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EXPERIMENTS

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FOREWORD

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

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

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

NEW DELHI,
March 26, 1965.

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

PREFACE

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

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

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

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

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

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

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

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

NEW DELHI,
March 25, 1965.

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

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

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9. ORISSA (BHUBANESWAR)	L.B.S. SOMAYAZULU	SHRI B. MISRA, Deputy Director of Agriculture (Hq.) SHRI D. MISRA, Principal, Uttakal Krushi Mahavidyalaya, Bhubaneswar.
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(TRIVANDRUM) Director of Agriculture.
SHRI N. SHANKARA MENON
Director of Agriculture.
SHRI P.D. NAIR,
Director of Agriculture.

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

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

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

Abbreviations adopted for States are as follows :-

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

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

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

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

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

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

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

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

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

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

Other abbreviations used in the text of experiments :

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

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

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

DETAILS OF EXPERIMENTAL STATIONS

A. General information :

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

B. Normal rainfall :

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

C. Irrigation and drainage facilities :

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

D. Soil type and soil analysis :

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

E. No. of experiments :

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

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

BASAL CONDITIONS

A. For experiments on annual crops :

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

B. For experiments on perennial crops :

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

C. For experiments on cultivators' fields :

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

DESIGN

A. For experiments on annual crops :

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

B. For experiments on perennial crops :

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

C. For experiments on cultivators' fields :

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

GENERAL

A. For experiments on annual crops :

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

B. For experiments on perennial crops :

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

C. For experiments on cultivators' fields :

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

TABLE OF CONVERSIONS TO METRIC UNITS

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

GLOSSARY OF VERNACULAR NAMES OF CROPS

Sl. No.	Name of Crop	Botanical Name	Assamese	Bengali	Oriya	Telugu	Tamil	Malayalam	Kannada	Marathi	Gujarati	Hindi	Punjabi
1.	Paddy	<i>Oryza sativa</i> L.	Dhan	Dhan	Dhano	Vadlu	Nel	Nellu	Bhatta	Bhat	Dangar	Dhan ; Chawal	Chaul ; Dhan
2.	Wheat	<i>Triticum sativum</i> Lamk <i>Triticum aestivum</i> L.	Gaum ; Ghehu	Gam	Gaham	Godhumalu	Kothumai	Gothamtu	Godhi	Gahu	Ghahu	Gehon	Kanak
3.	Maize	<i>Zea mays</i> L.	Gom dhan	Bhutta	Macca	Mokkajonna	Makka Cholam	Cholam Makka- cholam	Musukina Jola	Makka	Makkai	Makka	Makki ; Makayee
4.	Bhindi (Lady's finger)	<i>Hibiscus esculentus</i> ; <i>Abelmoschus esculentus</i> Moench.	Bhendi	Dhenrosh	Vendi	Benda	Bendai kai	Venda	Bende kayi	Bhendi	Bhida ; Bhinda	Bhindi	Bhindi ; Tori
5.	Brinjal ; Egg plant	<i>Solanum melongena</i> L.	Bengena	Begun	Baigan	Vankaya	Kathirikai	Vazhuthana	Badane kayi	Vange	Vengan	Baingan	Bengan ; Bataun
6.	Potato	<i>Solanum tuberosum</i> L.	Alooguti	Alu	Bilati Alu	Bangala- gumpu, Urlagadda	Urulai Kizhangu	Urala Kizangu	Alu gedde	Batata	Aloo ; Batato	Aaloo	Alu
7.	Sweet Potato	<i>Ipomoea batatas</i> Lam.	Mitha aloo	Misthi alu	Kandamula	Chilagada- dumpa	Seeni kilangu	Cheeni kizangu	Genasu	Ratalu	Shakaria	Shakarkandi	Shakarkandi
8.	Yam	<i>Dioscorea bulbifera</i> L. ; <i>Dioscorea alata</i> L.	Kathalu	Chupri alu	Desi ba khamka alu	Pendalamu	Kizhangu	Kachil	Kunti genasu	Goradu	Goradu ; Ratalu	Rataaloo	Ratalu
9.	Tapioca	<i>Manihot utilissima</i> ; <i>Manihot esculenta</i> Crantz.	Simolu Aloo	Shimul alu	—	Karra Pendalamu	Maravalli Kizhangu ; Kuchi Kizhangu	Maracheeni	Maragenasu	Tapioca	—	Tapioca	Tapioca
10.	Colocasia	<i>Colocasia antiquorum</i> Schott.	—	Kachu	Saru	Chamadum- paru	Sambu ; Sapan kizhangu	Chembu	Kasvina gedde	Alu	Alvi	Akhi Dhurya	Arvi
11.	Ginger	<i>Zingiber officinale</i> Rosc	Ada	Ada	Ada	Allamu	Ioji	Inchi	Shunti ; Allu	Ale	Adu	Adrakh	Adrak
12.	Arhar	<i>Cajanus cajan</i> Milsp. <i>Cajanus indicus</i> Sprengl	Arahar	Arahar	Harad	Kandulu	Thuvarai	Thuvara Payaru	Thogari	Tur	Tuver	Arhar	Harhar ; Arhar
13.	Biri & Mung	<i>Phaseolus mungo</i> var. <i>radiatus</i> Linn. <i>Phaseolus aureus</i> Roxb. <i>Saccharum officinarum</i> L.	Matimah	Mashkalai	Biri	Minumulu	Uzhundu	Uzhunnu	Uddu	Udid	Adad, Udad	Urd	Mash, Urd
14.	Sugarcane		Kuhiar	Akh	ikn	Cheruku	Karumbu	Karimbu	Kabbu	Oas	Sherdi	Ganna ; Kamad ; Naishakar	Kamad Ganna ; Fakh

GLOSSARY OF VERNACULAR NAME OF CROPS—contd.

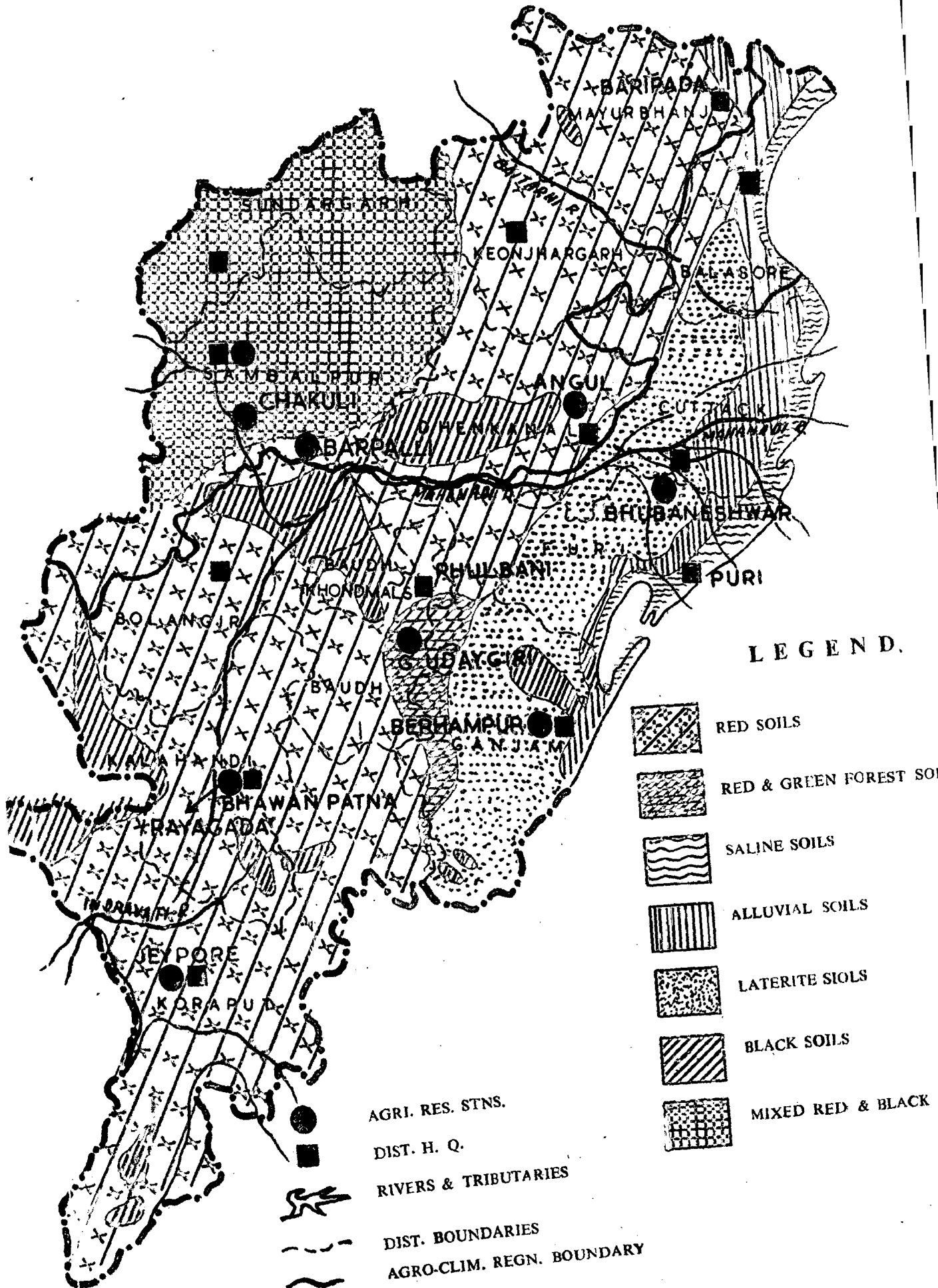
Sl. No.	Name of Crop	Botanical Name	Assamese	Bengali	Oriya	Telugu	Tamil	Malayalam	Kannada	Marathi	Gujarati	Hindi	Punjabi
15.	Cotton	<i>Gossypium</i> spp.	Kapah	Karpas, Tula	Kapa	Pratti	Paruthi	Paruthi	Hatti	Kapus	Kapas	Kapas	Kapah
16.	Jute	<i>Corchorus</i> spp.	Marapat	Shadapat Toshapat	Jhota	Janumu	Chanapai	Chanambu	Senabu	Joot	Moti Chhunchh	Jute	Patsan
17.	Tobacco	<i>Nicotiana tabacum</i>	Dhopat	Tasnak	Uanpatra	Pogaku	Pugayilai	Pukayila	Hoge Sappu	Tambaku	Tamaku	Tambaku	Tamaku Tambaku
18.	Turmeric	<i>Curcuma longia</i> ; <i>Curcumedemesticava</i> l	Halodhi	Halud, haldi	Hald i	Pasupu	Manjal	Manjal	Arisina	Halad	Haldar	Haldi	Hald, Haldi Bassar
19.	Groundnut	<i>Arachis hypogaea</i> L.	China badam	Cheena badam	China badam	Nelashanaga	Nielakadalai	Nilakkadala	Kadala kayi	Bhuimug	Magafali	Mungphali	Mungfali
20.	Linseed	<i>Linum Usitatissimum</i> L.	Tisi	Tishi	Peshi	Avise	Alivithai	Cherucha- navithu	Agase	Javas ; Alsi	Als i	Alsi	Alsi
21.	Gingelly	<i>Sesamum indicum</i> L. <i>Sesamum orientale</i> L.	Til	Til	Rasi	Nuvvulu	Ellu	Ellu	Yellu	Til, Tili	Tal	Til	Til
22.	Niger	<i>Guizotia abyssinica</i> . Cass.	Sorguja	Sarguaz	Alashi	Verrinu- vvulu	Peyellu	—	Huchellu	Karale khursani	Ramtal	Ramtil	Ram til
23.	Berseem	<i>Trifolium alexandrinum</i> L.	—	Berseem	Gini ghasa	—	—	—	—	Bersim gavat	Barsim	Berseem	Berscem
24.	Nagpur orange	<i>Citrus reticulata</i>	Kamala	Kamala lebu	Santra	Kamalapha- lamu	Kamala ; Koorg Kudegu orange	Aranju	—	Santra	Santra Narangi	Santra	Santra

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MAP OF ORISSA STATE SHOWING
 AGRO-CLIMATIC REGIONS, SOILS,
 AGRICULTURAL RESEARCH STATIONS
 ETC.



ORISSA

1. General :

The State of Orissa lies on the eastern coast of India with 4 of its 13 districts lying along the coast. On the other three sides it is surrounded by the States of West Bengal, Bihar, Madhya Pradesh and Andhra Pradesh. The State has a geographical area of 38,504 thousand acres and a reporting area of 38,401 thousand acres. The land utilization figures for this State are provided in table 1 below :—

TABLE 1.
Land utilization statistics of Orissa State (1958-59.)
(Area in '000 acres.)

1. Reporting area	38,401
2. Forests	8,799
3. Barren & uncultivable land	3,557
4. Land put to non-agricultural uses	2,717
5. Culturable waste	3,504
6. Permanent pastures & other grazing land	1,819
7. Land under miscellaneous tree crops	1,143
8. Current fallows	2,269
9. Other fallow land	739
10. Net area sown	13,854
11. Total cropped area	14,714
12. Area sown more than once	860

2. Topography :

In the north is the plateau—the continuation of Chotanagpur plateau of Bihar—with a gentle rolling form and undissected flat lands cut by steep sided valleys. In the middle or heart of the state is the table land. This consists of watersheds of the three rivers, the Baitarani, the Brahmani and the Mahanadi. The hills in table-land are not long continuous ranges, but are generally scattered in groups, running in the east and west direction and the entire area slopes from west to east. To the east and south-west of this table-land lies the Eastern Ghat division or the upland. These are ranges of dissected steep sided mountain ranges with canyons and fertile inter-mountain valleys and high plateaus or 'Dangarala'. The fourth is the coastal tract lying between the Eastern Ghat hill ranges and the Bay of Bengal.

The state can be divided into four distinct regions : (1) the northern plateau or lowland, (2) the central table-land, (3) the Eastern Ghat region or upland, and (4) the coastal tract.

The northern plateau, forms a part of the southern extension of the 'Central belt of India' and lies between 20° North latitude and 79°—87° East longitude. The hill ranges stretch from north to south and rise to an elevation of 2,500 to 3,500 ft. above sea level. On the extreme east, there lies the Similipal range of Mayurbhanj district. The central portion consists of rugged forest clad hills interspersed with fertile valleys. Considerable deposit of limestone in the nodular forms are found in this tract. The plateau is rich in iron ores, limestone and coal deposit and so has great potentialities for industrial development.

The central table land is the region of the Brahmani and the Mahanadi basins land and covers an area of about 14,259 sq. miles. The northern half of the Brahmani basin is thickly wooded and sparsely populated while the southern half contains a large number of fertile valleys. The Mahanadi basin spreads out into fertile plains, undulating landscape with a gradual slope from the northern or southern hill ranges of the Mahanadi.

The Eastern Ghat region is a section of the great line of Eastern Ghats which traverse the east coast of the Peninsular India and covers an area of about 17,190 sq. miles. The hill ranges run from north to south and are nowhere more than 50 miles from the sea.

The coastal belt covers an area of about 12,531 sq. miles and consists of three distinct tracts differing widely in their physical aspect. The first is a marshy weed land; the second is the cultivated alluvial plains, formed from the deposits of the rivers; and the third is the broken hill region and undulating tract which gradually ascends into weed land and hills of the central table-land.

3. Rain fall and climatic conditions :

The state is in the subtropical belt of medium pressure. The chief characteristics of its climate are high temperature and medium rainfall. But topography has altered the climate of this region and four well-defined seasons prevail in this state :

1. Cold dry winter—December, January, February
2. Hot dry summer—March, April, May
3. Monsoon warm wet seasons—June, July, August, September
4. Cool autumn—October, November

The coastal region, due to proximity to the Bay, has a higher rainfall. Most parts of the state have also a high rainfall owing to hillyness and forest cover. The state is also affected by cyclonic storms from the Bay of Bengal which cross the coast of Orissa and cause heavy rain fall in the Eastern Ghat. The average annual rainfall of the state is 58 inches, with 72 rainy days; about 45 inches are received during June to September, with 10 to 16 days of rain in each month. July receives maximum rains while December and January are the driest months, with a maximum of about 3" of rainfall.

The mean annual maximum temperature is 91°F, it rises to 101°F in April and May and falls to 97°F and 95°F in June and July respectively. The mean minimum is 73°F, it falls to 59° F or 60° F in December and January.

There is great variation in the humidity in different sections of Orissa. In Koraput, the humidity ranges from 92 per cent saturation in August and September, the wettest months, to 60 per cent in March and 61 per cent in April and May. Koraput is the dampest part in the state during the rainy season. The central table land has the lowest relative humidity during March, April and May. In the driest part of the state, the relative humidity varies from 51 to 54 per cent during the same months. The relative humidity of the coastal areas is highest and it never falls below 70 per cent.

4. Soils :

Northern plateau: The plateau consists of iron ore series of the upper Dharwar system and is rich in hematite, limonite and thick and extensive deposits of magnetite and dolomitic limestone in the western section. The tract has a type of soil known as red soil. The soil is neutral in reaction, poor in organic matter and plant nutrients. Lime content is small while that of magnesium is negligible and of phosphate low. They are comparatively more open in texture and vary from loamy to sandy and rarely clayey. These characteristics are most marked in the Bamanghati subdivision of Mayurbhanj and the Bonai basin of Sundergraph district.

Central table land: The relief, the type of native vegetation and the rocks that form the parent material of the central table land afford bases to subdivide into at least three zones each with a distinct soil type (1) north east section with yellow earth, (2) central and south west section of black earth, and (3) eastern plain of laterite soil extending upto where the Mahanadi discharges into the delta region.

Yellow earth is the predominant soil type of the region between the Ile and the champali in Rairakhol. Yellow soils are predominant on smooth relief where ground water stands at a depth of a few feet.

Whole of the central section of the table land comprising Athamllik Angul and Boudh sub-divisions on either side of the Mahanadi and the area between the Sukiel and the Loisinga Zamindari district, consists of black earth popularly known as the 'black cotton soil or *regur* of India'. The soils in general have a higher content of clay. Lime concretions known as *kankar* or *genguti* are found mixed with soil. The high clay content of the soil makes it crack during summer and sticky during the rainy season.

The soil is alkaline in reaction and the pH varies from 7.5 to 8.5. It generally contains soluble salts in all horizons though these do not reach the toxic limit for plant growth. Percentage of potassium, lime and magnesium are high but the nitrogen content is low, as is common in the Indian soil, ranging between 0.12 percent to 0.05 percent.

Eastern Ghat : Topography has played an important part in soil formation of this region. Differences in slope and elevation are usually associated with differences in drainage which has a strong influence on the development of soil and the uses to which they are put. The high humidity coupled with luxuriant forest vegetation creates an environments for the development of a group of soil. There is therefore a vertical distribution of zonal soil types viz., skeletal soil on the upper portion of the slope laterite, gray brown pod soil and valley soil.

Coastal division :—There are four well defined divisions of the deltaic alluvial soils from north to south as detailed below :

1. *North section :—*Delta of North Balasore formed by the Suvarnrekha, the Burabalong the Kansabonser and the salandi. The soil is more sandy or sandy loam.

2. *Central section :—*Delta of Baitarani and Brahmani. This includes part of Bhadrak sub division and Jaipur sub-division. Soil varies from clay loam to stiff clay.

3. *Mahandi delta :—*Delta of the Mahanadi and her tributaries in the Cuttack and in the Puri districts, *stratified* into clay silt, sandy and gritty.

4. *Rushikulaya delta :—*More sandy in nature. Except the Rushikulya delta, a large part of the other delta areas are subjected to flood.

5. Irrigation :

The State has a total irrigated area of 2414 thousand acres. The extent of area irrigated through different sources is given in table 2 below :

TABLE 2
Area irrigated through different sources (1958-59)
(Area in '000 acres)

Source	Acreage	% area irrigated.
Government canals	487	20.2
Private canals	69	2.9
Tanks	1223	50.6
Wells	94	3.9
Other sources	541	22.4
Total	2414	100.0

6. Agricultural Production and Normal cropping pattern.

Important crop of this area is paddy. Rest are all subsidiary crops occupying small areas. The total area, production and average yield of various crops in this state are given in table 3 below :

TABLE 3

Area, production and av. yield per acre of principal crops (1963—64).

	Area in '000 acres	Production in '000 tons	Yield. in lb./ac
Paddy	10,641	4238	892.1
Ragi	136	26	428.2
Maize	77	13	378.2
Other cereals	144	43	668.9
Pulses	2,144	423	441.9
Sesamum	242	20	185.1
Rape & Mustard	130	28	482.5
Groundnut	145	53	818.8
Other Oilseeds	91	20	492.3
Mesta	38	75	2**
Sugarcane	79	1554	19.67*
Jute	135	467	3.5**

* Yield of cane in ton/ac.

** Bales of 400 lb./ac.

7. Experimentation and Agricultural Research.

There were in all 207 experiments conducted during the period 1954-59 reported from this state. Besides, 145 experiments collected under the Model Agronomy Experiments, T.C.M.

TABLE 4
Distribution of experiments crop-wise and type-wise

Crop	M	MV	C	CV	CM	IM	D	DI	CMV	Total
Paddy	56	15	5	1	6	1	5	2	—	91
Wheat	9	—	1	—	—	—	—	—	—	10
Maize	—	—	1	—	—	—	—	—	—	1
Bhindi	—	—	—	—	—	—	1	—	—	1
Brinjal	—	—	—	—	—	—	5	—	—	5
Potato	4	—	3	—	—	—	—	—	—	7
Tomato	—	—	—	—	—	—	1	—	—	1
Sweet Potato	3	—	3	—	—	—	2	—	—	8
Yam	2	—	—	—	—	—	—	—	—	2
Tapioca	2	—	2	—	—	—	—	—	—	4
Colocasi	3	—	—	—	—	—	—	—	—	3
Arrowroot	1	—	—	—	—	—	—	—	—	1
Ginger	—	—	1	—	—	—	—	—	—	1
Arhar	1	—	—	—	—	—	—	—	—	1
Biri and Mung	1	—	—	—	—	—	—	—	—	1
Sugarcane	20	3	2	5	—	—	1	—	—	31
Cotton	3	—	—	—	—	—	1	—	1	5
Jute	—	—	1	—	—	—	—	—	—	1
Tabacca	2	—	—	—	—	—	—	—	—	2
Surmeic	2	—	5	—	—	—	—	—	—	7
Groundnut	1	—	2	1	—	—	1	—	—	5
Linseed	—	—	—	—	—	1	—	—	—	1
Gingilly	—	—	—	—	—	3	—	—	—	3
Niger	—	—	—	—	—	4	—	—	—	4
Berseem	2	—	—	—	—	—	—	—	—	2
Nagpur Orange	4	—	—	—	—	5	—	—	—	9
Total	116	18	26	7	6	14	17	2	1	207

experiments and the Simple Fertilizer Trial Schemes of the Indian Council of Agricultural Research and the experiments conducted on cultivators' fields by the State during this period have also been included in the compendium. Experiments with manurial combination of treatments formed about 75% of the total of which about 56% were purely of manurial type. Among food crops paddy accounted for the largest number of experiments conducted, about 44% of the experiments being on this crop. Among cash crops the largest number of experiments were conducted on Sugarcane these being about 15% of the total. Agricultural Research Stations at Bhubaneswar and Sambalpur are the two principal Research Stations in the State. Table 4 below gives the crop and typewise breakup of the experiments type-wise.

About 54.6% of the trials were laid out with Randomised block design and about 35.3% of the trials were with split plot and rest with confounded arrangement of treatments. Block size varied from 32 to 18 in case of R.B.D. while in split plot arrangement the no. of main plots varied from 2 to 12 and the no. of sub-plots per main plot generally varied from 2 to 9, although in a number of experiments with varieties forming part of the treatments as many as 45 sub-plots per main-plot were also recorded. The net plot size in an R.B.D. ranged between 1/1200th to 1/36.3 of an acre. In case of split-plot designs the net plot size varied from 1/2075 to 1/85th of an acre. Experiments with as many as 9 replications have been obtained while there have been a few experiments with 1/8th fractional replicate.

PARTICULARS OF RESEARCH STATIONS AND SOIL ANALYSIS

1. Citrus Fruit Research Station, Angul.

A. General information :

(i) Dhenakanal district, 16 miles from Meeramandali R.S. Lat. 21° N/Long. 85.2° E/Alt. —N.A. (ii) It represents red laterite soil tract (black cotton type of soil). (iii) Started in 1946. (iv) Only perennial crops. (v) Research on citrus varieties and collection of different varieties are the main aspects of research.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	to March	April	May	Total
121	368	124	132	58	58	—	—	51	13	925

(Av. based on rainfall data for 1957-58).

C. Irrigation and drainage facilities :

(i) (a) Facilities available since 1948. (b) Tanks are available for irrigation. (ii) There is a proper drainage system.

D. Soil type and soil analysis :

(i) Red loamy soil with an average depth of 2.1', black colour and medium structure.
(ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Nagpur orange 9, Total=9.

2. Agricultural and Demonstration Farm, Barpalli.

A. General information :

(i) 82 miles from Sambalpur R.S. (ii) to (v) N.A.

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

Details—N.A.

E. No. of experiments :

Sugarcane 1, Niger 3, Total=4.

3. Rice Research Sub-Station, Berhampur.

A. General information :

(i) Ganjam district, 6 miles from Berhampur R.S. ; Lat 19.5° N/Long. 84.3° E/Alt. N.A. As for general topography, the research station has (a) high land depending on the vagaries of the monsoon and low land having facilities. (ii) It represents coastal tract having red and clay soils. (iii) Started in 1932. (iv) Paddy, Dhaincha, Mung, *Biri* and Kulthi are the various crops tried in experimentation. (v) Breeding improved paddy varieties is the main programme of research.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
63	242	245	54	564	288	—	22	—	—	4		1422

(Av. based on rainfall data for 1958.59. This year rainfall was abnormal).

C. Irrigation and drainage facilities :

(i) (a) Facilities available since 1946. (b) Canal irrigation. (ii) No proper drainage is available.

D. Soil type and soil analysis :

(i) Laterite soil, slight grey in colour, to a depth of 9" to 1½' and has very fine sandy structure with clay colloidal patch. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy 17, Total=17.

4. State Research Station, Bhubaneswar.**A. General information :**

(i) Puri district, 4 miles from Bhubaneswar R.S. Lat. 20.2° N/Long. 86.1° E/Alt. 85'. (ii) It represents small valley tract with adjoining red soils. Land remains marshy and the water patches are called *dahals*. There is also a part of high land tract. (iii) Started in 1954. (iv) Paddy after paddy is the usual pattern. (v) Research with cultural, Rotational manurial and irrigational trials on paddy, wheat, pulses and oilseeds.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
249	324	238	221	162	142	—	32	8	49	39	45	1555

(Av. basal on rainfall data for the period 1950-53).

C. Irrigation and drainage facilities :

(i) (a) Facilities available since 1957. (b) Tank irrigation. (ii) Open drainage system is available.

D. Soil type and soil analysis :

(i) Red and yellow lateritic soils with varying depth from shallow to 10'. The soil has grey colour with yellow sub-soil and light red soil with deep red sub-soil. Red soils have comparatively looser structure than other paddy soils which are more compact with stiff sub-soil.

(ii) Chemical analysis.

Sand	Silt	Clay	Total carbon	Exchangeable base			
				Ca	Hg	Mn	pH
80.2	13.0	5.5	0.54	1.37	0.90	0.76	5.6
Total N		Base exchange m.e./100					
0.036		2.70					

(iii) Mechanical analysis—N.A.**E. No. of experiments :**

Paddy 49, Wheat 3, Bhindi 1, Brinjal 4, Potato 1, Sweet potato 7, Yam 2, Tapioca 4, Colacasia 3, Arrow root 1, Ginger 1, Biri and mung 1, Sugarcane 7, Groundnut 1, Linseed 1, Gingelly 3, and Niger 1, Total 91.

5. Cotton Research Station, Chakuli.**A. General information :**

(i) Sambalpur district, 35 miles from Sambalpur R.S. Lat. 21°22' N/Long 83°48' E/Alt. N.A. (ii) It represents upland tract of medium level. (iii) Started in 1956. (iv) Paddy, Cotton, Wheat, Groundnut and G.M. crops. (v) Research on economic cropping pattern suitable for Hirakud area.

B. Normal rainfall in mm. :

Details—N.A.

C. Irrigation and drainage facilities :

(i) (a) Facilities available. (b) Perennial supply from Hirakud reservoir. (ii) No proper drainage is available.

D. Soil type and soil analysis :

(i) Shallow soil of 3' depth, reddish brown colour and spheroidal structure. (ii) The soil is acidic with a pH of 5.1 to 6.4. Soluble salt content is very low, available P is very low. (iii) Mechanical analysis—N.A.

E. No. of experiments :

Cotton 3, Total=3.

6. Rice Research Sub-Station, Jeypore.**A. General information :**

(i) Koraput district, 106 miles from Vizianagaram R.S. Lat 18.2° N/Long 82.5° E/Alt. 2500'. Laterite and clayey soils. (ii) Half of the experimental area represents plain tract and the other half terraced system. (iii) Started in 1937. (iv) G.M. followed by paddy and early paddy followed by wheat is generally adopted for cropping pattern. (v) Research on high yielding varieties of paddy and evolve varieties suitable for the tract. Study of cultural and manurial practices are the important aspects of the programme of research.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
151	494	665	245	143	15	—	2	—	36	63	56	1870

C. Irrigation and drainage facilities :

(i) (a) and (b) N.A. (ii) National drainage is available.

D. Soil type and soil analysis :

(i) Laterite soil varying from a depth of 1' and above soil is of light red, very light yellow of the black cotton soil type. (ii) Chemical and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy 1, Total=1.

7. Sugarcane Research Sub-Station, Rayagada.**A. General information :**

(i) Kalahandi district, 2 miles from Rayagada R.S. (ii) to (v) N.A.

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

Details—N.A.

E. No. of experiments :

Sugarcane 22, Total 22.

8. Agricultural Research Station, Sambalpur.**A. General information :**

(i) Sambalpur district, 2 miles from Sambalpur R.S. Lat 20°30' N/Long 84°E/Alt. 595'. Central table land. (ii) It represents tract of Cuddapali rock system, resting uniformly on the schists and has a genesis of the Archean age. The rocks are normally horizontally bedded. The lowest land consists of sandy stone over laid by clays and clay succeeded by lime stone. (iii) Started 1954. (iv) During *Kharif* : G.M. paddy and Groundnut. During *Rabi* : Wheat, pulse as paddy. (v) Programme of Research is as follows.

Agronomy Section : To evolve suitable crop pattern for the Hirakud area as to study cultural, manurial and irrigational aspects of major crops of this area.

Botany Section : To introduce new crops and study on evolving new varieties of different crops in this area.

Chemistry Section : To study the effect of intensive cultivation through perennial irrigation on the soil of this area.

Mycology Section : To severly the aspect of diseases of major crops of this area and to study various control measures suitable for them.

Entomology Section : To study about the control of various pests attacking the major crops of this area.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov. to Feb.	March	April	May	Total
332	335	366	554	89	—	3	—	1	1730

(Av. based on data for 1955)

C. Irrigation and drainage facilities :

(i) (a) Facilities available since 1955. (b) Tanks and lift irrigation. (ii) Proper drainage system is available.

D. Soil type and soil analysis :

(i) Soil depth varies from 2' to 3' with pale brown to dark grey colour and granular to crumble structure. (ii) Chemical analysis : Total N—0.06 to 0.07%. Total P₂O₅—0.08 to 0.14%. Total K₂O—0.52 to 0.62%. T.S.S.—0.05 to 0.83%. pH—5.1 to 7.5 Organic matter 0.34 to 0.88%. Total exchange capacity 15.4 to 27 m.e./m.g. (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy 23, Wheat 7, Maize 1, Brinjal 1, Potato 6, Sweet potato 1, Arhar 1, Sugarcane 1, Cotton 2, Jute 1, Tobacco 2, Groundnut 4, Berseem 2, Total 52.

9. Turmeric Research Station, G. Udaygiri.

A. General information :

(i) Phulbani district, 112 miles from Berhampur R.S., Lat 20.8° N/Long 84.2° E/Alt. 2535'. (ii) It represents valley situated at 15' above level to G. Udaygiri on the west. The tract is subject to soil erosion during rainy season. (iii) Started in 1943. (iv) N.A. (v) Research on turmeric studying the cultural, varietal and manurial aspects.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
196	271	537	232	85	30	—	—	—	13	9	127	1500

(Figures relate to rainfall record for the year 1953)

C. Irrigation and drainage facilities :

(i) (a) Facilities available since 1944. (b) Lift irrigation by pump. (iii) No drainage system.

D. Soil type and soil analysis :

(i) Clayey loam and sandy loam soils with depth 20' for red laterite and 15' for clay complex. Soil has red and brown colour. (ii) Chemical and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy 1, Turmeric 7, Total=8,

Crop :- Paddy (Kharif).

Ref :- Or. 55(1).

Site :- Rice Res. Sub-Station, Berhampur.

Type :- 'M'.

Object :—To test the efficiency of Ammonium Chloride as a source of N.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) A/S at 40 lb./ac. of N. (ii) (a) Clay loam. (b) N.A. (iii) 22.6.1955/2.8.1955. (iv) (a) N.A. (b) Transplanting. (c) —. (d) N.A. (e) 1. (v) Nil. (vi) B.A.M-3. (vii) Irrigated. (viii) Weeding. (ix) 93%. (x) 8.12.1955.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as Amm. Chloride.
3. 20 lb./ac. of N as A/S.

Manuring on 31.7.1955 behind the plough in furrows when the plot is wet.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 12'×60'. (b) N.A. (v) Between plots 1'. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Weight of grain only. (iv) (a) 1955—56. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 23.24 lb./plot. (ii) 4.25 lb./plot. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./plot.

Treatment	1	2	3
Av. yield	18.95	25.57	25.20

S.E./mean = 2.12 lb./plot.

Crop :- Paddy (Kharif).

Ref :- Or. 56(1).

Site :- Rice Res. Sub-Stn., Berhampur.

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 4.7.1956. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) 41%. (x) N.A.

2. TREATMENTS :

7 manural treatments : M_0 =Control. M_1 =80 lb./ac. of Amm. Chloride at puddling. M_2 =80 lb./ac. of Amm. Chloride as deep placement. M_3 =100 lb./ac. of A/S at puddling. M_4 =100 lb./ac. of A/S as deep placement. M_5 =125 lb./ac. of Sod. Nitrate at puddling. M_6 =125 lb./ac. of Sod. Nitrate as deep placement.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) Not contd. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) As net plot size is not available the means are given in lb./plot.

5. RESULTS :

(i) 8.50 lb./plot. (ii) 2.23 lb./plot. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./plot.

Treatment	T ₀	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆
Av. yield	7.31	9.00	7.20	8.81	7.14	8.16	11.85

S.E./mean = 1.29 lb./plot.

Crop :- Paddy (Kharif).

Ref :- Or. 55(16).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To study the effect of artificial fertilizers in conjunction with organic manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 28.8.1955. (iv) (a) to (e) N.A. (v) Nil. (vi) B.A.M-6 (late). (vii) Unirrigated. (viii) 2 weedings and 2 roguing. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

- (1) 3 levels of N as A/S : N₀=0, N₁=20 and N₂=40 lb./ac.
- (2) 3 levels of P₂O₅ as Super : P₀=0, P₁=20 and P₂=40 lb./ac.
- (3) 3 levels of bulky manure : F₀=0, F₁=10 and F₂=20 C.L./ac. of F.Y.M.

3. DESIGN :

(i) 3³ confd. (ii) (a) 3 blocks/replication ; 9 plots/block. (b) N.A. (iii) 1. (iv) (a) 33'×33'. (b) N.A. (v) 1 row around. (vi) Yes.

4. GENERAL :

(i) Average. (ii) N.A. (iii) Biometric observations and yield. (iv) (a) 1955-1958. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1029 lb./ac. (ii) 116.0 lb./ac. (iii) Only N effect is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean	F ₀	F ₁	F ₂
N ₀	873	925	870	889	822	917	930
N ₁	887	1042	1262	1064	1043	1037	1110
N ₂	1098	1238	1063	1133	977	1147	1277
Mean	953	1068	1065	1029	947	1034	1106
F ₀	822	1020	1000				
F ₁	1037	1000	1063				
F ₂	1000	1185	1132				

S.E. of any marginal mean = 38.67 lb./ac.

S.E. of body of any table = 66.97 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 56(21).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To study the effects of organic and inorganic manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 22.6.1956/19.7.1956. (iv) (a) Ploughing, cross-ploughing in summer followed by laddering. Puddling at the time of planting. (b) to (d) N.A. (e) 4. (v) Nil. (vi) B.A.M-6 (late). (viii) Unirrigated. (viii) 2 weedings and 1 roguing. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

- (1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
 (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.
 (3) 3 levels of bulky manure : $F_0=0$, $F_1=100$ and $F_2=200$ md./ac. of F.Y.M.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 3 blocks/replication ; 9 plots/block. (b) N.A. (iii) 1. (iv) (a) $42' \times 13'$. (b) $40' \times 11'$.
 (v) 1 row around. (vi) Yes.

4. GENERAL :

(i) Average. (ii) Nil. (iii) Tiller count, height measurement, grain and straw yield. (iv) (a) 1955—1958.
 (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2038 lb./ac. (ii) 262.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	F_0	F_1	F_2
N_0	1822	1884	2031	1912	1565	2027	2145
N_1	2202	2206	1921	2110	1993	2164	2340
N_2	1858	2118	2303	2093	1993	1978	2308
Mean	1961	2069	2085	2038	1794	2056	2264
F_0	1593	1769	2021				
F_1	1767	2172	2231				
F_2	2522	2268	2003				

S.E. of any marginal mean = 87.3 lb./ac.

S.E. of body of any table = 151.3 lb./ac.

Crop :- Paddy.

Site :- Agri. Res. Stn., Bhubaneswar.

Ref :- Or. 57(9).

Type :- 'M'.

Object :—To study the effect of organic and inorganic manures on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) Ploughing and cross-ploughing in summer followed by laddering. Puddling at the time of planting. (b) to (d) N.A. (e) 4. (v) Nil. (vi) B.A.M—6 (late). (vii) Unirrigated. (viii) 2 weedings and 1 roguing. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 56(21) on page 2.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 3 blocks/replication ; 9 plots/block. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 1/117.33 ac.
 (v) 1 row around. (vi) Yes.

4. GENERAL :

(i) Average. (ii) N.A. (iii) Tiller count, height, grain and straw yield. (iv) (a) 1955—1958. (b) No.
 (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2097 lb./ac. (ii) 354.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean	F ₀	F ₁	F ₂
N ₀	2058	1760	2073	1964	1520	2307	2063
N ₁	2121	1985	2268	2125	2053	1946	2376
N ₂	2347	2092	2171	2203	2180	2268	2161
Mean	2175	1946	2171	2097	1918	2174	2200
F ₀	1823	1887	2043				
F ₁	2337	1858	2327				
F ₂	2366	2092	2141				

S.E. of any marginal mean =118.0 lb./ac.
S.E. of body of any table =204.4 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(18).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :- To study the response of Paddy to different levels of F.Y.M. and inorganic fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 12.6.1958/19.7.1958.
(iv) (a) to (c) N.A. (d) 9"×9". (e) N.A. (v) Nil. (vi) B.A.M-6 (late). (vii) Unirrigated. (viii)
Weeding with Japanese weeder and hand weeding. (ix) 53.15". (x) 12.12.1958.

2. TREATMENTS :

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

- (1) 3 levels of N as A/S : N₀=0, N₁=20 and N₂=40 lb./ac.
(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=20 and P₂=40 lb./ac.
(3) 3 levels of F.Y.M. : F₀=0, F₁=8000 and F₂=16000 lb./ac.

3. DESIGN :

(i) 3³ confd. (ii) (a) 3 blocks/replication ; 9 plots/block. (b) N.A. (iii) 1. (iv) (a) 29'×15'.
(b) 27'-6"×13'-6". (v) One row around. (vi) Yes.

