—1952. (b) Yes. (c) N.A. (v) (a) to (b) N.A. (vi) N.A. (vii) Plot wise data N.A.

5. RESULTS :

(i) 338 lb./ac.
(ii), (iii) N.A.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	254	6.	372
2.	288	7.	402
3.	293	8.	314
4.	287	9.	462
5.	374		

S.E./mean =N.A.

Crop :- Wheat. **Ref :- M.P. 50(45).**

Site :- Labhandi Farm, Raipur. **Type :- 'M'.**

Object .— To see the effect of T.C. on Wheat as compared to other fertilizers.

1. BASAL CONDITIONS :

(i) Nil. (b) Wheat. (c) As per treatments. (ii) (a) *Dorsa—Kankar.* (b) N.A. (iii) 7.1[illegible].1950. (iv) (a) Two ploughings by country plough after monsoon followed by peg-tooth harrow. (b) Drilled. (c) 100 lb./ac. (d) 12" approximately. (e) —. (v) Nil. (vi) A. 115 (local). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 26.3.1951.

2. TREATMENTS :

1. No manure.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948 to 1952. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 460 lb./ac.
(ii) 108.1 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	480	6.	507
2.	393	7.	500
3.	424	8.	453
4.	502	9.	478
5.	407		

S.E./mean =44.1 lb./ac.

Crop :- Wheat. **Ref :- M.P. 51(67).**

Site :- Labhandi Farm, Raipur. **Type :- 'M'.**

Object :—To study the effect of T.C. as compared to other fertilizers on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Heavy loam (*kanhar*). (b) N.A. (iii) 17.10.1951. (iv) (a) 2 ploughings with country plough after monsoon. (b) Seeds drilled by *nari* plough. (c) 100 lb./ac. (d) 12" apart. (e) —. (v) Nil. (vi) A. 115 (local). (vii) Irrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

1. No manure.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as Cowdung.
5. 40 lb./ac. of N as Cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.
10. Treat.9—20 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 66′×16½′. (v) Ni . (vi) Yes.

4. GENERAL :

(i) Good, no lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948 to 1952. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 389.5 lb./ac.
(ii) 110.5 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	273.5	6.	456.9
2.	270.1	7.	386.9
3.	340.2	8.	396.9
4.	313.5	9.	523.6
5.	286.8	10.	647.0

S.E./mean =45.1 lb./ac.

Crop :- Wheat. **Ref :- M.P. 52(53).**

Site :- Labhandi Farm, Raipur. **Type :- 'M'.**

Object :—To study the effect of T.C. on Wheat as compared to other manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Darsa (kanhar)*. (b) N.A. (iii) 17.10.1952. (iv) (a) Ploughing. (b) Drilled. (c) 80 lb./ac (d) N.A. (e) —. (v) Nil. (vi) A. 115 (local). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 8.3.1953.

2. TREATMENTS :

1. No manure.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.
10. Treatment 9+20 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) to (b) 66′×16½′ (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1948—1952. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 268.5 lb./ac.
(ii) 142.5 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	116.7	6.	293.5
2.	150.1	7.	376.9
3.	173.4	8.	316.8
4.	146.7	9.	433.6
5.	120.1	10.	556.9

S.E./mean =58.4 lb./ac.

Crop :- Wheat. **Ref :- M.P. 53(52).**

Site :- Labhandi Farm, Raipur. **Type :-'M'.**

Object :—To study the effect of C/N on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Dorsa.* (b) N.A. (iii) 1, 2.1.1953. (iv) (a) Ploughing. (b) to (e) N.A. (v) Nil. (vi) A. 115 (local). (vii) Irrigated, (viii) Weeding. (ix) N.A. (x) 15.2.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 doses of lime : L_0=0 and L_1=200 lb./ac.

(2) 5 doses of N : N_0=0, N_1=20 lb./ac. of N as A/S, N_2=40 lb./ac. of N as A/S, N_3=20 lb./ac. of N as C/N and N_4=40 lb./ac. of N as C/N.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) No. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 248.1 lb./ac.

(ii) 114.8 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	N_4	Mean
L_0	216.8	260.1	223.5	230.0	240.1	234.1
L_1	225.1	233.5	336.8	300.2	215.1	262.1
Mean	220.9	246.8	280.1	265.1	227.6	248.1

S.E. of marginal mean of L =21.0 lb./ac.
S.E. of marginal mean of N =33.1 lb./ac.
S.E. of body of table =46.9 lb./ac.

Crop :- Wheat. **Ref :- M.P. 53(20).**

Site :- Reura Farm, Satna. **Type :- 'M'.**

Object :—To find suitable source of N and its time of application on Wheat crop.

1. BASAL CONDITIONS :

(i) *Moong*—wheat. (b) *Moong.* (c) Nil. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 27.12.1953. (iv) (a) Sown by *nari* plough. (b) N.A. (c) 40 lb./ac. (d) and (e) N.A. (v) Nil (vi) C-591 (mid late). (vii) Irrigated. (viii) Nil. (ix) 2.00". (x) 13, 14.4.1954.

2. TREATMENTS :

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

(1) 3 applications of manure : M_1=A/S at $2\frac{1}{2}$ lb /plot. M_2=Urea at $1\frac{1}{8}$ lb /ac. and M_3=A/N at $1\frac{1}{2}$ lb /plot.

(2) 2 times of application : T_1=At sowing and T_2=At the time of 2nd irrigation after sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 40'×27'. (b) 36'×23'. (v) 2' alround. (vi) Yes.

4. GENERAL :

(i) Very poor crop. (ii) Attack of brown rust. No control measures were taken. (iii) Grain yield. (iv) (a) to (c) No. (v) (a) and (b) N.A. (vi) Nil. (vii) Sowing was done late.

5. RESULTS :

(i) 447.4 lb./ac.
(ii) 121.0 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

Control=389.5 lb./ac.

	M_1	M_2	M_3	Mean
T_1	397.8	535.7	509.6	481.0
T_2	410.0	461.8	427.2	433.0
Mean	403.9	498.7	468.4	457.0

S.E. of marginal mean of M =42.8 lb./ac.
S.E. of marginal mean of T =34.9 lb./ac.
S.E. of body of table =60.5 lb./ac.

Crop :- Wheat. **Ref :- M.P. 53(28).**

Site :- Govt. Seed and Demonstration Farm, Saugor. **Type :- 'M'.**

Object :—To study the effect of graded doses of C/N in comparison with A/S on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar*. (b) N.A. (iii) 30, 31.10.1953. (iv) (a) N.A. (b) Sown by *nari* plough. (c) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 4 levels of N : N_0=0, N_1=15, N_2=30, and N_3=45 lb./ac.
(2) 2 sources of N : S_1=A/S and S_2=C/N.

3. DESIGN :

(i) 2×4 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) and (b) 33'×33'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 847.8 lb./ac.
(ii) 94.00 lb./ac.
(iii) Only S effect is highly significant.
(iv) Av. yield of grain in lb./ac.

Control =869.0 lb./ac.

	N_1	N_2	N_3	Mean
S_1	886.0	938.0	960.0	928.0
S_2	776.0	780.0	704.0	753.3
Mean	831.0	859.0	832.0	840.6

S.E. of marginal mean of N =29.6 lb./ac.
S.E. of marginal mean of S =24.3 lb./ac.
S.E. of body of table =42.0 lb./ac.

Crop :-Wheat. Ref :- M.P. 51(23).

Site :-Govt. Seed and Demonstration Farm, Saugor. Type :- 'M'.

Object :—To study the effect of cotton seed cake in comparison with other fertilizers on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar* 2. (b) N.A. (iii) 25.10.1951. (iv) (a) to (c) N.A. (d) Rows 12" apart. (e) N.A. (v) N.A. (vi) A. 115. (vii) to (ix) N.A. (x) 20.3.1952.

2. TREATMENTS:

1. Control.
2. 15 lb./ac. of N as G.N.C.
3. 15 lb./ac. of N as decorticated cotton seedcake.
4. 15 lb./ac. of N as undecorticated cotton seedcake.
5. 15 lb./ac. of N as A/S.

Manures applied on 20.9.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 25.75'×42.75'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1553. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 349.7 lb./ac.
(ii) 61.2 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	321.0
2.	412.0
3.	320.6
4.	318.5
5.	376.4
S.E./mean	=27.60 lb./ac.

Crop :-Wheat. Ref :-M.P. 52(17).

Site :-Govt. Seed and Demonstration Farm, Saugor. Type :-'M'.

Object : —To study the effect of cotton seed cake in comparison with other manures on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar* 2. (b) N.A. (iii) 20.12.1952. (iv) (a) to (c) N.A. (d) Rows 12" apart. (e) N.A. (v) N.A. (vi) A. 115. (vii) to (x) N.A.

2. TREATMENTS :

1. Control (no manure).
2. G.N.C. quantity applied N.A.
3. Decorticated cotton seed cake-quantity applied N.A.
4. Undecorticated cotton seed cake-quantity applied N.A.
5. A/S - quantity applied N A.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 3. (iv) (a) and (b) 33'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment originally planned with 5 replications. 2 replications discarded due to poor yields.

5. RESULTS :

(i) 536 6 lb./ac.

(ii) 98.56 lb./ac.

(iii) Treatments do not differ significantly.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	516.8
2.	604.8
3.	476.6
4.	454.3
5.	630.6
S.E./mean	=57.20 lb./ac.

Crop :- Wheat. **Ref :- M P. 53(29).**

Site :- Govt. Seed and Demonstration Farm, Saugor. Type :- 'M'.

Object :—To study the effect of cotton seed cake in comparison with other manures on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar.* (b) N.A. (iii) 1.11.1953. (iv) (a) and (b) N.A. (c) 90 lb./ac. (d) and (e) N.A. (v) to (viii) N A. (ix) 1.75". (x) 5.4.1954.

2. TREATMENTS :

1. Control.
2. G.N.C.- quantity applied N.A.
3. A/S—quantity applied N.A.
4. Fertilizer mixture quantity applied N.A.
5. Decorticated cotton seed cake-quantity applied N.A.
6. Undecorticated cotton seed cake-quantity applied N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) and (b) 30'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 866.0 lb./ac.

(ii) 90.64 lb /ac.

(iii) Treatments differ highly significantly.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	764.4
2.	912.7
3.	928.4
4.	960.3
5.	761.2
6.	868.9
S.E./mean	= 40.48 lb./ac.

Crop :- Wheat. **Ref :- M.P. 48(20).**

Site :- Govt Seed and Demonstration Farm, Saugor. Type :- 'M'.

Object :—To study the comparative effect of T.C., F.Y.M., G.N.C. and A/S on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar* 2. (b) N.A. (iii) 20.10 1948. (iv) (a) 3 *bakharings.* (b) Sown by *nari* plough. (c) to (e) N.A. (v) Nil. (vi) A.O. 90. (vii) N.A. (viii) Nil. (ix) N.A. (x) 28.3.1949.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb /ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as F.Y.M.
5. 40 lb /ac. of N as F.Y.M.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1947 to 1953. (modified in 1943) (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 768 lb./ac.
(ii) 43.2 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	667	6.	820
2.	734	7.	787
3.	787	8.	753
4.	757	9.	807
5.	800		
	S.E./mean	±17.6 lb./ac.	

Crop :- Wheat. **Ref :- M.P. 49 (28).**

Site :- Govt. Seed and Demonstration Farm, Saugor. Type :- 'M'.

Object :—To study the comparative effect of T. C., F. Y. M., G.N.C. and A/S on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) *Kabar* (b) N.A. (ii) 22.10.49. (a) *Bakharing.* (b) Sown by *nari* plough. (c) to (e) N.A. (v) Nil. (vi) A.O.90. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 8.4.1950.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as F.Y.M.
5. 40 lb./ac. of N as F.Y.M.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb /ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6 (iv) (a), (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory in the beginning, but at later stage the crop suffered for want of moisture in the soil (ii) Nil. (iii) Grain and yield straw. (iv) (a) 1947 to 1953. (b) N.A. (c) N.A. (v) (a) Jabalpore. (b) N.A. (iv) and (vii) Nil.

5. RESULTS :

(i) 361.7 lb./ac.
(ii) 84.00 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av.yield	Treatment	Av. yield
1.	323.5	6.	353.5
2.	351.8	7.	358.5
3.	346.8	8.	440.2
4.	390.2	9.	378.5
5.	311.8		
	S.E./mean	±34.00 lb./ac.	

Crop :- Wheat. (*Rabi*) Ref :- M.P. 49 (62).

Site :-Govt. Seed and Demonstration Farm, Seoni. Type :- 'M'.

Object :—To compare the effect of T.C. with other manures and fertilizers in different doses.

1. BASAL CONDITIONS ;

(i) (a) to (c) N.A. (ii) (a), (b) N.A. (iii) 11.11.1949. (iv) (a) *Bakharing*. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) 26.3.1950.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGNS :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a),(b) 1/80. ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good general growth. (ii) Nil. (iii) Grain yield. (iv) (a) N.A. (b), (c) N.A. (v) (a), (b) N.A. (vi) Year of heavy rains with 67.70" as against 51.50" as normal. The distribution was also very unsatisfactory. (vii) Nil.

5. RESULTS :

(i) 858 lb./ac.
(ii) 91.71 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	726.	6.	836
2.	850	7.	926
3.	944	8.	750
4.	868	9.	834
5.	992		

S.E./mean =37.44 lb./ac.

Crop :- Wheat. (*Rabi*). Ref :- M.P. 50(65).

Site :- Govt. Seed and Demonstration Farm, Seoni. Type :- 'M'.

Object :—To compare the effect of T.C. with other manures and fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 20.10.1950. (iv) (a) 5 ***bakharings***. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) 24.3.1951.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac of N as cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 33'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Growth almost similar in all the plots. (ii) Nil. (iii) Grain yield. (v) (a) 1949—N.A. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) Comparatively dry year with 42.22" rain only as against 51.99" as average. (vii) Nil.

5. RESULTS :

(i) 882 lb./ac.
(ii) 100.9 lb./ac.

(iii) Treatment differences are not significant.

(iv) Av yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	820	6.	852
2.	926	7.	946
3.	872	8.	866
4.	840	9.	900
5.	904		
S.E./mean	=41.2 lb./ac.		

Crop :- Wheat (*Rabi*). Ref :- M.P. **51(86)**.

Site :- Govt. Seed and Demonstration Farm, Seoni. Type :- 'M'.

Object :—To compare the effect of T.C. with other manures and fertilizers with different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) N.A. (b) N.A. (iii) 8.11.1951. (iv) (a) 7 *bakharings*. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) 25.3.1952.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb /ac. of N as cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) (a) and (b) 32′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—N.A. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1351 lb./ac.

(ii) 235.4 lb./ac.

(iii) Treatment differences are not significant.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av yield
1.	1200	6.	1492
2.	1432	7.	1266
3.	1432	8.	1372
4.	1226	9.	1328
5.	1372		
	S.E./mean	=96.1 lb./ac.	

Crop :- Wheat (*Rabi*): Ref :- M.P. **50 (66)**.

Site :- Govt. Seed and Demostration Farm, Seoni. Type :- 'M'

Object :—To compare the residual effect of T.C. with other manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments (ii) (a) N.A. (b) N.A. (iii) 17.10.1950. (iv) (a) 5 *bakharings* (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) 19.3.1951.

2. TREATMENTS :

1. No manure (Control).
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

Treatments applied in 1949-1950 to wheat crop. Residual effect studied.

3. DESIGN :

(i) R. B. D. (ii) (a) 9 (b) N.A. (iii) 6 (iv) (a), (b) 33′×16½′ (v) Nil. (vi) Yes.

4. GENERAL :

(i) Crop growth was similar in all the plots. (ii) Nil. (iii) Grain yield. (iv) (a) 1950-continued. (b), (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 913 lb./ac.
(ii) 158.8 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	836	6.	856
2.	906	7.	930
3.	994	8.	872
4.	996	9.	884
5.	946		

S.E/mean =64.8 lb./ac.

Crop :—Wheat — Ref :—M.P. 51(87),

Site :—Govt. Seed and Demonstration Farm, Seoni — Type :—'M'

Object :—To compare the Residual effect of T.C. with other manures and fertilisers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat (c) As per treatments. (ii) (a), (b) N.A. (iii) 18.11.1951. (iv) (a) 7 *bakharings* (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) unirrigated. (viii) N.A. (ix) N.A. (x) 23.3.1952.

2. TREATMENTS :

1. No manure (control).
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowding.
5. 40 lb./ac. of N as cowding.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac of N as A/S.
9. 20 lb./ac. of N as A/S.

Treatments applied in 1950-1951 to wheat crop. Residual effect studied.

3. DESIGN :

(i) R.B.D. (ii) (a) 9 (b) N.A. (iii) 6 (iv) (a) and (b) 33′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Crop growth was uniform in all the plots of all the treatments. (ii) Nil. (iii) Grain yield. (iv) (a) 1950—Contd. (b), (c) N.A. (v) (a) and (b) N.A. (vi) & (vii) Nil.

5. RESULTS :

(i) 1034 lb./ac.
(ii) 215.0 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1106	6.	1052
2.	746	7.	1160
3.	970	8.	1066
4.	960	9.	1292
5.	960		

S.E./mean =87.86 lb./ac.

Crop :-Wheat (*Rabi*). Ref :- M.P. 51(83).

Site :-Govt. Seed and Demonstration Farm, Seoni. Type :- 'M'.

Object :—To compare the effect of cotton seed cake, decorticated and undecorticated with other cakes and fertilizers.

1. BASAL CONDITIONS .

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 9.11.1951. (iv) (a) 7 *bakharings*. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) and (ix) N.A. (x) 27.3.1952.

2. TREATMENTS :

1. No manure.
2. 20 lb /ac. of N as G.N.C.
3. 20 lb./ac. of N as decorticated cotton seed cake.
4. 20 lb./ac. of N as undecorticated cotton seed cake.
5. 20 lb./ac. of N as A/S.
6. 20 lb /ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.

3. DESIGN:

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) and (b) 33′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Crop looked similar in all the plots. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—continued. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Rain-fall was sub-normal (40.39″ only as against 51.68″) and there were no winter showers. (vii) Nil.

5. RESULTS :

(i) 1301 lb./ac.
(ii) 187.8 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1328
2.	1168
3.	1152
4.	1200
5.	1536
6.	1424
S.E./mean	=84.0 lb./ac.

———

Crop :- Wheat (*Rabi*). Ref :- M.P. 52(71).

Site :- Govt. Seed and Demonstration Farm, Seoni. Type :- 'M'.

Object :—To compare the effect of cotton seed cake, decorticated and undecorticated with other fertilizers.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 14.10.1952. (iv) (a) 7 *bakharings*. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) and (ix) N.A. (x) 16.3.1953.

2. TREATMENTS :

1. No manure.
2. 20 lb./ac. of N as G.N.C.
3. 20 lb./ac. of N as decorticated cotton seed cake.
4. 20 lb./ac. of N as undecorticated cotton seed cake.
5. 20 lb./ac. of N as A/S.
6. 20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) and (b) 33′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Crop looked similar in all the plots. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—continued. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 581 lb /ac.
(ii) 50.71 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	576
2.	592
3.	560
4.	592
5.	592
6.	576

S.E./mean = 22.68 lb./ac.

Crop :- Wheat (*Rabi*). Ref :- M.P. 52:94.
Site :- Govt. Seed and Demonstration Farm, Seoni. Type :- 'M'.

Object :—To compare the effect of cotton seed cake, decorticated and undecorticated with other cakes and manures.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 27.10.1953. (iv) (a) 6 *bakharis*/s. (b) to (g) N.A. (v) Nil. (vi) A.O. 90. (vii) Unirrigated. (viii) and (ix) N.A. (x) 21.3.1954.

2. TREATMENTS :

1. No manure (control).
2. 20 lb./ac. of N as G.N.C.
3. 20 lb./ac. of N as cotton seed cake decorticated.
4. 20 lb./ac. of N as cotton seed cake undecorticated.
5. 20 lb./ac. of N as A/S.
6. 20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
7. 164 lb./ac. of G.N.C.+54⅔ lb./ac. of A/S+20 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) and (b) 33' × 16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Crop uniform in all the plots. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—continued (b) and (c) N.A. (v) (a) and (b) N.A. (vi) The season was very draughty. (vii) Nil.

5. RESULTS :

(i) 984 lb./ac.
(ii) 64.76 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	744
2.	1036
3.	979
4	1011
5	1099
6	1012
7.	1009

S.E./mean = 28.96 lb./ac.

Crop :- Wheat. Ref :- M.P. 49(62).

Site :- Govt. Seed and Demonstration Farm, Seoni. Type :- 'M'.

Object :—To compare the effect of T.C. with other manures and fertilizers on Wheat yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 11.11.1949. (iv) (a) 6 *bakharings*. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) and (ix) N.A. (x) 28.3.1950.

2. TREATMENTS :

1. Control.
2. 20 lb /ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb /ac. of N as cattle dung.
5. 40 lb./ac. of N as cattle dung.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1949—contd. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 858 lb /ac.
(ii) 91.71 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	726	6.	836
2.	850	7.	926
3.	944	8.	750
4.	868	9.	834
5.	992		

S.E./mean =37.44 lb./ac.

Crop :- Wheat (*Rabi*). Ref :- M.P. 53(95).

Site :- Govt. Seed and Demonstration Farm, Seoni. Type :-'M'.

Object :—To compare the effect of C/N with other fertilizers on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) to (b) N.A. (iii) 28.10.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) A.O. 90. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) 21.3.1954.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 levels of N : $N_0=0$, $N_1=15$ and $N_2=30$ lb./ac.
(2) 2 sources of N : S_1=A/S and S_2=C/N.

3. DESIGN :

(i) 3×2 Fact. in R.B.D. (i) (a) 6. (b) N.A. (iii) 5. (iv) (a) and (b) 49½'×22'. (v) Nil. vi) Yes.

4. GENERAL :

(i) Crop growth was uniform in all the replications, but later due to excessive draught, cracks were formed unevenly. Withering of plants in the cracked area. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) to (b) N.A. (vi) Excessively drought condition effected the crop rather adversely. (vii) Nil.

5. RESULTS :

(i) 769 lb./ac.
(ii) 125 2 lb./ac.
(iii) Effect of N is highly significant and of S is significant. Interaction is not significant.

(iv) Av. yield of grain in lb./ac.

Control =759 lb./ac.

	N_1	N_2	Mean
S_1	903	788	846
S_2	805	591	698
Mean	854	690	772

S.E. of any marginal mean o. control mean =39.58 lb./ac.

S.E. of body of table =55.98 lb./ac.

Crop :- Wheat. Ref :- M.P. 53(22).

Site :-Central Res. Farm, Ujjain. Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 4.11.1953. (iv) (a) Tractor ploughing and *bakharing*. (b) Drilled. (c) 25 seers/ac. (d) 12". (e) —. (v) Nil. (vi) G.D. 11. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 28.3.1954.

2. TREATMENTS :

1. Control (no manure).
2. 50 lb./ac. of A/S.
3. 170 lb /ac. of G.N.C.
4. 50 lb/ac. of A/S+56 lb./ac. of Super.
5. 25 lb./ac. of A/S+85 lb /ac. of G.N.C.
6. 170 lb./ac. of G.N.C.+56 lb./ac. of Super.
7. 50 lb./ac. of A/S+170 lb./ac. of G.N.C.+112 lb./ac. of Super.
8. 340 lb./ac. of *Magh* manure.

Super drilled before sowing 4" deep and then levelled. A/S, *Magh* manure and G.N.C. mixed with the soil and drilled.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 8'×60'. (b) 6'×54'. (v) 1'×3'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 395.1 lb./ac.

(ii) 57.29 lb./ac.

(iii) Treatments do not differ significantly.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	432.6	5.	441.0
2.	358.0	6.	403.2
3.	380.1	7.	404.3
4.	376.9	8.	364.3

S.E./mean =28.64 lb./ac.

Crop :-Wheat. **Ref :- M.P. 50(18).**

Site :- Central Res. Farm, Ujjain. **Type :- 'M'.**

Object :—To find out suitable manurial dose for Wheat under dry conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 29, 30.10.1950. (iv) (a) *Bakharings*. (b) and (c) N.A. (d) Rows 1' apart. (e) N.A. (v) Nil. (vi) G.D. 11 (late). (vii) Unirrigated. (viii) Nil (ix) and (x) N.A.

2. TREATMENTS :

1. Control (no manure).
2. 10 lb./ac. of N.
3. 20 lb /ac. of N.
4. 30 lb /ac. of N.
5. 40 lb./ac. of N.
6. 10 lb /ac. of N+10 lb /ac. of P_2O_5.
7. 10 lb./ac. of N+20 lb./ac. of P_2O_5.
8. 10 lb./ac. of N+30 lb./ac. of P_2O_5
9. 20 lb./ac. of N+20 lb./ac. of P_2O_5
10. 20 lb./ac. of N+30 lb./ac. of P_2O_5.
11. 20 lb./ac. of N+40 lb./ac. of P_2O_5.

Source of N for treatments 2 to 8 is A/S while for 9 to 11, it is A/S and G.N.C. in 1 : 1 ratio. Source of P_2O_5 is Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 16'×96'. (b) 12'×90'. (v) 2'×3'. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950 –1951. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1610 lb./ac.
(ii) 232.7 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1385	7.	1891
2.	1404	8.	1805
3.	1337	9.	1843
4.	1356	10.	1834
5.	1327	11.	1891
6.	1642		

S.E./mean =95.1 lb./ac.

Crop :- Wheat. **Ref :- M.P. 51(2).**

Site :- Central Res. Farm, Ujjain. **Type :- 'M'.**

Object :—To find out suitable manurial dose for Wheat under dry conditions with a view to increase the out put.

1. BASAL CONDITIONS :

(i) Nil. (b) Groundnut. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 17, 18.10.1951. (iv) (a) *Bakharing*. (b) and (c) N.A. (d) Rows 1' apart. (e) N.A. (v) Nil. (vi) G.D. 11 (late). (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 13.3.1952.

2. TREATMENTS :

1. Control (no manure).
2. 10 lb./ac. of N.
3. 20 lb./ac. of N.
4. 30 lb./ac. of N.
5. 40 lb./ac. of N.
6. 10 lb./ac. of N+10 lb./ac. of P_2O_5.
7. 10 lb./ac. of N+20 lb./ac. of P_2O_5.
8. 10 lb./ac. of N+30 lb./ac. of P_2O_5.
9. 20 lb./ac. of N+20 lb./ac. of P_2O_5.
10. 20 lb./ac. of N+30 lb./ac. of P_2O_5.
11. 20 lb./ac. of N+40 lb./ac. of P_2O_5.

Source of N for treatments 2 to 8 is A/S while from 9 to 11 it is A/S and G.N.C. in 1 : 1 ratio. Source of P_2O_5 is Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 16'×95'. (b) 12'×90'. (v) 2'×3'. (vi) Yes.

4. GENERAL :

(i) Poor due to lack of winter rains. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950—1951. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 679.3 lb./ac.
(ii) 158.1 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	807	7.	578
2.	740	8.	606
3.	645	9.	559
4.	745	10.	597
5.	807	11.	659
6.	630		

S.E./mean = 64.2 lb./ac.

Crop :- Wheat. Ref :- M.P. 51(6).

Site :- Central Res. Farm, Ujjain. Type :- 'M'.

Object :—To study the effect of graded doses of K manure on the yield of Wheat grain.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Gram. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 19,20.10.1951. (iv) (a) 6 *bakharings*. (b) Seeds drilled. (c) 25 sr/ac. (d) Rows 12" apart approximately. (e) —. (v) Nil. (vi) G. D. 11. (vii) Unirrigated. (viii) Nil. (ix) 3.78". (x) 15.3.1952.

2. TREATMENTS :

1. No manure.
2. 30 lb./ac. of N as K manure.
3. 60 lb./ac. of N as K manure.
4. 90 lb./ac. of N as K manure.

Manures applied by broadcasting.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 140'×125'. (iii) 6. (iv) (a) 35'×125'. (b) 28'×115'. (v) 3 rows on both sides and 5 feet of each row at both ends. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 4·8 lb./ac.
(ii) 62.73 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	466
2.	460
3.	457
4.	408

S.E./mean = 25.61 lb./ac.

Crop :- Wheat. Ref :- M. P. 53(79).

Site :- Govt. Seed and Demonstration Farm, Waraseoni. Type :- 'M'.

Object :—To see the effect of C/N in comparison with A/S on Wheat after paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a), (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) 0.38". (x) N.A.

2. TREATMENTS :

1. Control.
2. 15 lb./ac. of N as A/S.
3. 30 lb./ac. of N as A/S.
4. 15 lb./ac. of N as C/N.
5. 30 lb./ac. of N as C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a), (b) 1/40 ac. (v) Nil. (vi) N.A.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) N.A. (b) N.A. (vi) Nil. (vii) Raw data N.A.

5. RESULTS :

(i) 802.5 lb./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	680
2.	756
3.	884
4.	764
5.	928
S.E./mean	=N.A.

Crop :- Wheat (*Rabi*). Ref :- M.P. 53(92).

Site :- Govt. Seed and Demontration Farm, Waraseoni Type :- 'M'.

Object :—To study the effect of C/N in comparision with A/S on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) to (iv) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS :

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

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (e) N.A. (c) to (vii) N.A.

5. RESULTS :

(i) 802 lb./ac.
(ii) 106.5 lb./ac.
(iii) Control *vs.*, others effect is significant, N effect is highly significant while other effects are not significant.

(iv) Av. yield of grain in lb./ac.

Control=680 lb./ac.

	N_1	N_2	Mean
S_1	756	884	820
S_2	764	928	846
Mean	760	906	833

S. E. of any marginal mean =33.7 lb./ac.
S. E. of body of table=47.6 lb./ac.

Crop :-Wheat. Ref :-Complex Experiments (T.C.M.), 1953.

Centre :-Obedullganj (M.P.). Type :-'NP'.

Object :--To study the effect of artificial fertilizers in conjunction with organic manures.

1. BASAL CONDITIONS :

(i) a) N.A. (b) N.A. (c) N.A. (ii) (a) Loam in texture and deep black in colour. (b) N.A. (c) 29-6-1953. (iv) N.A. (v) N.A. (vi) C-591. (vii) Irrigated. (viii) Nil. (ix) 53.42". (x) 25.3.1954.

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) 3 levels of P_2O_5 :—P_0=0, P_1=20 and P_2=40 lb./ac.
(3) 3 levels of F.Y.M. :—F_0=0, F_1=5 and F_2=10 C.L./ac.

F.Y.M. spread a week before sowing. N as A/S was broadcast just before sowing while P_2O_5 as Super was mixed with the seed and drilled.

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) 32' to 25'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal (ii) Case of loose-smut was noticed throughout the experiment. (iii) Grain yield. (iv) (a) 1953 to 56. (b) No. (c) N.A. (v) (a) Niphad. (b) N.A. (vi) Nil. (vii) N.A.

5. RESULTS :

(i) 880 lb./ac.
(ii) 78.92 lb./ac.
(iii) Only the interaction N×F is significant.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	F_0	F_1	F_2
P_0	861	889	1035	928	963	956	865
P_1	804	842	833	826	759	871	849
P_2	842	869	948	886	757	976	926
Mean	835	865	939	880	826	934	880
F_0	687	764	1028				
F_1	933	926	944				
F_2	996	908	846				

S. E. of any marginal mean =26.31 lb./ac.
S. E. of body of any table =45.56 lb./ac.

Crop :- Wheat. Ref :- Complex experiments (T.C.M.), 1953.

Centre :- Obedullgunj (M.P.). Type :- 'M'.

Object :—Additional expt., To study the effect of artificial fertilizers in conjunction with organic manures.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loam in texture and deep black in colour. (b) N.A. (iii) 29.10.1953. (iv) and (v) N.A. (vi) C-591. (vii) Irrigated. (viii) Nil. (ix) 53.42". (x) 27.4.1954.

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

(3) 3 levels of F Y.M. : F_0=0, F_1=10 and F_2=20 C.L./ac.

N as A/S broadcast one week before sowing where as P_2O_5 as Super was mixed with the seed and drilled. F.Y.M. spread in the plot one week before sowing.

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) 30'×25'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Crop suffered slightly from loose-smut and grass-hopper. (iii) Grain yield. (iv) (a) 1953–1956. (b) No. (c) N.A. (v) (a) Niphad. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1335 lb /ac.

(ii) 264.9 lb./ac.

(iii) Main effects of N and F are significant. Other effect and interactions are not significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	F_0	F_1	F_2
P_0	1205	1409	1491	1368	946	1426	1732
P_1	1083	1265	1518	1288	1145	1182	1538
P_2	1008	1359	1673	1347	1063	1549	1429
Mean	1099	1344	1561	1335	1051	1386	1566
F_0	717	1168	1270				
F_1	1195	1270	1692				
F_2	1384	1595	1720				

S.E. of any marginal mean = 88.3 lb./ac.

S.E. of body of any table =152.9 lb./ac.

Crop :- Wheat. Ref :- Complex experiments (T.C.M.), 1953.

Centre :- Obedullganj (M.P.). Type :- 'M'.

Object :—I (a), To study the effect of types and levels of N and P on non-acid soils (unirrigated).

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loam in texture and deep black in colour. (b) N.A. (iii) 28.10.1953. (iv) and (v) N.A. (vi) C-591. (vii) Unirrigated. (viii) Nil. (ix) 53.42". (x) 22.4.1954.

2. TREATMENTS :

All combinations of (1), (2) and (3)+3 extra treatments.

(1) 3 sources of N : S_1=A/S, S_2=A N and S_3=Urea.

(2) 3 levels of N : N_0=0, N_1=20 and N_2=40 lb /ac.

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

T_1=60 lb./ac. of N+40 lb./ac. of P_2O_5, T_2=40 lb./ac. of N+80 lb./ac. of P_2O_5 and T_3=60 lb./ac. of N+80 lb /ac. of P_2O_5.

N applied as A/S and P_2O_5 as Super.

N applied broadcast before sowing while Super was mixed with seed and sown along with seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 12 plots/block and 3 blocks/replication +3 extra treatments in each block. (b) N A. (iii) 1. (iv) (a) N.A. (b) 30'×25'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal, no lodging. (ii) Loose-smut was seen throughout the experiment. (iii) Grain yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Kotah and Niphad. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 967 lb./ac.

(ii) 102.6 lb /ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

T_1=1028 lb./ac., T_2=1025 lb./ac. and T_3=1035 lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2	S_3
P_0	866	988	993	950	861	940	1046
P_1	913	946	968	913	940	968	919
P_2	928	1041	1057	1009	1038	988	1000
Mean	903	991	1006	967	946	966	988
S_1	—	954	976				
S_2	—	986	993				
S_3	—	1036	1050				

S.E. of any marginal mean in N×P or S×P table	=34.2 lb./ac.
S.E. of marginal mean of N in N×S table	=39.3 lb./ac.
S.E. of marginal mean of S in N×S table	=31.2 lb /ac.
S.E. of body of N×P or S×P table	=59 2 lb./ac.
S.E. of body of S×N table	=55 8 lb./ac.
S.E. of T_1, T_2 or T_3 mean	=59.2 lb./ac.

Crop :- Wheat. Ref :- Complex experiments (T.C.M.), 1953.

Centre :- Obedullaganj (M.P.). Type :- 'M'.

Object :— I (a). To study the effect of types and levels of N and P on non-acid soils.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loam in texture, deep black in colour. (b) N.A. (iii) 27.10.1953. (iv) N.A. (v) N.A. (vi) C-591. (vii) Irrigated. (viii) Nil. (ix) 53.42". (x) 27, 28.3.1954.

2. TREATMENTS :

All combinations of (1), (2) and (3)+3 extra treatments.

(1) 3 levels of N : N_0=0, N_1=20 and N_2=40 lb /ac.

(2) 3 sources of N : S_1=A/S, S_2=A/N and S_3=Urea.

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

and 3 extra treatments : T_1=60 lb./ac. of N+40 lb./ac. of P_2O_5, T_2=40 lb./ac. of N+80 lb./ac. of P_2O_5, T_3=60 lb./ac. of N+80 lb./ac. of P_2O_5.

N as A/S broadcast before sowing and Super mixed with seed and was sown along with the seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 12 plots/block and 3 blocks/replication+3 extra treatments in each block. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 30′×25′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal, no lodging. (ii) Attack of grass-hopper and loose-smut was noticed. (iii) Grain yield. (iv) (a) 1953-1956. (b) No. (c) N.A. (v) (a) Kotah and Niphad. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1247 lb./ac.

(ii) 202 9 lb./ac.

(iii) Main effects of S and P are highly significant. Others are not significant.

(iv) Av. yield of grain in lb./ac.

T_1=1588 lb./ac., T_2=1872 lb./ac. and T_3=1979 lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2	S_3
P_0	727	933	1265	975	1057	1029	838
P_1	1085	1675	1386	1382	1210	1367	1570
P_2	938	1578	1640	1385	1423	1145	1588
Mean	917	1395	1430	1247	1230	1180	1332
S_1	—	1528	1484				
S_2	—	1336	1299				
S_3	—	1321	1508				

S.E. of any margin l mean in N×P or S×P table	=117.2 lb./ac.
S.E. of marginal mean of N in N×S table	= 77.8 lb./ac.
S.E. of marginal mean of S in N×S table	= 63.5 lb./ac.
S.E. of body of N×P or S×P table	=117.2 lb./ac.
S.E. of body of N×S table	=110.2 lb./ac.
S.E. of extra treatments	=117.2 lb./ac.

Crop :- Wheat. **Ref :- Complex experiments (T.C.M.), 1953.**

Centre :- Satna (M.P.). **Type :- 'M'.**

Object :– II To study the best time of application of N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey. (b) N.A. (iii) 27.12.1953. (iv) N.A. (v) N.A. (vi) C-591. (vii) Irrigated. (viii) Nil. (ix) 43.77". (x) 19.4.1954.

2. TREATMENTS :

All combinations of (1) and (2)+one control.

(1) 3 sources of N at 20 lb./ac. : S_1=A/S, S_2=Urea and S_3=A/N.

(2) 2 times of application : T_1=at sowing and T_2=at first irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 40′×27′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Crop suffered by brown-rust and draught. (iii) Grain yield. (iv) (a) 1953-56. (b) No. (c) N.A. (v) (a) Kotah, Banaras, Pura, Niphad and Palhad. (b) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 358 lb./ac.

(ii) 76.49 lb /ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

Control =307 lb./ac.

	S_1	S_2	S_3	Mean
T_1	313	374	409	365
T_2	323	406	378	369
Mean	318	390	394	367

S.E. of marginal mean of S =27.05 lb./ac.
S.E. of marginal mean of T =22 08 lb./ac.
S.E. of body of table. =38.25 lb./ac.

Crop :- Wheat **Ref :- Simple trials on cultivator's fields (T.C.M.), 1953.**

Centre :- Hoshangabad (M.P.) **Type :- 'M'**

Object :—II To study the effect of manures (N,P.)

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Deep black—heavy clay pH. 8.0 (iii) Nil (iv) Nil (v) N.A. (vi) October-November (vii) Unirrigated (viii) N.A. (ix) N.A. (x) March-April.

2. TREATMENTS :

O=Control
N=A/S at 20 lb./ac. of N.
NP=A/S at 20 lb./ac. of N+Super at 20 lb./ac. of P_2O_5.
N'P=A/N at 20 lb./ac. of N+Super at 20 lb./ac. of P_2O_5.
N"P=Urea at 20 lb./ac. of N+Super at 20 lb./ac. of P_2O_5.

3. DESIGN ;

(i) & (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-56. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield in lb./ac.
0	530
N	615
NP	613
N'P	653
N"P	583
G.M.	599
S.E./mean	= 19.42 lb./ac.
No. of experiments	40

Crop :- Wheat **Ref :- Simple trials on cultivator's fields (T.C.M.), 1953**

Centre :- Hoshangabad (M.P.) **Type :- 'M'**

Object :—III To study the effect of A/S with different sources of P.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Deep black—heavy clay-p.H. 8.0 (iii) Nil. (iv) Nil. (v) N.A. (vi) October-November. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) March-April.

2. TREATMENTS :

0 = Control.
N =A/S at 20 lb./ac. of N.
NP =A/S at 20 lb./ac. of N+ Super at 20 lb./ac. of P_2O_5.
NP' =A/S at 20 lb./ac. of N+ Nitro. Phos at 20 lb./ac. of P_2O_5.
NP'' =A/S at 20 lb./ac. of N+ Ammo. Phos. at 20 lb./ac. of P_2O_5.

3. DESIGN:

(i) & (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N. A. (iv) Yes.

4. GENERAL :

(i) Normal (ii) Nil (iii) Grain yield (iv) (a) 1953-56 (b) No (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS .

Treatment	Av. yield in lb./ac.
0	464
N	540
NP	598
NP'	562
NP''	563
G.M.	546
S.E./mean	= 17.03 lb./ac.
No. of experiments	40

Crop :-Wheat. **Ref :- Simple trials on cultivtors' fields (T.C.M.), 1953.**

Centre :- Hoshangabad (M.P.) **Type :- 'M'.**

Object :—I (a) (ii) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS .

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Deep black, heavy clay-pH. 8.0. (iii) Nil. (iv) Nil. (v) N.A. (vi) October-November. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) March-April.

2. TREATMENTS :

0 =Control.
N_1 =A/S at 20 lb./ac. of N.
N_2 =A/S at 40 lb./ac. of N.
N'_1 = Urea at 20 lb./ac. of N.
N''_2 = Urea at 40 lb./ac. of N.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 56. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield in lb./ac.
0	596
N_1	672
N_2	651
N'_1	680
N''_2	686
G.M.	657
S.E./mean	=33.82 lb./ac.
No. of expts.	22

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Hoshangabad (M.P.) Type :- 'M'.

Object :—I (a) (iii) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Deep black, heavy clay pH.-8.0. (iii) Nil (iv) Nil. (v) N.A. (vi) October-November. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) March-April.

2. TREATMENTS :

0 =Control.
N'_1 = A/N at 20 lb./ac. of N.
N'_2 = A/N at 40 lb./ac. of N.
N''_1 = Urea at 20 lb./ac. of N.
N'_2 = Urea at 40 lb./ac. of N.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-56. (b) No. (c) N. A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield in lb./ac.
0	546
N_1'	567
N_2'	546
N_1''	513
N_2''	485
G.M.	532
S.E./mean	± 39.00 lb./ac.
No. of expts.	10

Crop :- Wheat. Ref :- Simple trials on cultivators' Fields (T.C.M.), 1953.

Centre :- Hoshangabad (M.P.). Type :- 'M'.

Object :—I. (a) (i) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Deep black, heavy clay pH-8.0 (iii) Nil. (iv) Nil. (v) N.A. (vi) October-November. (vii) Unirrigated. (viii) and (ix) N.A. (x) March-April.

2. TREATMENTS :

0 =Control.
N_1=A/S at 20 lb./ac. of N.
N_2=A/S at 40 lb./ac. of N.
N'_1=A/N at 20 lb./ac. of N.
N'_2=A/N at 40 lb./ac. of N.

3. DESIGN:

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

RESULTS :

Treatment	Av. yield in lb./ac.
0	586
N_1	694
N_2	721
N'_1	644
N'_2	647
G.M.	658
S.E./mean	= 28.88 lb./ac.
No. of expts.	17

Crop :- Paddy (1st crop). Ref :- Simple trials on cultivators' fields (T.C.M) 1953.
Centre :- Raipura (M.P.) Block I. Type :- 'M'.

Object :—II. To study the effect of manures (N, P, K).

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and yellow—clay loam-pH. 7.0. (iii) to (v) N.A. (vi) June. (vii) Unirrigated. (viii) N.A. (ix) 50". (x) October-November.

2. TREATMENTS :

0 =Control.
N =A/S at 20 lb /ac. of N.
NP =A/S at 20 lb./ac. of N+Super at 20 lb./ac. of P_2O_5.
N'P =A/N at 20 lb./ac. of N+Super at 20 lb./ac. of P_2O_5.
N"P =Urea at 20 lb./ac. of N + Super at 20 lb./ac. of P_1O_5.
P =Super at 20 lb./ac. of P_2O_5.
Fertilizers broadcast after *biasi* operation.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

Treatment	Av. yield in lb./ac.
0	1315
N	1724
NP	1867
N'P	1618
N"P	1869
P	1567
G.M.	1660
S.E./mean	= 72.41 lb./ac.
No. of experiments	29

Crop :- Paddy (1st crop). Ref :- Simpe trials on cultivators' fields (T.C.M.) 1953.
Centre :- Raipura (M.P.) Block I. Type :- 'M'

Object :— IV (i) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Red and yellow—Clay loam pH. 7.0 (iii) Nil (iv) N.A. (v) N.A. vi) June (vii) Unirrigated (viii) N.A. (ix) 50" (x) October-November.

2. TREATMENTS :

0 = Control.
N = A/S at 40 lb./ac. of N.
NP_1 = A/S at 40 lb./ac. of N + Super at 20 lb./ac. of P_2O_5.
NP_2 = A/S at 40 lb./ac. of N + Super at 40 lb./ac. of P_2O_5.
NP'_1 = A/S at 40 lb./ac. of N + Nitro. Phos. at 20 lb./ac. of P_2O_5.
NP'_2 = A S at 40 lb./ac. of N + Nitro. Phos. at 40 lb./ac. of P_2O_5.
Fertilizers broadcast after *biasi* operation.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal (ii) Nil (iii) Grain yield (iv) (a) 1953—56 (b) No (c) N.A. (v) N.A. (vi) Nil (vii) Nil.

5. RESULTS :

Treatment	Av. yield in lb./ac.
0	1402
N	2281
NP_1	2412
NP_2	2539
NP'_1	2281
NP'_2	2251
G.M.	2194
S.E./mean	= 120.1 lb./ac.
No. of expts.	10

Crop :- Paddy (1st crop) Ref :- Simple trials on cultivators' fields (T.C.M.) 1953.

Centre :- Raipur a (M.P.) Block I Type :- 'M'

Object :— IV (ii) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Red and yellow—clay loam pH. 7.0 (iii) Nil (iv) N.A. (v) N.A. (vi) June (vii) Unirrigated (viii) N.A. (ix) 50" (x) October—November.

2. TREATMENTS :

0 = Control.
N = A/S at 40 lb./ac. of N
NP_1 = A/S at 40 lb./ac. of N + Super at 20 lb./ac. of P_2O_5.
NP_2 = A/S at 40 lb./ac. of N + Super at 40 lb./ac. of P_2O_5.
NP'_1 = A/S at 40 lb./ac. of N + Ammo. Phos. at 20 lb./ac. of P_2O_5.
NP''_2 = A/S at 40 lb./ac. of N + Ammo. Phos. at 40 lb./ac. of P_2O_5.
Fertilizers applied broadcast after *biasi* operation.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trail was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal (ii) Nil (iii) Grain yield (iv) (a) 1953-56 (b) No (c) N.A. (v) N.A. (vi) Nil (vii) Nil.

5. RESULTS :

Treatment	Av. yield in lb./ac.
0	1167
N	1676
NP_1	1886
NP_2	2102
NP'_1	1879
NP'_2	1929
G.M.	1765
S.E./mean	= 111.1 lb./ac.
No. of Expts.	10

Crop :- Paddy (1st crop). Ref :- Simple trials on cultivators fields (T.C.M.) 1953.
Centre :- Raipura (M.P.) Block I. Type :- 'M'.

Object :—IV (iii) To study the effects of types and levels of P and N.

1. BASAL CONDITIONS :
(i) (a) to (c) N.A. (ii) Red and yellow—Clay loam-pH. 7.0. (iii) Nil. (iv) N.A. (v) N.A. (vi) June. (vii) Unirrigated. (viii) N.A. (ix) 50". (x) October-November.

2. TREATMENTS :
0 =Control.
N =A/S at 40 lb./ac. of N.
NP'_1=A/S at 40 lb./ac. of N+Nitro. phos. at 20 lb./ac. of P_2O_5.
NP'_2=A/S at 40 lb./ac. of N+Nitro. phos. at 40 lb./ac. of P_2O_5.
NP''_1=A/S at 40 lb./ac. of N+Ammo. Phos. at 20 lb./ac. of P_2O_5.
NP''_2=A/S at 40 lb./ac. of N+Ammo. Phos. at 40 lb./ac. of P_2O_5.
Fertilizers broadcast after *biasi* operation.

3. DESIGN :
(i) to (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :
(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield in lb./ac.
0	1328
N	2048
NP'_1	1990
NP'_2	2036
NP''_1	2032
NP''_2	2261
G.M.	1949
S.E./mean	= 108.6 lb./ac.
No. of expts.	10

Crop :- Paddy (1st crop). Ref :- Simple trials on cultivators' fields (T.C.M.) 1953.
Centre :- Raipura (M.P.) Block I. Type :- 'M'.

Object :—I (a) (i) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :
(i) (a) to (c) N.A. (ii) Red and yellow-Clay loam pH. 7.0. (iii) Nil. (iv) N.A. (v) N.A. (vi) June. (vii) Unirrigated. (viii) N.A. (ix) 50". (x) October-November.

2. TREATMENTS :

0 =Control.
N_1=A/S at 20 lb./ac. of N.
N_2=A/S at 40 lb./ac. of N.
Fertilizers broadcast after *bias!* operation.

3. DESIGN :

(i) to (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (iv) (a) 1953-1956. (b) No. (c) N A. (v) N A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatments	Av. yield
0	1447
N_1	1844
N_2	1943
G.M.	1745
S.E./mean	=89.68 lb./ac.
No. of Expts.	11

Crop :-Paddy (1st crop). Ref :-Simple trials on cultivators' fields (T.C.M.) 1953.

Centre :-Raipura (M.P.) Block I. Type :-'M'.

Object :—I (a) (ii) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A.. (ii) Red and yellow—Clay loam, pH.-7.0. (iii) Nil. (iv) and (v) N.A. (vi) June. (vii) Unirrigated (viii) N.A. (ix) 50". (x) Oct.-Nov.

2. TREATMENTS :

0 =Control.
N_1 =A/S at 20 lb./ac. of N.
N_2 =A/S at 40 lb. a.c. of N.
N_1'' = Urea at 20 lb./ac. of N.
N_2'' = Urea at 40 lb./ac. of N.
Fertilizers broadcast after *bi ist* operation.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield
0	1332
N_1	1644
N_2	1950
N_1''	1803
N_2''	1785
G.M.	1703
S.E./mean	=100.4 lb./ac.
No. of expts.	12

Crop :-Paddy (1st crop). Ref :-Simple trials on cultivators' fields (T.C.M.) 1953.

Centre :-Raipura (M.P.) Block II. Type :- 'M'.

Object :—I (a) (ii) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and yellow—Clay loam pH. 7.0 (iii) Nil. (iv) and (v) N.A. (vi) June (vii) Unirrigated. (viii) N.A. (ix) 50". (x) Oct-Nov.

2. TREATMEMTS:

0 =Control.
N''_1=Urea at 20 lb./ac. of N.
N''_3=Urea at 40 lb./ac. of N.
Fertilizers broadcast after *biasi* operation.

3. DESIGN:

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield
0	1329
N''_1	1629
N''_2	1781
G.M.	1580
S.E./mean	=63.35 lb./ac.
No. of expts.	9

———

Crop :- Paddy. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Raipura (M.P.) Block II. Type :- 'M'.

Object :—I. (a) (iii) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and yellow clay loam-pH.-7.0. (iii) Nil. (iv) and (v) N.A. (vi) June. (vii) Unirrigated. (viii) N.A. (ix) 50". (x) October-November.

2. TREATMENTS :

0 =Control.
N''_1 = Urea at 20 lb./ac. of N-
N''_2=Urea at 40 lb./ac. of N.
Fertilizers broadcast after *biasi* operation.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

Treatment	Av. yield in lb./ac.
0	1122
N_1"	1493
N_2"	1561
G.M.	1392
S.E./mean	±53.93 lb./ac.
No. of expe.iments	8

Crop :- Paddy. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Site :- Raipura (M.P.) Block II). Type :- 'M'.

Object :—II. To study the effect of manures (N, P and K).

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and yellow clay loam pH-7.0 (iii) Nil. (iv) and (v) N.A. (vi) June. (vii) Unirrigated. (viii) N.A. (ix) 50". (x) October-November.

2. TREATMENTS:

0 =Control.
N =A/S at 20 lb./ac. of N.
P =Super at 20 lb./ac. of P_2O_5.
NP =A/S at 20 lb./ac. of N+Super at 20 lb./ac. of P_2O_5.
N P=A/N at 20 lb./ac. of N+Super at 20 lb./ac. of P_2O_5.
N P=Urea at 20 lb./ac. of N+ uper at 20 lb./ac. of P_2O_5.
Fertilizer broadcast after *biasi* operation.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

Treatment	Av. yield in lb./ac.
0	1171
N	1549
P	1332
NP	1817
N P	1420
N P	1718
G.M.	1536
S.E./mean	= 60.06 lb./ac.
No. of experiments	= 27

Crop :- Paddy. Ref :- Simple trials on cultivators fields (T.C.M.) 1953.