4. GENERAL :

(i) Average. (ii) Attack of stem-borer. (iii) Tillers, height, weight of grain and straw. (iv) (a) 1955—1958.
(b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2129 lb./ac. (ii) 486 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean	F ₀	F ₁	F ₂
N ₀	1753	1960	2259	1991	1926	2219	1826
N ₁	1904	2263	2454	2207	2168	2205	2249
N ₂	2408	2275	1887	2190	2373	2237	1960
Mean	2022	2166	2200	2129	2156	2220	2012
F ₀	1743	2339	2386				
F ₁	2278	2312	2070				
F ₂	2043	1848	2144				

S.E. of any marginal mean =162.0 lb./ac.
S.E. of body of any table =280.6 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(19).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To study the effect of N, P and K fertilizers with and without F.Y.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 9.7.1958/10.8.1958. (iv) (a) to (e) N.A. (v) Nil. (vi) T-90 (late) (vii) Unirrigated. (viii) Weeding by Japanese weeder and manual labour. (ix) 49.86%. (x) 19.12.1958.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

- (1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
 (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.
 (3) 3 levels of K_2O as Pot. Chloride : $K_0=0$, $K_1=20$ and $K_2=40$ lb./ac.
 (4) 2 levels of F.Y.M. : $F_0=0$ and $F_1=8000$ lb./ac.

3. DESIGN :

(i) $3^3 \times 2$ confd. (ii) (a) 6 blocks/replication ; 9 plots/block (b) N.A. (iii) 1 (iv) (a) $18' \times 24'$ (b) $16\frac{1}{2}' \times 22\frac{1}{2}'$. (v) One row all round. (vi) Yes.

4. GENERAL :

(i) Average. (ii) Slight attack of stem-borer. (iii) Height, tillers, grain and straw yield. (iv) (a) 1958—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1952 lb./ac. (ii) 359 lb./ac. (iii) N effect is significant. Others [are not significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	K_0	K_1	K_2	F_0	F_1	Mean
N_0	1780	1895	1972	1981	1716	1951	1556	2210	1883
N_1	1718	1977	1812	1701	2103	1704	1458	2214	1836
N_2	2030	2135	2246	2086	2240	2085	1793	2481	2137
Mean	1843	2002	2010	1923	2020	1913	1602	2302	1952
F_0	1494	1742	1572	1533	1679	1595			
F_1	2192	2263	2449	2312	2360	2231			
K_0	1702	1927	2139						
K_1	2082	2052	1925						
K_2	1744	2028	1968						

S.E. of N, P or K marginal mean = 84.6 lb./ac.
 S.E. of F marginal mean = 69.1 lb./ac.
 S.E. of body of $N \times P$, $N \times K$ or $P \times K$ table = 146.6 lb./ac.
 S.E. of body of $F \times N$, $F \times P$ or $F \times K$ table = 119.7 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 59(8).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To study the effect of application of N, P and K with and without organic manures on the yield of Paddy.

1. BASAL CONDITIONS

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 9.6.1959/10.7.1959. (iv) (a) 4 ploughings to 4" depth and levelling. (b) Transplanted. (c) —. (d) $9'' \times 9''$. (e) 4. (v) Nil. (vi) T-90 (late). (vii) Unirrigated. (viii) 2 hand weedings and 1 weeding with Japanese weeder. (ix) 52.99%. (x) 6.12.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58(19) on page 5.

4. GENERAL :

(i) Average. (ii) Slight attack of case-worm and stem-borer. Endrine sprayed. (iii) Tillers, height, weight of grain and straw. (iv) (a) 1958—contd. (b) Yes. (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1870 lb./ac. (ii) 361.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	F ₀	F ₁	Mean
N ₀	1596	1550	2036	1687	1779	1716	1488	1967	1727
N ₁	1716	2075	1868	1718	2020	1921	1716	2057	1886
N ₂	2116	1865	2007	2082	1892	2014	1699	2293	1996
Mean	1809	1830	1970	1829	1897	1884	1634	2105	1870
F ₀	1549	1562	1791	1602	1589	1712			
F ₁	2069	2097	2150	2056	2205	2055			
K ₀	1767	1787	1933						
K ₁	1818	1782	2091						
K ₂	1843	1921	1887						

S.E. of N, P or K marginal mean	= 85.1 lb./ac.
S.E. of F marginal mean	= 69.5 lb./ac.
S.E. of body of N×P, N×K or P×K table	= 147.4 lb./ac.
S.E. of body of F×N, F×P or F×K table	= 120.3 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 56(19).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To find out the effect of continuous application of A/S with and without organic manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 8.7.1956/13.8.1956. (iv) (a) Ploughing and cross-ploughing in summer followed by laddering. Puddling at planting. (b) N.A. (c) N.A. (d) 9'×9'. (e) 4. (v) Nil. (vi) T-90 (late). (vii) Unirrigated. (viii) 2 weedings. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 organic manures at 40 lb./ac. of N and control : M₀=No manure. and M₁=G.M, M₂=G.N.C. and M₃=F.Y.M.

Sub-plot treatments :

5 levels of N as A/S : N₀=0, N₁=20, N₂=40, N₃=60 and N₄=80 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 45'×12'-2". (b) 43'-6"×10'-8". (v) 9'×9'. (vi) Yes.

4. GENERAL :

(i) Average. (ii) Nil. (iii) Tiller count, height, length of earhead, grain and straw yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1669 lb./ac. (ii) (a) 428.0 lb./ac. (b) 263.0 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	Mean
M ₀	1768	1617	1849	1507	1660	1680
M ₁	1521	1600	1653	1630	1527	1586
M ₂	2016	1685	1803	1650	1671	1765
M ₃	1510	1608	1723	1715	1672	1646
Mean	1704	1628	1757	1626	1632	1669

S.E. of difference of two

1. M marginal means = 135.3 lb./ac.
2. N marginal means = 93.0 lb./ac.
3. N means at the same level of M = 186.0 lb./ac.
4. M means at the same level of N = 214.4 lb./ac.

Crop :- Paddy (Kharif)..

Ref :- Or. 57(7).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :- To find out the effect of continuous application of A/S with and without organic manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 6.7.1957/27.7.1957. (iv) (a) Ploughing and cross-ploughing in summer followed by laddering, Puddling at planting. (b) and (c) N.A. (d) 9"×9". (e) 4. (v) Nil. (vi) T-90 (late). (vii) Unirrigated. (viii) 2 weedings and one roguing. (ix) N.A. (x) 28.12.1967.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(19) on page 6.

4. GENERAL :

(i) Average. (ii) N.A. (iii) Tiller count, height, grain and straw yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2326 lb./ac. (ii) (a) 1047 lb./ac. (b) 437 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	Mean
M ₀	2096	2358	2545	2782	2485	2453
M ₁	1825	1831	2093	2485	2420	2131
M ₂	2208	2514	2791	2483	2235	2446
M ₃	2414	2055	2232	2344	2326	2274
Mean	2137	2190	2415	2524	2366	2326

S.E. of difference of two

1. M marginal means = 331.0 lb./ac.
2. N marginal means = 154.5 lb./ac.
3. N means at the same level of M = 309.0 lb./ac.
4. M means at the same level of N = 431.3 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 58(22).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To study the effect of continuous application of A/S with and without organic manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 15.7.1958, 16.8.1959.
 (iv) (a) 4 ploughings by country plough for 4" depth. (b) Transplanted. (c) —. (d) 6'×6'. (e) 4. (v) Nil. (vi) T-90 (late). (vii) Unirrigated. (viii) 2 weedings with Japanese weeder. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 55(19) on page 6.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 45'×12'-2".
 (b) 44'×11'-2". (v) 6'×6'. (vi) Yes.

4. GENERAL :

(i) Average. Plots with 60 lb./ac. of N and 80 lb./ac. of N showed leafy growth. (ii) Slight attack of stem-borer. (iii) Tiller, height, grain and straw yield. (iv) (a) 1958—contd. (b) Yes. (c) Nil.
 (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1520 lb./ac. (ii) (a) 296.3 lb./ac. (b) 250.0 lb./ac. (iii) Only M effect is significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	Mean
M ₃	1619	1717	1558	1762	1518	1635
M ₁	1650	1539	1519	1336	1263	1461
M ₂	1323	1383	1301	1325	1428	1352
M ₃	1584	1532	1828	1640	1575	1632
Mean	1544	1543	1551	1516	1446	1520

S.E. of difference of two

1. M marginal means = 93.7 lb./ac.
2. N marginal means = 88.4 lb./ac.
3. N means at the same level of M = 176.8 lb./ac.
4. M means at the same level of N = 183.6 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 59(4).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To study the effect of continuous application of A/S alone and in combination with organic manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 5.6.1959, 25.7.1959.
 (iv) (a) 4 ploughings to 4" depth. (b) Transplanted. (c) —. (d) 9'×9'. (e) 4. (v) Nil. (vi) T-90 (late).
 (vii) Unirrigated. (viii) 2 weedings with Japanese weeder and one hand weeding. (ix) 54.03%. (x) 25.12.1959.

2. TREATMENTS :

Same as in expt. no. 56(19) on page 6.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 45'×12'-2".
 (b) 43½'×10'-8". (v) 9'×9". (vi) Yes.

4. GENERAL :

(i) Average. (ii) Some plots were damaged by rats. (iii) Tillers, height and weight of grain and straw. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1740 lb./ac. (ii) (a) 477.8 lb./ac. (b) 335.0 lb./ac. (iii) Interaction M×N is significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	Mean
M ₀	1666	1948	1804	1833	1983	1847
M ₁	1831	1819	1769	1085	936	1488
M ₂	1787	1825	1578	1572	1833	1719
M ₃	2030	1787	1971	1948	1794	1906
Mean	1828	1845	1780	1610	1636	1740

S.E. of difference of two

1. M marginal means =151.1 lb./ac.
2. N marginal means =118.4 lb./ac.
3. N means at the same level of M =236.9 lb./ac.
4. M means at the same level of N =260.0 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 56(17).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To study the efficiency of various nitrogenous fertilizers on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 6.7.1956/26.7.1956. (iv) (a) Ploughing and cross ploughing in summer followed by laddering, puddling at the time of planting. (b) to (c) N.A. (v) 20 lb./ac. of P₂O₅ as Super. (vi) T—1242 (late). (vii) Unirrigated. (viii) 2 weedings and roguing. (ix) N.A. (x) 2.1.1957.

2. TREATMENTS :

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

(1) 3 levels of N : N₁=20, N₂=40 and N₃=60 lb./ac.

(2) 3 sources of N : S₁=A/S, S₂=Ammonium chloride and S₃=Urea.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 25'×21½'. (b) 23½'×20'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Average. (ii) Attacked by stem-borer. (iii) Tiller count, height, length of earhead, grain and straw yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1600 lb./ac. (ii) 376 lb./ac. (iii) S effect is highly significant. Interaction N×S is significant. N effect is not significant. (iv) Av. yield of grain in lb./ac.

Control =1268 lb./ac.

	S ₁	S ₂	S ₃	Mean
N ₁	1609	1296	1797	1567
N ₂	1681	1268	1729	1559
N ₃	1609	1810	1938	1786
Mean	1633	1458	1821	1637

S.E of N or S marginal mean = 108.5 lb./ac.
S.E of body of table = 188.0 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 57(4).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :- To study the efficiency of various nitrogenous fertilizers on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 6.7.1957, 4, 5.8.1957. (iv) (a) Ploughing and cross ploughing in summer followed by laddering. Puddling at the time of planting. (b) to (e) N.A. (v) 20 lb./ac. of P_2O_5 as Super. (vi) T-1242 (late). (vii) Unirrigated. (viii) 2 weedings and roguing. (ix) N.A. (x) 17.12.1957.

2. TREATMENTS :

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

(1) 3 levels of N : $N_1=20$, $N_2=40$ and $N_3=60$ lb./ac.

(2) 5 sources of N : $S_1=A/S$, $S_2=Ammonium Chloride$, $S_3=Urea$, $S_4=A/S/N$ and $S_5=C.A.N$.

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) $28' \times 15' - 7''$. (b) $26' - 5'' \times 14' - 1''$. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Average. (ii) Attacked by stem-borer. (iii) Tiller count, height, length of earhead, weight of grain and straw. (iv) (a) 1955-1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2153 lb./ac. (ii) 689 lb./ac. (iii) S effect is significant and N effect is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1856 lb./ac.

	S_1	S_2	S_3	S_4	S_5	Mean
N_1	2313	2028	1853	1364	1550	1822
N_2	2867	1969	1751	2416	1794	2159
N_3	3039	2610	2622	2433	1992	2539
Mean	2740	2202	2075	2071	1779	2173

S.E. of N marginal mean = 154.1 lb./ac.
S.E. of S marginal mean = 198.9 lb./ac.
S.E. of body of table or control mean = 344.5 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(14).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :- To study the efficiency of various nitrogenous fertilizers on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 23.6.1958. (iv) (a) 4 ploughings to 4" depth. (b) Transplanted. (c) --. (d) $9'' \times 9''$. (e) 4. (v) 20 lb./ac. of P_2O_5 as Super applied at the time of planting. (vi) T-1242 (late). (vii) Unirrigated. (viii) Weeding and roguing. (ix) 51.67". (x) 4, 5.12.1958.

2. TREATMENTS :

Same as in expt. no. 57(4) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 28'×15'-6". (b) 26'-6"×14'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Average. (ii) Slight attack of stem-borer. (iii) Height, tiller, grain and straw weight. (iv) (a) 1955—1959. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2297 lb./ac. (ii) 272 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Control=1977 lb./ac.

	S ₁	S ₂	S ₃	S ₄	S ₅	Mean
N ₁	1977	2499	2389	2228	2445	2308
N ₂	2396	2247	2418	2305	2342	2342
N ₃	2392	2249	2364	2042	2475	2304
Mean	2255	2332	2390	2192	2421	2318

S.E. of N marginal mean = 60.82 lb./ac.

S.E. of S marginal mean = 78.52 lb./ac.

S.E. of body of table or control mean = 136.00 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 59(19).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :- To study the efficiency of various nitrogenous fertilizers on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 6, 7.8.1959 (iv) (a) Puddling and ploughing before transplanting. (b) Transplanting. (c) —. (d) 9"×9". (e) 2. (v) 20 lb./ac. of P₂O₅ as Super. (vi) T—1242 (late). (vii) Irrigated. (viii) Weeding and roguing. (ix) 47 94". (x) 8.12.1959.

2. TREATMENTS :

Same as in expt. no. 57(4) on page 10.

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 27.5'×18'. (b) N.A. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Attack of mealy bug. Endrex was sprayed. (iii) Height, tiller, no. of ear heads, no. of grains per ear head and grain yield. (iv) (a) 1955—1959. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1422 lb./ac. (ii) 341 lb./ac. (iii) Only S effect is significant. (iv) Av. yield of grain in lb./ac.

Control=1108 lb./ac.

	S ₁	S ₂	S ₃	S ₄	S ₅	Mean
N ₁	1647	1276	1240	1287	1584	1407
N ₂	1738	1719	1240	1169	1606	1494
N ₃	1559	1501	1094	1545	1435	1477
Mean	1648	1499	1191	1334	1542	1443

S.E. of N marginal mean	= 76.25 lb./ac.
S.E. of S marginal mean	= 98.44 lb./ac.
S.E. of body of table or control mean	=170.50 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 55(16).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To find out the effect of different times of application of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 29, 30.7.1955. (iv) (a) Ploughing and cross ploughing in summer followed by laddering. (b) Transplanted. (c) —. (d) N.A. (e) 2. (v) 20 lb./ac. of P_2O_5 . (vi) T—1242 (late). (vii) Unirrigated. (viii) 2 weedings and one roguing. (ix) and (x) N.A.

2. TREATMENTS :

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

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

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

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 33'×33'. (b) 1/60 ac. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Average. (ii) N.A. (iii) Tillering, height, yield of grain and straw. (iv) (a) 1955—1959. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1697 lb./ac. (ii) 125.0 lb./ac. (iii) T effect, interaction $S \times T$ and control vs others are highly significant. S effect is not significant. (iv) Av. yield of grain in lb./ac.

Control=1380 lb./ac.

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
S_1	1715	1572	1660	1850	1447	1647	1930	1689
S_2	1687	2100	1362	1525	1985	1887	1715	1752
Mean	1701	1836	1511	1687	1716	1767	1822	1720

S.E. of S marginal mean	=27.28 lb./ac.
S.E. of T marginal mean	=51.03 lb./ac.
S.E. of body of table or control mean	=72.17 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 56(18).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To find out the effect of different times of application of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 8.6.1956/18.7.1956. (iv) (a) Ploughing and cross ploughing in summer followed by laddering. Puddling at the time of planting. (b) and (c) N.A. (d) 9"×9". (e) N.A. (v) 20 lb./ac. of P_2O_5 as Super+5000 lb./ac. of F.Y.M. (vi) T—1242 (late). (vii) Unirrigated. (viii) 2 weedings and roguing. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 55(16) on page 12.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 29'×15'. (b) 27½'×13½'. (v) 9"×9". (vi) Yes.

4. GENERAL :

(i) Average. (ii) Attack of stem-borer in all and by blue-green algae in two plots. (iii) Tiller count, height, grain and straw yield. (iv) (a) 1955—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1066 lb./ac. (ii) 149 lb./ac. (iii) T effect is significant. Control vs others is highly significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

Control = 798 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	1268	1090	1047	1042	1080	1188	1013	1104
S ₂	1262	802	1002	1093	1143	1133	1020	1065
Mean	1265	946	1025	1068	1112	1161	1017	1085

S.E. of S marginal mean = 32.51 lb./ac.

S.E. of T marginal mean = 60.83 lb./ac.

S.E. of body of table or control mean = 86.03 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 57(5).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :- To find out the effect of different times of application of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 7.6.1957/9.7.1957. (iv) (a) Ploughing and cross ploughing in summer followed by laddering. Puddling at the time of planting. (b) and (c) N.A. (d) 9"×9". (e) 3. (v) 20 lb./ac. of P₂O₅ as super + 5000 lb./ac. of F.Y.M. (vi) T—1242 (late). (vii) Unirrigated. (viii) 2 weedings and 1 roguing. (ix) N.A. (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 55(16) on page 12.

4. GENERAL :

(i) Average. (ii) Stem-borer attack. Bordeaux mixture sprayed. (iii) Tiller count, height, grain and straw weight. (iv) (a) 1955—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2374 lb./ac. (ii) 233 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

Control = 2171 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	2210	2181	2709	2425	2396	2445	2425	2399
S ₂	2464	2347	2171	2239	2223	2434	2708	2377
Mean	2337	2264	2440	2332	2312	2464	2567	2388

S.E. of S marginal mean = 50.84 lb./ac.

S.E. of T marginal mean = 95.12 lb./ac.

S.E. of body of table or control mean = 134.50 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 58(13).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.****Object :-** To find out the effect of different times of application of N on Paddy.**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 20.7.1958/2, 3, 4.9.1958. (iv) (a) 4 ploughings to 4" depth. (b) Transplanted. (c) —. (d) 9"×9". (e) 4. (v) 20 lb./ac. of P₂O₅ as Super at the time of planting. (vi) T—99 (late). (vii) Unirrigated. (viii) Weeding and removal of rogues. (ix) 36.82". (x) 2.1.1959.

2. TREATMENTS :

Same as in expt. no. 55(16) on page 12.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 42'×13'. (b) 40'-6"×11'-6". (v) One row aloud. (vi) Yes.

4. GENERAL :

(i) Average. (ii) Slight attack of stem-borer. (iii) Height, tillers, grain and straw yield. (iv) (a) 1955—1959. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1617 lb./ac. (ii) 335 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

Control=1791 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	1851	1660	1803	1383	1812	1719	1485	1673
S ₂	1397	1617	1282	1630	1514	1672	1648	1537
Mean	1624	1638	1542	1506	1663	1696	1566	1605

S.E. of S marginal mean = 73.1 lb./ac.

S.E. of T marginal mean = 136.8 lb./ac.

S.E. of body of table or control mean = 193.4 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 59(9).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.****Object :-** To study the most suitable time of application of N.**1. BASAL CONDITIONS :**

(i) (a) Paddy—Fallow—Paddy. (b) Paddy. (c) 10,000 lb./ac. F.Y.M of 30 lb./ac. of N as A/S and 20 lb./ac. of P₂O₅ as Super. (ii) (a) Sandy loam. (b) N.A. (iii) 12, 13 .7.1959. (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c) —. (d) 9"×9". (e) 4. (v) 20 lb./ac. of P₂O₅ as Super+10,000 lb./ac. of F.Y.M. (vi) T—90. (vii) Unirrigated. (viii) Weeding by Japanese weeder. (ix) 47.94". (x) 5.12.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 55(16) on page 12.

4. GENERAL :

(i) Good. (ii) Mild attack of mealy bug. Endrex sprayed. (iii) Height, tillers, no. of the effective earhead, and no. of grains per earhead. (iv) (a) 1955—1959. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1812 lb./ac. (ii) 314.0 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

Control =1851 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	1457	1952	1812	1762	1637	1812	1847	1754
S ₂	1890	1742	2198	1707	1991	2029	1491	1864
Mean	1674	1847	2005	1734	1814	1920	1669	1809

S.E. of S marginal mean = 68.52 lb./ac.

S.E. of T marginal mean =128.20 lb./ac.

S.E. of body of table or control mean =181.30 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 58(21).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To study the effect of P₂O₅ on mineralisation of green matter and its effect on the succeeding Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 25.7.1958/27.8.1958. (iv) (a) 4 ploughings to 4" depth by country plough. (b) Transplanting. (c)—. (d) 9"×9". (e) 4. (v) Nil. (vi) T-90 (late). (vii) Unirrigated. (viii) Weeding with Japanese weeder and hand weeding (ix) 34.26". (x) 7.12.1958.

2. TREATMENTS :

1. Control.
 2. *Dhanicha* alone
 3. *Dhanicha*+B.M. at the time of sowing *dhanicha*.
 4. *Dhanicha*+B.M. at the time of puddling.
 5. *Dhanicha*+5000 lb./ac. of cow dung at the time of sowing *dhanicha*.
 6. B.M. at the time of puddling.
- B.M. applied at 20 lb./ac. of P₂O₅.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) 29'×15'. (b) 27'-6"×13'-6". (v) 9"×9" (vi) Yes.

4. GENERAL :

(i) Average. (ii) Slight attack of stem-borer. (iii) Height, tillers, grain and straw weight.

5. RESULTS :

(i) 2140 lb./ac. (ii) 250 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5	6
Av. yield	2020	2127	2162	2316	2214	1998

S.E./mean =111.8 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 59(6).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To find the effect of P₂O₅ on mineralisation of green matter and its effect on the succeeding Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Mung* in *rabī*. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 5.7.1959/21.8.1959. (iv) (a) 4 ploughings by country plough to 4" depth. (b) Transplanting. (c)—. (d) 9"×9". (e) 4. (v) Nil. (vi) T-90 (late). (vii) Unirrigated. (viii) Weeding with Japanese weeder. (ix) 46.78". (x) 11 and 12.12.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58(21) on page 15.

4. GENERAL :

(i) Average. (ii) Slight attack of stem-borer. (iii) Tiller, height, grain and straw yield. (iv) (a) 1958—N.A. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2130 lb./ac. (ii) 246 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5	6
Av. yield	1918	2200	2221	2358	2150	1930

S.E./mean = 110.0 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 55(18).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :- To find the effect of placement of phosphatic fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) Sand 80.2%, silt 13.0%, clay 0.54%, total N 0.36%. (iii) 20, 21.8.1955. (iv) (a) 4 ploughings with mould board and *desi* ploughs to 4" depth, twice laddering. (b) Transplanted. (c) —. (d) 9" x 9". (e) 2. (v) 30 lb./ac. of N as A.S. (vi) T-90 (late). (vii) Unirrigated. (viii) 2 weedings. (ix) 53.88%. (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3) + 2 controls one in each block.

(1) 2 sources of P_2O_5 : S_1 = Super and S_2 = Ammo. Phos.

(2) 2 levels of P_2O_5 : P_1 = 20 and P_2 = 40 lb./ac.

(3) 4 methods of application : M_1 = Broadcasting at puddling, M_2 = Drilling, M_3 = Dipping the seedlings in mud slash and M_4 = Applied in the form of pellets.

3. DESIGN :

(i) $(4 \times 2^2 + 2)$ confd. fact. (ii) (a) 9 ; 2 blocks/replication (b) N.A. (iii) 3. (iv) (a) 33 x 33' (b) N.A. (v) One row on either side. (vi) Yes.

4. GENERAL :

(i) Average. (ii) N.A. (iii) Height, tillers and yield. (iv) (a) 1955—N.A. (b) and (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1763 lb./ac. (ii) 176.9 lb./ac. (iii) Main effects of M and control vs others are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1543 lb./ac.

	S_1	S_2	M_1	M_2	M_3	M_4	Mean
P_1	1874	1781	1995	1988	1609	1718	1828
P_2	1735	1774	1822	1996	1606	1595	1755
Mean	1805	1778	1909	1992	1608	1657	1792
M_1	1939	1878					
M_2	1932	2052					
M_3	1621	1594					
M_4	1727	1587					

S.E. of P or S marginal mean	=36.11 lb./ac.
S.E. of M marginal mean	=51.07 lb./ac.
S.E. of body of P×S table	=51.07 lb./ac.
S.E. of body of P×M or M×S table	=72.22 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 56(30).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To study the effect of different levels and forms of P_2O_5 on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 8.7.1956/4.8.1956. (iv) (a) 4 ploughings to 4" depth by country plough. (b) Transplanted. (c) —. (d) 9"×9". (e) 4. (v) 20 lb./ac. of N as A/S excepting control plot. (vi) B. A. M-6 (late). (vii) Unirrigated. (viii) 2 weedings and 1 roguing. (ix) 50 37". (x) 18.12.1956.

2. TREATMENTS :

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

(1) 3 levels of P_2O_5 : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.

(2) 3 sources of P_2O_5 : $S_1=B.M.$, $S_2=Rock$ phosphate and $S_3=Super$.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 42'×13'. (b) 40'-6"×11'-6". (v) 9"×9". (vi) Yes.

4. GENERAL :

(i) Average. (ii) N.A. (iii) Height, tillers, grain and straw weight. (iv) (a) 1956—contd. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1944 lb./ac. (ii) 496 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control=1829 lb./ac.

	S_1	S_2	S_3	Mean
P_1	2458	2040	1809	2102
P_2	1811	1952	2058	1940
Mean	2145	2013	1892	2017

S.E. of P marginal mean =165.3 lb./ac.

S.E. of S marginal mean =202.5 lb./ac.

S.E. of body of table =286.4 lb./ac.

S.E. of control mean =143.2 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 57(14).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To study the effect of different forms and levels of P_2O_5 on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 9.6.1957/10.7.1957. (iv) (a) 4 ploughings to 4" depth. (b) Transplanting. (c) —. (d) 9"×9". (e) 4. (v) 20 lb./ac. of N as A/S excepting control. (vi) B.A. M-6 (late). (vii) Unirrigated. (viii) 2 weedings and 1 roguing. (ix) 32.28". (x) 1.12.1957.

2. TREATMENTS :

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

1) 2 levels of P_2O_5 : $P_1=20$ and $P_2=40$ lb./ac.

2) 4 sources of P_2O_5 : $S_1=$ Rock phosphate, $S_2=B.M.$, $S_3=$ Super and $S_4=$ Hyper phosphate.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) $42' \times 13'$. (b) $40' \cdot 6" \times 11' \cdot 5"$. (v) $9' \times 9'$. (vi) Yes.

4. GENERAL :

(i) Average. (ii) N.A. (iii) Tillers, height, grain and straw yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2011 lb./ac. (ii) 397.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control=1859 lb./ac.

	S_1	S_2	S_3	S_4	Mean
P_1	1933	2147	2019	2050	2037
P_2	1909	2038	2217	1925	2022
Mean	1921	2092	2118	1988	2030

S.E. of S marginal mean = 162.4 lb./ac.

S.E. of P marginal mean = 114.9 lb./ac.

S.E. of body of table or control mean = 229.7 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(15).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To study the effect of different forms and levels of P_2O_5 on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 12.6.1958, 4.7.1958. (iv) (a) to (c) N.A. (d) $9' \times 9'$. (e) N.A. (v) Nil. (vi) B.A.M.—6 (late). (vii) Unirrigated. (viii) Weeding and roguing. (ix) 53.15%. (x) 28.12.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(14) on page 17.

4. GENERAL :

(i) Average. (ii) N.A. (iii) Height, tiller, grain and straw yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1998 lb./ac. (ii) 308.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control=1831 lb./ac.

	S_1	S_2	S_3	S_4	Mean
P_1	2130	2163	1841	1988	2030
P_2	2104	1843	2026	2060	2008
Mean	2117	2003	1934	2024	2019

S.E. of S marginal mean	=125.7 lb./ac.
S.E. of P marginal mean	= 88.9 lb./ac.
S.E. of body of table or control mean	=177.8 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 59(21).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To determine the response of Paddy to different levels and forms of P_2O_5 .

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 21.6.1959/13.7.1959. (iv) (a) Ploughing and puddling once before transplanting. (b) Transplanting. (c) —. (d) 9" to 9". (e) 3 to 4. (v) 20 lb./ac. of N as A/S broadcast on the day before transplanting. (vi) B.A.M.—6 (late). (vii) Unirrigated. (viii) Weeding with Japanese weeder followed by hand weeding, roguing at flowering. (ix) N.A. (x) 24.12.1959.

2. TREATMENTS :

Same as in expt. no. 57(14) on page 17.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 1/80 ac. (b) 1/91.1 ac. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Infestation by mealy bugs and heavy caterpillar. Endrex was sprayed. (iii) No. of effective tillers, height of plants, length of earhead, no. of grains and chaff per earhead and grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1841 lb./ac. (ii) 363 lb./ac. (iii) Control vs others alone is significant. (iv) Av. yield of grain in lb./ac.

Control=1372 lb./ac.

	S ₁	S ₂	S ₃	S ₄	Mean
P ₁	1685	1868	1936	1657	1786
P ₂	2004	2141	2141	1771	2014
Mean	1844	2005	2038	1714	1900

S.E. of S marginal mean	=128.3 lb./ac.
S.E. of P marginal mean	= 90.8 lb./ac.
S.E. of body of table or control mean	=181.5 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 59(7).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To find out the effect of organic wastes and green leaves in combination with Super and to find their residual value.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Mung. (c) 40 lb./ac. of P_2O_5 as Super. (ii) (a) Sandy loam. (b) N.A. (iii) 30.6.1959/30.7.1959. (iv) (a) 4 ploughings to 4" depth by country plough. (b) Transplanting. (c) —. (d) 9" x 9". (e) 4. (v) Nil. (vi) T—90 (late). (vii) Unirrigated. (viii) Weeding with Japanese weeder. (ix) 47.37%. (x) 25.12.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of Super : $S_0=0$ and $S_1=1$ md. ton of organic waste or green leaves.

(2) 6 green manures : $M_0=$ Control, $M_1=$ Night soil compost, $M_2=$ Dhanicha, $M_3=$ Sann hemp, $M_4=$ Glyricidia and $M_5=$ Ipomea cornea.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) $24' \times 21'$. (b) $22\frac{1}{2}' \times 19\frac{1}{2}'$. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Average in two replications and poor in one replication. (ii) Slight attack of stem-borer. (iii) Tillers, height, weight of grain and straw. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1494 lb./ac. (ii) 336.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	M_4	M_5	Mean
S_0	1654	1451	1369	1543	1464	1741	1537
S_1	1203	1642	1638	1394	1468	1365	1452
Mean	1428	1546	1504	1468	1466	1553	1494

S.E. of S marginal mean = 79.2 lb./ac.

S.E. of M marginal mean = 137.2 lb./ac.

S.E. of body of table = 194.0 lb./ac.

Crop :- Paddy.

Ref :- Or. 57(3).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) N.A./9.8.1957. (iv) (a) to (e) N.A. (v) 20 lb/ac. of P_2O_5 as Super before planting. (vi) T—141 medium. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 26.11.1957.

2. TREATMENTS :

$T_0=$ Control.

$T_1=$ 40 lb./ac. of N 14 days after transplanting.

$T_2=$ 20 lb./ac. of N 14 days after transplanting and 20 lb. ac. one month after transplanting.

$T_3=$ 10 lb./ac. of N 14 days after transplanting+20 lb./ac. one month after transplanting+10 lb./ac. one week before flowering.

$T_4=$ 40 lb./ac. of N 14 days after transplanting.

N applied as C/A/N. in T_1 , T_2 , and T_3 and as A/S in T_4 .

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) $22'3'' \times 19'6''$. (b) $20'9'' \times 18'$. (v) $9'' \times 9''$. (vi) Yes.

4. GENERAL :

(i) Average. (ii) Nil. (iii) Height, tiller, weight of grain and straw. (iv) (a) 1957—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2431 lb./ac. (ii) 313 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4
Av. yield	2099	2562	2409	2581	2506

S.E./mean = 156.5 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 57(8).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To find out the suitability of split application of N for Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 20 lb./ac. of N as A/S top dressed. (ii) (a) Sandy loam. (b) N.A. (iii) 20.8.1957 and 21.8.1957. (iv) (a) and (b) Ploughing during summer followed by three puddlings. Twice laddering at the time of transplanting. (c) to (e) N.A. (v) No. (vi) T—90 (late and improved variety). (vii) Unirrigated. (viii) Two weedings. (ix) and (x) N.A.

2. TREATMENTS :T₁=10 lb./ac. of N at puddling+10 lb./ac. one month after puddling+10 lb./ac. at flowering.T₂=15 lb./ac. of N at puddling+15 lb./ac. one month after puddling.T₃=30 lb./ac. of N at puddling.T₄=30 lb./ac. of N one month after puddling.T₅=30 lb./ac. of N before flowering.

N applied as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 34½'×10'. (b) 33'×9'. (v) 9"×6". (vi) Yes.

4. GENERAL :

(i) Poor due to drought. (ii) N.A. (iii) Yield of grain. (iv) (a) and (b) No (c) Nil. (v) (a) and (b) Nil. (vi) Heavy rains affected the yield. (vii) Nil.

5. RESULTS :

(i) 1111 lb./ac. (ii) 217.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T ₁	T ₂	T ₃	T ₄	T ₅
Av. yield	1261	1064	1068	1276	885

S.E./mean =108.5 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 59(23).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To find out the response of Paddy to application of N and P.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow. (b) Nil. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 7.6.1959/3.7.1959. (iv) (a) 2 ploughings with mould board plough. Puddling with *desi* plough before planting to 4"-5" depth. (b) Line planting. (c) 15 srs./ac. approximately. (d) 9"×9". (e) 3-4. (v) F Y.M. at 5000 lb./ac. (vi) T—1242 (late). (vii) Nil. (viii) Once weeding with Japanese weeder followed by hand weeding. (ix) 47.94". (x) 17.12.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N₀=0, N₁=30 and N₂=60 lb./ac.(2) 3 levels of P₂O₅ : P₀=0, P₁=30 and P₂=60 lb./ac.N as A/S and P₂O₅ as Super.**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 9. (iv) (a) 15'×29'. (b) 13½'×17½'. (v) One row all round. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Rat damage in some plots. No control measure. Endrex was sprayed during growth period to control mealy bugs. (iii) Height, no. of tillers, length of earhead, no. of chaff and grain per earhead—grain and straw yield. (iv) (a) 1958—continuing. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2139 lb./ac. (ii) 355 lb./ac. (iii) Main effects of N and P are not significant. Interaction $N \times P$ is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	1975	2229	1857	2020
N ₁	1992	2306	2149	2149
N ₂	2428	2092	2224	2248
Mean	2132	2209	2077	2139

S.E. of any marginal mean = 68.3 lb./ac.
S.E. of body of table = 118.5 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(38).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :-To study the effect of P₂O₅ applied to previous legume crop on the yield of succeeding cereal crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Biri+Mung*. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 25.6 1958 and 27.7.1958. (iv) (a) Ploughing, 4 cross ploughings to 4" depth followed by laddering. (b) Transplanting (c) 20 lb./ac. (d) 9" x 9". (e) 4. (v) Nil. (vi) T-141 (medium). (vii) Unirrigated (viii) 2 weedings and roguing. (ix) *Kharif* 50.43". (x) 28.11.1958.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2) + one control (fallow).

(1) 2 legumes : L₁=*Biri* and L₂=*Mung*.

(2) 3 levels of P₂O₅ : P₀=0, P₁=40 and P₂=80 lb./ac.

Sub-plot treatments :

3 levels of N as A/S : N₀=0, N₁=15 and N₂=30 lb./ac.

N as A/S to be applied to the cereal crop grown in all the plots including fallow plots.

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 20'3" x 21'6". (b) 18'9" x 20'. (v) One row around the net plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Height, tiller and no. of grain and straw. (iv) (a) 1956—con.d. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2702 lb./ac. (ii) (a) 498 lb./ac. (b) 300 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Fallow : N₀=2602, N₁=2592 and N₂=2694 lb./ac.

	P ₀	P ₁	P ₂	L ₁	L ₂	Mean
N ₀	2734	2681	2683	2887	2513	2700
N ₁	2651	2775	2665	2752	2643	2697
N ₂	2812	2720	2755	2813	2712	2762
Mean	2732	2725	2701	2817	2622	2719
L ₁	2986	2708	2759			
L ₂	2479	2744	2644			

S.E. of difference of two

1. L marginal means	=136 lb./ac.	5. P means at the same level of N	=218 lb./ac.
2. P marginal means	=166 lb./ac.	6. N means at the same level of L	=141 lb./ac.
3. N marginal means	=100 lb./ac.	7. L means at the same level of N	=178 lb./ac.
4. N means at the same level of P	=173 lb./ac.	S.E. of body of P×L table	=166 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 59(44).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To study the effect of P_2O_5 applied to previous legume crop on the yield of succeeding cereal crop.

1. BASAL CONDITIONS :

(i) (a) Paddy—Legume. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 16.7.1959 (iv) (a) Puddling and 4 ploughings to 4" depth with mould board and *desi* plough. (b) Transplanting. (c) and (d) N.A. (e) 2. (v) 10,000 lb./ac. of F.Y M. broadcast before puddling. (vi) T—141 (medi.m). (vii) Unirrigated. (viii) Weeding. (ix) 47.94". (x) 20.12.1959.

2. TREATMENTS :

Same as in expt. no. 58(38) on page 22.

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 27'×16'. (b) N.A. (v) One row around the net-plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Attack of mealy bug and smut ; Endrex sprayed. (iii) Height, tiller count, no. of earheads, no. of grains/head and yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) N.A. (vii) The *Kharif* experiment started in a new site on paddy and so the treatments of legume and phosphate not applied. Hence the expt. is analysed as R.B.D.

5. RESULTS :

(i) 1799 lb./ac. (ii) 277.3 lb./ac. (iii) N effect is highly significant. (iv) Av. yield of paddy in lt./ac.

Treatment	N_0	N_1	N_2
Av. yield	1655	1798	1944

S.E./mean =60.5 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(39).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To determine the method of placement of phosphatic fertilizers on Paddy under rainfed conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 29.6.1958/25.7.1958. (iv) (a) 4 ploughings with mould board and *desi* plough to 4" depth and laddering. (b) N.A. (c) Transplanted. (d) 9"×9". (e) 2. (v) 30 lb./ac. of N as A/S. (vi) T—1242 (late). (vii) Unirrigated. (viii) Weeding and roguing. (ix) 50.43". (x) 20 and 21.12.1958.

2. TREATMENTS :

All combinations of (1), (2) and (3)+3 controls (one in each block).

(1) 3 sources of P_2O_5 : S_1 =Super, S_2 =Rock phosphate and S_3 =Calcium phosphate.

(2) 3 methods of application : M_1 =Broadcasting, M_2 =Mud slash and M_3 =As pellets.

(3) 2 levels of P_2O_5 : P_1 =20 and P_2 =40 lb./ac.