Site :- Raipura (M.P.) Block II Type :- 'M'

Object :— I (a) (ii) To Study the effect of different levels and sources of N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Red and yellow clay loam pH-7.0 (iii) Nil (iv) N.A. (v) N.A. (vi) June (vii) Unirrigated (viii) N.A. (ix) 50" (x) October—November.

2. TREATMENTS :

0 =Control.
N_1 =A/S at 20 lb./ac. of N.
N_2 =A/S at 40 lb./ac. of N.
N''_1=Urea at 20 lb./ac. of N.
N'_2—Urea at 40 lb./ac. of N.
Fertilizers broadcast after *biasi* operation.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (ii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal (ii) Nil (iii) Grain yield (iv) (a) 1953–56 (b) No (c) N.A (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield in lb./ac.
0	1175
N_1	1753
N_2	1945
N''_1	1409
N'_2	1949
G.M.	1549
S.E./mean	=121.8 lb./ac.
No. of expts.	=7

Crop :- Paddy. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.
Centre :- Raipura (M.P.) Block II. Type :- 'M'.

Object :—(I) (a) (i) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and yellow-Clay loam, pH.=7.0 (iii) Nil. (iv) N.A. (v) N.A. (vi) June. (vii) Unirrigated (viii) N.A. (ix) 50". (x) Oct.-Nov.

2. TREATMENTS .

0=Control.
N_1=A/S at 20 lb./ac. of N.
N_2=A/S at 40 lb./ac. of N.
Fertilizers broadcast after *biasi* operation.

3. DESIGN :

(i) and (ii) Eleven community project centres, represening the entire paddy growing tract of the country, were selected From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an un replicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield
0	1303
N_1	1674
N_2	1677
G.M.	1551
S.E./mean	=153.0 lb./ac.
No. of expts.	=8

Crop :- Paddy. Ref :- Simple trials on cultivators 'fields (T.C.M.), 1953.

Centre :- Raipura (M.P.) Block II. Type :- 'M'.

Object :—IV (i) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and yellow—Clay loam pH.-7.0. (iii) Nil. (iv) and (v) N.A. (vi) June. (vii) Unirrigated. (viii) N.A. (ix) 50". (x) October-November.

2. TREATMENTS :

0 =Control.
N =A/S at 40 lb./ac. of N.
NP_1 =A/S at 40 lb./ac. of N+Super at 20 lb./ac. of P_2O_5.
NP_2 =A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P_2O_5.
NP'_1 =A/S at 40 lb./ac. of N+Nitro. Phos at 20 lb./ac. of P_2O_5.
NP'_2 =A/S at 40 lb./ac. of N+Nitro. Phos at 40 lb./ac. of P_2O_5.
Fertilizers broadcast after *biasi* operation.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

Treatment	Av. yield
0	1013
N	1553
NP_1	1978
NP_2	1583
NP'_1	1304
NP'_2	1868
G.M.	1550
S.E./mean	=221.3 lb./ac.
No. of expts.	=8

Crop :- Paddy. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Raipura (M.P.) Block II. Type :- 'M'.

Object :—IV (ii) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and yellow—Clay loam pH. 7.0. (iii) Nil. (iv) and (v) N.A. (vi) June. (vii) Unirrigared. (viii) N.A. (ix) 50". (x) Oct.-Nov.

2. TREATMENTS :

0 =Control.
N =A/S at 40 lb /ac.
NP_1 =A/S at 40 lb /ac. of N+Super at 20 lb./ac. of P_2O_5.
NP_2 =A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P_2O_5.
NP''_1 =A/S at 40 lb /ac. of N+Ammo. Phos at 20 lb./ac. of P_2O_5.
NP''_2 =A/S at 40 lb./ac. of N+Ammo. Phos at 20 lb./ac. of P_2O_5.
Fertilizers broadcast after *biasi* operation.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were

selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

Treatment	Av. yield
0	879
N	1376
NP_1	1631
NP_2	1685
NP''_1	1558
NP''_2	1591
G.M.	1453
S.E./mean	=107.8 lb./ac.
No. of expts.	9

Crop :- Paddy. Ref :- Simple trials on cultivators' fields (T.C.M.) 1953.

Centre :- Raipura (M.P.) (Block II). Type :- 'M'.

Object :—IV (iii) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

(i) (a to (c) N.A. (ii) Red and yellow-Clay loam, pH-7.0. (iii) Nil. (iv) N.A. (vi) June. (vii) Unirrigated. (viii) N.A. (ix) 50". (x) Oct.-Nov.

2. TREATMENTS :

0 =Control.
N =A/S at 40 lb./ac. of N.
NP'_1=A/S 40 lb./ac. +Nitro. Phos at 20 lb./ac. of P_2O_5.
NP'_2=A/S 40 lb./ac. + Nitro. Phos at 40 lb./ac of P_2O_5.
NP''_2=A/S 40 lb./ac. +Ammo. Phos at 20 lb./ac. of P_2O_5.
NP''_2=A/S 40 lb./ac. +Ammo. Phos at 40 lb./ac. of P_2O_5.
Ferti izers brodcast after *biasi* operation.

3. DESIGN :

(i) and (ii) Eleven communiiy project eentres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was se'ected. Villages were selected at random from the selected blocks and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-1956. (v) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatments	Av. yield in lb./ac.
0	871
N	1182
NP'_1	1231
NP'_2	1244
NP''_1	1205
NP''_2	1307
G. M.	1173
S.E./mean	=95.44 lb./ac.
No. of expt.	10

Crop :- Wheat. Ref :- M. P. 49 (47).

Site :- Harsi Exptl. Farm, Bagwai. Type :- 'C'.

Object :—To ascertain which seed rate gives highest yield under local conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, Bagwai. (iii) 2.11.1949. (iv) (a) Ist ploughed by *Chatanoga* plough. Twice ploughed by *desi* plough. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) F.Y.M. applied. (vi) *Bunlasharhatti* (local). (vii) Irrigated (viii) Weeding. (ix) 7.44". (x) N.A.

2. TREATMENTS :

5 seed rates : R_1=30, R_2=40, R_3=50, R_4=60, and R_5=70 srs./ac.

2. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 75'×22'. (b) 72'×20. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 571.9 lb./ac.
(ii) 142.7 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
R_1	677.9
R_2	548.5
R_3	542.3
R_4	541.6
R_5	549.1
S.E./mean	=58.26 lb./ac.

Crop :- Wheat. Ref :- M.P. 48(38).

Site :- Agri. Res. Farm, (Nabibagh), Bhopal. Type :- 'C'.

Object : To find out suitable seed rate for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 3, 4.11.1948. (iv) (a) N.A. (b) Drilled. (c) As per treatments. (d) N.A. (e) —. (v) N.A. (vi) C. 591. (vii) to (ix) N.A. (x) 27, 28.3.1949.

2. TREATMENTS :

4 seed rates : R_1=30, R_2=40, R_3=50 and R_4=60 srs./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 8 (2 plots for each treatment). (b) N.A. (iii) 5. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 486.5 lb./ac.
(ii) 72.49 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
R_1	471.0
R_2	473.0
R_3	486.3
R_4	515.7
S.E./mean	=22.94 lb./ac.

Crop :- Wheat (*Rabi*). Ref :- M.P. 51(80).

Site :- Govt. Exptl. Farm, Chindwara. Type :- 'C'.

Object :—To find out suitable stage for Wheat crop for harvesting in order to avoid damage due to hail storm.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 17.11.1951. (iv) (a) to (e) N.A. (v) N.A. (vi) A.O. 90. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) As per treatments.

2. TREATMENTS :

1. Harvesting at milk stage on 19.3.1952.
2. Harvesting 10 days after milk stage on 29.3.1952.
3. Harvesting at dry cake stage on 8.4.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) to (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) Powarkheda. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 604 1 lb./ac.
(ii) 78.48 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	599.7
2.	646.2
3.	566.4
S.E./mean	=32.06 lb./ac.

Crop :- Wheat. Ref :- M.P. 53(55).

Site :- Central Res. Farm, Gwalior. Type :- 'C'.

Object :—To find out the optimum seed rate and spacing for Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sannhemp for G.M. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Seeds drilled. (c) and (d) As per treatments. (e) N.A. (v) Sannhemp as G.M. (vi) NP. 710. (vii) Unirrigated. (viii) N.A. (ix) 2.13". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 spacings : S_1=9", S_2=12" and S_3=15".

Sub-plot treatments :

5 seed rates : R_1=30, R_2=35, R_3=40, R_4=45 and R_5=50 seer/ac.

3. DESIGN :

(i) Split plot. (ii) (a) 3 main plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30'×15'. (v) One row on both sides and 1½' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1953 to 1954. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 811.2 lb./ac.
(ii) (a) 157.8 lb./ac.
(b) 243.2 lb./ac.
(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean
S_1	970.9	825.7	970.7	916.4	641.3	865.0
S_2	780.4	732.0	849.9	762.1	819.4	788.8
S_3	768.1	753.1	759.1	780.4	837.8	779.7
Mean	839.8	770.3	859.9	819.6	766.2	811.2

S.E. of difference of two

1. marginal means of S = 49.90 lb./ac.
2. marginal means of R = 99.29 lb./ac.
3. R means at the same level of S = 171.9 lb./ac.
4. S means at the same level of R = 161.7 lb./ac.

Crop :- Wheat. **Ref :- M.P. 48(9).**

Site :- Institute of Plant Industry, Indore. **Type :- 'C'.**

Object :—To find out suitable spacing and economic seed rate for unirrigated Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 20, 21.10.1948. (iv) (a) *Bakharings*. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) 20 lb./ac. of N as G.N.C. applied a fortnight before sowing in 2 blocks, while in the other two blocks just before sowing. 2 blocks unmanured. (vi) *Malvi* E.K.D. (vii) Unirrigated. (viii) Weeding, hoeing. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 spacings : S_1=9" and S_2=14".

(2) 5 seed rates : R_1=40, R_2=60, R_3=80, R_4=100 and R_5=120 lb./ac.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 60'×16'. (b) 55'×11'8". (v) 2 rows for 14" spacing and 3 rows for 9" spacing on both sides and 2½' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 783.6 lb./ac.
(ii) 170.2 lb./ac.
(iii) Only R effect is highly significant.
(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean
S_1	912.0	950.2	735.3	615.8	661.0	774.9
S_2	917.7	905.9	731.7	771.3	635.6	792.4
Mean	914.8	927.5	733.5	693.6	648.3	783.6

S.E. of marginal mean of R = 49.14 lb./ac.
S.E. of marginal mean of S = 31.08 lb./ac.
S.E. of body of table = 69.49 lb./ac.

Crop :- Wheat (*Rabi*). Ref :- M.P. 49(6).

Site :- Institute of Plant Industry, Indore. Type :- 'C'.

Object :--To find out optimum spacing and economic seed rate for unirrigated Wheat.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 5.11.1949. (iv) (a) *Bakharing* and ploughing. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) Out of 6 blocks, 2 blocks were manured with 20 lb./ac. of N as G.N.C. a fortnight before sowing; 2 blocks manured with 20 lb./ac. of N as G.N.C. just before sowing. The remaining two blocks were not manured. (vi) *Malvi* E.K.D. (vii) Unirrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 2 spacings : S_1=9" and S_2=14".

(2) 5 seed rates : R_1=40, R_2=60, R_3=80, R_4=100 and R_5=120 lb./ac.

3. DESIGN:

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 11'8"×45'. (v) N.A. (vi) Yes.

4. GENERAL:

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

5. RESULTS:

(i) 776.6 lb./ac.

(ii) 109.8 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean
S_1	783.0	812.2	706.7	804.4	682.6	757.8
S_2	836.4	805.2	737.9	807.0	790.6	795.4
Mean	809.7	808.7	722.3	805.7	736.6	776.6

S.E. of marginal mean of R =31.69 lb./ac.
S.E. of marginal mean of S =20.04 lb./ac.
S.E. of body of table =44.81 lb./ac.

Crop :- Wheat. Ref :- M.P. 50(7).

Site :- Institute of Plant Industry, Indore. Type :- 'C'.

Object :—To find out the optimum seed rate and spacing for Wheat.

1. BASAL CONDITIONS:

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) E K.D. *Malvi*. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 2 spacings : S_1=9" and S_2=14".

(2) 5 seed rates : R_1=40, R_2=60, R_3=80, R_4=100 and R_5=120 lb./ac.

3. DESIGN:

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 47'×10.4". (b) 45'×9'4". (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) N.A. (b) and (c) No. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 451.2 lb./ac.
(ii) 155.0 lb /ac.
(iii) Only S effect is significant.
(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean
S_1	520.5	426.6	460.1	492.4	465.5	473.0
S_2	428.7	405.0	396.4	451.4	465.5	429.4
Mean	474.6	415.8	428.2	471.9	465.5	451.2

S.E. of marginal mean of R = 44.74 lb./ac.
S.E. of marginal mean of S = 28.31 lb./ac.
S.E. of body of table = 63.28 lb./ac.

Crop :- Wheat. Ref :- M.P. 48 (11).
Site :- Institute of Plant Industry, Indore. Type :- 'C'.

Object :—To study the effect of different spacings and different seed rates on irrigated Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 17,18.11.1948. (iv) (a) *Bakhering*. (b) N.A. (c), (d) As per treatments. (e) N.A. (v) Three blocks manured with 40 lb./ac. of N as G.N.C. and the remaining 3 blocks unmanured. (vi) C 591 (medium). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
1. 2 spacings : S_1=9" and S_2=14",
2. 5 seed rates : R_1=40, R_2=60, R_3=80, R_4=100 and R_5=120 lb./ac.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 11'8"×40'. (b) 7'×35'. (vi) 2 rows for 14" spacing and 3 rows for 9" spacing on both sides and 2½' each at both the ends.

4. GENERAL :

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

5. RESULTS :

(i) 1861 lb /ac.
(ii) 270 9 lb /ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean
S_1	1880	1787	1817	17.6	1765	1809
S_2	1844	1891	1900	1893	2035	1913
Mean	1862	1839	1858	1844	1900	1861

S.E. of marginal mean of R = 78.0 lb /ac.
S.E. of marginal mean of S = 49.3 lb./ac.
S.E. of body of table = 110.3 lb./ac.

Crop :- Wheat. (*Rabi*) **Ref :- M.P. 49(8).**

Site :- Institute of Plant Industry, Indore. **Type :- 'C'.**

Object : –To study the optimum spacing and economic seed rate for irrigated Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (iii) 7.11.1949. (iv) (a) *Bakharing*. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) Out of 6 blocks, for 4 blocks 20 lb./ac. of N as G.N.C. was given, in two blocks it was given a fortnight before sowing and for the remaining two just before sowing. For two blocks no manure was applied. (vl) *Malvi* EKD (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combination (1) and (2).

1. 2 spacings : S_1=9" and S_2=14".
2. 5 seed rates : R_1=40, R_2=60, R_3=80, R_4=100 and R_5=120 lb /ac.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 7'×35'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Very good. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1466 lb./ac.
(ii) 305.2 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean
S_1	1417	1498	1339	1417	1683	1471
S_2	1465	1506	1348	1437	1552	1462
Mean	1441	1502	1343	1427	1617	1466

S.E. of marginal mean of R = 88.1 lb./ac.
S.E. of marginal mean of S = 55.7 lb./ac.
S.E. of body of table =124.6 lb./ac.

Crop :- Wheat. **Ref :- M.P. 50(17).**

Site :- Institute of Plant Industry, Indore. **Type :- 'C'.**

Object :—To study the effect of different spacings and seed rates on irrigated Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) Ploughed twice. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) No. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 spacings : S_1=9" and S_2=14".
(2) 5 seed rates : R_1=40, R_2=60, R_3=80, R_4=100 and R_5=120 lb./ac.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 39'×12'. (b) 35'×8'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) Grain yield. (iv) (a) No. (b) and (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 1270 lb./ac.

(ii) 216.3 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean
S_1	1147	1273	1278	1202	1223	1225
S_2	1312	1196	1429	1338	1301	1315
Mean	1229	1234	1353	1270	1262	1270

S.E. of marginal mean of R = 62.43 lb./ac.
S.E. of marginal mean of S = 39.49 lb./ac.
S.E. of body of table = 88.30 lb./ac.

Crop :-Wheat. Ref :-M.P. **50(14)**.

Site :-Institute of Plant Industry, Indore. Type :-'C'.

Object :—To study the effect of interculturing with *daura* on the yield of Wheat under rain-fed conditions.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 16.10.1950. (iv) (a) *Bakharing* once. (b) to (e) N.A. (v) N.A. (vi) C. 591 (medium). (vii) Unirrigated. (viii) As per treatments. (ix) N.A. (x) 12.3.1951.

2. TREATMENTS :

3 levels of interculture : $I_0=0$, $I_1=1$ and $I_2=2$ intercultures.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 18'8"×92'. (b) 14'×87'. (v) 2½'×2'4". (vi) Yes.

4. GENERAL :

(i) Normal growth. (ii) Nil. (iii) Grain yield. (iv) (a) and (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 363.0 lb./ac.

(ii) 65.37 lb./ac.

(iii) Treatments do not differ significantly.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
I_0	379
I_1	354
I_2	356
S.E./mean	=23.10 lb./ac.

Crop :- Wheat. Ref :- M.P. **51(25)**.

Site :- Adhartal Farm, Jabalpore. Type :- 'C'.

Object :—To study the performance of the crop harvested at different stages so as to save the crop from hail-storm.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar*. (b) Refer soil analysis, Jabalpore. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) A.O. 90 (medium). (vii) N.A. (viii) Nil. (ix) N.A. (x) As per treatments.

2. TREATMENTS :

1. Harvesting at dough stage on 8.3.1952.
2. Harvesting 10 days after dough stage on 18.3.1952.
3. Harvesting at fully ripe stage (date not recorded).

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 736.7 lb./ac.
(ii) 94.40 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	718.7
2.	740.3
3.	750.9
S.E./mean	=38.40 lb./ac.

Crop :- Wheat. **Ref :- M.P. 49(29).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'C'.**

Object :—To study the effect of different implements for sowing on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powerkheda. (iii) 4.11.1949. (iv) (a) *Bakharing*. (b) As per treatments. (c) 80 lb./ac. (d) 9". (e) N.A. (v) N.A. (vi) A. 115 (local). (vi) to (ix) N.A. (x) 31.3.1950.

2. TREATMENTS :

5 implements : T_1=*Duffan*, T_2=*Nari*, T_3=*Dave's* drill, T_4=*Tiffan* and T_5=5-tyned drill.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 3. (iv) (a) and (b) 16½'×66'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949—1951. (b) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Yield is too poor.

5. RESULTS :

(i) 381.0 lb./ac.
(ii) 60.16 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
T_1	349.1
T_2	374.8
T_3	414.8
T_4	409.1
T_5	357.4
S.E./mean	=34.60 lb./ac.

Crop :- Wheat. **Ref :- M.P. 50(26).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'C'.**

Object :—To study the effect of different implements of sowing on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 25.10.1950. (iv) (a) *Bakharing*. (b) As per treatments. (c) 80 lb./ac. (d) and (e) N.A. (v) N.A. (vi) A. 115 (local). (vii) N.A. (viii) N.A. (ix) 2.11". (x) 31.3.1951.

2. TREATMENTS:

6 implements of sowing : T_1=*Duffan*, T_2=*Nari*, T_3=*Dave's* drill. T_4=*Tiffan*, T_5=5-tyned drill and T_6=8-tyned drill.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 16½'×66'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949–1951. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 676.6 lb./ac.
(ii) 91.60 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
T_1	744.0
T_2	657.0
T_3	607.8
T_4	701.2
T_5	686.1
T_6	663.5
S.E./mean	=37.40 lb./ac.

Crop :- Wheat. **Ref :- M.P. 51(52).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'C'.**

Object :—To study the effect of different implements of sewing on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 29.10 1951. (iv) (a) *bakharing*. (b) As per treatments. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) A. 115 (local). (vii) N.A. (viii) N.A. (ix) 2.24". (x) N.A.

2. TREATMENTS :

6 implements of sowing : T_1=*Duffan*, T_2=*Nari*, T_3=*Dave's* drill, T_4=*Tiffan*, T_5=5-tyned drill and T_6=8-tyned drill.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 16½'×66'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949–1951. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Season was not favourable for the crop. Yield is too poor. (vii) Nil.

5. RESULTS :

(i) 384.3 lb./ac.
(ii) 64.56 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av yield of grain in lb./ac.

Treatment	Av. yield
1.	352.6
2.	451.4
3.	403.1
4.	376.5
5.	436.9
6.	288.4
S.E./mean	=26.36 lb./ac.

Crop :- Wheat. Ref :- M.P. 53(44).

Site :- Govt. Exptl. Farm, Powarkheda. Type :- 'C'.

Object :—To find suitable seed rate for Wheat under irrigated conditions.

1. BASAL CONDITIONS :

(i) (a) to (c) N A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 11.11.1953. (iv) (a) *Bakharing*. (b) N.A. (c) As per treatments. (d) 12". (e) N.A. (v) N.A. (vi) Hy. 11-6 (medium). (vii) Irrigated. (viii) Nil. (ix) 1.25". (x) N.A.

2. TREATMENTS :

4 seed rates : R_1=40, R_2=60, R_3=80 and R_4=100 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 3. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 792.5 lb./ac.
(ii) 118.4 lb /ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
R_1	806.5
R_2	898.5
R_3	595.0
R_4	870.0
S.E./mean	=68.2 lb./ac.

Crop :- Wheat. Ref :- M.P. 48(25).

Site :- Govt. Exptl. Farm, Powarkheda. Type :- 'C'.

Object :—To study the effect of rotation of Wheat with different *Rabi* pulses.

1. BASAL CONDITIONS :

(i) (a) Pulse—Wheat—Pulse. (b) As per treatments. (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 23.10.1948. (iv) (a) *Bakharing*. (b) Drilling. (c) 80 lb./ac. (d) 12". (e) N A. (v) N.A. (vi) A-115 (local). (vii) to (x) N.A.

2. TREATMENTS :

1. Gram—Wheat.
2. K K. peas —Wheat.
3. *Masoor*—Wheat.
4. *Teora*—Wheat.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 11'×99'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good (ii) N.A. (iii) Grain yield. (iv) (a) 1945 to 1949. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 572.3 lb./ac.
(ii) 54.64 lb /ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	613.4
2.	588.9
3.	523.9
4.	563.0
S.E./mean	= 24.44 lb./ac.

Crop :- Wheat. Ref :- M.P. 49(34)

Site :- Govt. Exptl. Farm, Powarkheda. Type :-'M'

Object :—To study the effect of rotation of Wheat after different pulse.

1. BASAL CONDITIONS :

(i) (a) Pulse-Wheat-Pulse (b) As per treatments. (c) N.A. (ii) (a) Clay loom (*mariyar*) (b) Refer soil analysis, Powarkheda. (iii) N.A. (iv) (a) *bakharing*.. (b) N.A. (c) 80 lb./ac. (d) 12" (e) N.A. (v) N.A. (vi) A-115 (local) (vii) to (x) N.A.

2. TREATMENTS :

1. Gram Adv —Wheat.
2. K.K. Peas —Wheat.
3. *Masoor* —Wheat.
4. *Teora* —Wheat.

3. DESIGN :

(i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 5 (iv) (a) and (b) 11'×99' (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield (iv) (a) 1945 to 1949 (b) Yes (c) N.A. (v) (a) N.A. (b) N.A. (vi) & (vii) Nil.

5. RESULTS :

(i) 374.1 lb./ac.
(ii) 29.24 lb./ac.
(lii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1,	409.0
2.	339.0
3.	392.3
4.	356.0
S.E./mean	13.08 lb./ac.

Crop :- Wheat. Ref :- M.P. 48 (10)

Site :- Institute of Plant Industry, Indore. Type :- 'CV'

Object :—To find out proper sowing date for two varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil (b) N.A. (iii) As per treatments (iv) (a) *Bakharing* (b) N.A. (c) 60 lbs. (d) 14" (e) N.A. (v) Nil (vi) As per treatments (vii) Unirrigated. (vi i) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

4 sowing dates : D_1=15.10.1948, D_2=30.10.1948, D_3=15.11.1948 and D_4=30.11.1948.

Sub-plot treatments :

2 varieties : V_1=C. 591 (medium) and V_2=*Malvi* E.K.D.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 4 (iv) (a) 18'-8"×50' (b) 14'×45'. (v) 2' 4"×2'6" (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1947 to 1949. (b), (c) N.A. (v) (a) N.A. (b) N.A. (vi) &(vii) Nil.

5. RESULTS :

(i) 996 lb./ac.
(ii) (a) 157.4 lb./ac.
(b) 162.5 lb./ac.
(iii) Only D effect is highly significant.

(iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	D_4	Mean
V_1	1196	1322	939	715	1043
V_2	931	1039	1049	778	949
Mean	1063	1180	994	746	996

S.E. of difference of two

1. D marginal means = 88.7 lb./ac.
2. V marginal means = 57.4 lb./ac.
3. V means at the same level of D =114.9 lb./ac.
4. D means at the same level of V =113.1 lb./ac.

Crop :-Wheat (*Rabi*). **Ref :-M.P. 49(5).**

Site :-Institute of Plant Industry, Indore. **Type :-'CV'.**

Object :—To study the suitable sowing dates for the two varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments. (iv) (a) *Bakharnig* and ploughing. (b) and (c) N.A. (d) 14". (e) N.A. (v) N.A. (vi) As per treatments. (vii) N.A. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

4 sowing dates : D_1=15.10.1949, D_2=30.10.1949, D_3=15.11.1949 and D_4=30.11.1949.

Sub-plot treatments :

2 varieties : V_1=C-491 (medium) and V_2=*Malvi* E.K.D.

3. DESIGN :

(i) (a) Split-plot. (ii) (a) 4 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 18'8"×60'. (b) 14'×55'. (v) 2'4"×2'6". (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1947 to 1949. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 618 lb./ac.
(ii) (a) 157.27 lb./ac.
(b) 88.05 lb./ac.
(iii) V and D effects are highly significant, while interaction is not significant.
(iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	D_4	Mean
V_1	611	671	665	332	570
V_2	691	795	736	442	666
Mean	651	733	700	387	618

S.E. of difference of two

1. D marginal means =78.63 lb./ac,
2. V marginal means =31.13 lb./ac.
3. V means at the same level of D =62.89 lb./ac.
4. D means at the same level of V =90.32 lb./ac.

Crop :- Wheat. Ref :-M.P. 52(9).

Site :-Institute of Plant Industry, Indore. Type :-'CV'.

Object :—To find out the optimum date of sowing for Wheat under rain-fed conditions.

1. BASAL CONDITIONS :

(i) (a) No. (b) Cotton. (c) Sann as G.M. manure. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments. (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) and (ix) N.A. (x) 13.3.1953.

2. TREATMENTS :

Main-plot treatments :

3 sowing dates : D_1=1.10.1952. D_2=15.19.1952 and D_3=30.10.1952.

Sub-plot treatments :

2 varieties : V_1=C-591 and V_2=E.B. 69.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 45'×18'8". (b) 40'×14'. (v) 2'4"×2'6". (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1947—1952. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 571.4 lb./ac.

(ii) (a) 258.2 lb./ac.

(b) 122.2 lb /ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	Mean
V_1	484.8	792.0	388.8	555 2
V_2	672.0	739.2	351.6	587.6
Mean	578.4	765.6	370.2	571.4

S.E. of difference of two

1. D marginal means = 129.1 lb /ac.
2. V marginal means = 49.9 lb./ac.
3. V means at the same level of D = 86.4 lb./ac.
4. D means at the same level of V = 126.9 lb a..

Crop :- Wheat. Ref :- M.P. 50(27).

Site :- Govt. Exptl. Farm, Powarkheda. Type :- 'CV'.

Object :—To study the effect of spacing on the different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 25.10.1950. (iv) (a) *Bakharing*. (b) Drilling. (c) For S_1=80 lb./ac., for S_2=60 lb./ac. and for S_3=40 lb./ac. according to spacings (d) As per treatments.

(e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 2.11". (x) 25.3.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V_1=NP-52 and V_2=A-115 (local).

(2) 3 spacings : S_1=12", S_2=18" and S_3=24".

3. DESIGN :

(i) 2×3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 12'×90'-9". (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N A. (iii) Grain yield. (iv) (a) 1950—1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 622.9 lb./ac.
(ii) 88 8 lb./ac.
(iii) V effect is significant, S effect is highly significant while interaction is not significant.
(iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	Mean
V_1	710.3	576.1	474.0	586 8
V_2	708.6	662.7	605.6	659.0
Mean	709.4	619.4	539.8	622.9

S E. of S marginal mean =25.64 lb./ac.
S.E. of V marginal mean =20.92 lb./ac.
S.E. of body of table =36.28 lb./ac.

Crop :- Wheat. **Ref :- M.P. 51(53).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'CV'.**

Object :—To see the effect of spacing on different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 26, 27.10.1951. (iv) (a) *Bakharing*. (b) Drilling. (c) 80 lb. for S_1, 60 lb. for S_2 and 40 lb. for S_3. according to spacings (d) As per treatments. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 2.24". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 2 varieties : V_1=NP-52 and V_2=A-115 (local).
(2) 3 spacings : S_1=12", S_2=18" and S_3=24".

3. DESIGN :

(i) 3×2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 12'×90'-9". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 - 1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) The yield is too poor. The season was not favourable for the crop. (vii) Nil.

5. RESULTS :

(i) 315.9 lb./ac.
(ii) 109.6 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	Mean
V_1	288.9	268.4	299.7	285.6
V_2	398.9	281.4	358.4	346.2
Mean	343.9	274.9	329.1	

S.E. of S marginal mean =31.6 lb./ac.
S.E. of V marginal mean =25.8 lb./ac.
S.E. of body of table =44.5 lb./ac.

Crop :- Wheat. Ref :- M. P. 52 (37).

Site :- Govt. Exptl. Farm, Powarkheda. Type :- 'CV'.

Object :—To find the optimum spacing for different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a)Clay loam (*mariyar*). (b)Refer soil analysis, Powarkheda. (iii) 27.10.1952. (iv) (a) *Bakharing*. (b) and (c)N.A. (d)As per treatments. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 0.15". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V_1=A-115 (Local) and V_2=NP-52.

(2) 3 spacings : S_1=12", S_2=18" and S_3=24".

3. DESIGN :

(i) 2×3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 12'×45'4.5". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1953. (b) No. (c) N.A. (v) (a) N A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 308.6 lb./ac.

(ii) 48.00 lb./ac.

(iii) Only V effect is highly significant.

(iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	Mean
V_1	352.3	322.3	319.9	331.5
V_2	276.5	289.8	290.9	285.7
Mean	314.4	306.0	305.4	308.6

S.E. of S marginal mean =13.76 lb./ac.

S.E. of V maginal mean =11.20 lb./ac.

S.E. of body of table =19.52 lb./ac.

Crop :- Wheat. Ref :- M.P. 53(39).

Site :- Govt. Exptl. Farm, Powarkheda. Type :- 'CV'.

Object :— To find out suitable spacing for different Wheat varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 10 lb./ac. of N as A/S+10 lb./ac. P_2O_5 of as Super. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis Powarkheda. (iii) 31.10.1953. (iv) (a) *Bakharing*. (b) Seeds sown with *nari* plough. (c) 80 lb./ac. (d) As per treatments. (e) N.A (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 1.25". (x) 10.4.1954.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 varieties : V_1= Hy 11 and V_2=Hy.15

(2) 3 spacings : S_1=12", S_2=18" and S_3=24".

3. DESIGN :

(i) 2×3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a), (b) 16½'×33'. (v) Nil (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1950 to 1953. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 534.4 lb./ac.
(ii) 51.60 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain inlb./ac.

	S_1	S_2	S_3	Mean
V_1	543.2	543.9	486.5	524.5
V_2	551.3	567.2	554.7	544.4
Mean	547.2	535.5	520.6	534.4

S.E. of S marginal mean =14.88 lb./ac.
S.E. of V marginal mean =12.16 lb./ac.
S.E. of body of table =21.06 lb./ac.

Crop :- Wheat. Ref :- M.P. 51(1).
Site :- Central Res. Farm, Ujjain. Type :- 'CV'.

Object :—To find out suitable sowing date for different Wheat varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments. (iv) (a) *Bakharing*. (b) N.A. (c) N.A. (d) Rows 1' apart. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 17.3.1952.

2. TREATMENTS :

Main-plot treatments :
5 sowing dates : D_1=28.9.1951, D_2=6.10.1951, D_3=14.10.1951, D_4=22.10.1951 and D_5=30.10.1951.
Sub-plot treatments :
2 varieties : V_1=G.D. 11 (late) and V_2=Ujjain No. 22 (early).

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 16'×96' for main-plot and 8'×96' for sub-plot. (b) 6'×90'. (v) 1'×3'. (vi) Yes.

4. GENERAL :

(i) Stand was good but due to lack of winter rains the crop was poor. (ii) Nil. (iii) Grain and straw yield. (iv) (a) No. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 469.0 lb./ac.
(ii) (a) 72.60 lb./ac.
(b) 45.17 lb./ac.
(iii) D and V effects are highly significant while interaction D×V is not significant.
(iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	D_4	D_5	Mean
V_1	275.5	339.4	453.6	487.2	416.6	394.5
V_2	466.9	530.9	567.8	611.5	561.1	543.6
Mean	361.2	435.9	510.7	549.4	488.9	469.0

S.E. of difference of two
1. D marginal means =29.64 lb./ac.
2. V marginal means =11.66 lb./ac.
3. V means at the same level of D =25.81 lb./ac.
4. D means at the same level of V =34.68 lb./ac.

Crop :- Wheat. Ref :- M.P. 52(36).

Site :- Govt. Exptl. Farm, Powarkheda. Type :- 'CM'.

Object :—To see the effect of different doses of N and different seed rates for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 2.11.1952. (iv) (a) *Bakharing*. (b) N.A. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) Hy. 11-6. (vii) Unirrigated. (viii) Nil. (ix) 0.15". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 seed rates : R_1=60, R_2=80, and R_3=100 lb./ac.

Sub-plot treatments :

3 levels of N as A/S : N_0=0, N_1=10 and N_2=15 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) 16½'×33'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) N.A.

5. RESULTS :

(i) 354.4 lb./ac.

(ii) (a) 78.72 lb./ac.

(b) 49.84 lb./ac.

(iii) Only N effect is highly significant.

(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean
N_0	310.1	325.1	281.6	305.6
N_1	395.0	380.0	418.4	397.8
N_2	418.2	344.8	316.6	359.9
Mean	374.4	350.0	338.9	354.4

S.E. of difference of two

1. R marginal means =37.11 lb./ac.
2. N marginal means =23.49 lb./ac.
3. N means at the same level of R =40.72 lb./ac.
4. R means at the same level of N =49.84 lb./ac.

Crop :- Wheat. Ref :- M.P. 53(3)

Site :- Govt. Exptl. Farm, Powarkheda. Type :- 'CM'.

Object :—To study the effect of different doses of N with different seed rates on the yield of wheat.

1. BASAL CONDITIONS :

(i) (a) No (b) wheat. (c) 10 lb./ac. of N as A/S+10 lb./ac. of P_2O_5 as Ammo. Phos. (ii) (a) Clay loam (*marcyar*) (b) Refer soil analysis, Powarkheda. (iii) 31.10.53. (iv) (a) *Bakharing*. (b) Seed sown with *nari* plough. (c) As per treatments. (d) Lines 1' apart. (e) N.A. (v) No. (vi) Hy. 11. Improved (medium). (vii) Unirrigated. (viii) Nil. (ix) 1·25". (x) 6.4.1954.

2. TREATMENTS :

Main-plot treatments :

3 seed rates : R_1=60, R_2=80, and R_3=100 lb./ac.

Sub-plot treatment :

3 levels of N as A/S : N_0=0, N_1=10 and N_2=15 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 3 (iv) (a), (b) 33½'×16½' (v) Nil. (vi) yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1953. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 519.9 lb./ac.
(ii) (a) 68.8 lb./ac.
(b) 62.4 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean
N_0	458.2	483.3	506.7	482.7
N_1	548.3	561.4	531.5	547.1
N_2	531.8	532.9	524.9	529.9
Mean	512.8	525.8	521.0	519.9

S.E. of difference of two

1. R marginal means =32.43 lb./ac.
2. N marginal means =29.41 lb./ac.
3. N means at the same level of R =50.95 lb /ac.
4. R means at the same level of N =52.75 lb./ac.

Crop :- Wheat. Ref :- M.P. 48 (30)

Site :- Labhandi Farm, Raipur. Type :- 'CMV'.

Object :—To test the effect and interactions of different levels of manurial treatments and seed rates for two varieties of Wheat.

1. BASAL CONDITIONS :

(I) (a) Nil (b) wheat (c) N.A. (ii) (a) Heavy loam (*Kankar.*) (b) N.A. (iii) N.A. (iv) (a) Ploughing (b) Seeds drilled. (c) As per treatments. (d) and (e) N.A. (v) Nil (vi) As per treatments (vii) Irrigated (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1=A 115 (local) and V_2=AO 13 (local).

Sub-plot treatments :

4 manures : M_0=0, M_1=10 lb./ac. of N as G.N.C., M_2=10 lb./ac. of N as A/S and M_3=10 lb./ac. of N as Ammo. Phos.

Sub-sub-plot treatments :

2 seed rates : R_1=80 and R_2=100 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) 2 main-plot/block ; 4 sub-plots/main plot and 2 sub-sub-plots/sub-plot. (iii) 6 (iv) (a) and (b) 1/80 ac. (v) Nil (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain. yield. (Iv) (a) 1945 to 1950 (b) Yes. (c) N.A. (v) (a) N.A. (b) N.A. (vi) Nil. (vii) Polt-wise date N.A.

5. RESULTS :

(i) 302.7 lb./ac.
(ii), (iii) N.A.

(iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	Mean	R_1	R_2
V_1	247.5	251.0	333.5	410.0	310.5	310.5	310.5
V_2	239.0	246.5	316.0	378.0	294.9	302.0	287.8
Mean	243.3	248.8	324.8	394.0	302.7	306.3	299.1
R_1	246.0	252.5	325.0	401.5			
R_2	240.5	245.0	324.5	386.5			

S.E.'s N.A.

Crop :- Wheat. Ref :- M.P. 49(37).

Site :-Labhandi Farm, Raipur. Type :- 'CMV'.

Object :—To study the effect of manures and seed rates on Wheat varieties.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Heavy loam (*kankar*). (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated and unirrigated (2 experiments.) (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1=A 115 (local) and V_2=AO 13 (local).

Sub-plot treatments:

4 manures : M_0=0, M_1=10 lb./ac. of N as G.N.C., M_2=10 lb./ac. of A/S and M_3=10 lb./ac. of N as Ammo. Phos.

Sub-sub-plot treatments :

2 seed rates : R_1=80 and R_2=100 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block, 4 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1945 to 1950. (b) and (c) Yes. (v) (a) and (b) N.A. (vi) Nil. (vii) Plot wise data N.A.

5. RESULTS :

Irrigated

(i) 581.6 lb./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	Mean	R_1	R_2
V_1	412.0	462.5	502.0	595.5	493.0	474.0	512 0
V_2	572.0	688.0	639.5	781.0	670.2	598.5	741.8
Mean	492.0	575.3	570.8	688.3	581.6	536.3	626.9
R_1	439.0	527.0	500.0	679.0			
R_2	545.0	623.5	641.5	697.5			

Unirrigated

(i) 302 lb./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	Mean	R_1	R_2
V_1	252	341	342	356	322	304	341
V_2	249	287	282	312	282	267	298
Mean	250	314	312	334	302	285	319
R_1	268	303	289	282			
R_2	232	325	335	386			

Crop :-Wheat. **Ref :- M.P. 50(48).**
Site :- Labhandi Farm, Raipur. **Type :- 'CMV'.**

Object :—To study the effect of different levels of manures and seed rates on different varieties of Wheat under irrigated conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) *Kankar*. (b) N.A. (iii) N.A. (iv) (a) Ploughing. (b) Drilled. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :
2 varieties : V_1=A 115 (local) and V_2=AO 13 (local).
Sub-plot treatments :
4 manures : M_0=0, M_1=10 lb./ac. of N as G.N.C., M_2=10 lb./ac. of A/S and M_3=10 lb./ac. of N as Ammo. Phos.
Sub-sub-plot treatments :
2 seed rates : R_1=80 and R_2=100 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block, 4 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1945 to 1950. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 466.9 lb./ac.
(ii) (a) 77.8 lb./ac.
(b) 126 1 lb./ac.
(c) 107.0 lb./ac.
(iii) Only M effect is significant.
(iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	Mean	R_1	R_2
V_1	425.2	468.6	495.2	521.9	477.7	498.6	456.9
V_2	406.9	421.9	470.2	525.3	456.1	453.6	458.5
Mean	416.0	445.2	482.7	523.6	466.9	476.1	457.7
R_1	426.9	441.9	468.6	566.9	476.1		
R_2	405.2	448.6	496.9	480.2	457.7		

S.E. of difference of two

1.	V marginal means	=15.9 lb./ac.
2.	M marginal means	=36.4 lb./ac.
3.	R marginal means	=21.8 lb./ac.
4.	M means at the same level of V	=51.5 lb./ac.
5.	V means at the same level of M	=47.4 lb./ac.
6.	R means at the same level of V	=30.9 lb./ac.
7.	V means at the same level of R	=27.8 lb./ac.
8.	R means at the same level of M	=43.7 lb./ac.
9.	M means at the same level of R	=47.7 lb./ac.

Crop :- Wheat. Ref :- M.P. 48(31).

Site :- Labhandi Farm, Raipur. Type :- 'CMV'.

Object :—To study the effect of manures and seed rates on Wheat varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Heavy loam (*kankar*). (b) N.A. (iii) N.A. (iv) (a) Ploughing. (b) Seeds drilled. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Un-irrigated. (viii) N.A. (ix) 2.78". (x) N.A.

2. TREATMENTS .

Main-plot treatments :

2 varieties : V_1=A-115 (local) and V_2=AO-113 (local).

Sub-plot treatments :

4 manures : M_0=0, M_1=10 lb./ac. of N as G.N.C., M_2=10 lb./ac. of N as A/S and M_3=10 lb./ac. of N as Ammo. Phos.

Sub-sub-plot treatments :

2 seed rates : R_1=80 and R_2=100 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1945—1951. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Plot-wise data—N.A.

5. RESULTS :

(i) 260.5 lb./ac.

(ii) N.A.

(iii) N.A.

(iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	Mean	R_1	R_2
V_1	235.5	210.2	324.0	355.0	281.1	293.5	268.8
V_2	188.5	148.5	292.0	330.0	239.8	246.8	232.8
Mean	212.0	179.3	308.0	342.5	260.5	270.2	250.8
R_2	220.0	194.0	308.5	358.0			
R_2	204.0	164.5	307.5	327.0			

Crop :- Wheat *(Rabi)*. Ref :- M.P. 49(37).

Site :- Labhandi Farm, Raipur. Type :- 'CMV'.

Object .—To find the effect of manures and seed rate for unirrigated Wheat varieties.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Heavy loam (*Kankar.*) (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) N.A. (ix) 5.60". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1=A-115 (local) and V_2=AO 13 (local).

Sub-plot treatments :

4 manures : M_0=0, M_1=10 lb /ac. of N as G.N.C., M_2=10 lb./ac. of N as A/S and M_3=10 lb./ac. of N as Ammo. Phos.

Sub-sub-plot treatments :

2 seed rates : R_1=80 and R_2=100 lb./ac.

3. DESIGN :

(i) Split-split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot and 2 sub-sub-plots/sub-plot (b) N.A. (iii) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1945 to 1950. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Only the average yield was available.

5. RESULTS :

(i) 302.6 lb./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	Mean	R_1	R_2
V_1	251.0	341.5	342.0	356.0	322.6	304.5	340.8
V_2	249.0	287.0	282.0	312.5	282.6	267.2	298 0
Mean	250.0	314.2	312.0	334.2	302.6	285.9	319.4
R_1	268.5	303.0	289.5	282.5			
R_2	231.5	325.5	334.5	386.0			

Crop :- Wheat. Ref :- M.P. 50(49).

Site :- Labhandi Farm, Raipur. Type :- 'CMV'.

Object :—To study the effect of different levels of manure and seed rate on different varieties of Wheat under dry conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) Heavy loam (*Kankar*). (b) N.A. (iii) N.A. (iv) (a) Ploughing. (b) Drilled. (c) As per treatments. (d) N.A. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1=A. 115 (local) and V_2=AO 13 (local).

Sub-plot treatments :

4 manures : M_0=0, M_1=10 lb./ac. as oil cake, M_2=10 lb./ac. as A/S and M_3=10 lb./ac. as Ammo. Phos.

Sub-sub-plot treatments :

2 seed rates : R_1=80 and R_2=100 lb./ac.

3. DESIGN :

(i) Split-split-plot. (ii) 2 main-plots/block ; 4 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1945—1950. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 718.7 lb./ac.

(ii) (a) 59.4 lb./ac.

(b) 131.0 lb./ac.

(c) 110.3 lb./ac.

(iii) Only M effect is highly significant.

(iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	Mean	R_1	R_2
V_1	570.3	710.3	695.3	883.8	714.9	718.8	711.1
V_2	526.9	750.4	692.0	920.5	722.4	737.1	707.8
Mean	548.6	730.3	693.7	902.1	718.7	727.9	709.5
R_1	540.3	748.7	692.0	930.5			
R_2	556.9	712.0	695.4	873.7			

S.E. of difference of two

1. V marginal means = 12.1 lb./ac.
2. M marginal means = 37.8 lb./ac.
3. R marginal means = 22.5 lb./ac.
4. M means at the same level of V = 53.4 lb./ac.
5. V means at the same level of M = 47.8 lb./ac.
6. R means at the same level of V = 31.8 lb./ac.
7. V means at the seme level of R = 25.6 lb./ac.
8. R means at the same level of M = 45.0 lb./ac.
9. M means at the same level of R = 49.4 lb./ac.

Crop :- Wheat. **Ref :- M.P. 53(21).**

Site :- Reura Farm, Satna. **Type :- 'MI'.**

Object :—To study the effect of N and P under different number of irrigations.

1. BASAL CONDITIONS :

(i) (a) Paddy-Berseem-*Moong*-Wheat. (b) *Moong* type 1. (c) Nil. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 27.12.1953. (iv) (a) After harvesting *moong* two discings were given. (b) Sown by *nari* plough. (c) 32 srs/ac. (d) Rows 10" apart. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (x) 3.00". (x) N.A.

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) 3 levels of P_2O_5 : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.

(3) 3 levels of irrigation : $I_1=1$, $I_2=2$ and $I_3=3$ irrigations.

3. DESIGN :

(i) 3^3 confd. I component of J confounded. (ii) (a) 3 blocks/replication ; 9 plots/block. (b) N.A. (iii) 1. (iv) (a) 40'×27'. (b) 36'×23'. (v) 2' alround. (vi) Yes.

4. GENERAL :

(i) No lodging. (ii) Brown rust was common in all the plots. (iii) Height and tillering, No. of grains per earhead, wt. of 1000 grains, No. of earhead per plant. (iv) (a) 1953—1955. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 864 lb./ac.
(ii) 198.9 lb./ac.
(iii) Only main effects of N, P and I are highly significant.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
I_1	504	809	691	668	537	686	781
I_2	681	892	1025	866	713	890	995
I_3	748	1136	1287	1057	841	1025	1304
Mean	644	946	1001	864	697	867	1027
P_0	579	755	756	697			
P_1	596	1034	967	867			
P_2	757	1044	1280	1027			

S.E. of any marginal mean = 66.3 lb./ac.
S.E. of body of any table =114.7 lb./ac.

Crop :- Wheat. **Ref : Complex experiments (T.C.M.), 1953.**

Centre :- Obedullaganj (M.P.) **Type : 'IM'.**

Object :— VII. To study the effect of irrigation along with manures.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loam in texture and deep black in colour. (b) N.A. (iii) 30.10.1953. (iv) N.A. (v) N.A. (vi) C-591. (vii) Irrigated. (viii) Nil. (iv) 53. 42". (x) 27.4.1954.

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) 3 levels of P_2O_5 : P_0=0, P_1=20 and P_2=40 lb./ac.
(3) 3 irrigations : I_0=0, I_1=1 and I_2=2 irrigations.

N as A/S brodcast just before sowing while P_2O_5 as Super was mixed with seed and drilled in lines.
(Due to shortage of water, 2nd irrigation could not be given. So the plots which were to recieve 2 irrigations actually received only one irrigation).

3. DESIGN :

(i) 3^3 Fact. confd. (ii) (a) 3 blocks/replication ; 9 plots/block. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 30'×25'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Slight attack of grass-hopper and loose-smut. (iii) Yield of grain. (iv) (a) 1953-56. (b) No. (c) N.A. (v) (a) Kotah, Banaras, Pura, Satna, and Paliad. (b) N.A. (vi) Nil. (vii) I has only two levels I_0 and I_1; I_2 is the same as I_1.

5. RESULTS :

(i) 1318 lb./ac.
(ii) 234.8 lb./ac.
(iii) Main effect of I is significant. Other effects are not significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	I_0	I_1
P_0	1083	1334	1234	1234	1125	1288
P_1	1052	1361	1460	1291	975	1448
P_2	1356	1412	1525	1431	1003	1645
Mean	1164	1369	1423	1318	1034	1460
I_0	913	1135	1056			
I_1	1289	1486	1606			

S.E. of marginal mean of N, P and I_0 = 78.27 lb./ac.
S.E. of marginal mean of I_1 = 55.35 lb./ac.
S.E. of body of N × P table = 135.5 lb./ac.
S.E. of I_0 × P or I_0 × N means = 135.5 lb./ac.
S.E. of I_1 × P or I_1 × N means = 95.88 lb./ac.

Crop :- Wheat. **Ref :- Complex experiments (T.C.M.), 1953.**

Centre :- Satna (M.P.) **Type : 'IM'.**

Object :— VII, To study the effect of irrigation along with manures.

1. BASAL CONDITIONS :
(i) (a) to (c)N.A. (ii) (a) Clayey. (b) N.A. (iii) 28.12.1954. (iv) N.A (v). N.A. (vi) C-591 (vii) Irrigated. (viii) Nil. (ix) 43.77". (x) 21.4.1954.

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) 3 levels of P_2O_5 : P_0 = 0, P_1 = 20 and P_2 = 40 lb /ac.
(3) 3 irrigations : I_1 : 1, I_2 = 2 and I_3 = 3 irrigations.
Manures applied at the time of sowing. N as A/S and P_2O_5 as triple Super.

3. DESIGN :
(i) 3^3 Fact. in R.B.D. (confd.) (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 35'×22'. (v) N.A. (vi) Yes.

4. GENERAL :
(i) Normal. (ii) Crop suffered from brown-rust and draught conditions (iii) Grain yield. (iv) (a) 1953-1956 (b) No. (c) N.A. (v) (a) Kotah, Varanasi, Pura, Paliad and Obedullaganj. (b) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :
(i) 955 lb./ac.
(ii) 155.5 lb./ac.
(iii) Main effects of N, P and I are significant. None of the interactions is significant.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	I_1	I_2	I_3
P_0	640	834	836	770	593	788	928
P_1	659	1147	1086	964	759	984	1149
P_2	834	1154	1406	1131	863	1096	1435
Mean	711	1045	1109	955	738	956	1171
I_1	557	894	764				
I_2	751	987	1130				
I_3	824	1253	1435				

S.E. of any marginal mean = 51.8 lb./ac.
S.E. of body of any table = 89.8 lb./ac.

Crop :- Wheat. Ref :- M.P. 52(35).

Site :- Govt. Seed and Demonstration Farm, Betul. Type :- 'D'.

Object :—To study the effect of pre-treatment of Wheat seed with solution of fertilizers on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii (a) *Morand* II. (b) Refer soil analysis, Betul. (iii) 25.10.1952. (iv) (a) 4 *bakh-rings*. (b) to (e) N.A. (v) N.A. (vi) A 115 (early). (vii) Unirrigated. (viii) Nil (ix) 18.30". (x) 5.6.1953.

9. TREATMENTS :

1. Dry seed (control).
2. Seed s aked at 5½ lb. of pure water for 24 hours.
3. Seed soaked in one molar sol. of A/S for 24 hours.
4. Seed soaked in mono-potassium phosphate sol. one molar, for 24 hours.

The measured quantity of seed was taken and was soaked in glazed clay feet. A/S solution prepared by taking 330 grams of A/S dissolved in 5½ lb. of water. Mono potassium phosphate solution has been prepared by taking 340 grams of salt and dissolving in 5½ lb. of pure water.

3. DESIGN :

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

4. GENERAL :

(i) Satisfactory, except treatment 3 plots had defective germination. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 596 lb./ac.
(ii) 92.8 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb /ac.

Treatment	Av. yield
1.	640
2.	688
3.	528
4.	528
S.E./mean	=41.6 lb./ac.

Crop :- Wheat. Ref :- M.P.35 (34).

Site :- Govt. Seed and Demonstration Farm, Betul. Type :- 'D'.

Object :—To study the effect of pretreatment of seed with solution of some fertilizers on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Morand* II. (b) Refer soil analysis, Betul. (iii) N.A. (iv) (a) *Bakharings*. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Dry seed (control).
2. Seed soaked in pure water for 24 hours.
3. Seed soaked in A/S solution (1 molar) for 24 hours.
4. Seed soaked in Mono-potassium phosphate solution (1 molar) for 24 hours.

3. DESIGN :

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

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 490 lb./ac.
(ii) 97.60 lb./ac.

(iii) Treatments do not differ significantly.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	536
2.	436
3.	472
4.	516

S.E./mean =43.20 lb./ac.

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Crop :- Wheat (*Rabi*). Ref :- M.P. 53(93).

Site :- Govt. Seed and Demonstration Farm, Betul. Type :- 'D'.

Object :—To see the effect of seed soaked in different solutions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) Refer soil analysis, Betul. (iii) to (x) N.A.

2. TREATMENTS:

1. Dry seed sown.
2. Seed soaked in pure water for 24 hours.
3. Seed soaked in A/S solution for 24 hours (1 molar).
4. Seed soaked in Pot. Phos. solution for 24 hours (1 molar).

3. DESIGN :

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

4. GENERAL :

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

5. RESULTS :

(i) 1008 lb./ac.

(ii) 199.1 lb./ac.

(iii) Treatments do not differ significantly.

(iv) Av. yield of grain in lb./ac

Treatment	Av. yield
1.	1102
2.	897
3.	971
4.	1061

S.E./mean = 89.0 lb./ac.

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Crop :- Wheat. Ref :- :- M.P. 52(27).

Site :- Adhartal Farm, Jabalpore. Type :- 'D'.

Object :—To study the effect of soaking Wheat seed in different solutions prior to sowing.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar.* (b) Refer soil analysis, Jabalpore. (iii) 28.10.1952. (iv) (a) and (b) N.A. (c) 80 lb./ac. (d) and (e) N.A. (v) N.A. (vi) A.O. 90 (medium). (vii) to (ix) N.A. (x) 1.4.1953.

2. TREATMENTS .

1. Dry seed (control).
2. Seed soaked in pure water for 24 hours.
3. Seed soaked in one molar solution of A/S for 24 hours.
4. Seed soaked in one molar solution. of mono-potassium phosphate for 24 hours.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 33′ × 16½′. (v) 2′ between 2 plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1952—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Plants dried very fast for want of moisture in the soil. Whithering was common in all plots. (vii) Nil.

5. RESULTS :

(i) 309.4 lb./ac.
(ii) 29.20 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	272.0
2.	355.8
3.	311.8
4.	297.9
S.E./mean	=13.04 lb./ac.

Crop :- Wheat. **Ref :- M P. 52 (52)**
Site :- Labhandi Farm, Raipur. **Type :- 'M'**

Object :—To study the effect of heating the wheat seed with manurial solutions before sowing on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 7.11.1952. (iv) (a) Ploughing (b) Seeds drilled. (c) 80 lb./ac. (d) Rows 9" apart. (e) N.A. (v) Nil. (vi) A 115 (local) (vii) Irrigated. (viii) weeding. (ix) N.A. (x) 18.3.53.

2. TREATMENTS :

1. Dry seed (control).
2. Seed treated in water.
3. Seed treated in A/S solution for 24 hours.
4. Seed treated in mono-potassium phosphate solution for 24 hours.

3. DESIGN :

(i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 5' (iv) (a) 33'×16½' (b) 33'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1953. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) & (vii) Nil.

5. RESULTS :

(i) 206.9 lb./ac.
(ii) 31.48 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	195.0
2.	236.0
3.	196.5
4.	200.0
S.E./mean	=14.08 lb./ac.

Crop :- Wheat. **Ref :- M.P. 53 (45).**
Site :- Labhandi Farm, Raipur. **Type :- 'D'**

Object :—To study the effect of treating the wheat seed before sowing in different solutions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) *Dorsa.* (b) N.A. (iii) 4.11.1953. (iv) (a) Ploughing. (b) Seeds drilled. (c) and (d) N.A. (e) N.A. (v) N.A. (vi) A 115 (local). (vii) Irrigated. (viii) weeding. (ix) N.A. (x) 15.2.1954.

2. TREATMENTS :

1. Dry seed (control).
2. Seed soaked in pure water for 24 hours.
3. Seed soaked in A/S solution for 24 hours.
4. Seed soaked in Mono-potassium phosphate.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a), (b) 33′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1952 to 1953. (b) and (c) N.A. (v) (a) N.A. (b) N.A. (vi) & (vii) Nil.

5. RESULTS :

(i) 350 lb./ac.
(ii) 101.0 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	388
2.	324
3.	360
4.	328
S.E./mean	=45.4 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- M.P. 49(4).**

Site :- Institute of Plant Industry, Indore. **Type :- 'DV'.**

Object :—To study the effect of soaking wheat seed before sowing with the nutrients on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 8.11.1949. (iv) (a) *Bakharing*. (b) and (c) N.A. (d) 14″. (e) —. (v) N.A. (vi) As per treatments. (vii) N.A. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1=C. 591 and V_2=*Malvi* E.K.D.

Sub-plot treatments :

Soaking of seeds : D_1=Dry seed, D_2=Soaked in water once for 6 hours and then dried, D_3=Soaked in water twice and dried, D_4=Soaked in one molar solution of A/S, D_5=Soaked in one molar solution of A/P and D_6=Soaked in one molar solution of potassium phosphate.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 9′4″×60′. (b) 4′8″×55′. (v) 2′4″×2′6″. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Weight of grain and fodder. (iv) (a) 1949—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 705.0 lb./ac.
(ii) (a) 257.5 lb./ac.
(b) 131.3 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	Mean
V_1	501.6	615.7	727.2	668.8	634.3	615.7	627.2
V_2	727.2	846.6	814.8	713.9	788.2	806.8	782.9
Mean	614.4	731.1	771.0	691.3	711.2	711.2	705.0

S.E. of difference of two

1. V marginal means = 74.3 lb./ac.
2. D marginal means = 65.7 lb./ac.
3. D means at the same level of V = 92.8 lb./ac.
4. V means at the same level of D =112.7 lb./ac.

Crop :- Wheat. **Ref :- M.P. 50(8).**

Site :- Institute of Plant Industry, Indore. **Type :- 'DV'.**

Object :—To study the effect of seed soaked in different chemicals of the two varieties.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V_1=C. 591 and V_2=*Malvi* E.K.D.

(2) Soaking of seeds : D_0=No soaking, D_1=Soaked in water once, D_2=Soaked in water twice, D_3= Soaked in A/S, D_4=Soaked in Ammo. Phos. and D_5=Soaked in potassium phosphate.

3. DESIGN :

(i) 2×6 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 47′×10.4′. (b) 35′×7′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) Grain yield. (iv) (a) N.A. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 569.6 lb./ac.

(ii) 95.20 lb./ac.

(iii) V effect is highly significant, D effect is significant while interaction is not significant.

(iv) Av. yield of grain in lb./ac.

	D_0	D_1	D_2	D_3	D_4	D_5	Mean
V_1	565.1	609.4	542.9	576.1	476.4	454.2	537.3
V_2	620.4	653.7	631.5	631.5	542.9	531.8	602.0
Mean	592.7	631.5	587.2	603.8	509.6	493.0	569.6

S.E. of V marginal means =19.43 lb./ac.
S.E. of D marginal means =33.66 lb./ac.
S.E. of body of table =47.60 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :- M.P. 51(15).**

Site :- Institute of Plant Industry, Indore. **Type :- 'DV'.**

Object :—To study the effect of soaking wheat seed in nutrient solutions before sowing on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) 6 C.L./ac. of F.Y.M. and green manuring with sann. (ii) (a) Black cotton soil. (b) N.A. (iii) 5.10 1951. (iv) (a) *Bakharing*. (b) N.A. (c) 80 lb./ac. (d) 14". (e) N.A. (v) N.I. (vi) As per treatments. (vii) N.A. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V_1=C-591 and V_2=*malvi* E.K.D.

(2) Soaking of seeds : D_0=No soaking, D_1=Soaked in water once, D_2=Soaked in water twice, D_3=Soaked in A/S, D_4=Soaked in Ammo. Phos. and D_5=Soaked in Potassium Phosphate.

3. DESIGN :

(i) 2×6 Fact. in R.B D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 40'×11'-8". (b) 35'×7'. (v) Two rows on both the sides and 2½' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) Poor germination. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 150 lb./ac.

(ii) 45.10 lb./ac.

(iii) Both V and D effects are highly significant while interaction is not significant.

(iv) Av. yield of grain in lb./ac.

	D_0	D_1	D_2	D_3	D_4	D_5	Mean
V_1	167	156	186	80	56	69	119
V_2	189	164	208	186	169	167	180
Mean	178	160	197	133	112	118	150

S.E. of V marginal means = 9.22 lb./ac.

S.E. of D marginal means =15.85 lb./ac.

S.E. of body of table =22.55 lb./ac.

Crop :- Wheat. **Ref :- M.P. 48(26).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'CD'.**

Object :—To see the effect of Agroson G.N. on Wheat sown on different dates against foot-rot disease.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) As per treatments. (iv) (a) *Bakharing*. (b) Drilling. (c) 80. lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) A-115 (medium). (vii) and (viii) N.A. (ix) 2.11". (x) 25.3.1949.

2. TREATMENTS :

Main plot treatments :

4 dates of sowing : D_1=21.10.1948, D_2=28.10.1948, D_3=11.11.1948 and D_4=18.11.1948.

Sub-plot treatments :

Treating of seeds : T_0=Untreated seed and T_1=Seed treated with agroson.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 33′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1948 to 1950. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 487.1 lb./ac.
(ii) (a) 82.64 lb./ac.
(b) 46.48 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	Mean
T_0	513.6	487.4	478.8	441.0	480.2
T_1	501.2	501.8	491.2	482.2	494.1
Mean	507.4	494.6	485.0	461.6	487.1

S.E. of difference of two

1. D marginal means =41.32 lb./ac.
2. T marginal means =16.43 lb./ac.
3. T means at the same level of D =33.54 lb./ac.
4. D means at the same level of T =47.60 lb./ac.

Crop :- Wheat. **Ref :- M.P. 49 (33).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'CD'.**

Object :—To see the effect of Agroson G.N. on Wheat sown on different dates against foot-rot disease.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) As per treatments. (iv) (a) *Bakharing*. (b) N.A. (c) 80 lb./ac. (d) N.A. (e) N.A. (v) N.A. (vi) A. 115 (local). (vii) to (ix) N.A. (x) 27.3.1950.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D_1=20.10.1949, D_2=4.11.1949 and D_3=19.11.1949.

Sub-plot treatments :

2 seed treatments : T_0=Untreated seeds and T_1=Seed treated with Agroson.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) 33′×16½′. (v) Nil. (vi) N.A.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1948 to 1950. (b) No. (c) N.A. (v) (a) N.A. (b) N. A. (vi) and (vii) Nil.

5. RESULTS :

(i) 357.7 lb./ac.
(ii) (a) 27.44 lb./ac.
(b) 12.84 lb./ac.
(iii) None of the effects is significant.

(iv) Av. yield of grain lb./ac.

	D_1	D_2	D_3	Mean
T_0	368.3	344.8	319.8	344.3
T_1	368.3	424.8	320.0	371.1
Mean	368.3	384.8	319.9	357.7

S.E. of difference of two

1. D marginal means = 15.84 lb./ac.
2. T marginal means = 6.05 lb./ac.
3. T means at the same level of D = 10.48 lb./ac.
4. D means at the same level of T = 17.48 lb./ac.

Crop :- Wheat. **Ref :- M.P. 50(33).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'CD'.**

Object : —To see the effect of Agrosan G. N. on Wheat sown on different dates against foot-rot disease.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loom (*Mariyar*). (b) Refer soil analysis, Powarkheda. (iii) As per treatments. (iv) (a) *Bakharing*. (b) Drilling. (c) 80. lb./ac. (d) and (e) N.A. (v) N.A. (vi) A. 115 (local). (vii) N.A. (viii) N.A. (ix) 2.11". (x) 25.3.1951.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D_1=16.11.1950, D_2=27.11.1950 and D_3=7.12.1950.

Sub-plot treatments :

2 seed treatments : T_0=Untreated seed and T_1=Seed treated with Agrosan G.N.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block, 2 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) 33'×16½'. (v) Nil. (vi) N.A.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1948 to 1950. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 485.8 lb./ac.

(ii) (a) 35.28 lb./ac.

(b) 17.00 lb./ac.

(iii) Only D effect is significant.

(iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	Mean
T_0	564.9	489.9	373.4	476.1
T_1	580.1	498.2	408.3	495.5
Mean	572.5	494.1	390.8	485.8

S E. of difference of two

1. D marginal means = 20.37 lb./ac.
2. T marginal means = 8.01 lb./ac.
3. T means at the same level of D = 13.88 lb./ac.
4. D means at the same level of T = 22.60 lb./ac.

Crop :- Jowar. Ref :- M.P. 53(31).

Site :- Govt. Seed and Demonstration Farm, Damoh. Type : 'M'.

Object :— To study the effect of C/N on *Jowar* crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) *Kabar*. (b) N.A. (iii) 17,20.7.1953. (iv) (a) Ploughing. (b) Seed sown. (c) 45 lb./ac. (d) Rows 18" apart. (e) N.A. (v) Nil. (vi) Local *Bedia*. (vii) Unirrigated. (viii) N.A. (ix) 18.50". (x) 10 to 12.12.1953.

2. TREATMENTS :

1. Control (2 plots/block).
2. 15 lb./ac. of N as A/S.
3. 30 lb /ac, of N as A/S.
4. 45 lb./ac. of N as A/S.
5. 15 lb./ac of N as C/N.
6. 30 lb./ac. of N as C/N.
7. 45 lb./ac. of N as C/N.
8. 1 md./ac. of G.N.C.+10 lb /ac. of N as A/S.

Time and method of application of treatments N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) (a), (b) 50'-8"×21'-6". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) No. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1273 lb./ac.

(ii) 138.8 lb./ac.

(iii) Treatments differ highly significantly.

(vi) Av. yield of grain in lb./ac,

Treatment	Av. yield	Treatment	Av. yield
1.	807	5.	1167
2.	1350	6.	1445
3.	1511	7.	1624
4.	1653	8.	1091

S.E./mean for treatments 2 to 8 =62.8 lb./ac.

S.E./mean for treatment 1 =87.8 lb./ac.

Crop :- Jowar. Ref :- M.P. 51(50).

Site :- Central Res. Farm, Gwalior. Type :- 'M'.

Object :—To study the effect of A/S and Super on the growth and yield of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Gram. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 2.8.1951. (iv) (a) *Desi* ploughing and *Bakharing*. (b) N.A. (c) N.A. (d) 18". (e) N.A. (v) N.A. (vi) G. 12-2. (vii) Unirrigated. (viii) Intercuituring by Mayflower cultivator. (ix) N.A. (x) 29.11.1951.

2. TREATMENTS :

All combinations of (1) and (2),

(1) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=10$ and $P_2=20$ lb./ac.

(2) 2 levels of N as A/S: $N_0=0$ and $N_1=10$ lb./ac.

3. DESIGN :

(i) 2×3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) 21'×96'. (b) 12'×90'. (v) Three rows on both sides and 3' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Grain and *Kadbi* yield. (iv) (a) 1950—N.A (b), (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 973 lb./ac.

(ii) 161.7 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	1066	1000	933	1000
N_1	1080	906	853	946
Mean	1073	953	893	973

S.E. of marginal mean of N = 38.08 lb./ac.
S.E. of marginal mean of P = 46.64 lb./ac.
S.E. of body of table = 66.00 lb./ac.

Crop :- Jowar (*Kharif*). **Ref :- M.P. 52(62).**
Site :- Central Res. Farm, Gwalior. **Type :- 'M'.**

Object :—To find out the response of *Jowar* to manuring with A/S and Super.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 27.7.1952. (iv) (a) Ploughing. (b) Seeds drilled with 2 coultered seed drill. (c) N.A. (d) 18". (e) N.A. (v) N.A. (vi) G. 12-2. (vii) N.A. (viii) 1 weeding and interculturing by Mayflower cultivator. (ix) 22.60". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of P_2O_5 : P_0=0 and P_1=20 lb./ac.

(2) 5 levels of N : N_0=0, N_1=10, N_2=20, N_3=30 and N_4=40 lb./ac.

N as A/S top dressed on 25.8.1952 and P_2O_5 as Super drilled on 27.7.1952 before sowing.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) 96'×180'. (iii) 6. (iv) (a) 96'×18'. (b) 90'×12'. (v) 2 rows on both sides and 3' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 493.7 lb./ac.

(ii) 79.71 lb./ac.

(iii) P effect is highly significant, interaction NP is significant while N effect is not significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
P_0	342.3	371.9	351.3	434.4	450.9	390.2
P_1	684.6	569.4	542.2	573.5	616.3	597.2
Mean	513.4	470.7	446.8	503.9	533.6	493.7

S.E. of marginal mean of N = 23.01 lb./ac.
S.E. of marginal mean of P = 14.55 lb./ac.
S.E. of body of table = 32.54 lb./ac.

Crop :- Jowar (*Kharif*). Ref :- M.P. 53(76).

Site :- Central Res. Farm, Gwalior. Type :- 'M'.

Object :—To find out suitable manurial schedule for *Jowar*.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis. Gwalior. (iii) 21.7.1953. (iv) (a) N.A. (b) Seed drilled. (c) to (e) N.A. (v) N.A. (vi) G. 12-2 (early). (vii) Unirrigated. (viii) N.A. (ix) 23.93". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

5 levels of N as A/S : N_0=0, N_1=10, N_2=20, N_3=30 and N_4=40 lb./ac.

Sub-plot treatments :

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) 5 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 542 lb./ac.

(ii) (a) 58.54 lb./ac.

(b) 78.75 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	N_4	Mean
P_0	459	451	544	482	513	490
P_1	529	537	490	552	474	516
P_2	529	653	692	638	591	621
Mean	506	547	575	557	526	

S.E. of difference of two

1. N marginal means =23.90 lb./ac.
2. P marginal means =24.90 lb./ac.
3. P means at the same level of N =55.69 lb./ac.
4. N means at the same level of P =51.37 lb./ac.

Crop :- Jowar. Ref :- M.P. 51(44).

Site :- Central Exptl. Farm, Indore. Type :- 'M'.

Object :—To find a suitable dose of A/S and Super for *Jowar*.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Groundnut and onion. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 26.6.1951. (iv) (a) 2 *bakharings*. (b) and (c) N.A. (d) 14". (e) N.A. (v) N.A. (vi) *Jowar* No. 3. (vii) Unirrigated. (viii) 3 hoeings. (ix) N.A. (x) 19.11.1951.

2. TREATMENTS :

1. Control (no manure).
2. 10 lb./ac. of N as A/S.
3. 20 lb./ac. of N as A/S.
4. 30 lb./ac. of N as A/S.
5. 40 lb./ac. of N as A/S.
6. 5 lb./ac. of P_2O_5 as Super.
7. 10 lb./ac. of P_2O_5 as Super.
8. Treat. 2+treat. 6.
9. Treat. 2+treat. 7.
10. Treat. 4+treat. 6.
11. Treat. 4+treat. 7.

In 3 replications, the fertilizers were drilled with the seed and in the 3 replications it was applied a month after sowing. Hence the experiment has been taken as two experiments—one each for different times of application of manures.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 3 for each time of application of fertilizers. (iv) (a) 21′×66′. (b) 14′×60′. (v) Three rows on either side and 3′ of each row at both ends. (vi) Yes

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain and *kadbi* yield. (iv) (a) 1950 to N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Season was not favourable for the crop. (vii) Nil.

5. RESULTS :

Manure drilled with the seed

(i) 611.3 lb./ac.
(ii) 103.1 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	457.9
2.	544.3
3.	807.8
4.	619.9
5.	661.0
6.	570.2
7.	604.8
8.	609.1
9.	643.7
10.	563.8
11.	641.5

S.E./mean = 59.55 lb./ac.

Manure applied a month after sowing

(i) 644.9 lb./ac.
(ii) 109.7 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	524.9
2.	587.5
3.	671.8
4.	786.2
5.	632.9
6.	643.7
7.	721.4
8.	686.9
9.	568.1
10.	583.2
11.	686.9

S.E./mean = 63.37 lb./ac.

Crop :- Jowar. Ref :- M.P. 50(9).

Site :- Institute of Plant Industry, Indore. Type :-'M'.

Object :—To study the response to G.N.C. and P_2O_5 as Super applied singly and in combination.

1. BASAL CONDITIONS :

(i) (a) No. (b) Wheat. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 16.7.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) *Jowar* No. 3. (vii) Unirrigated. (viii) and (ix) N.A. (x) 4.1.1951.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 2 levels of N as G.N.C. : $N_0=0$ and $N_1=20$ lb./ac.
(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=20$ lb./ac.

3. DESIGN :

(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 23′4″×16′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) and (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 939 lb./ac.
(ii) 119.3 lb./ac.
(iii) Only N effect is highly significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	Mean
P_0	866	1056	961
P_1	856	978	917
Mean	861	1017	938

S.E. of any marginal mean = 47.07 lb./ac.
S.E. of body of table = 33.28 lb./ac.

Crop :- Jowar. **Ref :- M.P. 53(8).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To find out the response of *Jowar* to legume crops taken in combination with P_2O_5.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 9.7.1953. (iv) (a) *Bakharing* twice (b) Drilled. (c) 20 lb./ac. (d) Rows 14" apart. (e)—. (v) Nil. (vi) *Jowar* No. 3. (vii) Unirrigated. (viii) Hand weeding once followed by interculture with *dansa*. (ix) N.A. (x) 8, 10.1.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.

(2) 11 G.M. crops : G_0=No crop, G_1=*Dhaincha*, G_2=*Moong* T_1, G_3=*moong sindhikhera*, G_4=Sunhemp, G_5=*Udid*, G_6=Cowpea, G_7=Soyabean, G_8=Sesbania, G_9=*Guar* and G_{10}=*Moong* local.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 22. (b) N.A. (iii) 4. (iv) (a) 65'-4"×18'-8". (b) 60'-4"×14'. (v) Nearly 2½' on each side. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1950 to 1953. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 107.8 lb./ac.
(ii) 73.75 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	G_0	G_1	G_2	G_3	G_4	G_5	G_6	G_7	G_8	G_9	G_{10}	Mean
P_0	88.3	90.9	115.5	100.5	110.4	97.3	118.7	101.6	106.4	110.1	107.5	104.3
P_1	94.4	112.0	127.7	135.2	104.0	128.3	119.7	91.5	80.0	98.7	133.9	111.4
Mean	91.4	101.4	121.6	117.8	107.2	112.8	119.2	96.6	93.2	104.4	120.7	107.8

S.E. of marginal mean of P = 11.12 lb./ac.
S.E. of marginal mean of G = 26.08 lb./ac.
S.E. of body of table = 36.88 lb./ac.

Crop :- Jowar. Ref :- M.P. 53(7).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the response of different sources of N in combination with P_2O_5.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 6.7.1953. (iv) (a) *Bakharing* once. (b) Drilled. (c) 10 lb./ac. (d) Rows 14" apart. (e) N.A. (v) Nil. (vi) *Jowar* No. 3. (vii) Unirrigated. (viii) Hand weeding once followed by intercultivation with *danas*. (ix) 31.93". (x) 9.12.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.

(2) 5 manures : N_0=0, N_1=20 lb./ac. of N as Potassium nitrate, N_2=20 lb./ac. of N as F.Y.M., N_3=20 lb./ac. of N as farm compost and N_4=20 lb./ac. of N as G.N.C.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 60'×11'. (b) 55'×7'. (v) 2 rows on each side and 2½' on each end. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 949 lb./ac.

(ii) 115.6 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	N_4	Mean
P_0	934	840	1011	934	959	936
P_1	929	975	979	985	947	963
Mean	931	907	995	959	953	949

S.E. of marginal mean of N = 33.4 lb./ac.

S.E. of marginal mean of P = 21.1 lb./ac.

S.E. of body of table = 47.2 lb./ac.

Crop :- Jowar. Ref :- M.P. 53(4).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the response of different sources of N together with different doses of P on the yield of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 6.7.1953. (iv) (a) one *Bakharing*. (b) Drilled. (c) 10 lb./ac. (d) Rows 14" apart. (e) N.A. (v) Nil. (vi) *Jowar* No. 3. (vii) Unirrigated. (viii) Interculture with *desi damar* once. (ix) 31.93". (x) 22.12.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.

(2) 5 manures : N_0=0, N_1=20 lb./ac. of N as Potassium nitrate N_2=20 lb./ac. of N as F.Y.M., N_3=20 lb./ac. of N as farm compost and N_4=20 lb./ac. of N as G.N.C.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 60'×10'8". (b) 55'×7'. (v) 2' rows on each side and 2½' at each end. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1011 lb./ac.

(ii) 137.1 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	N_4	Mean
P_0	931	986	1118	981	966	996
P_1	987	1011	1112	1001	1021	1026
Mean	959	998	1115	991	993	1011

S.E. of marginal mean of P =25.0 lb./ac.

S.E. of marginal mean of N =39.6 lb./ac.

S.E. of body of table =56.0 lb./ac.

Crop :- Jowar (*Kharif*). **Ref :- M.P. 49(15).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To study the residual effect of different crops treated with different doses of N and P singly and in combination on *Jowar*.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) *Bakharings*. (b) N.A. (c) N.A. (d) 14". (e) N.A. (v) Nil. (vi) *Jowar* No. 3. (vii) N.A. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 previous crops : C_1=Wheat, C_2=Linseed and C_3=Gram.

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.

N and P applied to the main-plot treatments crops ; residual effect studied on *Jowar*.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 14'8" × 35'. (b) 10' × 30'. (v) 2 rows on both the sides and 2½' of each row at both ends. (vi) Yes.

4. GENERAL :

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

5, RESULTS :

(i) 506.8 lb./ac.

(ii) (a) 156.2 lb./ac.

(b) 117.8 lb./ac.

(iii) C and N effects are highly significant, interaction C × N is significant while other effects are not significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
C_1	312.1	337.2	470.2	373.3	384.0	337.2	398.6
C_2	523.0	614.1	709.7	615.6	652.3	565.2	629.2
C_3	370.0	552.8	671.5	531.4	482.2	562.4	549.6
Mean	401.7	501.4	617.3	506.8	506.2	488.3	525.8
P_0	385.1	501.8	631.9				
P_1	399.1	476.2	598.5				
P_2	420.8	535.0	621.6				

S.E. of difference of two

1. C marginal means = 30.1 lb./ac.
2. N or P marginal means = 22.6 lb./ac.
3. N or P means at the same level of C = 39.3 lb./ac.
4. C means at the same level of N or P = 44.0 lb./ac.

Crop :- Jowar (*Kharif*). Ref :- M.P. **49 (16).**

Site :- Institute of Plant Industry, Indore. Type :- 'M'

Object :— To study the residual effect of the application of N and P singly and in combination to previous *Rabi* crops on *Jowar*.

1. BASAL CONDITIONS :

(i) (a) N.A. (b), (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 5.7.1949. (iv) (a) *bakharing*. (b), (c) N.A. (d) 14". (e) N.A. (v) Nil. (vi) *Jowar* No. 3. (vii) N.A. (viii) **Weeding.** (ix) N.A. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 previous crops : C_1=Wheat, C_2=Linseed and C_3=Gram.

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.

N and P applied to the main-plot treatments crops. Residual effect on *Jowar*.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main plots/replication and 9 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 14'.8"×35' (b) 10'×30'. (v) 2 rows on both sides and 2½' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Jowar* grain and fodder yield. (iv) (a) to (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 540.7 lb./ac.
(ii) (a) 117.8 lb./ac.
(b) 116.0 lb./ac.
(iii) Interaction C×N alone is significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
C_1	488.2	559.7	569.3	539.1	519.4	555.7	542.1
C_2	539.1	539.6	553.2	543.9	587.9	475.6	568.3
C_3	479.7	543.6	594.4	539.2	529.0	541.1	547.6
Mean	502.3	547.6	572.3	540.7	545.4	524.1	552.7
P_0	451.0	561.7	623.6				
P_1	517.4	531.5	523.5				
P_2	538.6	549.6	569.8				

S.E. of difference of two

1. C marginal means =22.68 lb./ac.
2. N or P marginal means =22.33 lb./ac.
5. N or P means at the same level of C =38.67 lb./ac.
4. C means at the same level of N or P =38.75 lb./ac.

Crop :- Jowar. Ref :- M.P. 51 (21).

Site :- Institute of Plant Industry Indore. Type :- 'M'

Object :—To find out the residual effect of green manuring and growing catch crops like *Moong* and *Udid* preceding wheat on the yield of *Jowar* grain and straw following wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) G.M. and catch crops *moong* and *Udid* preceding wheat and wheat in 1950-1951. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.7.1951. (iv) (a) *Bakharing*. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.

(2) 4 previous crops : G_0=Fallow, G_1=Sann, G_2=*Moong* and G_3=*Udid*.

3. DESIGN :

(i) R.B.D. (ii) (a) 8 (b) N.A. (iii) 6, (iv) (a) N.A. (b) 55′×14′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Fodder and grain yield. (iv) (a) 1948.—N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 790 lb./ac.

(ii) 160.7 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	G_0	G_1	G_2	G_3	Mean
P_0	718	852	840	658	767
P_1	773	845	838	798	813
Mean	745	848	839	728	790

S.E. of marginal mean of G =46.4 lb./ac.

S.E. of marginal mean of P =32.8 lb./ac.

S.E. of body of table =65.6 lb./ac.

Crop :- Jowar. Ref :- M.P. 52(1).

Site :- Institute of Plant Industry, Indore. Type :-'M'

Object :—To study the residual effect of G.M. or catch crop grown before sowing Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) Wheat. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 2.7.1952. (iv) (a) 2 *bakharings*. (b) to (e) N.A. (v) Nil. (vi) *Jowar* no. 3 (early). (vii) Unirrigated. (viii) 1 hoeing. (ix) 16.9". (x) 12.11.1952 and 11.12.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 5 green manure crops : G_0=Fallow, G_1=Sann, G_2=*moong*, G_3= *Udid* and G_4=soyabeam.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.

Treatments applied to wheat crop. Residual effect studied.

3. DESIGN :

(i) 5×2 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 60'×23'4". (b) 55'×18'4". (v) 2.5' alround. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1626 lb./ac.

(ii) 296.4 lb./ac.

(iii) Only main effect of G is significant.

(iv) Av. yield of grain in lb./ac.

	G_0	G_1	G_2	G_3	G_4	Mean
P_0	1417	1515	1585	1702	1648	1573
P_1	1301	1835	1638	1994	1628	1679
Mean	1359	1675	1611	1848	1638	1626

S.E. of marginal mean of G = 105.3 lb./ac.
S.E. of marginal mean of P = 66.4 lb./ac.
S.E. of body of table = 148.2 lb./ac.

Crop :-Jowar. Ref :-M.P. 49(12).

Site :-Institute of Plant Industry, Indore. Type :-'M'.

Object :—To study the effect of graded doses of N and P singly and in combination.

1. BASAL CONDITIONS .

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.7.1949. (iv) (a) *Bakharing*. (b) and (c) N.A. (d) 14". (e) N.A. (v) N.A. (vi) *Jowar* No. 3. (vii) N.A. (viii) Weeding. (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=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. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 14'×35'. (b) 10'×30'4". (v) 2'×2'4". (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 570.4 lb./ac.
(ii) 139.7 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	423.3	592.4	605.8	540.5
P_1	487.7	646.2	756.9	630.3
P_2	357.5	453.3	810.8	540.5
Mean	422.8	563.9	724.5	570.4

S.E. of any marginal mean =33.0 lb./ac.
S.E. of body of table =57.0 lb./ac.

Crop :- Jowar. **Ref :- M.P. 48 (5).**

Site :- Institute of Plant Industry, Indore. **Type 'M'.**

Object :—To study the effect on *Jowar* of the application of different doses of N and P singly and in combination.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 levels of N as G.N.C. : 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. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 15′×35′. (b) 10′×30′4″. (v) 2 rows on both sides and 2½′ of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and fodder yield. (iv)(a) to (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 560.04 lb./ac.
(ii) 271.02 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	287.4	666.2	513.5	489.0
P_1	362.3	778.4	714.1	618.3
P_2	438.6	513.5	766.5	572.8
Mean	362.8	652.7	664.7	560.0

S.E. of any marginal mean = 63.85 lb./ac.
S.E. of body of table =110.63 lb./ac.

Crop:- Jowar. Ref : M.P. 51 (18).

Site :- Industry of Plant Industry, Indore. Type :- 'M'.

Object :—To find out the effect of application of P_2O_5 and compost in various combinations on the yield of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 1.6.1951. (iv) (a) *Bakharing*. (b), (c) N.A. (d) 14". (e) N.A. (v) N.A. (vi) *Jowar* no. 3. (vii) N.A. (viii) Thinning on 6.7.1951 and weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

(1) 2 levels of compost : C_0=0 and C_1=compost (quantity N.A.)

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

(3) 2 levels of N as A/S : N_0=0 and N_1=20 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 25'×14'. (b) 23' 4"×10'. (v) 2 rows on both sides and 2 feet of each row at both ends (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1951 to N.A. (b) N.A. (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 575.0 lb./ac.

(ii) 168.4 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	C_0	C_1	Mean	P_0	P_1
N_0	550.4	592.9	571.7	558.2	585.1
N_1	573.5	583.2	578.4	590.0	566.7
Mean	562.0	588.1	575.0	574.1	575.9
P_0	531.0	617.2			
P_1	592.9	558.9			

S.E. of any marginal mean =34.2 lb./ac.

S.E. of body of table =48.7 lb./ac.

Crop :- Jowar. Ref :- M.P. 51(75).

Site :- Govt. Exptl. Farm, Khandwa. Type :- 'M'.

Object :—To study the effect of different manures on the yield of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 9.7.1951. (iv) (a) *Bakharing*. (b) Sown with *tiffan*. (c) to (e) N.A. (v) Nil. (vi) A-123 (medium). (viii) Hoeing and weeding. (x) 25.25". (x) 13.12.1951.

2. TREATMENTS:

1. 15 lb./ac. of N as oil cake.
2. 15 lb./ac. of N as A/S.
3. 15 lb./ac. of N as decorticated cotton seed cake.
4. 15 lb./ac. of N as undecorticated cotton seed cake.
5. Control (no manure).

3. DESIGN :

(i) L. sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 34½'×34½'. (b) 33'×33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1131 lb./ac.
(ii) 242.6 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1320
2.	1352
3.	1056
4.	896
5.	1032
S.E./mean	= 108.5 lb./ac.

Crop :- Jowar. **Ref :- M.P. 50(52).**

Site :- Govt. Exptl. Farm, Khandwa. **Type :- 'M'.**

Object :—To study the effect of nitrogenous manures both organic and inorganic singly and in combination on *Jowar*.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 10.7.1950. (iv) (a) *Bakharing*. (b) Sown by tiffan. (c) to (e) N.A. (v) Nil. (vi) Nj. 171. (vii) Unirrigated. (viii) Hoeing and weeding. (ix) 29.38". (x) 22.12.1950.

2. TREATMENTS :

1. Control.
2. 15 lb /ac. of N as F.Y.M.
3. 15 lb./ac. of N as T.C.
4. 15 lb./ac. of N as farm compost.
5. 15 lb./ac. of N as A/S.
6. 15 lb./ac. of N as F.Y.M. and A/S in 1 : 1 ratio.
7. 15 lb./ac. of N as T.C. and A/S in 1 : 1 ratio.
8. 15 lb./ac. of N as F.C. and A/S in 1 : 1 ratio.

Manures applied on 6.7.1950 and 7.7.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 68'×18½'. (b) 66'×16½'. (v) 1' alround. (vi) No.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and *kadbi* yield. (iv) (a) No. (b) and (c)—. (v) (a) Nil. (b) N.A. (vi) Nil. (vii) Treatments are not randomised.

5. RESULTS :

(i) 745.9 lb./ac.
(ii) 62.3 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	532.5	5.	815.0
2.	797.5	6.	765.0
3.	785.0	7.	727.5
4.	797.5	8.	747.5
	S.E./mean	=31.1 lb./ac.	

Crop :- Jowar. Ref :- M.P. 50(53).

Site :- Govt. Exptl. Farm, Khandwa. Type :- 'M'.

Object :—To study the effect of T.C. with other organic manures and ascertain the optimum dose.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) Nil. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 8.7.1950. (iv) (a) *Bakharing*. (b) Sown by *tiffen*. (c) to (e) N.A. (v) Nil. (vi) Nj. 171. (vii) Unirrigated. (viii) Hoeing and weeding. (ix) 29.38". (x) 22.12.1950.

2. TREATMENTS :

7 manures : M_0=0 (control), M_1=10 C.L./ac. of T.C., M_2=20 C.L /ac. of T.C., M_3=10 C.L./ac. of F.Y.M., M_4=20 C.L./ac. of F.Y.M., M_5=4 md./ac of G.N.C. and M_6=4 md./ac of A/S.
Manures applied on 6 and 7.7.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 68'×18½'. (b) 65'×16½'. (v) 1' alround. (vi) No.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and *Kadbi* yield. (iv) (a) to (c) No. (v) (a) Nil. (b) N.A. (vi) and (vii) Nil.

5. RESULTS ;

(i) 1008 lb./ac.
(ii) 97.7 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
M_0	835
M_1	1033
M_2	1133
M_3	1030
M_4	1035
M_5	968
M_6	1020
S.E./mean	=48.9 lb./ac.

Crop :- Jowar (*Kharif*). Ref :- M.P. 53(83).

Site :- Govt. Exptl. Farm, Khandwa. Type :- 'M'.

Object :—To study the effect of different sources and doses of N on *Jowar* yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) and (b) N.A. (iii) 30.6.1953. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2) + a control
(1) 3 levels of N : N_1=15, N_2=30 and N_3=45 lb./ac.
(2) 2 sources of N : S_1=A/S and S_2=C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 33'×33'. (v) and (vi) N.A.

4. GENERAL :

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

5. RESULTS :

(i) 1306 lb /ac.
(ii) 288.4 lb./ac.
(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

Control =1044 lb /ac.

	N_1	N_2	N_3	Mean
S_1	1342	1240	1234	1271
S_2	1309	1294	1419	1341
Mean	1325	1267	1326	1306

S.E. of marginal mean of N = 91.2 lb./ac.
S.E. of marginal mean of S = 74.5 lb./ac.
S.E. of body of table =129.0 lb./ac.

Crop :- Jowar. **Ref :- M.P. 52 (18).**

Site :- Govt. Seed and Demonstration Farm, Saugor. **Type :- 'M'.**

Object :—To study the effect of cotton seed cake in comparison with other fertilizers on *Jowar.*

1. BASAL CONDITIONS:

(i) (a) to (c). (ii) (a) *Kabar* 2. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (d) 18″×12″. (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

1. Control (no manure).
2. G.N.C.
3. A/S.
4. Decorticated cotton seed cake.
5. Undecoraticated cotton seed cake.

Quantity of fertilizers applied not available.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 33′×16½′. (b) 30′×16½′. (v) One row on both sides of breadth. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1953. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) Nil. (vii) Transplanting of *Jowar* is not practiced in this tract. This had to be adopted as special measure to save the experiment from complete failure. Due to continuous rains after sowing the germination was very poor. Hence the healthy plants from non-experimental crop were transplanted which proved a success.

5. RESULTS :

(i) 531.6 lb./ac.
(ii) 214.7 lb./ac.
(iii) Treatments do not differ signficantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	502.9
2.	442.6
3.	412.3
4.	621.3
5,	679.1
S.E./mean	= 107.4 lb./ac.

Crop :- Jowar. Ref :- M.P. 53 (27).

Site :- Govt. Seed and Demonstration Farm, Saugor. Type :- 'M'

Object :—To study the manurial value of cotton seed cake for production of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar* 2. (b) N.A. (iii) 9.7.1953. (iv) (a) to (e) N.A. (v) N.A. (vi) White *bedra* (local). (vii) N.A. (viii) Heoing, weeding and mulching. (ix) N.A. (x) 17.12.1953.

2. TREATMENTS :

1. Control (no manure).
2. G.N.C.
3. A/S.
4. Fertilizer mixture.
5. Dectorticated cotton seed cake.
6. Undecorticated cotton seed cake.

Quantity of various manures—N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) and (b) 30′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Grain yield. (iv) (a) No. (b), (c) —. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1040 lb./ac.
(ii) 152.2 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	933
2.	966
3.	1316
4.	1016
5.	964
6.	1047
S.E./mean	=67.8 lb./ac.

Crop :- Jowar. Ref :- M.P. 53(26).

Site :- Govt. Seed and Demonstration Farm, Saugar. Type :- 'M'.

Object :—To study the effect of C/N on *Jowar*.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar* 2. (b) N.A. (iii) 9.7.1953. (iv) (a) N.A. (b) Seeds drilled. (c) N.A. (d) Rows 18″ apart. (e) N.A. (v) N.A. (vi) White *bedra* (local). (vii) to (ix) N.A. (x) 4.12.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N : N_0=0, N_1=15, N_2=30 and N_3=45 lb /ac.
(2) 2 sources of N : S_1=A/S and S_2=C/N.

3. DESIGN :

(i) 2×4 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) and (b) 33′×33′. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 798 lb./ac.
(ii) 190.8 lb./ac.

(iii) Control *vs.* treated and N effects are highly significant. Other effects are not significant.
(iv) Av. yield of grain in lb./ac.

Control =496 lb./ac.

	N_1	N_2	N_3	Mean
S_1	748	884	1232	955
S_2	744	868	916	843
Mean	746	876	1074	899

S.E. of marginal mean of S =49.2 lb./ac.
S.E. of marginal mean of N =60.4 lb./ac.
S.E. of body of table =85.2 lb./ac.

Crop :- Jowar. **Ref :- M.P. 51(4).**

Site :- Central Res. Farm, Ujjain. **Type :- 'M'.**

Object :—To find a suitable dose of A/S for *Jowar*.

1. BASAL CONDITIONS :

(i) (a) No. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 5.7.1951. (iv) (a) Four *bakharings*. (b) and (c) N.A. (d) Rows 18" apart. (e) N.A. (v) 5 C.L./ac. of F.Y.M. broadcasted on 20.6.1951 just before fourth *bakharing*. (vi) Ujjain No. 6 (late). (vii) Unirrigated. (viii) *Dora*. (ix) N.A. (x) 16, 19.11.1951.

2. TREATMENTS :

1. Control (no manure).
2. 10 lb./ac. of N.
3. 20 lb./ac. of N.
4. 30 lb./ac. of N.
5. 40 lb./ac. of N.
6. 5 lb./ac. of P_2O_5.
7. 10 lb./ac. of P_2O_5.
8. 10 lb./ac. of N+5 lb./ac. of P_2O_5.
9. 10 lb./ac. of N+10 lb./ac. of P_2O_5.
10. 30 lb./ac. of N+5 lb./ac. of P_2O_5.
11. 30 lb./ac. of N+10 lb./ac. of P_2O_5.

In 3 blocks, fertilizers were drilled in furrows with seed and in remaining 3 blocks fertilizers were applied as top dressing 3 to 4 weeks after germination. N applied as A/S and P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 21'×66'. (b) 12'×60'. (v) 4.5'×3'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain and *kadbi* yield. (iv) (a) No. (b) and (c) —. (v) (a) and (b) N A. (vi) and (vii) Nil.

5. RESULTS :

(i) 614.7 lb./ac.
(ii) 128.2 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	544.3	7.	535.4
2.	675.4	8.	580.8
3.	738.4	9.	577.1
4.	758.5	10.	682.9
5.	469.9	11.	595.9
6.	603.5		

S.E./mean =52.3 lb./ac.

Crop :- Jowar. Ref :- M.P. 48(1).

Site :- Institute of Plant Industry, Indore. Type :- 'CM'.

Object :—To find suitable seed rate and manurial dose for *Jowar*.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 30.6.1948. (iv) (a) *Bakharing*. (b) N.A. (c) As per treatments. (d) 14". (e) N.A. (v) N.A. (vi) *Jowar* No. 3. (vii) N.A. (viii) Weeding and thinning. (ix) N.A. (x) 6.12.1948.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 6 seed rates : R_1=10 lb./ac. (thinned), R_2=5, R_3=10, R_4=15, R_5=20 and R_6=25 lb./ac.

(2) 2 levels of N as A/S : N_0=0 and N_1=20 lb./ac.

10 lb./ac. of seed rate with thinning is control.

3. DESIGN :

(i) 2×6 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 14'×50'. (b) 9'4"×45'. (v) Two rows on both sides and 2½' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain and stalk yield. (iv) (a) 1947 to 1949. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 517.8 lb./ac.

(ii) 145.0 lb./ac.

(iii) R effect is significant, N effect is highly significant while interaction is not significant.

(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	R_5	R_6	Mean
N_0	611.6	403.1	543.6	455.0	430.1	378.2	470.3
N_1	584.6	600.9	620.3	626.8	531.7	428.0	565.4
Mean	598.1	502.0	581.9	540.9	480.9	403.1	517.8

S.E. of marginal mean of N =24.2 lb./ac.
S.E. of marginal mean of R =41.9 lb./ac.
S.E. of body of table =58.6 lb./ac.

Crop :- Jowar (*Kharif*). Ref :- M.P. 49(3).

Site :- Institute of Plant Industry, Indore. Type :- 'CM'.

Object :—To study the different seed rates and the effect of different doses of N on the yield of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.7.1949. (iv) (a) *Bakharing*. (b) and (c) N.A. (c) As per treatments. (d) 14". (e) N.A. (v) N.A. (vi) Indore No. 3. (vii) N.A. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 6 seed rates : R_1=10 lb./ac. (thinned), R_2=5, R_3=10, R_4=15, R_5=20 and R_6=25 lb./ac.

(2) 2 levels of N as A/S : N_0=0 and N_1=20 lb./ac.

10 lb./ac. of seed rate with thinning is control.

3. DESIGN :

(i) 2×6 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 11'8"×60'. (b) 7'×55'. (v) Two rows on both sides and 2½ feet of each row at both ends. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1947 to 1949. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 462.1 lb./ac.
(ii) 143.0 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	R_5	R_6	Mean
N_0	497.4	490.3	495.0	470.3	396.0	260.5	434.9
N_1	543.3	574.0	541.0	465.5	388.9	423.1	489.3
Mean	520.3	532.1	518.0	467.9	392.5	341.8	462.1

S.E. of marginal mean of N =23.8 lb./ac.
S.E. of marginal mean of R =41.2 lb./ac.
S.E. of body of table =58.3 lb./ac.

Crop :- Jowar. **Ref :- M.P. 50 (16),**

Site :- Institute of Plant Industry, Indore. **Type :- 'CM'.**

Objeet :—To find out the optimum seed rate for *Jowar* with and without manuring.

1, BASAL CONDITIONS :

(i) (a) No. (b) No. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 18.7.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) *Jowar* No 3. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 22.1.1951.

2. TREATMENTS :

1. 10 lb./ac. of seed rate (thinned)+0 lb./ac of N as A/S.
2. 10 lb./ac. of seed rate (thinned)+20 lb./ac. of N as A/S.
3. 10 lb./ac. of seed rate (Unthinned) +0 lb./ac as N A/S.
4. 10 lb./ac. of seed rate (Unthinned) +20 lb./ac. as N A/S.
5. 15 lb./ac. of seed rate (Unthinned) +0 lb./ac. as N A/S.
6. 15 lb./ac. of seed rate (Unthinned) +20 lb./ac. as N A/S.

3. DESIGN:

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6 (iv) (a) 14′×66′. (b) 9′4″×55′. (v) 2½′ on each side. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) Grain yield. (iv) (a), (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 793.0 lb./ac.
(ii) 56.35 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	792
2.	979
3.	789
4.	792
5.	723
6.	685
S E./mean	=23.00 lb./ac.

Crop :- Jowar. Ref :- M.P. 53(3).

Site :- Institute of Plant Industry, Indore. Type :- 'CM'.

Object :—To study the effect of N with pre-monsoon and monsoon sowings on *Jowar* yield.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) No. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) *Bakhared* once. (b) Drilled. (c) 10 lb./ac. (d) Rows 14" apart. (e) N. A. (v) No. (iv) *Jowar* no 3. (vii) Unirrigated. (viii) 2 hand weedings followed by intercultre with *daura*. (ix) N.A. (x) M_1 on 4.12.1953 and M_2 on 19.12.1953.

2. TREATMENTS :

Main-plot treatments.

2 sowings : M_1=Pre-monsoon and M_2=Monsoon sowing.

Sub-plot treatments.

4 levels of N as A/S : N_0=0, N_1=10, N_2=20 and N_3=30. lb./ac.

3. DESIGN :

(i) Split-plot (ii) (a) 2 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 50'×21'. (b) 45'×16'4". (v) 2½' on each side of the plot. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) N.A. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 853 lb./ac.

(ii) (a) 178.9 lb./ac.

(b) 165.0 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
M_1	783	898	813	972	866
M_2	798	752	921	888	840
Mean	790	825	867	930	853

S.E. of difference of two

1. M marginal means = 63.3 lb./ac.
2. N marginal means = 82.5 lb./ac.
3. N means at the same level of M =116.6 lb./ac.
4. M means at the same level of N =118.8 lb./ac.

Crop :- Jowar. Ref :- M.P. 52(7).

Site :- Institute of Plant Industry, Indore. Type :- 'CMV'.

Object :—To study the effect of graded doses of N on the yield of *Jowar* sown dry (pre-monsoon) and normal after rains.

1. BASAL CONDITIONS :

(i) (a) No. (b) Wheat. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) 1 thinning. (ix) 25 6". (x) 11, 29.11.1952 and 5.12.1952.

2. TREATMENTS:

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

(1) 5 levels of N as A/S : N_0=0, N_1=5, N_2=10, N_3=15 and N_4=20 lb./ac.

(2) 2 varieties : V_1=*Jowar* No. 3 and V_2=*Jowar* No. 9.

(3) 2 dates of sowing : D_1=pre-monsoon sowing on 10.6.1952 and D_2=monsoon sowing on 26.6.1952.

3. DESIGN :

(i) 5×2×2 Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 4. (iv) (a) 60'×11'-8". (b) 55'×7'. (v) 2½' on either side. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1955. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(I) 914 lb./ac.
(ii) 154.5 lb /ac.
(iii) Only V and D effects are highly significant.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean	D_1	D_2
V_1	939	929	1040	992	1051	990	1072	909
V_2	831	760	825	862	906	837	867	806
Mean	885	844	933	927	978	914	970	858
D_1	941	831	1032	981	1061			
D_2	828	858	833	872	895			

S.E. of marginal mean of N =38.6 lb./ac.
S.E. of marginal mean of V or D =24.4 lb./ac.
S.E. of body of N×V or N×D table =54.6 lb./ac.
S.E. of body of V×D table =34.6 lb./ac.

Crop :- Jowar. **Ref :- M.P. 48(27).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'D'.**

Object :— To study the efficiency of different treatments of seeds on the incidence of *Jowar* smut.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 21, 22.6.1948. (iv) (a) *Bakharing*. (b) Drilling. (c) N.A. (d) 18". (e) N.A. (v) N.A. (vi) and (vii) N.A. (viii) 1 interculture, 1 weeding and 1 gap-filling. (ix) N.A. (x) 7.12.1948.

2. TREATMENTS :

1. Control.
2. Seed treated with copper carbonate.
3. Seed treated with sulphur.
4. Seed soaked in water and dried in shade.
5. Seed soaked and dried in sun shine.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 16½'×66'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1944 to 1950. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) Grain was slightly damaged and blackened due to late rains. (vii) Crop failed during year, 1949.

5. RESULTS :

(i) 400.5 lb./ac.
(ii) 62.56 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	442.5
2.	422 5
3.	379.0
4.	369.9
5.	389.0
S.E./mean	=27.96 lb./ac.

Crop :- Jowar. Ref :- M.P. 50 (34).

Site :- Govt. Exptl. Farm, Powarkheda. Type :- 'D'.

Object :—To study the efficiency of different treatments of seed on the incidence of *Jowar* smut.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 13.7.1950. (iv) (a) *Bakharing*. (b) Drilling 18". (c) to (e) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) Intercultivation on 18, 26.8.1951. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control.
2. Seed treated with copper corbonate.
3. Seed treated with Sulphur.
4. Seed soaked in water and dried in shade.
5. Seed soaked in water and dried in sunshine.