3. DESIGN :

(i) $3^2 \times 2 + 3$ confd. (ii) (a) 7 ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 30'×18'. (b) 28'-6"×16'-6". (v) One row around. (vi) Yes.

4. GENERAL ;

(i) Good. (ii) Slight attack of stem-borer. (iii) Tillers, height, grain and straw yield. (iv) (a) to (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2098 lb./ac. (ii) 280.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control=1821 lb./ac.

	M ₁	M ₂	M ₃	Mean	P ₁	P ₂
S ₁	2020	1928	2374	2107	2021	2194
S ₂	2297	1853	2454	2201	2087	2315
S ₃	2142	2096	2128	2122	1948	2297
Mean	2153	1959	2319	2144	2019	2269
P ₁	2125	1920	2011			
P ₂	2182	1999	2626			

S.E. of S or M marginal mean =114.6 lb./ac.
 S.E. of P marginal mean = 93.6 lb./ac.
 S.E. of body of S×P or M×P table =162.1 lb./ac.
 S.E. of body of S×M table =212.2 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 59(29).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :- To determine the best method of application of phosphatic fertilizers with suitable type and optimum dose of the fertilizer.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 18.7.1959/12.8.1959. (iv) (a) 3 ploughings and cross ploughings, two laddering and puddling. (b) Transplanted. (c) 15 srs./ac. (d) 9'×9'. (e) 3-4. (v) F.Y.M. at 5000 lb./ac. broadcast at ploughing. N at 30 lb./ac. as A.S broadcast at planting. (vi) T-1242(late). (vii) Unirrigated. (viii) Weeding and interculture with Japanese weeder, hand weeding and roguing. (ix) 47.94". (x) 27 and 28.12.1959.

2. TREATMENTS :

All combinations of (1), (2) and (3)+3 controls (one in each block)

(1) 3 sources of P₂O₅ : S₁=Super, S₂=Dicalcium phosphate and S₃=Rock phosphate.

(2) 3 methods of application : M₁=Broadcasting at puddling, M₂=Dipping the seedlings in mud slash mixed with fertilizer before transplanting and M₃=Applying as pellets placed near the roots of the seedlings.

(3) 2 levels of P₂O₅ : P₁=20 and P₂=40 lb./ac.

3. DESIGN :

(i) 3²×2+3 confd. (ii) (a) 7 ; 3 blocks/replication. (b) N.A. (iii) 3. (iv) (a) 16½'×22'. (b) 15'×20½'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Below normal. (ii) Attack of mealy bugs in nearly all the plots. Sprayed Endrex. (iii) Tillers, height, length of earhead, no. of grains and chaff per earhead, grain and straw yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1738 lb./ac. (ii) 291.0 lb./ac. (iii) S effect alone is significant. (iv) Av. yield of grain in lb./ac.

Control=1700 lb./ac.

	M ₁	M ₂	M ₃	Mean	P ₁	P ₂
S ₁	1650	1883	1856	1796	1696	1897
S ₂	1478	1349	1892	1573	1531	1615
S ₃	1856	1824	1912	1864	1861	1867
Mean	1661	1685	1887	1744	1696	1793
P ₁	1655	1588	1845			
P ₂	1668	1782	1928			

S.E. of S or M marginal mean	= 68.6 lb./ac.
S.E. of P marginal mean	= 56.0 lb./ac.
S.E. of body of S×P or M×P table	= 97.0 lb./ac.
S.E. of body of S×M table	=127.0 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 55(17).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To find the effect of trace elements and potash on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) Analysis of control plot : sand 80.2%, clay 0.54%, silt 13.0%, total No. 0.036, base exchangeable capacity 2.70. (iii) 22.8.1955. (iv) (a) 4 ploughings with mould board and *desi* plough to 4" depth. Twice laddering. (b) N.A. (c) Transplanted. (d) 9"×9". (e) 2. (v) 20 lb./ac. of N as A/S, 20 lb./ac. of P₂O₅ as Super. (vi) T-90 (late). (vii) Unirrigated. (viii) 2 weedings and one roguing. (ix) 53.88". (x) N.A.

2. TREATMENTS :

$\frac{1}{8}$ of all combinations of (1) to (8)

- (1) 2 levels of MgSO₄ : a₀=0 and a₁= 2 cwt./ac.
- (2) 2 levels of FeSO₄ : b₀=0 and b₁=100 lb./ac.
- (3) 2 levels of MnSO₄ : c₀=0 and c₁= 80 lb./ac.
- (4) 2 levels of ZnSO₄ : d₀=0 and d₁= 20 lb./ac.
- (5) 2 levels of CuSO₄ : e₀=0 and e₁= 20 lb./ac.
- (6) 2 levels of boron as borax : f₀=0 and f₁=10 lb./ac.
- (7) 2 levels of molybdenum as sodium molybdate : g₀=0 and g₁=2 oz./ac.
- (8) 2 levels of potash as K₂SO₄ : h₀=0 and h₁=20 lb./ac.

3. DESIGN :

(i) 1/8 fractional replicate of 2⁸. Fact. (ii) (a) 8 plots/block and 4 blocks/replication. (b) N.A. (iii) 1/8 replicate. (iv) (a) 33'×33'. (b) N.A. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Average. (ii) N.A. (iii) Height, tiller and yield data. (iv) (a) 1955—contd. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1485 lb./ac. (ii) 197.6 lb./ac. (iii) None of the effects is significant. (iv) Mean responses in lb./ac.

Treatment	A	B	C	D	E	F	G	H
Mean response	-47.4	64.5	-37.3	-18.9	-11.0	-57.5	30.7	23.3

S.E. of mean response =49.4 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 56(16).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To find the effect of trace elements and potash on the growth and yield of Paddy and incidence of diseases.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 7.6.1956/8, 9.7.1956. (iv) (a) 4 ploughings both with mould board plough and country plough 4" depth, twice ladderings. (b) N.A. (c) Transplanted. (d) 9"×9". (e) 4 seedlings/hole. (v) 20 lb./ac. of N as A/S and 20 lb./ac. of P₂O₅ as Super. (vi) T—90 (late). (vii) Unirrigated. (viii) 2 weedings and one roguing. (ix) 54.87%. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 55(17) on page 25.

3. DESIGN :

(i) 1/8 fractional replicate of 2^s Fact. (ii) (a) 8 plots/blocks ; 4 blocks/replications. (b) N.A. (iii) 1,8 replicate. (iv) (a) 45'×18'. (b) 43½'×16½'. (v) one row around. (vi) Yes.

4. GENERAL :

(i) Average. (ii) Presence of blue green algae. (iii) Tiller count, height, wt. of grain and straw. (iv) (a) 1955—contd. (b) N.A. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1922 lb./ac. (ii) 215 lb./ac. (iii) None of the effects is significant. (iv) Mean responses in lb./ac

Treatment	A	B	C	D	E	F	G	H
Mean response	—128.5	—45.0	+59.8	—123.0	64.0	—23.8	—0.2	102.0

S.E. of mean response = 53.75 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 57(32).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To find out the effect of trace elements and potash on the growth and yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 24.6.1957/16.7.1957 (iv) (a) 4 ploughings with mould board and *dest* plough to 4" depth, twice ladderings. (b) N.A. (c) Transplanted. (d) 9"×9". (e) 4 seedlings/hole. (v) 20 lb./ac. of N as A/S and 20 lb./ac. of P₂O₅ as Super. (vi) T—90 (late). (vii) Unirrigated. (viii) 2 weedings and one roguing. (ix) 29.93%. (x) 2.12.1957.

2. TREATMENTS :

Same as in expt. no. 55(17) on page 25.

3. DESIGN :

(i) 1/8 fractional replicate of 2^s Fact. (ii) (a) 8 plots/block ; 4 blocks/replication. (b) N.A. (iii) 1,8 replicate. (iv) (a) 27'3"×16'. (b) 25'9"×14'6". (v) One row around. (vi) Yes.

4. GENERAL :

(i) Average. (ii) Leaf spot disease, withering and twisting of young leaves was noticed. (iii) Tiller, height and weight of grain and straw. (iv) (a) 1955-58. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1922 lb./ac. (ii) 330.8 lb./ac. (iii) None of the effects is significant. (iv) Mean responses in lb./ac.

Treatment	A	B	C	D	E	F	G	H
Mean response	45.5	56.0	—110.8	26.8	119.0	85.2	155.2	—64.2

S.E. of mean response = 82.7 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 57(34).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To study the effect of direct application of P on a legume and effect of N to the succeeding Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Legumes (*biri* and *mung*). (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 25.6.1957/18.7.1957. (iv) (a) 2 ploughings and cross ploughings followed by laddening. (b) Transplanting. (c) 20 lb./ac. (d) 9"×9". (e) 4 seedlings/hole. (v) Nil. (vi) T—141 (medium). (vii) Unirrigated. (viii) 2 weedings and roguing. (ix) 29.93". (x) 24.11.1957.

2. TREATMENTS :**Main-plot treatments :**

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

(1) 2 legumes : $L_1 = \text{Mung}$ and $L_2 = \text{Biri}$.

(2) 3 levels of P_2O_5 : $P_0=0$, $P_1=40$ and $P_2=80$ lb./ac.

Sub-plot treatments :

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

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 20'3"×21' 6". (b) 18' 9"×20'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Height, tiller count, weight of grain and straw. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2568 lb./ac. (ii) (a) 753.5 lb./ac. (b) 229.8 lb./ac. (iii) Effect of fallow vs. legumes is significant. Interaction of main treatments×sub. treatments is highly significant. (iv) Av. yield of paddy in lb./ac.

$N_0=2316$, $N_1=1217$, and $N_2=1864$ in the fallow plots.

	N_0	N_1	N_2	Mean	L_1	L_2
P_0	2277	2496	2512	2428	2376	2481
P_1	2311	2641	2751	2568	2503	2633
P_2	2700	2686	2737	2708	2377	3038
Mean	2430	2608	2667	2568	2419	2717
L_1	2192	2448	2617			
L_2	2668	2768	2716			

S.E. of difference of two

- | | | | |
|-----------------------------------|----------------|-----------------------------------|----------------|
| 1. L marginal means | =205.1 lb./ac. | 5. L means at the same level of N | =223.1 lb./ac. |
| 2. P marginal means | =251.2 lb. ac. | 6. N means at the same level of P | =132.7 lb./ac. |
| 3. N marginal means | = 76.6 lb./ac. | 7. P means at the same level of N | =273.5 lb./ac. |
| 4. N means at the same level of L | =108.3 lb./ac. | 8. N mean in the fallow plots | =187.6 lb./ac. |

Crop :- Paddy (Kharif).**Ref :- Or. 56(6).****Site :- Turmeric Res. Stn., G. Udaygiri.****Type :- 'M'.**

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

1 BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Clay. (b) N.A. (iii) 27.7.1956. (iv) (a) to (e) N.A. (v) Nil. (vi) T—1242 (late). (vii) Unirrigated. (viii) Weeding. (ix) 27.85". (x) 26.12.1956.

2. TREATMENTS :

1. Urea.
2. A/S/N.
3. Control.

Amount of fertilizers along with time and method of application is N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 2. (iv) (a) 42'×32'. (b) 40'×30'. (v) 1' around. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 4386 lb./ac. (ii) 275.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	3848	5028	4283

S.E./mean = 194.6 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 54(2).

Site :- Rice Res. Stn., Jeypore.

Type :- 'M'.

Object :—To study the effect of Super, Hyper Phos. and B.M. on Paddy yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Super and Hyper Phos. at 250 lb./ac. and B.M. at 125 lb./ac. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.8.1954. (iv) (a) to (c) N.A. (d) 6"×6". (e) 2 seedlings hole. (v) Nil. (vi) J-5 (medium). (vii) Unirrigated. (viii) Weeding. (ix) 50.17%. (x) 27.11.1954.

2. TREATMENTS :

1. Hyper Phos. at 250 lb./ac.
2. Super at 250 lb./ac.
3. B.M. at 125 lb./ac.
4. Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 33'×11'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1954. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2411 lb./ac. (ii) 419.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4
Av. yield	2392	2217	2782	2253

S.E./mean = 187.6 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 54(18).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) Clay. (b) N.A. (iii) 21 and 22.8.1954. (iv) (a) 6 ploughings. 4" to 6" deep with country plough and 2 ladderings. (b) Transplanted. (c) Nil. (d) N.A. (e) 2. (v) Nil. (vi) T-141 (medium). (vii) Unirrigated. (viii) 2 weedings. (ix) 0.18%. (x) 30.11.1954 and 1.12.1954.

2. TREATMENTS :

Main-plot treatments :

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

Sub-plot treatments :

5 levels of N : $N_0=0$, $N_1=20$, $N_2=40$ lb./ac. of N as A/S, $N_3=20$ and $N_4=40$ lb./ac. of N as Urea. Super applied on 19.7.1954 and A/S and Urea on 20.8.1954.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 11'×33'. (b) 9'×31'. (v) 1' around. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 3310 lb./ac. (ii) (a) 390.3 lb./ac. (b) 495.0 lb./ac. (iii) Main effect of N and interaction N×P are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
P_0	2557	3474	3630	3396	3728	3357
P_1	2674	3201	3689	2752	3454	3154
P_2	2615	3689	3767	3611	3415	3419
Mean	2615	3455	3695	3253	3532	3310

S.E. of difference of two

1. P marginal means = 123.3 lb./ac.
2. N marginal means = 202.1 lb./ac.
3. N means at the same level of P = 350.1 lb./ac.
4. P means at the same level of N = 336.7 lb./ac.

Crop :- Paddy (Kharif).

Site :- Agri. Res. Stn., Sambalpur.

Ref :- Or. 58(5).

Type :- 'M'.

Object :- To study the effect of compost and B.M on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) N.A. (iv) (a) 6 ploughings with country plough 4"—6" deep and laddering. (b) Transplanted in lines. (c) 20 lb./ac. (d) 8"×6". (e) 2. (v) Nil. (vi) T-141 (medium). (vii) Unirrigated. (viii) and (ix) N.A. (x) 13.12.1958.

2. TREATMENTS :

1. Control.
 2. Compost at 1 ton/ac.
 3. Compost and B.M. mixed at the time of preparing compost.
 4. Compost and B.M. mixed at the time of application.
- Amount of compost and B.M. in treatments 3 and 4 N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 30'×12'. (b) 29'4"×11'6" (v) 1 row on one side. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Height, tillers, length of earhead and grain yield. (iv) (a) 1958—N.A. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3062 lb./ac. (ii) 129.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4
Av. yield	3040	3169	2994	3046

S.E./mean = 57.7 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(7).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'M'.

Object:—To study the effect of N applied at different times.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 31.8.1958. (iv) (a) 6 ploughings with country plough 4"—6" deep and laddering. (b) Transplanted in lines. (c) 20 lb./ac. (d) 8"×6". (e) 2 seedlings/hole. (v) Super at 32 lb./ac. of P₂O₅. (vi) T—141 (medium). (vii) Unirrigated. (viii) 2 weedings, 2 puddlings and gap-filling on 11.9.1958. (ix) N.A. (x) 10.12.1958.

2. TREATMENTS :

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

(1) 2 sources of 40 lb./ac. of N : N₁=C/A/N and N₂=A/S.

(2) 7 times of application : T₁=Before planting, T₂=14 days after planting, T₃=1 month after planting, T₄=Half before planting + half one month after planting, T₅=Half 14 days and the other half one month after planting, T₆=½ before planting + ½ one month after planting + ½ one week before flowering and T₇=½ two weeks after planting + ½ one month after planting + ½ one week before flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 18'×12'. (b) 17'×11'. (v) 1 row on either side. (vi) Yes.

4. GENERAL :

(i) Lodged. (ii) N.A. (iii) Yield of grain, height, No. of tillers and length of earhead. (iv) (a) 1958—cont'd. (b) and (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2721 lb./ac. (ii) 617 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control=2813 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
N ₁	3188	3210	2242	2859	2453	2387	2982	2760
N ₂	1719	3311	3221	2653	2415	2240	3129	2670
Mean	2454	3260	2732	2756	2434	2314	3055	2715

S.E. of marginal mean of N = 135 lb./ac.

S.E. of marginal mean of T = 252 lb./ac.

S.E. of body of table = 356 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 59(10).****Site :- Agri. Res. Stn., Sambalpur.****Type :- 'M'.**

Object :—To study the effect of N applied at different times.

1. BASAL CONDITIONS :

(i) (a) Paddy—*Mung*. (b) *Mung*. (c) N.A. (ii) (a) Clay. (b) N.A. (iii) 21.8.1959. (iv) (a) 4 ploughings, one cross ploughing, puddling and 2 laddering. (b) 20 lb./ac. (c) Transplanted. (d) 9"×6". (e) 2 seed ings per hole. (v) 32 lb./ac. of P₂O₅. (vi) T—141 (medium). (vii) Irrigated. (viii) 2 weedings and gap filling on 8.9.1959. (ix) 22.32". (x) 1.12.1959.

2. TREATMENTS :

Same as in expt. no. 58(7) on page 30.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) 102'×39'. (iii) 3. (iv) (a) 18'×12'. (b) 16½'×11'. (v) One row aloud. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Height, effective tillers, length of earhead and grain yield. (iv) (a) N.A. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3293 lb./ac. (ii) 430 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control mean=3166 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
N ₁	2975	2935	3470	3005	3020	3835	3650	3270
N ₂	3469	3290	3176	3026	3608	3310	3470	3336
Mean	3222	3112	3323	3015	3314	3572	3560	3303

S.E. of N marginal mean = 94 lb./ac.
 S.E. of T marginal mean = 176 lb./ac.
 S.E. of body of table = 248 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 55(7).****Site :- Agri. Res. Stn., Sambalpur.****Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay. (b) N.A. (iii) 13, 14.8.1955. (iv) (a) 6 to 8 ploughings to 6" depth with country plough and laddering. (b) Transplanted. (c) 20 lb./ac. (d) 9"×6". (e) 2 seedlings/hole. (v) Nil. (vi) T—141 (medium). (vii) Unirrigated. (viii) N.A. (ix) 67.97". (x) 4 to 6.12.1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : N₀=0, N₁=20, N₂=40 and N₃=60 lb./ac.(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=40 and P₂=60 lb./ac.**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 22'×30'. (b) 20'×28'. (v) 1' aloud. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Height, no. of tillers and grain yield. (iv) (a) 1955—1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1742 lb./ac. (ii) 175 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
P ₀	1718	1837	1752	1621	1732
P ₁	1779	1799	1720	1703	1750
P ₂	1804	1821	1773	1582	1745
Mean	1767	1819	1748	1635	1742
S.E. of N marginal mean					=51 lb./ac.
S.E. of P marginal mean					=44 lb./ac.
S.E. of body of table					=88 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 56(25).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5 C.L./ac. of F.Y.M. and 100 lb./ac. of A/S. (ii) (a) Loamy. (b) N.A. (iii) 7.8.1956. (iv) (a) 6 ploughings 4" to 6" deep with country plough followed by laddering. (b) Transplantec. (c) 20 srs./ac. (d) 9"×6". (e) 2 seedlings/hole. (v) Nil. (vi) T—141 (medium). (vii) Nil. (viii) Two weedings. (ix) 75.52%. (x) 13.12.1956.

2. TREATMENTS :

Same as in expt. no. 55(7) on page 31.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 28'×12'. (b) 27'×11'. (v) 1 row alround. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1955—1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3251 lb./ac. (ii) 427 lb./ac. (iii) Main effect of N is highly significant Interaction N×P is significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean
P ₀	3574	3532	3095	2549	3187
P ₁	3639	3127	2892	3514	3293
P ₂	3350	3546	3234	2962	3273
Mean	3521	3402	3074	3008	3251

S.E. of marginal mean of N =123 lb./ac.
 S.E. of marginal mean of P =107 lb./ac.
 S.E. of body of table =214 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 55(12).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'M'.

Object :—To study the effect of organic and inorganic manures on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (ii) Paddy. (c) A/S at 20, 40 and 60 lb./ac. and Super at 20, 40 and 60 lb./ac. (ii) (a) Clay. (b) N.A. (iii) 30, 31.8.1955. (iv) (a) 6 to 8 ploughings to 6" depth. (b) Transplanted. (c) and (d) N.A. (e) 2 seedlings/hole. (v) Nil. (vi) T-141 (medium). (vii) Unirrigated. (viii) 2 weedings after one month and after 2 months of planting. (ix) 67.97". (x) 7, 8.12.1955.

2. TREATMENTS :

Main-plot treatments :

4 sources of 10 lb./ac. of N + a control : S_0 =No manure (control), S_1 =F.Y.M., S_2 =*Dhaincha* G.M. and S_4 =G.N.C.

Sub-plot 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 $P_1=40$ lb./ac.

Manures applied on 30.8.1955.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 11'×33'. (b) 9'×31'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) No lodging. (ii) N.A. (iii) Height, tiller, grain and straw yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3125 lb./ac. (ii) (a) 312.3 lb./ac. (b) 231.4 lb./ac. (iii) Main effect of S and interaction main-plot × sub-plot are significant. (iv) Av. yield of grain in lb./ac. †

	S_0	S_1	S_2	S_3	Mean	N_0	N_1
P_0	3243	3304	3006	2986	3134	3112	3157
P_1	3130	3342	2806	3184	3116	3160	3072
Mean	3187	3323	2906	3085	3125	3136	3114
N_0	3311	3352	2874	3006			
N_1	3062	3294	2938	3165			

S.E. of difference of two

1. S marginal means	=110.4 lb./ac.
2. N or P marginal means	= 57.8 lb./ac.
3. N or P means at the same level of S	=115.7 lb./ac.
4. S means at the same level of N or P	=137.4 lb./ac.
S.E. of body of N×P table	= 57.8 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 56(27).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'M'.

Object :—To study the effect of organic and inorganic manures on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5 C.L./ac. of F.Y.M. and 100 lb./ac. of A/S. (ii) (a) Loam. (b) N.A. (iii) 14.8.1956. (iv) (a) 6 ploughings with country plough 4" to 6" deep, laddering and levelling. (b) Transplanted. (c) N.A. (d) 9"×6" (e) N.A. (v) Nil. (vi) T-141 (medium). (vii) Nil. (viii) Two weedings. (ix) N.A. (x) 7.12.1956.

2. TREATMENTS :

Same as in expt. no. 55(12) on page 32.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 30'×11'. (b) 29.3'×10'. (v) 1 row around. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Height and grain yield. (iv) (a) 1955—1956. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3260 lb./ac. (ii) (a) 303.3 lb./ac. (b) 420.0 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	Mean	N ₀	N ₁
P ₀	3376	3406	3196	3154	3266	3209	3322
P ₁	3452	3185	3014	3368	3255	3248	3263
Mean	3379	3295	3105	3261	3260	3228	3292
N ₀	3276	3357	3122	3157			
N ₁	3482	3234	3087	3366			

S.E. of difference of two

- | | |
|--|----------------|
| 1. S marginal means | =107.2 lb./ac. |
| 2. N or P marginal means | =105.0 lb./ac. |
| 3. N or P means at the same level of S | =210.0 lb./ac. |
| 4. S means at the same level of N or P | =183.2 lb./ac. |
| S.E. of body of N×P table | =105.0 lb./ac. |

Crop :- Paddy (Kharif).

Site :- Agri. Res. Stn., Sambalpur.

Ref :- Or. 57(1).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) pH 5.9. (iii) 22.7.1957. (iv) (a) Puddling. (b) Transplanting. (c) N.A. (d) 9"×6". (e) 2 seedlings/hole. (v) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) Weeding, hoeing with Japanese weeder and gap filling. (ix) N.A. (x) 12.12.1957.

2. TREATMENTS :

- No manure.
- 30 lb./ac. of P₂O₅ as Super.
- 20 lb./ac. of N as G.M. + 30 lb./ac. of P₂O₅.
- 20 lb./ac. of N as A/S + 30 lb./ac. of P₂O₅.
- 10 lb./ac. of N as A/S + 10 lb./ac. of N as G.M. + 30 lb./ac. of P₂O₅.
- 30 lb./ac. of N as G.M. + 30 lb./ac. of P₂O₅.
- 30 lb./ac. of N as A/S + 30 lb./ac. of P₂O₅.
- 15 lb./ac. of N as A/S + 15 lb./ac. of N as G.M. + 30 lb./ac. of P₂O₅.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 22'×12'. (b) 21'×10'. (v) 1 row around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) At the time of harvest 10 plants were selected at random and height of plant, no. of effective tillers, length of earhead and grain yield were taken. (iv) (a) No. (b) and (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3719 lb./ac. (ii) 339.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5	6	7	8
Av. yield	3476	3773	3551	4032	4026	3254	3841	3798
S.E./mean	=169.6 lb./ac.							

Crop :- Paddy (Kharif).

Ref :- Or. 56(26).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'M'.

Object :—To find out the comparative effect of A/S and Ammo. Chloride on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay. (b) N.A. (iii) 31.7.1956/1.8.1956. (iv) (a) 6 ploughings with country plough 4" to 6" deep, laddering and levelling. (b) Transplanted. (c) 20 lb./ac. (d) 9" × 6". (e) 2 seedlings/hole. (v) Nil. (vi) T—141 (medium.) (vii) Unirrigated. (viii) 1 weeding. (ix) N.A. (x) 2.12.1956.

2. TREATMENTS :

Main-plot treatments :

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

Sub-plot treatments :

2 sources of N : $S_1=A/S$ and $S_2=Ammo. Chloride$.

Manures applied on 31.7.1956.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 20' × 16.5' (b) 18.5' × 15.5' (v) 1 row around. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 2463 lb./ac. (ii) (a) 589 lb./ac. (b) 247 lb./ac. (iii) Interaction N × S alone is significant. (iv) Av. yield of grain in lb./ac.

	N_1	N_2	N_3	Mean
S_1	2253	2871	2478	2534
S_2	2599	2499	2080	2393
Mean	2426	2685	2279	2463

S.E. of difference of two

- | | |
|-----------------------------------|--------------|
| 1. N marginal means | =294 lb./ac. |
| 2. S marginal means | =101 lb./ac. |
| 3. S means at the same level of N | =175 lb./ac. |
| 4. N means at the same level of S | =320 lb./ac. |

Crop :- Paddy (Kharif).

Ref :- Or. 58(3).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'M'.

Object:—To find out a suitable combination of N, P and K for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Clay. (b) N.A. (iii) 10.8.1958. (iv) (a) 6 ploughings. 4" to 6" deep with country plough, 3 puddlings and laddering. (b) Transplanted. (c) 20 lb./ac. (d) 5" × 6". (e) 2 seedlings/hole. (v) Sannhemp ploughed on 1.8.1958. (vi) MTU—15 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 13.11.1958.

2. TREATMENTS :

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

- (1) 2 levels of N as A/S : $N_0=0$ and $N_1=20$ lb./ac.
 (2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=20$ lb./ac.
 (3) 2 levels of K_2O as Pot. Sul. : $K_0=0$ and $K_1=20$ lb./ac.

3. DESIGN :

- (i) 2³ Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 15'×13'. (b) 14'×12'. (v) 1 row around.
 (vi) Yes.

4. GENERAL :

- (i) and (ii) N.A. (iii) Height, tillers, length of earhead and grain yield. (iv) (a) 1958—contd. (b) No.
 (c) Nil. (v) (a) Barpalli. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 575 lb./ac. (ii) 175 lb./ac. (iii) Main effects of N and P are significant and interaction $N \times K$ is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	Mean	P_0	P_1
K_0	616	551	584	482	685
K_1	383	749	566	523	609
Mean	499	650	575	502	647
P_0	454	551			
P_1	545	749			

S.E. of any marginal mean =44 lb./ac.

S.E. of body of any table =62 lb./ac.

Crop :- Paddy (Kharif).

Site :- Agri. Res. Stn., Sambalpur.

Ref :- Or. 58(4).

Type :- 'M'.

Object :- To find out a suitable combination of N, P and K for Paddy.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) and (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 23.8.1958. (iv) (a) 6 ploughings with country plough 4" to 6" deep and laddering. (b) Transplanting. (c) 20 lb./ac. (d) 6"×6.8". (e) 2 seedlings/hole. (v) Nil. (vi) T—1242 (late). (vii) N.A. (viii) 2 weedings. (ix) N.A. (x) 27.12.1958.

2. TREATMENTS :

Same as in expt. no. 58(3) on page 35.

3. DESIGN :

- (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 13'-7"×16'. (b) 12'-5.4"×15'. (v) 1 row all round. (vi) Yes.

4. GENERAL :

- (i) and (ii) N.A. (iii) Height, length of earhead, no. of tillers and grain yield. (iv) (a) 1958—contd. (b) and (c) Nil. (v) (a) Paramanpur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1101 lb./ac. (ii) 269 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	Mean	P ₀	P ₁
K ₀	809	1245	1027	977	1078
K ₁	1013	1338	1175	1181	1170
Mean	911	1292	1101	1079	1124
P ₀	930	1228			
P ₁	893	1355			

S.E. of any marginal mean = 67 lb./ac.

S.E. of body of table = 95 lb./ac.

Crop :- Paddy (Kharif).

Site :- Agri. Res. Stn., Sambalpur.

Ref :- Or. 58(2).

Type :- 'M'.

Object :- To find out a suitable combination of N, P and K for Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Clay. (b) N.A. (iii) 5.8.1958. (iv) (a) 6 ploughings 4" to 6" deep and laddering. (b) Transplanted. (c) N.A. (d) 6"×6". (e) 2 seedlings/hole. (v) Nil. (vi) N-136 (early). (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 12.11.1958.

2. TREATMENTS :

Same as in expt. no. 58(3) on page 35.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 15'×13'. (b) 14'×12'. (v) 1 row around. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Height of plant, no. of tillers and grain yield. (iv) (a) 1958--contd. (b) and (c) Nil. (v) (a) Paramanpur and Barpalli. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 632 lb./ac. (ii) 243 lb./ac. (iii) Main effect of P and interaction N×K are highly significant. Main effect of N is significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	Mean	P ₀	P ₁
K ₀	418	883	650	498	803
K ₁	648	579	614	498	729
Mean	533	731	632	498	766
P ₀	401	596			
P ₁	664	867			

S.E. of any marginal mean = 61 lb./ac.

S.E. of body of any table = 86 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 59(14).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) pH 5.4, T.S.S. 0.45 ; Organic carbon 0.51%, available N_2 322 lb./ac., P_2O_5 15.35 lb./ac. and K_2O 54.08 lb./ac. (iii) 1.7.1959/1.8.1959. (iv) (a) to (e) As per Japanese method of cultivation. (v) Nil. (vi) T—1242 (late). (vii) Irrigated. (viii) 6 hoeings, weedings and 1 roguing. (ix) 37.90%. (x) 16.12.1959.

2. TREATMENTS :

Main-plot treatments :

3 levels of lime : $L_0=0$, $L_1=500$ and $L_2=750$ lb./ac.

Sub-plot treatments :

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

(1) 2 levels of N : $N_0=0$ and $N_1=30$ lb./ac.

(2) 2 levels of P_2O_5 : $P_0=0$ and $P_1=20$ lb./ac.

(3) 2 levels of K_2O : $K_0=0$ and $K_1=20$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $14' 3'' \times 14' 3''$, (b) $13' 6'' \times 13' 6''$. (v) one row all round.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) No. of effective tillers, length of earhead, height of plant, grain and straw yield. (iv) (a) 1959—N.A. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil

5. RESULTS :

(i) 2080 lb./ac. (ii) (a) 315.5 lb./ac. (b) 210.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	Mean	P_0	P_1	K_0	K_1
L_0	2045	2048	2047	2007	2086	2067	2027
L_1	2036	2083	2059	2048	2070	2077	2041
L_2	2198	2073	2135	2088	2182	2040	2231
Mean	2093	2068	2080	2048	2113	2061	2100
K_0	2110	2012	2061	2032	2090		
K_1	2075	2124	2100	2063	2135		
P_0	2070	2025					
P_1	2115	2111					

S.E. of difference of two

1. L marginal means = 78.9 lb./ac.
 2. N, P or K marginal means = 42.9 lb./ac.
 3. N, P or K means at the same level of L = 74.2 lb./ac.
 4. L means at the same level of N, P or K = 120.4 lb./ac.
- S.E. of body of $N \times P$, $N \times K$ or $P \times K$ table = 42.9 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 57(MAE).

Site :- M. A. E. Farm, Barpalli.

Type :- 'M'.

Object :—To study the long term effect of N, P, K and bulky manure.

1. BASAL CONDITIONS :

(i) (a) Maize—Paddy—Cotton. (b) Maize. (c) Nil. (ii) (a) Red loam. (b) N.A. (iii) 3rd week of July/ middle of August, 1957. (iv) (a) 3-4 ploughings and 2 plankings before sowing. (b) Transplanting. (c) —. (d) 9"×6". (e) N.A. (v) Nil. (vi) T—141 (medium). (vii) N.A. (viii) 1 to 2 weedings after sowing. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

- (1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
 (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.
 (3) 3 levels of K_2O as Mur. of Pot. : $K_0=0$, $K_1=20$ and $K_2=40$ lb./ac.
 (4) 2 levels of bulky manure : $F_0=0$ and $F_1=5000$ lb./ac.

N applied by broadcasting at the time of planting and by top dressing. P_2O_5 broadcast at planting and top dressed and K_2O applied by broadcast at planting and top dressed.

3. DESIGN :

(i) $3^3 \times 2$ fact. confd. (ii) (a) 9 plots/block ; 6 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 1/100 ac. (dimensions N.A.) (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Case-worm attack noticed during September-October, but controlled by cultural operations. (iii) Nil. (iv) (a) 1956—contd. (b) Yes. (c) No. (v) Kendrapara. (vi) Due to drought conditions during growth stage crop was affected adversely. (vii) Cumulative and residual effect studied together. N, P or K marginal means based on 36 observations.

5. RESULTS :

(i) 2118 lb./ac. (ii) 112.6 lb./ac. (iii) Main effects of F, N and P and interactions $N \times P$, $F \times N$, $F \times P$ are highly significant. Interaction FNP is significant while other effects are not significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	K_0	K_1	K_2	F_0	F_1	Mean
N_0	1555	1684	1746	1660	1658	1668	1633	1690	1662
N_1	1800	1913	2171	1922	1968	1994	1837	2086	1961
N_2	2325	2683	3184	2751	2669	2772	2416	3046	2731
Mean	1893	2093	2367	2111	2098	2145	1962	2274	2118
F_0	1779	1958	2148	1972	1957	1957			
F_1	2007	2229	2586	2250	2239	2333			
K_0	1912	2077	2344						
K_1	1863	2094	2337						
K_2	1904	2110	2420						

S.E. of marginal mean of N, P or K = 18.77 lb./ac.
 S.E. of body of $N \times P$, $N \times K$ or $P \times K$ table = 32.56 lb./ac.
 S.E. of body of $N \times F$, $P \times F$ or $K \times F$ table = 26.54 lb./ac.

Crop :- Paddy (Kharif).

Site :- M.A.E. Farm, Barpalli.

Ref :- Or. 58(MAE).

Type :- 'M'.

Object :—To study the long term effect of N, P, K and bulky manure.

1. BASAL CONDITIONS ;

(i) (a) Maize—Paddy—Cotton. (b) Maize. (c) Nil. (ii) (a) Red loam. (b) N.A. (iii) 28 to 30.6.1958/ 14, 15.8.1958. (iv) (a) 3 ploughings. (b) Transplanting. (c) —. (d) 9"×6". (e) N.A. (v) 500 lb./ac. of F.Y.M. to experimental area and 36 lb. of A/S to seed bed. (vi) T—141 (medium). (vii) Unirrigated. (viii) 3 weedings. (ix) N.A. (x) 4.12.1958.

2. TREATMENTS :

Same as in expt. no. 57(MAE) on page 38.

(Each plot divided into 3 sub-plots to study the cumulative, residual and direct effects).

3. DESIGN :

(i) $3^3 \times 2$. (ii) (a) 9 plots/block ; 6 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 1/80 ac. (b) 1/100 ac. (v) and (vi) N.A.

4. GENERAL :

(i) Good. (ii) 2 to 3% of the crop damaged due to incidence of case-worm and borer attack while 2% of the crop attacked by wild rats. (iv) (a) 1956—contd. (b) Yes. (c) No. (v) (a) and (b) Kendrapara. (vi) Drought conditions during the month of September 1958 affected the crop. (vii) Nil.

5. RESULTS :

Cumulative Effect

(i) 3168 lb./ac. (ii) 482.1 lb./ac. (iii) Interaction $F \times N$ alone is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	F ₀	F ₁	Mean
N ₀	2883	3047	3150	3099	2916	3065	2864	3189	3027
N ₁	3416	3083	2933	3249	2933	3250	3301	2988	3144
N ₂	3467	3065	3467	3684	3032	3283	3055	3611	3333
Mean	3255	3065	3183	3344	2960	3199	3073	3263	3168
F ₀	3166	3142	2911	3132	2910	3177			
F ₁	3344	2988	3456	3556	3011	3222			
K ₀	3334	3349	3349						
K ₁	2866	2865	3150						
K ₂	3566	2981	3051						

Residual Effect

(i) 2980 lb./ac. (ii) 482.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	F ₀	F ₁	Mean
N ₀	2814	3032	3065	3231	2916	2765	2909	3032	2970
N ₁	3267	3117	2515	2966	2933	2999	2800	3132	2966
N ₂	3116	3215	2683	2983	3082	2949	3065	2944	3005
Mean	3066	3122	2754	3060	2977	2904	2925	3036	2980
F ₀	3165	3088	2522	2932	3132	2710			
F ₁	2966	3155	2987	3188	2821	3099			
K ₀	3367	2931	2883						
K ₁	2733	3451	2747						
K ₂	3097	2983	2633						

Direct Effect

(i) 3260 lb./ac. (ii) 482.1 lb./ac. (iii) Interaction $F \times P$ alone is highly significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	F ₀	F ₁	Mean
N ₀	3231	3582	3116	3300	3431	3198	3254	3366	3310
N ₁	3165	3300	3035	3267	3516	2717	2989	3344	3167
N ₂	3367	3116	3433	3334	3382	3200	3178	3432	3305
Mean	3254	3333	3195	3300	3443	3038	3140	3381	3260
F ₀	3344	3344	2734	3155	3399	2866			
F ₁	3165	3322	3635	3445	3487	3210			
K ₀	3249	3585	3067						
K ₁	3431	3198	3700						
K ₂	3083	3215	2817						

S.E. of marginal mean of N, P or K = 113.6 lb./ac.

S.E. of body of N×P, N×K or P×K table = 196.8 lb./ac.

S.E. of body of N×F, P×F or K×F table = 160.7 lb./ac.

(for cumulative, direct and residual effects)

Crop :- Paddy (Kharif).

Site :- M.A.E. Farm, Barpalli.

Ref :- Or. 59(MAE).

Type :- 'M'.

Object :—To study the long term effect of N, P, K and bulky manure.

1. BASAL CONDITIONS :

(i) (a) Maize—Paddy—Cotton. (b) Maize. (c) Nil. (ii) (a) Red loam. (b) N.A. (iii) N.A. (iv) (a) 3 ploughings. (b) Transplanted. (c)—. (d) 9"×6". (e) N.A. (v) Nil. (vi) T—141 (medium). (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

- (1) 3 levels of N as A/S : N₀=0, N₁=30 and N₂=60 lb./ac.
- (2) 3 levels of P₂O₅ as Super : P₀=0, P₁=30 and P₂=60 lb./ac.
- (3) 3 levels of K₂O as Mur. of Potash : K₀=0, K₁=30 and K₂=60 lb./ac.
- (4) 2 levels of F.Y.M. : F₀=0 and F₁=4000 lb./ac.

3. DESIGN :

(i) 3³×2 fact. confd. Interaction NPK² is confd. (ii) (a) 9 plots/block ; 6 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 33'×16.5'. (b) 31'×14.5'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of wild rats in most of the plots specially in plots with treatments N₂P₁K₂F₀, N₂P₁K₁F₁, N₀P₁K₀F₀ in all the phases ; N₀P₀K₂F₁ in cumulative effect, in N₀P₁K₀F₁ (direct and residual effects). (iii) Grain yield. (iv) (a) 1957 (kharif)—contd. (b) Yes. (c) N.A. (v) (a) Kendrapara. (b) Nil. (vi) Nil. (vii) Values of plots severely damaged by rats were estimated.

5. RESULTS :

Cumulative Effect

(i) 2875 lb./ac. (ii) 718 8 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	F ₀	F ₁	Mean
N ₀	2783	2473	2648	2377	2382	3145	2375	2894	2635
N ₁	2907	2681	2229	2536	2648	2633	2488	2724	2606
N ₂	3376	3346	3434	3522	3653	2981	3604	3167	3385
Mean	3022	2833	2770	2812	2894	2920	2822	2928	2875
F ₀	2773	2952	2742	2586	2890	2991			
F ₁	3271	2715	2799	3037	2898	2849			
K ₀	2570	2859	3005						
K ₁	3272	2958	2453						
K ₂	3224	2683	2853						

Direct Effect

(i) 2754 lb./ac. (ii) 718.8 lb./ac. (iii) Only interaction P × K is highly significant (iv) Av. yield of grain in lb./ac

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	F ₀	F ₁	Mean
N ₀	2618	2813	2792	3290	2528	2405	2432	3050	2741
N ₁	2916	2729	2584	2827	2462	2940	2718	2768	2743
N ₂	2702	2917	2716	2907	2946	2482	2063	2494	2778
Mean	2745	2820	2697	3008	2735	2609	2738	2771	2754
F ₀	2722	2691	2800	3035	2755	2603			
F ₁	2768	2949	2595	2981	2715	2616			
K ₀	2471	3645	2907						
K ₁	3032	2635	2268						
K ₂	2732	2179	2917						

Residual Effect

(i) 2641 lb./ac. (ii) 718.8 lb./ac. (iii) Only P effect is highly significant. (iv) Av. yield of grain in lb./ac

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	F ₀	F ₁	Mean
N ₀	2762	2862	2260	2635	2311	2939	2487	2769	2628
N ₁	2921	2972	2230	2666	2954	2503	2541	2875	2708
N ₂	2648	2729	2388	2794	2665	2307	2473	2704	2588
Mean	2777	2854	2293	2698	2643	2583	2500	2783	2641
F ₀	2788	2510	2203	2434	2508	2559			
F ₁	2767	3199	2382	2962	2779	2607			
K ₀	2777	2814	2503						
K ₁	2794	3117	2019						
K ₂	2761	2632	2356						

S.E. of marginal mean of N, P or K

=169.4 lb./ac.

S.E. of body of N × P, N × K or P × K table

=293.4 lb./ac.

S.E. of body of N × F, P × F or K × F table

=239.6 lb./ac.

(for cumulative direct and residual effects,

Crop :- Paddy (Kharif).**Ref :- Or. 57(MAE).****Site :- M.A.E. Farm, Barpalli.****Type :- 'M'.**

Object :—Type IV—To study the effect of direct application of phosphate on a legume vs direct effect of N to the succeeding Paddy crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) Legumes. (c) As per treatments. (ii) (a) Red loam. (b) N.A. (iii) July 1957/August 1957. (iv) (a) 3-4 ploughings and 2 plankings before sowing. (b) Transplanting. (c) 25 lb./ac. in nursery. (d) 9"×6". (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1—2 weedings after sowing. (x) N.A. (x) Dec. 1957.

2. TREATMENTS :**Main-plot treatments :**

All combinations of (1) and (2) + a control (fallow plot L_0P_0).

(1) 2 legumes : L_1 =Pea and L_2 =Gram.

(2) 3 levels of P_2O_5 as Super : P_0 = 0, P_1 =40 and P_2 =80 lb./ac.

Sub-plot treatments :

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

P_2O_5 applied to legumes and N applied to Paddy by broadcasting at the time of planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Crop adversely affected due to dry conditions. (ii) Case-worm attack noticed during September—October but controlled by cultural operations. Borer attack also noticed. (iii) Grain yield only. (iv) (a) No. (b) No. (c) N.A. (v) (a) Kendrapara. (b) Nil. (vi) Due to drought conditions during growth stage crop was effected adversely. Rains lacked during the month of September to November. (vii) Legume yields are L_1P_0 =1613, L_1P_1 =1703, L_1P_2 =1860, L_2P_0 =1637, L_2P_1 =1769 and L_2P_2 =1934 lb. ac.

5. RESULTS :

(i) 1729 lb./ac. (ii) (a) 85.4 lb./ac. (b) 93.2 lb./ac. (iii) N, P and control vs others effects are highly significant. Interactions $N \times L$ and $N \times P$ are significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	L_0P_0	L_1P_0	L_1P_1	L_1P_2	L_2P_0	L_2P_1	L_2P_2	Mean
N_0	1127	1117	1130	1193	1183	1357	1283	1199
N_1	1553	1623	1613	1720	1777	1797	1847	1704
N_2	2070	2110	2177	2203	2333	2430	2667	2234
Mean	1583	1617	1640	1705	1764	1861	1932	1729

S.E. of difference of two

1. LP marginal means =40.26 lb./ac.
2. N marginal means =28.76 lb./ac.
3. N means at the same level of LP =76.10 lb./ac.
4. LP means at the same level of N =74.03 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 56(MAE)****Site :- M.A.E. Farm, Barpalli.****Type :- 'M'.**

Object :—Type V—To study the most suitable time for the application of N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) 3rd week of July/middle of August. (iv) (a) Ploughings. (b) Transplanted. (c)—. (d) 9"×6". (e) N.A. (v) 20 lb./ac. of P_2O_5 . (vi) N.A. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) December.

2. TREATMENTS :

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

(1) 2 sources of N : S₁=Urea and S₂=A/S.

(2) 7 times of application : T₁=Application of fertilizers before planting, T₂=application of fertilizers at planting, T₃= application of fertilizers at tillering, T₄= application of fertilizers half before planting and half at planting, T₅=application of fertilizers half at planting and half at tillering, T₆=application of fertilizers $\frac{1}{3}$ before planting, $\frac{1}{3}$ at planting and $\frac{1}{3}$ a week before flowering and T₇=application of fertilizers $\frac{1}{3}$ each at planting, at tillering and one week before flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 33' x 16.5'. (b) 29' x 15'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of paddy. (iv) (a) 1956--contd. (b) N.A. (c) No. (v) (a) Kendrapara (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2636 lb./ac. (ii) 438.0 lb./ac. (iii) Control vs others and T effects are highly significant. (iv) Av. yield of grain in lb./ac.

Control =1835 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	2436	2485	2600	2831	3036	2600	2600	2655
S ₂	2501	2732	2600	3201	2872	2600	2617	2732
Mean	2468	2608	2600	3016	2954	2600	2608	2693

S.E. of T marginal mean =178.8 lb./ac.
 S.E. of S marginal mean = 95.6 lb./ac.
 S.E. of body of T x S table or control mean =252.9 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 57(MAE).

Site :- M.A.E. Farm, Barpalli.

Type :- 'M'.

Object :-Type V--To study the most suitable time for the application of N.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 56(MAE) on page 43.

5. RESULTS :

(i) 2470 lb./ac. (ii) 90.6 lb./ac. (iii) All effects except S effect are highly significant. (iv) Av. yield of grain in lb./ac.

Control =2087 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	2527	2530	2307	2547	2497	2583	2357	2478
S ₂	2560	2663	2470	2700	2667	2303	2253	2517
Mean	2543	2596	2387	2623	2582	2443	2305	2497

S.E. of T marginal mean = 37.0 lb./ac.
 S.E. of S marginal mean = 19.8 lb./ac.
 S.E. of body of table or control mean = 52.3 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 58(MAE).****Site :- M.A.E. Farm, Barpalli.****Type :- 'M'.**

Object :—Type V—To study the most suitable time for the application of N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) 19.8.1958. (iv) (a) 3 ploughings. (b) Transplanted. (c) —. (d) 9"×6". (e) N.A. (v) Nil. (vi) T—1242 (late). (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 14.1.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(MAE) on page 43.

4. GENERAL :

(i) Good. (ii) 4 to 5% crop damaged due to attack of case worm and borer, 6% crop damaged by wild rats. (iii) Grain and straw yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2674 lb./ac. (ii) 473.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control=2617 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	2633	2833	2483	2867	2617	2183	2817	2633
S ₂	2733	2550	2500	2933	3100	2617	2567	2714
Mean	2683	2692	2492	2900	2858	2400	2692	2674

S.E. of S marginal mean =103.3 lb./ac.

S.E. of T marginal mean =193.3 lb./ac.

S.E. of body of table or control mean =273.4 lb./ac.

Crop :- Paddy.**Ref :- Or. 59(MAE).****Site :- M.A.E. Farm, Barpalli.****Type :- 'M'.**

Object :—Type V—To study the most suitable time for the application of N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) N.A. (iv) (a) Ploughing. (b) Transplanting. (c) —. (d) 9"×6". (e) N.A. (v) 4000 lb./ac. of cowdung manure. (vi) T—1246 (late) 158 days. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(MAE) on page 43.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1956 (kharif)—contd. (b) N.A. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1948 lb./ac. (ii) 438.0 lb./ac. (iii) T effect is highly significant. Control vs others effect is significant while no other effect is significant. (iv) Av. yield of grain in lb./ac.

Control=1325 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	1873	2422	1775	1810	2842	1355	1969	2007
S ₂	1936	1716	2098	1810	2551	1906	1840	1980
Mean	1905	2069	1937	1810	2697	1631	1905	1993

S.E. of T marginal mean	=178.8 lb./ac.
S.E. of S marginal mean	= 95.6 lb./ac.
S.E. of body of table or control mean	=252.9 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 56(MAE).

Site :- M.A.E. Farm, Barpalli.

Type :- 'M'.

Object :—Type VI—To study the effect of different types and levels of phosphate along with different methods of placement.

1. BASAL CONDITIONS :

- (i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) First week of August. (iv) (a) N.A. (b) Transplanted. (c) —. (d) 9"×6". (e) N.A. (v) 5,000 lb./ac. of F.Y.M. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) End of December, 1956.

2. TREATMENTS :

- (1) 2 doses of P_2O_5 : $P_1=20$ and $P_2=40$ lb./ac.
 (2) 2 sources of P_2O_5 : $S_1=$ Super and $S_2=$ Ammono. Phos.
 (3) 4 methods of application of P_2O_5 : M_1 = Fertilizers broadcast before puddling, $M_2=$ Fertilizers drilled before puddling, $M_3=$ Seedlings dipped in mud slash and $M_4=$ Applied as pellets at transplanting.

N equalised by applying A/S at the rate of 30 lb./ac. of N.

3. DESIGN :

- (i) $2^2 \times 4$ Fact. confd. (ii) (a) 3 plots/block ; 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Nil. (ii) Incidence of case worm. Control measures adopted. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3202 lb./ac. (ii) 277.5 lb./ac. (iii) Only P effect is significant. (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	M_4	Mean	S_1	S_2
P_1	3083	3033	3150	3167	3108	3142	3075
P_2	3333	3283	3233	3333	3296	3259	3333
Mean	3208	3158	3191	3250	3202	3200	3204
S_1	3250	3100	3283	3167			
S_2	3167	3217	3100	3333			

S.E. of marginal mean of P or S	= 56.6 lb./ac.
S.E. of marginal mean of M	= 80.1 lb./ac.
S.E. of body of P×S table	= 80.1 lb./ac.
S.E. of body of P×M or S×M table	=113.3 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(MAE).

Site :- M.A.E. Farm, Barpalli.

Type :- 'M'.

Object :—Type VI—To study the effect of different types and levels of phosphate along with different methods of placement.

1. BASAL CONDITIONS :

- (i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) 2nd week of August. (iv) (a) 3 ploughings. (b) Transplanting. (c)—. (d) 9"×6". (e) Nil. (v) and (vi) N.A. (vii) Irrigated. (viii) 3 weedings. (ix) and (x) N.A.

2. TREATMENTS:

All combinations of (1), (2) and (3)+3 control plots/replication.

- (1) 2 doses of P_2O_5 : $P_1=20$ and $P_2=40$ lb./ac.
 (2) 3 sources of P_2O_5 : $S_1=$ Super, $S_2=$ Ammo. Phos. and $S_3=$ Dicalcium Phosphate.
 (3) 3 methods of placement of P_2O_5 : $M_1=$ Broadcast, $M_2=$ Dipping in slush and $M_3=$ Pellet form.

3. DESIGN :

(i) $3^2 \times 2 + 3$ Fact. confd. (ii) (a) 7 ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) $33' \times 16.5'$. (b) $31' \times 14.5'$. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Worm and stem-borer. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2143 lb./ac. (ii) 261.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control=2158 lb./ac.

	M_1	M_2	M_3	Mean	S_1	S_2	S_3
P_1	2175	2083	2133	2130	2142	2117	2133
P_2	2133	2117	2200	2150	2133	2250	2067
Mean	2154	2100	2166	2140	2137	2183	2100
S_1	2100	2087	2225				
S_2	2312	2075	2162				
S_3	2050	2137	2112				

S.E. of marginal mean of M or S = 53.4 lb./ac.
 S.E. of marginal mean of P = 43.6 lb./ac.
 S.E. of body of $M \times S$ table = 98.9 lb./ac.
 S.E. of body of $M \times P$ or $S \times P$ table or control mean = 75.5 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 59(MAE).

Site :- M.A.E. Farm, Barpalli.

Type :- 'M'.

Object :—Type VI—To study the effect of different types and levels of phosphate along with different methods of placement.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay to clay loam. (b) N.A. (iii) 14, 15.8.1959. (iv) (a) 6 ploughings besides puddling after rain. (b) Transplanting (c)—. (d) $9' \times 6'$. (e) N.A. (v) 50 lb. of cowdung per plot. (vi) T—1242 (late). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 28.12.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58(MAE) on page 46.
 Hyperphosphate applied in the absence of Ammo. Phos.

4. GENERAL:

(i) Germination good. (ii) Nearly 30% of the plots were damaged severely by blast. Treated with endrex. (iii) Grain and straw yield. (iv) (a) 1956 (kharif)—contd. (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 2405 lb./ac. (ii) 255.1 lb./ac. (iii) M effect is significant, P effect and interaction $S \times M$ are highly significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

Control = 2608 lb./ac.							
	M ₁	M ₂	M ₃	Mean	S ₁	S ₂	S ₃
P ₁	2252	2397	2148	2266	2252	2197	2348
P ₂	2650	2422	2356	2476	2397	2592	2438
Mean	2451	2410	2252	2371	2325	2395	2393
S ₁	2267	2465	2242				
S ₂	2806	2234	2144				
S ₃	2280	2530	2370				

S.E. of the marginal mean of P or S = 52.1 lb./ac.
 S.E. of the marginal mean of M = 42.5 lb./ac.
 S.E. of body of table M×S = 95.4 lb./ac.
 S.E. of body of table P×S or P×M or control mean = 73.6 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 56(MAE).

Site :- M.A.E. Farm, Kendrapara.

Type :- 'M'.

Object :—Type II—To study the long term effects of three levels of N, P, K and 2 levels of bulky manure

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam to clay loam. (b) N.A. (iii) 7, 8.8.1956. (iv) (a) N.A. (b) Transplanted. (c)—. (d) 9'×9'. (e) N.A. (v) N.A. (vi) T-141 (medium). (vii) Unirrigated. (viii) and (ix) N.A. (x) 17.12.1956.

2. TREATMENTS :

(1) 3 levels of N as A/S : N₀=0, N₁=30 and N₂=60 lb./ac.
 (2) 3 levels of P₂O₅ as Super : P₀=0, P₁=30 and P₂=60 lb./ac.
 (3) 3 levels of K₂O as Pot. Sulphate : K₀=0, K₁=30 and K₂=60 lb./ac.
 (4) 2 levels of F.Y.M. = F₀=0 and F₁=5,000 lb./ac.
 Fertilizers broadcast at planting.

3. DESIGN :

(i) 3³×2 Fact confd. Interaction NPK³ is confd. in F₀ and F₁. (ii) (a) 9 plots/block; 6 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 33'×16.5'. (b) 29'×15'. (v) 2'×9'. (vi) Yes.

4. GENERAL :

(i) Poor germination in general. (ii) Rice 'burnt' disease noticed at a later stage. (iii) Grain and straw yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) Barpalli. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2299 lb./ac. (ii) 352.0 lb./ac. (iii) Interaction NPK alone is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	F ₀	F ₁	Mean
N ₀	2225	2275	2248	2241	2260	2248	2228	2271	2250
N ₁	2356	2431	2335	2358	2384	2380	2413	2334	2374
N ₂	2262	2354	2206	2210	2303	2309	2264	2284	2274
Mean	2281	2353	2263	2270	2316	2312	2302	2296	2291
F ₀	2388	2308	2209	2294	2316	2296			
F ₁	2174	2399	2317	2245	2315	2329			
K ₀	2292	2317	2200						
K ₁	2216	2333	2398						
K ₂	2336	2410	2191						

S.E. of marginal mean of F	= 67.7 lb./ac.
S.E. of N,P or K marginal mean	= 83.0 lb./ac.
S.E. of body of N×P, N×K or P×K table	=143.7 lb./ac.
S.E. of body of N×F, P×F or K×F table	=117.3 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 57(MAE).

Site :- M.A.E. Farm, Kendrapara.

Type :- 'M'.

Object :—Type II—To study the long term effects of three levels of N, P, K and 2 levels of bulky manure.

BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mahanadi alluvium. (b) N.A. (iii) N.A. (iv) (a) Preliminary and final puddling. (b) Transplanted. (c) —. (d) 9"×6". (e) N.A. (v) N.A. (vi) T—141 (medium). (vii) Irrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(MAE) on page 48.

4. GENERAL :

(i) Good. (ii) Rice grass-hoppers in general attacked. Light trap was used. (iii) Grain and straw yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) Barpalli. (b) Nil. (vi) (a) Due to general drought conditions stunted crop growth was observed. (vii) Nil.

5. RESULTS :

(i) 3324 lb./ac. (ii) 213.3 lb./ac. (iii) N effect is highly significant. Interaction F×P is significant while other effects are not significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	F ₀	F ₁	Mean
N ₀	2946	3294	3112	3196	2958	3198	3044	3190	3117
N ₁	3375	3406	3262	3367	3381	3296	3381	3315	3348
N ₂	3475	3529	3516	3616	3414	3489	3597	3416	3507
Mean	3265	3410	3297	3393	3251	3328	3341	3307	3324
F ₀	3153	3504	3365	3375	3271	3376			
F ₁	3378	3315	3229	3411	3232	3279			
K ₀	3277	3494	3408						
K ₁	3187	3340	3227						
K ₂	3331	3396	3256						

S.E. of marginal mean of F	=41.0 lb./ac.
S.E. of N, P or K marginal mean	=50.3 lb./ac.
S.E. of body of N×P, N×K or P×K table	=87.1 lb./ac.
S.E. of body of N×F, P×F on K×F table	=71.1 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(MAE).

Site :- M.A.E. Farm, Kendrapara.

Type :- 'M'.

Object :—Type II—To study the long term effects of three levels of N, P, K and 2 levels of bulky manure.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mahanadi alluvium. (b) N.A. (iii) 4.8.1958. (iv) (a) Ploughings, cross ploughings and laddering. (b) Transplanted. (c) 480 bundles of seedling/ac. (d) 9"×6". (e) N.A. (v) F.Y.M at 5,000 lb./ac. (vi) Medium variety. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 16.12.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(MAE) on page 48.

Single Super and Pot. Sul. applied on 3.8.1958 by broadcast at the time of final puddling before laddering while A/S applied on 4.8.1958 at the time of transplanting.

4. GENERAL :

(i) Normal growth throughout the growing period. (ii) Rice grass-hoppers in general were noticed and light traps were used. (iii) Grain and straw yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) Barpa li. (b) Nil. (vi) Heavy wind and rains. (vii) Nil.

5. RESULTS :

(i) 2712 lb./ac. (ii) 216.8 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	F ₀	F ₁	Mean
N ₀	2460	2585	2588	2485	2525	2623	2506	2583	2544
N ₁	2697	2763	2810	2777	2757	2737	2773	2740	2757
N ₂	2708	2862	2932	2867	2840	2795	2888	2780	2874
Mean	2622	2737	2777	2709	2707	2718	2722	2701	2712
F ₀	2618	2757	2792	2734	2649	2783			
F ₁	2626	2717	2761	2684	2766	2653			
K ₀	2575	2738	2815						
K ₁	2597	2760	2765						
K ₂	2693	2712	2750						

S.E. of marginal mean of F = 41.7 lb./ac.
 S.E. of N, P or K marginal mean = 51.1 lb./ac.
 S.E. of body of N×P, N×K or P×K table = 88.5 lb./ac.
 S.E. of body of N×F, P×F or K×F table = 72.3 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 59(MAE).

Site :- M. A. E. Farm, Kendrapara.

Type :- 'M'.

Object :- Type II—To study the long term effects of three levels of N, P, K and 2 levels of bulky manure.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mahanadi alluvium. (b) Nil. (iii) 27.7.1959. (iv) (a) N.A. (b) Transplanted. (c) —. (d) 9"×6". (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) T—141 (medium). (vii) Irrigated. (viii) Weeding and roguing. (ix) N.A. (x) 28.11.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(MAE) on page 48.

4. GENERAL :

(i) Good. (ii) Part of the crop was affected by smut. (iii) Straw and grain yield. (iv) (a) 1956—contd (b) Yes. (c) Nil. (v) (a) Barpalli. (b) Nil. (vi) Heavy grain loss due to heavy rains. (vii) Nil.

5. RESULTS :

(i) 2753 lb./ac. (ii) 197.3 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	F ₀	F ₁	Mean
N ₀	2555	2558	2725	2661	2589	2588	2596	2629	2613
N ₁	2635	2932	2798	2853	2752	2759	2729	2847	2788
N ₂	2813	2891	2873	2902	2872	2803	2896	2821	2859
Mean	2667	2793	2799	2805	2738	2717	2740	2766	2753
F ₀	2623	2798	2800	2711	2768	2743			
F ₁	2712	2789	2797	2899	2708	2691			
K ₀	2674	2854	2887						
K ₁	2647	2752	2814						
K ₂	2681	2774	2695						

S.E. of marginal mean of F = 38.0 lb./ac.
 S.E. of N, P or K marginal mean = 46.5 lb./ac.
 S.E. of body of N×P, N×K or P×K table = 80.5 lb./ac.
 S.E. of body of N×F, P×F or K×F table = 65.8 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 57(MAE).

Site :- M. A. E. Farm, Kendrapara.

Type :- 'M'.

Object :—Type IV—To study the effect of direct application of phosphate on a legume vs direct effect of N to the succeeding Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) As per treatments. (ii) (a) Mahanadi alluvium. (b) N.A. (iii) July-August, 1957. (iv) (a) Preliminary and final puddlings. (b) Transplanting. (c) 40 lb./ac. in nursery. (d) 9"×6". (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Weeding only. (ix) N.A. (x) Nov.—Dec. 1957.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2) + a control (fallow plot L₀P₀)

(1) 2 legumes L₁ = *Moong* and L₂ = *Biri*.

(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=40 and P₂=80 lb./ac.

Sub-plot treatments :

3 levels of N as A/S : N₀=0, N₁=15 and N₂=30 lb./ac.

P₂O₅ applied to legumes and N applied to paddy crop broadcast at transplanting.

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/blocks ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Stunted crop growth observed. (ii) Rice grass-hoppers in general attacked. (iii) Grain and straw yield. (iv) (a) and (b) No. (c) Nil. (v) (a) Barpalli. (b) Nil. (vi) Drought conditions prevailed. (vii) Legume yields are L₁ P₀=3036, L₁ P₁=3267, L₁ P₂=3036, L₂ P₀=3349, L₂ P₁=3119 and L₂ P₂=3193 lb./ac.

5. RESULTS :

(i) 3174 lb./ac. (ii) (a) 214.1 lb./ac. (b) 308.9 lb./ac. (iii) Interaction L×P alone is significant. (iv) Av. yield of grain in lb./ac.

	L ₀ P ₀	L ₁ P ₀	L ₁ P ₁	L ₁ P ₂	L ₂ P ₀	L ₂ P ₁	L ₂ P ₂	Mean
N ₀	3267	2900	3300	2942	3408	2908	3100	3118
N ₁	3300	3075	3200	2850	3317	3283	3192	3174
N ₂	3133	3133	3292	3308	3308	3158	3283	3231
Mean	3233	3036	3264	3033	3344	3116	3192	3174

S.E. of difference of two

1. LP marginal means = 100.9 lb./ac.
2. N marginal means = 95.3 lb./ac.
3. N means at the same level of LP = 252.2 lb./ac.
4. LP means at the same level of N = 229.3 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(MAE).

Site :- M. A. E. Farm, Kendrapara.

Type :- 'M'.

Object :—Type IV—To study the effect of direct application of phosphate on a legume vs. direct effect of N to the succeeding Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) As per treatments. (ii) (a) Recent alluvium. (b) N.A. (iii) 22.8.1958. (iv) (a) Ploughings, cross ploughing and laddering twice. (b) Transplanted in lines. (c) 480 bundles of seedlings/ac. (d) 9"×6". (e) Nil. (v) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 11.12.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(MAE) on page 51.

4. GENERAL :

(i) Normal. (ii) At flowering stage, almost all the plots were subjected to half lodged condition and empty grains were observed. Rats attacked almost all plots. (iii) Grain and straw yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Heavy wind and rains. (vii) Nil.

5. RESULTS :

(i) 2096 lb./ac. (ii) (a) 241.6 lb./ac. (b) 216.8 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of grain in lb./ac.

	L ₀ P ₀	L ₁ P ₀	L ₁ P ₁	L ₁ P ₂	L ₂ P ₀	L ₂ P ₁	L ₂ P ₂	Mean
N ₀	1900	1963	1887	2020	2047	2037	1507	1966
N ₁	2023	2210	2157	2113	1980	1933	2170	2084
N ₂	2010	2437	2377	2047	2383	2287	2123	2238
Mean	1978	2203	2140	2060	2137	2086	2067	2096

S.E. of difference of two

1. LP marginal means = 113.9 lb./ac.
2. N marginal means = 66.9 lb./ac.
3. N means at the same level of LP = 177.0 lb./ac.
4. LP means at the same level of N = 184.0 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 59(MAE).****Site :- M.A.E. Farm, Kendrapara.****Type :- 'M'.**

Object :—Type IV—To study the effect of direct application of phosphate on a legume vs. effect of N to the succeeding cereal Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil (b) and (c) As per treatments. (ii) (a) Mahanadi alluvium. (b) Nil. (iii) 29.7.1959. (iv) (a) N.A. (b) Transplanting in lines. (c) 480 bundles of seedlings. (d) 9"×6". (e) N.A. (v) Nil. (vi) T—141 (medium). (vii) Irrigated. (viii) Weeding and roguing were done. (ix) N.A. (x) 29.11.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57 (MAE) on page 51.

4. GENERAL :

(i) Good. (ii) Part of the crop affected by paddy smut. (iii) Grain and straw yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) Barpalli. (vi) Heavy loss in the form of empty grain due to heavy rains and storm. (vii) Nil.

5. RESULTS :

(i) 2441 lb./ac. (ii) (a) 256.4 lb./ac. (b) 208.3 lb./ac. (iii) Interaction LP×N effect is highly significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	L ₀ P ₀	L ₁ P ₀	L ₁ P ₁	L ₁ P ₂	L ₂ P ₀	L ₂ P ₁	L ₂ P ₂	Mean
N ₀	2244	2408	2345	2255	2046	2403	2356	2294
N ₁	2474	2663	2397	2474	2274	2718	2537	2505
N ₂	2493	2460	2650	2433	2222	2622	2795	2525
Mean	2404	2510	2464	2387	2181	2581	2563	2441

S.E. of the difference of two

1. LP marginal means = 120.9 lb./ac.
2. N marginal means = 64.3 lb./ac.
3. N means at the same level of LP = 170.1 lb./ac.
4. LP means at the same level of N = 184.1 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 56 (MAE).****Site :- M.A.E. Farm, Kendrapara.****Type :- 'M'.**

Object :—Type V—To study the most suitable time for the application of N to Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Recent alluvium. (b) N.A. (iii) 10.8.1956. (iv) (a) Ploughings. (b) Transplanted. (c)—. (d) and (e) N.A. (v) 5,000 lb./ac. of F.Y.M. (vi) T—141. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) 4.12.1956.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56 (MAE) on page 46.

4. GENERAL :

(i) Good. (ii) Rice 'burnt' disease found at a later stage. (iii) Grain and straw yield. (iv) (a) to (c) No. (v) (a) Barpalli. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2429 lb./ac. (ii) 239.6 lb./ac. (iii) Control vs. others effect is highly significant. S effect is significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

Control = 1876 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	2674	2279	2197	2460	2395	2370	2378	2393
S ₂	2477	2526	2395	2724	2551	2493	2641	2544
Mean	2575	2402	2296	2592	2473	2431	2509	2468

S.E. of marginal mean of T = 97.8 lb./ac.
 S.E. of marginal mean of S = 52.3 lb./ac.
 S.E. of body of table or control mean = 138.3 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 56(MAE).****Site :- M.A.E. Farm, Kendrapara.****Type :- 'M'.**

Object :—Type VI—To study the effect of different types and levels of phosphate along with different methods of placement.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Recent alluvium. (b) N.A. (iii) 22.8.1956. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) T-1242 (late). (vii) Unirrigated. (viii) and (ix) N.A. (x) 29.12.1956.

2. TREATMENTS :

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

(1) 3 sources of P₂O₅ : S₁=Super, S₂=Dicalcium phosphate and S₃=Ammono. phos.

(2) 2 levels of P₂O₅ : P₁=20 and P₂=40 lb./ac.

(3) 3 methods of application of P₂O₅ : M₁=Broadcasting at puddling time. M₂=dipping the seedlings in mud-slash mixed with the fertilizers before transplanting and M₃=application in the form of pellets to be placed near the roots at the time of planting.

N equalised by applying A/S to make up 30 lb./ac. of N at planting time.

3. DESIGN :

(i) 3²×2 fact. confd. (ii) (a) 6 plots/block; 3 blocks/replication. (b) N.A. (iii) 4. (iv) 33'×16.5'. (b) 29'×15'. (v) 2'×9'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Silver-shoot attack to a negligible extent. (iii) Grain and straw yield. (iv) (a) and (b) No. (c) Nil. (v) (a) Barpalli. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2174 lb./ac. (ii) 150.0 lb./ac. (iii) M effect is highly significant, interaction S×M×P is significant while other effects are not significant. (iv) Av. yield of grain in lb./ac.

	S ₁	S ₂	S ₃	Mean	M ₁	M ₂	M ₃
P ₁	2252	2052	2277	2194	2185	2129	2268
P ₂	2257	2092	2112	2154	2211	2144	2106
Mean	2254	2072	2194	2174	2198	2136	2187
M ₁	2317	2041	2235				
M ₂	2170	2087	2151				
M ₃	2276	2087	2197				

S.E. of marginal mean of S or M	=30.6 lb./ac.
S.E. of marginal mean of P	=25.0 lb./ac.
S.E. of body of table S×P or M×P	=43.3 lb./ac.
S.E. of body of table S×M	=56.8 lb./ac.

Crop :- Paddy.

Ref :- Or. 56(TCM).

Site :- M.A.E. Farm, Kendrapara.

Type :- 'M'.

Object :—Type VI (TCM)—To study the direct, residual and cumulative effects of phosphate application to Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) (a) Recent alluvium. (b) N.A. (iii) 4, 5.8.1956. (iv) (a) N.A. (b) Transplanting. (c)—. (d) and (e) N.A. (v) 5,000 lb./ac. of F.Y.M. (vi) B.A.M.—9 (late). (vii) Unirrigated. (viii) No. (ix) N.A. (x) 17.12.1956.

2. TREATMENTS :

Treatment	1	2	3	4	5	6	7	8	9	10	11	12
First year	0	C	C	p ₁	p ₂	0	0	0	0	p _½	p ₁	p ₂
Second year	0	C	C	0	0	p ₁	p ₂	0	0	p _½	p ₁	p ₂
Third year.	0	C	C	0	0	0	0	p ₁	p ₂	p _½	p ₁	p ₂

Treatments are three-year course rotations with 11 distinct treatments. Plots under one treatment do not receive any fertilizer N or P. Plots under the other ten treatments receive a basal application of N. One of the ten treatments consists of the application of basal dose of N only. This treatment which serves as control is applied to two plots in each block. Various symbols denote : p_½ = 10 lb./ac., p₁ = 20 lb./ac. and p₂ = 40 lb./ac. of P₂O₅.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 33'×33'. (b) 27'×27'. (v) 3' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Rice 'burnt' disease. (iii) Grain and straw yield. (iv) (a) 1953—contd. (b) Yes. (c) N.A. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2278 lb./ac. (ii) 252.5 lb./ac. (iii) Treatment differences are highly significant. Control vs. others is also highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2,3	4	5	6	7	8	9	10	11	12
Av. yield	1819	2221	2102	2158	2055	2283	2167	2480	2393	2608	2834

S.E./mean except 2,3=126.3 lb./ac. S.E./mean for 2, 3=89.3 lb./ac.

Crop :- Paddy.

Ref :- Or. 57(TCM).

Site :- M.A.E. Farm, Kendrapara.

Type :- 'M'.

Object :—Type VI (TCM)—To study the cumulative, residual and direct effects of phosphate application to Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) (a) Mahanadi alluvium. (b) N.A. (iii) July—August. (iv) (a) Preliminary and final puddlings. (b) Transplanting. (c) 40 lb./ac. in nursery. (d) 9'×6'. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) November—December.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(TCM) above.

4. GENERAL :

(i) Stunted crop growth observed. (ii) Rice grass-hoppers attacked in general and light trap was used to control. Damaged by rats. (iii) Grain yield. (iv) (a) 1953—contd. (b) Yes. (c) Nil. (v) (a) No. (b) Nil. (vi) Drought conditions generally prevailed. (vii) Nil.

5. RESULTS :

(i) 3491 lb./ac. (ii) 271.8 lb./ac. (iii) Control vs. others effect is significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	(2, 3)	4	5	6	7	8	9	10	11	12
Av. yield	3293	3433	3514	3540	3483	3536	3495	3528	3540	3465	3633

S.E./mean excluding (2, 3)=135.9 lb./ac. and S.E./mean for (2, 3)=96.1 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(TCM).

Site :- M.A.E. Farm, Kendrapara.

Type :- 'M'.

Object :- Type VI (TCM)—To study the cumulative, residual and direct effects of phosphate application to Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—paddy. (b) Paddy. (c) As per treatments. (ii) (a) Recent alluvium. (b) N.A. (iii) 29.7.1958. (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c) 480 bundles of seedlings/ac. (d) 9"×6". (e) N.A. (v) Nil. (vi) B.A.M.—9 (late). (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(TCM) on page 55.

4. GENERAL :

(i) Good. (ii) Rice grass hoppers. (iii) Grain and straw yield. (iv) (a) 1953—contd. (b) Yes. (c) No. (v) (a) No. (b) Nil. (vi) Heavy wind and rains. (vii) Nil.

5. RESULTS :

(i) 3253 lb./ac. (ii) 294.6 lb./ac. (iii) Only control vs. others effect is highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2, 3	4	5	6	7	8	9	10	11	12
Av. yield	2838	3223	3304	3295	3249	3384	2989	3226	3196	3528	3580

S.E./mean except (2, 3)=147.3 lb./ac. and S.E./mean for (2, 3)=104.2 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(SFT).

Centre :- Bolangir (c.f.).

Type :- 'M'.

Object :- Type A—To study the response of Paddy to N, P₂O₅ and K₂O applied alone and in combinations.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Red loam. (iii) N.A. (iv) Local. (v) (a) Ploughings and plankings. (b) Transplanting. (c) —. (d) and (e) N.A. (vi) July—August. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) Nov.—Dec.

2. TREATMENTS :

0 = Control (no manure).

n = 20 lb./ac. of N as A/S.

p = 20 lb./ac. of P₂O₅ as Super.

np = 20 lb./ac. of N as A/S+20 lb./ac. of P₂O₅ as Super.

k = 20 lb./ac. of K₂O as Mur. of Potash.

nk = 20 lb./ac. of N as A/S+20 lb./ac. of K₂O as Mur. of Potash.

pk = 20 lb./ac. of P₂O₅ as Super+20 lb./ac. of K₂O as Mur. of Potash.

npk = 20 lb./ac. of N as A/S+20 lb./ac. of P₂O₅ as Super+20 lb./ac. of K₂O as Mur. of Potash.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one Revenue circle or thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crops, 4 on an oil-seed crop and 3 on a leguminous crop. Half the number of trials conducted are of Type A and the other half of Type B on crops other than the legumes. The three trials on legumes are of Type C. Residual effects of phosphate application are studied on Type C trials in two out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) 1/80 ac. (b) 1/40 ac. (iv) Yes.

4. GENERAL :

(i) Normal to good. (ii) N.A. (iii) Grain yield. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) As per treatments. (b) Nil. (vi) and (vii) N.A.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	2938	3826	3184	3686	3003	3612	3110	4048

G.M.=3426 lb./ac. ; S.E.=171.6 lb./ac. and no. of trials=8.

Crop :- Paddy (*Kharif*).

Ref :- Or. 59(SFT).

Centre :- Balasore (c. f.).

Type :- 'M'.

Object :—Type A—To study the response of Paddy to N, P₂O₅ and K₂O applied alone and in combinations.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Saline. (iii) N.A. (iv) *Desi*. (v) (a) 5 to 7 ploughings. (b) Transplanting. (c) —. (d) and (e) N.A. (vi) July—August. (vii) Unirrigated. (viii) 2 weedings ; 2 intercultivations and roguing. (ix) N.A. (x) Nov.—December.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A on page 56 conducted at Bolangir.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	2386	2543	2436	2946	2353	2781	2650	2872

G.M.=2621 lb./ac. ; S.E.=86.0 lb./ac. and no. of trials=4.

Crop :- Paddy (*Kharif*).

Ref :- Or. 58(SFT).

Centre :- Cuttack (c.f.).

Type :- 'M'.

Object :—Type A—To study the response of Paddy to N, P₂O₅ and K₂O applied alone and in combinations.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Red alluvial. (iii) N.A. (iv) Local. (v) (a) to (e) N.A. (vi) July—August. (vii) Unirrigated. (viii) and (ix) N.A. (x) Nov.—Dec.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58 (SFT) Type A on page 56 conducted at Bolangir.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	3357	3752	3588	3859	3481	3769	3703	3925

G.M.=3679 lb./ac. ; S.E.=51.2 lb./ac. and no. of trials=7.

Crop :- Paddy (Kharif).**Ref :- Or. 58 (SFT).****Centre :- Dhenkanal (c.f.).****Type :- 'M'.**Object :—Type A—To study the response of Paddy to N, P₂O₅ and K₂O applied alone and in combinations.**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Red loam. (iii) N.A. (iv) Local. (v) (a) Ploughings and plankings. (b) Transplanting. (c)—. (d) and (e) N.A. (vi) July—August. (vii) N.A. (viii) N.A. (ix) N.A. (x) Nov.—Dec.

2. TREATMENTS to 4 GENERAL :

Same as in expt. no. 58 (SFT) Type A on page 56 conducted at Bolangir.

5. RESULTS :

Treatment	0	n	p	np	k	nk	nk	npk
Av. yield	3061	3695	3810	4575	3777	4320	4180	5340

G.M.=4095 lb./ac. ; S.E.=178.6 lb./ac. and no. of trials=12.

Crop :- Paddy (Kharif).**Ref :- Or. 59(SFT).****Centre :- Dhenkanal (c.f.).****Type :- 'M'.**Object :—Type A—To study the response of paddy to N, P₂O₅ and K₂O applied alone and in combinations.**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Red and black. (iii) N.A. (iv) Local. (v) (a) 3 to 5 ploughings and 3 plankings. (b) Transplanting. (c)—. (d) and (e) N.A. (vi) July—August. (vii) N.A. (viii) N.A. (ix) N.A. (x) Nov.—December.