3. DESIGN :

(i) R.B.D. (ii) (a) 5 (b) N.A. (iii) 5. (iv) (a), (b) $16\frac{1}{2}' \times 66'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1944 to 1950. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) N.A.

5. RESULTS :

(i) 216.3 lb./ac.
(ii) 87.36 lb./ac.
(iii) Treatments do not differ significantly
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	201.9
2.	222.5
3.	278.5
4.	177.0
5.	201.4
S.E./mean	=39.0 lb./ac.

Crop :- Bajra (*Kharif*). Ref :- :- M.P. 51(47).

Site :- Central Res. Farm, Gwalior. Type :- 'M'.

Object :—To study the effect of A/S and Super on the yield of *Bajra*.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Gram. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 3.8.1951. (iv) (a) *Sabul* ploughing. (b), (c) N.A. (d) 18". (e) N.A. (v) N.A. (vi) *Nabha*. (vii) Unirrigated. (viii) Interculture by May flower cultivator. (ix) 25.29". (x) 22, 23.10.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : $N_0=0$ and $N_1=20$ lb./ac.

(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=10$ and $P_2=20$ lb./ac.

3. DESIGN :

(i) 2×3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) $21' \times 96'$. (b) $12' \times 90'$. (v) 3 rows on both sides and 3' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—N.A. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1341 lb./ac.

(ii) 308.2 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	1291	1419	1326	1346
N_1	1399	1309	1303	1337
Mean	1345	1364	1315	1341

S.E. of N marginal mean = 72.6 lb./ac.
S.E. of P marginal mean = 89.0 lb./ac.
S.E. of body of table =125.8 lb./ac.

Crop :-Bajra. **Ref :- M.P. 52(59).**

Site :-Central Res. Farm, Gwalior. **Type :-'M'.**

Object :—To find out suitable dose of A/S and Super for *Bajra.*

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 28.7.1952. (iv) (a) to (c) N.A. (d) 18". (e) N.A. (v) N.A. (vi) Nabha. (vii) N.A. (viii) 1 weeding and 1 interculturing. (ix) 22.60". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 5 levels of N as A/S : N_0=0, N_1=10, N_2=20, N_3=30 and N_4=40 lb./ac.

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

N applied as top dressing on 30.8.1952 aud P_2O_5 drilled before sowing on 28.7.1952.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) 96'×180'. (iii) 4. (iv) (a) 96'×18'. (b) 90'×12'. (v) 2 rows on both sides and 3' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted with 6 replications, but 2 replications dropped as the yields were too poor.

5. RESULTS :

(i) 536.7 lb./ac.

(ii) 142.6 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	N_4	Mean
P_0	661.0	546.7	543.0	461.3	582.0	558.8
P_1	528.9	489.9	541.8	418.6	593.6	514.6
Mean	595.0	518.3	542.4	439.9	587.8	536.7

S.E. of marginal mean of N =50.4 lb./ac.
S.E. of marginal mean of P =31.9 lb./ac.
S.E. of body of table =71.3 lb./ac.

Crop :- Bajra (*Kharif*). Ref :- M.P. 53(75).

Site :- Central Res. Farm, Gwalior. Type :- 'M'.

Object :—To find out suitable manurial schedule for *Bajra*.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 21.7.1953. (iv) (a) N.A. (b) Drilled. (c) N.A. (d) 18". (e) N.A. (v) N.A. (vi) Baroda 5 (early). (vii) Unirrigated. (viii) N.A. (ix) 23.87". (x) 26.9.1953. (maturity date).

2. TREATMENTS :

Main-plot treatments :

5 levels of N as A/S : N_0=0. N_1=10, N_2=20, N_3=30 and N_4=40 lb./ac.

Sub-plot treatments :

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) 5 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1952 to 1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Raw data N.A.

5. RESULTS :

(i) 614 lb./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
P_0	582	674	705	612	705	656
P_1	380	404	596	437	467	467
P_2	674	721	871	576	809	730
Mean	545	600	724	558	660	614

S.E.'s N.A.

Crop :- Kodon (*Kharif*). Ref :- M.P. 52(72).

Site :- Govt. Seed and Demonstration Farm, Dindori. Type :- 'C'.

Object :—To find out the best rotation for *Kodon* crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

1. *Kodon* ; Wheat, Gram.
2. *Kodon* ; *Tur*.
3. *Kodon* ; *Lakh*.
4. *Kodon* ; Kodon.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 33'×16½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) to (vi) N.A. (vii) *Tur* crop failed completely. The site in heavy rains is susceptible to gally formation resulting in washing away of *Kharif* crops., which resulted in nearly failure of the crop. Gram and *Lakh* were badly affected by catter-pillar.

5. RESULTS :

(i) 22 lb./ac.
(ii) 11 31 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of *Kodon* in lb./ac.

Treatment	Av. yield
1.	26
2.	13
3.	27
4.	21
S.E./mean	=4.62 lb./ac.

Crop :- Kodon (*Kharif*). Ref :- M.P. 53(86).

Site :- Govt. Seed and Demonstration Farm, Dindori. Type :- 'C'.

Object :—To find out the best rotation for *Kodon* crop on heavy soil.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

1. *Kodon* ; Wheat and Gram.
2. *Kodon* ; *Tur.*
3. *Kodon* ; *Lakh.*
4. *Kodon* ; *Kodon.*

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 30'×16½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) to (c) N.A. (v) and (vi) N.A. (vii) Wheat, Gram and *Tur* crops failed completely. The experiment consists of both *kharif* and *rabi* crops. It goes very difficult in giving preliminary cultivation and sowing of *rabi* crops. The experiment is always failure.

5. RESULTS :

(i) 46 lb./ac.
(ii) 25.40 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of kodon in lb./ac.

Treatment	Av. yield
1.	75
2.	6
3.	99
4.	46
S.E./mean	=10.37 lb./ac.

Crop :- Kodon (*Kharif*). Ref :- M.P. 52(73).

Site :- Govt. Seed and Demonstration Farm, Dindori. Type :- 'C'.

Object :—To find out the best rotation for *Kodon* crop on light soil.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) and (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

1. *Kodon, til* and sann.
2. *Kodon* and *urid*.
3. *Kodon* and *Ramtil*.
4. *Kodon—kodon* (control).

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 33'×16½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) to (vi) N.A. (vii) Sann and *urid* crops failed. Remarks by the Supdt. of the Farm :—the experimental results are far below the average yield of crop sown and the only conclusion that can be drawn is that light soils of the tract should not be cultivated year after year and should be left for recouping after three years of cultivation. This is also the practice of the tract and is further confirmed by the completely failure of the experiment in last year which was the best year for kodon crop.

5. RESULTS :

(i) 21 lb./ac.
(ii) 22.49 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	24
2.	14
3.	35
4.	10
S.E./mean	= 9.18 lb./ac.

Crop :- Kodon (*Kharif*). Ref :- M.P. 53(87).

Site :- Govt. Seed and Demonstration Farm, Dindori. Type :- 'C'.

Object :—To find out the best rotation for *Kodon* crop on light soil.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) and (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

1. *Kodon, til* and sann.
2. *Kodon* and *urid*.
3. *Kodon* and *Ramtil*.
4. *Kodon* and *Kodon*.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 33'×16½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) to (vi) N.A. (vii) *Urid* and sann plants dried out. Best economical rotation seems to be *Kodon* after *Ramtil*, as it pays in both the crops.

5. RESULTS :

(i) 114 lb./ac.
(ii) 39.19 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	133
2.	144
3.	138
4.	41
S.E./mean	= 16.00 lb./ac.

Crop :- Kutki (*Kharif*). Ref :- M.P. 52(74).

Site :- Govt. Seed and Demonstration Farm, Dindori. Type :- 'C'.

Object :—To find out the best rotation for *Kutki* crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) and (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

1. *Kutki*, *Til* and sann.
2. *Kutki* and *Urid*.
3. *Kutki* and *Ramtil*.
4. *Kutki* and *Kutki*.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 33′×16½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) to (vi) N.A. (vii) Sann and *urid* crops failed. Only yield data of *Kutki* crop is taken for analysis, as other crops failed.

5. RESULTS :

(i) 78 lb./ac.
(ii) 14.97 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of *kutki* in lb./ac.

Treatment	Av. yield
1.	93
2.	74
3.	84
4.	62

S.E./mean = 6.11 lb./ac.

Crop :- Kutki (*Kharif*). Ref :- M.P. 53(88).

Site :- Govt. Seed and Demonstration Farm, Dindori. Type :- 'C'.

Object :—To find out best rotation for *Kutki* crop on light soil.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) and (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

1. *Kutki*, sann and *til*.
2. *Kutki*, and *urid*.
3. *Kutki* and *Ramtil*.
4. *Kutki* and *Kutki*.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 34′×16½′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) to (vi) N.A. (vii) Sann and *urid* crops failed. Remarks by the Farm Supdt :-the growth of *kukti* upto September was good. But due to cloudy weather, the attack by blister bettle was very severe and this affected the yield very badly. Lack of rains and moisture caused complete failure in pod formation of *urid* and sann plots.

5. RESULTS :

(i) 77 lb./ac.
(ii) 24.64 lb./ac.
(iii) Treatment differences are significant.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	118
2.	55
3.	78
4.	58
S.E./mean	= 15.06 lb./ac.

Crop :- Potato (*Rabi*). **Ref :- M.P. 48(43).**

Site :- Govt. Exptl. Farm, Chindwara. **Type :- 'M'.**

Object :—To find out optimum manurial dose for Potato under local conditions.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 2.12.1948. (iv) (a) Plots prepared on 22.11.1948. Ridges and furrows were prepared on 1.12.1948. (b) N.A. (c) 10 mds/ac. (d) N.A. (e) N.A. (v) F.Y.M. at 120 lb./ac. of N applied in furrows on 2.12.1948. (vi) Patna Red (medium). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:

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

(1) 3 levels of N as A/S : $N_0=0$, $N_1=100$ and $N_2=200$ lb./ac.
(2) 3 levels of P_2O_5 as triple Super : $P_0=0$, $P_1=250$ and $P_2=500$ lb./ac.
(3) 3 levels of K_2O as muriate of Potash : $K_0=0$, $K_1=125$ and $K_2=250$ lb./ac.

3. DESIGN:

(i) 3^3 Confd. (ii) (a) 3 blocks/replication, 9 plots/block (b) N.A. (iii) 1. (iv) (a) and (b) 18.15'×6'. (v) Nil. (vi) Yes.

4. GENERAL:

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

5. RESULTS :

(i) 14592 lb./ac.
(ii) 1204 lb./ac.
(iii) Main effects of N and P alone 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	11466	12400	13466	12444	12133	12000	13200
N_1	12800	16666	15600	15022	15333	14800	14933
N_2	13600	17733	17600	16311	16266	16400	16266
Mean	12622	15600	15555	14592	14577	14400	14800
K_0	11866	15466	16400				
K_1	13066	15200	14933				
K_2	12933	16133	15333				

S.E. of any marginal mean =401 lb./ac.

S.E. of body of table =695 lb./ac.

Crop :- Potato (*Rabi*). Ref :- M P. 49(56).

Site :- Govt. Exptl. Farm, Chindwara. Type :- 'M'.

Object :—To find out suitable combination of N and P_2O_5 for Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 20.11.1949. (iv) (a) to (e) N.A. (v) F.Y.M. at 120 lb./ac. of N applied in furrows on 21.11.1949. (vi) Patna Red (medium). (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(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 tripple Super : P_0=0, P_1 =250 and P_2=500 lb./ac.

3. DESIGN :

(i) 3×3 'Fact. in R.B.D. (ii) (a) 9. (b) 235.8'×4.5'. (iii) 3. (iv) (a) and (b) 24.2'×4.5'. (v) 2 feet margin between plots and blocks. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) No. (b) N.A. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 4129 lb./ac.

(ii) 1024 lb./ac.

(iii) Main effects of N and P and their interaction are highly significant.

(iv) Av. yield of potato in lb./ac.

	N_0	N_1	N_2	Mean
P_0	2165	3699	3465	3110
P_1	2733	4667	6133	4511
P_2	6133	2416	5748	4765
Mean	3677	3594	5115	4129

S.E. of any marginal mean =341 lb./ac.

S.E. of body of table =591 lb./ac.

Crop :- Potato (*Rabi*). Ref :- M. P. 51 (82).

Site :- Govt. Exptl. Farm, Chindwara. Type :-'M'.

Object :—To find out suitable manure for Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) N.A. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) Darjeeling Red. (vii) N.A. (viii) N.A. (ix) N.A. (x) 6 and 7.3.1952.

2. TREATMENTS :

1. A/S at 100 lb./ac. of N on 31.12.1951.
2. Compost at 30 lb./ac.+ Oil cake at 20 md./ac.+mixture of A/S at 10 lb./plot and Ammo. Phos. at 10 lb./plot and saw dust at 40 lb./plot.
3. Half the dose in treatment 2.
4. Double the dose in treatment 2.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination was poor. Growth was good. (ii) N.A. (iii) Potato yield. (iv) (a) 1951 to N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 4048 lb./ac.

(ii) 1034 lb./ac.

(iii) Treatment differences are not significant.

(iv) Av. yield of potato in lb./ac.

Treatment	Av. yield
1.	3703
2.	3604
3.	3670
4.	5217

S.E./mean =462 lb./ac.

Crop :- Potato (*Rabi*). **Ref :- M. P. 48(44).**

Site :- Govt. Exptl. Farm, Chindwara. **Type :- 'M'.**

Object :—To find out the effect of compost when applied at different times singly and in combination with G.N.C. and A/S.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 15.10.1948. (iv) (a) to (e) N.A. (v) N.A. (vi) Patna Red (medium). (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. No manure.
2. T. C. at 30 C.L./ac. applied before monsoon.
3. T. C. at 30 C.L./ac. applied in furrows at sowing.
4. T. C. at 30 C.L./ac. applied half before monsoon and the remaining half at transplanting.
5. T. C. at 15 C.L./ac. before monsoon+5 md./ac. of G.N.C. at planting.
6. T. C. at 15 C.L./ac. before monsoon+120 lb./ac. of A/S at planting.
7. T. C. at 15 C.L./ac. before monsoon+10 md./ac. of G.N.C at planting.
8. T. C. at 15 C.L./ac. before monsoon+240 lb./ac. of A/S at planting in furrows.
9. T. C. at 30 C.L./ac. togather with 5 md. of cake at planting in furrows.
10. T. C. at 30 C.L./ac. togather with 10 md./ac. at planting in furrows.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) 187′×33′. (iii) 6. (iv) (a) and (b) 16½′×33′. (v) 3′ margin between plots was left. (vi) N.A.

4. GENERAL :

(i) Germination satisfactory in all plots. In general good growth. (ii) N.A. (iii) Potato yield. (iv) (a) to (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 10659 lb./ac.

(ii) 984.1 lb./ac.

(iii) Treatment differences are highly significant.

(iv) Av. yield of potato in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	8763	6.	11821
2.	10189	7.	10971
3.	9819	8.	12987
4.	9174	9.	10779
5.	10409	10.	11684

S.E./mean =401.8 lb./ac.

Crop :-Potato (*Rabi*). Ref :-M.P. 51(81).

Site :-Govt. Exptl. Farm, Chindwara. Type:- 'M'.

Object :—To find out suitable doses of T.C. so as to get maximum yield of Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

1. Control (unmanured).
2. Manuring with T.C. at 30 C.L./ac. before monsoon.
3. Manuring with T.C. at 30 C.L./ac. at planting in furrows.
4. T.C. at 30 C.L./ac. half before monsoon and remaining half at planting.
5. T.C. at 15 C.L./ac. before monsoon and 5 md./ac. of cake at planting.
6. T.C. at 15 C.L./ac. before monsoon and 15 C.L. at planting in furrows and 120 lb of A/S at planting.
7. T.C. as in treatment 6 and 10 md./ac. of cake in furrows at planting.
8. T.C. at 30 C.L./ac. as in treatment 6 and 240 lb. of A/S at planting in furrows.
9. T.C. at 30 C.L./ac. togather with 5 md./ac. of cake at planting.
10. T.C. at 30 C.L./ac. togather with 10 md./ac. of cake at planting in furrows.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Potato yield. (iv) (a) No. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 5915 lb./ac.
(ii) 1328 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of potato in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	6035	6.	6144
2.	5801	7.	5952
3.	5788	8.	7406
4.	5541	9.	5513
5.	5404	10.	5568

S.E./mean ±542 lb./ac.

Crop :-Potato (*Kharif*). Ref :-M.P. 48(45).

Site :- Govt. Exptl. Farm., Chindwara. Type :- 'M'.

Object :—To find out the suitable manurial dose for Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 22.6.1948. (iv) (a) Ridges and furrows prepared on 21.6.1948. (b) N.A. (c) 10 md./ac. (d) Between plants 8" to 9" and between rows 12". (e) N.A. (v) F.Y.M. at 120 lb./ac. of N as applied on 22.6.1948 before planting. (vi) Nainital. (vii) N.A. (viii) I weeding. (ix) and (x) N.A.

2. TREATMENTS :

1. Control.
2. A/S at 100 lb./ac. of N in two equal doses, first dose one month after planting and second 3 weeks after first dose.
3. 100 lb./ac. of N as Ammo. Phos. in two equal doses as in treatment 2.
4. 100 lb./ac. of N as G.N.C in two equal doses as in treatment 2.
   First dose on 2.8.1948 and second dose on 18.8.1948.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 24.2'×4.5'. (v) 2' spacing between plots. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Potato yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 18917 lb./ac.
(ii) 2924 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of potato in lb./ac.

Treatment	Av. yield
1.	14401
2.	18868
3.	24932
4.	17468
S.E./mean	±1194 lb./ac.

Crop:- Potato (*Rabi*). Ref :- M. P. 49 (58).

Site :- Govt. Exptl. Farm, Chindwara. Type :- 'M'.

Object :—To find out suitable manure for Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 16.11.1949. (iv) (a) and (b) N.A. (c) ¾ seer/plot. (d) and (e) N.A. (v) F.Y. M at 22½ lb./plot applied in furrows. (vi) Farukhabad. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control.
2. A/S at 100 lb./ac. of N.
3. Ammo. Phos. at 100 lb./ac. of N.
4. G.N.C. at 100 lb./ac. of N.

Applied in two equal doses first dose one month after planting and second 3 weeks after first dose.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 18'×5½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory. (ii) N.A. (iii) Potato yield. (iv) (a) 1948 to N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 7680 lb./ac.
(ii) 4232 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of potato in lb./ac.

Treatment	Av. yield
1.	5211
2.	7336
3.	10902
4.	7268
S.E./mean	±1728 lb./ac.

Crop :- Potato. Ref :- M.P. 50(60).

Site :- Govt. Exptl. Farm, Chindwara. Type :- 'M'.

Object :—To find out suitable manure for Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a), (b) N.A. (iii) 30.10.1950. (iv) (a) to (e) N.A. (v) F.Y.M. added in furrows at 120 lb./ac. of N. (vi) Patna Red. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 28.3.1951.

2. TREATMENTS .

1. Control.
2. A/S at 100 lb./ac. of N.
3. Ammo. Phos. at 100 lb./ac. of N.
4. G.N.C. at 100 lb./ac. of N.

Applied in two equal doses.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 18.15'×6'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory. (ii) N.A. (iii) Potato yield. (iv) (a) to (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 23295 lb./ac.
(ii) 2584 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of potato in lb./ac

Treatment	Av. yield.
1.	21719
2.	22678
3.	25488
4.	23295

S.E./mean =1055 lb./ac.

Crop :- Potato (*Rabi*). Ref :- M.P. 49(55).

Site :- Govt. Exptl. Farm, Chindwara. Type :- 'M'.

Object :—To find out suitable manure for Potato.

1. BASAL CONDITIONS :

(i) to (a) (c) N.A. (ii) (a) and (b) N.A. (iii) 16.11.1949. (iv) (a) to (e) N.A. (v) F.Y.M. at 22½ lb./plot applied in furrows. (vi) Patna Red (medium). (vii) to (x) N.A.

2. TREATMENTS :

1. No manure.
2. Sannhemp ploughed in soil on 21.8.1949 at 30 lb./plot.
3. A/S at 100 lb./ac. of N.
4. Ammo. Phos. at 100 lb./ac. of N.
5. G.N.C. at 100 lb./ac. of N.

Applied in 2 equal doses 1st dose one month after planting and 2nd dose 3 weeks after 1st dose.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 112'×5' 7⅛". (iii) 6. (iv) (a) and (b) 18'×5' 7½". (v) Spacing between plots 2'. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Potato yield. (iv) (a) 1949—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2041 lb./ac.
(ii) 396.8 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of potato in lb./ac.

Treatment	Av. yield
1.	1429
2.	1315
3.	2437
4.	3144
5.	1880
S.E./mean	=162.0 lb /ac.

Crop :- Potato (*Rabi*). Ref :- M.P. 50(62).

Site :- Govt. Exptl. Farm, Chindwara. Type :- 'M'.

Object :—To find out a suitable manure for Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 30.10.1950. (iv) (a) to (e) N.A. (v) F.Y.M. at 120 lb./ac. of N applied as basal manure. (vi) Farukhabad. (vii) Irrigated. (viii) and (ix) N.A. (x) 17.3.1951.

2. TREATMENTS :

1. Control.
2. A/S at 100 lb./ac. of N.
3. Ammo. Phos. at 100 lb./ac. of N.
4. G.N.C. at 100 lb./ac. of N.

Applied in two equal doses 1st dose at planting and 2nd dose 3 weeks after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 1/400 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory in all plots. (ii) N.A. (iii) Potato yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 26337 lb./ac.
(ii) 2412 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of potato in lb./ac.

Treatment	Av. yield
1.	24409
2.	25232
3.	30066
4.	25643
S.E./mean	=985 lb./ac.

Crop :- Potato. Ref :- M.P. 49(17).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the effect of different doses of N, P, and K applied singly and in combination on the yield of Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) *Bakharing*. (b) to (e) N.A. (v) 3 blocks received farm compost and for the remaining 3 blocks night soil was given. (vi) *Tabar*. (vii) N.A. (viii) Weeding. (ix) N.A. (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=40 lb./ac.

(3) 2 levels of K_2O as Pot. Sul. : K_0=0 and K_1=80 lb./ac.

3. DESIGN:

(i) 2^3 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 6′×50′. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Germination slightly defective ; growth good. (ii) Crop damaged considerably due to frost in February. (iii) Potato yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 7454 lb./ac.

(ii) 1363 lb./ac.

(iii) Main effect of N alone is significant.

(iv) Av. yield of potato in lb./ac.

	N_0	N_1	Mean	K_0	K_1
P_0	6877	7689	7283	7854	6712
P_1	7016	8237	7626	7659	7594
Mean	6946	7963	7454	7756	7153
K_0	7110	8403			
K_1	6782	7523			

S.E. of any marginal mean =278 lb./ac.

S.E. of body of any table =393 lb./ac.

Crop :- Potato (*Rabi*). **Ref :- M.P. 51(9).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To find out optimum manurial dose for Potato under local conditions.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow with Sann G.M. for first block. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 4.12.1951. (iv) (a) to (c) N.A. (d) 18″. (e) N.A. (v) *Sann* in one replication as G.M., farm compost in second replication and night soil in the remaining two replications. (vi) N.A. (vii) N.A. (viii) Weeding. (ix) N.A. (x) 24.3.1952.

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=40 lb./ac.

(3) 2 levels of K_2O as Mono. Potash : K_0=0 and K_1=80 lb./ac.

Manures applied on 3.12.1951.

3. DESIGN :

(i) 2^3 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 40′×7′6″. (b) 40′×4′6″. (v) One row on both sides. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Number of potatos and weight of potatos. (iv) (a) 1947—N.A. (b) N.A. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 12577 lb./ac.
(ii) 1449 lb./ac.
(iii) Main effect of P alone is significant.
(iv) Av. yield of potato in lb./ac.

	N_0	N_1	Mean	K_0	K_1
P_0	11440	12463	11951	11880	12022
P_1	13003	13402	13203	12637	13774
Mean	12222	12932	12577	12256	12898
K_0	11988	12523			
K_1	12455	13342			

S.E. of any marginal mean =362 lb./ac.
S.E. of body of any table =512 lb./ac.

Crop :- Potato (*Kharif*). Ref :- M.P. 48(42).
Site :- Govt. Exptl. Farm, Chindwara. Type :- 'C'.

Object :- To find out optimum spacing for Potato planting.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) N.A. (b) N.A. (iii) 26.6.1948. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) F.Y.M. at 120 lb./ac. of N applied at planting in furrows. A/S applied as top dressing at 1¼ lb. per plot on 18.8.1948. (vi) N.A. (vii) N.A. (viii) One earthing. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 spacings between tubers : S_1=6″, S_2=9″ and S_3=12″.
(2) 4 spacings between rows : R_1=12″, R_2=18″, R_3=24″ and R_4=30″.

3. DESIGN :

(i) 3×4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) 24.2′×4.5′. (v) Nil. (vi) yes.

4. GENERAL :

(i) Tubers germinated on 13.7.1948, growth ordinary. (ii) N.A. (iii) No. of plants as on 18.8.1948 and potato yield. (iv) (a) to (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 4167 lb./ac.
(ii) 2279 lb./ac.
(iii) Main effect of R and interaction R×S are highly significant. Main effect of S is not significant.
(iv) Av. yield of patato in lb./ac.

	S_1	S_2	S_3	Mean
R_1	18401	17134	18401	17979
R_2	15267	14867	14934	15023
R_3	13801	12067	10867	12245
R_4	12401	11201	10667	11423
Mean	14967	13825	13717	14167

S.E. of marginal mean of S =465 lb./ac.
S.E. of marginal mean of R =537 lb./ac.
S.E. of body of table =930 lb./ac.

Crop :- Potato (*Rabi*). Ref :- M.P. 49(57).

Site :- Govt. Exptl. Farm, Chindwara. Type :- 'C'.

Object :—To find out proper spacing for Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) N.A. (b) N.A. (iii) 18.11.1949. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) F.Y.M. at 120 lb./ac. of N given in furrows on 18.11. 1949. (vi) to (x) N.A.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 3 spacings between tubers : S_1=6", S_2=9" and S_3=12".

(2) 4 spacings between lines : R_1=12", R_2=18", R_3=24" and R_4=30".

3. DESIGN :

(i) 3×4 Fact. in R.B.D. (ii) (a) 12. (b) 98'×18'. (iii) 6. (iv) (a), (b) 18.15'×6'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Potato yield. (iv) (a) to (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 5149 lb./ac.

(ii) 1002 lb./ac.

(iii) Main effect of R is highly significant.

(iv) Av. yield of potato in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_1	6066	6182	5149	4800	5549
S_2	5600	5300	4800	4334	5009
S_3	5392	5600	4634	3934	4890
Mean	5686	5694	4861	4356	5149

S.E. of marginal mean of S =204 lb./ac.

S.E. of marginal mean of R =236 lb./ac.

S.E of body of table =409 lb./ac.

Crop :- Potato (*Rabi*). Ref :- M.P. 50(61).

Site :- Govt. Exptl. Farm, Chindwara. Type :-'C'.

Object :—To find out suitable spacing between lines and tubers for Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 29.10.1950. (iv) (a) to (c) N.A. (d) As per treatments. (e) One tuber/hole. (v) N.A. (vi) Patna Red. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 24.3.1951 to 27.3.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 spacings between tubers : S_1=6", S_2=9" and S_3=12".

(2) 4 spacings between rows : R_1=12", R_2=18", R_3=24" and R_4=30".

3. DESIGN :

(i) 3×4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) 1/400 ac. (v) No. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Potato yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 19604 lb./ac.

(ii) 3708 lb./ac.

(iii) Main effect of R alone is highly significant.

(iv) Av. yield of potato in lb./ac.

	S_1	S_2	S_3	Mean
R_1	19815	21872	19130	20272
R_2	24272	21461	21129	22421
R_3	21941	18718	20707	20455
R_4	15427	14536	15839	15267
Mean	20364	19147	19301	19604

S. E. of marginal mean of S = 757 lb./ac.
S. E. of marginal mean of R = 874 lb./ac.
S. E. of body of table = 1514 lb./ac.

Crop :- Potato (*Rabi*). Ref :- M.P. 49(53).

Site :- Govt. Exptl. Farm, Chindwara. Type :- 'C'.

Object :—To find out optimum size of tubers for planting so as to get maximum yield.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 27.11.1949. (iv) (a) to (e) N.A. (v) F.Y.M. at 120 lb./ac. applied in furrows before planting. Top dressing with A/S at 100 lb./ac. of N. (vi) Patna Red. (vii) to (x) N.A.

2. TREATMENTS :

5 sizes of whole tubers for planting :-
$S_1=\frac{1}{2}''$, $S_2=\frac{3}{4}''$, $S_3=1''$, $S_4=1\frac{1}{4}''$ and $S_5=1\frac{1}{2}''$.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 18.15'×6'. (v) 2' margin between plots and blocks. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory but poor growth of plants under treatment 3. (ii) N.A. (iii) Potato yield. (iv) (a) No. (b) N.A. (c) Nil. (v) (a) Nil. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2545 lb./ac.

(ii) 1023 lb./ac.

(iii) Treatment differences are highly significant.

(iv) Av. yield of potato in lb./ac.

Treatment	Av. yield
S_1	2261
S_2	2228
S_3	547
S_4	4026
S_5	3664
S.E. /mean.	=417 lb./ac.

Crop :- Potato (*Rabi*). Ref :- M.P. 49(51).

Site :- Govt. Exptl. Farm, Chindwara. Type :- 'C'.

Object :—To find the optimum size of cut tubers for planting Potato so as to get maximum yield.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 28.11.1949. (iv) (a) to (e) N.A. (v) F.Y.M. at 120 lb./ac. of N applied in furrows before planting. Top dressing with A/S at 100 lb./ac. of N. (vi) Patna red. (vii) to (x) N.A.

2. TREATMENTS :

5 sizes of cut tubers for planting : $S_1=\frac{1}{2}''$, $S_2=\frac{3}{4}''$, $S_3=1''$, $S_4=1\frac{1}{4}''$, and $S_5=1\frac{1}{2}''$.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 181.5'×6'. (v) 2' margin between plants and between blocks. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory in plots under treatments 4 and 5 and extremely poor in plots under treatment 3. (ii) N.A. (iii) Weight of tubers. (iv) (a) and (b) N.A. (c) Nil. (v) (a) Nil. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 9913 lb./ac.
(ii) 2030 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of potato in lb./ac.

Treatment	Av. yield
S_1	9873
S_2	8312
S_3	6223
S_4	12940
S_5	12218

S.E./mean = 829l b./ac.

Crop :- Tur. Ref :- M.P. 48(7).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the effect of N applied singly and in combination with P_2O_5 on the yield of *Tur*.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (d) 14". (e) N.A. (v) to (vii) N.A. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 levels of N as G.N.C. : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
(2) 3 levels of P_2O_5 as B.M. : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 15'×35'. (b) 10'×30'4". (v) Two rows on both sides and 2½' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain and fodder yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) The experiment is laid out in 6 replications. But the crop failed in two replications.

5. RESULTS :

(i) 391 lb./ac.
(ii) 88.27 lb./ac.
(iii) Main effect of N alone is significant.

(iv) Av. yield of *tur* in lb./ac.

	N_0	N_1	N_2	Mean
P_0	326	422	449	399
P_1	332	363	422	374
P_2	339	445	413	399
Mean	332	412	428	391

S.E. of any marginal mean =25.50 lb./ac.
S.E. of body of table =44.13 lb./ac.

Crop :- Tur (*Kharif*). Ref :- M.P. 49(13).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the effect of N and P applied singly and in combination on the yield of *Tur*.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.7.1949. (iv) (a) *Bakharing*. (b) and (c) N.A. (d) 14". (e) N.A. (v) N.A. (vi) *Tur* type 5. (vii) N.A. (viii) Weeding. (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=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. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 14'×35'. (b) 10'×30'4". (v) 1'×1 (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 871 lb./ac.
(ii) 148.7 lb./ac.
(iii) Main effect of P alone is significant.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	761	854	863	826
P_1	893	957	980	943
P_2	782	853	897	844
Mean	812	888	913	871

S.E. of any marginal mean =35.0 lb./ac.
S.E. of body of table =60.7 lb./ac.

Crop :- Tur. Ref :- M.P. 51(20).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find out the effect of application of N, P and compost on the yield of *Tur*.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 1.6.1951. (iv) *Bakharing*. (b) and (c) N.A. (d) 14". (e) N.A. (v) N.A. (vi) Type 5. (vii) N.A. (viii) Weeding and thinning. (ix) and (x) N.A.

2. TREATMENTS :

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

(1) 2 levels of farm compost : F_0=no compost and F_1=compost (dose N.A.)
(2) 2 levels of N as A/S : N_0=0 and N_1=20 lb./ac.
(3) 2 levels of P_2O_5 as Super : P_0=0 and P_1=20 lb./ac.

3. DESIGN :

(i) 2^3 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 28'×14'. (b) 23'4"×10'. (v) 1'2"×1'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 102.7 lb./ac.
(ii) 77.8 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	F_0	F_1	Mean	P_0	P_1
N_0	110.8	116.6	113.7	130.2	97.2
N_1	104.0	79.7	91.8	104.0	79.7
Mean	107.4	98.1	102.7	117.1	88.4
P_0	117.6	116.6			
P_1	97.2	79.7			

S.E. of any marginal mean =15.3 lb./ac.

S.E. of body of any table =22.5 lb./ac.

Crop :- Moong. Ref M.P. :- 53(100).

Site :- Institute of Plant Industry, Indore. Type :- 'C'.

Object :—To find out the residual effect of trace elements on growth and yield of *Moong*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

Trace element :	Quantity applied in 1947 in lb./ac.	Quantity applied in 1948 in lb./ac.	Quantity applied in 1949 in lb./ac.
1. Control (no element)	—	—	—
2. Molybdenum	14	7	7

3. Boron	20	10	10
4. Copper	24	12	12
5. Magnesium	40	20	20
6. Iron	30	15	15
7. Manganese	20	10	10
8. Zinc	20	10	10
9. Chromium	2	2	2

Method of application :—The salts after powdering and mixing with earth, were spread uniformly in the respective plots and thoroughly mixed with the soil by means of hand *daura*.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 7½'×33'. (b) 6'×30'. (v) N.A. (vi) N.A.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) N.A. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 173 lb./ac.
(ii) 31.53 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	157	6.	167
2.	158	7.	180
3.	188	8.	180
4.	171	9.	177
5.	182		
	S.E./mean	=12.37 lb./ac.	

Crop :- Masoor. Ref :- M.P. 50(24).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the effect of different doses of N given in the form of Ammo. Phos and A/S on *masoor* crop in Haveli tract.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar*. (b) Refer soil analysis, Jabalpore. (iii) 4.10.1950. (iv) (a) *Bakharing*. (b) to (e) N.A. (v) N.A. (vi) *Masoor*. (vii) N.A. (viii) Weeding on 22.11.1950. (ix) N.A. (x) 28.2.1951.

2. TREATMENTS :

All combinations (1) and (2) +a control.
(1) 2 sources of N : N_1=Ammo. Phos. and N_2=A/S.
(2) 4 levels of N : L_1=5, L_2=10, L_3=15 and L_4=20 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 33'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1943.—N.A. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1211 lb./ac.
(ii) 142.4 lb./ac.
(iii) L and 'control *vs.* others' effects are highly significant.

(iv) Av. yield of grain in lb./ac.

Control=1000 lb./ac.

	L_1	L_2	L_3	L_4	Mean
N_1	1160	1163	1256	1373	1238
N_2	1130	1236	1230	1353	1237
Mean	1145	1199	1243	1363	1238

S.E. of marginal mean of N =29.1 lb./ac.
S.E. of marginal mean of L =41.1 lb./ac.
S.E. of body of table =58.4 lb./ac.

Crop :- Masoor. **Ref :- M.P. 51(30).**

Site :- Adhartal Farm, Jabalpore. **Type :- 'M'.**

Object :—To find the economic manuring dose of N in the form of A/S and Ammo. Phos. for *Masoor*.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar* (heavy clay). (b) Refer soil analysis, Jabalpore. (iii) 18.10.1951. (iv) (a) *Bakharing*. (b) N.A. (c) 40 lb./ac. (d) and (e) N.A. (A) N.A. (vi) A.U. 90. (vii) N.A. (viii) 1 weeding. (ix) N.A. (x) 8.3.1952.

2. TREATMENTS :

All combinations of (1) and (2)+a control
(1) 2 sources of N : N_1=Ammo. Phos. and N_2=A/S.
(2) 4 levels of N : L_1=5, L_2=10, L_3=15 and L_4=20 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 33′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. Crop suffered for want of moisture. Scanty winter rains. (ii) Nil. (iii) Grain and fodder yield. (iv) 1948—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Season was most unfavourable for the crop. (vii) Nil.

5. RESULTS :

(i) 333.2 lb./ac.
(ii) 44.80 lb./ac.
(iii) "Control *vs.* others" effect alone is highly significant.
(iv) Av. yield of grain in lb./ac.

Control =274.9 lb./ac.

	L_1	L_2	L_3	L_4	Mean
N_1	340.7	349.8	353.2	361.0	351.2
N_2	328.1	322.2	329.7	338.4	329.6
Mean	334.4	336.0	341.4	349.7	340.4

S.E. of marginal mean of N = 9.12 lb./ac.
S.E. of marginal mean of L =12.88 lb./ac.
S.E. of body of table =18.3 lb./ac.

Crop :- Masoor. Ref :- M.P. 52(19).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To study the comparative effect of different doses of A/S and Ammo. Phos. on *Masoor*.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar*. (b) Refer soil analysis, Jabalpore. (iii) 16.10.1952. (iv) (a) and (b) N.A. (c) 40 lb./ac. (d) and (e) N.A. (v) N.A. (vi) *Masoor*. (vii) to (ix) N.A. (x) 23.2.1953.

2. TREATMENTS :

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

(1) 2 sources of N : N_1=Ammo. Phos. and N_2=A/S.

(2) 4 levels of N : L_1=5, L_2=10, L_3=15 and L_4=20 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 33'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1948—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 478.6 lb./ac.

(ii) 54.24 lb./ac.

(iii) "Control *vs.* others" effect alone is highly significant.

(iv) Av. yield of grain in lb./ac.

Control =371.5 lb./ac.

	L_1	L_2	L_3	L_4	Mean
N_1	493.3	483.2	508.1	528.1	503.2
N_2	464.0	465.8	484.9	508.3	480.7
Mean	478.7	474.5	496.5	518.2	491.9

S.E. of marginal mean of N =11.08 lb./ac.

S.E. of marginal mean of L =15.60 lb./ac.

S.E. of body of table =22.16 lb./ac.

Crop :- Gram (*Rabi*). Ref :- M.P. 48(15)

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find out suitable manurial dose for Gram.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) *Bakharing*. (b) N.A. (c) 40 lb./ac. (d) 14". (e) N.A. (v) N.A. (vi) Gram-707. (vii) N.A. (viii) Weeding and hoeing. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as G.N.C. : 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. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 10'×30'-4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain and fodder yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 713.3 lb./ac.
(ii) 77.3 lb./ac.
(iii) P effect alone differs significantly.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	724.1	616.4	679.2	673.2
P_1	721.1	709.1	722.6	717.6
P_2	792.9	721.1	733.0	749.0
Mean	746.0	682.2	711.6	713.3

S.E. of any marginal mean = 18.1 lb./ac.
S.E. of body of table = 31.5 lb./ac.

Crop :- Gram (*Rabi*). Ref :- M.P. 48(18).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find out the suitable combination of N and P for Gram.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sann. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) *Bakharing*. (b) and (c) N.A. (d) 14". (e) N.A. (v) Sann as G.M. (vi) Gram-707. (vii) N.A. (viii) *Dora* and weeding. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 levels of N as G.N.C. : 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. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 14'×35'. (b) 10'×30'-4". (v) Two rows on both sides and 2' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain and fodder yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 460 6 lb./ac.
(ii) 85.9 lb./ac.
(iii) N effect is significant, P effect is highly significant, interaction N×P is not significant.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	391.9	445.8	372.5	403.4
P_1	432.3	423.3	556.5	470.7
P_2	514.6	496.6	511.6	507.6
Mean	446.3	455.2	480.2	460.6

S.E. of any marginal mean = 20.2 lb./ac.
S.E. of body of table = 35.1 lb./ac.

Crop :-Gram. Ref :- M.P. 49(19).

Site :-Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the response to graded doses of N applied singly and in combination with different doses of P_2O_5.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.11.1949. (iv) (a) to (c) N.A. (d) 14". (e) N.A. (v) N.A. (vi) Gram 707. (vii) N.A. (viii) Weeding. (ix) N.A. (x) N.A.

2. 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.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 10'×23'-4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 575.3 lb./ac.

(ii) 100.4 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	547.1	558.7	613.0	572.9
P_1	597.5	566.5	583.9	582.6
P_2	576.2	547.1	587.8	570.4
Mean	573.6	557.4	594.9	

S.E. of marginal mean of N or P =23.69 lb./ac.
S.E. of body of table =40.96 lb./ac.

Crop :-Gram. Ref :- M.P. 48(24).

Site :-Institute of Plant Industry, Indore. Type :- 'M'.

Object: —To study the response of Gram to the application of N and P_2O_5 singly and in combination.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 30.11.1949. (iv) (a) to (c) N.A. (d) 14". (e)N.A. (v) N.A. (vi) Gram 707. (vii) N.A. (viii) Weeding. (ix) N.A. (x) N.A.

2. 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.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 35'×14'. (b) 30'-4"×10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 543.0 lb./ac.
(ii) 130.6 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	493.5	5.0.0	556.5	540.0
P_1	541.5	594.0	529.5	555.0
P_2	508.5	573.0	520.5	534.0
Mean	514.5	579.0	535.5	543.0

S.E. of marginal mean of N or P =30.8 lb./ac.
S.E. of body of table =53.4 lb./ac.

Crop :-Gram. Ref :- M.P. 50(2).

Site :-Institute of Plant Industry, Indore. Type :- 'M'.

Object : - To study the response to N and P_2O_5 applied singly and in combination of the yield of Gram.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 14.10.1950. (iv) (a) to (e) N.A. (v) N.A. (vi) Gram. 707 (medium). (vii) Unirrigated. (viii) and (ix) N.A. (x) 10.3.1951.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 2 levels of N as A/S : N_0=0 and N_1=20 lb./ac.
(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=20 lb./ac.

3. DESIGN :

(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 35'8"×15'. (b) 30'8"×10'. (v) 2½' on either side. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 641.8 lb./ac.
(ii) 101.3 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	Mean
P_0	630.0	578.2	604.1
P_1	611.1	698.1	679.6
Mean	645.5	638.1	641.8

S.E. of marginal mean of N or P =29.9 lb./ac.
S.E. of body of table =41.4 lb./ac.

Crop :- Gram. Ref :- M.P. 50(6).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :- To study the response to N and P_2O_5 applied singly and in combination of the yield of Gram.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) Gram. 707. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : N_0=0 and N_1=20 lb./ac.

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

3. DESIGN :

(i) 2×2 Fact. in R B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 35'8" × 15'. (b) 30'8" × 10'. (v) 2½' on each side. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) The same experiment repeated at the same centre. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 465.9 lb./ac.

(ii) 94.81 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	Mean
P_0	431.8	489.5	460.7
P_1	483.6	458.5	471.1
Mean	457.7	474.0	465.9

S.E. of any marginal mean =27.2 lb./ac.

S.E. of body of table =38.7 lb./ac.

Crop :- Gram. Ref :- M.P. 50(25).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To see the effect of manuring Gram with Super at different levels and its residual effect on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar*. (b) Refer soil analysis, Jabalpore. (iii) 7.10.1950. (iv) (a) and (b) N.A. (c) 60 lb./ac. (d) and (e) N.A. (v) N.A. (vi) to (ix) N.A. (x) 12.3.1951.

2. TREATMENTS :

5 levels of P_2O_5 as Super : P_0=0, P_1=15, P_2=20, P_3=25 and P_4=30 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 66'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination and growth in the initial stage was satisfactory. The growth of the crop suffered due to frost which occurred on 25 and 26.1.1950. The damage was uniform in all the plots. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950—1955. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 626.4 lb./ac.

(ii) 54.08 lb./ac.

(iii) Treatments differ highly significantly.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
P_0	533.0
P_1	597.4
P_2	619.3
P_3	665.9
P_4	716.4

S.E./mean = 27.04 lb./ac.

Crop :- Gram. **Ref : M.P. 51(28).**

Site :- Adhartal Farm, Jabalpore. **Type :- 'M'.**

Object :—To see the effect of manuring Gram with super.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar.* (b) Refer soil analysis, Jabalpore. (iii) 22.10.1951. (iv) (a) *Bakharing.* (b) N.A. (c) 60 lb./ac. (d) and (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 29.3.1952.

2. TREATMENTS :

5 levels of P_2O_5 as Super : P_0=0, P_1=15, P_2=20, P_3=25 and P_4=30 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) In the beginning the growth was satisfactory and later it suffered for want of moisture in the soil. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950 to 1955. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Season was not favourable for the crop. (vii) Nil.

5. RESULTS :

(i) 487.5 lb./ac.

(ii) 125.6 lb /ac.

(iii) Treatments do not differ significantly.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
P_0	419.0
P_1	454.0
P_2	505.9
P_3	528.9
P_4	529.6

S.E /mean = 62.8 lb./ac.

Crop :- Gram. **Ref :- M.P. 52(20).**

Site :- Adhartal Farm, Jabalpore. **Type :- 'M'.**

Object :—To see the effect of different doses of Super on Gram and its residual effect on wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar.* (b) Refer soil analysis, Jabalpore. (iii) 15.10.1952. (iv) (a), (b) N.A. (c) 60 lb./ac. (d) and (e) N.A. (v) N.A. (vi) Adt. V. (vii) to (ix) N.A. (x) 10.3.1953.

2. TREATMENTS :

5 levels of P_2O_5 as Super : P_0=0, P_1=15, P_2=20, P_3=25 and P_4=30 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5 (b) N.A. (iii) 4. (iv) (a) and (b) 66′×16½′. (v) 2 feet space was left between two plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1955. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 388.3 lb./ac.
(ii) 36.00 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
P_0	305.0
P_1	366.8
P_2	388.1
P_3	400.6
P_4	481.2
S.E./mean	=18.00 lb./ac.

Crop :- Gram. Ref :- M.P. 53(38).

Site :- Adhartal Farm, Jabalpore. Type :- 'M'.

Object :—To see the effect of different doses of super on Gram and its residual effect on wheat.

1. BASAL CONDITIONS :

(i) (a) Gram-wheat-gram. (b) Wheat. (c) Nil. (ii) (a) *Kabar* 2. (b) Refer soil analysis, Jabalpore. (iii) 28.10.1953. (iv) (a) *Bakharing*. (b) N.A. (c) 60 lb./ac. (d) and (e) N.A. (v) N.A. (vi) Adt V. (vii) Unirrigated (viii) N.A. (ix) 0.98″. (x) N.A.

2. TREATMENTS :

5 levels of P_2O_5 as Super : P_0=0, P_1=15, P_2=20, P_3=25 and P_4=30 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. Growth in manured plots was better than in unmanured. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1955. (b) Alternate years. (c) N.A. (v) (a) Powarkheda. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 218.8 lb./ac.
(ii) 122.4 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
P_0	218.1
P_1	213.3
P_2	259.3
P_3	253.8
P_4	149.9
S.E./mean	=61.2 lb./ac.

Crop :- Gram. Ref :- M.P. 48(21).

Site :- Govt. Seed and Demonstration Farm, Saugor. Type :- 'M'.

Object :—To study the residual effect of N manures applied to the previous wheat crop on the succeeding Gram crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) As per treatments. (ii) (a) *Kabar* 2. (b) N.A. (iii) 23.10.1948. (iv) (a) 3 *bakharings*. (b) Sown with *nari* plough. (c) to (e) N.A. (v) Nil. (vi) N.A. (vii) Nil. (viii) Nil. (ix) N.A. (x) 10.3.1949.

2. TREATMENTS :

1. Control (no manure).
2. T.C. at 10 C.L./ac.
3. T.C. at 20 C.L./ac.
4. F.Y.M. at 10 C.L./ac.
5. F.Y.M. at 20 C.L./ac.
6. G.N.C. at 4 md./ac.
7. A/S at 120 lb./ac.

Manures applied to previous wheat crop.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948—1949. (b) and (c) N.A. (v) (a) Jabalpore (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1180 lb./ac.
(ii) 29.60 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1034
2.	1167
3.	1237
4.	1201
5.	1241
6.	1261
7.	1121
S.E./mean	=12.08 lb./ac.

Crop :- Gram. Ref :- M.P. 49(27).

Site :- Govt. Seed and Demonstration Farm, Saugor. Type :- 'M'.

Object :—To study the residual effect of N manures applied to the previous wheat crop on the succeeding Gram crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) As per treatments. (ii) (a) *Kabar* 2. (b) N.A. (iii) 13.11.1949. (iv) (a) *Bakharing*. (b) Sown with *nari* plough. (c) to (e) N.A. (v) Nil. (vi) Gram V. (vii) Nil. (viii) Nil. (ix) N.A. (x) 7.4.1950.

2. TREATMENTS :

1. Control.
2. T.C. at 20 lb./ac. of N.
3. T.C. at 40 lb./ac. of N.
4. F.Y.M. at 20 lb./ac. of N.
5. F.Y.M. at 40 lb./ac. of N.
6. G.N.C. at 10 lb./ac. of N.
7. G.N.C. at 20 lb./ac. of N.
8. A/S at 10 lb./ac. of N.
9. A/S at 20 lb./ac. of N.

Manures applied to previous wheat crop.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory in the beginning but suffered for want of moisture at later stage. (ii) Nil. (iii) Grain yield. (iv) (a) 1948—1949. (b) and (c) N.A. (v) (a) Jabalpore. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 469.2 lb./ac.
(ii) 88.80 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	456.9	6.	488 6
2.	465.2	7.	495.2
3.	445.2	8.	465.2
4.	455.2	9.	446.9
5.	504.0		
	S.E./mean	=36.40 lb./ac.	

Crop :- Gram. Ref :- M.P. 50(32).

Site :- Govt. Exptl. Farm, Powarkheda. Type :- 'M'.

Object :—To study the residual effect of the manures applied to wheat during 1947-1948 on its yield in two succeeding years 1948-49 and 1949-50 and on Gram during 1950-1951.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 7.10.1950. (iv) (a) *Bakharing*. (b) N.A. (c) 60 lb./ac. (d) and (e) N.A. (v) N.A. (vi) Ad. V. (vii) Unirrigated. (viii) N.A. (ix) 2.11″. (x) 27.2.1951.

2. TREATMENTS :

1. Control.
2. T.C. at 10 C.L./ac. before monsoon.
3. T.C. at 20 C.L./ac. before monsoon.
4. F.Y.M. at 10 C.L./ac. applied before monsoon.
5. F.Y.M. at 20 C.L./ac. applied before monsoon.
6. G.N.C. at 4 md./ac. applied at the time of sowing.
7. A/S at 120 lb./ac. drilled with seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 16½′×66′. (v) Nil. (vi) N.A.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1950-1951. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 810.9 lb./ac.
(ii) 68.52 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	786.1
2.	824.9
3.	879.5
4.	834.5
5.	896.6
6.	764.5
7.	690.3
S.E./mean	=27.96 lb./ac.

Crop :- Gram. Ref :- M.P. 50(30).

Site :- Govt. Exptl. Farm, Powarkheda. Type :- 'M'.

Object :—To study the residual effect of T.C. and other fertilizers applied to wheat during 1948-49 on the succeeding crop wheat during 1949-50 and on Gram during 1950-51.

1. BASAL CONDITIONS :

(i) N.A. (b) Wheat. (c) Nil. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 12.10.1950. (iv) (a) *Bakharing*. (b) and (c) N.A. (d) 12". (e) N.A. (v) Nil. (vi) Ad. V. (vii) N.A. (viii) Nil. (ix) 2.11". (x) 4.3.1951.

2. TREATMENTS :

1. Control.
2. T.C. at 20 lb./ac. of N applied before monsoon.
3. T.C. at 40 lb./ac. of N applied before monsoon.
4. F.Y.M. at 20 lb./ac. of N applied before monsoon.
5. F.Y.M. at 40 lb./ac. of N applied before monsoon.
6. G.N.C. at 10 lb /ac. of N applied in September 1948.
7. G.N.C. at 10 lb./ac. of N applied in September 1948.
8. A/S at 10 lb./ac. of N drilled with seed.
9. A/S at 20 lb /ac. of N drilled with seed.

Applied during 1948-49 for wheat crop.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 11'×99'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1948–1950. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 738.6 lb./ac.
(ii) 96.4 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	684 5	6.	715.3
2.	681.1	7.	717.8
3.	767.0	8.	725.3
4.	803.7	9.	733.7
5.	818.7		

S.E./mean =39.4 lb./ac.