2. TREATMENTS to 4 GENERAL :

Same as in expt. no. 58 (SFT) Type A on page 56 conducted at Bolangir.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	4937	5365	5176	5612	5052	5785	5530	5900

G.M.=5420 lb./ac. ; S.E.=161.5 lb./ac. and no. of trials=2.

Crop Paddy (Kharif).**Ref :- Or. 58 (SFT).****Centre :- Ganjam (c.f.).****Type :- 'M'.**Object :—Type A—To study the response of Paddy to N, P₂O₅ and K₂O applied alone and in combinations.**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Laterite. (iii) N.A. (iv) Local. (v) (a) Ploughing, plankings etc. (b) Transplanting. (c) —. (d) and (e) N.A. (vi) August—Sept. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) Dec.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58 (SFT) Type A on page 56 conducted at Bolangir.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	2436	3077	3349	3382	3184	3110	3448	3472

G.M.=3182 lb./ac. ; S.E.=134.4 lb./ac. and no. of trials=8.

Crop :- Paddy (Kharif).**Ref :- Or. 59(SFT).****Centre :- Ganjam (c.f.).****Type :- 'M'.**Object :—Type A—To study the response of Paddy to N, P₂O₅ and K₂O applied alone and in combinations.**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Red soil. (iii) N.A. (iv) Local. (v) (a) 3 to 5 ploughings, 2 plankings etc. (b) Transplanting. (c)—. (d) and (e) N.A. (vi) August—Sept. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) December.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A on page 56 conducted at Bolangir.

5. RESULTS :

Treatment	0	n	p	np	k	rk	pk	npk
Av. yield	2222	2839	2757	2888	2576	2847	2748	3143

G.M.=2752 lb./ac. ; S.E.=64.5 lb./ac. and no. trials=14.

Crop :- Paddy (Kharif).**Ref :- Or. 58(SFT).****Centre :- Kalahandi (c.f.).****Type :- 'M'.**Object :—Type A—To study the response of Paddy to N, P₂O₅ and K₂O applied alone and in combinations.**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Red loam. (iii) N.A. (iv) Local. (v) (a) Ploughings and plankings. (b) Transplanting. (c)—. (d) and (e) N.A. (vi) July—August. (vii) Unirrigated. (viii) and (ix) N.A. (x) Nov. 1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A on page 56 conducted at Bolangir.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	1876	2526	2288	3102	2172	3028	2962	3563

G.M.=2690 lb./ac. ; S.E.=72.1 lb./ac. and no. of trials=10.

Crop :- Paddy (Kharif).**Ref :- Or. 59(SFT).****Centre :- Kalahandi (c.f.).****Type :- 'M'.**Object :—Type A—To study the response of Paddy to N, P₂O₅ and K₂O applied alone and in combinations.**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Red soil. (iii) N.A. (iv) Local (v) (a) Ploughings and plantings. (b) Transplanting. (c)—. (d) and (e) N.A. (vi) July—August. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) Nov. 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A on page 56 conducted at Bolangir.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	1473	2543	2345	2600	2205	2098	2189	2707

G.M.=2270 lb./ac. ; S.E.=337.1 lb./ac. and no. of trials=7.

Crop :- Paddy (Kharif).**Ref :- Or. 58(SFT).****Centre :- Korapat (c.f.).****Type :- 'M'.**Object :-Type A—To study the response of Paddy to N, P₂O₅ and K₂O applied alone and in combinations**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Red loam. (iii) and (iv) N.A. (v) (a) to (e) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A on page 56 conducted at Bolangir.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	1662	2288	2172	2403	1761	2271	2139	2633

G.M. = 2166 lb./ac. ; S.E. = 101.2 lb./ac. and no. of trials = 7.

Crop :- Paddy (Kharif).**Ref :- Or. 58(SFT).****Centre :- Mayurbhanj (c.f.).****Type :- 'M'**Object :-Type A—To study the response of Paddy to N, P₂O₅ and K₂O applied alone and in combinations.**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Red and black. (iii) N.A. (iv) Local. (v) (a) Ploughings and plankings. (b) Transplanting. (c) —. (d) and (e) N.A. (vi) Mid July 1958. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) Nov. 1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A on page 56 conducted at Bolangir.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	2469	3300	3259	3686	3036	3383	3703	4847

G.M. = 3535 lb./ac. ; S.E. = 118.1 lb./ac. and no. of trials = 15.

Crop :- Paddy (Kharif).**Ref :- Or. 59(SFT).****Centre :- Mayurbhanj (c.f.).****Type :- 'M'.**Object :-Type A—To study the response of Paddy to N, P₂O₅ and K₂O applied alone and in combinations.**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Red soil. (iii) N.A. (iv) Local. (v) (a) 2 to 3 ploughings and plankings. (b) Transplanting. (c) —. (d) and (e) N.A. (vi) Mid July. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) November.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A on page 56 conducted at Bolangir.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	2296	3020	2864	3481	2707	3250	3598	4090

G.M. = 3138 lb./ac. ; S.E. = 135.3 lb./ac. and no. of trials = 15.

Crop :- Paddy (Kharif).**Ref :- Or. 58(SFT).****Centre :- Puri (c.f.).****Type :- 'M'.**Object :—Type A—To study the response of Paddy to N, P₂O₅ and K₂O applied alone and in combinations.**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Red alluvial. (iii) N.A. (iv) Improved. (v) (a) Ploughing. (b) Transplanting. (c) —. (d) and (e) N.A. (vi) July—August. (vii) N.A. (viii) N.A. (ix) N.A. (x) December.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A on page 56 conducted at Bolangir.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	1448	1925	1925	2074	1794	2279	2090	2650

G.M.=2023 lb./ac. ; S.E.=123.9 lb./ac. and no. of trials=7.

Crop :- Paddy (Kharif).**Ref :- Or. 59(SFT).****Centre :- Puri (c.f.).****Type :- 'M'.**Object :—Type A—To study the response of Paddy to N, P₂O₅ and K₂O applied alone and in combinations.**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Coastal. (iii) N.A. (iv) Improved. (v) (a) 6 ploughings. (b) Transplanting. (c) —. (d) and (e) N.A. (vi) July—August. (vii) N.A. (viii) N.A. (ix) N.A. (x) December.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A on page 56 conducted at Bolangir.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	2872	3514	3168	3711	3127	3793	3390	4090

G.M.=3458 lb./ac. ; S.E.=89.9 lb./ac. and no. of trials=3.

Crop :- Paddy (Kharif).**Ref :- Or. 58(SFT).****Centre :- Sambalpur (c.f.).****Type :- 'M'.**Object :—Type A—To study the response of Paddy to N, P₂O₅ and K₂O applied alone and in combinations.**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Red and black. (iii) N.A. (iv) Local. (v) (a) Puddling, ploughing and planking. (b) Transplanting. (c) —. (d) and (e) N.A. (vi) First week of August, 1958. (vii) Un-irrigated. (viii) and (ix) N.A. (x) December, 1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. No. 58(SFT) Type A on page 56 conducted at Bolangir.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	1670	1934	2098	2246	1687	2024	2312	2674

G.M.=2081 lb./ac. S.E.=154.8 lb./ac. and no. of trials=10.

Crop :- Paddy (Kharif).

Ref :- Or. 59(SFT).

Centre :- Sambalpur (c.f.).

Type :- 'M'.

Object :- Type A—To study the response of Paddy to N, P₂O₅ and K₂O applied alone and in combinations.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Red soil. (iii) N.A. (iv) Local. (v) (a) 5 times puddling, 5 ploughings and plankings. (b) Transplanting. (c)—, (d) and (e) N.A. (vi) First week of August. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) Decemboer.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A on page 56 conducted at Bolangir.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	2041	2172	2839	3349	1942	2370	2666	3514

G.M.=2612 lb./ac. S.E.=95.0 lb./ac. and no. of trials=4.

Crop :- Paddy (Kharif).

Ref :- 58(SFT).

Centre :- Bolangir (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Red loam. (iii) N.A. (iv) N.A. (v) (a) 3 to 7 ploughings (b) Transplanting. (c)—, (d) and (e) N.A. (vi) 3rd week of Aug. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) Nov. 1958.

2. TREATMENTS :

0 = Control

n₁' = 20 lb./ac. of N as Urea.

n₂' = 40 lb./ac. of N as Urea.

n₁'' = 20 lb./ac. of N as ASN.

n₂'' = 40 lb./ac. of N as ASN.

n₁''' = 20 lb./ac. of N as C.A.N.

n₂''' = 40 lb./ac. of N as C.A.N.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant posted in each zone. The field assistant conducts the trials in one revenue circle or thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crop, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of Type C. Residual effects of phosphate application are studied on Type C trials in two out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) 1/80 ac. (b) 1/40 ac. (iv) Yes.

4. GENERAL :

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

5. RESULTS :

Treatment	0	n ₁ '	n ₂ '	n ₁ ''	n ₂ ''	n ₁ '''	n ₂ '''
Av. yield	2584	3028	2929	2995	2872	2946	3094

G.M.=2921 lb./ac. ; S.E.=181.0 lb./ac. and no. of trials=8.

Crop :- Paddy.**Ref :- Or. 59(SFT).****Site :- Bolangir (c.f.).****Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Red. (iii) N.A. (iv) N.A. (v) (a) 3 ploughings. (b) Transplanting. (c) —. (d) and (e) N.A. (vi) 1 to 10.8.1959. (vii) N.A. (viii) N.A. (ix) N.A. (x) 16 to 18.10.1959 and 3 to 7.11.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58 (SFT) Type B on page 62 conducted at Bolangir.

4. GENERAL :

(i) Good. (ii) Case-worms. Controlled by dusting gammexane. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) N.A. (v) (a) As per treatments (b) No. (vi) and (vii) Nil.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	1514	1942	2008	1969	2090	2222	2584

G.M. = 2038 lb./ac. ; S.E./mean = 65.2 lb./ac. and no. of trials = 4.

Crop :- Paddy (Kharif).**Ref :- Or. 59(SFT).****Centre :- Balasore (c.f.).****Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Saline. (iii) N.A. (iv) Improved. (v) (a) 4 ploughings and 2 plankings. (b) Transplanting. (c)—. (d) and (e) N.A. (vi) Middle of August. (vii) N.A. (viii) 2 times weeding and roguing. (ix) N.A. (x) Nov. and Dec.

2. TREATMENTS :

0 = Control (no manure).

 n_1 = 20 lb./ac. of N as A/S. n_2 = 40 lb./ac. of N as A/S. n_1' = 20 lb./ac. of N as Urea. n_2' = 40 lb./ac. of N as Urea. n_1''' = 20 lb./ac. of N as C.A.N. n_2''' = 40 lb./ac. of N as C.A.N.**3. DESIGN and 4. GENERAL :**

Same as in expt. no. 58(SFT) Type B on page 62 conducted at Bolangir.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	2181	2419	2551	2534	2798	2534	2633

G.M. = 2521 lb./ac. ; S.E./mean = 75.1 lb./ac. and no. of trials = 4

Crop :- Paddy (Kharif).**Ref :- Or. 58(SFT).****Centre :- Cuttack (c.f.).****Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Red alluvium. (iii) N.A. (iv) Local. (v) (a) to (e) N.A. (vi) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 62 conducted at Bolangir.

5. RESULTS :

Treatment	0	n ₁ '	n ₂ '	n ₁ ''	n ₂ ''	n ₁ '''	n ₂ '''
Av. yield	3300	3917	4131	3555	3645	3769	3719

G.M. = 3719 lb./ac. ; S.E. = 49.5 lb./ac. and no. of trials = 8

Crop :- Paddy.

Ref :- Or. 58(SFT).

Centre :- Dhenkanal (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 62 conducted at Bolangir.

5. RESULTS :

Treatment	0	n ₁ '	n ₂ '	n ₁ ''	n ₂ ''	n ₁ '''	n ₂ '''
Av. yield	2386	2864	3012	3143	3332	3036	3530

G.M. = 3050 lb./ac. ; S.E./mean = 120.4 lb. ac. and no. of trials = 12.

Crop :- Paddy (Kharif).

Ref :- Or. 58(SFT).

Centre :- Dhenkanal (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) N.A. (iii) Red and black. (iv) Local. (v) (a) 5 ploughings and 2 to 3 plankings. (b) Transplanting. (c) —. (d) and (e) N.A. (vi) July—August. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) December.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 62 conducted at Bolangir.

5. RESULTS :

Treatment	0	n ₁ '	n ₂ '	n ₁ ''	n ₂ ''	n ₁ '''	n ₂ '''
Av. yield	4690	5809	6221	5118	4929	5134	5349

G.M. : = 5321 lb./ac. ; S.E./mean = 161.8 lb. ac. and no. of trials = 7.

Crop :- Paddy (Kharif).

Ref :- Or. 58(SFT).

Centre :- Ganjam (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite. (iii) N.A. (iv) Local. (v) (a) Ploughings and rolling. (b) Transplanting. (c) —. (d) and (e) N.A. (vi) Aug.—Sept. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Dec. 1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 62 conducted at Bolangir.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	2156	3086	3168	3061	3119	3226	3514

G.M. = 3047 lb./ac. ; S.E./mean = 132.1 lb./ac. and no. of trials = 8.

Crop :- Paddy (*Kharif*).

Ref :- Or. 59(SFT).

Centre :- Ganjam (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red. (iii) N.A. (iv) Both local and improved. (v) (a) Ploughings and rolling. (b) Transplanting. (c) —. (d) and (e) N.A. (vi) July to Sept. 1959. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Dec. 1959.

2. TREATMENTS :

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

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 62 conducted at Bolangir.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	2543	3563	3802	3431	3612	3160	3110	3588	3785

G.M. = 3399 lb./ac. ; S.E./mean = 100.7 lb./ac. and no. of trials = 12.

Crop :- Paddy (*Kharif*).

Ref :- Or. 58(SFT).

Centre :- Kalahandi (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loam. (iii) and (iv) N.A. (v) (a) to (e) N.A. (vi) Aug. 1958. (vii) Unirrigated. (viii) and (ix) N.A. (x) Nov. 1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 62 conducted at Bolangir.

5. RESULT :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	1555	2123	2798	1901	2444	2304	3094

G.M. = 2317 lb./ac. ; S.E./mean = 84.4 lb./ac. and no. of trials = 8

Crop :- Paddy (*Kharif*).

Ref :- Or. 59(SFT).

Centre :- Kalahandi (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red. (iii) and (iv) N.A. (v) (a) 2 to 4 ploughings. (b) Transplanting. (c) —. (d) and (e) N.A. (vi) 6 to 20.8.1959. (vii) Unirrigated. (viii) and (ix) N.A. (x) 18 to 26.11.1959.

2. TREATMENTS :

Same as in expt. no. 59(SFT) Type B on page 65 conducted at Ganjam.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 62 conducted at Bolangir.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	1103	963	1094	1646	1744	2444	2946	1827	2123

G.M.=1766 lb./ac. ; S.E./mean=321.2 lb./ac. and no. of trials=7

Crop :- Paddy (Kharif).

Ref :- Or. 58(SFT).

Centre :- Mayurbhanj (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loam. (iii) and (iv) N.A. (v) (a) to (e) N.A. (vi) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in experiment no. 58(SFT) Type B on page 62 conducted at Bolangir.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	2650	3259	3974	3283	3991	3275	4084

G.M.=3502 lb./ac. ; S.E.=149.5 lb./ac. and no. of trials=14

Crop :- Paddy (Kharif).

Ref :- Or. 59(SFT).

Centre :- Mayurbhanj (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red. (iii) N.A. (iv) Local (late). (v) (a) 2 to 3 ploughings. (b) Broadcasting and transplanting. (c) to (e) N.A. (vi) 22 to 30.5.1959 (broadcasting) and end of August 1959 (transplanting). (vii) N.A. (viii) 1 to 2 weedings. (ix) N.A. (x) End of Nov. and mid Dec. 1959.

2. TREATMENTS :

Same as in expt. no. 59(SFT) Type B on page 65 conducted at Ganjam.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 62 conducted at Bolangir.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	2057	1819	2156	2576	3094	3152	3785	2855	3242

G.M.=2637 lb./ac. ; S.E./mean=112.9 lb./ac. and no. of trials=15

Crop :- Paddy (Kharif).**Ref :- Or. 58(SFT).****Centre :- Puri (c.f.).****Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red alluvium. (iii) and (iv) N.A. (v) (a) to (e) N.A. (vi) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 62 conducted at Bolangir.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	1983	2419	2460	2362	2444	2353	2501

G.M. = 2360 lb./ac. ; S.E. = 48.3 lb./ac. and no. of trials = 10.

Crop :- Paddy.**Ref :- Or. 59(SFT).****Centre :- Puri (c.f.).****Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Coastal. (iii) N.A. (iv) N.A. (v) (a) to (e) N.A. (vi) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58 (SFT) Type B on page 62 conducted at Bolangir.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	2098	2543	2888	2460	2773	2559	2757

G.M. = 2583 lb./ac. ; S.E./mean = 65.2 lb./ac. and no. of trials = 3.

Crop :-Paddy (Kharif).**Ref :- Or. 58(SFT).****Centre :- Sambalpur (c.f.).****Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loam. (iii) and (iv) N.A. (v) (a) 4 ploughings and 2 plankings. (b) Transplanting. (c)—. (d) and (e) N.A. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 62 conducted at Bolangir.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	2378	2732	3316	3160	3472	2831	3242

G.M. = 3019 lb./ac. ; S.E. = 142.0 lb./ac. and no. of trials = 11.

Crop :- Paddy (Kharif).**Ref :- Or. 59(SFT).****Centre :- Sambalpur (c.f.).****Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and black. (iii) and (iv) N.A. (v) (a) 4 ploughings and 2 plankings. (b) Transplanting. (c)—. (d) and (e) N.A. (vi) August 1959. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) End of Nov. and early Dec. 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 62 conducted at Bolangir.

5. RESULTS :

Treatment	0	n ₁ '	n ₂ '	n ₁ ''	n ₂ ''	n ₁ '''	n ₂ '''
Av. yield	3341	3703	4098	4090	4098	4221	3810

G.M.=3909 lb./ac. ; S.E./mean=331.7 lb./ac. and no. of trials=4.

Crop :- Paddy (Kharif).**Ref :- Or. 54(TCM).****Centre :- Cuttack (c.f.).****Type :- 'M'.**

Object :—Type I (a)—To assess the average response to N and P applied alone and in combination.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy loam to clay loam. pH 6.5. (iii) and (iv) Nil. (v) (a) N.A. (b) Transplanted. (c)—. (d) and (e) N.A. (vi) First week of August. (vii) Irrigated. (viii) and (ix) N.A. (x) Nov.—Dec.

2. TREATMENTS :

All combinations of (1), (2) and (3)+3 extra treatments/block :

(1) 3 levels of N : N₀=0, N₁=20 and N₂=40 lb./ac.(2) 3 sources of N : S₁=A/S, S₂=A/N and S₃=Urea.(3) 3 levels of P₂O₅ as Super : P₀=0, P₁=20 and P₂=40 lb./ac.3 extra treatments : G₁=60 lb./ac. of N+40 lb./ac. of P₂O₅, G₂=40 lb./ac. of N+80 lb./ac. of P₂O₅ and G₃=60 lb./ac. of N+80 lb./ac. of P₂O₅. N as A/S and P₂O₅ as Super.**3. DESIGN :**

(i) 3³-3 Fact. confd. (ii) (a) 12 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) No. (iii) Yield of grain. (iv) (a) 1953 to 1955. (b) N.A. (c) Nil. (v) (a) and (b) Nil. (vi) Yes. (vii) Results as available are furnished. The trial was conducted at Sahaspur.

5. RESULTS :

(i) to (iii) N.A. (iv) Av. yield of grain in lb. ac.

	N ₀	N ₁	N ₂	Mean		N ₁	N ₂	Mean
P ₀	2278	2704	2983	2655	S ₁	2847	2958	2900
P ₁	2123	2585	2818	2509	S ₂	2519	2740	2630
P ₂	2261	2715	2836	2604	S ₃	2644	2938	2791
Mean	2221	2668	2879	2589	Mean	2668	2879	2774

S.E.'s N.A.

Crop :- Paddy (Kharif).**Ref :- Or. 55 (TCM).****Centre :- Cuttack (c.f.).****Type :- 'M'.**

Object :—Type I (a)—To assess the average response to N and P applied alone and in combination.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Recent alluvium. (iii) N.A. (iv) N.A. (v) (a) N.A. (b) Transplan.ed. (c) to (e) N.A. (vi) June—July. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Nov.—Dec.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54 (TCM) Type I (a) on page 68 conducted at Cuttack.

5. RESULTS :

(i) N.A. (ii) 249.3 lb./ac. (iii) Main effect of N is significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	S ₀	S ₁	S ₂	Mean
P ₀	1639	2064	1908	2065	1764	1782	1370
P ₁	1803	1956	2130	2243	1905	1742	1963
P ₂	1828	2094	2008	1853	2140	1936	1977
Mean	1757	2038	2015	2054	1936	1820	1937
S ₀	—	2074	2202				
S ₁	—	1910	2092				
S ₂	—	2130	1752				

S.E. of marginal mean of N, P or S (P×S or P×N table) = 83.1 lb./ac.

S.E. of marginal mean of S (N×S table) = 101.8 lb./ac.

S.E. of body of any table = 143.9 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 54(TCM).****Centre :- Cuttack (c.f.).****Type :- 'M'.**

Object :—Type II—To study the effect of different sources of N applied at different times.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy loam to clay loam. (iii) to (v) N.A. (vi) Transplanting in Ist week of August. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Nov.—Dec.

2. TREATMENTS :

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

(1) 2 sources of 30 lb./ac. of N : S₁=Urea and S₂=A/S.(2) 7 times of application N : T₁=Full application before planting, T₂=Full application at planting, T₃=Full application at tillering, T₄= $\frac{1}{2}$ applied before planting and $\frac{1}{2}$ applied at tillering, T₅= $\frac{1}{2}$ applied at planting and $\frac{1}{2}$ at tillering, T₆= $\frac{1}{3}$ applied before planting, $\frac{1}{3}$ applied at tillering and $\frac{1}{3}$ applied a week before flowering and T₇= $\frac{1}{3}$ applied at planting, $\frac{1}{3}$ applied at tillering and $\frac{1}{3}$ applied a week before flowering.**3. DESIGN :**

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 27'×27'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) No. (iii) Yield of grain. (iv) (a) 1953—contd. (b) No. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) The trial was conducted at Sahaspur.

5. RESULTS :

(i) 2639 lb./ac. (ii) 179.3 lb./ac. (iii) Control vs others and T effects are highly significant. No other effect is significant. (iv) Av. yield of grain in lb./ac.

Control=2107 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	2798	2888	2156	2732	2510	2732	2534	2621
S ₂	2839	2872	2551	2814	2732	2732	2592	2733
Mean	2818	2880	2353	2773	2621	2732	2563	2677

S.E. of marginal mean of T = 73.2 lb./ac.

S.E. of marginal mean of S = 39.1 lb./ac.

S.E. of body of table = 103.5 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 55(TCM).****Centre :- Cuttack (c.f.).****Type :- 'M'.**

Object :- Type II—To study the effect of different sources of N applied at different times.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Recent alluvium. (iii) to (v) N.A. (vi) June—July. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Nov.—Dec.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54 (TCM) Type II on page 69 conducted at Cuttack.

5. RESULTS :

(i) 1667 lb./ac. (ii) 189.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control=1563 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	1629	1728	1588	1728	1646	1662	1629	1659
S ₂	1769	1893	1572	1810	1802	1662	1317	1689
Mean	1669	1810	1580	1769	1724	1662	1473	1674

S.E. of marginal mean of T = 77.3 lb./ac.

S.E. of marginal mean of S = 41.3 lb./ac.

S.E. of body of table or control mean = 109.4 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 54(TCM).****Centre :- Cuttack (c.f.).****Type :- 'M'.**Object :- Type IV—To study the effect of different doses and sources of P₂O₅ applied at different times.**1. BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) Sandy loam. (iii) and (iv) N.A. (v) (a) N.A. (b) Transplanting. (c)—, (d) and (e) N.A. (vi) 1st week of August. (vii) Irrigated. (viii) and (ix) N.A. (x) Nov.—Dec.

2. TREATMENTS :

All combinations of (1), (2) and (3)+2 control plots/replication.

- (1) 2 doses of P_2O_5 : $P_1=20$ and $P_2=40$ lb./ac.
 (2) 2 sources of P_2O_5 : S_1 =Nitro. Phos. and S_2 =Ammo. Phos.
 (3) 4 methods of application of P_2O_5 : M_1 =Broadcasting at puddling time, M_2 =Drilling at puddling time, M_3 =Dipping in mud slash and M_4 =Application as pellets.

N to be equalised to 30 lb./ac. by the addition of A/S.

3. DESIGN :

- (i) R.B.D. (ii) (a) 18. (b) N.A. (iii) 3. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) No. (iii) Yield of grain. (iv) (a) 1953—contd. (b) and (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) This expt. was conducted at Sahaspur. Results of experiment conducted during 1955 not available.

5. RESULTS :

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

	M_1	M_2	M_3	M_4	Mean	S_1	S_2
P_1	2735	2852	2749	2580	2729	2737	2722
P_2	2850	2867	2950	2908	2894	2983	2804
Mean	2792	2859	2850	2744	2811	2860	2763
S_1	2817	2989	2876	2757			
S_2	2768	2729	2823	2731			

S.E.'s N.A.

Crop :- Paddy (Kharif).

Centre :- Cuttack (c.f.).

Ref :- Or. 54(TCM).

Type :- 'M'.

Object :-Type VI—To study the direct and residual effect of Phosphatic manure.

1. BASAL CONDITIONS :

- (i) (a) to (c) N.A. (ii) Sandy loam to clay loam. (iii) N applied to all plots except plot with treatment 1. (iv) N.A. (v) (a) N.A. (b) Transplanted. (c)—. (d) and (e) N.A. (vi) 1st week of August. (vii) Irrigated. (viii) and (ix) N.A. (x) Nov.—Dec.

2. TREATMENTS :

Year	1	2	3	4	5	6	7	8	9	10	11	12
1	0	C	C	p_1	p_2	C	C	C	C	$p_{\frac{1}{2}}$	p_1	p_2
2	0	C	C	C	C	p_1	p_2	C	C	$p_{\frac{1}{2}}$	p_1	p_2
3	0	C	C	C	C	C	C	p_1	p_2	$p_{\frac{1}{2}}$	p_1	p_2
4	0	C	C	p_1	p_2	C	C	C	C	$p_{\frac{1}{2}}$	p_1	p_2

$p_1=20$ lb./ac. of P_2O_5 , $p_{\frac{1}{2}}=10$ lb./ac. of P_2O_5 and $p_2=40$ lb./ac. of P_2O_5 . N applied to all plots except the plot with treatment 1.

3. DESIGN :

- (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/59.82 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1953—contd. (b) Yes. (c) No. (v) (a) and (b) No. (vi) Nil. (vii) Experiment was continued under model agronomy scheme at Kendrapara (name changed).

5. RESULTS :

(i) 2503 lb./ac. (ii) 328.4 lb./ac. (iii) Treatment 1 vs others is highly significant. Other treatments (viz 4 to 7 and 10 to 12) are highly significantly different. Treatment CC vs others is not significant. (iv) Av. yield of green fodder in lb./ac.

Treatment	1	(2, 3, 8 and 9)	4	5	6	7	10	11	12
Av. yield	1658	2527	2591	2297	2418	2852	2503	2840	2768

S.E./mean (except treatments 2, 3, 8 and 9) = 164.2 lb./ac.

S.E./mean for treatments 2, 3, 8 and 9 = 82.1 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 55(TCM).

Centre :- Cuttack (c.f.).

Type :- 'M'.

Object :- Type VI—To study the direct and residual effect of Phosphatic manure.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Recent alluvium. (iii) to (v) N.A. (vi) June—July. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Nov.—Dec.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) Type VI on page 71 conducted at Cuttack.

5. RESULTS :

(i) 2237 lb./ac. (ii) 181.0 lb./ac. (iii) Treatments 2 to 5 vs other treatments effect is highly significant. Treated 1 vs other treatments and other treatments are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2 to 5	6	7	8	9	10	11	12
Av. yield	2316	2088	2335	2354	2306	2253	2251	2262	2420

S.E./mean (other than treatments 2 to 5)=90.5, S.E./mean (for treatment 2 to 5)=45.2 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 54(TCM).

Centre :- Cuttack (c.f.).

Type :- 'M'.

Object :- To study the effect of different doses and sources of N on Paddy yield.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy loam to clay loam. (iii) 20 lb./ac. of P_2O_5 . (iv) N.A. (v) (a) N.A. (b) Transplanted. (c) —. (d) $9' \times 6'$. (e) N.A. (vi) August. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

(1) 3 levels of N : $N_1=20$, $N_2=40$ and $N_3=60$ lb./ac.

(2) 3 sources of N : $S_1=A/S$, $S_2=A/S/N$ and $S_3=Ammonium$ chloride.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $27' \times 27'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. Lodging in some plots. (ii) No. (iii) Yield of grain. (iv) Nil. (v) (a) 1953—1955. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2859 lb./ac. (ii) 333.76 lb./ac. (iii) Control vs others effect is significant. N effect is highly significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

Control=2458 lb./ac.

	N ₁	N ₂	N ₃	Mean
S ₁	2938	3119	3225	3094
S ₂	2376	2635	3315	2775
S ₃	2633	2831	3061	2842
Mean	2649	2862	3200	2904

S.E. of any marginal mean = 96.34 lb./ac.
 S.E. of body of table or control mean = 166.88 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 55(TCM).****Centre :- Cuttack (c.f.).****Type :- 'M'.**

Object :—Type X—To study the effect of different doses and sources of N on Paddy yield.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Recent alluvium. (iii) to (v) N.A. (vi) June—July. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Nov.—Dec.

2. TREATMENTS :

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

(1) 3 levels of N : N₁=20, N₂=40 and N₃=60 lb./ac.(2) 3 sources of N : S₁=A/S, S₂=Nitro chalk and S₃=Ammonium chloride.

N applied before transplanting.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 54(TCM) Type X on page 72 conducted at Cuttack.

5. RESULTS :

(i) 2334 lb./ac. (ii) 189.26 lb./ac. (iii) Only control vs others effect is significant. (iv) Av. yield of grain in lb./ac.

Control=2135 lb./ac.

	N ₁	N ₂	N ₃	Mean
S ₁	2349	2413	2362	2375
S ₂	2426	2299	2337	2354
S ₃	2376	2390	2251	2339
Mean	2384	2367	2317	2356

S.E. of any marginal mean = 54.64 lb./ac.
 S.E. of body of table or control mean = 94.63 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 54(TCM).****Centre :- Kalahandi (c.f.).****Type :- 'M'.**

Object :—Type I—To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loam. (iii) Nil. (iv) and (v) N.A. (vi) July—August. (vii) to (ix) N.A. (x) December.

2. TREATMENTS :

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

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract, 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 these lists 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) Yield of paddy. (iv) (a) 1953—1955. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

Treatment	0	N_1	N_2	N_1'	N_2'
Av. yield	1554	2227	2701	2158	2108

G.M.=2150 lb./ac. ; S.E./mean=78.2 lb./ac. and no. of trials= 39.

Crop :- Paddy (Kharif).

Ref :- Or. 55(TCM).

Centre :- Kalahandi (c.f.).

Type :- 'M'.

Object : Type I—To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loam. (iii) Nil. (iv) and (v) N.A. (vi) July—August. (vii) to (ix) N.A. (x) December.

2. TREATMENTS :

- 0 =Control (no manure).
 N_1 =20 lb./ac. of N as A/S.
 N_2 =40 lb./ac. of N as A/S.
 N_1' =20 lb./ac. of N as A/N.
 N_2' =40 lb./ac. of N as A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 54(T.C.M) Type I above conducted at Kalahandi.

5. RESULTS :

Treatment	0	N_1	N_2	N_1'	N_2'
Av. yield	1418	1972	2307	1823	1977

G.M.=1899 lb./ac. ; S.E./mean= 39.2 lb./ac. and no. of trials = 74.

Crop :- Paddy (Kharif).

Ref :- Or. 55(TCM).

Centre :- Kalahandi (c.f.).

Type :- 'M'.

Object : —Type V—To study the effect of different levels and sources of N.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 54(TCM) Type I on page 73 conducted at Kalahandi.

5. RESULTS

Treatment	0	N ₁	N ₂	N ₁ '	N ₂ '
Av yield	1582	2009	2381	1837	2124

G.M. =1987 lb./ac. ; S.E./mean=119.5 lb./ac. and no. of trials=14

Crop :- Paddy (Kharif).

Ref :- Or. 54(TCM).

Centre :- Kalahandi (c.f.).

Type :- 'M'.

Object :—Type II—To study the effect of P alone and in combination with N on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N A. (ii) Red loam. (iii) to (v) N.A. (vi) July—August. (vii) to (ix) N.A. (x) Dec.

2. TREATMENTS :

0 =Control (no manure).

P₁ =20 lb./ac. of P₂O₅ as Super.

N₁P₁ =20 lb./ac. of N as A/S +20 lb./ac. of P₂O₅ as Super.

N₂P₁ =40 lb./ac. of N as A/S +20 lb./ac. of P₂O₅ as Super.

N₁'P₁=20 lb./ac. of N as Urea+20 lb./ac. of P₂O₅ as Super.

N₂'P₁=40 lb./ac. of N as Urea+20 lb./ac. of P₂O₅ as Super.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 54(TCM) Type I on page 73 conducted at Kalahandi.

5. RESULTS :

Treatment	0	P ₁	N ₁ P ₁	N ₂ P ₁	N ₁ 'P ₁	N ₂ 'P ₁
Av. yield	1808	2067	2492	2562	2058	2195

G.M. =2197 lb./ac. ; S.E./mean=73.6 lb./ac. and no. of trials=61.

Crop :- Paddy (Kharif).

Ref :- Or. 55(TCM).

Centre :- Kalahandi (c.f.).

Type :- 'M'.

Object :—Type II—To study the effect of P alone and in combination with N on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loam. (iii) N.A. (iv) and (v) N.A. (vi) July—August. (vii) to (ix) N.A. (x) December.

2. TREATMENTS :

0 =Control (no manure).

P₁ =20 lb./ac. of P₂O₅ as Super.

N₁P₁=20 lb./ac. of N as A/S+20 lb./ac. of P₂O₅ as Super.

N₂P₁ =40 lb./ac. of N as A/S+20 lb./ac. of P₂O₅ as Super.

N₁'P₁=20 lb./ac. of N as A/N+20 lb./ac. of P₂O₅ as Super.

N₂'P₁=40 lb./ac. of N as A/N+20 lb./ac. of P₂O₅ as Super.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 54(TCM) Type I on page 73 conducted at Kalahandi.

5. RESULTS :

Treatment	0	P ₁	N ₁ P ₁	N ₂ P ₁	N ₁ 'P ₁	N ₂ 'P ₁
Av. yield	1412	1730	2170	2390	2015	2006

G.M.=1954 lb./ac. ; S.E./mean=44.0 lb./ac. and no. of trials=67.

Crop :- Paddy (Kharif).
Centre :- Kalahandi (c.f.).

Ref :- Or. 54(TCM).
Type :- 'M'.

Object :—Type III—To study the effect of A/S along with different sources and levels of P_2O_5 .

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loam. (iii) to (v) N.A. (vi) July—Aug. (vii) to (ix) N.A. (x) Dec.

2. TREATMENTS :

0 = Control (no manure).

N_1 = 20 lb./ac. of N as A/S.

N_1P_1 = 20 lb./ac. of N as A/S + 20 lb./ac. of P_2O_5 as Super.

N_1P_2 = 20 lb./ac. of N as A/S + 40 lb./ac. of P_2O_5 as Super.

N_1P_1' = 20 lb./ac. of N as A/S + 20 lb./ac. of P_2O_5 as Nitro-phos.

N_1P_2' = 40 lb./ac. of N as A/S + 40 lb./ac. of P_2O_5 as Nitro-phos.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 54(TCM) Type I on page 73 conducted at Kalahandi.

5. RESULTS :

Treatment	0	N_1	N_1P_1	N_1P_2	N_1P_1'	N_1P_2'
Av. yield	1572	1992	2167	2476	2158	2105

G.M. = 2073 lb./ac. ; S.E./mean = 94.4 lb./ac. and no. of trials = 25.

Crop :- Paddy. (Kharif).
Centre :- Kalahandi (c.f.).

Ref :- Or. 55(TCM).
Type :- 'M'.

Object :—Type III—To study the effect of A/S along with different sources and levels of P_2O_5 .

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loam. (iii) N.A. (iv) and (v) N.A. (vi) July—Aug. (vii) to (ix) N.A. (x) Dec

2. TREATMENTS :

0 = Control (no manure).

N_1 = 20 lb./ac. of N as A/S.

N_1P_1 = 20 lb./ac. of N as A/S + 20 lb./ac. of P_2O_5 as Super.

N_1P_2 = 20 lb./ac. of N as A/S + 40 lb./ac. of P_2O_5 as Super.

N_1P_1'' = 20 lb./ac. of N as A/S + 20 lb./ac. of P_2O_5 as Ammo. Phos.

N_1P_2'' = 20 lb./ac. of N as A/S + 40 lb./ac. of P_2O_5 as Ammo. Phos.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 54(TCM) Type I on page 73 conducted at Kalahandi.

5. RESULTS :

Treatment	0	N_1	N_1P_1	N_1P_2	N_1P_1'	N_1P_2'
Av. yield	1361	1829	2138	2218	1983	1974

G.M. = 1917 lb./ac. ; S.E./mean = 41.1 lb./ac. and no. of trials = 58.

Crop :- Paddy (Kharif).
Centre :- Kalahandi (c.f.).

Ref :- Or. 54(TCM).
Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loam. (iii) to (v) N.A. (vi) July—Aug. (vii) to (ix) N.A. (x) Dec.

2. TREATMENTS :

0 =Control (no manure).

 N_1 =20 lb./ac. of N as A/S. N_1P_1 =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super. N_1P_2 =20 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super. $N_1P_1K_1$ =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Mur. of Potash. $N_1P_1K_2$ =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super+40 lb./ac. of K_2O as Mur. of Potash.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 54(TCM) Type I on page 73 conducted at Kalahandi.

5. RESULTS :

Treatment	0	N_1	N_1P_1	N_1P_2	$N_1P_1K_1$	$N_1P_1K_2$
Av. yield	1572	1992	2167	2476	2158	2105

G.M. =2078 lb./ac. ; S.E./mean=98.7 lb./ac. and no. of trials=25.

Crop :- Paddy (Kharif).**Ref :- Or. 56(2).****Site :- Rice Res. Sub-Stn., Berhampur.****Type :- 'MV'.**

Object :—To find out a suitable dose of N for different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 4.7.1956. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 41". (x) N.A.

2. TREATMENTS :

Main-plot treatments :4 levels of N : $N_0=0$, $N_1=30$, $N_2=60$ and $N_3=90$ lb./ac.**Sub-plot treatments :**2 varieties : $V_1=B.C.-3$ (bulk) and $V_2=T-1145$.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $13' \times 10.5'$. (b) $12' \times 10.5'$. (v) N.A. (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) 2188 lb./ac. (ii) (a) 532.4 lb./ac. (b) 234.4 lb./ac. (iii) Main effect of V alone is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
V_1	1881	2413	2489	2624	2351
V_2	1608	2247	2192	2057	2056
Mean	1746	2330	2340	2340	2188

S.E. of difference of two

1. N marginal means =266.2 lb./ac.
2. V marginal means = 82.9 lb./ac.
3. V means at the same level of N =165.7 lb./ac.
4. N means at the same level of V =290.9 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 56(4).

Site :- Rice Res. Sub-Stn., Berhampur.

Type :- 'MV'.

Object : --To study the effect of N on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) Nil. (b) Paddy. (c) A/S at 40 lb./ac. (ii) (a) Clay loam. (b) N.A. (iii) 4.7.1956. (iv) (a) to c) N.A. (d) 6" x 6". (e) 1 seedling/hole. (v) *Dhaincha* at 40 lb./ac. of N. Compost at 25 lb./plot and Super at 12 oz./plot. (vi) As per treatments. (vii) Irrigated. (viii) Weeding. (ix) 41". (x) 12.12.1956.

2. TREATMENTS :

Main-plot treatments :

4 levels of N : $N_0=0$, $N_1=30$, $N_2=60$ and $N_3=90$ lb./ac.

Sub-plot treatments :

4 varieties : $V_1=G 4-2-35-35$, $V_2=G 4-2-35-18$, $V_3=G 4-2-35-10$ and $V_4=T-90$ (standard).

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 4 sub-plots main-plot. (b) N.A. (iii) 3. (iv) (a) 19 x 3 1/2'. (b) 18 x 3 1/2'. (vi) 1' between plots and 1' between blocks. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1956 N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2249 lb./ac. (ii) (a) 119.8 lb./ac. (b) 301.4 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
V_1	2171	2448	2358	1874	2213
V_2	2261	2233	2192	2116	2200
V_3	2192	2434	2766	1998	2348
V_4	2233	2130	2302	2275	2235
Mean	2214	2311	2404	2066	2249

S.E. of difference of two

1. N marginal means = 48.9 lb./ac.
2. V marginal means = 123.0 lb./ac.
3. V means at the same level of N = 246.1 lb./ac.
4. N means at the same level of V = 218.7 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 56(3).

Site :- Rice Res. Sub-Stn., Berhampur.

Type :- 'MV'.

Object : --To study the effect of N on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 40 lb./ac. of N as B.D. (ii) (a) Clay loam. (b) N.A. (iii) 4.7.1956. (iv) (a) to (c) N.A. (d) 6" between lines. (e) One seedling/hole. (v) Super at 12 ozs./plot. *Dhaincha* at 40 lb./ac. of N. Compost at 25 lb./plot. (vi) As per treatments. (vii) Irrigated. (viii) Weeding. (ix) 41". (x) 12.12.1956.

2. TREATMENTS :

Main-plot treatments :

4 levels of N : $N_0=0$, $N_1=30$, $N_2=60$ and $N_3=90$ lb./ac.

Sub-plot treatments :

3 varieties : $V_1=G 4-1-70-28$, $V_2=G 4-1-70-21$ and $V_3=T-812$ (standard).

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 3 sub-plots/main-plot. (b) 19'×16'. (iii) 2. (iv) (a) 19'×5'. (b) 18'×5'. (v) 1' between plots and 1' between blocks. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1459 lb./ac. (ii) (a) 83.8 lb./ac. (b) 211.0 lb./ac. (iii) Main effect of N is highly significant while effect of V is significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean
V ₁	1389	1089	1539	1573	1398
V ₂	1660	1360	1844	1723	1647
V ₃	1268	1162	1389	1510	1332
Mean	1439	1204	1591	1602	1459

S.E. of difference of two

1. N marginal means = 48.4 lb./ac.
2. V marginal means = 105.5 lb./ac.
3. V means at the same level of N = 211.0 lb./ac.
4. N means at the same level of V = 178.9 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 57(29).

Site :- Rice Res. Sub-Stn., Berhampur.

Type :- 'MV'.

Object :—To find out the response of segregating pure line cultures of *Japonica*×*Indica* crosses to different doses of N.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) *Dhaincha* as G.M. (ii) (a) Clay loam. (b) N.A. (iii) 25.6.1957/1.8.1957. (iv) (a) 6 ploughings with country plough 4" to 6" deep. (b) Transplanted. (c) N.A. (d) 9"×6". (e) One seedling/hole. (v) *Dhaincha* puddled at the optimum stage. 450 lb./ac. of organic matter added on 14.7.1957 to the whole expt. excepting control. F.Y.M. at 10 C.L./ac. applied before sowing *Dhaincha*. (vi) As per treatments. (vii) Irrigated. (viii) Thrice weeding and removal of rogue plants. (ix) 19.5". (x) 20.11.1957, flowering 28.9.1957 to 17.10 1957.

2. TREATMENTS :

Main plot treatments :

4 levels of N as A/S : N₀=0, N₁=20, N₂=40 and N₃=60 lb./ac.

Sub-plot treatments :

32 segregating cultures of *Japonica*×*Indica* crosses. Details N.A.

N applied on 1.8.1957.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 32 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 14'×2½'. (v) One row along length. (vi) Yes.

4. GENERAL :

(i) Good at flowering. (ii) Grass-hopper and stem-borer. Dusting with Gammexane and using light trap. (iii) Grain yield. (iv) (a) No. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2440 lb./ac. (ii) (a) 828.0 lb./ac. (b) 615.0 lb./ac. (iii) Main effects of N and V are highly significant. (iv) Av. yield of grain in lb./ac.

Variety	N ₀	N ₁	N ₂	N ₃	Mean	Variety	N ₀	N ₁	N ₂	N ₃	Mean
V ₁	1901	2161	2161	2103	2082	V ₁₈	1152	1815	1815	1613	1599
V ₂	2679	3342	2881	2506	2852	V ₁₉	1844	2017	1930	1210	1750
V ₃	2074	2795	3313	1815	2499	V ₂₀	3515	3630	3342	1988	3119
V ₄	2103	2103	2305	2046	2139	V ₂₁	1700	2535	2679	2190	2276
V ₅	2362	2478	2823	2161	2456	V ₂₂	2622	3054	3400	2161	2809
V ₆	2449	2737	2996	2074	2564	V ₂₃	2017	2708	2564	2046	2334
V ₇	2708	3486	2939	2017	2787	V ₂₄	2506	2823	3111	2737	2794
V ₈	2967	3659	3284	1930	2960	V ₂₅	1642	3198	2535	2103	2370
V ₉	1700	1498	2161	1354	1678	V ₂₆	2564	2622	3313	1901	2600
V ₁₀	2103	2334	2305	2017	2190	V ₂₇	2218	2766	2766	2420	2542
V ₁₁	1498	2593	2218	1844	2038	V ₂₈	2161	2823	2679	1815	2370
V ₁₂	2823	2593	2708	1844	2492	V ₂₉	2766	2017	2881	2391	2514
V ₁₃	2132	2593	2478	1354	2139	V ₃₀	2593	2190	2449	1671	2226
V ₁₄	1786	2103	2046	2247	2045	V ₃₁	3140	2939	3630	2939	3162
V ₁₅	2535	2737	2535	2449	2564	V ₃₂	2939	3371	3889	2334	3133
V ₁₆	2535	2247	1901	2017	2175						
V ₁₇	2420	2766	3572	2737	2874	Mean	2317	2647	2737	2064	2441

S.E. of difference of two

1. marginal mean of N = 119.5 lb./ac.
2. marginal mean of V = 251.1 lb./ac.
3. V means at the same level of N = 502.2 lb./ac.
4. N means at the same level of V = 508.5 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 57(25).

Site :- Rice Res. Sub-Stn., Berhampur.

Type :- 'MV'.

Object :—To find out the response of segregating pure line cultures of *Japonica* × *Indica* crosses to different doses of N.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) *Dhaincha* as G.M. (ii) (a) Clay loam. (b) N.A. (iii) 26.6.1957/29.7.1957. (iv) (a) 6 ploughings 4" to 6" deep with country plough. Puddling of *dhaincha*. (b) Transplanted. (c) N.A. (d) 9" × 6". (e) One seedling-hole. (v) 450 lbs. of organic matter applied on 14.7.1957 to the whole expt. except control plots. (vi) *Japonica* × *Indica* crosses (medium). (vii) Irrigated. (viii) Weeding thrice before flowering and removal of rogues. (ix) 19.5". (x) 2.12.1957.

2. TREATMENTS :

Main-plot treatments :

4 levels of N : N₀ = 0, N₁ = 20, N₂ = 40 and N₃ = 60 lb./ac.

Sub-plot treatments :

42 segregating cultures of *Japonica* × *Indica* crosses.

N applied on 29.7.1957.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 42 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 7' × 3'. (v) One row along length. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Grass-hopper and stem-borer attack. (iii) Grain yield. (iv) (a) N.A. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3230 lb./ac. (ii) (a) 2366 lb./ac. (b) 690 lb./ac. (iii) Main effect of N is significant and effect of V is highly significant. (iv) Av. yield of grain in lb./ac.

Variety	N ₀	N ₁	N ₂	N ₃	Mean	Variety	N ₀	N ₁	N ₂	N ₃	Mean
V ₁	4537	3889	4234	2895	3889	V ₂₃	2809	4062	4018	2593	3370
V ₂	3975	3327	3457	2549	3327	V ₂₄	3673	3284	3284	2506	3187
V ₃	2333	2765	3068	2074	2560	V ₂₅	3759	3759	4062	2160	3435
V ₄	2031	2204	3154	2204	2398	V ₂₆	3759	3241	3630	1858	3122
V ₅	2765	3241	3586	2420	3003	V ₂₇	3111	2895	3500	2679	3046
V ₆	3802	4062	5142	3111	4029	V ₂₈	3889	4234	3586	2333	3510
V ₇	3586	3284	3889	2722	3370	V ₂₉	3068	2938	3154	2160	2830
V ₈	2895	3154	2981	2636	2916	V ₃₀	3975	3500	4278	2204	3489
V ₉	3500	3154	3975	2376	3251	V ₃₁	3630	3241	3370	2679	3230
V ₁₀	2722	3025	3111	2376	2808	V ₃₂	4018	4148	3111	2377	3414
V ₁₁	2549	2895	2938	1685	2517	V ₃₃	3932	3846	4407	2333	3629
V ₁₂	2593	2765	3457	2031	2711	V ₃₄	4623	2549	3802	1358	3208
V ₁₃	2549	2679	3457	2290	2744	V ₃₅	2506	3327	3284	1901	2754
V ₁₄	4451	3457	3500	2809	3554	V ₃₆	2895	2981	2809	1556	2560
V ₁₅	4278	3241	2809	2506	3208	V ₃₇	2074	3154	3414	1901	2636
V ₁₆	4062	3586	3586	2420	3414	V ₃₈	3932	2722	4148	2333	3284
V ₁₇	4018	4321	3759	2204	3575	V ₃₉	3284	3068	3846	1988	3046
V ₁₈	3802	2852	3630	2463	3187	V ₄₀	4407	3889	4494	2549	3835
V ₁₉	3889	2938	4278	3025	3532	V ₄₁	5574	2852	4796	2463	3921
V ₂₀	3802	4105	4494	3457	3964	V ₄₂	3370	3975	3630	2809	3446
V ₂₁	4062	3154	3327	1988	3133						
V ₂₂	3802	3630	4234	2895	3640	Mean	3531	3319	3683	2390	3230

S.E. of difference of two

- | | |
|-----------------------------------|--------------|
| 1. N marginal means | =298 lb./ac. |
| 2. V marginal means | =282 lb./ac. |
| 3. V means at the same level of N | =563 lb./ac. |
| 4. N means at the same level of V | =631 lb./ac. |

Crop :- Paddy (*Kharif*).

Ref :- Or. 57(30).

Site :-Rice Res. Sub-Stn, Berhampur.

Type :- 'MV'.

Object :—To find out the response of segregating pure line cultures of *Japonica* × *Indica* crosses (medium duration) to different doses of N.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) *Dhaincha* as G.M. (ii) (a) Clay loam. (b) N.A. (iii) 25.6.57/27.7.1957. (iv) (a) 6 ploughings with country plough to 4"—6" depth. (b) Transplanted. (c) N.A. (d) 9" × 6". (e) One seedling/hole. (v) *Dhaincha* was puddled. 450 lbs. of organic matter added to the whole expt. except in control plots on 14.7.1957. Spreading F.Y.M. at 10 C.L./ac. before *dhaincha*. (vi) *Japonica* × *Indica* pure segregating line cultures of medium duration. (vii) Irrigated. (viii) Three weedings before flowering (ix) 19.5". (x) 20.11.1957.

2. TREATMENTS :

Main-plot treatments :

4 levels of N : N₀=0, N₁=20, N₂=40 and N₃=60 lb./ac.

Sub-plot treatments :

45 cultures of *Japonica* × *Indica* crosses.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 45 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 9'×3'. (v) One row along length. (vi) Yes.

4. GENERAL :

(i) No lodging. Condition good at flowering stage. (ii) Virulent attack of grass-hopper and stem-borer. Dusting with Gammexane and catching by light-trap. (iii) Grain yield. (iv) (a) N.A. (b) Nil. (c) Nil. (v) (a) and (b) Nil. (vi) Due to continuous drought the crop condition was not satisfactory. (vii) Nil.

5. RESULTS :

(i) 2001 lb./ac. (ii) (a) 1116 lb./ac. (b) 353 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in lb./ac.

Variety	N ₀	N ₁	N ₂	N ₃	Mean	Variety	N ₀	N ₁	N ₂	N ₃	Mean
V ₁	2790	1916	2050	1378	2033	V ₂₄	1680	1849	1815	1714	1765
V ₂	2386	2218	1882	2117	2151	V ₂₅	1849	2050	2484	1176	1882
V ₃	2622	2050	1882	1546	2025	V ₂₆	2084	1983	2218	1176	1865
V ₄	1983	2117	2487	1613	2050	V ₂₇	2084	2017	2050	1412	1891
V ₅	2151	2185	2017	1714	2017	V ₂₈	1748	2521	2353	1714	2084
V ₆	2185	2117	2050	1412	1941	V ₂₉	2117	2487	2117	1680	2101
V ₇	2084	2484	2420	1445	2101	V ₃₀	2017	2319	2420	1781	2134
V ₈	1916	2353	2252	1143	1916	V ₃₁	2151	2084	2117	1983	2084
V ₉	2252	2487	2554	1546	2210	V ₃₂	2622	2622	1949	1580	2193
V ₁₀	1949	2218	2050	1983	2050	V ₃₃	2117	2218	2383	1445	2033
V ₁₁	2017	2353	1949	1781	2025	V ₃₄	2319	1983	2521	1647	2117
V ₁₂	1983	1916	1949	1311	1790	V ₃₅	2151	2050	2252	1512	1991
V ₁₃	2218	2050	1849	1344	1865	V ₃₆	2050	2521	2521	1210	2075
V ₁₄	2084	2353	2218	1680	2084	V ₃₇	2017	2353	2017	1546	1983
V ₁₅	2252	2117	1983	1781	2033	V ₃₈	1949	2218	1983	1580	1933
V ₁₆	1983	1916	1714	1445	1765	V ₃₉	2420	2050	2252	1546	2067
V ₁₇	1949	2084	1916	2285	2059	V ₄₀	1781	1983	2689	1344	1949
V ₁₈	2017	2353	1882	1647	1975	V ₄₁	2117	2386	2117	2151	2193
V ₁₉	2050	2017	2285	1580	1983	V ₄₂	2285	2386	1849	1580	2025
V ₂₀	1849	1949	2117	2084	2000	V ₄₃	1882	1983	2084	1378	1916
V ₂₁	1949	2185	1983	1445	1891	V ₄₄	2353	2050	2185	1647	2059
V ₂₂	2252	2252	1983	1643	2025	V ₄₅	2319	2521	2084	1277	2050
V ₂₃	2117	1849	1781	1378	1781						
						Mean	2114	2181	2126	1586	2001

S.E. of difference of two

1. N marginal means = 136 lb./ac.
2. V marginal means = 144 lb./ac.
3. V means at the same level of N = 288 lb./ac.
4. N means at the same level of V = 316 lb./ac.

Crop :- Paddy (*Kharif*).

Site :- Rice Res. Sub-Stn., Berhampur.

Ref :- Or. 58(27).

Type :- 'MV'.

Object :- To study the effect of N on segregating line cultures of *Japonica* × *Indica* crosses of early duration.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) N.A. (iii) 27.6.1958/3.8.1958. (iv) (a) 3 ploughings in summer, 2 ploughings at transplanting and 2 ploughings before final puddle 5" to 6" deep with country plough. (b) Transplanted. (c) N.A. (d) 9"×6". (e) 1 to 2 seedlings/hole. (v) 3 C.L./ac. of F.Y.M. before G.M. crop and 30 lb./ac. of N as *dhaincha* G.M. excluding control plot. (vi) *Japonica* × *Indica* crosses of F.H. (early). (vii) Irrigated. (viii) 2 weedings. (ix) 69.17". (x) 15.11.1958.

2. TREATMENTS :

Main-plot treatments :

4 levels of N as A/S : $N_0=0$, $N_1=20$, $N_2=40$ and $N_3=60$ lb./ac.

Sub-plot treatments :

10 varieties : $V_1=F.H.-2$, $V_2=F.H.-7$, $V_3=F.H.-8$, $V_4=F.H.-20$, $V_5=F.H.-22$, $V_6=F.H.-24$, $V_7=F.H.-27$, $V_8=F.H.-31$, $V_9=F.H.-32$ and $V_{10}=T-1145$ (standard).

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 10 sub-plots/main-plot. (b) 66'×96'. (iii) 3. (iv) (a) and (b) 3'–9"×30'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) V_{10} lodged at the time of flowering during 2nd week of Oct. (ii) Helminthosporium, grass-hopper and leaf-eating caterpillar attack. Dusting with Gammexane on 5.9.1958 and again on 15.9.1958. (iii) Crain yield. (iv) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1242 lb./ac. (ii) (a) 433.7 lb./ac. (b) 247.8 lb./ac. (iii) Main effect of V is highly significant. (iv) Av. yield of grain in lb./ac.

	V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	V_9	V_{10}	Mean
N_0	1009	968	1041	807	928	960	1098	1033	1017	1210	1007
N_1	1227	1372	1348	807	1323	1219	1300	1130	1380	1549	1265
N_2	1275	1622	1606	944	968	1380	1862	960	1380	1558	1285
N_3	1461	1404	1598	928	1533	1420	1267	1202	1670	1654	1413
Mean	1243	1341	1398	871	1188	1245	1207	1081	1362	1498	1242

S.E. of difference of two

- | | |
|-----------------------------------|----------------|
| 1. marginal means of N | =112.0 lb./ac. |
| 2. marginal means of V | =101.2 lb./ac. |
| 3. V means at the same level of N | =202.3 lb./ac. |
| 4. N means at the same level of V | =222.2 lb./ac. |

Crop :- Paddy (*Kharif*).

Ref :- 58(28).

Site :- Rice Res. Sub-Stn., Berhampur.

Type :- 'MV'.

Object :—To study the effect of N on *Japonica* × *Indica* segregating cultures of medium duration.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) N.A. (iii) 27.6.1958/9.8.1958. (iv) (a) 3 summer ploughings, 2 at transplanting and 2 before final puddling with country plough 5" to 6" deep, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9"×9". (e) 1 to 2 seedlings/hole. (v) G.M. to give N at 30 lb./ac. as *dhaincha*. 2 C.L./ac. of F.Y.M. before G.M. (vi) *Japonica* × *Indica* F.H. back crosses (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 69.17". (x) 10.11.1958.

2. TREATMENTS :

Main-plot treatments :

4 levels of N as A/S : $N_0=0$, $N_1=20$, $N_2=40$ and $N_3=60$ lb./ac.

Sub-plot treatments :

15 varieties : V_1 =F.H.—2, V_2 =F.H.—4, V_3 =F.H.—7, V_4 =F.H.—9, V_5 =F.H.—14, V_6 =F.H.—23, V_7 =F.H.—29, V_8 =F.H.—30, V_9 =F.H.—32, V_{10} =F.H.—34, V_{11} =F.H.—36, V_{12} =F.H.—39, V_{13} =F.H.—41, V_{14} =F.H.—44 and V_{15} =T—1145.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 15 sub-plots/main-plot. (b) 62'×30'. (iii) 3. (iv) (a and (b) 9'×10½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Heavy lodging due to heavy rains and winds. Most of the plots were spoiled as water was standing above the crop at time of flowerings. (ii) Dusting on 4.9.1958 and 9.9.1958. (iii) Grain yield. (iv) (a) N.A. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1099 lb./ac. (ii) (a) 716.5 lb./ac. (b) 233.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Variety	N ₀	N ₁	N ₂	N ₃	Mean	Variety	N ₀	N ₁	N ₂	N ₃	Mean
V ₁	1152	912	960	1085	1027	V ₉	893	778	1325	1162	1039
V ₂	1286	989	1142	1526	1236	V ₁₀	1008	768	1046	1286	1027
V ₃	1258	874	662	1344	1034	V ₁₁	1162	826	922	1258	1042
V ₄	1171	931	566	1248	979	V ₁₂	1142	1219	931	1363	1164
V ₅	1046	1018	1315	1488	1217	V ₁₃	1190	970	1258	1229	1162
V ₆	1066	922	1037	1190	1054	V ₁₄	998	998	1123	1565	1171
V ₇	1046	1056	1430	1325	1214	V ₁₅	1133	816	902	1114	991
V ₈	883	941	1190	1498	1128	Mean	1096	934	1054	1312	1099

S.E. of difference of two

1. marginal mean of N = 151.0 lb./ac.
2. marginal mean of V = 95.1 lb./ac.
3. V means at the same level of N = 190.2 lb./ac.
4. N means at the same level of V = 237.9 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(30).

Site :- Rice Res. Sub-Stn., Berhampur.

Type :- 'MV'.

Object :—To study the effect of N on segregating line cultures of *Japonica*×*Indica* crosses of medium duration.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) N.A. (iii) 27.6.1958/1.8.1953. (iv) (a) 3 ploughings in summer, 2 before transplanting and 2 before final puddle to 5" 6" depth. (b) Transplanted. (c) N.A. (d) 6"×9". (e) 1—2 seedlings hole. (v) *Dhaincha* to supply 30 lb./ac. of N and 2 C.L./ac. of F.Y.M. before *dh inch*. (vi) *Japonica*×*Indica* crosses F.H. (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 69.17". (x) 12.12.1958.

2. TREATMENTS :**Main-plot treatments :**

* levels of N as A/S : N₀=0, N₁=20, N₂=40 and N₃=60 lb./ac.

Sub-plot treatments :

14 *Japonica*×*Indica* crosses : V_1 =F.H.—1, V_2 =F.H.—6, V_3 =F.H.—14, V_4 =F.H.—16, V_5 =F.H.—17, V_6 =F.H.—19, V_7 =F.H.—20, V_8 =F.H.—22, V_9 =F.H.—29, V_{10} =F.H.—31, V_{11} =F.H.—34, V_{12} =F.H.—41 (T—141), V_{13} =F.H.—42 (BAM—11) and V_{14} =T—1145.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; and 14 sub-plots/main-plot. (b) 30'×51'. (iii) 3. (iv) (a) N.A. (b) 1/431 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Crop lodged due to heavy rains at the time of flowering. (ii) Slight attack of stem-borer. No control measure taken. (iii) Grass-hopper attack. Crop dusted twice. (iii) Grain yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1465 lb./ac. (ii) (a) 496.7 lb./ac. (b) 262.0 lb./ac. (iii) Main effect of V is highly significant. (iv) Av. yield of grain in lb./ac.

Variety	N ₀	N ₁	N ₂	N ₃	Mean	Variety	N ₀	N ₁	N ₂	N ₃	Mean
V ₁	1338	1455	1679	1697	1542	V ₉	1069	1320	1607	1275	1318
V ₂	1221	1518	1410	1527	1419	V ₁₀	1446	1293	1293	1580	1403
V ₃	1401	1293	1464	1473	1408	V ₁₁	1293	1311	1401	1482	1372
V ₄	1114	1455	1419	1661	1412	V ₁₂	1383	1527	1580	1670	1540
V ₅	1131	1356	1347	1697	1383	V ₁₃	1500	1518	1805	1958	1695
V ₆	1320	1356	1679	1563	1479	V ₁₄	1563	1428	1527	1607	1531
V ₇	1410	1616	1760	1868	1664						
V ₈	1203	1194	1598	1419	1354	Mean	1313	1402	1540	1604	1465

S.E. of difference of two

- | | |
|-----------------------------------|----------------|
| 1. N marginal means | =108.4 lb./ac. |
| 2. V marginal means | =107.0 lb./ac. |
| 3. V means at the same level of N | =213.9 lb./ac. |
| 4. N means at the same level of V | =232.9 lb./ac. |

Crop :- Paddy (Kharif).

Ref :- Or. 57(27).

Site :- Rice Res. Sub-Stn., Berhampur.

Type :- 'MV'.

Object :—To find out the effect of different doses of N to segregating pure line cultures of *Japonica*×*Indica* crosses of late duration.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) *Dhaincha* as G.M. (ii) (a) Clay loam. (b) N.A. (iii) 25.6.1957/28.7.1957. (iv) (a) 3 summer ploughings, 3 at transplanting and 2 before final puddling 5" to 6" deep with country plough. (v) Transplanted. (c) —. (d) 6"×9". (e) 1 to 2 seedlings/hole. (v) 450 lb./ac. of organic matter added on 14.7.1957. Spreading of F.Y.M. at 10 C.L./ac. before *dhaincha* except for control plot. (vi) *Japonica*×*Indica* crosses (late). (vii) Irrigated. (viii) Weeding done thrice vigorously before flowering. Removal of rogues. (ix) 19.5". (x) 10.12.1957.

2. TREATMENTS :

Main-plot treatments :

4 levels of N as A/S : N₀=0, N₁=20, N₂=40 and N₃=60 lb./ac. .

Sub-plot treatments :

6 varieties of segregating pure line cultures of *Japonica*×*Indica* crosses.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 15'×5½'. (v) 9"×6". (vi) Yes.

4. GENERAL :

(i) Good at flowering. (ii) Grass-hopper and stem-borer were virulent. Dusting with Gammexane and using light-trap. (iii) Grain yield. (iv) (a) 1957—1958. (b) N.A. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 973.5 lb./ac. (ii) (a) 226.7 lb./ac. (b) 215.8 lb./ac. (iii) Main effect of V is highly significant. (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	Mean
N ₀	704	704	572	803	1507	1364	942
N ₁	627	561	770	880	1771	1551	1026
N ₂	803	792	671	880	1551	1683	1063
N ₃	638	759	660	880	968	1265	862
Mean	693	704	668	861	1449	1466	973

S.E. of difference of two

1. N marginal means = 75.6 lb./ac.
2. V marginal means = 88.1 lb./ac.
3. V means at the same level of N = 176.2 lb./ac.
4. N means at the same level of V = 177.7 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(29).

Site :- Rice Res. Sub-Stn., Berhampur.

Type :- 'MV'.

Object :—To find out the effect of different doses of N to segregating pure line cultures of *Japonica* × *Indica* crosses of late duration.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) N.A. (iii) 27.6.1958/5.8.1958. (iv) (a) 3 ploughings in summer, 2 at transplanting and 2 before final puddle 5" to 6" deep. (b) Transplanted. (c) N.A. (d) 6" × 9". (e) 1 to 2 seedlings/hole. (v) *Dhaincha* to give 30 lb./ac. of N and $\frac{1}{2}$ C.L./ac. of F.Y.M. before *dhaincha*. (vi) *Japonica* × *Indica* F.H. crosses (late). (vii) Irrigated. (viii) 2 weedings. (ix) 69.17" (x) 24.12.1958.

2. TREATMENTS :

Same as in expt. no. 57(27) on page 85.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 6 sub-plots/main-plot. (b) 14½' × 35'. (iii) 3. (iv) (a) N.A. (b) 15' × 5½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Lodging on 22.9.1958. (ii) Incidence of blast. Dusting with Gammexane on 29.10.1958 and 30.10.1958. (iii) Grain yield. (iv) (a) 1957—1958. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Heavy rains at the time of flowering. (vii) Nil.

5. RESULTS :

(i) 754 lb./ac. (ii) (a) 419.1 lb./ac. (b) 217.1 lb./ac. (iii) Effect of V is highly significant and interaction N × V is significant. (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	Mean
N ₀	649	440	517	451	1364	583	667
N ₁	638	627	583	572	737	572	621
N ₂	847	495	539	803	1551	924	860
N ₃	715	451	770	770	1408	1100	869
Mean	712	503	602	649	1265	795	754

S.E. of difference of two

- | | |
|-----------------------------------|----------------|
| 1. N marginal means | =139.7 lb./ac. |
| 2. V marginal means | = 88.6 lb./ac. |
| 3. V means at the same level of N | =177.3 lb./ac. |
| 4. N means at the same level of V | =213.8 lb./ac. |

Crop :- Paddy (Kharif).**Ref :- Or. 57(26).****Site :- Rice Res. Sub-Stn., Berhampur.****Type :- 'MV'.**

Object :—To find out the response of different doses of N to segregating line cultures of *Japonica* × *Indica* crosses of medium duration.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) *Dhaincha* as G.M. (ii) (a) Clay loam. (b) N.A. (iii) 25.6.1957/29.7.1957. (iv) (a) 3 ploughings in summer, 3 at transplanting and two at final puddle 5" to 6" deep with country plough. (b) Transplanted. (c) N.A. (d) 6" × 9". (e) 1 to 2 seedlings/hole. (v) Good crop of *dhaincha* as G.M.+F.Y.M. at 10. C.L./ac. (except in control plot.) (vi) *Japonica* × *Indica* (medium). (vii) Irrigated. (viii) 3 weedings. (ix) 19.5". (x) 3.12.1957.

2. TREATMENTS :**Main-plot treatments :**4 levels of N as A/S : $N_0=0$, $N_1=20$, $N_2=40$ and $N_3=60$ lb./ac.**Sub-plot treatments :**7 *Japonica* × *Indica* segregating cultures of medium duration.

N applied on 29.7.1957.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 7 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) Main-plot : 33' × 19'. Sub-plot : 19' × 5'. (v) 9" × 6". (vi) Yes.

4. GENERAL :

(i) Good at flowering. (ii) Grass-hopper and stem-borer. Dusting with Gammexane. (iii) Grain yield. (iv) (a) No. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1877 lb./ac. (ii) (a) 592.7 lb./ac. (b) 410.0 lb./ac. (iii) Main effect of V is highly significant. (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	V ₇	Mean
N ₀	1843	1824	2292	2368	2111	2158	1604	2029
N ₁	1509	1394	2378	1881	1614	2053	1652	1783
N ₂	1633	1585	2149	2607	2626	2378	1432	2059
N ₃	1375	1442	1681	1967	1996	1633	1375	1638
Mean	1590	1561	2125	2206	2087	2055	1516	1877

S.E. of difference of two

- | | |
|-----------------------------------|----------------|
| 1. N marginal means | =182.9 lb./ac. |
| 2. V marginal means | =167.4 lb./ac. |
| 3. V means at the same level of N | =334.8 lb./ac. |
| 4. N means at the same level of V | =359.9 lb./ac. |

Crop :- Paddy (Kharif).**Ref :- Or. 57(28).****Site :- Rice Res. Sub-Stn., Berhampur.****Type :- 'MV'.**

Object :—To find out the effect of different doses of N to segregating pure line cultures of *Japonica* × *Indica* crosses of late duration.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) *Dhaincha* as G.M. (ii) (a) Clay loam. (b) N.A. (iii) 25.6.1957/28.7.1957. (iv) (a) 3 summer ploughings ; 3 at transplanting and 2 final puddles with country plough 5" to 6" deep ; laddering and levelling. (b) Transplanted (c) N.A. (d) 6"×9". (e) 1 to 2 seedlings/hole. (v) 450 lb./ac. of organic matter and F.Y.M. at 10 C.L./ac. before *dhaincha* was sown (except control plot.) (vi) *Japonica* × *Indica* crosses (late). (vii) Irrigated. (viii) Thrice weeding and roguing. (ix) 19.5". (x) 18.12. 1957.

2. TREATMENTS :

Main-plot treatments :

4 levels of N as A/S : $N_0=0$, $N_1=20$, $N_2=40$ and $N_3=60$ lb./ac.

Sub-plot treatments :

1 to 16 segregating pure line cultures of *Japonica* × *Indica* crosses.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/blok ; 16 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) Main-plot : 26'×28'. Sub-plot : 13.5×3'. (v) 9"×6". (vi) Yes.

4. GENERAL :

(i) Good at flowering. (ii) Grass-hopper and stem-borer. Dusting with Gammexane. (iii) Grain yield. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1996 lb./ac. (ii) (a) 480.6 lb./ac. (b) 440 lb./ac. (iii) Main effects of N and V are highly significant. (iv) Av. yield of grain in lb./ac.

Variety	N_0	N_1	N_2	N_3	Mean	Variety	N_0	N_1	N_2	N_3	Mean
V ₁	2129	2039	1838	1165	1793	V ₁₀	2196	1681	1882	1412	1798
V ₂	2420	2420	2510	1300	2162	V ₁₁	2263	1860	1972	1367	1865
V ₃	2219	2017	2174	1031	1860	V ₁₂	2600	2488	2375	1614	2269
V ₄	2622	1950	2263	1412	2062	V ₁₃	1658	1412	1882	1143	1524
V ₅	1614	1815	1658	1143	1557	V ₁₄	3115	2734	3339	1591	2695
V ₆	2286	1860	2286	1434	1966	V ₁₅	2734	2174	2779	1838	2381
V ₇	2331	1770	1748	1165	1753	V ₁₆	2712	2151	3160	1300	2331
V ₈	2174	1703	2062	1618	1899						
V ₉	2398	2084	2286	1322	2022	Mean	2342	2010	2263	1368	1996

S.E. of difference of two

1. N marginal means = 98.1 lb./ac.
2. V marginal means = 179.6 lb./ac.
3. V means at the same level of N = 359.3 lb./ac.
4. N means at the same level of V = 361.4 lb./ac.

Crop :- Paddy (*Kharif*).

Site :- Agri. Res. Stn., Bhubaneswar.

Ref :- Or. 59(5).

Type :- 'MV'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 5.6.1959/5.7.1959. (iv) (a) 4 ploughings to 4" depth. (b) Transplanted. (c) 20 lb./ac. (d) 9"×9". (e) 4 seedlings/hole. (v) 5000 lb./ac. of F.Y.M. (vi) As per treatments. (vii) Unirrigated. (viii) One weeding with Japanese weeder and one hand weeding. (ix) 53.72". (x) 16.11.1959.

2. TREATMENTS :

Main-plot treatments :

5 varieties : $V_1=T-1145$, $V_2=T-812$, $V_3=T-58-1034$, $V_4=T-58-904$ and $V_5=T-58-860$.

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 : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.

3. DESIGN :

(i) Split-plot—confd. (ii) (a) 5 blocks/replication and 9 sub-plots/main-plot. (b) N.A. (iii) 2. (v) (a) $15' \times 29'$. (b) $13\frac{1}{2}' \times 27\frac{1}{2}'$. (v) One row all round. (vi) Yes.

4. GENERAL :

(i) Good. (ii) False smut was found in plots of T-812, T-1145 and T-58-860 attacked by cate-pillar, gall-fly and grass-hopper. (iii) Tillers, height, grain and straw yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1983 lb./ac. (ii) (a) 366.1 lb./ac. (b) 210.0 lb./ac. (iii) Main effect of V is confounded with blocks. Main effect of N is significant. (iv) Av. yield of grain in lb./ac.

	V_1	V_2	V_3	V_4	V_5	Mean	P_0	P_1	P_2
N_0	1997	1788	1753	1946	1933	1883	1881	1944	1824
N_1	2127	1876	1849	1992	1980	1965	1944	1975	1974
N_2	2360	1923	1977	2117	2123	2100	2078	2039	2184
Mean	2161	1862	1860	2018	2012	1983	1968	1986	1994
P_0	2107	1920	1931	2007	1875				
P_1	2288	1850	1778	1909	2105				
P_2	2089	1817	1870	2139	2057				

S.E. of difference of two

- | | |
|--|-----------------|
| 1. V marginal means | = 122.0 lb./ac. |
| 2. N or P marginal means | = 54.2 lb./ac. |
| 3. N or P means at the same level of V | = 121.2 lb./ac. |
| 4. V means at the same level of N or P | = 157.1 lb./ac. |
| S.E. of body of N×P table | = 66.4 lb./ac. |

Crop :- Paddy (Kharif).

Site :- Agri. Res. Stn., Sambalpur.

Ref :- Or. 54(19).

Type :- 'MV'.

Object :- To study the effect of N and P on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Clay. (b) N.A. (iii) V_1 and V_2-8 , 9.9.1954, V_3 and V_4-4 , 5.9.1954. (iv) (a) 6 ploughings with country plough 4" to 6" deep and laddering. (b) Transplanted. (c) 20 lb./ac. (d) $9" \times 6"$. (e) 2 seedlings/hole. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) One weeding. (ix) N.A. (x) $V_1-3.1.1955$, $V_2-5.1.1955$, $V_3-16.12.1954$, $V_4-18.12.1954$.

2. TREATMENTS :

Main-plot treatments :

4 varieties : $V_1=T-1242$, $V_2=Obs-7$, $V_3=T-141$ and $V_4=T-90$.

Sub-plot treatments :

6 doses of manures : $M_1=20$ lb./ac. of N+20 lb./ac. of P_2O_5 , $M_2=20$ lb./ac. of N+40 lb./ac. of P_2O_5 ,
 $M_3=40$ lb./ac. of N+20 lb./ac. of P_2O_5 , $M_4=40$ lb./ac. of N+40 lb./ac. of P_2O_5 ,
 $M_5=40$ lb./ac. of N+60 lb./ac. of P_2O_5 and $M_6=60$ lb./ac. of N+60 lb./ac. of
 P_2O_5 .

N applied as A/S and P_2O_5 as Super.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 6 sub-plots, main-plot. (b) N.A. (iii) 3. (iv) (a) $13' \times 46'$.
 (b) $11' \times 44'$. (v) 1' all round. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Paddy yield. (iv) (a) No. (b) and (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii)
 Expt. planned with 4 replications but data for one replication N.A.

5. RESULTS :

(i) 2147 lb./ac. (ii) (a) 392 lb./ac. (b) 247 lb./ac. (iii) Main effects of M and V are highly significant
 while interaction MV is significant. (iv) Av. yield of paddy in lb./ac.

	M_1	M_2	M_3	M_4	M_5	M_6	Mean
V_1	1837	2224	1935	1987	1852	1991	1971
V_2	859	836	686	765	802	787	789
V_3	2535	2932	2936	3210	3217	3060	3082
V_4	2426	2782	2674	2929	2906	2745	2744
Mean	1914	2194	2058	2223	2194	2296	2147

S.E. of difference of two

1. V marginal means = 130.7 lb./ac.
2. M marginal means = 100.8 lb./ac.
3. M means at the same level of V = 201.7 lb./ac.
4. V means at the same level of M = 225.8 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 54(TCM).

Site :- Cuttack (c.f).

Type :- 'MV'.

Object :—Type VIII—To study the effect of N and P on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy loam to clay loam. (iii) N.A. (iv) N.A. (v) (a) N.A. (b) Transplanted.
 (c)—. (d) and (e) N.A. (vi) 1st week of Aug. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

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

- (1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ 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 varieties : $V_1=Local$, $V_2=Improved$ variety and $V_3=Improved$ variety.

Nitrogenous fertilisers applied before transplanting and phosphatic fertilisers before puddling.

3. DESIGN :

(i) 3^3 Fact. confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b)
 $27' \times 27'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) No. (iii) Yield of grain. (iv) (a) 1953 to 1955. (b) No. (c) N.A. (v) (a) and (b)
 Nil. (vi) Nil. (vii) Results as available are furnished. The expt. was conducted at Sahaspur.

5. RESULTS :

(i) 1596 lb./ac. (ii) 317.1 lb./ac. (iii) N effect is highly significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	Mean	V ₁	V ₂	V ₃
P ₀	1292	1304	1481	1359	1224	1356	1498
P ₁	1470	1639	2234	1781	1526	1735	2083
P ₂	1173	1650	2121	1648	1671	1561	1711
Mean	1312	1531	1945	1596	1473	1551	1764
V ₁	1086	1471	1863				
V ₂	1215	1501	1936				
V ₃	1634	1621	2037				

S.E. of any marginal mean =105.7 lb./ac.
S.E. of body of table =183.0 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 55(TCM).