Crop :- Cotton. Ref :- M.P. 53(107).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the effect of soaking Cotton seeds in solutions of trace elements.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) Indore 1. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)+9 controls

(1) 3 salts : S_1= Cu SO_4, S_2=Potassium Chromate and S_3=Chromium Sulphate.
(2) 3 concentrations : C_1=M/50, C_2=M/100 and C_3=M/200.
(3) 3 periods of soaking : T_1=2, T_2=4 and T_3=6 hours.

3. DESIGN :

(i) R.B.D. (ii) (a) 36. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 56'×9'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 102 lb./ac.
(ii) 26.17 lb./ac.
(iii) Only interaction S×T is significant.
(iv) Av. yield of *kapas* in lb./ac.

Control=103 lb./ac.

	C_1	C_2	C_3	Mean	S_1	S_2	S_3
T_1	94	89	99	94	111	97	74
T_2	102	104	113	106	104	88	127
T_3	99	103	111	104	109	102	102
Mean	98	99	107	101	108	96	101
S_1	106	101	116				
S_2	86	95	106				
S_3	103	100	100				

S.E. of any marginal mean =6.17 lb./ac.
S.E. of body of any table =10.69 lb./ac.

Crop :- Cotton. Ref :- M.P. 53(106).
Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To test the effect of applying trace elements to soil on the yield of Cotton.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Groundnut. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) Indore 1. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+4 control plots
1. 4 trace elements : T_1=Chromium Sulphate, T_2=Mn SO_4, T_3=Borax and T_4=Pot. Chromate.
2. 4 doses of trace elements : D_1=0.5, D_2=1.0, D_3=1.5 and D_4=2.0 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 20. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 56'×9'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 105 lb./ac.
(ii) 25.28 lb./ac.
(iii) Only interaction D×T is significant.

(iv) Av. yield of *Kapas* in lb./ac.

Control = 111 lb./ac.

	D_1	D_2	D_3	D_4	Mean
T_1	107	92	95	104	99
T_2	104	92	139	92	107
T_3	100	136	85	105	107
T_4	85	121	112	88	102
Mean	99	110	108	97	104

S.E. of marginal means = 6.32 lb./ac.
S.E. of body of table = 12.64 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. 51(95).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find out the effect of spraying trace elements on Cotton crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 28.6.1951. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:

All combinations of (1) and (2)+2 control plots.

1. 5 trace elements : T_1=Copper, T_2=Boron, T_3=Zinc, T_4=Chromium and T_5=Manganese.
2. 2 concentrations : C_1=0.5 and C_2=1.0 %.

Spraying on 22.8 1951 at 80 gallon/ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/207.6 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 534 lb /ac.
(ii) 61.86 lb./ac.
(iii) Only 'control *vs* other treatments' effect is significant.
(iv) Av. yield of *kapas* in lb./ac.

Control=483 lb./ac.

	T_1	T_2	T_3	T_4	T_5	Mean
C_1	536	531	530	566	546	542
C_2	527	541	526	579	560	547
Mean	532	536	528	573	553	544

S.E. of T marginal means =21.87 lb./ac.
S.E. of C marginal means =13.83 lb./ac.
S.E. of body of table =30.93 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. **51(93).**

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find out the effect of burning stubbles and ash on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

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

(1) 2 manures : S_1=Burning stubbles and S_2=Ash.

(2) 2 doses : D_1=Single and D_2=Double.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 21'×42'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) No. (b) and (c) N.A. (v) (a) N.A. (b) N.A. (vi) Nil. (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.)

5. RESULTS :

(i) 911 lb./ac.

(ii) 44.40 lb./ac.

(iii) Only S and 'control *vs* treated' effects are highly significant.

(vi) Av. yield of *Kapas* in lb./ac.

Control=809 lb./ac.

	S_1	S_2	Mean
D_1	996	836	916
D_2	1067	850	958
Mean	1031	843	937

S.E. of any marginal mean =15.70 lb./ac.

S.E. of body of table =22.20 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. **49(67).**

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find out the effect of burning stubbles on early sown Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control.
2. Burning stubbles.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 6'×30'. (v) and (vi) N.A.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment was conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 386 lb./ac.

(ii) 39.50 lb./ac.

(iii) Treatment difference is not significant.

(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	367
2.	404
S.E./mean	=19.75 lb./ac.

Crop :- Cotton. Ref :- M.P. 49 (68).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find out the effect of burning stubbles on late sown Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control.
2. Burning stubbles.

3. DESIGN :

(i, R.B.D. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6'×30'. (v) and (vi) N.A.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C).

5. RESULTS :

(i) 173 lb./ac.
(ii) 60 89 lb./ac.
(iii) Treatment difference is not significant.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	133
2.	212
S.E./mean	= 30.45 lb./ac.

Crop :- Cotton (*Kharif*). Ref : M.P. 49(66).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object : To find out the effect of soaking seed in chemical solutions.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3) + 3 controls (seeds soaked in water for 4 hours).

1. 4 chemical solutions : S_1=Glysin, S_1=Sodium Nitro Prusside, S_3=Ferrous Ammo. Sul. and S_4= Uranium acetate.
2. 3 concentrations of solutions : C_1=m/100, C_2=m/200 and C_3=m/500.
3. 2 periods of soaking seeds : T_1=2 and T_2=4 hours.

3. DESIGN:

(i) R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 4'×40'. (v) N.A. (vi) N.A.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 186 lb./ac.
(ii) 40.16 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of cotton in lb./ac.

Control =180 lb./ac.

	S_1	S_2	S_3	S_4	Mean	T_1	T_2
C_1	187	183	204	195	192	201	183
C_2	191	184	184	189	187	191	182
C_3	149	204	179	184	179	184	175
Mean	176	190	189	189	186	192	180
T_1	176	209	195	185			
T_2	176	172	183	193			

S.E. of S marginal mean = 8.20 lb./ac.
S.E. of C marginal mean = 7.10 lb./ac.
S.E. of T marginal mean = 5.80 lb./ac.
S.E. of body of S × C table = 14.20 lb./ac.
S.E. of body of C × T table = 10.04 lb./ac.
S.E. of body of S × T table = 11.59 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. 48(47).
Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find out the effect of trace elements on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control
2. Mg at 40 lb./ac.
3. Mo at 14 lb./ac.
4. Ca at 80 lb./ac.
5. Co at 10 lb./ac.
6. Cu at 24 lb./ac.
7. Zn at 20 lb./ac.
8. B at 10 lb./ac.
9. Mn at 20 lb./ac.
10. Fe at 30 lb./ac.
11. Cr at 2 lb./ac.
12. Cu at 24 lb./ac. + Zn at 20 lb./ac.
13. Mn at 20 lb./ac. + Fe at 30 lb./ac.
14. B at 10 lb./ac. + Ca at 80 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 6′×27′. (v) N.A. (vi) N.A.

4. GENERAL :

(i) N.A. (ii) N.A. (iiii) *Kapas* yield. (iv) (a) No. (b) and (c) Nil. (v) (a) N.A. (b) Nil. (vi) Nil. (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 358 lb./ac.
(ii) 59.44 lb./ac.
(iii) Treatment differences are not significant.

(iv) Av. yield of *Kapas* in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	344	8.	355
2.	336	9.	371
3.	311	10.	379
4.	335	11.	368
5.	393	12.	332
6.	403	13.	333
7.	400	14.	350

S.E./mean =24.27 lb./ac.

Crop :- Cotton. **Ref :- M.P. 48(48).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To find out the effect of trace elements on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control.
2. Magnesium (Mg) at 40 lb./ac.
3. Iron (Fe) at 30 lb./ac.
4. Molybdenum (Mo) at 14 lb./ac.
5. Copper (Cu) at 24 lb./ac.
6. Zinc (Zn) 20 lb./ac.
7. Manganese (Mn) at 20 lb./ac.
8. Chromium (Cr) at 2 lb./ac.
9. Boron (B) at 20 lb./ac.

3. DESIGN :

(i) R B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 4'×36'. (v) and (vi) N.A.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 520 lb./ac.
(ii) 72.24 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	453	6.	528
2.	494	7.	535
3.	532	8.	534
4.	458	9.	537
5.	608		

S.E./mean =41.71 lb./ac.

Crop :-Cotton. **Ref :-M.P. 48(49).**

Site :-Institute of Plant Industry, Indore. **Type :-'M'.**

Object :—To find out the effect of trace elements on growth and yield of American Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) American. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

Treatments	Control	Mo	B	Cu	Mg	Fe	Mn	Zn	Cr
Quantity applied during 1947	—	14	20	24	40	30	20	20	2
Quantity applied during 1948	—	7	10	12	20	15	10	10	2

Doses applied in lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 7½′×33′. (b) 6′×27′. (v) and (vi) N.A.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1947-1952. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C C.)

5. RESULTS :

(i) 549 lb./ac.
(ii) 66.26 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
Control	496	Fe	518
Mo	519	Mn	537
B	574	Zn	583
Cu	562	Cr	616
Mg	537		

S.E./mean =27.06 lb /ac.

Crop :- Cotton **Ref :- M. P. 49(65).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To find out the effect of trace elements on growth and yield of American Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A (vi) American. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS

Main-plot treatments :

2 levels of N as F.Y.M. : N_0 =0, N_1=20 lb /ac.

Sub-plot treatments :

9 trace elements :

Treatment	Control	M_0	B	Cu	Mg	Fe	Mn	Zn	Cr
Quantity applied in 1947.	—	14	20	24	40	30	20	20	2
Quantity applied in 1948.	—	7	10	12	20	15	10	10	2
Quantity applied in 1949.	—	7	10	12	20	15	10	10	2

Doses applied in lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 9 sub-plots/main-plots. (b) N.A. (iii) 3. (iv) (a) 7½′×33′ (b) 6′×30′. (v) N.A. (vi) N.A.

4, GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1947-1952. (b) Yes. (c) N.A. (v) (a) N.A. (b) N.A. (vi) Nil. (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 448 lb./ac.
(ii) (a) 93.63 lb./ac.
(b) 52.19 lb./ac.
(iii) Effect of N and trace elements are significant. Interaction is not significant.

(iv) Av. yield of *Kapas* in lb./ac.

	Control	Mo	B	Cu	Mg	Fe	Mn	Zn	Cr	Mean
N_0	309	369	431	437	368	353	387	409	458	391
N_1	486	483	520	485	484	487	540	513	552	505
Mean	397	426	476	461	426	420	463	461	505	443

S.E. of difference of two

1. main-plot marginal means =25.48 lb /ac.
2. sub-plot marginal means =30.13 lb./ac.
3. sub-plot treatment means at a level of main-plot treatment =42.61 lb./ac.
4. main-plot treatment means at a level of sub-plot treatment =47.58 lb./ac.

Crop :- Cotton. **Ref :- M.P. 50(70).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To find out the residual effect of trace elements on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) American. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

Treatment	Control	M_0	B	Cu	Mg	Fe	Mn	Zn	Cr
Quantity applied during 1947.	—	14	20	24	40	30	20	20	2
Quantity applied during 1948.	—	7	10	12	20	15	10	10	2
Quantity applied during 1949.	—	7	10	12	20	15	10	10	2

Doses applied in lb./ac. Residual effect studied.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 7½′×33′. (b) 6′×30′. (v) N.A. (vi) N.A.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1947 to 1952. (b) Yes. (c) Nil. (v) (a), (b) and N.A. (vi) Yield data and analysis not available. (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 254 lb./ac.

(ii) 42.32 lb./ac.

(iii) Treatment differences are not significant.

(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
Control	225	Fe	257
M_0	249	Mn	276
B	254	B	251
Cu	259	Cr	264
Mg	247		

S.E./mean 17.28 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. 51(90).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find out the residual effect of trace elements on growth and yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) American cotton. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

Treatment	Control	Mo	B	Cu	Mg	Fe	Mn	Zn	Cr
Quantity applied during 1947	—	14	20	24	40	30	20	20	2
Quantity applied during 1948	—	7	10	12	20	15	10	10	2
Quantity applied during 1949	—	7	10	12	20	15	10	10	2

Doses applied in lb./ac. Residual effect studied.

3. DESIGN :

(i) R.B.D (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 7½′×33′. (b) 6′×30′. (v) and (vi) N.A.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1947—1952. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 494 lb./ac.

(ii) 54.42 lb./ac.

(iii) Treatment differences are not significant.

(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
Control	452	Fe	453
Mo	518	Mn	532
B	515	Zn	476
Cu	507	Cr	518
Mg	478		

S.E./mean =22.22 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. 52(76).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find out the residual effect of trace elements on growth and yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) American cotton. (vii) Unirrigated. (viii) to (x). N.A.

2. TREATMENTS :

Treatment	Control	Mo	B	Cu	Mg	Fe	Mn	Zn	Cr
Quantity applied during 1947	—	14	20	24	40	30	20	20	2
Quantity applied during 1948	—	7	10	12	20	15	10	10	2
Quantity applied during 1949	—	7	10	12	20	15	10	10	2

Doses applied in lb./ac. Residual effects studied.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 7½′×33′. (b) 6′×30′. (v) 1.5′×0.75′. (vi) N.A.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1947—1952. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme.

5. RESULTS :

(i) 537 lb./ac.
(ii) 73.96 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
Control	529	Fe	537
Mo	526	Mn	526
B	530	Zn	565
Cu	555	Cr	536
Mg	528		

S.E./mean =30.20 lb./ac.

Crop :-Cotton (*Kharif*). Ref :-M.P. 49(63).

Site :-Institute of Plant Industry, Indore. Type :-'M'.

Object :—To find out the effect of trace elements, with and without F.Y.M. on Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 levels of N as F.Y.M. : $N_0=0$ and $N_1=20$ lb./ac.

Sub-plot treatments :

16 trace elements : M_0=Control, M_1=20 lb./ac. of Zn, M_2=20 lb./ac. of Cr, M_3=24 lb./ac. of Cu, M_4=20 lb./ac. of B, M_5=20 lb./ac. of Mn, $M_6=M_1+M_2$, $M_7=M_1+M_3$, $M_8=M_1+M_4$, $M_9=M_1+M_5$, $M_{10}=M_2+M_3$, $M_{11}=M_2+M_4$, $M_{12}=M_2+M_5$, $M_{13}=M_3+M_4$, $M_{14}=M_3+M_5$ and $M_{15}=M_4+M_5$.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 16 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6'×30'. (v) N.A. (vi Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) and (b) Nil. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 357 lb./ac.
(ii) (a) 105.4 lb./ac.
(b) 34.5 lb./ac.
(iii) Only main effect of N is significant.
(iv) Av. yield of *kapas* in lb./ac.

	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}	M_{11}	M_{12}	M_{13}	M_{14}	M_{15}	Mean
N_0	281	310	304	330	301	314	317	320	314	308	288	314	290	297	286	307	305
N_1	390	407	419	403	396	423	402	436	383	415	449	434	387	424	407	380	410
Mean	336	359	361	367	349	369	360	379	349	361	369	374	339	360	346	344	357

S.E. of difference of two

1. N marginal means =18.6 lb./ac.
2. M marginal means =17.3 lb./ac.
3. M means at the same level of N =24.4 lb./ac.
4. N means at the same level of M =30.1 lb./ac.

Crop :- Cotton. Ref :- M.P. 50(68).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find out the effect of trace elements on the yield of Cotton.

1. BASAL CONDITIONS .

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control.
2. Boron at 10 lb./ac.
3. Copper at 20 lb./ac.
4. Manganese at 20 lb./ac.
5. Zinc at 20 lb./ac.
6. Chromium at 20 lb./ac.

The salts, powdered and mixed with earth were spread in plots and then thoroughly mixed with soil.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 6'×35'. (v) N.A. (vi) Yes.

4. GENERAL :

(i and (ii) N.A. (iii) *Kapas* yield. (iv) (a)1950—1951. (b) Yes. (c) —. (v) (a) and (b) N.A. (vi) Nil. (vii) Plot-wise yield data and analysis of variance not available. Experiment conducted under Cotton Physiological Scheme (I.C.C.C.)

5. RESULTS :

(i) 547 lb./ac.
(ii) 75 42 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	507
2.	564
3.	555
4.	588
5.	551
6.	517
S.E./mean	=33.73 lb./ac.

Crop :- Cotton. Ref :- M.P. 51(88).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object : –To find out the residual effect of trace elements on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control.
2. Boron at 10 lb./ac.
3. Copper at 20 lb./ac.
4. Manganese at 20 lb./ac.
5. Zinc at 20 lb./ac.
6. Chromium at 20 lb./ac.

The salts, powdered and mixed with earth were spread in plots and then thoroughly mixed with soil.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 6'×35'. (v) N.A. (vi) N.A.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1950—1951. (b) Yes. (c) —. (v) (a) Nil. (b) Nil. (v) Nil. (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 680 lb./ac.
(ii) 69.90 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	621
2.	726
3.	695
4.	706
5.	653
6.	678
S.E./mean	=31.26 lb./ac.

Crop :- Cotton. **Ref :- M.P. 49(64).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To find out the effect of trace elements with and without F.Y.M. on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 levels of N as F.Y.M. : N_0=0 and N_1=20 lb./ac.

Sub-plot treatments :

11 applications of trace elements : T_0=Control, T_1=Cu at 18 lb./ac., T_2=Cu at 36 lb./ac., T_3= Boron at 5 lb./ac., T_4=Boron at 10 lb./ac., T_5=Mn at 25 lb./ac., T_6=Mn at 50 lb./ac., T_7=Zn at 15 lb./ac., T_8=Zn at 30 lb./ac., T_9=Cr at 5 lb./ac. and T_{10}=Cr at 10 lb./ac.

3. DESIGN :

(i) Split-plot. (a) 2 main-plots/replication ; 11 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 5′×30′ (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1949—1952. (b), (c) No. (v) (a) N.A. (b) No. (vi) Nil. (viii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 540 lb./ac.
(ii) (a) 77.13 lb./ac.
(b) 68.86 lb./ac.
(iii) N effect alone is highly significant.
(iv) Av. yield of *Kapas* 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}	Mean
N_0	411	439	476	461	487	486	388	481	443	446	444	451
N_1	574	649	667	652	588	629	592	610	622	659	680	629
Mean	492	544	572	556	537	558	490	546	533	553	561	540

S.E. of difference of two

1. N marginal means =16.44 lb./ac.
2. T marginal means =34.43 lb./ac.
3. T means at the same level of N =48.69 lb./ac.
4. N means at the same level of T =49.25 lb./ac.

Crop :- Cotton. Ref :- M.P 50(69).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find out the residual effect of trace elements on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control.
2. Copper at 18 lb./ac.
3. Copper at 36 lb /ac.
4. Boron at 5 lb /ac.
5. Boron at 10 lb /ac.
6. Manganese at 25 lb /ac.
7. Manganese at 50 lb./ac.
8. Zinc at 15 lb./ac.
9 Zinc at 30 lb./ac.
10. Chromium at 5 lb./ac.
11. Chromium at 10 lb./ac.

Treatments applied in 1949 and residual effect studied in 1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 6'×30'. (v) N.A. (vi) N.A.

4. GENERAL :

(i) N.A. ii) N.A. (iii) *Kapas* yield. (iv) (a) 1949—1952. (b) Yes. (c) Nil. (v) (a) Nil. (b) Nil. (vi) Nil. (vii) Orginal yield data and analysis of variance not available. Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 177 lb./ac.
(ii) 39.08 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of *kapas* in lb /ac.

Treatment	Av. yield	Treatment	Av. yield
1.	156	7.	184
2.	182	8.	180
3.	173	9.	165
4.	183	10.	172
5.	213	11.	160
6.	175		

S.E./mean = 13.82 lb./ac.

Crop :- Cotton. Ref :- M.P. 51(89)

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find out the residual effect of trace elements on the yield of Cotton.

1. BASAL CONDITIONS

(i) (a) Nil. (b) Cotton (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control
2. Copper at 18 lb./ac.
3. Copper at 36 lb./ac.
4. Boron at 5 lb./ac.
5. Boron at 10 lb ac
6. Manganese at 25 lb /ac
7. Manganese at 50 lb./ac.
8. Zinc at 15 lb./ac.
9. Zinc at 30 lb./ac.
10. Chromium at 5 lb./ac.
11. Chromium at 10 lb./ac.

Treatments applied in 1949 and residual effect studied.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 6'×30'. (v) N.A. (vi) N.A.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1949—1952. (b) Yes. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Nil. (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 569 lb./ac.
(ii) 55.97 lb./ac.
(iii) Treatment difference are not significant.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	550	7.	562
2.	550	8.	556
3.	561	9.	574
4.	614	10.	571
5.	574	11.	574
6.	567		
	S.E./mean	=19.79 lb./ac.	

Crop :- Cotton. **Ref :- M.P. 52(75).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To find out the residual effect of trace elements on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 18.6.1952. (iv) (a) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control.
2. Copper at 18 lb./ac.
3. Copper at 36 lb./ac.
4. Boron at 5 lb./ac.
5. Boron at 10 lb./ac.
6. Manganese at 25 lb./ac.
7. Manganese at 50 lb./ac.
8. Zinc at 15 lb./ac.
9. Zinc at 30 lb./ac.
10. Chromium at 5 lb./ac.
11. Chromium at 10 lb./ac.

Treatments applied in 1949 and its residual effect studied.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 6′×32′. (v) and (vi) N.A.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1949—1952. (b) Yes. (c) Nil. (v) (a) N.A. (b) Nil. (v) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS:

(i) 457 lb./ac.
(ii) 54.55 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	442	7.	450
2.	464	8.	441
3.	487	9.	459
4.	455	10.	459
5.	447	11.	476
6.	446		
	S.E./mean	=19.29 lb./ac.	

Crop :- Cotton. Ref :- M.P. 53(17).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :— To study the residual effect of organic and inorganic manures applied to preceding crops of *Jowar*, *Tur* and groundnut on the succeeding Cotton crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) *Jowar*, *tur* and groundnut. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 4.7.1953. (iv) (a) One *bakharing*. (b) Drilled. (c) 10 lb./ac. (d) 14" between rows. (e)—. (v) Nil. (vi) *Dhar*-43. (vii) Unirrigated. (viii) Hand weeding one time followed by interculture with *daura*. (ix) 32.53". (x) 3 pickings on 19.11.1953, 14.12.1953 and 11.1.1954.

2. TREATMENTS :

Main-plot treatments :

3 previous crops : C_1=Groundnut, C_2=*Jowar* and C_3=*Tur*.

Sub-plot treatments :

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

(1) 2 levels of N : N_0=0 and N_1=20 lb./ac.

(2) 2 levels of P : P_0=0 and P_1=20 lb./ac.

(3) 2 basal dressings : B_0=Nil and B_1=Farm compost.

Manures applied to previous crops.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 8 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 35'×14'. (b) 30'×9'-4". (v) 2 rows on each side and 2½' on each end. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) Yield of cotton. (iv) (a) 1952—1956. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 417 lb./ac.

(ii) (a) 197.0 lb./ac.

(b) 66.4 lb./ac.

(iii) Main effect of C, P and B are highly significant. Others are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	C_1	C_2	C_3	Mean	B_0	B_1	P_0	P_1
N_0	527	346	376	416	411	421	379	453
N_1	541	355	355	417	391	443	387	447
Mean	534	350	366	417	401	432		
P_0	503	326	320	383	369	397		
P_1	565	374	412	450	433	468		
B_0	519	336	348					
B_1	548	365	384					

S.E. of difference of two

1. C marginal means =40.21 lb./ac.
2. N, P or B marginal means =11.07 lb./ac.
3. N, P or B means at the same level of C =19.18 lb./ac.
4. C means at the same level of N, P or B =42.43 lb./ac.

S.E. of body of N×P, N×B or P×B tables =11.07 lb./ac.

Crop :- Cotton **Ref :- M.P. 50(11).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To study the residual effect of P_2O_5 applied to the previous *kharif* crops, on Cotton crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of P_2O_5 as Super : P_0=0, P_1=30 lb./ac.

(2) 7 previous crops : C_1=*Jowar* No. 3, C_2=Groundnut, C_3=*Sann*, C_4=*Tur*, C_5=Soyabean, C_6=Cowpea and C_7=Gram.

3. DESIGN :

(i) 2×7 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 55′×28′. (b) 50′×21′. (v) 2½′ on either side and 3½′ on each row. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) *Kapas* yield. (iv) (a) N.A. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 757 lb./ac.

(ii) 158.2 lb./ac.

(iii) Effect of C and interaction C×P are highly significant. P effect is significant.

(iv) Av. yield of *kapas* in lb./ac.

	C_1	C_2	C_3	C_4	C_5	C_6	C_7	Mean
P_0	1669	561	778	769	363	161	677	711
P_1	1604	608	948	938	502	225	790	802
Mean	1636	584	863	853	432	193	733	757

S.E. of marginal mean of C =55.94 lb./ac.
S.E. of marginal mean of P =29.90 lb./ac.
S.E. of body of table =79.11 lb./ac.

Crop :- Cotton. **Ref :- M.P. 49 (11).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To study the residual effect of manures applied to Potato on the succeeding Cotton crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Potato. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 4.6.1949. (iv) (a) *Bakharing*. (b) and (c) N.A. (d) 18″. (e) N.A. (v) N.A. (vi) Combodia Indore 1. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

Two times of planting potato in previous season : C_1=early and C_2=late planting.

Sub-plot 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=40 lb./ac.

(3) 2 levels K_2O as Mono Pot. Phos. : K_0=0 and K_1=80 lb./ac.

Manures applied to previous crop potato.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 9′×40′ (b) 6′×35′. (v) 2 rows on both sides and 2½′ of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of Jassides and rollers in July and August. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 686.3 lb./ac.
(ii) (a) 296.7 lb./ac.
(b) 87.4 lb./ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of *kapas* in lb./ac.

	C_1	C_2	Mean	N_0	N_1	P_0	P_1
K_0	651.5	710.4	680.9	630.4	730.9	681.7	680.1
K_1	656.3	727.1	691.7	686.1	697.4	651.5	732.0
Mean	653.9	718.7	686.3	658.5	714.1	666.6	706.0
P_0	645.0	688.2	666.6	629.3	703.9		
P_1	662.8	749.2	706.0	687.7	724.4		
N_0	603.4	713.6	658.5				
N_1	704.4	723.9	714.1				

S.E. of difference of two

1. C marginal means =60.5 lb./ac.
2. N, P or K marginal means =17.8 lb./ac.
3. N, P or K means at the same level of C =25.2 lb./ac.
4. C means at the same levels of N, P or K =38.4 lb./ac.
5. means in body of N×P, N×K or P×K table =25.3 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. 52(5).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find the relative efficiency of organic nitrogenious manures when applied alone and in combination with Super.

1. BASAL CONDITIONS :

(i) (a) Groundnut—cotton. (b) Groundnut. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 1.6.1952. (iv) (a) 2 to 3 *bakharings*. (b) to (e) N.A. (v) Nil. (vi) *Dhar* 43 (*Bhoj*). (vii) Unirrigated. (viii) Nil. (ix) 25.6". (x) 4 pickings on 18.12.1952, 21.1.1953, 9.2.1953 and 24.2.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.
(2) 5 kinds of manures : M_0=no manure, M_1="K" manure at 20 lb./ac., M_2=F.Y.M. at 20 lb./ac., M_3=F.C. at 20 lb./ac. of N and M_4=G.N.C. at 20 lb./ac. of N.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 60′×11′8". (b) 55′×7′. (v) 2½′ on each side of the end. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1952 to 1955. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 323.8 lb./ac.
(ii) 51.30 lb./ac.
(iii) Main effects of M and P are significant. Interaction is not significant.
(iv) Av. yield of *kapas* in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean
P_0	260.2	291.3	330.2	293.4	335.8	302.2
P_1	281.4	318.2	429.1	314.6	383.9	345.4
Mean	270.8	304.7	379.6	304.0	359.9	323.8

S.E. of M marginal means =14.81 lb./ac.
S E. of P marginal means = 9.40 lb./ac.
S.E. of body of table =20.94 lb./ac.

Crop :- Cotton. **Ref :- M.P. 48(2).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To study the residual effect of manures, applied to previous *kharif* crops, on Cotton crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 16, 17.6.1948. (iv) (a) to (e) N.A. (v) N.A. (vi) *Jarila.* (vii) N.A. (viii) Weeding and *duara.* (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 previous crops : C_1=Groundnut, C_2=*Jowar* and C_3=*Tur.*

Sub-plot treatments :

All combinations of (1) and (2)
(1) 3 levels of N as G.N.C. : N_0=0, N_1=20 and N_3=40 lb./ac.
(2) 3 levels of P_2O_5 Super. : P_0=0, P_1=20 and P_2=40 lb./ac.

Manure applied to previous crops.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block, 9 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 24′4″×10′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) No. of plants and *kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 321.7 lb./ac.
(ii) (a) 95.00 lb./ac.
(b) 60.33 lb./ac.
(iii) N and P effects are highly significant. Others are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
C_1	360.2	385.4	392.5	379.4	348.6	382.2	407.4
C_2	249.0	247.0	254.8	250.3	241.2	246.4	263.2
C_3	322.7	320.1	364.1	335.6	279.7	329.8	397.7
Mean	310.6	317.5	337.1	321.7	289.7	319.4	356.1
P_0	267.1	292.9	309.1				
P_1	320.7	303.9	333.7				
P_2	344.0	355.7	368.6				

S.E. of difference of two

1. C marginal means =18.31 lb./ac.
2. N or P marginal means =11.50 lb./ac.
3. N or P means at the same level of C =20.11 lb./ac.
4. C means at the same level of N or P =24.57 lb./ac.
5. means in the body of N×P table =20.11 lb./ac.

Crop :- Cotton. **Ref :- M.P. 50(15).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To study the effect of N obtained from different sources and P_2O_5 on Cotton yield.

1. BASAL CONDITIONS :

(i) (a) and (b) *Jowar*. (c) No. (ii) (a) Black cotton soil. (b) N.A. (iii) 12.7.1950. (iv) (a) to (e) N.A. (v) N.A. (vi) *Dhar* 43. (vii) Unirrigated. (viii) No. (ix) N.A. (x) 2 pickings on 5.12.1950 and 11.1.1951.

2. TREATMENTS :

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

(1) 4 levels of N : N_0=0, N_1=20, N_2=40 and N_3=60 lb./ac.
(2) 3 sources of N : S_1=G.N.C., S_2=A/S and S_3=C/N.
(3) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.

3. DESIGN :

(i) 2×3×4 Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 3. (iv) (a) 11'8"×70'. (b) 7'×65'. (v) 2'4" on either side and 2½' on each end. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) *Kapas* yield. (iv) (a) and (b) No. (c) N.A. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 288 lb./ac.
(ii) 61.45 lb./ac.
(iii) N and P effects are highly significant. S×P interaction is significant. Others are not significant.
(iv) Av. yield of *kapas* in lb./ac.

N_0P_0 =213 lb./ac. N_0P_1=239 lb./ac.

	N_1	N_2	N_3	Mean	S_1	S_2	S_3
P_0	275	272	319	288	277	283	305
P_1	298	350	339	329	284	331	372
Mean	286	311	329		281	307	338
S_1	244	271	327				
S_2	266	309	346				
S_3	348	353	314				

S.E. of N marginal means	=14.48 lb./ac.
S.E. of S marginal means	=14.48 lb./ac.
S.E. of P marginal means	=11.82 lb./ac.
S.E. of body of S×P or N×P tables	=20.48 lb./ac.
S.E. of body of S×N table	=25.09 lb./ac.

Crop :- Cotton. **Ref :- M.P. 51(13).**

Site:- Institute of Plant Industry, Indore. **Type .- 'M'.**

Object : -To study the effect N obtained from different sources and P_2O_5 on Cotton yield.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Jowar*. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 28.6.1951. (iv) (a) *Bakharing* and ploughing. (b) N.A. (c) 25 lb./ac. (d) 14". (e) N.A. (v) Nil. (vi) *Dhar*-43. (vii) N.A. (viii) Thinning and weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

(1) 4 levels of N : N_0=0, N_1=20, N_2=40 and N_3=60 lb./ac.
(2) 3 sources of N : S_1=G.N.C., S_2=A/S and S_3=C/N.
(3) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.

3. DESIGN :

(i) 4×3×2 Fact. in R.B.D. (ii) (a) 24. (b) 100'×168'. (iii) 3. (iv) (a) 50'×14'. (b) 45'×9'8". (v) 2 rows on both sides and 2½' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 577 lb./ac.
(ii) 75.22 lb./ac.
(iii) N effect and interaction N×S are highly significant. S effect is significant. Others are not significant.
(iv) Av. yield of *kapas* in lb./ac.

N_0P_0=427 lb./ac. N_0P_1=431 lb./ac.

	N_1	N_2	N_3	Mean	S_1	S_2	S_3
P_0	583	622	677	627	600	646	636
P_1	567	590	707	621	570	683	611
Mean	575	606	692	624	585	665	623
S_1	562	542	650				
S_2	605	598	791				
S_3	559	676	635				

1. S.E. of N marginal mean excluding N_0 mean	=17.73 lb./ac.
2. S.E. of S marginal means	=17.73 lb./ac.
3. S.E. of P marginal means	=14.47 lb./ac.
4. S.E. of body of S×P or N×P table	=25.07 lb./ac.
5. S.E. of body of S×N table	=30.71 lb./ac.
6. S.E. of N_0P_0 or N_0P_1 mean	=25.07 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. 51(14).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the effect of N obtained from different sources and P_2O_5 on Cotton yield.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) ***Jowar.*** (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 26.6.1951. (iv) (a) ***Bakharing*** (b) N.A. (c) 25 lb./ac. (d) 14". (e) N.A. (v) N.A. (vi) *Dhar* 43. (vii) N.A. (viii) Thinning and weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

(1) 4 levels of N : N_0=0, N_1=20, N_2=40 and N_3=60 lb./ac.

(2) 3 sources of N : S_1=G.N.C., S_2=A/S and S_3=C/N.

(3) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.

3. DESIGN :

(i) 4×3×2 Fact. in R.B.D. (ii) (a) 24. (b) 70'×68'. (iii) 3. (iv) (a) 35'×14". (b) 30'×9' 4". (v) Two rows on both sides and 2½' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1948—N.A. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 555 lb./ac.

(ii) 100.6 lb./ac.

(iii) N and P effects are highly significant. Other effects are not significant.

(iv) Av. yield of ***kapas*** in lb./ac.

N_0P_0=283 lb./ac. N_0P_1=441 lb./ac.

	N_1	N_2	N_3	Mean	S_1	S_2	S_3
P_0	485	568	760	605	549	618	647
P_1	470	613	807	633	603	676	620
Mean	477	591	788	619	576	647	633
S_1	463	587	677				
S_2	519	600	823				
S_3	450	585	865				

S.E. of N marginal means excluding N_0	=23.70 lb./ac.
S.E. of S marginal means	=23.70 lb./ac.
S.E. of P marginal means	=16.76 lb./ac.
S.E. of body of S×P or N×P tables	=33.52 lb./ac.
S.E. of body of N×S table	=41.06 lb./ac.
S.E. of N_0P_0 or N_0P_1 mean	=33.52 lb./ac.

Crop :- Cotton. Ref :- M.P. 53(11).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the effect of N obtained from different sources and P_2O_5 on Cotton yield.

1. BASAL CONDITIONS :

(i) (a) No. (b) ***Tur.*** (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 4.7.1953. (iv) (a) ***Bakharing.*** (b) Drilling. (c) lb./ac. (d) 14" between rows. (e) —. (v) Nil. (vi) *Dhar* 43. (vii) Unirrigated. (viii) Hand weeding followed by interculture with *daura.* (ix) 32.53". (x) 3 pickings on 20.11.1953, 19.12.1953 and 12.1.1954.

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) 4 sources of N : S_1= K manure, S_2=F.Y.M., S_3=Farm Compost and S_4=G.N.C.

(3) 2 levels of P_2O_5 as Super : P_0=0, and P_1=30 lb./ac.

3. DESIGN :

(i) 4×3×2 Fact in R.B.D. (ii) (a) 24. (b) N.A. (iii) 3. (iv) (a) 45′×14′ (b) 40′×9′4″. (v) 2 rows on each side and 2½ on each end. (vi) Yes.

4 GENERAL :

(i) Good. (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1952 to 1955. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 711 lb./ac.

(ii) 119.4 lb./ac.

(iii) N and S effects are highly significant.

(iv) Av. yield of *kapas* in lb./ac.

N_0P_0=636 lb./ac. N_0P_1=640 lb./ac.

	S_1	S_2	S_3	S_4	Mean	P_0	P_1
N_1	637	665	768	757	704	667	741
N_2	678	719	836	931	791	749	834
Mean	657	687	802	844	748	708	788
P_0	633	631	775	792			
P_1	682	744	829	896			

S.E. of marginal mean of N	=24.4 lb./ac.
S.E. of marginal mean of P	=19.9 lb./ac.
S.E of marginal mean of S	=34.5 lb./ac.
S.E. of body of S×N or S×P table	=48.7 lb./ac.
S.E. of body of N×P table	=34.5 lb./ac.
S.E. of N_0P_0 or N_0P_1 mean	=34.5 lb./ac.

Crop :-Cotton. **Ref :- MP. 48(8).**

Site :-Institute of Plant Industry, Indore. **Type :- 'M'.**

Object : - To study the effect of P_2O_5 applied to leguminous crops on the succeeding Cotton crop, with and without N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) *Bakharing*. (b) and (c) N.A. (d) 14″. (e) N.A. (v) to (vii) N.A. (viii) Weeding and thinning. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 7 leguminous crops : C_1=*Tur*, C_2=Soyabean, C_3=Gram, C_4=Sann, C_5=Groundnut, C_6=*Jowar* and C_7=Pea.

(2) 2 levels of P_2O_5 : P_0=0 and P_1=30 lb./ac.

Sub-plot treatments :

2 levels of N : N_0=0 and N_1=20 lb./ac. applied to cotton.

3. DESIGN :

(i) Split-plot. (ii) (a) 14 main-plots/block, 2 sub-plot/main-plot. (b) N.A. (iii) 4. (iv) (a) 14′×69′. (b) 9′4″×64′. (v) Two rows on both sides and 2½′ of each row at both ends. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Stand of the crop and *kapas* yield. (iv) (a) 1947—N.A. (plot size changed in 1948). (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 450.2 lb./ac.
(ii) (a) 102.4 lb./ac.
(b) 48.47 lb./ac.
(iii) P effect is highly significant. C effect is significant. Others are not significant.
(iv) Av. yield of *kapas* in lb./ac.

	C_1	C_2	C_3	C_4	C_5	C_6	C_7	Mean	P_0	P_1
N_0	447.3	421.7	402.9	369.8	396.6	358.4	340.2	391.0	353.5	428.6
N_1	560.7	550.5	519.7	541.9	488.4	476.4	427.4	509.3	380.2	538.5
Mean	504.0	486.1	461.3	455.8	442.5	417.4	383.8	450.2		
P_0	477.0	437.7	438.8	422.2	397.7	355.0	389.2	416.8		
P_1	531.1	534.5	483.8	489.5	487.3	479.8	378.4	483.5		

S.E. of difference of two

1. C marginal means =36.20 lb./ac.
2. P marginal means =19.35 lb./ac.
3. N marginal means = 9.16 lb./ac.
4. N means at a level of C =24.23 lb./ac.
5. N means at a level of P =12.95 lb./ac.
6. C means at a level of N =40.04 lb./ac.
7. P means at a level of N =21.39 lb./ac.
8. body of C×P table =51.20 lb./ac.

Crop :- Cotton. Ref :- M.P. 49(26).

Site :- Institute of Plant Indnstry, Indore. Type :- 'M'.

Object :—To study the effect of P_2O_5 applied to leguminous crops on the succeeding Cotton crop, with and without N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 1.7.1949. (iv) (a) to (c) N.A. (d) 14". (e) N.A. (v) N A. (vi) *Malvi dhar* 43. (vii) N.A. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 7 leguminous crops : C_1=*Jowar*, C_2=Groundnut, C_3=Sann, C_4=*Tur*, C_5=Soyabean, C_6=Cowpea and C_7=Gram.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.

Sub-plot treatments :

2 levels of N as A/S : N_0=0 and N_1=30 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 14 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 14'×70'. (b) 9'4"×65'. (v) Two rows on both sides and 2½' of each row at both ends. (vi) Yes

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 263.9 lb./ac.
(ii) (a) 61.06 lb./ac.
(b) 23.57 lb./ac.

(iii) Main effects of C, P and N are highly significant. Other effects are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	C_1	C_2	C_3	C_4	C_5	C_6	C_7	Mean	P_0	P_1
N_0	214.9	249.2	242.4	223.3	256.3	256.4	167.2	230.0	191.5	268.4
N_1	305.2	326.6	312.6	286.8	330.0	282.6	240.7	297.8	257.1	338.4
Mean	260.0	287.9	277.5	255.0	293.1	269.5	204.0	263.9	224.3	303.4
P_0	230.6	226.1	223.3	205.9	244.5	232.1	207.6	224.3		
P_1	289.5	349.6	331.6	304.1	341.7	306.9	200.3	303.4		

S.E. of difference of two

1. C marginal means =21.59 lb./ac.
2. P marginal means =11.54 lb./ac.
3. N marginal means = 4.45 lb./ac.
4. N means at the same level of C =11.79 lb./ac.
5. N means at the same level of P = 6.30 lb./ac.
6. C means at the same level of N =23.14 lb./ac.
7. P means at the same level of N =12.37 lb./ac.
8. means in the body of C×P table =30.53 lb./ac.

Crop :-Cotton (*Kharif*). **Ref : M.P. 51(11).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To study the effect of P_2O_5 applied to leguminous crops on the succeeding Cotton crop with and without N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 29.6.1951. (iv) (a) and (b) N.A. (c) 25 lb./ac. (d) 14". (e) N.A. (v) Nil. (vi) and (vii) N.A. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2).

(1) 7 leguminous crops : C_1=*Jowar*, C_2=Groundnut, C_3=Sann, C_4=*Tur*, C_5=Soyabean, C_6=Cow-pea and C_7=Gram.

(2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.

Sub-plot treatments :

2 levels of N as G.N.C. : N_0=0 and N_1=30 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 14 main-plots/block and 2 sub-plots/main-plot. (b) 192'×110'. (iii) 4. (iv) (a) Main-plot 28'×55' and sub-plot : 14'×55'. (b) 9'4"×50'. (v) Two rows on both sides and 2½' of each row at both sides. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 589.0 lb./ac.

(ii) (a) 155.9 lb./ac.

(b) 95.2 lb./ac.

(iii) Only 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	C_6	C_7	Mean	P_0	P_1
N_0	355.9	582.1	522.3	508.5	574.1	580.6	504.1	518.2	480.8	555.7
N_1	519.4	736.8	638.3	649.2	692.3	741.9	640.5	659.8	654.1	665.5
Mean	437.6	659 4	580.3	578.8	633.2	661.2	572.3	589.0		
P_0	451.5	631.7	480.7	529.6	635.4	660.9	582.1	567.4		
P_1	423.8	687.2	679.9	628.1	631.0	661.6	562.4	619.6		

S.E. of difference of two

1. C marginal means =55.12 lb./ac.
2. P marginal means =29.46 lb./ac.
3. N marginal means =17.99 lb./ac.
4. N means at the same level of C=47.60 lb./ac.
5. N means at the same level of P =25.44 lb./ac.
6. C means at the same level of N =64.58 lb./ac.
7. P means at the same level of N =34.52 lb./ac.
8. means in the body of C×P table =77.95 lb./ac.

Crop :- Cotton. Ref :- M.P. 52(15).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the effect of P_2O_5 applied to leguminous crops on the succeeding Cotton crop, with and without N.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 22.6.1952. (iv) (a) Ploughing. (b) to (e) N.A. (v) N.A. (vi) *Dhar*-43 (*bhoj*). (vii) Unirrigated. (viii) 2 weedings. (ix) 25.5". (x) 7 pickings on 29.10.1952, 3.11.1952, 7.11.1952, 8.11.1952, 1.12.1952 and 12.1.1953.

2. TREATMENTS :

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

(1) 7 leguminous crops : C_1=*Jowar*, C_2=Groundnut, C_3=Cowpea, C_4=Sann, C_5=*Tur*, C_6=Soya-bean and C_7=Gram.

(2) 2 levels of N as A/S : N_0=0 and N_1=30 lb./ac.

(3) 2 levels of P_2O_5 as Super : P_0=0 and P_1=30 lb./ac.

3. DESIGN :

(i) 7×2×2 Fact. in R.B.D. (ii) (a) 28. (b) N.A. (iii) 4. (iv) (a) 11'8"×75'. (b) 7'×70'. (v) 2½'×2½'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1947—1952. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 315 lb./ac.
(ii) 61.17 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	C_6	C_7	Mean	P_0	P_1
N_0	305	343	295	282	320	319	305	310	315	305
N_1	335	328	294	300	321	332	325	319	316	322
Mean	320	336	294	291	321	325	315	315	316	314
P_0	320	305	298	299	346	325	317			
P_1	320	366	291	284	295	325	313			

S.E. of marginal mean of C =15.29 lb./ac.
S.E. of marginal mean of N or P = 8.18 lb./ac.
S.E. of body of C×N or C×P tables =21.63 lb./ac.
S.E. of body of N×P table =11.56 lb./ac.

Crop :- Cotton. Ref :- M.P. 48(3).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the effect of N and P_2O_5 on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 20.6.1948., resowing on 3.7.1948. (iv) (a) and (b) N A (c) 30 lb./ac. (d) and (e) N.A. (v) N.A. (vi) *Jarilla*. (vii) N A. (viii) Weeding and gap filling. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

(1) 5 levels of N : N_0=0, N_1=20, N_2=40, N_3=60 and N_4=80 lb./ac.
(2) 2 sources of N : S_1=G.N.C. and S_2=A/S.
(3) 2 levels of P_2O_5 as Bone Char : P_0=0 and P_1=40 lb./ac.

3. DESIGN :

(i) 5×2×2 Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 3. (iv) (a) 11 8"×66'. (b) 7'×55'. (v) Two rows on both sides and 2½' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yied. (iv) (a) to (c) N.A. (v) (a), (b)N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 221.4 lb./ac.
(ii) 57.2 lb./ac.
(iii) Control v. treated and effect of S are highly significant. Others are not significant.
(iv) Av. yield of *kapas* in lb./ac.

N_0P_0=170.8 lb./ac. N_0P_1=173.2 lb./ac.

	N_1	N_2	N_3	N_4	Mean	P_0	P_1
S_1	237.2	232.5	325 7	239 5	258.7	234.2	283.2
S_2	210.0	192.3	201.8	233.6	209.4	210.0	208.9
Mean	223.6	212.4	263 7	236.6	234.1	222.1	246.0
P_0	226.6	204.1	249.0	208.9			
P_1	220.7	220.7	278.5	264.3			

S.E. of N marginal means =16.69 lb./ac.
S.E. of S or P marginal means =11.81 lb./ac.
S.E. body of N×S or N×P table 2[illegible]1 lb./ac.
S.E. of body of S×P table =16.69 lb./ac.

Crop :- Cotton. Ref :- M.P. 49(22).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object : To study the effect of N and P_2O_5 on the [illegible] Cotton.

1. BASAL CONDITIONS.

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 1,2.7.1949. (iv) (a) to (c) N.A. (d) 14". (e) N.A (v) N.A. (vi) *Dhar* 43 *Malvi*. (vii) N.A. (viii) N.A [illegible] and (x) N.A.

2. TREATMENTS :

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

(1) 5 levels of N : N_0=0, N_1=20, N_2=40, N_3=60 and N_4=80 lb /ac.

(2) 2 sources of N : S_1=G.N.C. and S_2=A/S.

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

Super drilled A/S and G.N.C. broadcasted.

3. DESIGN :

(i) 5×2×2 Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 3. (iv) (a) 10′6″×70′. (b) 5′10″×65′. (v) 2 rows on both the sides and 2½′ of each row at both ends (vi) Yes.

4. GENERAL :

(i) Not good. Heavy shedding due to heavy rains in Oct. and Nov. 1949. (ii) N.A. (iii) *Kapas* yield. (iv) **(a)** to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 436.0 lb./ac.

(ii) 32.60 lb./ac.

(iii) All the effeet are highly significant.

(iv) Av. yield of *kapas* in lb./ac.

N_0P_0=354.5 lb./ac ; N_0P_1=380.9 lb./ac.

	N_1	N_2	N_3	N_4	Mean	P_0	P_1
S_1	398.7	429.9	489.7	433.5	437.9	387.4	488.5
S_2	391.6	409.5	508.9	564.0	468.5	453.2	483.7
Mean	395.1	419.7	499.3	498.7	453.2	420.3	486.1
P_0	385.6	376.0	476.6	443.0			
P_1	404.7	463.4	522.1	554.4			

S.E. of N marginal means	= 9.40 lb./ac.
S.E. of S or P marginal means	= 6.60 lb./ac.
S.E. of body N×S or N×P tables	=13.28 lb./ac.
S.E. of body of S×P table	= 9.40 lb./ac.

Crop :- Cotton. **Ref :- M.P. 48(4).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To study the effect of N and P_2O_5 on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 26.6.1948. (iv) (a) and (b) N.A. (c) 30 lb./ac **(d)** 14″. (e) N.A. (v) N.A. (vi) Dhar 43. (vii) N.A. (viii) *Dowra* and weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

(1) 5 levels of N : N_0=0, N_1=20, N_2=40, N_3=60 and N_4=80 lb./ac.

(2) 2 sources of N : S_1=G.N.C. and S_2=A/S.

(3) 2 levels of P_2O_5 as Bone Char : P_0=0 and P_1=40 lb./ac.

3. DESIGN :

(i) 5×2×2 Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 3. (iv) (a) 11′-8″×60′. (b) 7′×50′. (v) 2 rows on both sides and 2½′ of each row at both sides. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Stand of the crop and weight *Kapas*. (iv) (a) to (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 362.0 lb./ac.

(ii) 98.77 lb./ac.

(iii) Only S effect and control *vs* treated are highly significant.

(iv) Av. yield of *kapas* in lb./ac.

N_0P_0 =268.7 lb./ac. N_0P_1 = 256.9 lb./ac.

	N_1	N_2	N_3	N_4	Mean	P_0	P_1
S_1	405.9	442.5	499.1	505.0	463.1	433.1	493.2
S_2	346.9	336.3	308.0	251.3	310.6	323.3	297.9
Mean	376.4	389.4	403.6	378.2	386.9	378.2	395.6
P_0	382.3	362.3	405.9	362.3			
P_1	370 5	416.5	401.2	394.1			

S.E. of N marginal means =28 56 lb./ac.
S.E of S or P marginal means =20.15 lb./ac.
S.E. of body of N×S or N×P tables =40.37 lb./ac.
S.E. of body of S×P table =28.56 lb./ac.

Crop :- Cotton. Ref :- M.P. 49(21).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the effect of N and P_2O_5 on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 1,2.7.1949. (iv) (a) to (c) N.A. (d) 14". (e) N.A. (v) N.A. (vi) Dhar 43 *Malvi*. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

(1) 5 levels of N : N_0=0, N_1=20, N_2=40, N_3=60 ann N_4=80 lb./ac.

(2) 2 sources of N : S_1=G.N.C. and S_2=A/S.

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

A/S and G.N.C. broadcast while Super drilled.

3. DESIGN :

(i) 5×2×2 Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 3. (iv) (a) 10' 6"×70'. (b) 5' 10"×65'. (v) 2 rows on both sides and 2½' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) N.A. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 754.5 lb./ac.

(ii) 172.7 lb./ac.

(iii) Control *vs* treated effect is highly significant, N effect is significant. Other effects are not significant.

(iv) Av. yield of *kapas* in lb./ac.

N_0P_0 =619.3 lb./ac. N_0P_1 =486.3 lb./ac.

	N_1	N_2	N_3	N_4	Mean	P_0	P_1
S_1	699.3	862.1	815.4	919.6	824.1	787.9	860.3
S_2	647.8	756.8	863.3	876.5	786.1	703.5	868.7
Mean	673.5	809.4	839.4	898.0	805.1	745.7	864.5
P_0	623.8	754.4	761.6	843.0			
P_1	723.2	864.5	917.2	953.1			

S.E. of N marginal means =49.83 lb./ac.
S.E. of S or P marginal means =35.26 lb./ac.
S.E. of body of N×S or N×P tables =70.51 lb./ac.
S.E. of body of S×P table =49.83 lb./ac.

Crop :- Cotton. Ref :- M.P. 51(74).

Site :- Govt. Farm, Khandwa. Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Groundnut—Cotton—*Jowar*. (b) *Jowar*. (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 30.6.1951. (iv) (a) *Bakharing*. (b) Sown with *tiffan*. (c) to (e) N.A. (v) N.A. (vi) H. 420 (medium). (vii) Unirrigated. (viii) Hoeing and weeding. (ix) 25.25". (x) 3 pickings on 14.11.1951, 30.11.1951 and 28.12.1951.

2. TREATMENTS :

1. Control.
2. Oil cake at 20 lb./ac. of N.
3. A/S at 20 lb./ac. of N.
4. Decorticated cake at 20 lb./ac. of N.
5. Undecorticated cake at 20 lb./ac. of N.

Manures applied just before sowing.

3. DESIGN :

(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 34½'×34½'. (b) 33'×33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) *Kapas* yield. (iv) (a) No. (b) N.A. (c) N.A. (v) (a) Nil. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 409.2 lb /ac.
(ii) 72.72 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	364.0
2.	432.0
3.	480.0
4.	398.0
5.	372.0
S.E./mean	=32.48 lb./ac.

Crop :- Cotton. **Ref :- M.P. 50(54).**

Site :-Govt. Farm, Khandwa. **Type :- 'M'.**

Object :—To study the comparative effect of F.Y.M., G.N.C. and A/S on Cotton.

1. BASAL CONDITIONS :

(i) (a)Cotton—*Jowar*—Groundnut. (b) Soyabean. (c) Nil. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 9.7.1950. (iv) (a) *Bakharing*. (b) Sown by *tiffan*. (c) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) Hoeing and weeding. (ix) 28.96". (x) 3 pickings on 6.12.1950, 3.1.1951 and 18.1.1951.

2. TREATMENTS :

1. Control.
2. F.Y.M. at 50 C.L./ac.
3. G.N.C. at 7 md./ac.
4. A/S at 50 lb./ac. of N.
5. A/S at 50 lb./ac. of N+oil cake at 7 md./ac.
6. G.N.C. at 11 md./ac.
7. A/S at 75 lb./ac. of N.
8. G.N.C. at 11 md./ac.+A/S at 75 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) 282'×66'. (iii) 4. (iv) (a) and (b) 66'×33'. (v) Nil. (vi) No.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) *Kapas* yield. (iv) (a) No. (b) Nil. (c) N.A. (v) (a) Nil. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 688.6 lb./ac.
(ii) 64.60 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1,	357.5	5.	945.0
2.	447.5	6.	620.0
3.	512.5	7.	857.5
4.	711.3	8.	1057.5

S.E./mean =32.30 lb./ac.

Crop :- Cotton. **Ref :- M.P. 53(25).**

Site :- Govt. Farm, Khandwa. **Type :- 'M'.**

Object :—To compare the effect of different sources of N on Cotton.

1. BASAL CONDITIONS :

(i) (a) No. (b) *Jowar*. (c) N.A. (ii) (a) Medium black cotton. (b) N.A. (iii) 30.6.1953. (iv) (a) *Bakharing* and hoeing. (b) Sown by *tiffan*. (c) 16 lb./ac. (d) Between rows—18" and between plants—9". (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) Weeding. (ix) 32.30". (x) N.A.

2. TREATMENTS :

1. Control.
2. A/S at 20 lb./ac. of N.
3. A/S at 40 lb./ac. of N.
4. A/S at 60 lb./ac. of N.
5. C/N at 20 lb./ac. of N.
6. C/N at 40 lb./ac. of N.
7. C/N at 60 lb./ac. of N.
8. 2 mds. oilcake 2 weeks before sowing+½ mds. of A/S at flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 1/36 ac. (b) 33'×33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) *Kapas* yield. (iv) (a) No. (b) Nil. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 422.9 lb./ac.
(ii) 94.00 lb./ac.
(iii) Treatments differ highly significantly.

(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	294.8	5.	389.6
2.	440.8	6.	394.0
3.	487.2	7.	373.2
4.	572.8	8.	430.9

S.E./mean = 42.04 lb./ac.

Crop :- Cotton (*Kharif*). **Ref :- M.P. 48(51).**

Site :- Institute of Plant Industry, Indore. **Type :- 'MV'.**

Object :—To find out suitable variety and manurial schedule for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

Two varieties : V_1=Indore 1 and V_2=*Buri*-107.

Sub-plot treatments :

3 levels of P_2O_5 : P_0=0, P_1=25 and P_2=50 lb./ac.

Sub-sub-plot treatments :

6 levels of N : N_0=0, N_1=20, N_2=40, N_3=60, N_4=80 and N_5=100 lb./ac.

3. DESIGN :

(i) Split-split-plot. (ii) (a) 2 main-plots/block, 3 sub-plots/main-plot and 6 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 3'×30'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) No. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 779 lb./ac.

(ii) (a) 37.4 lb./ac.

(b) 100.7 lb./ac.

(c) 87.4 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	Mean	P_0	P_1	P_2
V_1	467	703	767	964	968	1050	820	811	786	862
V_2	448	669	755	838	883	841	739	657	809	750
Mean	458	686	761	901	925	945	779	734	798	806
P_0	464	641	689	852	866	894				
P_1	465	685	797	938	969	930				
P_2	444	732	797	915	941	1012				

S.E. of difference of two

1. V marginal means = 8.82 lb./ac.
2. P marginal means = 29.07 lb./ac.
3. N marginal means = 35.69 lb./ac.
4. P means at the same level of V = 41.11 lb./ac.
5. V means at the same level of P = 34.71 lb./ac.
6. N means at the same level of V = 50.48 lb./ac.
7. V means at the same level of N = 46.92 lb./ac.
8. N means at the same level of P = 61.82 lb./ac.
9. P means at the same level of N = 63.49 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. 48(50).

Site :- Institute of Plant Industry, Indore. Type :- 'MV'.

Object :—To find out suitable variety and manurial schedule for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (*viii*) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1=American and V_2=*Desi*.

Sub-plot treatments :

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

(1) 4 levels of N : N_0=0, N_1=25, N_2=50 and N_3=75 lb./ac.

(2) 3 levels of P_2O_5 : P_0=0, P_1=25 and P_2=50 lb./ac.

(3) 3 levels of K_2O : K_0=0, K_1=50 and K_2=100 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 36 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 6′×30′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) No. (b) and (c) —. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 636 lb./ac.

(ii) (a) 65.48 lb./ac.

(b) 66.76 lb./ac.

(iii) Main effects of V, N and P and interaction V×N are highly significant. Interactions V×N×P, V×N×K and V×P×K are significant. Others are not significant.

(iv) Av. yield of *Kapas* in lb./ac.

	V_1	V_2	Mean	N_0	N_1	N_2	N_3	P_0	P_1	P_2
K_0	767	512	639	427	647	694	790	599	662	657
K_1	769	510	639	417	621	708	810	612	665	641
K_2	756	503	630	443	577	708	792	564	664	662
Mean	764	508	636	429	615	703	797	592	663	653
P_0	724	459	592	393	600	640	734			
P_1	785	541	663	450	629	746	828			
P_2	783	524	653	444	615	722	831			
N_0	522	337	429							
N_1	733	497	615							
N_2	838	569	703							
N_3	964	631	797							

S.E. of difference of two

1.	V marginal means	=10.91 lb./ac.
2.	N marginal means	=15.74 lb./ac.
3.	P or K marginal means	=13.63 lb./ac.
4.	N means at the same level of V	=22.25 lb./ac.
5.	V means at the same level of N	=22.15 lb./ac.
6.	P or K means at the same level of V	=19.27 lb./ac.
7.	V means at the same level of P or K	=19.15 lb./ac.
8.	means in body of P×K table	=23.60 lb./ac.
9.	means in body of N×P or N×K table	=27.26 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. 49(1)

Site :- Institute of Plant Industry, Indore. Type :- 'MV'.

Object :—To study the effect of treating Cotton seed before sowing with different nutrient solutions.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Block cotton soil. (b) N.A. (iii) 5.7.1949. (iv) (a) *Bakharing*. (b) and (c) N.A. (d) 14". (e) N.A. (v) N.A. (vi) As per treatments. (vii) N.A. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V_1 = *Malvi* Dhar 43 and V_2 = Combodia Indore.

(2) 5 solutions for soaking : S_0 = Dry, S_1 = Water, S_2 = A/S, S_3 = Ammo. Phos. and S_4 = Mono. Pot.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 9' 4"×60'. (b) 4' 8"×55'. (v) Two rows on both sides and 2½ feet of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 303.3 lb./ac.

(ii) 40.1 lb./ac.

(iii) V and S effects are highly significant. Interaction is not significant.

(iv) Av. yield of *kapas* in lb./ac.

	S_0	S_1	S_2	S_3	S_4	Mean
V_1	286.4	358.6	408.4	421.6	365.9	370.2
V_2	164.4	201.5	291.7	262.5	262.5	236.5
Mean	225.4	285.4	350.0	342.0	314.2	303.3

S.E. of S marginal means = 14.42 lb./ac.
S.E. of V marginal means = 8.90 lb./ac.
S.E. of body of table = 20.00 lb./ac.

Crop :- Cotton. Ref :- M.P. 50(10).

Site :- Institute of Plant Industry, Indore. Type :- 'MV'.

Object :—To study the effect of soaking cotton seed in nutrient solutions before sowing on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) No. (b) *Jowar*. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 12.7.1950. (iv) (a) to (c) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) and (ix) N.A. (x) 3 pickings on 6.12.1950, 12.1.1951 and 11.4.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V_1 = *Malvi* Dhar 43 and V_2 = Combodia Indore 1.

(2) 5 solutions for soaking : S_0 = Dry, S_1 = Water, S_2 = A/S, S_3 = Ammo. Phos. and S_4 = Mono. Pot.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 9'8"×60'. (b) 4'8"×55'. (v) 2½' on each side. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) *Kapas* yield. (iv) (a) N.A. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 277.1 lb./ac.
(ii) 37.10 lb./ac.
(iii) S and V effects are highly significant. Interaction is not significant.
(iv) Av. yield of *kapas* in lb./ac.

	S_0	S_1	S_2	S_3	S_4	Mean
V_1	329.6	384.8	374.4	364.0	369.2	364.4
V_2	156.0	156.0	210.6	202.8	223.6	189.8
Mean	242.8	270.4	292.5	283.4	296.4	277.1

S.E. of S marginal means = 8.30 lb./ac.
S.E. of V marginal means =13.12 lb./ac.
S.E. of body of table =18.55 lb./ac.

Crop :- Cotton. Ref :- M.P. 52(12).

Site :- Institute of Plant Industry, Indore. Type :- 'MV'.

Object :—To study the effect of soaking cotton seed in nutrient solutions on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 25.6.1952. (iv) (a) *Bakhared* four times. (b) and (c) N.A. (d) Rows 14" apart. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) N.A. (ix) 25.5". (x) 5 pickings on 4.12.1952, 18.12.1952, 19.1.1953. 13.2.1953 and 12.3.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V_1=Indore 2 and V_2=Dhar 43.
(2) 6 solutions for soaking : S_0=Control, S_1=Water, S_2=0.25, S_3=0.5, S_4=0.75 and S_5=1.00 molar solutions of A/S.

3. DESIGN :

(i) 2×6 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 55'×11'8". (b) 50'×7'. (v) 2½' on each side. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1948 to 1953. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 253 lb./ac.
(ii) 158.7 lb./ac.
(iii) Only V effect is highly significant.
(iv) Av. yield of *kapas* in lb./ac.

	S_0	S_1	S_2	S_3	S_4	S_5	Mean
V_1	208	252	196	157	162	152	188
V_2	512	421	343	227	227	179	318
Mean	360	336	270	192	194	166	253

S.E. of V marginal means =32.5 lb./ac.
S.E. of S marginal means =56.4 lb./ac.
S.E. of body of table =79.4 lb./ac.

Crop :- Cotton. Ref :- M.P.51(94).

Site :- Institute of Plant Industry, Indore. Type :- 'C'.

Object : —To find out proper spacing for Cotton crop.

1. BASAL CONDITION :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

Two spacings between rows :

1. Control : 18".
2. A set of treatments with closer spacings *i.e.* less than 18" spacing.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 15'×45'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 219 lb /ac.
(ii) 11.66 lb./ac.
(iii) Treatment difference is highly significant.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	171
2.	267
S.E./mean	=4.76 lb./ac.

Crop :- Cotton. Ref :- M.P. 53(6).

Site :- Institute of Plant Industry, Indore. Type :- 'C'.

Object :— To compare the effect of drilling cotton seeds in dry soil before the advent of rains with the normal sown seed at the break of monsoon.

1. BASAL CONDITIONS :

(i) (a) No. (b) Groundnut. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments. (iv) (a) One *bakharing*. (b) Drilling. (c) to (e) N.A. (v) Nil. (vi) Dhar 43. (vii) Unirrigated. (viii) Hand weeding two lines followed by interculture with *daura*. (ix) 32". (x) 4 pickings on 18.11. 1953, 12.12.1953, 18.1.1954 and 5.3.1954.

2. TREATMENTS :

1. Pre-monsoon sowing on 14.6.1953.
2. Pre-monsoon sowing on 22.6.1953.
3. Monsoon sowing on 3.7.1953.

3. DESIGN :

(i) R.B.D (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 50'×28'. (b) 45'×23' 4". (v) 2 rows on each side and 2½' on each end. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1950 to 1953. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 346.0 lb./ac.
(ii) 38.84 lb./ac.
(iii) Treatments do not differ significantly.

(iv) Av. yied of *Kapas* in lb./ac.

Treatment	Av. yield
1.	336
2.	334
3.	368

S.E./mean = 13.73 lb./ac.

Crop :- Cotton. **Ref :- M.P. 53(1).**

Site :- Institute of Plant Industry, Indore. **Type :- 'C'.**

Object :—To study the effect of various cultural operations on the yield of *desi* Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar* and *tur*. (c) Mixture of A/S and G.N.C. (ii) (a) Black cotton soil. (b) N.A. (iii) 9.7.1953. (iv) (a) *Bakharing* once. (b) Drilled. (c) 20 lb./ac. (d) Rows 14" apart. (e) N.A. (v) N.A. (vi) Dhar-43. (vii) Unirrigated. (viii) Hand weeding two times followed by interculture with *daura*. (ix) 32.53". (x) 3 pickings on 1.12.1953, 6.1.1954 and 1.2.1954.

2. TREATMENTS :

Main-plot treatments :

4 ploughings : P_1=One ploughing + *bakhar*, P_2=Two ploughings+*bakhar*, P_3=*Bakhar* and P_4=Ploughing.

Sub-plot treatments :

7 cultural operations : C_0=Control, C_1=Hand weeding, C_2=Interculture with *daura*, C_3=Interculture with ridges, C_4=Hand weeding+interculture with *daura*, C_5=Hand weeding +interculture with ridges and C_6=Hand weeding+interculture with *daura* and ridges.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 40'×18' 8". (b) 35'×14'. (v) 2 rows on each side and 2½' on each end. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) *Kapas* yield. (iv) (a) No. (b) and (c)—. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 481.5 lb./ac.

(ii) (a) 199.3 lb./ac.

(b) 98.6 lb./ac.

(iii) C effect alone is highly significant.

(iv) Av. yield of *kapas* in lb./ac.

	C_0	C_1	C_2	C_3	C_4	C_5	C_6	Mean
P_1	30.5	577.2	274.7	308.0	621.7	654.9	596.1	437.6
P_2	33.3	635.5	346.9	324.7	771.4	702.1	518.9	476.1
P_3	47.2	746.5	222 0	321.9	743.7	743.7	682.6	501.1
P_4	66.6	607.7	316.3	388.5	710.4	729.8	760.3	511.4
Mean	44.4	641.7	290.0	335.8	711.7	707.6	639.5	481.5

S.E. of difference of two

1. P marginal means = 53.27 lb./ac.
2. C marginal means = 34.86 lb./ac.
3. C means at the same level of P = 69.72 lb./ac.
4. P means at the same level of C = 83.68 lb./ac.

Crop :- Cotton. **Ref :- M.P. 53(5).**

Site :- Institute of Plant Industry, Indore. **Type :- 'C'.**

Object :—To find out the best combination of spacing and seed rate for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) Groundnut. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 8.7.1953. (iv) (a) *Bakhared* once. (b) to (d) As per treatments. (e) N.A. (v) Nil. (vi) Dhar-43. (vii) Unirrigated. (viii) 3 hand weedings and interculture with *daura*. (ix) 32.53". (x) 2 pickings on 4.12.1953 and 23.1.1954.

2. TREATMENTS :

Main-plot treatments :

3 seed rates : R_1=10, R_2=20 and R_3=30 lb./ac.

Sub-plot treatments :

4 row spacings : S_1=7, S_2=14, S_3=21 and S_4=28 inches.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 45'×14'. (b) 40'×9'-4". (v) 2½' on either side. (vi) Yes.

4. GENERAL :

(i) Poor growth. (ii) No. (iii) *Kapas* yield. (iv) (a) 1953 to 1956. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 263 lb./ac.

(ii) (a) 62.95 lb /ac.

(b) 54.19 lb./ac.

(iii) R effect alone is highly significant.

(v) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	S_4	Mean
R_1	261	263	256	210	248
R_2	224	325	223	249	255
R_3	293	310	266	276	286
Mean	259	299	248	245	263

S.E. of difference of two

1. R marginal means = 22.26 lb./ac.
2. S marginal means = 22.12 lb./ac.
3. S means at the same level of R = 38.40 lb./ac.
4. R means at the same level of S = 39.96 lb./ac.

Crop :- Cotton. **Ref :- M.P. 52(4).**

Site :- Institute of Plant Industry, Indore. **Type :- 'CV'.**

Object :—To study the effect of pre-monsoon and monsoon sowing on different Cotton varieties.

1. BASAL CONDITIONS :

(i) (a) No. (b) Groundnut. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments. (iv) (a), (b) N.A. (b) 20 lb./ac. (d) 14". (e) N.A. (v) No. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 25.6". (x) 5 pickings on 4.12.1952, 18.12.1952, 16.1.1953, 9.2.1953 and 12.3.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 dates of sowing : D_1=Pre-monsoon (26.6.1952) and D_2=Monsoon (29.9.1952).

(2) 2 varieties : V_1=Dhar and V_2=Indore.

3. DESIGN:

(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 50′×42′. (b) 45′×37.4′. (v) 2½′ on either side. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1948 to 1953. (b) No. (c) N.A. (v) (a) No. (b) N.A. (v.) and (vii) Nil.

5. RESULTS:

(i) 719 lb./ac.

(ii) 242.6 lb./ac.

(iii) V effect alone is highly significant.

(iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	Mean
V_1	846	1074	960
V_2	457	498	477
Mean	652	786	719

S.E. of any marginal mean = 90.9 lb./ac.

S.E. of body of table = 121.3 lb./ac.

Crop :- Cotton. Ref :- M.P. 52(16).

Site :- Govt. Farm, Khandwa. Type :- 'CM'.

Object :- To compare the effect of G.M., F.Y.M. and A/S along with different spacings on Cotton.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 7.7.1952. (iv) (a) *Bakharing*. (b) N.A. (c) 16 lb./ac. (d) As per treatments. (e) —. (v) N.A. (vi) H. 420 (medium). (v i) Unirrigated. (viii) Weeding. (ix) 16.14″. (x) 29.11.1952 and 29.12.1952.

2. TREATMENTS:

1. No manure—18″ spacing.
2. 10 C.L./ac. of F.Y.M.—18″ spacing.
3. 20 lb /ac. of N as A/S drilled at sowing—18″ spacing.
4. 20 lb./ac. of N as A/S top dressed—18″ spacing.
5. Sannhemp—9″ spacing.
6. Sannhemp+ 1 cwt/ac. of P_2O_5 drilled at sowing—9″ spacing.
7. *Udid* as G.M —9″ spacing.
8. *Udid*+ 1 cwt/ac. of P_2O_5 drilled at sowing—9″ spacing.
9. No manure—24″ spacing.
10. 10 C.L /ac. of F.Y.M.—24″ spacing.
11. 20 lb /ac of N as A/S drilled at sowing—24″ spacing.
12. 20 lb /ac. of N as A/S top dressed—24″ spacing.
13. Sannhemp—12″ spacing.
14. Sannhemp+1 cwt/ac. of P_2O_5 drilled at sowing—12″ spacing.
15. *Udid*—12″ spacing.
16. *Udid*+ 1 cwt/ac. of P_2O_5 drilled at sowing—12″ spacing.

3. DESIGN:

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 13′×37.3′. (b) 12′×36.3′. (v) ½′ on either side. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1952-1956. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 484.4 lb./ac.

(ii) 100.0 lb./ac.

(iii) Treatments do not differ significantly.

(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	375.0	9.	387.5
2.	550.0	10.	500.0
3.	562.5	11.	562.5
4.	550.0	12.	556.2
5.	475.0	13.	450.0
6.	493.8	14.	431.2
7.	475.0	15.	412.5
8	512.5	16.	456.2

S.E./mean = 50.00 lb./ac.

Crop :- Cotton. Ref :- M.P. **53(24).**

Site :- Govt. Farm, Khandwa. Type :- 'CM'.

Object :—To compare the effect of G.M., F.Y.M. and A/S along with different spacings on Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 23.6.1953. (iv) (a) *Bakharing* and hoeing. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) H. 420 (medium). (vii) Unirrigated. (viii) Weeding, thinning and hoeing. (ix) 32.30". (x) 3 pickings. Last picking on 9.2.1954.

2. TREATMENTS :

1. No manure—18" spacing.
2. 10 C.L./ac. of F.Y.M.—18" spacing.
3. 20 lb./ac. of N as A/S drilled at sowing—18" spacing.
4. 20 lb./ac. of N as A/S top dressed—18" spacing.
5. Sannhemp—9" spacing.
6. Sannhemp+1 cwt/ac. of P_2O_5 drilled at sowing—9" spacing.
7. *Udid* as G.M.—9" spacing.
8. *Udid*+1 cwt/ac. of P_2O_5 drilled at sowing—9" spacing.
9. No manure—24" spacing.
10. 10 C.L./ac. of F.Y.M—24" spacing.
11. 20 lb./ac. of N as A/S drilled at sowing—24" spacing.
12. 20 lb./ac. of N as A/S top dressed—24" spacing,
13. Sannhemp—12" spacing.
14. Sannhemp+1 cwt/ac. of P_2O_5 drilled at sowing—12" spacing.
15. *Udid*—12" spacing.
16. *Udid*+1 cwt/ac. of P_2O_5 drilled at sowing—12" spacing

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 12'×36.3'. (v) N.A. (vi) Yes

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1952 to 1956. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 606.1 lb./ac.

(ii) 143.6 lb./ac.

(iii) Treatments differ highly significantly.

(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	472.5	9.	603.7
2.	508.7	10.	755.7
3.	535.0	11.	776.2
4.	522.5	12.	738.7
5.	469.5	13.	563.7
6.	546.7	14.	863.3
7.	435.0	15.	611.3
8.	492.0	16.	803.8

S.E./mean =71.80 lb./ac.

Crop :- Cotton. **Ref :- M.P. 49(9).**

Site :- Institute of Plant Industry, Indore. **Type :- 'CMV'.**

Object :—To study the effect of dates of sowing and manures on the yield of different varieties of Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments. (iv) (a) and (b) N.A. (c) As per treatments. (d) 14". (e) N.A. (v) N.A. (vi) As per treatments. (vii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

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

(1) 3 varieties : V_1=*Dhar* 43, V_2=*Jarilla* and V_3=Indore 1.

(2) 2 times of sowing : S_1=Pre-monsoon and S_2=At monsoon.

(3) 2 seed rates : R_1=20 and R_2=30 lb./ac.

Sub-plot treatments :

2 levels of N as A/S : N_0=0 and N_1=30 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 12 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 9'4"×30'. (b) 4'8"×25'. (v) Two rows on both sides and 2½' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) First sowing was done on 10.6.1949 But there were heavy rains on 3rd and 4th June 1949. Hence the experiment cannot be treated as pre-monsoon *vs* monsoon sowing but as early sowing *vs* normal sowing. (vii) Nil.

5. RESULTS :

(i) 297.8 lb./ac.

(ii) (a) 111.9 lb./ac.

(b) 38.9 lb./ac.

(iii) V, R, S and interactions NV, NR and NS are highly significant.

(iv) Av. yield of *kapas* in lb /ac.

	S_1	S_2	R_1	R_2	N_0	N_1	Mean
V_1	570.3	180.9	393.8	357.3	325.2	425.9	375.6
V_2	437.5	107.9	287.3	258.1	285.9	259.6	272.7
V_3	439.0	51.0	247.9	242.1	230.4	259.6	245.0
Mean	482.3	113.3	309.7	285.9	280.5	315.0	297.8
N_0	446.3	114.7	294.6	266.4			
N_1	518.2	111.8	324.8	305.3			
R_1	500.7	118.6					
R_2	463.8	107.9					

S.E. of difference of two

1. V marginal means =27.97 lb./ac.
2. S or R marginal means =22.84 lb./ac.
3. N marginal means = 7.95 lb./ac.
4. N means at the same level of V =13.76 lb./ac.
5. V means at the same level of N =29.62 lb./ac.
6. N means at the same level of R or S =11.23 lb./ac.
7. R or S means at the same level of N =24.18 lb./ac.
8. means in the body of V×R or V×S tables =39.57 lb./ac.
9. means in the body of R×S table =32.30 lb./ac.

Crop :-Cotton. Ref :- M.P. 50(31).

Site :- Central Res. Farm, Ujjain. Type :- 'CMV'.

Object :— To study the response of different varieties to application of N and sowing conditions.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Gram. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments. (iv) (a) *Bakharing*. (b) Drilling. (c) N.A. (d) 18". (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) 3 Inter-cultivations with *desi doura*. (ix) N.A. (x) 23.11.1950. and 13.1.1951.

2. TREATMENTS :

Main-plot treatments :

6 manures : M_0=0, M_1=10 lb./ac. of N as A/S, M_2=20 lb./ac. of N as A/S, M_3=10 C.L./ac of F.Y.M. $M_4=M_1+M_3$ and $M_5=M_2+M_3$.

Sub-plot treatments :

2 sowing dates : D_1=Sowing before rains on 16,17.6.1950. and D_2=With rains on 13.7.1950.

Sub-sub plot treatments :

2 varieties : V_1=Combodia and V_2=G-16.

3. DESIGN :

(i) Split split-plot. (ii) (a) 6 main-plots/block ; 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 6. (iv) (a) Main-plot : 24'×72', sub-plot : 12'×72' and sub-sub-plot : 6'×72'. (b) 3'×66'. (v) One row on both sides and 3' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield, ginning percentage per plot and staple length. (iv) (a) 1950 to 1951. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 466 lb./ac.

(ii) (a) 113.7 lb./ac.

(b) 111.5 lb./ac.

(c) 81.1 lb./ac.

(iii) M and V effects are significant. Others are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	M_0	M_1	M_2	M_3	M_4	M_5	Mean	V_1	V_2
D_1	477	477	474	472	488	544	480	475	486
D_2	372	463	468	441	452	518	452	422	482
Mean	400	470	471	457	470	531	449	449	484
V_1	360	468	456	425	461	523			
V_2	440	472	486	488	479	540			

S.E. of difference of two

1. M marginal means =32.8 lb./ac.
2. D marginal means =18.6 lb./ac.
3. V marginal means =13.5 lb./ac.
4. D means at a level of M =45.5 lb./ac.
5. M means at a level of D =45.9 lb./ac.
6. V means at a level of M =33.1 lb./ac.
7. M means at a level of V =40.3 lb./ac.
8. V means at a level of D =19.1 lb./ac.
9. D means at a level of V =22.9 lb./ac.

Crop :- Cotton. Ref :- M.P. 51(3).

Site :- Central Res. Farm, Ujjain. Type :- 'CMV.'

Object :— To study the response of different varieties to application of N and sowing conditions.

1. BASAL CONDITIONS :

(i) (a) No. (b) Wheat. (c) No. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and *daura*. (ix) 30.87". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

6 manures : M_0=0, M_1=10 lb./ac. of N as A/S, M_2=20 lb./ac. of N as A/S, M_3=10 C.L./ac. of F.Y.M. $M_4=M_1+M_3$ and $M_5=M_2+M_3$.

Sub-plot treatments :

2 sowing dates : D_1=Sowing before rains and D_2=sowing with rains.

Sub-sub-plot treatments :

2 varieties : V_1=Combodia and V_2=G-16.

3. DESIGN :

(i) Split split-plot. (ii) (a) 6 main-plots/block ; 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 6. (iv) (a) 6'×72'. (b) 3'×66'. (v) One row on either side and 3 feet of each row at both ends. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of *kapas*, staple length and ginning percentage. (iv) (a) and (b) No. (c) N.A. (v) (a) and (b) N.A. (iv) and (vii) Nil.

5. RESULTS :

(i) 327.93 lb./ac.

(ii) (a) 114.67 lb./ac.
(b) 87.45 lb./ac.
(c) 56.92 lb./ac.

(iii) V and M effects are highly significant. Interactoin VM is significant. Other effects are not significant.

(iv) Av. .yield of *kapas* in lb./ac.

	M_0	M_1	M_2	M_3	M_4	M_5	Mean	V_1	V_2
D_1	259	326	449	347	325	257	327	238	416
D_2	239	321	393	331	368	304	326	215	437
Mean	249	324	421	339	346	281	327	227	427
V_1	168	238	311	209	242	192			
V_2	329	410	532	469	451	370			

S.E. of difference of two

1. M marginal means =33.11 lb./ac.
2. D marginal means =14.58 lb./ac.
3. V marginal means = 9.49 lb./ac.
4. D means at the same level of M =35.75 lb./ac.
5. M means at the same level of D =41.66 lb./ac.
6. V means at the same level of M =23.92 lb./ac.
7. M means at the same level of V =37.13 lb./ac
8. V means at tfie same level of D =13.75 lb./ac.
9. D means at the same level of V =17.60 lb /ac.

Crop :- Cotton. Ref :- M.P. 53(14).

Site :- Institute of Plant Industry, Indore. Type :- 'D'.

Object :—To study the effect of soaking Cotton seeds in molar solution on its yield.

1. BASAL CONDITIONS :

(i) (a) No. (b) Groundnut. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 8.7.1953. (iv) (a) *Bakhared*. (b) Drilling. (c) 20 lb./ac. (d) Between rows—7". (e) N.A. (v) Nil. (vi) *Dhar*-43. (vii) Unirrigated. (viii) Hand weeding two times followed by interculture with *daura*. (ix) 32.53". (x) 3 pickings : 27.11.1953, 26.12.1953 and 21.1.1954.

2. TREATMENTS :

All combinations of (1), (2) and (3)+3 extra treatments.

(1) 3 concentrations : C_1=0.1, C_2=0.2 and C_3=0.3 molars.

(2) 2 sources of solutions : S_1=A/S and S_2=Super.

(3) 2 period of soaking : H_1=4 and H_2=8 hours.

3 extra treatments are : T_1=Dry seeds (4 plots/block), T_2=Soaked in water for 4 hours (2 plots/block) and T_3=Soaked in water for 8 hours (2 plots/block).

3. DESIGN :

(i) R.B.D. (ii) (a) 20. (b) N.A. (iii) 3. (iv) (a) 60'×14'. (b) 55'×9'-4". (v) 2 rows on each side and 2½' on each end. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1948—1953. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 373 lb./ac.

(ii) 46 62 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of *Kapas* in lb./ac.

T_1=382 lb./ac., T_2=362 lb./ac. and T_3=342 lb./ac.

	C_1	C_2	C_3	Mean	S_1	S_2
H_1	375	394	380	383	373	388
H_2	400	371	339	370	380	361
Mean	388	383	360	377	379	374
S_1	396	362	380			
S_2	379	404	339			

S.E. of C marginal means	=13.46 lb./ac.	S.E. of T_2 or T_3 means	=19.03 lb./ac.
S.E of H or S marginal means	=10.99 lb./ac	S.E. of body of C×S or C×H tables	=19.03 lb./ac.
S.E. of T_1 mean	=13.46 lb./ac.	S.E. of body of H×S table	=10.99 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. 49(69).

Site :- Institute of Plant Industry, Indore. Type :- 'D'.

Object :—To find out the effect of insecticides on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

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

(1) 2 insecticides : C_1=Guesrol-550 and C_2=Guesrol-410.

(2) Number of applications : A_1=one and A_2=2.

Insecticides dusted on 25.7.1949 and 25.8.1949.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 5'×33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) No. (b) and (c)—. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C C.).

5. RESULTS :

(i) 268 lb./ac.

(ii) 49.84 lb./ac.

(iii) Control *vs.* treated is highly significant. A effect is significant. Other effects are not significant.

(iv) Av. yield of *kapas* in lb./ac.

Control=181 lb./ac.

	A_1	A_2	Mean
C_1	246	329	288
C_2	257	325	291
Mean	252	327	290

S.E. of any marginal mean =17.62 lb./ac.
S.E. of body of table =24.92 lb./ac.

Crop :- Cotton (*Kharif*). **Ref :- M.P. 50(71).**

Site :- Institute of Plant Industry, Indore. **Type :- 'D'.**

Object :—To find out the effect of insecticides on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2) + 2 controls (no treatment)

(1) 2 insecticides : C_1=Guesrol-550 and C_2=Guesrol-410.

(2) No. of applications : A_1=one, A_2=two and A_2=three.

Insecticides applied on 10.8.1950, 10.9.1950 and 10.10.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) N.A. (v) N.A. (vi) N.A.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) No. (b), (c) —. (v) (a), (b) N.A. (vi) Nil. (vii) Raw data N.A. Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) to (iii) N.A.

(iv) Av. yield of *kapas* in lb./ac.

Control =N.A.

	A_1	A_2	A_3	Mean
C_1	308	256	314	293
C_2	329	288	303	307
Mean	319	272	309	300

S.E. of C marginal means =11.83 lb./ac.
S.E. of A marginal means =14.49 lb./ac.
S.E. of body of table =20.49 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. 51(96).

Site :- Institute of Plant Industry, Indore. Type :- 'D'.

Object :—To study the effect of spraying harmones on Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

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

1. 3 harmones : H_1=Tri-iodo Benzoic Acid, H_2=Naphthalene acetic acid and H_3=Indoly Buteric acid.
2. 2 concentrations : C_1=25 and C_2=50 p.p.m.
   8 gallon/ac. of solution sprayed.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 9'×35'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 788 lb./ac.

(ii) 55.57 lb./ac.

(iii) Control *vs.* others effect is highly significant. H effect is significant. Others are not significant.

(iv) Av. yield of *kapas* in lb./ac.

Control =647 lb./ac.

	H_1	H_2	H_3	Mean
C_1	755	823	830	803
C_2	777	839	848	821
Mean	766	831	839	812

S.E. of H marginal mean =19.65 lb./ac.
S.E. of C marginal mean =16.04 lb./ac.
S.E. of body of table =27.79 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. 52(81).

Site :- Institute of Plant Industry, Indore. Type :- 'D'.

Object :—To study the effect of spraying harmones on Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) Indore 1. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control.
2. Spraying Tri-iodo Benzoic Acid (TIBA).
3. Spraying Naphthalene Acetic Acid (NAA).
4. Spraying Indoly Buteric Acid (IBA).

Concentrations of sprays—N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) and (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6'×27'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (e) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 798 lb./ac.
(ii) 63.40 lb /ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	802
2.	735
3.	832
4.	823
S.E./mean	=31.70 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. 52(80).
Site :- Institute of Plant Industry, Indore. Type :-'D'.

Object :—To study the effect of spraying harmones on Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) Indore I. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control.
2. Spraying Tri-iodo Benzoic Acid (TIBA).
3. Spraying Naphthalene Acitic Acid (NAA).
4. Spraying Indoly Buteric Acid (IBA).

Concentrations of sprays—N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 7½'×30'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (e) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.),

5. RESULTS :

(i) 793 lb./ac.
(ii) 100.4 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	814
2.	742
3.	804
4.	814
S.E./mean	=50.2 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. 52(79).
Site :- Institute of Plant Industry, Indore. Type :- 'D'.

Object :—To study the effect of spraying harmones on the Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 22.6.1952. (iv) (a) to (e) N.A. (v) 20 lb./ac. of N as municipal compost applied in May 1952. (vi) *Dhar*-43. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control.
2. Spraying Tri-iodo Benzoic Acid (TIBA).
3. Spraying with Naphthalene Acetic Acid (NAA).
4. Spraying with Indoly Buteric Acid (IBA).

Date of spraying 12 8.1952.

3. DESIGN

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/197.55 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 481 lb./ac.
(ii) 49.94 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	471
2.	494
3.	443
4.	518
S.E./mean	=24.97 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. **53(105).**

Site :- Institute of Plant Industry, Indore. Type :- 'D'.

Object :—To study the effect of spraying harmones on Cotton yield.

1. BASAL CONDITIONS :

(i) (a) Nil (b) Groundnut. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.7.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) Indore. II. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2) +2 controls.

(1) 3 concentrations of alpha naphthalene acetic acid : $C_1=10$, $C_2=20$ and $C_3=30$ p.p.m.
(2) 2 dates of spraying : $D_1=27.8.1953$ and $D_2=16.9.1953$.

Alpha Naphthalene Acetic acid sprayed at 80 gallon/ac.

3. DESIGN

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 46'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 106 lb./ac.
(ii) 46.09 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of *kapas* in lb./ac.

Control=114 lb./ac.

	C_1	C_2	C_3	Mean
D_1	75	120	115	103
D_2	110	131	69	103
Mean	93	125	92	103

S.E. of D marginal mean =13.30 lb./ac.
S.E. of C marginal mean =16.29 lb./ac.
S.E. of body of table =23.04 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. 53(104).

Site :- Institute of Plant Industry, Indore. Type :- 'D'.

Object :—To study the effect of spraying harmones on Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 2.7.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) *Dhar* 43. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+2 controls

(1) 3 concentrations of Alpha Naphthalene Acetic Acid : C_1=10, C_2=20 and C_3=30 p.p.m.

(2) 2 dates of spraying : D_1=26.8.1953 and D_2=15.9.1953.

Alpha Naphthalene Acitic Acid sprayed at 80 gallon/ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 37×16½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS :

(i) 537 lb./ac.

(ii) 64.87 lb./ac.

(iii) 'Control *vs.* other effects' alone is highly significant.

(iv) Av. yield of *kapas* in lb./ac.

Control =466 lb./ac.

	C_1	C_2	C_3	Mean
D_1	568	538	517	541
D_2	583	593	569	581
Mean	575	565	543	561

S.E. of D marginal mean =21.62 lb./ac.

S.E. of C marginal mean =26.48 lb./ac.

S.E. of body of table =37.45 lb./ac.

Crop :- Cotton (*Kharif*). Ref :- M.P. 53(103).

Site :- Institute of Plant Industry, Indore. Type :- 'D'.

Object :—To study the effect of spraying harmones on Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Moong*. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 4.7.1953. (iv) (a) to (e) N.A. (v) Nil. (v)) *Dhar* 43. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+2 controls

(1) 3 concentrations of Alpha Naphthalene Acetic Acid : C_1=10, C_2=20 and C_3=30 p.p.m.

(2) 2 dates of spraying : D_1=27.8.1953 and D_2=16.9.1953.

Alpha Naphthalene Acetic Acid sprayed at 80 gallon/ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 37'×19'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.)

5. RESULTS :

(i) 386 lb./ac.
(ii) 98.47 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of *kapas* in lb./ac.

Control =372 lb./ac.

	C_1	C_2	C_3	Mean
D_1	348	376	482	402
D_2	321	405	410	379
Mean	335	391	446	391

S E. of D marginal mean =28.43 lb./ac.
S.E. of C marginal mean =34.81 lb./ac.
S.E. of body of table =49.24 lb./ac.

Crop :- Sugarcane. Ref :- M.P. 49(49).

Site :- Harsi Experimental Farm, Bagwai. Type :- 'M'.

Object :—To ascertain which of the organic or inorganic manures and their mixtures are best suited to Sugarcane under local conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, Bagwai. (iii) 22.23.1.1949. (iv) (a) Ploughing and planking. (b) Ridge planting. (c) to (e) N.A. (v) Nil. (vi) CO.421. (vii) Irrigated. (viii) Weeding twice. (ix) 22.55". (x) N.A.

2. TREATMENTS :

1. F.Y.M. at 120 lb./ac. of N.
2. A/S at 120 lb./ac. of N.
3. G N C. at 120 lb./ac. of N.
4. F.Y.M. at 60 lb./ac. of N. + A/S at 60 lb./ac. of N.
5. F.Y.M. at 60 lb./ac. of N. + G.N.C. at 60 lb./ac. of N.
6. Control.

3. DESIGN .

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a), (b) 75'×21'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Sugarcane yield. (iv) (a) No. (b) N.A. (c) N.A. (v) (a) Nil. (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 11.19 ton/ac.
(ii) 1.82 ton/ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	10.05
2.	14.95
3.	11.92
4.	12.94
5.	11.19
6.	6.11
S.E./mean	=0.91 ton/ac.

Crop :- Sugarcane. **Ref :- M.P. 51(42).**

Site :- Harsi Experimental Farm, Bagwai. **Type :- 'M'.**

Object :- To find out suitable manurial dose of N and P for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Bagwai. (iii) 9 to 12.2.1951. (iv) (a), (b) Ploughing by *desi* plough. Levelling after giving basal manure. Spreading the manure, ploughing by *desi* plough 5 times. Making ridges by *jagat* ridger. (c) Total weight of sugarcane sown is 28 mds and 35 srs. (d) 3' between ridges. (e) —. (v) For two blocks sheep dung at 13 C.L. and for the remaining two blocks F.Y.M. at 16 C.L. (vi) CO.453. (vii) (vii) Irrigated. (viii) Interculturing and two earthings. (ix) 23.3." (x) N.A.

2. TREATMENTS :

1. A/S at 80 lb./ac. of N.
2. A/S at 120 lb./ac. of N.
3. A/S at 160 lb./ac. of N.
4. A/S at 200 lb./ac. of N.
5. 80 lb./ac. of N as A/S and G.N.C. in 1 : 1 ratio.
6. 100 lb./ac. of N as A/S and G.N.C. in 1 : 1 ratio.
7. A/S at 80 lb./ac. of N + Super at 50 lb./ac. of P_2O_5.
8. A/S at 160 lb./ac. of N + Super at 50 lb./ac. of P_2O_5.
9. Control (20 C.L. of F.Y.M. + 40 lb. of N as G.N.C.)

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 24'×78'. (b) 12'×72'. (v) Two rows on both sides and 3' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Total weight of sugarcane per plot, number of canes per plot. (iv) (a) to (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 47.16 ton/ac.
(ii) 3.48 ton/ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of sugarcane in ton./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	41.55	6.	51.93
2.	42.92	7.	51.07
3.	45.31	8.	55.46
4.	48.39	9.	40.70
5.	47.14		

S.E./mean =1.74 ton/ac.

Crop :- Sugarcane. **Ref :- M.P. 48(12).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :- To study the effect of different doses of N as mixtures of A/S, G.N.C. and Castor cake singly and in combination with F.Y.M. and Farm Compost.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) *Bakharing*. (b) N.A. (c) 2400 cane setts/ca. (d) 3'. (e) N.A. (v) As per treatments. (vi) CO. 419. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

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

(1) 2 basal manures : B_1=F.Y.M. and B_2= F.C. each at 50 lb./ac. of N.
(2) 4 levels of N : N_1=50, N_2=100, N_3=150 and N_4=200 lb./ac.
(3) 2 sources of N : S_1=A/S+G.N.C. in 1 : 1 ratio and S_2=A/S+Castor cake in 1 : 1 ratio.

3. DESIGN :

(i) 2×4×2 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) 18'×40'. (b) 12'×40'. (v) One row on both sides. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) No. of canes, cane weight, weight of juice and *gur*. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

RESULTS :

(i) 5.46 ton/ac.
(ii) 1.46 ton/ac.
(iii) N effect is highly significant, interaction B×N×S is significant, while all other effects are not significant.
(iv) Av. yield of sugarcane in ton/ac.

	N_1	N_2	N_3	N_4	Mean	S_1	S_2
B_1	4.38	5.76	6.33	6.07	5.63	5.69	5.57
B_2	3.44	5.37	6.29	6.05	5.29	5.49	5.08
Mean	3.91	5.56	6.31	6.06	5.46	5.59	5.33
S_1	4.38	5.66	6.68	5.64	5.59		
S_2	3.43	5.46	5.94	6.48	5.33		

S.E. of N marginal means =0.42 ton/ac.
S.E. of B or S marginal means =0.30 ton/ac.
S.E. of body of B×N or N×S table =0.60 ton/ac.
S.E. of body of B×S table =0.42 ton/ac.

Crop :- Sugarcane. Ref : M.P. 51(10).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the effect of different doses of N as mixtures of A/S, G.N.C. and Castor cake singly and in combination with F.Y.M. and Farm Compost.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 20.2.1951. (iv) (a) N.A. (b) Planted. (c) N.A. (d) Rows 3′ apart. (e) N.A. (v) As per treatments. (vi) CO. 419. (vii) Irrigated (viii) to (x) N.A.

2. TREATMENTS :

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

(1) 2 basal dressings : B_1=F.Y.M. and B_2=F.C. each at 50 lb./ac. of N.
(2) 4 levels of N : N_1=50, N_2=100, N_3=150 and N_4=200 lb./ac. of N.
(3) 2 sources of N : S_1=A/S+G.N.C. in 1 : 1 ratio and S_2=A/S+Castor cake in 1 : 1 ratio.

3. DESIGN :

(i) 2×4×2 Fact. in R.B.D. (ii) (a) 16. (b) 60′×144′. (iii) 3. (iv) (a) 30′×18′. (b) 30′×12′. (v) One row on both sides. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Stand of 4 rows, cane number, cane weight and *gur* weight. (iv) (a) 1948—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 30.49 ton/ac.
(ii) 4.29 ton/ac.
(iii) S effect and interaction B×N×S are significant. Other effects are not significant.

(iv) Av. yield of sugarcane in ton/ac.

	N_1	N_2	N_3	N_4	Mean	S_1	S_2
B_1	29.16	33.12	29.67	28.06	30.00	30.74	29.26
B_2	29.37	32.48	31.95	30.17	30.99	33.03	28.96
Mean	29.27	32.80	30.81	29.11	30.49	31.88	29.11
S_1	31.29	34.38	30.95	30.92	31.88		
S_2	27.25	31.22	30.67	27.31	29.11		

S.E. of N marginal means =1.24 ton/ac.
S.E. of B or S marginal means =0.88 ton/ac.
S.E. of body of B×N or S×N table =1.75 ton/ac.
S.E. of body of B×S table =1.24 ton/ac.

Crop :- Sugarcane. Ref :- M.P. 49(41).

Site :- Govt. Seed and Demonstration Farm, Bilaspur. Type :- 'C'.

Object :—To ascertain the most suitable spacing for Sugarcane on *kankar* soil.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kankar.* (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) 150 lb./ac. of N. (vi) CO. 312. (vii) Irrigated. (viii) and (ix) N.A. (x) 12 to 15.3.1950.

2. TREATMENTS :

4 spacings between rows : S_1=2.5', S_2=3' S_3=3.5' and S_4=4'.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 33'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Sugarcane yield. (iv) (a) No. (b) and (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 21 42 ton/ac.
(ii) 4.05 ton/ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
S_1	23.56
S_2	22.62
S_3	19.81
S_4	19.71
S.E./mean	=1.65 ton/ac.

Crop :- Sugarcane. Ref :- M.P. 49(42).

Site :- Govt. Seed and Demonstration Farm, Bilaspur. Type :- 'C'.

Object :—To find out the optimum seed rate for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) N.A. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Planted in rows. (c) As per treatments. (d) 2½' apart. (e) —. (v) 150 lb./ac. of N. (vi) CO. 312. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

5 seed rates : R_1=12000, R_2=15000, R_3=18000, R_4=21000 and R_5=24000 setts/ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 33' x 16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and ii) N.A. (iii) Sugarcane, juice and *gur* yield. (iv) (a) 1948 –1949. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 12.84 ton/ac.
(ii) 3 14 ton/ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
R_1	21.48
R_2	24.37
R_3	25.06
R_4	21.35
R_5	21.96

S.E./mean =1.28 ton/ac.

Crop :- Sugarcane. Ref :- M.P. 49(43).

Site :- Govt. Seed and Demonstration Farm, Bilaspur. Type :- 'CM'.

Object :—To study the interaction of manuring and method of planting on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kankar*. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) As per treatments. (c) to (e) N.A. (v) 56 lb./ac. of N as cake and 64 lb./ac. of N as A/S. (vi) CO.312. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 methods of planting : M_1=dry planting and M_2=wet planting.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of P_2O_5 : P_0=0 and P_1=60 lb./ac.

(2) 2 levels of K_2O : K_0=0 and K_1=60 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Sugarcane, juice and *gur* yield. (iv) (a) 1948—1949. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 28.45 ton/ac.
(ii) (a) 3.88 ton/ac.
(b) 3 37 ton/ac.
(iii) None of the effects is significant.

(iv) Av. yield of sugarcane in ton/ac.

	P_0	P_1	Mean	K_0	K_1
M_1	28.33	30.35	29.34	28.93	29.75
M_2	27.70	27.44	27.57	27.20	27.95
Mean	28 01	28.89	28.45	28.06	28.85
K_0	27.94	28.18	28.06		
K_1	28.09	29.60	28.85		

S.E. of difference of two

1. M marginal means =1.58 ton/ac.
2. P or K marginal means =0.69 ton/ac.
3. P or K means at the same level of M =1.38 ton/ac.
4. M means at the same level of P or K =1.48 ton/ac.
5. means in the body of P × K table =0.97 ton/ac.

Crop :- Sugarcane. Ref :- M.P. 49(44).

Site :- Govt. Seed and Demonstration Farm, Bilaspur. Type :- 'I'.

Object :—To find out the optimum interval for irrigation to Sugarcane.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kankar*. (b) N.A. (iii) 12 to 18.2.1949. (iv) (a) N.A. (b) Wet method of planting. (c) and (d) N.A. (e) —.(v) N.A. (vi) CO. 312. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 7 to 9 3.1950.

2. TREATMENTS :

3 intervals of irrigation : I_1=10. I_2=20 and I_3=30 days interval.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 16½'×33'. (v) N.A. (iv) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of sugarcane, juice and *gur*. (iv) (a) 1948 to 1949. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 36.35 ton/ac.
(ii) 7.02 ton/ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	40.09
2.	34.66
3.	34.29
S.E./mean	= 2.87 ton/ac.

Crop :- Linseed. (*Rabi*). Ref :- M.P. 48(14).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find the optimum manurial dose for Linseed.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) *Bakharing*. (b) and (c) N.A. (d) 14" between rows. (e) N.A. (v) N.A. (iv) Linseed type 6. (vii) N.A. (viii) Weeding and hoeing. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as G.N.C. : N_0=0, N_1=20 and N_2=40 lb./ac. of N.

(2) 3 levels of P_2O_2 as Super : P_0=0, P_1=20 and P_2=40 lb./ac. of P_2O_5.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 10′×34′4″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of seed and fodder. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 657.9 lb./ac.

(ii) 82.0 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of linseed in lb./ac.

	N_0	N_1	N_2	Mean
P_0	662.7	643.3	664.2	656.7
P_1	646.3	631.3	652.2	643.3
P_2	686.7	661.2	673.2	673.7
Mean	665 2	645.3	663.2	657.9

S.E. of any marginal mean = 19.33 lb./ac.

S.E. of body of table = 33.48 lb./ac.

Crop :- Linseed (*Rabi*). Ref :- M.P. 48(17).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find the suitable combination of N and P for Linseed.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Sann.* (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) *Bakharing*. (b) and (c) N.A. (d) 14″ between rows. (e) N.A. (v) G.M. by *sann.* (vi) I.P.I. type 6. (vii) N.A. (viii) *Daura* weeding. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of G.N.C. : N_0=0, N_1=20 and 40 lb./ac. of N.

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

3. DESIGN :

(i) 3×5 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 14′×35′. (b) 10′×30′ 4″. (v) 2′ 4″×2′. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Seed and fodder yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 389.3 lb./ac.

(ii) 56.2 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of linseed in lb./ac.

	N_0	N_1	N_2	Mean
P_0	344.1	383.0	396.4	374.5
P_1	381.5	399.4	393.4	391.4
P_2	393.4	424.8	387.4	401.9
Mean	373.0	402.4	392.4	389.3

S.E. of any marginal mean =13.25 lb./ac.
S.E. of body of table =22.94 lb./ac.

Crop :- Linseed. **Ref :- M.P. 49(20).**
Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To study the effect of graded doses of N singly and in combination with different doses of P_2O_5.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.11.1949. (iv) (a) to (c) N.A. (d) 14". (e) N.A. (v) N.A. (vi) I.P.I. type 6. (vii) N.A. (viii) N.A. (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=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. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A, (b) 10'×23' 4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Seed and fodder yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) N.A. (vii) The field in which the experiment is laid out is water logged field.

5. RESULTS :

(i) 425.7 lb./ac.
(ii) 69.67 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of linseed in lb./ac.

	N_0	N_1	N_2	Mean
P_0	386.1	411.3	436.5	411.3
P_1	461.7	415.2	448.1	441.7
P_2	457.8	393.8	421.0	424.2
Mean	435.2	406.8	435.2	425.7

S.E. of any marginal mean =16.42 lb./ac.
S.E. of body of table =28.44 lb./ac.