Site :- Cuttack (c.f.).

Type :- 'MV'.

Object :—Type VIII—To study the effect of N and P on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Recent alluvium. (iii) to (v) N.A. (vi) June—July. (vii) Irrigated. (viii) and (ix) N.A. (x) Nov.—Dec.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) Type VIII on page 90 conducted at Cuttack.

5. RESULTS :

(i) 1731 lb /ac. (ii) 116.01 lb /ac. (iii) N and V effects are highly significant. (iv) Av. yield of grain in lb /ac.

	N ₀	N ₁	N ₂	Mean	V ₁	V ₂	V ₃
P ₀	1517	1721	1844	1694	1906	1475	1701
P ₁	1557	1721	1946	1741	1844	1577	1803
P ₂	1619	1792	1864	1758	1782	1659	1833
Mean	1564	1745	1885	1731	1844	1570	1779
V ₁	1701	1865	1967				
V ₂	1393	1619	1700				
V ₃	1598	1752	1987				

S.E. of any marginal mean =38.67 lb./ac.
S.E. of body of table =67.00 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 59(24).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'C'.

Object :—To study the effect of ploughing with *desi* and iron ploughs at different intervals on the yield of Paddy.

1. BASAL CONDITIONS :

- (i) (a) Paddy—Fallow—Paddy. (b) Paddy. (c) 10,000 lb./ac. of F.Y.M. and 30 lb./ac. of N as A/S. (ii) (a) Sandy loam. (b) N.A. (iii) 6.7.1959. (iv) (a) As per treatments. (b) Transplanting. (c) N.A. (d) 9"×9". (e) N.A. (v) 10,000 lb./ac. of F.Y.M. and 40 lb./ac. of N as A/S+25 lb. ac. of P₂O₅ as Super. (vi) T—1242 (late). (viii) Unirrigated. (viii) Weeding. (ix) 47.94%. (x) 24.12.1959.

2. TREATMENTS :

Main-plot treatments :

2 kinds of ploughs : P₁=Iron and P₂=Desi plough.

Sub-plot treatments :

7 ploughings : T₁=Control, T₂=Once in every month, T₃=Once in alternate months, T₄=Once in every third month, T₅=Just after previous harvest and before broadcasting, T₆=Fallow till July, puddling and transplanting and T₇=Fallow till Aug., puddling and transplanting.

3. DESIGN :

- (i) Split-plot (ii) (a) 2 main-plots/replication, 7 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 24'×18'. (b) 22½'×16½'. (v) One row around. (vi) Yes.

4. GENERAL :

- (i) Good. (ii) Attack of smut ; no control measure taken. (iii) Weight of grain and straw. (iv) (a) 1958—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2154 lb./ac. (ii) (a) 301 lb./ac. (b) 408 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
P ₁	1753	2068	2171	2303	2090	2508	1987	2126
P ₂	2075	2325	1958	2046	2552	2405	1914	2182
Mean	1914	2196	2064	2174	2321	2456	1950	2154

S.E. of difference of two

1. P marginal means = 93 lb./ac.
2. T marginal means = 236 lb./ac.
3. T means at the same level of P = 334 lb./ac.
4. P means at the same level of T = 322 lb./ac.

Crop :-Paddy (Kharif).

Site :- Agri. Res. Stn., Sambalpur.

Ref :- Or. 57(24).

Type :- 'C'.

Object :-To find out the optimum spacing for different varieties of Paddy.

1. BASAL CONDITIONS :

- (i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) Transplanted on 19 and 20.8.1957 (iv) (a) 6 ploughings with country plough to 4"—6" depth. (b) Transplanted. (c) N.A. (d) As per treatments. (e) 2. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 40 lb./ac. of N as A/S and 30 lb./ac. of P₂O₅ as Super top dressed on 18.9.57. (ix) N.A. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

4 varieties of Paddy : V₁=T—442 (early), V₂=T—141 (medium), V₃=T—50 (late) and V₄=T—1242 (late).

Sub-plot treatments :

3 spacing : S₁=6"×6", S₂=6"×9" and S₃=9"×9".

3. DESIGN :

- (i) Split-plot. (ii) (a) 4 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 18'×12' (b) N.A. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Blast attack—Endrine sprayed. (iii) Height, tillers, length of earhead and grain yield. (iv) (a) No. (b) Nil. (c) Nil. (v) N.A. (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2218 lb./ac. (ii) (a) 254 lb./ac. (b) 258 lb./ac. (iii) Only V effect is highly significant. (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	V ₄	Mean
₁ S	1739	2772	2621	1604	2184
S ₂	2218	2689	2540	1445	2223
₃	2058	2662	2558	1713	2248
Mean	2005	2708	2573	1588	2218

S.E. of difference of two

1. V marginal means = 120 lb./ac.
2. S marginal means = 105 lb./ac.
3. S means at the same level of V = 207 lb./ac.
4. V means at the same level of S = 210 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(1).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'C'.

Object :- To find out the optimum spacing for *Mal* Paddy under intensive cultivation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Mung*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 23.7.1958. (iv) (a) 6 ploughings with country plough to 4" to 6" deep, laddering—interculture at the time of puddling. (b) Transplanted in lines. (c) 20 lb/ac. (d) As per treatments. (e) 2. (v) 5 C.L./ac of F.Y.M. with 1 md of *S. Speciosa* plants incorporated into soil. (vi) T-442 (early). (vii) Unirrigated. (viii) Gap-filling, top-dressing and weeding. (ix) N.A. (x) 11.11.1958.

2. TREATMENTS :

4 spacings : S₁=6"×4", S₂=6"×6", S₃=6"×9" and S₄=9"×9".

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 18'×12'. (b) 11'×17' (S₁), 11'×17½' (S₂), 11'×16½' (S₃) and 10½'×16½' (S₄). (v) 1 row around. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of case-worm and stem-borer. Endrine sprayed on 31.8.1958. (iii) Height, tiller count, length of earhead and grain yield. (iv) (a) No. (b) and (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Figures based on gross plot size.

5. RESULTS :

(i) 1215 lb/ac. (ii) 234 lb/ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S ₁	S ₂	S ₃	S ₄
Av. yield	1012	1260	1194	1394

S.E./mean = 96 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 58(6).****Site :- Agri. Res. Stn., Sambalpur.****Type :- 'C'.**Object :—To find out the optimum spacing for *Biali* Paddy under intensive cultivation.**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Mung*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 15.7.1958. (iv) (a) 6 ploughings with country plough 4" to 6" deep, laddering and interculture at the time of puddling. (b) Transplanted in lines. (c) 20 lb./ac. (d) As per treatments. (e) 2. (v) 5 C.L./ac. of F.Y.M. with 1 md. of *S. Speciosa* plants incorporated into the land at the time of puddling. (vi) N-136 (early). (vii) Not irrigated. (viii) Weeding. (ix) N.A. (x) 29.9.1958.

2. TREATMENTS :4 spacings : $S_1=4" \times 4"$, $S_2=4" \times 6"$, $S_3=6" \times 6"$ and $S_4=6" \times 9"$.**3. DESIGN :**

(i) R B D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) $18' \times 12'$. (b) $11\frac{1}{2}' \times 17\frac{1}{2}'$ (S_1), $11' \times 17\frac{1}{2}'$ (S_2), $11' \times 17'$ (S_3) and $10\frac{1}{2}' \times 17'$ (S_4). (v) 1 row around. (vi) Yes.

4. GENERAL :

(i) Entire crop lodged. (ii) Attack of case-worm and stem-borer ; Endrine sprayed on 31.8.1958. (iii) Height, tiller count and length of earhead. (iv) (a) No. (b) and (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1154 lb./ac. (ii) 240 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_1	S_2	S_3	S_4
Av. yield	867	1170	1311	1265

S.E./mean = 98 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 58(12).****Site :- Agri. Res. Stn., Sambalpur.****Type :- 'C'.**

Object :—To find out the optimum spacing under intensive cultivation of medium and late varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) Transplanting on 16.8.58. (iv) (a) 6 ploughings 4" to 6" deep with country plough. (b) Transplanting. (c) N.A. (d) As per treatments. (e) 2. (v) 32 lb./ac. of P_2O_5 at puddling. (vi) As per treatments. (vii) Unirrigated. (viii) Top-dressing of A/S on 6.9.58. (ix) N.A. (x) 6.12.58.

2. TREATMENTS :**Main-plot treatments :**2 varieties : $V_1=T-141$ (medium) and $V_2=T-90$ (late).**Sub-plot treatments :**4 spacings : $S_1=6" \times 6"$, $S_2=6" \times 9"$, $S_3=9" \times 9"$ and $S_4=12" \times 9"$.**3. DESIGN :**

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 4 sub-plot/main-plot. (b) N.A. (iii) 4. (iv) (a) $18' \times 12'$. (b) N.A. (v) One row around. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Weight of grain and straw, height, no. of tillers and length of earhead. (iv) N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2060 lb./ac. (ii) (a) 141 lb./ac. (b) 131 lb./ac. (iii) Main effects of S and interaction $S \times V$ are highly significant. (iv) Av. yield of grain in lb./ac.

	S ₁	S ₂	S ₃	S ₄	Mean
V ₁	2107	2017	1859	2049	2008
V ₂	2456	2224	1928	1839	2112
Mean	2282	2120	1894	1944	2060

S.E. of difference of two

1. V marginal means = 50 lb./ac.
2. S marginal means = 66 lb./ac.
3. S means at the same level of V = 93 lb./ac.
4. V means at the same level of S = 95 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 59(49).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'CV'.

Object :- To study the effect of methods of planting on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) No. (b) *Sesbania speciosa*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 18.5.59 to 26.9.59. (iv) (a) 5 ploughings and 3 ladderings. (b) As per treatments. (c) N.A. (d) 9"×6". (e) N.A. (v) 300 lb./ac. of B.M. applied after 1st ploughing, G.M. with *dhaincha* which was attacked by pest. 10 C.L./ac. of compost was applied and 20 lb./ac. of N as A/S. top dressed, G.L. manuring at 3000 lb./ac. and 30 lb./ac. of N as A/S top-dressed to late crop. (vi) As per treatments. (vii) Irrigated. (viii) 2 hand weedings to early paddy (line sown) and 2 weedings with Japanese weeder to all treatments. (ix) N.A. (x) 26.3.1959 and 12.1.1960

2. TREATMENTS :

Main-plot treatments :

2 methods of planting : M₁=Transplanting and M₂=Line sowing.

Sub-plot treatments :

4 combinations of early and late varieties : V₁=N-136 (early) and T-90 (late), V₂=N-36 (early) and GEB-24 (late), V₃=PTB-10 (early) and T-90 (late) and V₄=PTB-10 (early) and GEB-24 (late).

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 4 sub-plots/main-plot. (b) 68'×62'. (iii) 6. (iv) (a) 28'×15'. (b) 25' 10"×14' (M₂ : early paddy), 27'×14½' (M₁ : early and late paddy). (vi) One row on each side. (vi) Yes.

4. GENERAL :

(i) Satisfactory. N-136 lodged slightly before harvesting. (ii) Attack of rice case-worm. Endrine sprayed on 21.10.1959. (iii) Yield of grain, height and no. of effective tillers. (iv) (a) 1957-contd, (modified every year) (b) No. (c) Nil. (v) (a) and (b) No. (vi) Drought conditions in late June and early July. (vi) Nil.

5. RESULTS :

(i) 3327 lb./ac. (ii) (a) 284 lb./ac. (b) 351 lb./ac. (iii) Main effects of M and V alone are highly significant. (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	V ₄	Mean
M ₁	4469	4013	3574	2848	3726
M ₂	4015	3335	2329	2029	2927
Mean	4242	3674	2952	2439	3327

S.E. of difference of two

1. M marginal means	= 82 lb./ac.
2. V marginal means	= 143 lb./ac.
3. V means at the same level of M	= 203 lb./ac.
4. M means at the same level of V	= 194 lb./ac.

Crop :- Paddy (Charif).**Ref :- Or. 54(1).****Site :- Rice Res. Sub-Stn., Berhampur.****Type :- 'CM'.**

Object :—To test the efficiency of Japanese method of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 40 lb./ac. of N as A/S. (ii) (a) Clay loam. (b) N.A. (iii) Transplanting on 29.7.1954. (iv) (a) N.A. (b) As per treatments. (c) and (d) N.A. (e) 1 seedling/seed. (v) Nil. (vi) T—141. (vii) Irrigated. (viii) Weeding. (ix) 58%. (x) N.A.

2. TREATMENTS :T₁—Control (ordinary seed bed, no manure and bulk planting).T₂—Raised seed bed, line planting and no manuring.T₃—Raised seed bed, bulk planting and Japanese method of manuring.T₄—Ordinary seed bed, line planting and Japanese method of manuring.T₅—Raised seed bed, Japanese method of planting and manuring.

Manuring on 28.7.1954 and 20.9.1954.

Raised bed : Two beds of size 4'×112'×6" manured with 20 baskets of F.Y.M., 1 lb. of A/S and 2 lb. of oil cake.

Seed treatment : The seeds treated with brine solution of 1% concentration and Porenok 2 lb. of seed were sown in each bed of 1/99 ac. Watering was done by soaking. Periodical weeding was done.

Main field : *Dhanicha* was sown to supply about 6000 lb./ac. of G.M. and ploughed in. A day before ploughing, Super at 100 lb./ac. was applied. A/S and oilcake at 50 and 100 lb./ac. respectively were applied before planting.

Care of seedlings : The seedlings were pulled out carefully and transplanted. Another dose of A/S at 100 lb./ac. was applied about 52 days after planting.

Line planting : Spacing 12"×9".

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 13'×46'. (b) 11'×44.5'. (v) 12"×9". (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Weight of grain only. (iv) (a) 1953—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2166 lb./ac. (ii) 317 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T ₁	T ₂	T ₃	T ₄	T ₅
Av. yield	1750	1348	2939	2240	2553

S.E., mean = 200 lb./ac.

Crop :- Paddy (Charif).**Ref :- Or. 55(3).****Site :- Rice Res. Sub-Stn., Berhampur.****Type :- 'CM'.**

Object :—To test the efficiency of Japanese method of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 5.7.1955-2.8.1955. (iv) (a) to (d) As per treatments. (e) 1. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 methods of manuring : M_0 =No manure and M_1 =Manuring as in Japanese method (G.M. with *dhaincha* at 40 lb./ac. of N during puddling and as top-dressing along with 100 lb./ac. of P_2O_5).

Sub-plot treatments :

2 methods of planting : S_1 =Bulk planting and S_2 =Line planting with 9"×9" spacing and 2 to 3 seedlings/hole. Also weeding and hoeing.

Sub-sub-plot treatments :

2 seed beds : B_1 =Seedlings from raised seed bed of size 4'×4", thin sowing, manuring and weeding and B_2 =Ordinary seed bed.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 35'×24'. (v) 1½' around. (vi) Yes.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2518 lb./ac. (ii) (a) 216 lb./ac. (b) 207 lb./ac. (c) 157 lb./ac. (iii) Only main effect of P is significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	Mean	B_1	B_2
M_0	2502	2855	2678	2852	2505
M_1	2360	2356	2358	2442	2273
Mean	2431	2605	2518	2647	2389
B_1	2571	2723			
B_2	2290	2488			

S.E. of difference of two

- | | | | |
|-----------------------------------|----------------|-----------------------------------|-----------------|
| 1. M marginal means | =88.18 lb./ac. | 6. S means at the same level of B | =106.06 lb./ac. |
| 2. S marginal means | =84.51 lb./ac. | 7. M means at the same level of B | =109.00 lb./ac. |
| 3. B marginal means | =64.09 lb./ac. | 8. S means at the same level of M | =119.51 lb./ac. |
| 4. B means at the same level of S | =90.65 lb./ac. | 9. M means at the same level of S | =122.13 lb./ac. |
| 5. B means at the same level of M | =90.65 lb./ac. | | |

Crop :- Paddy (*Kharif*).

Ref :- Or. 56(31).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'CM'.

Object :—To determine the optimum spacing, suitable dates of transplanting and optimum no. of seedlings/ per hole with placement of manures for Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 8.6.1956 Transplanting as per treatments. (iv) (a) N.A. (b) Transplanted. (c)—. (d) and (e) As per treatments. (v) 5000 lb./ac. of F.Y.M. (vi) T—1242 (late). (vii) Unirrigated. (viii) 2 weedings and roguing. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

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

(1) 3 spacings : S_1 =6"×6", S_2 =8"×8" and S_3 =10"×10".

(2) 3 dates of planting : D_1 =1st July, D_2 =15th July and D_3 =30th July.

(3) No. of seedlings/hole : R_1 =2, R_2 =4 and R_3 =6 seedlings/hole.

Sub-plot treatments :

All combinations of (1) and (2)

- (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. DESIGN :

- (i) $3^3 \times 4$ split-plot. (ii) (a) 3 blocks/replication ; 9 main-plots/block and 4 sub-plots/main-plot. (b) N.A.
 (iii) 1. (iv) (a) $29' \times 15'$. (b) 1/111.12 ac. (S_1) 1/115.20 ac. (S_2) 1/119.53 ac. (S_3). (v) One row around.
 (vi) Yes.

4. GENERAL :

- (i) Good. (ii) Stem-borer attack. Control measures taken—N.A. (iii) No. of tillers, height, grain and straw yield. (iv) 1956—N.A. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2197 lb./ac. (ii) (a) 294 lb./ac. (b) 195 lb./ac. (iii) Main effects of N and P are highly significant. Interactions $N \times P$, $D \times N$, $S \times N$ and $R \times N$ are significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	R_1	R_2	R_3	N_0	N_1	P_0	P_1	Mean
D_1	2114	2264	2347	2132	2413	2181	2203	2281	2228	2256	2242
D_2	2184	2255	2295	2273	2297	2164	2134	2355	2149	2340	2244
D_3	2164	2170	1978	2053	2158	2101	1944	2264	2057	2151	2104
Mean	2154	2230	2207	2153	2289	2149	2094	2300	2145	2249	2197
P_0	2064	2256	2115	2101	2230	2103	2084	2205			
P_1	2245	2204	2299	2204	2349	2194	2103	2395			
N_0	2124	2076	2081	2018	2258	2006					
N_1	2185	2384	2332	2288	2321	2291					
R_1	2154	2187	2117								
R_2	2233	2391	2244								
R_3	2076	2111	2259								

S.E. of difference of two

1. D, S or R marginal means = 69.3 lb./ac.
 2. P or N marginal means = 37.5 lb./ac.
 3. P or N means at the same level of D, S or R = 65.0 lb./ac.
 4. D, S or R means at the same level of P or N = 83.1 lb./ac.
- S.E. of body of $D \times S$, $D \times R$ or $S \times R$ table = 84.9 lb./ac.
 S.E. of body of $P \times N$ table = 46.0 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 57(31).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'CM'.**

Object :—To determine the optimum spacing, suitable dates of transplanting and optimum no. of seedlings per hole with placement of manures for Paddy.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) Basal dose of 5000 lb./ac. of F.Y.M. (ii) (a) Sandy loam. (b) N.A. (iii) 7.25.6.1957 and 6.7.1957. (iv) (a) ploughing and cross ploughing in summer followed by laddering. Puddling at the time of planting. (b) Transplanted. (c) N.A. (d) and (e) As per treatments (v) N.A. (vi) T—1242 (late). (vii) Unirrigated. (viii) 2 weedings and roguing. (ix) N.A. (x) 21.12.1957.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(31) on page 97.

4. GENERAL :

- (i) Average. (ii) Stem-borer attack. (iii) Tiller count, height, grain and straw yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2263 lb./ac. (ii) (a) 434 lb./ac. (b) 311 lb./ac. (iii) Main effect of N and interaction S×N are highly significant. Main effect of D and interaction D×N are significant. (iv) Av. yield of grain in lb./ac.

	S ₁	S ₂	S ₃	R ₁	R ₂	R ₃	N ₀	N ₁	P ₀	P ₁	Mean
D ₁	2431	2598	2355	2662	2320	2402	2443	2479	2576	2346	2461
D ₂	2149	2089	2356	2044	2345	2206	2069	2328	2165	2231	2198
D ₃	2016	2310	2065	1994	2206	2191	1894	2367	2140	2121	2130
Mean	2199	2332	2259	2233	2290	2266	2135	2391	2294	2233	2263
P ₀	2188	2384	2310	2234	2382	2266	2152	2436			
P ₁	2210	2281	2208	2233	2198	2267	2119	2347			
N ₀	2109	2126	2070	2135	2117	2154					
N ₁	2188	2538	2448	2332	2464	2378					
R ₁	2226	2254	2221								
R ₂	2248	2336	2287								
R ₃	2123	2407	2269								

S.E. of difference of two

1. D, S or R marginal means = 102 lb./ac.
 2. P or N marginal means = 60 lb./ac.
 3. P or N means at the same level of D, S or R = 104 lb./ac.
 4. D, S or R means at the same level of P or N = 126 lb./ac.
- S.E. of body of D×S, D×R or S×R table = 125 lb./ac.
S.E. of body of P×N table = 73 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(17).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'CM'.

Object :—To determine the optimum spacing, suitable dates of transplanting and optimum no. of seedlings per hole with placement of manures for Paddy.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 1.6.1958, 15.6.1958, 30.6.1958. (iv) (a) 4 ploughings with country plough 3"—4" deep followed by laddering. (b) Transplanted. (c) 20 lb./ac. (d) and (e) As per treatments. (v) 5000 lb./ac. of F.Y.M. before puddling. (vi) T—1242 (late). (vii) Unirrigated. (viii) Weeding with hand and with Japanese weeder. (ix) 50.42". (x) 25.12.1958.

2. TREATMENTS :

Main-plot treatments :

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

- (1) 3 spacings : S₁=6"×6", S₂=8"×8" and S₃=10"×10".
- (2) 3 dates of planting : D₁=1st July, D₂=15th July and D₃=30th July.
- (3) No. of seedlings/hole : R₁=2, R₂=4 and R₃=6 seedlings/hole.

Sub-plot treatments :

All combinations of (1) and (2)

- (1) 2 levels of N as A/S : N₀=0 and N₁=20 lb./ac.
- (2) 2 levels of P₂O₅ as Super : P₀=0 and P₁=20 lb./ac.

3. DESIGN :

Same as in expt. no. 56(31) on page 97.

4. GENERAL :

(i) Average. (ii) Attack of stem-borer. No control manures taken. (iii) Height, tillers, weight of grain and straw. (iv) 1956—1958. (b) Yes. (c) Nil. (v) 'a' and 'b' Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2191 lb./ac. (ii) (a) 156 lb./ac. (b) 241 lb./ac. (iii) Only main effect of N and interaction $D \times N$ are highly significant. (iv) Av. yield of grain in lb./ac.

	S ₁	S ₂	S ₃	R ₁	R ₂	R ₃	N ₀	N ₁	P ₀	P ₁	Mean
D ₁	2283	2191	2137	2230	2209	2173	2189	2218	2246	2161	2203
D ₂	2229	2106	2240	2133	2210	2232	2152	2229	2175	2208	2191
D ₃	2135	2164	2235	2259	2205	2070	1989	2369	2152	2204	2178
Mean	2216	2154	2204	2207	2208	2158	2110	2272	2191	2191	2191
P ₀	2151	2182	2241	2199	2226	2149	2111	2271			
P ₁	2280	2126	2168	2215	2190	2168	2109	2273			
N ₀	2166	2054	2110	2075	2150	2105					
N ₁	2265	2254	2298	2339	2266	2212					
R ₁	2256	2238	2128								
R ₂	2157	2136	2330								
R ₃	2233	2087	2154								

S.E. of difference of two

1. D, S or R marginal means = 37 lb./ac.
2. P or N marginal means = 46 lb./ac.
3. P or N means at the same level of D, S or R = 80 lb./ac.
4. D, S or R means at the same level of P or N = 67 lb./ac.
- S.E. of body of $D \times S$, $D \times R$ or $S \times R$ table = 45 lb./ac.
- S.E. of body of $P \times N$ table = 57 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 54(15).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'CM'.

Object :- To compare Japanese method of Paddy cultivation with local method.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) Clay. (b) N.A. (iii) 27.8.1954. (iv) (a) to (e) As per treatments. (v) As per treatments. (vi) T—141 (medium). (vii) Unirrigated. (viii) Weeding. (ix) 45.56°. (x) 3, 4 and 5.12.1954.

2. TREATMENTS :

1. Control (5 C.L./ac. of F.Y.M).
2. Local method of cultivation + manuring according to the departmental method.
3. Local method of cultivation + manuring according to Japanese method.
4. Manuring and cultivation according to Japanese method.
5. Japanese method of cultivation + manuring as departmental method.

Japanese method of manuring : 15 to 20 C.L./ac. of compost + 100 lb. of A/S + 100 lb. of Super applied at the time of puddling.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) $22' \times 49\frac{1}{2}'$. (b) $22' \times 49\frac{1}{2}'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of case-worm on 20.9.1954. Insecticide dusted on 28.9.1954. (iii) Grain yield. (iv) (a) 1954—not contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3054 lb./ac. (ii) 196 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5
Av. yield	2536	3116	3017	3252	3348

S.E./mean = 87.6 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- Or. 56(MAE).

Site :- M.A.E. Farm, Kendrapara.

Type :- 'CM'.

Object :—Type VII—To determine the optimum spacing, suitable dates of transplanting and the optimum no. of seedlings per hole, when fertilizers in the form of N and P are applied to Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Recent alluvium. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) Transplanting. (c)—. (d) and (e) As per treatments. (v) 5,000 lb./ac. of F.Y.M. applied at the time of preliminary cultivation. (vi) B.A.M.—9. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1), (2) and (3) (normal date of transplanting)

(1) 3 transplanting dates : $D_1=6.8.1956$, $D_2=21.8.1956$ and $D_3=5.9.1956$.

(2) No. of seedlings/hole : $R_1=2$, $R_2=4$ and $R_3=6$ seedlings/hole.

(3) 3 spacings : $S_1=6'' \times 6''$, $S_2=8'' \times 8''$ and $S_3=10'' \times 10''$.

Sub-plot treatments :

All combinations of (1) and (2)

(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.

N applied at the time of planting and P_2O_5 applied at final puddling.

3. DESIGN :

(i) Split-plot. confd. (ii) (a) 27 main-plots in 3 blocks of 9/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) $33' \times 16.5'$. (b) $29' \times 15'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2399 lb./ac. (ii) (a) 278.7 lb./ac. (b) 188.5 lb./ac. (iii) N.A. (iv) Av. yield of grain in lb./ac.

	R ₁	R ₂	R ₃	S ₁	S ₂	S ₃	N ₀	N ₁	P ₀	P ₁	Mean
D ₁	2565	2812	2391	2532	2734	2502	2324	2854	2545	2634	2589
D ₂	2154	2075	2143	2221	2129	2022	1948	2300	2071	2177	2124
D ₃	2499	2456	2500	2491	2504	2459	2267	2703	2440	2530	2485
Mean	2406	2447	2345	2415	2456	2328	2180	2619	2352	2447	2399
P ₀	2307	2393	2355	2367	2402	2286	2113	2590			
P ₁	2505	2501	2334	2462	2509	2370	2246	2648			
N ₀	2108	2307	2124	2193	2237	2109					
N ₁	2705	2588	2565	2636	2674	2547					
S ₁	2368	2563	2312								
S ₂	2510	2415	2442								
S ₃	2340	2364	2280								

S.E. of difference of two

1. D, R or S marginal means = 55.7 lb./ac.
2. N or P marginal means = 36.3 lb./ac.
3. N or P means at the same level of D, R or S = 52.8 lb./ac.
4. D, R or S means at the same level of N or P = 79.3 lb./ac.
5. Means in the body of D×R, D×S or R×S table = 113.8 lb./ac.
6. Means in the body of N×P table = 51.3 lb./ac.

Crop :- Paddy (Kharif).**Ref :- Or. 57(MAE).****Site :- M.A.E. Farm, Kendrapara.****Type :- 'CM'.**

Object :—Type VII—To determine the optimum spacing, most suitable dates of transplanting and the optimum no. of seedlings/hole when fertilizers in the form of N and P are applied to Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Recent alluvium. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) As per treatments. (v) 5,000 lb./ac. of F.Y.M. applied at the time of preliminary cultivation. (vi) B.A.M.—9 (late variety). (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :**Main-plot treatments :**

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

3 sowing dates : D₁=18.7.1957, D₂=2.8.1957 and D₃=17.8.1957.

No. of seedlings/hole : R₁=2, R₂=4 and R₃=6 seedlings/hole.

3 spacing : S₁ = 6" × 6", S₂ = 8" × 8" and S₃ = 10" × 10".

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : N₀ = 0 and N₁ = 40 lb./ac.

(2) 2 levels of P₂O₅ as Super : P₀ = 0 and P₁ = 40 lb./ac.

3. DESIGN and 4. GENERAL :

Same as in expt no. 56(MAE) on page 101.

5. RESULTS :

(i) 3183 lb./ac. (ii) (a) 159.25 lb./ac. (b) 308.5 lb./ac. (iii) D effect and interactions D×R, N×P are highly significant. R effect and interaction R×S are significant. Others effects are not significant. (iv) Av. yield of grain in lb./ac.

	R ₁	R ₂	R ₃	S ₁	S ₂	S ₃	N ₀	N ₁	P ₀	P ₁	Mean
D ₁	3556	3102	3196	3158	3350	3346	3254	3315	3276	3293	3285
D ₂	3079	3219	3190	3138	3117	3233	3239	3086	3103	3222	3165
D ₃	3167	3060	3077	3167	3087	3050	3174	3029	3008	3194	3105
Mean	3267	3127	3154	3154	3185	3210	3222	3144	3129	3237	3185
P ₀	3171	3072	3144	3074	3157	3157	3071	3187			
P ₁	3364	3182	3164	3235	3213	3263	3373	3100			
N ₀	3312	3087	3267	3293	3150	3224					
N ₁	3222	3167	3042	3015	3219	3196					
S ₁	3273	3148	3042								
S ₂	3208	3217	3129								
S ₃	3321	3017	3292								

S.E. of difference of two

1. D, R or S marginal means = 37.54 lb./ac.
2. N or P marginal means = 59.37 lb./ac.
3. N or P means at the same level of D, R or S = 102.83 lb./ac.
4. D, R or S means at the same level of N or P = 81.83 lb./ac.
5. Means in the body of D×R, D×S or R×S table = 65.01 lb./ac.
6. Means in the body of N×P table = 83.96 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 58(MAE).

Site :- M.A.E., Farm, Kendrapara.

Type :- 'CM'.

Object :—Type VII—To determine the optimum spacing, most suitable dates of transplanting and the optimum no. of seedlings/hole when fertilizers in the form of N and P are applied to Paddy.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy BAM. 9. (c) N.A. (ii) (a) Recent alluvium. (b) N.A. (iii) As per treatments. (iv) (a) Preliminary and final puddling. (b) Transplanted in lines. (c) About 500 bundles of seedlings ac. (d) and (e) As per treatments. (v) 5,000 lb./ac. of F.Y.M. (vi) B.A.M. 9 (late sarda). (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

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

(1) 3 transplanting dates : D₁=26.7.1958, D₂=10.8.1958 and D₃=24.8.1958.

(2) No. of seedlings/hole : R₁=2, R₂=4 and R₃=6 seedlings/hill.

(3) 3 spacings : S₁=6"×6". S₂=8"×8" and S₃=10"×10".

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : N₀=0 and N₁=40 lb./ac.

(2) 2 levels of P₂O₅ : P₀=0 and P₁=40 lb./ac.

Super and A/S broadcast on 25.7.1958, 9.8.1958. and 23.8.1958 in D₁, D₂ and D₃ plots.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 56 (MAE) on page 101.

5. RESULTS :

- (i) 2417 lb./ac. (ii) (a) 223.4 lb./ac. (b) 183.9 lb./ac. (iii) D effect is highly significant. S, N effects and interactions S×N and R×N×P are significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	R ₁	R ₂	R ₃	S ₁	S ₂	S ₃	N ₀	N ₁	P ₀	P ₁	Mean
D ₁	2717	2529	2636	2732	2603	2547	2606	2649	2574	2681	2627
D ₂	2442	2512	2411	2599	2460	2306	2438	2472	2426	2484	2455
D ₃	2239	2103	2168	2372	2142	1997	2088	2253	2149	2191	2170
Mean	2466	2381	2405	2568	2402	2283	2377	2458	2383	2452	2417
P ₀	2422	2329	2398	2562	2364	2223	2347	2419			
P ₁	2511	2433	2412	2574	2439	2344	2407	2497			
N ₀	2441	2318	2373	2576	2273	2282					
N ₁	2492	2444	2437	2559	2530	2284					
S ₁	2537	2607	2559								
S ₂	2512	2337	2357								
S ₃	2350	2201	2299								

S.E. of the difference of two

1. Marginal means of D, R or S = 52.7 lb./ac.
2. Marginal means of N or P = 35.4 lb./ac.
3. N or P mean at the same level of D, R or S = 61.3 lb./ac.
4. D, R or S means at the same level of N or P = 68.2 lb./ac.
5. Means in the body of D×R, D×S or R×S = 91.2 lb./ac.
6. Means in the body of N×P = 50.1 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 59(MAE)

Site :- M.A.E., Farm, Kendrapara.

Type :- 'CM'.

Object : Type VII—To determine the optimum spacing, most suitable dates of transplanting and optimum no. of seedlings per hole when fertilizers in the form of N and P are applied to Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Recent alluvium. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) Transplanting. (c)—. (d) and (e) As per treatments. (v) 5000 lb./ac. of F.Y.M. (vi) B.A.M. 9 (late Sarada). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 9.12.1959.

2. TREATMENTS :

Main-plot treatments:

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

(1) 3 sowing dates : D₁=(30.7.1959), D₂=Normal (14.8.1959) and D₃=(29.8.1959).

(2) 3 no. of seedlings/hole R₁=2, R₂=4 and R₃=6.

(3) 3 spacings : S₁=6"×6", S₂=8"×8" and S₃=10"×10".

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : N₀=0 and N₁=40 lb./ac.

(2) 2 levels of P₂O₅ as Super : P₀=0 and P₁=40 lb./ac.

3. DESIGN and GENERAL :

Same as in expt no. 56 (MAE) on page 101.

5. RESULTS :

(i) 2685 lb./ac. (ii) (a) 393.2 lb./ac. (b) 286.1 lb./ac. (iii) Only S effect and interaction S×N are significant. (iv) Av. yield of grain in lb./ac.

	R ₁	R ₂	R ₃	S ₁	S ₂	S ₃	N ₀	N ₁	Mean	P ₀	P ₁
D ₁	2901	2674	2740	2907	2846	2562	2751	2792	2772	2761	2781
D ₂	2861	2617	2800	2891	2931	2456	2751	2768	2759	2787	2731
D ₃	2488	2550	2537	2709	2456	2408	2421	2628	2525	2552	2497
Mean	2750	2614	2692	2836	2744	2475	2641	2729	2685	2700	2670
P ₀	2737	2650	2713	2796	2760	2544	2650	2750			
P ₁	2763	2577	2671	2876	2728	2407	2632	2709			
N ₀	2673	2563	2687	2901	2666	2356					
N ₁	2827	2665	2697	2771	2823	2595					
S ₁	2933	2778	2796								
S ₂	2820	2645	2769								
S ₃	2497	2418	2511								

S.E. of the difference of two

1. D, R or S marginal means = 92.7 lb./ac.
2. N or P marginal means = 55.1 lb./ac.
3. N or P means at the same level of D,R or S = 95.4 lb./ac.
4. D,R,S means at the same level of N or P = 114.6 lb./ac.
5. means in body of D×R, D×S or R×S table = 160.5 lb./ac.
6. means in body of N×P table = 77.9 lb./ac.

Crop :- Paddy (Rabi).

Ref :- Or. 57(6).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'IM'.

Object :-To study the response of Paddy to different phosphatic fertilizers under different water logging conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 18.12.1957./16.1.1958. (iv) (a) N.A. (b) Transplanted. (c) N.A. (d) 9"×6". (e) 3 seedlings/hole. (v) Nil. (vi) MTU—15. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 25.4.1958.

2. TREATMENTS :

Main-plot treatments :

3 sources of P₂O₅ : S₁=Super, S₂=Bone meal and S₃=Rock phosphate.

Sub-plot treatments :

5 water logging conditions : W₁=Below 3" (normal), W₂=3", W₃=6", W₄=9" and W₅=1'.

P₂O₅ applied at 20 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 24'×18'.2". (b) 1/107.6 ac. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Average. (ii) Stem-borer. (iii) Height, tiller count, grain and straw yield. (iv) (a) 1957—N.A. (b) and (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1421 lb./ac. (ii) (a) 498 lb./ac. (b) 202 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	W ₁	W ₂	W ₃	W ₄	W ₅	Mean
S ₁	1399	1425	1479	1192	1156	1330
S ₂	1471	1475	1268	1560	1448	1444
S ₃	1556	1533	1367	1479	1506	1488
Mean	1475	1478	1371	1410	1370	1421

S.E. of difference of two

1. S marginal means = 182 lb./ac.
2. W marginal means = 95 lb./ac.
3. W means at the same level of S = 165 lb./ac.
4. S means at the same level of W = 234 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 56(MAE).

Site :- M.A.E. Farm, Barpalli.

Type :- 'IM'.

Object :—To study the direct response of Paddy to N, P, irrigation and their interactions.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) First week of August. (iv) (a) N.A. (v) Transplanting. (c) —. (d) 9' × 6'. (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) N.A. (vii) As per treatments. (viii) No. (ix) N.A. (x) End of December.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

- (1) Total amount of irrigation : A₁=72", A₂=84" and A₃=96".
- (2) 3 intensities of irrigation : I₁=2", I₂=3" and I₃=4".

Sub-plot treatments :

All combinations of (1) and (2)

- 3 levels of N of A/S : N₀=0, N₁=30 and N₂=60 lb./ac.
- 3 levels of P₂O₅ as Super : P₀=0, P₁=30 and P₂=60 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Incidence of case-worm. Control measures taken. (iii) Grain and straw yield. (iv) (a) to (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1974 lb./ac. (ii) (a) 191.5 lb./ac. (b) 183.4 lb./ac. (iii) Main effects of I, N and P and interaction N × P are highly significant. Main effect of A is significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	A ₁	A ₂	A ₃	N ₀	N ₁	N ₂	P ₀	P ₁	P ₂	Mean
I ₁	1878	1767	1928	1562	1822	2189	1684	1828	2061	1858
I ₂	2000	2017	2083	1711	2067	2322	1861	2067	2172	2033
I ₃	1972	1975	2144	1706	1983	2403	1794	2017	2281	2031
Mean	1950	1920	2052	1660	1957	2305	1780	1971	2171	1974
P ₀	1778	1739	1822	1439	1917	1983				
P ₁	1928	1933	2050	1723	1933	2256				
P ₂	2144	2086	2283	1817	2022	2675				
N ₀	1617	1656	1706							
N ₁	1922	1922	2028							
N ₂	2311	2181	2422							

S.E. of difference of two

1. A or I marginal means = 36.9 lb./ac.
2. N or P marginal means = 35.3 lb./ac.
3. N or P means at the same level of A or I = 61.1 lb./ac.
4. A or I means at the same level of N or P = 62.0 lb./ac.
5. means in the body of A × I table = 63.8 lb./ac.
6. means in the body of N × P table = 61.1 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 57(13).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- D².

Object :- To find out the efficiency of different insecticides for controlling Paddy gall-fly.

1. BASAL CONDITIONS :

- (i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 26.7.1957.
 (iv) (a) 2 ploughings. (b) Transplanted. (c) N.A. (d) 9' × 9'. (e) 2 seedlings/hole. (v) 10 C.C.L./ac.
 of cowdung. (vi) T-1242 (late). (vii) Unirrigated. (viii) 2 weedings and 2 manurings with 20 lb./ac.
 of N as A/S. (ix) N.A. (x) 9.12.1957.