Crop :- Linseed. Ref :- M.P. 49(25).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the response of Linseed to the application of N and P_2O_5 singly and in combination.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 30.11.1949. (iv) (a) to (c) N.A. (d) 14" between rows. (e) N.A. (v) N.A. (vi) I.P.I. type 5. (vii) N.A. (viii) Weeding. (ix) N.A. (x) N.A.

2. 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.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 35'×14'. (b) 30' 4"×10'. (v) 2' 4"×2'. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Weight of seed and fodder. (iv) (a) to (c) N.A. (v) (a) N.A. (b) N.A. (vi) Nil. (vii) The field in which this experiment is laid out is a rich field.

5. RESULTS :

(i) 505.3 lb./ac.

(ii) 49.3 lb./ac.

(iii) Main effects of N and P and their interaction are significant.

(iv) Av. yield of seed in lb./ac.

	N_0	N_1	N_2	Mean
P_0	429.0	537.0	483.0	483.0
P_1	519.0	525.0	553.5	532.5
P_2	495.0	484.5	522.0	500.5
Mean	481.0	515.5	519.5	505.3

S.E. of any marginal mean = 11.62 lb./ac.

S.E. of body of table = 20.13 lb./ac.

Crop :- Linseed. Ref :- M.P. 50(1).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the response of N and P singly and in combination on the yield of Linseed.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 13.10.1950. (iv) (a) to (e) N.A. (v) N.A. (vi) Linseed I.P.I. type. (vii) Un-irrigated. (viii) N.A. (ix) N.A. (x) 8.3.1951.

2. TREATMENTS :

All combinations (1) and (2)

(1) 2 levels of N as A/S : $N_0=0$ and $N_1=20$ lb./ac.

(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=20$ lb./ac.

3. DESIGN :

(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 35'8"×15'. (b) 30' 8"×10'. (v) 2½' all round. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) Yield of seed/plot. (iv) (a) N.A. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 316.8 lb./ac.
(ii) 43.12 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of seed in lb./ac.

	N_0	N_1	Mean
P_0	316.5	307.6	312.1
P_1	313.5	329.8	321.6
Mean	315.0	318.7	316.8

S.E. of any marginal mean =12.45 lb./ac.
S.E. of body of table =17.60 lb./ac.

Crop :-Linseed. Ref :- M.P. 50(3).
Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the response of N and P singly and in combination on the yield of Linseed.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 16.10.1950. (iv) (a) to (e) N.A. (v) N.A. (vi) Linseed I.P.I. type (late). (vii) Unirrigated. (viii) N.A. (ix) Nil. (x) 10.3.1951.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 2 levels of N as A/S : $N_0=0$ and $N_1=20$ lb./ac.
(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=20$ lb./ac.

3. DESIGN :

(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 35′8″×15′. (b) 30′8″×10′. (v) 2½′ alround. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) Yield of seed/plot. (iv) (a) N.A. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 409.6 lb./ac.
(ii) 51.74 lb /ac.
(iii) None of the effects is significant.
(iv) Av. yield of seed in lb./ac.

	N_0	N_1	Mean
P_0	431.8	415 6	423.7
P_1	372.7	418.5	395.6
Mean	402.3	417.0	409.6

S.E. of any marginal mean =14.93 lb./ac.
S.E. of body of table =21.12 lb./ac.

Crop :- Linseed (*Rabi*). Ref :- M.P. 49(7).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To study the effect of treating seed in different nutrients before sowing on the yield of Linseed.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 9.11.1949. (iv) (a) *Bakharing*. (b) and (c) N.A. (d) 14" between rows. (e) N.A. (v) N.A. (vi) I.P.I. type 6. (vii) N.A. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

1. Dry seed (control).
2. Seed soaked in pure water.
3. Seed soaked in A/S solution (one molar solution).
4. Seed soaked in Ammo. Phos. solution (one molar solution).
5. Seed soaked in Potassium Phosphate solution.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 50'×9'4". (b) 45'×4'8". (v) 2 rows on both sides and 2½' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Weight of seed and fodder. (iv) (a) N.A.—1949. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Germination in Ammo. Phos. solution treatment was poor. (vii) Nil.

5. RESULTS :

(i) 528.3 lb./ac.
(ii) 82.81 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of seed in lb./ac.

Treatment	Av. yield
1.	585.3
2.	575.0
3.	567.2
4.	326.3
5.	587.9

S.E./mean =37.03 lb./ac.

Crop :- Linseed. Ref :- M.P. 52(6).

Site :- Institute of Plant Industry, Indore. Type :- 'MV'.

Object :—To study the effect of graded doses of N on the performance of different Linseed varieties

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sannhemp. (c) Green manuring with sannhemp. (ii) (a) Black cotton soil. (b) N.A. (iii) 30.9.1952. (iv) (a) and (b) N.A. (c) 20 lb./ac. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 2.7". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 4 levels of N as A/S : N_0=0, N_1=20, N_2=40 and N_3=60 lb./ac.
(2) 4 varieties of linseed : V_1=I.P.I-6, V_2=I.P.I-65, V_3=I.P.I-11 and V_4=P.F.-55.

3. DESIGN :

(i) 4×4 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 50'×14'. (b) 45'×9'. (v) 2½' allround. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Attacked by wilt. Details N.A. (iii) Linseed yield. (iv) (a) and (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 229.2 lb./ac.
(ii) 72.2 lb./ac.
(iii) Only V effect is significant.

(iv) Av. yield of linseed in lb./ac.

	N_0	N_1	N_2	N_3	Mean
V_1	215.2	248.8	225.3	186.9	219.1
V_2	143.1	213.7	200.3	233.8	197.7
V_3	252.0	174.7	230.5	264.1	230.3
V_4	213.7	268.8	297.7	299.0	269.8
Mean	206.0	226.5	238.5	245.9	229.2

S.E. of any marginal mean = 18.05 lb./ac.
S.E. of body of table = 36.1 lb./ac.

Crop :- Linseed. **Ref :. M.P. 53(16).**

Site :- Institute of Plant Industry, Indore. **Type :- 'MV'.**

Object :—To study the effect of graded doses of N on the performance of different Linseed varieties.

1. BASAL CONDITIONS :

(i) (a) No. (b) Sann as G.M. (c) N.A. (ii) (a) Black catton soil. (b) N.A. (iii) 22.10.1953. (iv) (a) 3 *bakharings*. (b) Drilled. (c) N.A. (d) Rows 14" apart. (e) N.A (v) N.A. (vi) As per treatments (vii) Unirrigated. (viii) N.A. (ix) 2.57". (x) 24.2.1954 to 4.3.1954.

2. TREATMENTS :

Main-plot treatments :

4 varieties : V_1=T-6, V_2=T-11, V_3=C P F-55 and V_4=T-65.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : N_0=0, N_1=20, N_2=40 and N_3=60 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) Split-plot. (ii) (a) 4 main-plots/replication and 12 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 40'×14'. (b) 35'×9'-4". (v) 2 rows on each side and 2½' at each end. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Seed yield. (iv) (a) and (b) N.A. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 457 lb./ac.

(ii) (a) 163.04 lb./ac.

(b) 77.70 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of linseed in lb./ac.

	N_0	N_1	N_2	N_3	Mean	P_0	P_1	P_2
V_1	446	458	492	493	472	434	491	492
V_2	449	474	407	519	462	453	478	456
V_3	432	443	434	472	445	449	449	437
V_4	459	439	461	439	449	435	465	448
Mean	446	453	449	481	457	443	471	458
P_0	456	419	433	463				
P_1	453	485	458	487				
P_2	430	456	455	492				

S.E. of difference of two

1. V marginal means	=38.43 lb./ac.	6. V means at the same level of N	=49.83 lb./ac.
2. N marginal means	=18.31 lb./ac.	5. P means at the same level of V	=31.72 lb./ac.
3. P marginal means	=15.86 lb./ac.	7. V means at the same level of P	=46.34 lb./ac.
4. N means at the same level of V	=36.62 lb./ac.	8. means in the body of N×P table	=31.72 lb./ac.

Crop :- Linseed. Ref :- M.P. 48(27).

Site :- Govt. Exptl. Farm, Powarkheda. Type :- 'CM'.

Object :— To compare the out-turn of linseed with different spacings, seed rates and doses of N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) N.A. (iv) (a) N.A. (b) Sown by *tiffan*. (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) E.B III. (vii) to (x) N.A.

2. TREATMENTS :

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

(1) 3 spacings : S_1=9", S_2=12" and S_3=15" between rows.

(2) 3 seed rates : R_1=12, R_2=16 and R_3=20 lb./ac.

(3) 3 levels of N as A/S : N_0=0, N_1=15 and N_2=30 lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a), (b) 15'×72' 7". (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and *bhusa* yield. (iv) (a) 1946 to 1950. (b) N.A. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) The layout was not available, hence the expt. analysed as R.B.D

5. RESULTS :

(i) 759.3 lb./ac.

(ii) 106.6 lb./ac.

(iii) Only N effect is highly significant.

(iv) Av. yield of seed in lb./ac.

	S_1	S_2	S_3	Mean	R_1	R_2	R_3
N_0	655.2	690.7	671.5	672.5	686.9	694.0	636.4
N_1	759.5	778.7	786.7	774.9	763.7	806.6	754.5
N_2	849.5	824.6	817.9	830.6	812.1	791.9	887.9
Mean	754.7	764.7	758.7	759.3	754.2	764.2	759.6
R_1	750.3	752.8	759.6				
R_2	763.2	792.1	737.4				
R_3	750.7	749.1	779.1				

S.E. of any marginal mean =25.13 lb./ac.

S.E. of body of table =43.52 lb./ac.

Crop :- Linseed. Ref :- M.P. 49(35).

Site :- Govt. Exptl. Farm, Powarkheda. Type :- 'CM'.

Object :—To compare the out-turn of linseed EB III with different spacings, seed rates and doses of N.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 30,31.11.1949. (iv) (a) N.A. (b) Sown by *tiffan*. (c) to (e) N.A. (v) N.A. (vi) E.B. III. (vii) to (ix) N.A. (x) 11.3.1950.

2. TREATMENTS :

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

(1) 3 spacings : S_1=9", S_2=12" and S_3=15" between rows.

(2) 3 seed rates : R_1=12 lb./ac., R_2=16 lb./ac. and R_3=20 lb./ac.

(3) 3 levels of N as A/S : N_0=0, N_1=15 and N_2=30 lb./ac. of N.

3. DESIGN :

(i) 3^3 confd. factorial. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) and (b) 15'×72-7". (v) Margin between plots 2', margin between blocks 3' and margin between replications 12". No guard rows left. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Linseed and *bhusa* yield.(iv) (a) 1946 to 1950. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) N.A. (vii) Nil.

5. RESULTS :

(i) 530.2 lb./ac.

(ii) 73.44 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
N_0	552.3	539.4	549.0	546.9	529.8	551.9	559.0
N_1	496.0	513.6	507.7	505·8	492.6	497.7	526.9
N_2	513.5	546.5	553.5	537.8	535.2	538.1	540.1
Mean	520.6	533.2	536.7	530.2	519.2	529.2	542.0
R_1	503.0	510.0	544.3				
R_2	516.5	543.6	527.7				
R_3	542.3	545.6	538.1				

S.E. of any marginal mean =17.31 lb./ac.
S.E. of body of table =29.98 lb./ac.

Crop :- Linseed. **Ref :- M.P. 50(35).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'CM'.**

Object : –To compare the effect of different spacings, seed rates and doses of N on the out-turn of Linseed.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*Mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 26, 27.10.1950. (iv) (a) N.A. (b) Sown by *tiffan*. (c) to (e) N.A. (v) N.A. (vi) E.B. III. (vii) N.A. (viii) N.A. (ix) 2.11". (x) 28.3.1951.

2. TREATMENTS :

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

(1) 3 spacings : S_1=9", S_2=12" and S_3=15" between rows.

(2) 3 seed rates : R_1=12 lb./ac., R_2=16 lb./ac. and R_3=20 lb./ac.

(3) 3 levels of N as A/S : N_0=0. N_1=15 and N_2=30 lb./ac. of N.

3. DESIGN :

(i) 3^3 confounded factorial. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a), (b) 15'×72' 7". (v) Margin between plots 2', margin between blocks 3' and margin between replications 12". (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Linseed and *bhusa* yield. (iv) (a) 1946 to 1950. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 531 lb./ac.
(ii) 106.6 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of linseed in lb./ac.

	S_1	S_2	S_3	Mean	R_1	R_2	R_3
N_0	512	489	457	486	491	476	491
N_1	569	545	559	558	597	522	554
N_2	572	551	531	551	477	562	616
Mean	551	528	515	531	521	520	554
R_1	586	532	446				
R_2	520	500	540				
R_3	547	553	561				

S.E. of any marginal mean =25.14 lb./ac.
S.E. of body of tables =43.14 lb./ac.

Crop :- Groundnut. **Ref :- M.P. 50(51).**

Site :- Central Res. Farm, Gwalior. **Type :- 'M'.**

Object :—To study the effect of Super on the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 28.7.1950. (iv) (a) Ploughing by *sabul* plough. (b) Sown by 2 coultered seed drill. (c) 4 chattacks/plot. (d) 18" between rows. (e) —. (v) N.A. (vi) A.H. 334. (vii) Unirrigated. (viii) N.A. (ix) 27.76". (x) N.A.

2. TREATMENTS :

4 levels of P_2O_5 : $P_0=0$, $P_1=10$, $P_2=20$ and $P_3=30$ lb./ac.
P_2O_5 as Super drilled in furrows before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 84'×96'. (iii) 6. (iv) (a) 21'×96'. (b) 12'×90'. (v) 4.5'×3'. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Percentage germination, weight of groundnut pods. (iv) (a) 1950 to 1951. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 798.3 lb./ac.
(ii) 186.2 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of pod in lb./ac.

Treatment	Av. yield
P_0	765.5
P_1	844.1
P_2	757.6
P_3	826.0
S.E./mean	=76.02 lb./ac.

Crop :- Groundnut. **Ref :- M.P. 51(49).**

Site :- Central Res. Farm, Gwalior. **Type :- 'M'.**

Object :—To study the effect of Super on the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) N A. (b) Sugarcane. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 30.7.1951. (iv) (a) *Sabul* ploughing. (b) and (c) N.A. (d) 18" between rows. (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) Interculturing by Mayflower cultivator on 31.8.1951. Weeding between 22.8.1951 to 29.8.1951. (ix) N.A. (x) 12 to 19.1.1952.

2. TREATMENTS :

4 levels of P_2O_5 *:* $P_0=0$, $P_1=10$, $P_2=20$ *and* $P_3=30$ *lb./ac.*

P_2O_5 as Super drilled in furrows before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 21'×96'. (b) 12'×90'. (v) 4.5'×3'. (vi) Yes.

4. GENERAL :

(i) Poor due to insufficient rains. (ii) Crop damaged by white ants and crows. (iii) Groundnut pod yield. (iv) (a) 1950—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 396.1 lb./ac.
(ii) 122.2 lb /ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of pod in lb./ac.

Treatment	Av. yield
P_0	387.6
P_1	357.7
P_2	420.8
P_3	418.3
S.E./mean	±49.89 lb./ac.

Crop :- Groundnut. **Ref :- M.P. 50(12).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To find the response of Groundnut to P_2O_5 as Super and G.N.C. singly and in combination.

1. BASAL CONDITIONS:

(i) (a) No. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 16.7.1950. (iv) (a) to (e) N.A. (v) N.A. (vi) AK. 24. (vii) Unirrigated. (viii) and (ix) N.A. (x) 8.11.1950.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N as G.N.C. : $N_0=0$ and $N_1=20$ lb./ac.
(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=20$ lb./ac.

3. DESIGN :

(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 28'6"×19'8". (b) 23'6"×16'. (v) 2½' on either side and 1'10" at the ends. (vi) Yes.

4. GENERAL:

(i) Good. (ii) No. (ii) Pod yield. (iv) (a) and (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 649.7 lb./ac.
(ii) 73.84 lb./ac.
(iii) Levels of P and N are highly significant. Interaction is not significant.

(iv) Av. yield of groundnut in lb./ac.

	N_0	N_1	Mean
P_0	506.6	604.1	555.4
P_1	686.6	801.4	744.0
Mean	596.6	702.8	649.7

S.E. of any marginal mean =21.32 lb./ac.
S.E. of body of table =30.14 lb./ac.

Crop :- Groundnut. **Ref :- M.P. 51(19).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To find out the effect of application of N, P_2O_5 and compost in various combinations on the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 1.6.1951. (iv) (a) *Bakhar*ing. (b) and (c) N.A. (d) 14" between rows. (e) N.A. (v) N.A. (vi) AK-12-24. (vii) N.A. (viii) Weeding and thinning on 6.7.1951. (ix) and (x) N.A.

2. TREATMENTS :

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

(1) 2 levels of Farm compost : F_0=0 and F_1=F. Compost (quantity—N.A.)
(2) 2 levels of N as A/S : N_0=0 and N_1=20 lb./ac. of N.
(3) 2 levels of P_2O_5 as Super : P_0=0 and P_1=20 lb./ac. of P_2O_5

3. DESIGN :

(i) 2^3 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 28'×14' (b) 23'-4"×10'. (v) 2'-4"×2'. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Pod yield. (iv) (a) 1951—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Similar experiment was laid out during 1949—1950. During 1951 the experiment was replanned. (vii) The experiment was laid out with *jowar* and cotton with the same purpose and same treatments in the form of strip plot design. Hence randomisation is not done independently for each crop.

5. RESULTS :

(i) 1338 lb./ac.
(ii) 190.0 lb./ac.
(iii) Only main effect of N is significant.
(iv) Av. yield of groundnut in lb./ac.

	N_0	N_1	Mean	P_0	P_1
F_0	1239	1430	1334	1271	1398
F_1	1299	1382	1341	1308	1373
Mean	1269	1406	1337	1289	1386
P_0	1205	1374			
P_1	1333	1438			

S.E. of any marginal mean =38.79 lb./ac.
S.E. of body of table =54.85 lb./ac.

Crop :- Groundnut. **Ref :- M.P. 48(6).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To study the effect of application of N and P_2O_5 singly and in combination on the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (d) Rows 14" apart. (e) N.A. (v) to (vii) N.A. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as G.N.C. : N_0=0, N_1=20 and N_2=40 lb./ac.

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

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 15'×35'. (b) 10'×30'4". (v) 2'4"×2.5'. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Groundnut yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 399.9 lb./ac.
(ii) 93.48 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	414.7	357.8	431.1	401.2
P_1	395.2	410.2	420.7	408.7
P_2	387.7	377.2	404.2	389.7
Mean	399.2	381.7	418.7	339.9

S.E. of any marginal mean =22.03 lb./ac.
S.E. of body of table =38.16 lb./ac.

Crop :- Groundnut. **Ref :- M.P. 49(14).**

Site :- Institute of Plant Industry, Indore. **Type :- 'M'.**

Object :—To find the effect of N and P_2O_5 singly and in combination on Groundnut.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.7.1949. (iv) (a) *Bakharing*. (b) to (c) N A. (d) 14" between rows. (e) N.A. (v) N.A. (vi) A.K.24. (vii) N.A. (viii) Weeding. (ix) N.A. (x) N.A.

2. 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. of N.

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

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 14'×35'. (b) 10'×30'4". (v) 2' 4'×2'. (vi) Yes.

4. GENERAL:

(i) Good (ii) N.A. (iii) Weight of groundnut and fodder. (iv) (a) to (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1297 lb./ac.
(ii) 167.1 lb /ac.
(iii) Only levels of N are highly significant.
(iv) Av. yield of groundnut in lb./ac.

	N_0	N_1	N_2	Mean
P_0	1209	1346	1376	1310
P_1	1161	1382	1316	1286
P_2	1179	1328	1376	1294
Mean	1183	1352	1356	1297

S.E. of any marginal mean = 39.39 lb./ac.
S.E. of body of table = 68.22 lb./ac.

Crop :- Groundnut. Ref :- M.P. 53(99).

Site :- Institute of Plant Industry, Indore. Type :- 'M'.

Object :—To find out the residual effect of trace elements on the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control (no treatment).
2. Cu_1 = Copper at 18 lb./ac.
3. Cu_2 = Copper at 36 lb./ac.
4. B_1 = Boron at 5 lb./ac.
5. B_2 = Boron at 10 lb./ac.
6. Mn_1 = Manganese at 25 lb./ac.
7. Mn_2 = Manganese at 50 lb./ac.
8. Zn_1 = Zinc at 15 lb./ac.
9. Zn_2 = Zinc at 30 lb /ac.
10. Cr_1 = Chromium at 5 lb./ac.
11. Cr_2 = Chromium at 10 lb./ac.

3. DESIGN:

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 6'×32'. (v) N.A. (vi) N.A.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Pod yield. (iv) (a) N.A. (b) Yes. (c) No. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil

5. RESULTS :

(i) 875 3 lb./ac.
(ii) 89 91 lb./ac.
(iii) Residual effect of trace elements is not significant.
(iv) Av. yield of groundnut in lb /ac.

Treatment	Av. yield	Treatment	Av. yield
1.	867	7.	887
2.	818	8.	877
3.	851	9.	941
4.	836	10.	878
5.	876	11.	858
6.	899		

S.E./mean = 31.75 lb./ac.

Crop :- Groundnut (*Kharif*). Ref :- M.P. 51(17).

Site :- Institute of Plant Industry, Indore. Type :- 'C'.

Object :— To find out optimum seed rate for Groundnut under local conditions.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Jowar*. (c) Nil. (ii) (a) Black cotton soil. (b) Nil. (iii) 3.7.1951. (iv) (a) *Bakharing*. (b) N.A. (c) As per treatments. (d) 14" between rows. (e) N.A. (v) N.A. (vi) Ak-12-24. (vii) N.A. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

4 seed rates : R_1=40, R_2=60, R_3=80 and R_4=100 lb./ac.

3. DESIGN:

(i) R.B.D (ii) (a) 4 (b) 50'×93' 4". (iii) 8. (iv) (a) 50'×23' 4". (b) 45'×18' 8". (v) 2' 4"×2.5'. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Wieght. of pods, stand of crop, weight of fodder. (iv) (a) 1950—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 780 lb./ac.
(ii) 1300 lb./ac.
(iii) Treatment difference are not significant.
(iv) Av. yield of groundnut in lb./ac.

Treatment	Av. yield
R_1	766
R_2	829
R_3	748
R_4	776
S.E./mean	=45.96 lb./ac.

Crop :- Jowar and Arhar (*Kharif*). Ref :- M.P. 53(73).

Site :- Central Res. Farm, Gwalior. Type :- 'X'.

Object :— To find out suitable ratio of mixture of *Jowar* and *Arhar* which will give maximum returns.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b)—. (iii) 23.7.1953. (iv) (a) N.A. (b) Seeds of both crops drilled. (c) As per treatments. (d) Usually 18". (e) N.A. (v) N.A. (vi) *Jowar* G-12-2 (main season variety) *Arhar* G-3 (late). (vii) Unirrigated. (viii) N.A. (ix) 26.06". (x) Date of maturity of *jowar* 30.9.1953. and *Arhar* 12.3.1954.

2. TREATMENTS :

1. *Jowar* alone at 6 lb /ac.
2. *Arhar* alone at 16 lb./ac.
3. *Jowar* and *Arhar* in 4 : 1 proportion.
4. *Jowar* and *Arhar* in 3 : 2 proportion.
5. *Jowar* and *Arhar* in 2 : 3 proportion.
6. *Jowar* and *Arhar* in 1 : 4 proportion.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 96'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Av. yield of *Jowar* and *Arhar* grains in lb./ac. (iv) (a) 1952 to 1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Analysed on the basis of money value in Rs./plot.

5. RESULTS :

(i) 63.27 Rs./ac.
(ii) 19 16 Rs./ac.
(iii) Treatments do not differ significantly.

(iv) Av. value of grain in Rs./ac.

Treatment	Av. value
1.	46.6
2.	82.9
3.	54.1
4.	65.7
5.	62.5
6.	67.8
S.E./mean	=9.58 Rs./ac.

Crop :- Groundnut and Cotton. Ref :- M.P. 52(10).

Site :- Institute of Plant Industry, Indore. Type :- 'X'.

Object :—To find out the best way of intercropping Groundnut and Cotton for getting the maximum return.

1. BASAL CONDITIONS :

(i) (a) No. (b) *Jowar*. (c) 20 lb./ac. of N as a mixture of A/S and G.N.C. (ii) (a) Black cotton soil. (b) N.A. (iii) 25.6.1952. (iv) (a) to (e) N.A. (v) N.A. (vi) Cotton *Dhar* 43 (*Ehcj*) Groundnut A.K. 12.24. (vii) Unirrigated. (viii) and (ix) N.A. (x) Cotton pickings on 7.11.1952. and 24.1.1953.

2. TREATMENTS :

1. Two rows of cotton with 6 rows of groundnut.
2. Two rows of cotton with 14 rows of groundnut.
3. Control (with two rows of groundnut).

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 56'×112'. (v) No. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) Groundnut and cotton yield. (iv) (a) 1952 to 1956. (b) No. (c) N.A. (vi) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 230.6 Rs./ac.
(ii) 35.79 Rs./ac.
(iii) Treatment differences are not significant.
(iv) Av. value of yield in Rs./ac.

Treatment	Av. value
1.	226.5
2.	238.3
3.	227.0
S.E./mean	=14.61 Rs./ac.

Crop :- Wheat and Gram. Ref :- M.P. 51(29).

Site :- Adhartal Farm, Jabalpore. Type :- 'X'.

Object :—To compare sowing methods of *Birra*.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar* (heavy soil). (b) —. (iii) 7.11.1951. (iv) (a) N.A. (b) Drilled. (c) As per treatment. (d) and (e) N.A. (v) N.A. (vi) Wheat A.O. 90 and Gram Adt. V. (vii) to (x) N.A.

2. TREATMENTS :

1. Wheat alone at 80 lb./ac.
2. Gram alone at 80 lb./ac.
3. Sowing wheat and gram together in the same row each with seed rate at 40 lb./ac.

4. Sowing wheat and gram together in the same row each with seed rate of 80 lb./ac.
5. Sowing wheat and gram separately in cross directions each with seed rate of 40 lb./ac.
6. Sowing wheat and gram separately in cross directions each with seed rate of 80 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 15′×40′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain and straw yield for both gram and wheat. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) In between two plots 1½′ space was left where 1 row of linseed was grown. Farm harvest prices for Jabalpore district for the year 1951-52 have been taken in working out the money values. Wheat at Rs. 16.00/md. while Gram at Rs. 14.50/md.

5. RESULTS:

(i) 55.64 Rs./ac.
(ii) 14.70 Rs./ac.
(iii) Treatment differences are not significant.
(iv) Av. value of grain in Rs./ac.

Treatment	Av. value
1.	55.80
2.	46.70
3.	55.80
4.	62.20
5.	54.82
6.	58.32
S.E./mean	=6.00 Rs./ac.

Crop :- Wheat and Gram. **Ref :- M.P. 50(29).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'X'.**

Object :—To compare the two methods of sowing *Birra* (Wheat and Gram together).

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 24.10.1950. (iv) (a) *Bakharing*. (b) and (c) As per treatments. (d) 12″. (e) N.A. (v) N.A. (vi) Gram Ad. V ; Wheat A-115 (local). (vii) Unirrigated. (viii) Nil. (ix) 2.11″. (x) 25.3.1951.

2. TREATMENTS :

1. Wheat alone at 80 lb./ac.
2. Gram alone at 80 lb./ac.
3. Sowing wheat and gram together in the same row each with seed rate of 40 lb./ac.
4. Sowing wheat and gram together in the same row each with seed rate of 80 lb./ac.
5. Sowing wheat and gram separately in cross direction each with seed rate of 40 lb./ac.
6. Sowing wheat and gram separately in cross direction each with seed rate of 80 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 30′×40′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Farm harvest prices for Hoshangabad district for the year 1950—1951 have been taken in working out money value : Wheat at Rs. 18.50/md. and Gram at Rs. 11.69/md.

5. RESULTS :

(i) 104.22 Rs./ac.
(ii) 18.32 Rs./ac.
(iii) Treatment differences are highly significant.

(iv) Av value of grain in Rs./ac.

Treatment	Av. value
1.	113.68
2.	65.58
3.	112.65
4.	123.18
5.	102.97
6.	107.27
S.E./mean	=7.48 Rs./ac.

Crop :- Wheat and Gram. Ref :- M.P. 51(60).

Stie :- Govt. Exptl. Farm, Powarkheda. Type :- 'X'.

Object :—To compare the two methods of sowing *Bijra* (Wheat and Gram together).

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 25.10.1951. (iv) (a) *Bakharing*. (b) Drilling. (c) As per treatments. (d) 12". (e) N.A. (v) N.A. (vi) Gram A.I. V and Wheat A-115 (local). (vii) Unirrigated. (viii) Nil. (ix) 2.34". (x) N.A.

2. TREATMENTS :

1. Wheat alone at 80 lb./ac.
2. Gram alone at 80 lb./ac.
3. Wheat and gram sown together in the same row each with seed rate at 40 lb./ac.
4. Wheat and gram sown together in the same row each with seed rate at 80 lb./ac.
5. Wheat and gram sown in cross directions each with seed rate at 40 lb./ac.
6. Wheat and gram sown in cross directions each with seed rate at 80 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 30'×40'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) The season was most unfavourable for the crop. The yield of both gram and wheat is too poor. (vii) Farm harvest prices for the year 1951—1952 for Hoshangabad district have been taken in working out the money value. Wheat at Rs. 16.25/md. and gram at Rs. 11.44/md.

5. RESULTS :

(i) 38.37 Rs./ac.
(ii) 11.25 Rs./ac.
(iii) Treatment differences are highly significant.
(iv) Av. value of grain in Rs./ac.

Treatment	Av. value
1.	45 43
2.	19.78
3.	39·08
4.	46.83
5.	33.88
6.	47.37
S.E /mean	=4.60 Rs./ac.

Crop :- Wheat and Gram. Ref :- M.P. 52(42).

Site :- Govt. Exptl. Farm, Powarkheda. Type :- 'X'.

Object :—To compare the two methods of sowing *Birra*.

1. BASAL CONDITIONS :

(i) (a) to (c)N.A. (ii) (a) Clay loam (*Mariyar*) (b) N.A. (iii) 25.10.1952. (vi) (a) *Bakharing*. (b) Drilling. (c) As per treatments. (d) 12". (e) N.A. (v) N.A. (vi) Wheat A-115 (local) Gram A.I. V. (vii). Unirrigated. (viii) Nil. (ix) 0.15". (x) N.A.

2. TREATMENTS :

1. Wheat alone at 80 lb./ac.
2. Gram alone at 80 lb./ac.
3. Sowing wheat and gram together in the same row each with seed rate of 40 lb./ac.
4. Sowing wheat and gram together in the same row each with seed rate of 80 lb./ac.
5. Sowing wheat and gram separately in cross directions each with seed rate of 40 lb./ac.
6. Sowing wheat and gram separately in cross directions each with seed rate of 80 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a), (b) 30′×40′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1953. (b), (c) N.A. (v) (a), (b) N.A. (vi) Nil. (vii) Farm harvest prices for the year 1952-53 for Hoshangabad Distt. have been taken in working out the money value. Wheat at Rs. 17.47/md. while gram at Rs. 16.95/md.

5. RESULTS :

(i) 79.38 Rs./ac.
(ii) 15.36 Rs./ac.
(iii) Treatment differences are not significant.
(iv) Av. value of grain in Rs./ac.

Treatment	Av. value
1.	73.51
2.	91.41
3.	75.02
4.	79.68
5.	78.95
6.	77.68
S.E./mean	=6.27 Rs./ac.

Crop :- Wheat and Gram. **Ref :- M.P. 53(37).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :-'X'.**

Object :—To findout suitable mixture of Gram and Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 10 lb./ac. of N as A/S + 10 lb./ac. of P_2O_5 as Super. (ii) (a) Clay loam (*mariyar*) (b) —. (iii) 3.11.1953. (iv) (a) Timely *bakharings*. (b) Sown with *nari*. (c) As per treatments. (d) Between lines 1′. (v) Nil. (vi) Wheat Hy. 11. Improved (medium) ; gram Adv. Improved . (vii) Unirrigated. (viii) Nil. (ix) 1.25″. (x) 8.4.1954.

2. TREATMENTS :

1. Wheat alone at 80 lb./ac.
2. Gram alone at 80 lb./ac.
3. Sowing wheat and gram together in the same row each with seed rate of 40 lb./ac.
4. Sowing wheat and gram together in the same row each with seed rate of 80 lb./ac.
5. Sowing wheat and gram separately in cross directions each with seed rate of 40 lb./ac.
6. Sowing wheat and gram separately in cross directions each with seed rate of 80 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a), (b) 30′×40′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1950 to 1953. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) Nil. (vii) Farm harvest prices for the year 1953-1954 have been taken for Hoshangabad Distt. in working out the money value, wheat at Rs. 15.31/md. while gram at Rs. 11.06/md.

5. RESULTS :

(i) 67.51 Rs./ac.
(ii) 10.79 Rs./ac.
(iii) Treatment differences are significant.

(iv) Av. value of grain in Rs./ac.

Treatment	Av. value
1.	78.35
2.	61.77
3.	70.18
4.	71.15
5.	65.46
6.	58.14
S.E./mean	=4.40 Rs./ac.

Crop :- Wheat and Gram. Ref :- M.P. 50(67).

Site :- Govt. Seed and Demonstration Farm, Seoni. Type :- 'X'.

Object :—To compare the two methods of sowing *Birrah*.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 24, 25.11.1950. (iv) (a) 5 *bakharings* (b) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) and (ix) N.A. (x) 16.3.1951.

2. TREATMENTS :

1. Wheat alone at 80 lb./ac.
2. Gram alone at 80 lb./ac.
3. Sowing wheat and gram together in the same row each with seed rate of 40 lb./ac.
4. Sowing wheat and gram together in the same row each wish seed rate of 80 lb./ac.
5. Sowing wheat and gram separately in cross directions each with seed rate of 40 lb./ac.
6. Sowing wheat and gram separately in cross directions each with seed rate 80 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 40' × 30'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) After good germination of all seeds, gram soon got upper hand over wheat which remained poor till end. (ii) Nil. (iii) Wheat and gram yield. (iv) (a) No. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) The year was dry one. (vii) Farm harvest prices for Seoni district for the year 1950-51 have been taken in working out the money value ; wheat at Rs. 17.50/md. and gram at Rs. 12 69/md.

5. RESULTS :

(i) 213.13 Rs./ac

(ii) 18.32 Rs./ac.

(iii) Treatment differences are highly significant.

(iv) Av. value of grain in lb./ac.

Treatment	Av. value
1.	119.73
2.	243.94
3.	230.81
4.	218.59
5.	214.41
6.	251.32
S.E./mean	=7.48 Rs./ac.

Crop :- Groundnut and Cotton. Ref :- M.P. 51(7)

Site :- Central Res. Farm, Ujjain. Type :- 'X'.

Object :—To find out if any of the inter-cropping treatments gives any extra monetary return to cultivator.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Linseed. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 4.7 1951. (iv) (a) 3 *bakharings*. (b) Seeds drilled. (c) to (e) N.A. (v) Compost worth of Rs. 36/- (quantity N.A., was spread and *bakhared*. (vi) Variety : Cotton G--16. Groundnut A.K. 12-24. (vii) N.A. (viii) First *dora* was given on 24, 25.7.1957. second *dora* on 2, 3.8.1951 and weeding on 29.8.1954. (ix) N.A. (x) Groundnut 16 to 19.10 1951. Cotton 1st picking 16 to 19.11.1951. 2nd picking on 9.1.1952.

2. TREATMENTS :

1. 2 rows of cotton+6 rows of groundnut.
2. 2 rows of cotton+14 rows of groundnut.
3. 2 rows of cotton+20 rows of groundnut.
4. Only cotton.
5. Only groundnut

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 76′×75′. (b) 70′×72′. (v) 3′×1.5′. (vi) Yes.

4. GENERAL :

(i) Healthy and good. (ii) Nil. (iii) Cotton and groundnut yield. (iv) (a) and (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

Groundnut

(i) to (iv) Av. yield of pod in lb./ac.

Treatment	Av. yield
1.	1229
2.	1400
3.	1426
5.	1564

Cotton

(i) to (iv) Av. yield of cotton in lb./ac.

Treatment	Av. yield
1.	106.95
2.	55.39
3.	32.41
4.	659.02

Crop :- Wheat. **Ref :- M.P. 48(24).**

Site :- Govt. Exptl. Farm, Powarkheda. **Type :- 'R'.**

Object :—To find best rotation for Wheat.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 23.10.1948. (iv) (a) *Bakharing* and ploughing. (b) Drilling. (c) 100 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) A-115 (local). (vii) to (ix) N.A. (x) 2.3.1949.

2. TREATMENTS :

1. Wheat after *tur*.
2. Wheat after gram.
3. Wheat after *birrah*.
4. (a) Wheat after fallow.
   (b) Wheat after wheat after fallow.
5. Wheat continuously.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 2. (iv) (a) and (b) 11′×99′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N A. (iii) Grain and *bhusa* yield. (iv) (a) 1942—1949. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) There are 10 plots in a block of which wheat is grown in 6 plots only. In one plot each *tur*, gram, *birrah* is grown and one is kept fallow.

5. RESULTS :

(i) 444.3 lb./ac.
(ii) 76.56 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb /ac.

Treatment		Av. yield
1.		461.2
2.		582.6
3.		395.0
4.	(a)	372.4
	(b)	423.6
5.		431.2

S.E./mean = 54.12 lb./ac.

Crop :- Wheat. Ref :- M.P. 49(32).

Site :- Govt. Exptl. Farm, Powarkheda. Type :- 'R'.

Object :—To find the best rotation for Wheat.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) Clay loam (*mariyar*). (b) Refer soil analysis, Powarkheda. (iii) 24.10.1949. (iv) (a) *Bakharing*. (b) N.A. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) A-115 (local). (vii) to (ix) N.A. (x) 3.4.1950.

2. TREATMENTS :

1. Wheat after *Tur*.
2. Wheat after Gram.
3. Wheat after *Birrah*.
4. (a) Wheat after fallow.
   (b) Wheat after Wheat.
6. Wheat continuously.

3. DESIGN :

(i) R.B D. (ii) (a) 10. (b) N.A. (iii) 2. (iv) (a) and (b) 11'×99'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1942—1949. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) The yield for treatment 3 was not recorded in both the replications. There are 10 plots in a block of which only in 6 plots wheat is grown, in one *Tur*, one for gram and one for *Birrah* and one fallow.

5. RESULTS :

(i) 220.2 lb./ac.
(ii) 82.52 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	225.0
2.	246.2
3.	N.A.
4. (a)	180.0
(b)	172.4
5.	177.4
S.E./mean	±58.36 lb./ac.

Crop :- Groundnut-Cotton-Wheat-Jowar. Ref :- M.P. 51(91).

Site :- Institute of Plant Industry, Indore. Type :- 'MR'.

Object :—To test the effect of rotation of crops and trace elements on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Cotton—Wheat—*Jowar*. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) Cotton : American. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control (no manure).
2. 18 lb./ac. of Cu as Copper Sulphate.
3. 15 lb /ac. of Zn as Zinc Sulphate.
4. 10 lb./ac. of B as Borax.

Treatments applied in 1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 4 (in each crop). (b) N.A. (iii) 2 (for each crop). (iv) (a) N.A. (b) 18'×37' for cotton, 16½'×36' for groundnut, wheat and *jowar*. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Pod, *kapas* and grain yields. (iv) (a) 1951—N.A. (b) Trace elements applied only in the first year 1951. Afterwards residual effect studied. (c) N.A. (v) (a) and (b) N A. (vi) Field No. 20 (poor field). (vii) Experiment conducted under the Cotton Physiological Scheme.

5. RESULTS :

(i) to (iv) All figures in lb./ac.

	Groundnut	Cotton (*kapas*)	Wheat	*Jowar*
G.M.	636	261	N.A.	692
S.E /plot	15.21	69.26	N.A.	101.24
Treatment	Av. yield.	Av. yield	Av. yield.	Av. yield.
1.	602	242	N.A.	643
2.	676	273	N.A.	726
3.	646	254	N.A.	745
4.	619	273	N.A.	656
S.E./mean	10.76	48.98	N.A.	71.60
Significance	N.S.	N.S.	N.A.	N.S.

Crop :- Groundnut-Cotton-Wheat-Jowar. **Ref :- M.P. 52(77)/51(91).**

Site :- Institute of Plant Industry, Indore. **Type :- 'R'.**

Object :—To find out the effect of rotation of crops and trace elements on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Groundnut-Cotton-Wheat-*Jowar*. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) American Cotton. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control.
2. 18 lb./ac. of Cu as Copper Sulphate.
3. 15 lb./ac. of Zn as Zinc Sulphate.
4. 10 lb./ac. of B as Borax.

Treatments applied in 1951.

3. DESIGN :

(i) R.B.D. (ii) (a) (4 in each crop). (b) N.A. (iii) 2 (for each crop). (iv) (a) N.A. (b) 18′×37′ for cotton 16½′×36′ for wheat, *jowar* and groundnut. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Pod, *kapas* and grain yield. (iv) (a) 1951—N.A. (b) Trace elements applied only in 1951. Afterwards residual effect studied. (v) (a) and (b) N.A. (vi) Field No. 20 (poor field). (vii) Experiment conducted under the Cotton Physiological Scheme (I.C.C.C).

5. RESULTS :

(i) to (iv) All figures in lb./ac.

	Groundnut	Cotton (*kapas*)	Wheat	*Jowar*
G.M.	892	300	442	866
S.E./plot	78.04	41.43	128.25	61.52
Treatment	Av. yield.	Av. yield	Av. yield.	Ax. yield.
1.	815	315	466	822
2.	970	362	419	975
3.	989	266	373	776
4.	793	256	511	889
S.E./mean	55.17	41.43	90.67	43.49
Significance	N.S.	N.S.	N.S.	N.S.

Crop :- Groundnut-Cotton-Wheat-Jowar. **Ref :- M.P. 53(101).**

Site :- Institute of Plant Industry, Indore. **Type :- 'R'.**

Object :—To find out the effect of rotation of crops and trace elements on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Cotton—Wheat—*Jowar*. (b) As per rotation. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) American Cotton. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control.
2. 18 lb./ac. of Cu as Copper Sulphate.
3. 15 lb./ac. of Zn as Zinc Sulphate.
4. 10 lb./ac. of B as Borax.

Trace elements applied in 1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 4 (in each crop). (b) N.A. (iii) 2 (for each crop). (iv) (a) N.A. (b) 18′×37′ for cotton and 16½′×36′ for wheat, groundnut and *jowar*. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Pod, *kapas* and grain yield. (iv) (a) 1951—N.A. (b) Trace elements applied only in 1951. Afterwards residual effect studied. (c) N.A. (v) (a) and (b) N.A. (vi) Field. No. 20. (poor field) (vii) Experiment conducted under the Cotton Physiological Scheme.

5. RESULTS :

(i) to (iv) All figures in lb./ac.

	Groundnut	Cotton (*kapas*)	Wheat	*Jowar*
G.M.	660	112	378	565
S.E./plot	172.20	15.10	82.00	252.60
Treatment	Av. yield	Av. yield	Av. yield	Av. yield
1.	683	123	407	711
2.	681	104	375	445
3.	683	110	363	741
4.	591	112	368	363
S.E./mean	121.75	10.68	57.97	178.59
Significance	N.S.	N.S.	N.S.	N S.

Crop :- Groundnut-Cotton-Wheat-Jowar. **Ref :- M.P. 51(92).**

Site :- Institute of Plant Industry, Indore. **Type :- 'R'.**

Object :—To find out the effect of rotation of crops and trace elements on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Cotton—Wheat—*Jowar*. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) American Cotton. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control.
2. 18 lb./ac. of Cu as Copper Sulphate.
3. 15 lb./ac. of Zn as Zinc Sulphate.
4. 10 lb./ac. of B as Borax.

Treatments applied in 1951 only.

3. DESIGN :

(i) R.B.D. (ii) (a) 4 (in each crop). (b) N.A. (iii) 4 (for each crop). (iv) (a) N.A. (b) 18′×37′ for cotton and 16½′×36′ for wheat, *jowar* and groundnut. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Pod, *kapas* and grain yield. (iv) (a) 1951—N.A. (b) Manurial treatments applied only in the first year 1951. Afterwards residual effect studied. (v) (a) and (b) N.A. (vi) Field No. 42 (rich field). (vii) Experiment eonducted under the Cotton Physiological Scheme.

5. RESULTS :

(i) to (iv) All figures in lb./ac.

	Groundnut	Cotton (*kapas*)	Wheat	*Jowar*
G.M.	1156	416	N.A.	736
S.E./plot	83.82	83.80	N.A.	52.60
Treatment	Av. yield	Av. yield	Av. yield	Av. yield
1.	1096	388	N.A.	725
2.	1200	421	N.A.	829
3.	1170	436	N.A.	738
4.	1160	417	N.A.	800
S.E./mean	41.91	41.90	N.A.	26.30
Significance	N.S.	N.S.	N.A.	N.S

Crop :- Groundnut-Cotton-Wheat-Jowar **Ref :- M.P. 52(78)/51(92).**

Site :- Institute of Plant Industry, Indore. **Type :- 'R'.**

Object :—To find out the effect of rotation of crops and trace elements on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Groundnut-Cotton-Wheat-*Jowar*. (b) As per rotations. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) American Cotton. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control.
2. 18 lb./ac. of Cu as Copper Sulphate.
3. 15 lb./ac. of Zn as Zinc Sulphate.
4. 10 lb /ac. of B as Borax.

Treatments applied in 1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 4 (in each crop). (b) N.A. (iii) 4 (for each crop). (iv) (a) N.A. (b) 18′×37′ for cotton, 16.3′×36′ for groundnut, *jowar* and wheat. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Pod, *kapas* and grain yield. (iv) (a) 1951—N.A. (b) Manures applied only in the first year—1951. Residual effect studied afterwards. (c) N.A. (v) (a) and (b) N.A. (vi) Field No. 42 (rich field). (vii) Experiment conducted under the Cotton Physiological Scheme.

5. RESULTS :

(i) to (iv) All figures in lb./ac.

	Groundnut	Cotton (*kapas*)	Wheat	*Jowar*
G.M.	1031	356	433	1473
S.E./plot	175.86	63.42	81.21	167.27
Treatment	Av. yield	Av. yield	Av. yield	Av. yield
1.	992	344	437	1365
2.	1065	380	453	1553
3.	1030	353	405	1446
4.	1039	348	436	1530
S.E./mean	87.93	31.71	40.60	83.63
Significance	N.S.	N.S.	N.S.	N.S.

Crop :- Groundnut-Cotton-Wheat-Jowar. Ref :- M.P. 53(102)/52(78)/51(92).

Site :- Institute of Plant Industry, Indore. Type :- 'R'.

Object :—To find out the effect of rotation of crops and trace elements on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Groundnut-Cotton-Wheat-*Jowar*. (b) As per rotations (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) American Cotton. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1- Control.
2. 18 lb./ac. of Cu as Copper Sulphate.
3. 15 lb./ac. of Zn as Zinc Sulphate.
4. 10 lb./ac. of B as Borax.

Treatments applied in 1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 4 (in each crop). (b) N.A. (iii) 4 (for each crop). (iv) (a) N.A. (b) 18′×37′ for cotton, 16½′×36′ for groundnut, wheat and *jowar*. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Pod, *kapas* and grain yields. (iv) (a) 1951. (b) Manurial treatments applied only in the first year 1951. Residual effect studied afterwards. (v) (a) and (b) N.A. (vi) Field No. 42 (rich field). (vii) Experiment conducted under the Cotton Physiological Scheme.

5. RESULTS :

(i) to (iv) All figures in lb./ac.

	Groundnut	Cotton (*kapas*)	Wheat	*Jowar*
G.M.	564	59.0	462	1019
S.E./plot	82.60	10.88	69.31	91.26
Treatment	Av. yield	Av. yield	Av. yield	Av. yield
1.	525	63.4	530	1030
2.	573	60.3	457	1030
3.	592	56.2	441	1015
4.	569	56.2	420	1000
S.E./mean	41.30	5.44	34.66	45.63
Significance	N.S.	N.S.	N.S.	N.S.

Crop :- As per treatments. Ref :- M.P. 53(98)/52(72)/51(84)/50(68)/49(63)/48(47).

Site :- Institute of Plant Industry, Indore. Type :- 'R'.

Object :—To study the effect of organic and inorganic nitrogenous fertilizers on rotation crops and the influence of (a) rotation and (b) frequency of manuring on changes in soil productivity as measured principally by crop yields.

1. BASAL CONDITIONS :

(i) (a) Three course rotations of *Jowar*-Cotton-Wheat. Four course rotation of *Jowar*-Groundnut-Cotton-wheat. (b) As per rotation every year. (c) As per scheme. (ii) (a) Black cotton soil of medium fertility. (b) Soil samples are taken after completion of each rotation but analysis not completd as yet. (iii) From 25th June to 1st July depending upon advent of monsoon. (iv) (a) Necessary number of *bakharings* every year before sowing. (b) to (e) N.A. (v) No. (vi) Bhoj (*Dhar*-43) for cotton, I.P.I-3 for *jawar*, C-591 for wheat and AK-12-24 for groundnut. (vii) Unirrigated. (viii) Summer *bakharings*. (ix) N.A. (x) N.A.

2. TREATMENTS :

Details of frequency of manuring during the rotations.
Starting plots *Jowar* in the year 1947.

	Rotation I (*Jowar*-Cotton-Wheat) Year of manuring			Rotation II *Jowar*-Groundnut-Cotton-Wheat. Year of manuring.			
	1	2	3	1	2	3	4
1.	O	O	O	O	X	O	O
2.	F	O	O	F	X	O	O
3.	O	F	O	O	X	F	O

Contd.

Contd.

Contd.				Contd.			
4.	O	O	F	O	X	O	F
5.	F	F	O	F	X	F	O
6.	F	O	F	F	X	O	F
7.	O	F	F	O	X	F	F
8.	F	F	F	F	X	F	F
9.	O	O	O	O	X	O	O
10.	S	O	O	S	X	O	O
11.	O	S	O	O	X	S	O
12.	O	O	S	O	X	O	S
13.	S	S	O	S	X	S	O
14.	S	O	S	S	X	O	S
15.	O	S	S	O	X	S	S
16.	S	S	S	S	X	S	S
17.	O	O	O	O	X	O	O
18.	G	O	O	G	X	O	O
19.	O	G	O	O	X	G	O
20.	O	O	G	O	X	O	G
21.	G	G	O	G	X	G	O
22.	G	O	G	G	X	O	G
23.	O	G	G	O	X	G	G
24.	G	G	G	G	X	G	G

Above are 24 main plot treatments where F=manuring with F.Y.M., S=Manuring with A/S, G=manuring with G.N.C. and O=No manure, Frequency of manuring used as per scheme given above.

Each plot is divided in 3 sub-plots and following treatments given : M_1=20 lb./ac. of N, M_2=20 lb./ac. of P_2O_5 and M_3=20 lb./ac. of N+20 lb./ac. of P_2O_5.

Groundnut crop in the four course rotation is left unmanured, and the symbol is X.

3. DESIGN :

(i) (a) Split-plot (ii) (a) 24 main-plots/replication ; 3 sub-plots/main-plot. (b) 116′8″ × 162′ for each crop (iii) 2. (iv) (a) 9′4″×27′. (b) 4′8″×22′. (v) Two guard rows on either side of each crop plot. (vi) Randomisation at the starting time of the experiment and are continued as per scheme.

4. GENERAL :

(i) No lodging (ii) No incidence of pests. (iii) Height of random plants in *jowar* and wheat crops for statistical study and average yield. (iv) (a) Long term duration. Started in *kharif* season of 1947 and is in progress still. (b) The crop plots are same every year as per crop rotation and manuring as per scheme. (c) Nil. (v) (a) and (b) No. (vi) Nil. (vii) In expressing S.E.s., main-plots have been denoted by M while sub-plots by S.

5. RESULTS : YEAR 1948

CROP COTTON Rotation I

(i) 285 lb./ac.

(ii) (a) 54.15 lb./ac.

(b) 41.42 lb./ac.

(iii) Control *vs.* treated effect and interaction manures × $\left(\text{np } vs \frac{n+p}{2}\right)$ are significant. Effects due to kinds of effects and np *vs* $\frac{n+p}{2}$ are highly significant. Other effects are not significant.

(iv) Av. yield of *kapas* in lb./ac.

Control =265 lb./ac.

	FO	OF	FF	SO	OS	SS	GO	OG	GG	Mean
N	262	285	282	230	325	343	242	297	302	285
P	249	320	290	249	315	265	242	257	269	273
NP	278	288	292	290	396	366	285	282	371	316
Mean	263	298	288	256	345	325	256		314	291

S.E. of control mean = 9.03 lb./ac.

S.E. of difference of two

1. M marginal means =22.11 lb./ac.
2. S marginal means = 9.76 lb./ac.
3. S means at the same level of M =29.29 lb./ac.
4. M means at the same level of S =32.57 lb./ac.

CROP COTTON

(i) 345 lb./ac.

(ii) (a) 82.00 lb./ac.
(b) 58.77 lb./ac.

(iii) Only control *vs* treated and n *vs* $\frac{n+p}{2}$ effects are highly significant.

(iv) Av. yield of *kapas* in lb./ac.
Control mean=350 lb./ac.

	XF	XS	XG	Mean
N	310	316	357	328
P	342	312	366	340
NP	305	362	392	353
Mean	319	330	372	340

S.E. of control mean = 9.66 lb./ac.
S.E. of difference of two
1. M marginal means =23.67 lb./ac.
2. S marginal means =16.97 lb./ac.
3. S means at the same level of M =29.39 lb./ac.
4. M means at the same level of S =33.70 lb./ac.

Rotation II CROP GROUNDNUT

(i) 551 lb./ac.

(ii) (a) 137.64 lb./ac.
(b) 101.52 lb./ac.

(iii) None of the effects is significant.

(iv) Av yield of dry pod in lb./ac.
Control mean=541 lb./ac.

	FX	SX	GX	Mean
N	584	551	534	556
P	592	603	553	583
NP	577	530	533	547
Mean	584	561	540	562

S.E. of control mean =16.22 lb./ac.
S.E. of difference of two
1. M marginal means =39.73 lb./ac.
2. S marginal means =29.31 lb./ac.
3. S means at the same level of M =50.76 lb./ac.
4. M means at the same level of S =57.42 lb./ac.

CROP JOWAR (both rotations)

(i) 481 lb./ac.

(ii) (a) 153.8 lb./ac.
(b) 114.2 lb./ac.

(iii) Control *vs* treated and np *vs* $\frac{n+p}{2}$ effect are highly significant. Interaction manures × kinds of effects is significant. Other effects are not significant.

(iv) Av. yield of grain in lb./ac.
Control =423 lb./ac.

	N	P	NP	Mean
FO	479	471	471	474
OF	403	481	492	459
FF	538	515	561	538
SO	476	409	553	479
OS	411	422	490	441
SS	567	519	669	585
GO	510	454	533	499
OG	540	494	611	548
GG	485	455	506	482
Mean	490	469	543	501

S. E. of the Control mean =18.13 lb./ac.
S.E. of difference of two
1. M marginal means =44.00 lb./ac.
2 S marginal means =19.03 lb./ac.
3. S means at the same level of M=57.10 lb./ac.
4. M means at the same level of S=64.38 lb./ac.

CROP WHEAT (both rotations)

(i) 722 lb./ac.

(ii) (a) 183.3 lb./ac.
(b) 116.9 lb./ac.

(iii) Control *vs* treated effect is significant. np *vs* $\frac{n+p}{2}$ effect is highly significant. Other effects are not significant.

(iv) Av. yield of grain in lb./ac.
Control =682 lb./ac.

	N	P	NP	Mean
FO	771	697	749	739
OF	663	730	861	751
FF	724	735	788	749
SO	709	683	731	708
OS	700	695	853	749
SS	741	757	928	809
GO	675	674	716	688
OG	686	693	722	700
GG	680	742	760	727
Mean	705	712	790	736

S. E. of the Control mean =21.60 lb./ac.
S.E. of difference of two
1. M marginal means =52.91 lb./ac.
2. S marginal means =19.48 lb./ac.
3. S means at the same level of M=58.45 lb./ac.
4. M means at the same level of S=71.26 lb./ac.

COTTON Rotation I Year 1949.

(i) 276 lb./ac.

(ii) (a) 59.2 lb./ac.

(b) 47.0 lb./ac.

(iii) Control *vs.* treated, kinds of effects, n *vs.* p, np *vs.* $\frac{n+p}{2}$ effects and interactions effects × sub-treatments and manures × effects × np *vs* $\frac{n+p}{2}$ are highly significant. Interactions manures and manure × effects × np *vs.* $\frac{n+p}{2}$ are significant. Other effects are not significant.

(iv) Av. yield of *kapas* in lb./ac.
Control=215 lb./ac.

	N	P	NP	Mean
FOO	205	202	219	209
OFO	282	235	275	264
OOF	255	318	275	283
FFO	305	239	315	286
FOF	262	275	308	282
OFF	285	282	332	300
FFF	305	259	252	272
SOO	242	255	159	219
OSO	169	206	242	206
OOS	288	219	394	300
SSO	272	239	262	258
SOS	391	278	540	403
OSS	355	252	355	321
SSS	378	225	448	350
GOO	255	235	245	245
OGO	215	215	215	215
OOG	275	242	328	282
GGO	242	202	212	219
GOG	368	318	424	370
OGG	312	262	448	341
GGG	388	285	428	367
Mean	288	250	318	285

S.E. of the control mean =13.95 lb./ac.

S.E. of difference of two

1. M marginal means =34.18 lb./ac.
2. S marginal means =10.26 lb./ac.
3. S means at the same level of M =47.00 lb./ac.
4. M means at the same level of S =51.39 lb./ac.

WHEAT Rotation II Year 1949.

(i) 556 lb./ac.

(ii) (a) 93.9 lb./ac.

(b) 81.2 lb./ac.

(iii) Control *vs.* treated and manures effects are significant, kinds of effects and np *vs.* $\frac{n+p}{2}$ effects are highly significant. Others are not significant.

(iv) Av. yield of grain in lb./ac.
Control=505 lb./ac.

	N	P	NP	Mean
FOO	587	474	550	537
OFO	461	597	481	513
OOF	550	530	564	548
FFO	534	560	587	560
FOF	550	746	683	660
OFF	636	683	511	610
FFF	600	743	656	666
SOO	514	524	504	514
OSO	577	564	477	539
OOS	537	660	557	585
SSO	577	627	646	617
SOS	534	557	636	576
OSS	481	650	597	575
SSS	583	630	656	623
GOO	537	418	474	476
OGO	497	497	507	500
OOG	477	554	600	544
GGO	484	411	467	454
GOG	491	607	547	548
OGG	560	650	653	621
GGG	448	670	557	558
Mean	534	588	567	563

S.E. of the control mean =22.13 lb /ac.

S.E. of difference of two

1. M marginal means =54.21 lb./ac.
2. S marginal means =17.72 lb./ac.
3. S means at the same level of M =81.20 lb /ac.
4. M means at the same level of S =85.64 lb /ac.

COTTON Rotation II Year 1949.

(i) 308 lb./ac.

(ii) (a) 96.7 lb./ac.

(b) 53.8 lb./ac.

WHEAT Rotation II Year 1949.

(i) 489 lb./ac.

(ii) (a) 110.5 lb./ac.

(b) 71.7 lb./ac.

(iii) Control *vs.* treated, kinds of effects, np *vs.* $\frac{n+p}{2}$ effects and interaction manure × np *vs.* $\frac{n+p}{2}$ and effects × sub-treatments are highly significant. Interaction manures × effects × np *vs.* $\frac{n+p}{2}$ is significant.

(iii) Only control *vs.* treated, n *vs.* p and np *vs.* $\frac{n+p}{2}$ effects are significant.

(iv) Av. yield of *kapas* in lb./ac.

Control=261 lb./ac.

	N	P	NP	Mean
FXO	280	292	297	290
OXF	346	358	345	350
FXF	293	295	303	297
SXO	224	273	215	237
OXS	320	312	477	370
SXS	297	341	439	359
GXO	252	292	297	280
OXG	335	330	436	367
GXG	292	341	466	366
Mean	293	315	364	324

S.E. of the control mean =16.12 lb./ac.
S.E. of difference of two
1. M marginal means =39.48 lb./ac.
2. S marginal means =12.68 lb./ac.
3. S means at the same level of M =38.04 lb./ac.
4. M means at the same level of S =50.23 lb./ac.

(iv) Av. yield of grain in lb./ac.

Control=452 lb./ac.

	N	P	NP	Mean
FXO	429	509	524	487
OXF	466	486	487	480
FXF	497	620	577	565
SXO	441	522	540	501
OXS	424	497	514	478
SXS	456	545	527	509
GXO	474	509	514	499
OXG	477	481	519	492
GXG	564	479	489	511
Mean	470	516	521	502

S.E. of the control mean =18.42 lb./ac.
S.E. of difference of two
1. M marginal means =45.11 lb./ac.
2. S marginal means =16.90 lb./ac.
3. S means at the same level of M =50.70 lb./ac.
4. M means at the same level of S =61.23 lb./ac.

JOWAR Both Rotations Year 1949

(i) 627 lb./ac.

(ii) (a) 200.5 lb./ac.
(b) 184.8 lb./ac.

(iii) Control *vs.* treated, kinds of effects, np *vs.* $\frac{n+p}{2}$ effects and interaction manures × effects are highly significant, n *vs.* p effect and interaction effects × sub-treatments are significant, while others are not significant.

(iv) Av. yield of grain in lb./ac.

Control mean=494 lb./ac.

	N	P	NP	Mean
FOO	595	393	479	489
OFO	417	566	771	585
OOF	693	597	722	671
FFO	467	437	555	486
FOF	554	569	830	651
OFF	710	659	1042	804
FFF	582	627	775	661

GROUNDNUT Year 1949.

(i) 1364 lb./ac.

(ii) (a) 203.1 lb./ac.
(b) 137.0 lb./ac.

(iii) Control *vs.* treated and manures effects are significant, n *vs.* p and np *vs.* $\frac{n+p}{2}$ effects are highly significant. Others are not significant.

(iv) Av. yield of dry pod in lb./ac.

Cotrol mean=1288 lb./ac.

	N	P	NP	Mean
FOX	1407	1442	1525	1458
OFX	1497	1328	1492	1439
FFX	1425	1599	1545	1523
SOX	2227	1561	1452	1413
OSX	1195	1289	1427	1304
SSX	1253	1459	1515	1409
GOX	1155	1223	1412	1265

Contd.

Contd.

	N	P	NP	Mean
SOO	569	451	626	549
OSO	627	549	428	535
OOS	889	629	1038	852
SSO	570	486	381	479
SOS	797	764	1029	863
OSS	741	501	949	730
SSS	784	594	915	764
GOO	476	529	456	487
OGO	460	338	463	420
OOG	655	778	744	726
GGO	667	657	722	682
GOG	788	652	1004	815
OGG	777	641	991	803
GGG	517	457	575	516
Mean	635	565	738	646

	N	P	NP	Mean
OGX	1288	1333	1329	1317
GGX	1260	1437	1434	1377
Mean	1301	1408	1459	1389

S.E. of the control mean = 33.42 lb./ac.
S.E of difference of two
1. M marginal means = 81.85 lb./ac.
2. S marginal means = 28.52 lb./ac.
3. S means at the same level of M = 130.67 lb./ac.
4. M means at the same level of S = 134.48 lb./ac.

S.E. of the control mean = 33.85 lb./ac.
S.E. of difference of two
1. M marginal means = 82.91 lb./ac.
2. S marginal means = 32.29 lb./ac.
3. S means at the same level of M = 96.87 lb./ac.
4. M means at the same level of S = 114.59 lb./ac.

COTTON Rotation I Year 1950.

(i) 241 lb./ac.

(ii) (a) 62.9 lb./ac.
(b) 35.5 lb /ac.

(iii) Control *vs* treated, kinds of effects, n *vs* p, np *vs* $\frac{n+p}{2}$ effects and interactions effects × sub treatments and manures × effects × np *vs* $\frac{n+p}{2}$ are highly significant. Manures effect is highly significant. Other effects are not significant.

(iv) Av. yield of *kapas* in lb./ac.

Control = 174 lb./ac.

	N	P	NP	Mean
FOOF	262	199	249	237
OFOO	159	186	252	199
OOFO	202	189	212	201
FFOF	278	209	295	261
FOFF	229	182	272	228
OFFO	265	225	269	253
FFFF	245	206	262	238
SOOS	385	229	421	345
OSOO	199	192	159	183

COTTON Rotation II Year 1950.

(i) 376 lb./ac.

(ii) (a) 72.9 lb./ac.
(b) 52.9 lb./ac.

(iii) Control *vs* treated, np *vs* $\frac{n+p}{2}$ effects and interaction effects × sub-treatments are highly significant. Kinds of effects and n *vs* p effects are significant. Other effects are not significant.

(iv) Av. yield of *kapas* in lb./ac.

Control = 317 lb./ac.

	N	P	NP	Mean
FOXO	355	335	361	350
OFXO	411	514	345	423
OOXF	348	315	371	345
FFXO	388	302	388	359
FOXF	312	355	348	338
OFXF	318	328	391	346
FFXF	434	391	464	430
SOXO	328	375	295	333
OSXO	418	285	371	358

Contd.

Contd.

	N	P	NP	Mean		N	P	NP	Mean
OOSO	179	186	146	170	OOXS	411	312	441	388
SSOS	361	305	385	350	SSXO	312	292	381	328
SOSS	348	232	438	339	SOXS	428	378	501	436
OSSO	206	202	229	212	OSXS	391	325	457	391
SSSS	285	202	431	306	SSXS	394	394	527	438
GOOG	341	202	351	298	GOXO	368	414	355	379
OGOO	159	219	215	198	OGXO	312	315	348	325
OOGO	139	166	143	149	OOXG	504	292	487	428
GGOG	368	215	345	309	GGXO	358	325	404	362
GOGG	361	265	328	318	GOXG	394	374	474	414
OGGO	186	212	196	198	OGXG	428	404	511	448
GGGG	308	156	365	276	GGXG	404	385	530	440
Mean	260	209	284	251	Mean	382	353	417	384

S.E. of the control mean =14.83 lb./ac.

S.E. of difference of two

1. M marginal means =36.32 lb./ac.
2. S marginal means = 7.75 lb./ac.
3. S means at the same level of M =35.50 lb./ac.
4. M means at the same level of S =46.46 lb./ac.

S.E. of the control mean =17.18 lb./ac.

S.E. of difference of two

1. M marginal means =42.09 lb./ac.
2. S marginal means =11.54 lb./ac.
3. S means at the same level of M =52.90 lb./ac.
4. M means at the same level of S =60.31 lb./ac.

WHEAT Rotation I Year 1950

(i) 570 lb./ac.

(ii) (a) 159.1 lb./ac.

(b) 97.2 lb./ac.

(iii) Only np *vs* $\frac{n+p}{2}$ effect is significant.

(iv) Av. yield of grain in lb./ac.

Control=594 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOOF	499	684	507	563	FXOO	418	581	600	533
OFOO	532	508	514	518	OXFO	569	518	489	525
OOFO	480	664	514	553	OXOF	429	620	591	546
FFOF	643	638	732	671	FXFO	497	555	581	544
FOFF	533	631	514	559	FXOF	568	555	530	551
OFFO	457	424	695	525	OXFF	561	551	453	522
FFFF	566	608	585	586	FXFF	490	471	594	518
SOOS	638	563	552	584	SXOO	527	444	453	475
OSOO	520	485	547	517	OXSO	591	422	576	530
OOSO	454	499	559	504	OXOS	558	549	517	541
SSOS	587	527	814	643	SXSO	436	462	477	458
SOSS	583	747	766	699	SXOS	439	39	569	465
OSSO	465	391	561	472	OXSS	540	512	477	510
SSSS	631	593	752	659	SXSS	423	565	391	460
GOOG	536	515	510	520	GXOO	470	517	466	484
OGOO	402	452	493	449	OXGO	474	560	646	560

WHEAT Rotation II year 1950

(i) 515 lb./ac.

(ii) (a) 105.0 lb./ac.

(b) 78.6 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

Control=547 lb./ac.

Contd.

Contd.

	N	P	NP	Mean
OOGO	578	540	570	563
GGOG	620	629	571	607
GOGG	663	587	695	648
OGGO	512	541	580	544
GGGG	545	525	494	521
Mean	545	560	596	567

S.E. of control mean = 37.50 lb./ac.

S.E. of difference of two

1. M marginal means = 91.86 lb./ac.
2. S marginal means = 21.21 lb./ac.
3. S means at the same level of M = 97.20 lb./ac.
4. M means at the same level of S = 121.40 lb./ac.

	N	P	NP	Mean
OXOG	413	502	572	496
GXGO	477	494	546	506
GXOG	480	605	501	529
OXGG	473	496	495	488
GXGG	497	428	555	493
Mean	492	514	528	511

S.E. of control mean = 24.75 lb./ac.

S.E. of difference of two

1. M marginal means = 60.62 lb./ac.
2. S marginal means = 17.15 lb./ac.
3. S means at the same level of M = 78.60 lb./ac.
4. M means at the same level of S = 88.28 lb./ac.

JOWAR Rotation I Year 1950

(i) 981 lb./ac.

(ii) (a) 160.4 lb./ac.

(b) 164.4 lb./ac.

(iii) Control *vs* treated, kinds of effects, n *vs* p, np *vs* $\frac{n+p}{2}$ effects and interaction manures × effects are all highly significant. Interactions manures × np *vs* $\frac{n+p}{2}$ and effects × sub-treatments are significant. Other effects are not significant.

(iv) Av. yield of grain in lb./ac.

Control = 748 lb./ac.

	N	P	NP	Mean
FOOF	907	1077	1320	1101
OFOO	760	837	891	829
OOFO	924	1026	1272	1074
FFOF	786	898	996	893
FOFF	949	767	1041	919
OFFO	1146	1043	989	1059
FFFF	903	987	1001	964
SOOS	830	872	1050	917
OSOO	926	978	931	945
OOSO	975	924	1204	1034
SSOS	907	839	1354	1033
SOSS	933	844	1457	1078
OSSO	974	985	1356	1105
SSSS	1434	766	1677	1292
GOOG	1132	1006	1064	1067
OGOO	758	779	797	778
OOGO	1026	760	963	916
GGOG	856	760	1209	942

JOWAR Rotation II year 1950

(i) 1003 lb./ac.

(ii) (a) 201.3 lb./ac.

(b) 176.4 lb./ac.

(iii) Control *vs* treated, manures, kinds of effects, np *vs* $\frac{n+p}{2}$ effects and interaction manures × np *vs* $\frac{n+p}{2}$ are all highly significant. Interaction-effects × sub treatments is significant while other effects are not significant.

(iv) Av. yield of grain in lb./ac.

Control = 769 lb /ac.

	N	P	NP	Mean
XFOO	788	1028	974	930
XOFO	649	780	1008	812
XOOF	1070	771	993	945
XFFO	1066	956	1150	1057
XFOF	908	956	935	933
XOFF	1100	903	929	977
XFFF	985	795	1135	972
XSOO	741	891	1070	901
XOSO	1048	971	1250	1090
XOOS	895	925	1227	1016
XSSO	717	855	1068	880
XSOS	880	804	1344	1009
XOSS	864	958	1615	1146
XSSS	1003	1070	2000	1358
XGOO	827	967	945	913
XOGO	1076	588	1126	930
XOOG	1194	1009	1306	1170
XGGO	1187	953	1410	1183

Contd.

	N	P	NP	Mean		N	P	NP	M
GOGG	1417	910	1410	1246	XGOG	856	830	1446	954
OGGO	873	694	1260	942	XOGG	1193	1099	1707	1333
GGGG	1244	900	1352	1165	XGGG	1450	872	1487	1270
Mean	984	888	1171	1014	Mean	977	904	1230	1037

S.E. of the control mean = 37.81 lb./ac.

S.E. of difference of two

1. M marginal means = 92.61 lb./ac.
2. S marginal means = 35.87 lb./ac.
3. S means at the same level of M = 164.40 lb./ac.
4. M means at the same level of S = 163.10 lb./ac.

S.E. of the control mean = 47.45 lb./ac.

S.E. of difference of two

1. M marginal means = 116.22 lb./ac.
2. S marginal means = 38.49 lb./ac.
3. S means at the same level of M = 175.40 lb./ac.
4. M means at the same level of S = 135.10 lb./ac.

GROUNDNUT Year 1950

(i) 1024 lb./ac.

(ii) (a) 351.5 lb./ac.

(b) 160.8 lb./ac.

(iii) n *vs* p effect alone is highly significant.

(iv) Av. yield of dry pod in lb./ac.

Control = 995 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOOX	981	981	1266	1076	XFOOX	1107	1048	945	1033
OFOX	1061	915	988	988	XOFOX	965	1024	1011	1000
OOFX	988	1008	1114	1037	XOOFX	898	888	869	885
FFOX	1114	1147	1187	1149	XFFOX	1127	1340	1425	1231
FOFX	1253	1107	1353	1238	XFOFX	1061	1236	1200	1166
OFFX	1180	1174	1266	1207	XOFFX	1207	1233	1399	1280
FFFX	1061	1180	1140	1127	XFFFX	1180	1120	1366	1222
SOOX	822	1154	1174	1050	XSOOX	965	1087	885	979
OSOX	1187	1193	1174	1185	XOSOX	819	978	1041	956
OOSX	981	1286	1147	1138	XOOSX	869	1134	1091	1031
SSOX	895	1061	975	977	XSSOX	908	1057	991	985
SOSX	941	1034	1101	1025	XSOSX	772	1140	1094	1002
OSSX	875	1101	1021	999	XOSSX	680	1124	988	931
SSSX	762	1326	1034	1041	XSSSX	918	1167	1236	1107
GOOX	776	1001	928	902	XGOOX	1038	998	1280	1105
OGOX	776	1140	968	961	XOGOX	888	1183	963	1011
OOGX	842	855	849	849	XOOGX	1001	1041	1253	1098
GGOX	829	1067	948	948	XGGOX	941	1256	1266	1154
GOGX	908	935	842	895	XGOGX	994	1034	961	996
OGGX	955	862	1014	944	XOGGX	882	1240	1054	1059
GGGX	643	1041	888	857	XGGGX	1031	1081	1064	1059
Mean	944	1075	1066	1028	Mean	966	1105	1113	1061

S.E. of the control mean = 82.85 lb./ac.

S.E. of difference of two

1. M marginal means = 202.90 lb./ac.
2. S marginal means = 35.09 lb./ac.
3. S means at the same level of M = 160.80 lb./ac.
4. M means at the same level of S = 241.70 lb./ac.

GROUNDNUT Year 1951

(i) 1048 lb./ac.

(ii) (a) 181.9 lb./ac.

(b) 131.3 lb./ac.

(iii) n *vs* p and np *vs* $\frac{n+p}{2}$ effects are highly significant. Control *vs* treated and manures effects are significant. Other effects are not significant.

(iv) Av. yield of dry pod in lb./ac.

Control = 956 lb./ac.

S.E. of the control mean = 42.87 lb./ac.

S.E. of difference of two

1. M marginal means = 105.00 lb./ac.
2. S marginal means = 28.65 lb./ac.
3. S means at the same level of M = 131.30 lb./ac.
4. M means at the same level of S = 150.10 lb./ac.

COTTON Rotation I Year 1951

(i) 302 lb./ac.

(ii) (a) 50.9 lb./ac.

(b) 35.3 lb./ac.

(iii) Control *vs* treated, kinds of effects, n *vs* p, np *vs* $\frac{n+p}{2}$ effects and interaction of effects × sub-treatments are all highly significant. Interaction manures × effects and manures × effects × np *vs* $\frac{n+p}{2}$ are all significant. Others are not significant.

(iv) Av. yield of cotton in lb./ac.

Control =257 lb./ac.

	N	P	NP	Mean
FOOFO	322	229	341	297
OFOOF	318	265	285	289
OOFOO	265	265	322	284
FFOFF	371	278	355	335
FOFFO	285	269	315	290
OFFOF	315	235	308	286
FFFFF	308	269	318	298
SOOSO	252	295	202	250
OSOOS	414	325	428	389
OOSOO	239	285	245	256
SSOSS	454	255	414	374
SOSSO	239	272	252	254
OSSOS	398	292	467	386
SSSSS	394	239	351	328
GOOGO	275	265	229	256
OGOOG	355	302	404	354
OOGOO	219	242	232	231
GGOGG	424	275	431	377
GOGGO	265	249	222	245
OGGOG	381	239	375	332
GGGGG	358	298	385	347
Mean	326	269	328	308

S.E. of the control mean =12.00 lb./ac.

S.E. of difference of two

1. M marginal means =29.39 lb./ac.
2. S marginal means = 7.70 lb./ac.
3. S means at the same level of M =35.30 lb./ac.
4. M means at the same level of S =41.16 lb./ac.

COTTON Rotation II Year 1951.

(i) 488 lb./ac.

(ii) (a) 124.0 lb./ac.

(b) 70.0 lb./ac.

(iii) Control *vs* treated n *vs* p, np *vs* $\frac{n+p}{2}$ effects and interaction of effects × sub-treatments are all highly significant, kinds of effects is significant and others are not significant.

(iv) Av. yield of cotton in lb./ac.

Control =387 lb./ac.

	N	P	NP	Mean
FOOXF	557	494	491	514
OFOXO	434	451	564	483
OOFXO	564	524	517	535
FFOXF	461	441	573	492
FOFXF	577	527	554	553
OFFXO	491	554	640	562
FFFXF	540	497	627	555
SOOXS	617	358	636	537
OSOXS	351	388	454	398
OOSXO	418	504	401	441
SSOXS	501	428	636	522
SSOXS	534	385	590	503
OSSXO	394	358	428	393
SSSXS	587	464	809	620
GOOXG	653	431	666	583
OGOXO	418	391	388	399
OOGXO	328	388	345	354
GGOXG	534	537	527	533
GOGXG	610	474	663	582
OGGXO	491	481	474	482
GGGXG	504	438	550	497
Mean	503	453	549	502

S.E. of the control mean =29.23 lb./ac.

S.E. of difference of two

1. M marginal means =71.59 lb./ac.
2. S marginal means =15.28 lb./ac.
3. S means at the same level of M =70.00 lb./ac.
4. M means at the same level of S =91.61 lb./ac.

WHEAT Rotation I Year 1951

(i) 323 lb./ac.

(ii) (a) 163.8 lb./ac.

(b) 65.6 lb./ac.

(iii) None of the effects is significant.

WHEAT Rotation II Year 1951

(i) 262 lb./ac.

(ii) (a) 88.7 lb./ac.

(b) 51.1 lb./ac.

(iii) Interaction of effects × sub-treatments alone is significant.

(iv) Av. yield of grain in lb./ac.

Control=265 lb./ac.

	N	P	NP	Mean
FOOFO	341	332	381	351
OFOOF	341	278	219	279
OOFOO	335	434	322	364
FFOFF	328	421	355	368
FOFFO	312	308	206	275
OFFOF	358	328	388	358
FFFFF	298	394	332	341
SOOSO	328	398	497	408
OSOOS	295	368	252	305
OOSOO	371	315	378	355
SSOSS	346	328	359	344
SOSSO	401	345	404	383
OSSOS	308	391	318	339
SSSSS	239	318	245	267
GOOGO	404	361	322	362
OGOOG	262	285	275	274
OOGOO	262	308	282	284
GGOGG	302	292	235	276
GOGGO	378	471	514	454
OGGOG	262	355	285	301
GGGGG	272	272	265	270
Mean	321	348	325	331

S.E. of the control mean = 38.61 lb./ac.

S.E. of difference of two

1. M marginal means = 94.57 lb./ac.
2. S marginal means = 14.31 lb./ac.
3. S means at the same level of M = 65.60 lb./ac.
4. M means at the same level of S = 108.70 lb./ac.

(iv) Av. yield of grain in lb./ac.

Control=255 lb./ac.

	N	P	NP	Mean
FOXOF	356	264	235	285
OFXOO	253	304	199	252
OOXFO	260	302	276	279
FFXOF	294	306	278	293
FOXFF	305	315	300	307
OFXFO	286	233	312	278
FFXFF	284	282	274	280
SOXOS	261	258	259	259
OSXOO	276	309	276	287
OOXSO	158	126	191	158
SSXOS	262	296	269	275
SOXSS	160	214	177	184
OSXSO	217	194	274	228
SSXSS	235	270	320	275
GOXOG	235	348	263	282
OGXOO	230	277	229	245
OOXGO	312	268	306	295
GGXOG	328	263	273	288
GOXGG	263	247	292	267
OGXGO	269	215	312	282
GGXGG	198	234	258	233
Mean	258	265	267	263

S.E. of the control mean = 20.9 lb./ac.

S.E. of difference of two

1. M marginal means = 51.21 lb./ac.
2. S marginal means = 11.15 lb./ac.
3. S means at the same level of M = 51.10 lb./ac.
4. M means at the same level of S = 66.50 lb./ac.

JOWAR Rotation I Year 1951

(i) 784 lb./ac.

(ii) (a) 240.4 lb./ac.

(b) 164.7 lb./ac.

(iii) Kinds of effects is significantly different. np *vs* $\frac{n+p}{2}$ effect and interaction manures×np *vs* $\frac{n+p}{2}$ are highly significant. Other effects are not significant.

(iv) Av. yield of grain in lb./ac.

Control=709 lb./ac.

	N	P	NP	Mean
FOOFO	935	786	769	830
OFOOF	865	680	636	727
OOFOO	723	806	623	717
FFOFF	1001	683	859	848

JOWAR Rotation II Year 1951.

(i) 782 lb./ac.

(ii) (a) 163.0 lb./ac.

(b) 135.0 lb./ac.

(iii) Control *vs* treated, kinds of effects, n *vs* p, np *vs* $\frac{n+p}{2}$ effects are highly significant. Interaction manures×np *vs* $\frac{n+p}{2}$ is significant while other effects are not significant.

(iv) Av. yield of grain in lb./ac.

Control=575 lb./ac.

	N	P	NP	Mean
FXOOF	567	708	706	60
OXFOO	548	623	545	572
OXOFO	698	864	915	826
FXFOF	938	769	730	812

Contd.

Contd.

	N	P	NP	Mean		N	P	NP	Mean
FOFFO	812	951	855	873	FXOFF	859	888	845	864
OFFOF	630	656	829	705	OXFFO	668	776	777	740
FFFFF	656	726	842	741	FXFFF	920	771	923	871
SOOSO	812	547	915	758	SXOOS	637	687	961	762
OSOOS	633	666	1014	771	OXSOO	669	602	674	648
OOSOO	424	550	786	587	OXOSO	805	771	832	803
SSOSS	743	859	1465	1022	SXSOS	720	611	870	734
SOSSO	706	590	1111	802	SXOSS	974	699	1059	911
OSSOS	544	557	835	645	OXSSO	829	756	1062	882
SSSSS	1057	912	1127	1032	SXSSS	953	734	1033	907
GOOGO	862	656	878	799	GXOOG	820	704	831	785
OGOOG	554	448	690	564	OXGOO	817	831	638	762
OOGOO	706	762	686	718	OXOGO	834	551	1008	798
GGOGG	955	696	1061	904	GXGOG	926	676	915	839
GOGGO	812	746	1167	908	GXOGG	1091	802	1109	1001
OGGOG	991	779	1087	952	OXGGO	890	717	1098	902
GGGGG	815	733	815	788	GXGGG	933	762	1212	969
Mean	773	704	907	795	Mean	814	729	893	812

S.E. of the control mean = 56.7 lb./ac.

S.E. of difference of two

1. M marginal means =138.8 lb./ac.
2. S marginal means = 35.9 lb./ac.
3. S means at the same level of M =164.7 lb./ac.
4. M means at the same level of S =193.3 lb./ac.

S.E. of the control mean = 38.4 lb./ac.

S.E. of difference of two

1. M marginal means = 94.1 lb./ac.
2. S marginal means = 29.4 lb./ac.
3. M means at the same level of S =135.0 lb./ac.
4. S means at the same level of M =144.9 lb./ac.

COTTON Rotation I Year 1952

(i) 344 lb./ac.

(ii) (a) 63.1 lb./ac.

(b) 60.1 lb./ac.

(iii) Kinds of effects, n *vs.* p and np *vs.* $\frac{n+p}{2}$ effects are highly significant. Control *vs.* treated effect and interaction of manures × effects are significant.

(iv) Av. yield of seed cotton in lb./ac.

Control = 308 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOOFOO	348	331	288	322	XFOOXF	388	514	461	454
OFOOFO	338	295	328	320	XOFOXO	454	361	434	410
OOFOOF	312	385	348	348	XOOFXO	398	491	421	437
FFOFFO	378	361	434	391	XFFOXF	444	511	547	501
FOFFOF	355	371	348	358	XFOFXF	560	484	527	524
OFFOFF	355	345	411	370	XOFFXO	474	517	537	509
FFFFFF	318	302	348	323	XFFFXF	511	484	583	526
SOOSOO	292	308	305	302	XSOOXS	461	467	527	485
OSOOSO	302	272	345	306	XOSOXO	371	418	441	410
OOSOOS	448	275	398	374	XOOSXO	371	461	457	430

COTTON Rotation II Year 1952

(i) 467 lb./ac.

(ii) (a) 91.8 lb./ac.

(b) 68.8 lb./ac.

(iii) Control *vs* treated, np *vs* $\frac{n+p}{2}$ effects are highly significant, kinds of effects is significant while other effects are not significant.

(iv) Av. yield of seed cotton in lb./ac.

Control =377 lb./ac.

Contd.

Contd.

	N	P	NP	Mean		N	P	NP	Mean
SSOSSO	365	239	361	322	XSSOXS	461	461	597	503
SOSSOS	454	345	517	439	XSOSXS	45	414	437	46-
OSSOSS	345	255	365	322	XOSSXO	371	385	474	410
SSSSSS	484	331	438	418	XSSSXS	491	577	537	535
GOOGOO	378	355	315	349	XGOOXG	454	527	520	5.0
OGOOGO	318	288	295	300	XOGOXO	391	531	564	452
OOGOOG	365	272	335	324	XOGOXO	394	517	458	453
GOOGGO	358	215	282	285	XGOGXG	597	5 4	577	509
GOGGOG	361	405	434	400	XG[illegible]XG	421	4 7	403	5.5
OGGOGG	304	269	527	367	XOGGXO	368	467	557	474
GGGGGG	404	285	408	366	XGGGXG	564	481	623	533
Mean	365	310	371	349	Mean	448	477	526	480

S.E. of control mean = 14.87 lb./ac.
S.E. of the difference of two
1. M marginal means = 30.43 lb./ac.
2. S marginal means = 13.[illegible] lb./ac.
3. S means at the same level of M = 60.[illegible] lb./ac.
4. M means at the same level of S = 61.12 lb./ac.

S.E. of control mean = 23.64 lb./ac.
S.E. of the difference of two
1. M marginal means = 48.20 lb./ac.
2. S marginal means = 15.01 lb./ac.
3. S means at the same level of M = 8,80[illegible] lb./ac.
4. M means at the same level of S = 17.23 lb./ac.

WHEAT Rotation I Year 1952

(i) 484 lb./ac.

(ii) (a) 64.2 lb./ac.

(b) 76.2 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain lb./ac.

Control = 458 lb./ac.

WHEAT Rotation II Year 1953

(i) 453 lb./ac.

(ii) (a) 103.4 lb./ac.

(b) 84.8 lb./ac.

(iii) Control vs. treated, $F = \frac{n_1 n_2}{n_1 + n_2} D^2$ effects are highly significant. Interaction of manures × effects is significant while other effects are not significant.

(iv) Av. yield of grain in lb./ac.

Control = 386 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOOFOO	517	494	524	512	FOOXFO	527	408	504	480
OFOOFO	474	487	451	471	OFOXOF	391	454	583	476
OOFOOF	511	444	444	466	OOFXOO	557	444	454	485
FFOFFO	507	481	454	481	FFOXFF	401	434	570	468
FOFFOF	401	517	610	509	FOFXFO	471	444	557	491
OFFOFF	520	448	484	484	OFFXOF	431	537	603	524
FFFFFF	441	570	517	509	FFFXFF	431	560	613	535
SOOSOO	434	457	438	443	SOOXSO	511	252	494	419
OSOOSO	527	530	507	521	OSOXOS	328	421	444	398
OOSOOS	481	540	494	505	OOSXOO	451	434	474	453
SSOSSO	421	448	524	464	SSOXSS	388	577	517	494
SOSSOS	520	398	507	475	SOSXSO	414	368	375	386
OSSOSS	461	560	564	528	OSSXOS	418	414	378	403

Contd.

Contd.

	N	P	NP	Mean		N	P	NP	Mean
SSSSSS	511	504	501	505	SSSXSS	573	474	653	567
GOOGOO	481	428	428	446	GOOXGO	544	438	544	509
OGOOGO	524	464	471	486	OGOXOG	368	371	394	378
OOGOOG	408	471	524	468	OOGXOO	335	398	401	378
GGOGGO	464	504	564	509	GGOXGG	438	597	341	459
GOGGOG	381	477	544	467	GOGXGO	517	504	583	535
OGGOGG	481	457	520	486	OGGXOG	441	497	580	506
GGGGGG	467	507	550	508	GGGXGG	381	318	441	380
Mean	473	485	506	488	Mean	444	445	500	463

S.E. of the control mean =15.13 lb./ac.
S.E. of difference of two
1. M marginal means =37.07 lb./ac.
2. S marginal means =16.63 lb./ac.
3. S means at the same level of M =76.20 lb./ac.
4. M means at the same level of S =72.44 lb./ac.

S.E. of the control mean =24.37 lb./ac.
S.E. of difference of two
1. M marginal means =59.70 lb./ac.
2. S marginal means =18.50 lb./ac.
3. S means at the same level of M =84.80 lb /ac.
4. M means at the same level of S =91.42 lb./ac.

JOWAR Rotation I Year 1952

(i) 1048 lb./ac.
(ii) (a) 173.5 lb./ac.
(b) 117.0 lb./ac.
(iii) Control *vs* treated, np *vs* $\frac{n+p}{2}$ effects and interactions effects × sub-treatments and manures × effects × np *vs* $\frac{n+p}{2}$ are highly significant, kinds of effects is significant, while other effects are not significant.
(iv) Av. yield of grain in lb./ac.
Control=861 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOOFOO	1038	994	1130	1054	FOXOFO	978	958	1021	985
OFOOFO	941	839	1263	1014	OFXOOF	1117	1087	1014	1073
OOFOOF	869	895	928	897	OOXFOO	825	892	998	905
FFOFFO	985	1124	991	1033	FFXOFF	1190	978	1183	1117
FOFFOF	951	1091	1253	1098	FOXFFO	892	938	855	895
OFFOFF	1210	1001	1296	1169	OFXFOF	985	716	1167	956
FFFFFF	965	786	1134	962	FFXFFF	1117	994	1107	1073
SOOSOO	1004	1157	968	1043	SOXOSO	951	746	1097	931
OSOOSO	1111	1041	1223	1125	OSXOOS	786	1017	1144	928
OOSOOS	1018	938	1157	1038	OOXSOO	971	729	928	876
SSOSSO	1170	1101	1353	1208	SSXOSS	875	882	1084	947
SOSSOS	1034	1144	1243	1140	SOXSSO	918	951	1293	1054
OSSOSS	981	932	1319	1091	OSXSOS	815	938	1111	955
SSSSSS	932	1001	1671	1201	SSXSSS	859	938	1217	1005
GOOGOO	756	865	835	819	GOXOGO	1555	1439	1744	1579
OGOOGO	1167	925	1273	1122	OGXOOG	716	1084	1014	938
OOGOOG	994	875	1061	977	OOXGOO	1048	948	1057	1018

JOWAR Rotation II Year 1952

(i) 1036 lb./ac.
(ii) (a) 379.2 lb./ac.
(b) 161.4 lb./ac.
(iii) Manures effect is significant, np *vs* $\frac{n+p}{2}$ effect is highly significant. Other effects are not significant
(iv) Av. yield of grain in lb./ac.
Control=982 lb./ac.

Contd.

Contd.

	N	P	NP	Mean		N	P	NP	Mean
GGOGGO	1097	1120	1147	1121	GGXOGG	1243	1084	1353	1227
GOGGOG	1001	978	1362	1114	GOXGGO	1008	1067	1316	1130
OGGOGG	1359	1101	1306	1275	OGXGOG	1111	1276	1193	1193
GGGGGG	1120	945	1154	1073	GGXGGG	888	1051	1329	1089
Mean	1033	993	1198	1075	Mean	993	991	1149	1044

S.E. of control mean = 40.89 lb./ac. S.E. of control mean = 89.4 lb./ac.

S.E. of difference of two

1. M marginal means = 100.20 lb./ac. = 218.9 lb./ac.
2. S marginal means = 25.53 lb./ac. = 35.2 lb./ac.
3. S means at the same level of M = 117.00 lb./ac. = 161.4 lb./ac.
4. M means at the same level of S = 138.42 lb./ac. = 255.5 lb./ac.

GROUNDNUT Year 1952

(i) 754 lb./ac.

(ii) (a) 182.8 lb./ac.

(b) 115.0 lb./ac.

(iii) Control *vs.* treated effect is highly significant. Interaction manures × effects × np *vs.* $\frac{n-p}{2}$ is significant. Other effects are not significant.

(iv) Av. yield of pod in lb./ac.

Control = 642 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FXOOFX	673	676	912	754	FOXOFOX	1018	1014	1038	1023
OXFOOX	676	613	673	654	OFXOOFX	888	1004	1101	998
OXOFOX	753	878	1097	909	OOXFOOX	782	839	796	806
FXFOFX	922	1031	766	906	FFXOFFX	951	1084	1061	1032
FXOFFX	878	849	905	877	FOXFFOX	981	1111	1200	1097
OXFFOX	832	729	743	768	OFXFOFX	1074	1107	1246	1142
FXFFFX	829	753	915	832	FFXFFFX	1074	1011	1412	1166
SXOOSX	839	875	815	843	SOXOSOX	892	965	1190	1016
OXSOOX	776	835	713	775	OSXOOSX	726	1054	955	912
OXOSOX	610	650	769	676	OOXSOOX	762	918	786	822
SXSOSX	750	713	825	766	SSXOSSX	869	1107	1260	1079
SXOSSX	709	782	703	731	SOXSSOX	703	1054	975	911
OXSSOX	676	636	696	669	OSXSOSX	802	1210	1200	1107
SXSSSX	743	852	693	763	SSXSSSX	845	1067	769	894
GXOOGX	580	627	593	600	GOXOGOX	806	998	1038	947
OXGOOX	812	683	938	811	OGXOOGX	786	802	1210	933
OXOGOX	759	753	663	725	OOXGOOX	776	812	776	788
GXGOGX	726	869	772	789	GGXOGGX	882	1107	1048	1012
GXOGGX	693	915	835	814	GOXGGOX	829	1130	1114	1024
OXGGOX	623	776	812	737	OGXGOGX	862	928	1041	944
GXGGGX	699	872	776	782	GGXGGGX	1038	1150	1227	1138
Mean	741	779	791	770	Mean	874	1022	1069	988

GROUNDNUT Year 1953

(i) 967 lb./ac.

(ii) (a) 223.4 lb./ac.

(b) 144.4 lb./ac.

(iii) Control *vs.* treated, n *vs* p and np *vs.* $\frac{n+p}{2}$ effects are highly singnificant. Kinds of effects is significant. Other effects are not significant.

(iv) Av. yield of pod in lb./ac.

Control = 820 lb./ac.

S.E. of control mean = 43.1 lb./ac.
S.E. of difference of two
1. M marginal means =105.5 lb./ac.
2. S marginal means = 25.1 lb./ac.
3. S means at the same level of M =115.0 lb./ac.
4. M means at the same level of S =124.7 lb./ac.

S.E. of control mean = 52.7 lb./ac.
S.E. of difference of two
1. M marginal means =128.9 lb./ac.
2. S marginal means = 31.5 lb./ac.
3. S means at the same level of M =144.4 lb./ac.
4. M means at the same level of S =174.7 lb./ac.

COTTON Rotation I Year 1953

(i) 248 lb./ac.
(ii) (a) 55.3 lb./ac.
(b) 27.6 lb./ac.

(iii) Control *vs.* treated, kinds of effects, np *vs.* $\frac{n+p}{2}$ effects and interaction effects × sub-treatments and manures × effects × np *vs.* $\frac{n+p}{2}$ are highly significant. Other effects are not significant.

(iv) Av. yield of *kapas* in lb./ac.

Control =196 lb./ae.

	N	P	NP	Mean
FOOFOOF	265	192	305	254
OFOOFOO	239	202	285	242
OOFOOFO	252	199	252	234
FFOFFOF	278	225	292	265
FOFFOFF	239	192	305	245
OFFOFFO	275	206	265	249
FFFFFFF	278	179	288	248
SOOSOOS	318	295	315	309
OSOOSOO	242	186	212	213
OOSOOSO	245	229	209	228
SSOSSOOS	328	229	328	295
SOSSOSS	295	225	401	307
OSSOSSO	239	199	255	231
SSSSSSS	288	209	322	273
GOOGOOG	298	199	288	262
OG OOGOO	176	189	199	188
OOGOOGO	232	229	262	241
GGOGGOG	351	229	371	317
GOGGOGG	285	196	312	264
OGGOGGO	292	199	225	239
GGGGGGG	298	162	335	265
Mean	272	208	287	256

S.E. of control mean =13.03 lb./ac.
S.E. of difference of two
1. M marginal means =31.93 lb./ac.
2. S marginal means = 6.02 lb./ac.
3. S means at the same level of M =27.60 lb./ac.
4. M means at the same level of S =39.08 lb./ac.

COTTON Rotation II Year 1953

(i) 339 lb./ac.
(ii) (a) 42.3 lb./ac.
(b) 33.1 lb./ac.

(iii) Control *vs.* others, kinds of effects, n *vs.* p np *vs.* $\frac{n+p}{2}$ effects and interaction effects × sub-treatments and manures × effects × np *vs.* $\frac{n+p}{2}$ are highly significant. Interaction manures × effects is significant. Other effects are not significant.

(iv) Av. yield of *kapas* in lb./ac.

Control =286 lb./ac.

	N	P	NP	Mean
FXOOFXO	295	272	315	294
OXFOOXF	298	288	361	316
OXOFOXO	345	325	375	348
FXFOFXF	365	388	441	398
FXOFFXO	318	282	318	306
OXFFOXF	404	315	355	358
FXFFFXF	507	315	424	415
SXOOSXO	275	282	305	287
OXSOOXS	348	361	424	378
OXOSOXO	302	295	328	308
SXSOSXS	365	312	338	338
SXOSSXO	348	305	338	330
OXSSOXS	414	371	537	441
SXSSSXS	388	325	421	378
GXOOGXO	282	269	298	283
OXGOOXG	401	348	378	376
OXOGOXO	345	298	325	323
GXGOGXG	341	282	371	331
GXOGGXO	302	328	368	333
OXGGOXG	355	275	424	351
GXGGGXG	368	322	474	388
Mean	351	312	377	347

S.E. of control mean = 9.97 lb./ac.
S.E. of difference of two
1. M marginal means =24.42 lb /ac.
2. S marginal means = 7.22 lb./ac.
3. S means at the same level of M =33 10 lb./ac.
4. M means at the same level of S =36.42 lb./ac.

WHEAT Rotation I Year 1953

(i) 353 lb./ac.

(ii) (a) 134.2 lb./ac.

(b) 86.5 lb./ac.

(iii) np *vs* $\frac{n+p}{2}$ effect is significant, interaction manures × np *vs.* $\frac{n+p}{2}$ is highly significant while other effects are not significant.

(iv) Av. yield of grain in lb./ac.

Control =307 lb./ac.

	N	P	NP	Mean
FOOFOOF	438	368	322	376
OFOOFOO	391	338	312	347
OOFOOFO	308	391	305	335
FFOFFOF	398	259	331	329
FOFFOFF	269	457	315	347
OFFOFFO	322	249	252	274
FFFFFFF	331	345	325	334
SOOSOOS	437	351	434	407
OSOOSOO	341	285	371	332
OOSOOSO	298	185	222	235
SSOSSOS	242	308	477	342
SOSSOSS	305	258	378	314
OSSOSSO	335	318	404	352
SSSSSSS	517	434	513	488
GOOGOOG	378	407	335	333
OGOOGOO	325	275	351	317
OOGOOGO	391	394	361	382
GGOGGOG	407	298	404	370
GOGGOGG	457	407	653	506
OGGOGGO	298	421	503	407
GGGGGGG	378	301	480	386
Mean	360	336	383	360

S.E. of control mean = 31.63 lb./ac.

S.E. of difference of two

1. M marginal means = 77.48 lb./ac.
2. S marginal means = 18.88 lb./ac.
3. S means at the same level of M = 86.50 lb./ac.
4. M means at the same level of S=104.84 lb./ac.

WHEAT Rotation II Year 1953

(i) 339 lb./ac.

(ii) (a) 158.8 lb./ac.

(b) 96.9 lb./ac

(iii) n *vs.* p effect alone is highly significant

(iv) Av. yield of grain in lb./ac.

Control =282 lb./ac.

	N	P	NP	Mean
XFOOXFO	283	570	295	334
XOFOXOF	411	394	477	427
XOOFXOO	245	206	315	255
XFFOXFF	431	345	322	366
XFOFXFO	308	411	394	37
XOFFXOF	398	378	325	367
XFFFXFF	169	368	176	238
XSOOXSO	269	391	272	31
XOSOXOS	235	361	255	284
XOOSXOO	189	338	235	271
XSSOXSS	182	298	361	280
XSOSXSO	391	454	467	43
XOSSXOS	225	322	477	34
XSSSXSS	225	520	424	390
XGOOXGO	285	474	341	367
XOGOXOG	341	235	212	25
XOOGXOO	454	494	540	496
XGGOXGG	335	457	328	37
XGOGXGO	245	235	421	300
XOGGXOG	351	225	481	352
XGGGXGG	385	351	517	41
Mean	303	373	366	347

S.E. of control mean = 37.43 lb./ac.

S.E. of difference of two

1. M marginal means = 91.69 lb./ac.
2. S marginal means = 21.15 lb./ac.
3. S means at the same level of M = 93.90 lb./ac.
4. M means at the same level of S=121.10 lb./ac.

JOWAR Rotation I Year 1953

(i) 634 lb./ac.

(ii) (a) 135.1 lb./ac.

(b) 123.2 lb./ac.

(iii) Control *vs.* treated, np *vs.* $\frac{n+p}{2}$ effects are highly significant. Manures and interaction manures × effects are significant Other effects are not significant.

JOWAR Rotation II Year 1953

(i) 636 lb./ac.

(ii) (a) 215.5 lb./ac.

(b) 169.7 lb./ac.

(iii) Control *vs.* treated effect alone is highly significant.

(iv) Av. yield of grain in lb./ac.

Control =503 lb./ac.

	N	P	NP	Mean
FOOFOOF	603	696	941	747
OFOOFOO	540	646	557	581
OOFOOFO	683	666	729	693
FFOFFOF	759	643	736	713
FOFFOFF	570	567	796	644
OFFOFFO	835	683	703	740
FFFFFFF	580	560	806	649
SOOSOOS	593	686	633	637
OSOOSOO	686	819	643	716
OOSOOSO	467	428	517	471
SSOSSOS	726	696	859	760
SOSSOSS	534	583	802	640
OSSOSSO	613	739	829	727
SSSSSSS	915	577	829	774
GOOGOOG	610	481	527	539
OGOOGOO	554	590	650	598
OOGOOGO	610	497	627	578
GGOGGOG	461	544	617	541
GOGGOGG	550	660	845	685
OGGOGGO	650	564	527	580
GGGGGGG	666	693	726	695
Mean	629	620	709	653

S.E. of control mean = 31.84 lb./ac.

S.E. of difference of two

1. M marginal means = 78.00 lb./ac.
2. S marginal means = 26.88 lb./ac.
3. S means at the same level of M = 123.20 lb./ac.
4. M means at the same level of S = 127.30 lb./ac.

(iv) Av. yield of grain in lb./ac.

Control =504 lb./ac.

	N	P	NP	Mean
FOOXFOO	690	414	769	624
OFOXOFO	537	756	762	685
OOFXOOF	912	743	799	818
FFOXFFO	650	597	736	661
FOFXFOF	514	358	617	496
OFFXOFF	640	630	769	680
FFFXFFF	869	799	912	860
SOOXSOO	729	567	796	697
OSOXOSO	524	501	620	548
OOSXOOS	646	749	723	706
SSOXSSO	520	544	799	621
SOSXSOS	471	587	328	462
OSSXOSS	573	388	859	607
SSSXSSS	567	497	762	609
GOOXGOO	617	593	627	612
OGOXOGO	570	421	743	578
OOGXOOG	484	444	706	545
GGOXGGO	855	951	935	914
GOGXGOG	660	385	829	625
OGGXOGG	815	451	643	636
GGGXGGG	822	607	908	779
Mean	651	570	745	655

S.E. of control mean =50.79 lb./ac.

S.E. of difference of two

1. M marginal means =124.42 lb./ac.
2. S marginal means = 37.03 lb./ac.
3. S means at the same level of M =169.70 lb./ac.
4. M means at the same level of S =186.20 lb./ac.