2. TREATMENTS :

1. Control.
2. Folidol at 1 lb./ac.
3. Folidol at 0.5 lb./ac.
4. Endrine at 1 lb./ac.
5. Endrine at 0.5 lb./ac.

I spraying on 8.9.1957. II spraying on 27.9.1957.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 33' × 22'. (b) N.A. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) Gall-fly. As per treatments. (iii) Count of galls from 3 sq. yds of each plot selected at random. 10 counts in all. Yield of grain and no. of tillers. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (i) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1230 lb./ac. (ii) 133 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5
Av. yield	980	1412	1234	1337	1186

S.E./mean = 54.3 lb./ac.

Crop :- Paddy (Rabi).

Ref :- Or. 53(26).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'D'.

Object :—To find out the efficiency of different insecticides for controlling Paddy stem-borer.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 10 C.L./ac. of F.Y.M. (ii) (a) Sandy loam. (b) N.A. (iii) 11.12.1958, transplanting on 27.1.1959. (iv) (a) 4 ploughings with country plough to 4" depth. (b) Transplanted. (c) N.A. (d) 6"×6". (e) 2 seedlings/hole. (v) 15 C.L./ac. of F.Y.M. and 40 lb./ac. of N as A/S. (vi) N—136 (early) and PTB—10 (early). (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 11.4.1959.

2. TREATMENTS :

1. Control.
2. Endrine (0.05%).
3. Folidol (0.05%).
4. D.D.T. (0.25%).
5. Malathion (0.08%).

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 17'×17'. (b) 16'×16'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Stem-borer, gall-fly, case-worm. Control measures as per treatments. (iii) Count on dead hearts, empty panicles and yield of grain. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 486 lb./ac. (ii) 284 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5
Av. yield	116	1149	677	286	204

S.E./mean = 116 lb./ac.

Crop :- Paddy (Rabi).

Ref :- Or. 59(1).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'D'.

Object :—To find out the efficiency of different insecticides for controlling Paddy stem-borer.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 20 C.L./ac. of F.Y.M. (ii) (a) Sandy loam. (b) N.A. (iii) 15.12.1959. (iv) (a) 2 ploughings with country plough to 4" depth. (b) Transplanted. (c) N.A. (d) 9"×9". (e) 2. (v) 20 C.L./ac. of F.Y.M. (vi) PTB—10 (early). (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 26.4.1960.

2. TREATMENTS :

1. Control.
2. Endrine (0.04%).
3. Folidol (0.08%).
4. Diazinon (0.04%).
5. Phosdrine (0.04%).
6. Roger (0.08%).

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) $17\frac{1}{2}' \times 17\frac{1}{2}'$. (b) $16' \times 16'$. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Gall-fly and stem-borer. Control measures as per treatments. (iii) % count of dead-hearts and empty panicles and yield of grain. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1450 lb./ac. (ii) 245 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5	6
Av. yield	496	2938	1874	1714	931	748

S.E./mean = 110 lb./ac.

Crop :- Paddy (Kharif).

Ref :- Or. 54(20).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'D'.

Object :—To study the effect of fungicidal spray to control the incidence of blast on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 20.7.1954/15.8.1954. (iv) (a) 6 ploughings with country plough 4" to 6" deep. (b) Transplanted. (c) N.A. (d) 6" × 6". (e) 2 seedlings/hole. (v) 5 C.L./ac. of F.Y.M. (vi) CO—13. (vii) N.A. (viii) 2 weedings. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 fungicides : F_1 = Bordeaux mixture, F_2 = Perenox and F_3 = Coppesan.

Sub-plot treatments :

4 toxicants : T_0 = Control, T_1 , T_2 and T_3 are different for different fungicides.

Quantity sprayed : For F_1 — T_1 = 2 : 5 : 50, T_2 = 5 : 5 : 50 and T_3 = 7 : 5 : 50 ; for F_2 — T_1 = 4 ozs./10 gallon, T_2 = 5 ozs./10 gallons and T_3 = 6 ozs./10 gallons ; and for F_3 — T_1 = $4\frac{1}{2}$ lbs./100 gallons, T_2 = 5 lbs./100 gallons and T_3 = $5\frac{1}{2}$ lb./100 gallons.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $11' \times 5\frac{1}{2}'$. (b) $10' \times 4\frac{1}{2}'$. (v) $\frac{1}{2}'$ around. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Blast attack. Control measures as per treatments. (iii) Neck infected earheads and total no. of earheads from small sample areas of $2' \times 2'$ yield in oz./plot. (iv) (a) 1954—N.A. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2627 lb./ac. (ii) (a) 111 lb./ac. (b) 105 lb./ac. (iii) Main effect of F and interaction are highly significant (iv) Av. yield of grain in lb./ac.

	T_0	T_1	T_2	T_3	Mean
F_1	1588	3116	2465	3146	2579
F_2	1286	3025	2662	3267	2560
F_3	1376	3222	2949	3418	2741
Mean	1417	3121	2692	3277	2627

S.E. of difference of two

- | | |
|-----------------------------------|----------------|
| 1. F marginal means | = 39.2 lb./ac. |
| 2. T marginal means | = 42.9 lb./ac. |
| 3. T means at the same level of F | = 74.2 lb./ac. |
| 4. F means at the same level of T | = 75.3 lb./ac. |

Crop :- Paddy (Kharif).**Ref :- Or. 55(14).****Site :- Agri. Res. Stn., Sambalpur.****Type :- 'D'.**

Object :—To study the effect of fungicidal spray on the incidence of blast on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 14.7.1955, 17.8.1955. (iv) (a) 6 ploughings with country plough 4" to 6" deep. (b) Transplanted. (c) N.A. (d) 6"×6". (e) 2 seedlings/hole. (v) 40 lb./ac. of N as A/S and 30 lb./ac. of P₂O₅ as Super. (vi) CO—13 (N.A.). (vii) N.A. (viii) 2 weedings. (ix) and (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(20) on page 109.

4. GENERAL :

(i) N.A. (ii) Attack of blast ; control measures as per treatments. (iii) Neck infected ear-heads, total no. of ear-heads and grain yield. (iv) (a) 1954—1955. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5 RESULTS :

(i) 3074 lb./ac. (ii) (a) 454 lb./ac. (b) 234 lb./ac. (iii) Only interaction F×T is highly significant. (iv) Av. yield of grain in lb./ac.

	T ₀	T ₁	T ₂	T ₃	Mean
F ₁	2087	3660	2813	3388	2987
F ₂	2148	3025	2889	3660	2930
F ₃	2178	3660	3237	4144	3305
Mean	2138	3448	2980	3731	3074

S.E. of difference of two

- | | |
|-----------------------------------|---------------|
| 1. F marginal means | = 160 lb./ac. |
| 2. T marginal means | = 96 lb./ac. |
| 3. T means at the same level of F | = 165 lb./ac. |
| 4. F means at the same level of T | = 215 lb./ac. |

Crop :- Paddy (Rabi).**Ref :- Or. 58(16).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'DI'.**

Object :—To induce drought resistance in Paddy by plant extracts and hormones and test under different intervals of irrigation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 20.1.1959, 24.2.1959. (iv) (a) N.A. (b) Transplanted. (c) N.A. (d) 6"×6". (e) N.A. (v) 5000 lb./ac. of F.Y.M. before puddling. (vi) N—136 (early). (vii) As per treatments. (viii) Hand weeding. (ix) 0.93%. (x) 28.4.1959.

2. TREATMENTS :

Main-plot treatments :

3 irrigations : I₁=Irrigation every day, I₂=Irrigation at 7 days interval and I₃=Irrigation at 10 days interval.

Sub-plot treatments :

6 plant extracts : E₀=Control, E₁=Nicotinic acid 100 ppm, E₂=Riboflavin 100 ppm., E₃=Root of *Ipomia bilobata*, E₄=Stem of *Ipomia bilobata* and E₅=Leaf of *Ipomia bilobata*.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 6 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 11 × 11'. (b) 10' × 10'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Not lodged. (ii) Attack of case-worm and stem-borer ; Endrine sprayed. (iii) Tiller height, weight of grain and straw. (iv) (a) 1958—N.A. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 851 lb./ac. (ii) (a) 335 lb./ac. (b) 261 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	E ₀	E ₁	E ₂	E ₃	E ₄	E ₅	Mean
I ₁	939	1089	1143	1198	749	680	966
I ₂	734	708	952	516	913	926	792
I ₃	926	939	625	791	815	680	796
Mean	866	912	907	835	826	762	851

S.E. of difference of two

1. I marginal means = 137 lb./ac.
2. E marginal means = 151 lb./ac.
3. E means at the same level of I = 261 lb./ac.
4. I means at the same level of E = 275 lb./ac.

Crop :- Paddy (*Rabi*).

Ref :- Or. 59(20).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'DP'.

Object :—To induce drought resistance in Paddy by plant extracts and hormones and test under different intervals of irrigation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 20.12.1959/27.1.1960. (iv) (a) 4 ploughings with country plough. (b) Transplanted. (c) 20 lb./ac. (d) 9' × 9'. (e) 4. (v) 5000 lb./ac. of F.Y.M. just before final puddling and 20 lb./ac. of P₂O₅ as Super. (vi) N—136 (early). (vii) As per treatments. (viii) 2 weedings by hand and 2 by Japanese weeder. (ix) N.A. (x) 15.4.1960.

2. TREATMENTS :

Main-plot treatments :

4 durations of irrigations : I₁=Every day, I₂=At 7 days, I₃=At 11 days and I₄=At 15 days interval.

Sub-plot treatments :

6 plants extracts : E₀=Control, E₁=Nicotinic acid., E₂=Riboflavin, E₃=Root of *Ipomia bilobata*, E₄=Stem of *Ipomia bilobata* and E₅=Leaf of *Ipomia bilobata*.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 6 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 24' × 18'. (b) 22½' × 16½'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Average. (ii) Attack of stem-borer ; Endrine sprayed. (iii) Tiller, height, weight of grain and straw. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 748 lb./ac. (ii) (a) 480 lb./ac. (b) 116 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	E ₀	E ₁	E ₂	E ₃	E ₄	E ₅	Mean
I ₁	1253	916	777	799	1004	851	933
I ₂	659	733	645	711	594	666	668
I ₃	623	675	499	733	499	440	578
I ₄	792	934	842	770	645	887	812
Mean	832	814	691	753	685	711	748

S.E. of difference of two

1. I marginal means = 196 lb./ac.
2. E marginal means = 58 lb./ac.
3. E means at the same level of I = 116 lb./ac.
4. I means at the same level of E = 223 lb./ac.

Crop :- Wheat (Rabi).

Ref :- Or. 56(32).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To find out the effect of trace elements and potash on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) N.I. (b) Fallow in *kharif*. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 29.11.1956. (iv) (a) Three ploughings 1st with mould board plough and then with *deshi* plough to 3"–4" depth, twice laddering. (b) Line sowing. (c) N.A. (d) 9" between rows. (e) Nil. (v) 20 lb./ac. of N as A/S, 20 lb./ac. of P₂O₅ as Super. (vi) N.P.—710. (vii) Irrigated. (viii) Hoeing and weeding. (ix) 2.77". (x) 9.3.1957.

2. TREATMENTS :

1/8 of all combinations of (1) to (8) each at 2 levels.

- (1) MgSO₄ at A₀=0 and A₁=224 lb./ac. (5) CuSO₄ at E₀=0 and E₁=20 lb./ac.
- (2) FeSO₄ at B₀=0 and B₁=100 lb./ac. (6) Borax at F₀=0 and F₁=10 lb./ac. of borax.
- (3) MnSO₄ at C₀=0 and C₁=80 lb./ac. (7) Sodium Molybdate at G₀=0 and G₁=2 oz./ac. of Molybdenum.
- (4) ZnSO₄ at D₀=0 and D₁=20 lb./ac. (8) K₂SO₄ at K₀=0 and K₁=20 lb./ac. of K₂O.

3. DESIGN :

(i) 1/8 fractional replicate 2⁸ fact. confd. (ii) (a) 8. (b) N.A. (iii) 1/8 replicate. (iv) (a) 1/100 acre. (b) 1/108 acre. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Average. (ii) N.A. (iii) Yield of grain. (iv) (a) 1956—N.A. (b) N.A. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 319.8 lb./ac. (ii) 96.64 lb./ac. (iii) None of the effects is significant. (iv) Mean response in lb./ac.

Treatment	A	B	C	D	E	F	G	K
Mean response	6.61	82.13	58.72	20.44	–5.61	10.81	44.49	13.51

S.E. of mean response = 24.16 lb./ac.

Crop :- Wheat (Rabi).

Ref :- Or. 57(33).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To find the effect of trace elements and potash on wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy T—141 in *kharif*. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 28.11.1957. (iv) (a) 3 ploughings first with mould board plough and subsequently with *deshi* plough to 3"—4" depth, twice laddering. (b) Sowing in lines. (c) N.A. (d) 9" spacing between lines. (e) Nil. (v) 20 lb./ac. of N as A/S and 20 lb./ac. of P₂O₅ as Super. (vi) N.P.—710. (vii) Irrigated. (viii) 2 weedings. (ix) 5.12". (x) 17.2.1958.

2. TREATMENTS :

Same as in expt. no. 56(32) on page 112.

3. DESIGN :

(i) 1/8 fractional replicate of 2⁸ fact. confd. (ii) (a) 8. (b) N.A. (iii) 1/8th replicate. (iv) (a) 29'×15'. (b) 27½'×13½' (v) One row around. (vi) Yes.

4. GENERAL :

(i) Average. (ii) N.A. (iii) Yield of grain. (iv) (a) 1956—1957. (b) N.A. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 349.7 lb./ac. (ii) 144.9 lb./ac. (iii) None of the effects is significant. (iv) Mean response in lb./ac.

Treatment	A	B	C	D	E	F	G	K
Mean response	33.75	61.70	8.77	-10.59	2.32	64.69	-58.33	61.91

S.E. of mean response = 36.2 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Or. 56(34).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To study the most suitable time of application of N obtained from different sources.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 20,21.11.1956. (iv) (a) 3 ploughings with mould board and *deshi* plough to 3"—4" depth and two laddering. (b) Line sowing. (c) N.A. (d) 9" between lines (v) F.Y.M. at 5000 lb./ac. and P₂O₅ at 20 lb./ac. as Super. (vi) N.P.—710. (vii) Irrigated (viii) Hoeing and weeding. (ix) 2.77". (x) 7, 8.3.1957.

2. TREATMENTS :

All combinations of (1), (2) and (3) + 1 control in each block.

(1) 2 levels of N : N₁=20 and N₂= 40 lb./ac.

(2) 3 sources of N : S₁=A/S, S₂=A/N and S₃=Urea.

(3) 3 times of application of N : T₁=At sowing, T₂=At 1st irrigation and T₃=Half at sowing+half at 1st irrigation.

3. DESIGN :

(i) 3²×2+3 confd. (ii) (a) 3 blocks/replication ; 6 treatments+1 control/block. (b) N.A. (iii) 4. (iv) (a) 36'-6"×13'. (b) 35'×11½'. (v) One row around. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 527.1 lb./ac. (ii) 125.8 lb./ac. (iii) Control vs others alone is significant. (iv) Av. yield of grain in lb./ac.

Control=456.2 lb./ac.

	S ₁	S ₂	S ₃	Mean	N ₁	N ₂
T ₁	493.7	588.7	467.4	516.6	524.5	479.6
T ₂	491.1	520.2	585.3	532.2	558.6	509.8
T ₃	545.5	573.2	602.2	568.3	555.9	618.0
Mean	510.1	555.4	551.6	539.0		
N ₁	558.5	564.3	516.3			
N ₂	493.1	552.6	561.7			

S.E. of S or T marginal mean	= 25.68 lb./ac.
S.E. of N marginal mean	= 20.97 lb./ac.
S.E. of body of S × T table	= 47.55 lb./ac.
S.E. of body of S × N or T × N table	= 36.32 lb./ac.

Crop :- Wheat (Rabi).**Ref :- Or. 54(16).****Site :- Agri. Res. Stn., Sambalpur.****Type :- 'M'.**Object :—To study the effect of different sources of P₂O₅ on the yield of Wheat.**1. BASAL CONDITIONS :**

(i) (a) No. (b) and (c) N.A. (ii) (a) Clay. (b) N.A. (iii) 2.11.1954. (iv) (a) 6 ploughings with country plough to 4"–6" depth followed by laddering. (b) In furrows. (c) 70 lb./ac. (d) Between rows 9'. (e) N.A. (v) Nil. (vi) N.P.—775. (vii) Irrigated. (viii) No. (ix) 0.18". (x) 23 and 24.2.1955.

2. TREATMENTS :

1. No P₂O₅.
2. 40 lb./ac. of P₂O₅ as Super.
3. 40 lb./ac. of P₂O₅ as raw bone meal.
4. 40 lb./ac. of P₂O₅ as steamed bone meal.

P₂O₅ applied on 2.11.1954.**3. DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 22' × 11'. (b) 20' × 9'. (v) 1' × 1'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 2391 lb./ac. (ii) 264.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4
Av. yield	2284	2405	2594	2282

S.E./mean = 118.0 lb./ac.

Crop :- Wheat (Kharif).**Ref :- Or. 55(10).****Site :- Agri. Res. Stn., Sambalpur.****Type :- 'M'.**

Object :—To find out the best combination of manures and fertilizers for Wheat crop.

1. BASAL CONDITIONS:

(i) (a) No. (b) and (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 3.11.1955. (iv) (a) 6 ploughings to 4"–6" depth with country plough followed by laddering. (b) In furrows. (c) 70 lb./ac. (d) Between rows 9". (e) Nil. (v) Nil. (vi) N.P.—761. (vii) Irrigated. (viii) Gap-filling on 14.11.1955. (ix) 67.97%. (x) 23.2.1956.

2. TREATMENTS:

Main-plot treatments:

2 organic manures to supply 10 lb./ac. of N : M_1 =F.Y.M. and M_2 =Groundnut cake.

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) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=40$ lb./ac.

Manures applied on 3.11.1955.

3. DESIGN:

(i) Split-plot. (ii) (a) 2 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 30'×7½'. (b) 30'×6'. (v) One row on either side. (vi) Yes.

4. GENERAL:

(i) Crop in many plots lodged due to rain and wind. (ii) N.A. (iii) Height, no. of effective tillers per hill, length of earhead and grain yield. (iv) (a) 1955—not cntd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 1491 lb./ac. (ii) (a) 704.5 lb./ac. (b) 315 lb./ac. (iii) Effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1
M_1	1111	1554	1750	1472	1404	1539
M_2	1271	1554	1706	1510	1578	1442
Mean	1191	1554	1728	1491	1491	1491
P_0	1210	1539	1723			
P_1	1171	1568	1733			

S.E. of difference of two

- | | | |
|--|----------------|--|
| 1. M marginal means | =203.4 lb./ac. | 5. M means at the same level of N=240.5 lb./ac. |
| 2. N marginal means | =111.4 lb./ac. | 6. P means at the same level of M=128.6 lb./ac. |
| 3. P marginal means | =90.9 lb./ac. | 7. M means at the same level of P =222.8 lb./ac. |
| 4. N means at the same level of M =157.5 lb./ac. | | S.E. of body of N×P table =111.4 lb./ac. |

Crop :- Wheat (Rabi).

Ref :- Or. 56(22).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'M'

Object :- To evolve a suitable manurial dose for Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Tomato. (c) Nil. (ii) (a) Clay. (b) N.A. (iii) 17.11.1956. (iv) (a) 6 ploughings to 4"–6" depth by country plough followed by laddering. (b) In furrows. (c) 84.6 lb./ac. (d) Between rows 9". (e) Nil. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 3 weedings. (ix) 4.88%. (x) 24.3.1957.

2. TREATMENTS:

Main-plot treatments:

2 organic manures to supply 10 lb./ac. of N : M_1 =F.Y.M. and M_2 =G.N.C.+a control (M_0).

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) 2 levels of P_2O_5 as Super. : $P_0=0$ and $P_1=40$ lb./ac.

Super applied on 17.11.1956 and A/S applied on 17.12.1956.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 30'×7½'. (b) 29'×6'. (v) 6'×9'. (vi) Yes.

4. GENERAL :

(i) Rep. IV damaged by rats upto about 10%. (ii) Nil. (iii) Grain yield. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 920 lb./ac. (ii) (a) 255.3 lb./ac. (b) 170.0 lb./ac. (iii) Main effect of M is significant. Effect of N is highly significant. Others are not significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁
M ₀	441	838	1063	781	833	1020
M ₁	592	977	1204	924	853	995
M ₂	645	1127	1396	1056	1058	761
Mean	559	981	1221	920	915	925
P ₀	515	995	1234			
P ₁	603	966	1207			

S.E. of difference of two

- | | | | |
|-----------------------------------|---------------|-----------------------------------|----------------|
| 1. M marginal means | =73.7 lb./ac. | 5. M means at the same level of N | =101.2 lb./ac. |
| 2. N marginal means | =49.1 lb./ac. | 6. P means at the same level of M | = 69.4 lb./ac. |
| 3. P marginal means | =40.1 lb./ac. | 7. M means at the same level of P | = 88.5 lb./ac. |
| 4. N means at the same level of M | =85.0 lb./ac. | S.E. of body of N×P table | = 49.1 lb./ac. |

Crop :- Wheat (Rabi).

Ref :- Or. 58(8).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'M'.

Object :- To study the suitable time of application of N to Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 19.12.1958. (iv) (a) 6 ploughings by country plough to 4"—6" depth followed by laddering. (b) In furrows. (c) 70 lb./ac. (d) 9" between rows. (e) N.A. (v) 12 C.L./ac. of F.Y.M. (vi) N.P.—799. (vii) Irrigated. (viii) Flowering and weeding. (ix) N.A. (x) 23.3.1959.

2. TREATMENTS :

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

(1) 3 sources of N : S₁=A/S, S₂=C.A.N. and S₃=Urea.

(2) 3 times of application : T₁=Full dose at planting, T₂= Full dose 15 days after planting and T₃= ½ dose at planting+½ dose 15 days after planting.

Amount of dose is N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 15'-9"×15'. (b) 14'×13'-5". (v) 1 row around the net plot. (vi) Yes.

4. GENERAL :

(i) Nil. (ii) Brown rust attack. (iii) Height of plants, tillers/hill, length of earhead and grain yield. (iv) (a) 1958--contd. (b) and (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1511 lb./ac. (ii) 254 lb./ac. (iii) Treatment vs. control is highly significant. (iv) Av. yield of grain in lb./ac.

Control=825 lb./ac.

	T ₁	T ₂	T ₃	Mean
S ₁	1881	1551	1712	1715
S ₂	1385	1650	1491	1509
S ₃	1572	1553	1500	1541
Mean	1613	1585	1568	1588

S.E. of marginal mean of S or T = 73.3 lb./ac.

S.E. of body of table = 127.0 lb./ac.

Crop :- Wheat (Rabi).**Ref :- Or. 59(15).****Site :- Agri. Res. Stn., Sambalpur.****Type :- 'M'.**

Object :- To find out a suitable source of N and its time of application to Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Clay. (b) N.A. (iii) 16.11.1959. (iv) (a) 6 ploughings, 4 ladderings and breaking of clods. (b) Line sowing. (c) 35 sr./ac. (d) 9" between rows. (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) N.P.—799. (vii) Irrigated. (viii) Hoeing on 11.12.1959 to 14.12.1959. (ix) 2.82". (x) 1.3.1960.

2. TREATMENTS :

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

(1) 3 sources of 40 lb./ac. of N : S₁=A/S, S₂=C.A.N. and S₃=Urea.(2) 3 times of application : T₁=Full dose at sowing, T₂=Full dose one month after sowing and T₃= $\frac{1}{2}$ dose at sowing + $\frac{1}{2}$ dose one month after sowing.

Manures applied on 15.12.1959. Amount of N applied N.A.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) 79'×32 $\frac{1}{2}$ '. (iii) 4. (iv) (a) 15'9"×15'. (b) 14'3"×14'. (v) 9"×6". (vi) Yes.

4. GENERAL :

(i) Good. (ii) Dusting with Gammexane against jassids. (iii) Yield of grain. (iv) (a) 1958—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1964 lb./ac. (ii) 277 lb./ac. (iii) Control vs others effect is highly significant. (iv) Av yield of grain in lb./ac.

Control = 1105 lb./ac.

	T ₁	T ₂	T ₃	Mean
S ₁	2096	1969	2251	2072
S ₂	2039	1878	2076	1998
S ₃	2124	2159	2048	2110
Mean	2086	1969	2125	2060

S.E. of marginal mean of S or T = 80.0 lb./ac.

S.E. of body of table = 138.5 lb./ac.

Crop :- Wheat (Rabi).**Ref :- Or. 59(11).****Site :- Agri. Res. Stn., Sambalpur.****Type :- 'M'.**

Object :- To find out suitable manurial doses for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Paddy. (b) Paddy. (c) 5000 lb./ac. of F.Y.M., 20 lb./ac. of N as A/S and 20 lb./ac. of P_2O_5 as Super. (ii) (a) Clay loam. (b) N.A. (iii) 9.12.1959. (iv) (a) 4 ploughings and 2 laddering. (b) Sown in lines. (c) 1 md./ac. (d) 9" between rows. (e) N.A. (v) Nil. (vi) N.P.—799. (vii) Irrigated. (viii) Hoeing from 15 to 18.1.1960. (ix) 2.82". (x) 25.3.1960.

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) 2 levels of P_2O_5 as Super : $P_0 = 0$ and $P_1 = 30$ lb./ac.

Manures applied on 19.1.1960.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) 67' × 60'. (iii) 4. (iv) (a) 28' × 21'. (b) 27' × 19½'. (v) 6' × 9'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :(i) 649 lb./ac. (ii) 182 lb./ac. (iii) Effect of P is significant and of N is highly significant. Interaction $N \times P$ is not significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	289	632	723	548
P_1	481	832	940	751
Mean	385	732	831	649

S.E. of marginal mean of N = 64.34 lb./ac.

S.E. of marginal mean of P = 52.53 lb./ac.

S.E. of body of table = 91.00 lb./ac.

Crop :- Wheat (Rabi).**Ref :- Or. 56(MAE).****Site :- M.A.E. Farm, Barpalli.****Type :- 'M'.**

Object :- Type VI—To determine the method of placement of fertilizers.

1. BASAL CONDITIONS :

(i) (a) Wheat—Potato—Cotton. (b) Cotton. (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) 17 to 21.11.1956. (iv) (a) 4 to 5 ploughings. (b) N.A. (c) 50 to 60 lb./ac. (d) Rows 9" apart. (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) N.A. (vii) Irrigated. (viii) 3 weedings and 4 hoeings. (ix) N.A. (x) 20.3.1957 to 19.4.1957.

2. TREATMENTS :

All combinations of (1), (2) and (3) + a control (no manure)

(1) 2 sources of P_2O_5 : $S_1 =$ Super and $S_2 =$ Ammo. Phos.(2) 2 levels of P_2O_5 : $P_1 = 20$ and $P_2 = 40$ lb./ac.(3) 3 methods of placement : $M_1 =$ Broadcast before final cultivation, $M_2 =$ Placing 2½" below seed and $M_3 =$ Band placement.

N equalized to 30 lb./ac. by applying A/S at sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 685 lb./ac. (ii) 56.3 lb./ac. (iii) Main effects of S, P and M, and control vs. others effects are highly significant. Interaction P×M is significant. All other effects are not significant. (iv) Av. yield of grain in lb./ac.

Control = 425 lb./ac.

	M ₁	M ₂	M ₃	Mean	S ₁	S ₂
P ₁	619	705	664	663	539	787
P ₂	695	809	748	751	653	848
Mean	657	757	706	707	596	817
S ₁	564	612	612			
S ₂	750	902	800			

S.E. of M marginal mean = 16.3 lb./ac.

S.E. of P or S marginal mean = 13.3 lb./ac.

S.E. of body of M×P or M×S table = 23.0 lb./ac.

S.E. of body of S×P table = 18.8 lb./ac.

S.E. of control mean = 32.5 lb./ac.

Crop :- Wheat (Rabi).

Ref :- Or. 58(SFT).

Centre :- Bolangir (c.f.).

Type :- 'M'.

Object :—Type A—To study the response of Wheat to different levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red soil. (iii) Nil. (iv) N.A. (v) (a) to (e) N.A. (vi) Nov.—Dec. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

0 = Control (no manure).

n = 20 lb./ac. of N as A/S.

p = 20 lb./ac. of P₂O₅ as Super.

np = 20 lb./ac. of N as A/S + 20 lb./ac. of P₂O₅ as Super.

k = 20 lb./ac. of K₂O as Mur. of Potash.

nk = 20 lb./ac. of N as A/S + 20 lb./ac. of K₂O as Mur. of Potash.

pk = 20 lb./ac. of P₂O₅ as Super + 20 lb./ac. of K₂O as Mur. of Potash.

npk = 20 lb./ac. of N as A/S + 20 lb./ac. of P₂O₅ as Super + 20 lb./ac. of K₂O as Mur. of Potash.

3. DESIGN :

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

4. GENERAL :

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

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	1061	1753	1456	2065	1794	1794	1722	2403

G.M.=1755 lb./ac. ; S.E.=65.2 lb./ac. and no. of trials=11.

Crop :- Wheat (Rabi).

Ref :- Or. 59(SFT).

Centre :- Balasore (c.f.).

Type :- 'M'

Object :-Type A—To study the response of Wheat to different levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Saline. (iii) Nil. (iv) N.A. (v) (a) to (c) N.A. (vi) Nov.—Dec. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) April.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58(SFT) Type A on page 119 conducted as Bolangir.

4. GENERAL :

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

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	864	1061	905	1193	839	1144	1061	1284

G.M. =1044 lb./ac. ; S.E. =26.91 lb./ac. and no. of trials = 4.

Crop :- Wheat (Rabi).

Ref :- Or. 58(SFT).

Centre :- Kalahandi (c.f.).

Type :- 'M'.

Object :-Type A—To study the response of Wheat to different levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS to 3. DESIGN :

Same as in expt. no. 58(SFT) Type A on page 119 conducted at Bolangir.

4. GENERAL :

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

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	765	963	905	1037	1012	1136	1144	1193

G.M.=1019 lb./ac. ; S.E.=51.2 lb./ac and no. of trials=4.

Crop :- Wheat (Rabi).

Ref :- Or. 59(SFT).

Centre :- Kalahandi (c.f.).

Type :- 'M'.

Object :-Type A—To study the response of wheat to different levels of N, P₂O₅ and K₂O applied individually and in combinations :

1. BASAL CONDITIONS to 3. DESIGN :

Same as in expt. no. 58(SFT) Type A on page 119 conducted at Bolangir.

4. GENERAL :

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

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	428	560	510	634	485	617	568	806

G.M.=576 lb./ac. ; S.E.=1928 lb./ac. and no. of trials=3.

Crop :- Wheat (Rabi).

Ref :- Or. 58(SFT).

Centre :- Mayurbhanj (c.f.).

Type :- 'M'.

Object :—Type A—To study the responses of Wheat to different levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red. (iii) Nil. (iv) N.A. (v) (a) to (e) N.A. (vi) Nov.—Dec. (vii) 7 trials irrigated while 2 unirrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A on page 119 conducted at Bolangir.

5. RESULTS

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	2189	2757	2929	3604	2781	3275	3201	4328

G.M.=3132 lb./ac. ; S.E.=101.8 lb./ac. and no. of trials=9.

Crop :- Wheat (Rabi).

Ref :-Or. 59(SFT).

Centre :- Mayurbhanj (c.f.).

Type :- 'M'.

Object :—Type A—To study the response of Wheat to levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58 (SFT) Type A on page 119 conducted at Bolangir.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	1572	2543	2436	3752	2279	3423	3579	4345

G.M. =2991 lb./ac ; S.E.=64.4 lb./ac. and no. of trials=7.

Crop :-Wheat (Rabi).

Ref :- Or. 58(SFT).

Centre :-Sambalpur. (c.f.).

Type :- 'M'.

Object :—Type A—To study the response of Wheat to different levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and black. (iii) Nil. (iv) N.A. (v) (a) to (e) N.A. (vi) Nov.—Dec. (vii) 8 trials irrigated and 4 unirrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58 (SFT) Type A on page 119 conducted at Bolangir.

4. GENERAL :

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

5. RESULTS :

Treatment	0	n	p	np	k	nk	p<	npk
Av. yield	452.6	526.6	584.2	715.9	617.1	740.6	732.3	880.5

G.M. = 656.2 lb./ac. ; S.E./mean = 27.9 lb./ac. and no. of trials = 12.

Crop :- Wheat (Rabi).

Ref :- Or. 58(SFT).

Centre :- Bolangir (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red soil. (iii) Nil. (iv) N.A. (v) (a) to (e) N.A. (vi) Nov.—Dec. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

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

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58 (SFT) Type A on page 119 conducted at Bolangir.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	601	1119	1243	1243	1382	1275	1539

G.M. = 1200 lb./ac. ; S.E./mean = 45.4 lb./ac. and no. of trials = 11.

Crop :- Wheat (Rabi).

Ref :- Or. 59(SFT).

Centre :- Palasore (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Saline. (iii) Nil. (iv) N.A. (v) (a) to (e) N.A. (vi) Nov.—Dec. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

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

$n_2' = 40$ lb./ac. of N as Urea.

$n_1''' = 20$ lb./ac. of N as C.A.N.

$n_2''' = 40$ lb./ac. of N as C.A.N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 58 (SFT) Type A on page 119 conducted at Bolangir.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	823	963	1259	1037	1193	913	1086

G.M. = 1039 lb./ac. ; S.E./mean = N.A. and no. of trials = 4.

Crop :- Wheat (Rabi).

Ref :- Or. 58(SFT).

Centre :- Kalahandi (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 122 conducted at Bolangir.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	510.1	938.1	789.9	872.2	757.0	896.9	855.8

G.M. = 802.9 lb./ac. ; S.E./mean = 27.3 lb./ac. and no. of trials = 4.

Crop :- Wheat.

Ref :- Or. 58(SFT).

Centre :- Mayurbhanj (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 122 conducted at Bolangir.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	1506	1802	2181	2378	2576	2172	2740

G.M. = 2194 lb./ac. ; S.E./mean = 225.8 lb./ac. and no. of trials = 6.

Crop :- Wheat.

Ref :- Or. 59(SFT).

Centre :- Mayurbhanj (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 122 conducted at Bolangir.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	1769	2222	2699	2312	2337	2427	2543

G.M. = 2339 lb./ac. ; S.E./mean = N.A. and no. of trials = 4.

Crop :- Wheat.**Ref :- Or. 58(SFT).****Centre :- Sambalpur (c.f.).****Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and black. (iii) Nil. (iv) N.A. (v) (a) to (c) N.A. (vi) Nov.—Dec. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 122 conducted at Bolangir.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	477.2	567.8	633.6	748.8	641.8	707.7	773.5

G.M. = 650.1 lb./ac. ; S.E./mean = 41.3 lb./ac. and no. of trials = 12.

Crop :- Wheat (Rabi).**Ref :- Or. 54(TCM).****Centre :- Kalahandi (c.f.).****Type :- 'M'.**

Object :- Type I—To study the effect of different levels and sources of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loam—clay to clay loam, pH. 7.0. (iii) Nil. (iv) N.A. (v) (a) to (c) N.A. (vi) Nov.—Dec. (vii) Irrigated and unirrigated conditions. (viii) and (ix) N.A. (x) April.

2. TREATMENTS :

0 = Control (no manure).

N_1 = 20 lb./ac. of N as A.S.

N_2 = 40 lb./ac. of N as A.S.

N_1'' = 20 lb. ac. of N as Urea.

N_2'' = 40 lb./ac. of N as Urea.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the county, 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) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

Treatment	Irrigated				
	0	N_1	N_2	N_1''	N_2''
Av. yield	351	658	846	710	633

G.M. = 640 lb./ac. ; S.E. = 70.85 lb./ac. and no. of trials = 5.

Treatment	Unirrigated				
	0	N_1	N_2	N_1''	N_2''
Av. yield	343.1	664.9	827.8	678.9	673.9

G.M. = 637.7 lb./ac. ; S.E./mean = 58.34 lb./ac. and no. of trials = 3.

Crop :- Wheat (Rabi).**Ref :- Or. 54(TCM).****Centre :- Kalahandi (c.f.).****Type :- 'M'.**

Object :-Type II—To study the effect of different levels and sources of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loam—clay to clay loam ; pH. 70. (iii) Nil. (iv) N.A. (v) Nov.—Dec. (vi) (a) to (e) N.A. (vii) Irrigated and unirrigated conditions. (viii) and (ix) N.A. (x) April.

2. TREATMENTS :

0 =Control (no manure).

P₁ =20 lb./ac. of P₂O₅ as Super.P₁N₁ =20 lb./ac. of P₂O₅ as Super+20 lb./ac. of N as A/S.P₁N₂ =20 lb./ac. of P₂O₅ as Super+40 lb./ac. of N as A/S.P₁N₁" =20 lb./ac. of P₂O₅ as Super+20 lb./ac. of N as Urea.P₁N₂" =20 lb./ac. of P₂O₅ as Super+40 lb./ac. of N as Urea.**3. DESIGN and 4. GENERAL :**

Same as in expt. no. 54(TCM) Type I on page 124 conducted at Kalahandi.

5. RESULTS :

Treatment	Irrigated					
	0	P ₁	P ₁ N ₁	P ₁ N ₂	P ₁ N ₁ "	P ₁ N ₂ "
Av. yield	372.8	529.9	845.9	843.4	623.7	676.4

G.M.=648.7 lb./ac. ; S.E.=45.67 lb./ac. and no. of trials=4.

Treatment	Unirrigated					
	0	P ₁	P ₁ N ₁	P ₁ N ₂	P ₁ N ₁ "	P ₁ N ₂ "
Av. yield	353.8	596.6	794.9	831.1	683.8	714.2

G.M.=662.4 lb./ac. ; S.E.=45.50 lb./ac. and no. of trials=5.

Crop :- Wheat (Rabi).**Ref :- Or. 58(9).****Site :- Agri. Res. Stn., Sambalpur.****Type :- 'C'.**

Object :-To determine the optimum spacing and seed rate for Wheat crop.

1. BASAL CONDITIONS :(i) (a) Nil. (b) *Dhaincha*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 1.12.1958. (iv) (a) 6 p'oughings by country plough to 4"—6" depth each time followed by laddering. (b) In furrows. (c) and d) As per treatments. (e) Nil. (v) 8 C.L./ac. of F.Y.M., 20 lb./ac. of N as C.A.N. and 32 lb./ac. of P₂O₅ as Super. (vi) N.P.—797. (vii) Irrigated. (viii) Weeding and top-dressing. (ix) N.A. (x) 9.3.1959.**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 3 spacings : S₁=4", S₂=6" and S₃=9".(2) 3 seed rates : R₁=50, R₂=70 and R₃=90 lb./ac.**3. DESIGN :**(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 18'×9'. (b) 16'×8½', 16'×8' and 16'×7½' for spacings S₁, S₂ and S₃ respectively. (v) 1 row around the net plot. (vi) Yes.**4. GENERAL :**

(i) Lodged. (ii) N.A. (iii) Height, tillers/hill, length of earhead and grain yield. (iv) (a) 1958—N.A. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1190 lb./ac. (ii) 220 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	S ₁	S ₂	S ₃	Mean
R ₁	1256	1221	1256	1244
R ₂	1000	1183	1355	1179
R ₃	1135	1129	1175	1146
Mean	1130	1178	1262	1190

S.E. of marginal mean of R or S = 63.5 lb./ac.
S.E. of body of table = 110.0 lb./ac.

Crop :- Wheat (Rabi).

Ref :- Or. 59(MAE).

Site :- M. A. E. Farm, Barpalli.

Type :- 'CM'.

Object :- Type VIII—To study the effect of N and P₂O₅ along with different seed rates and sowing dates on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) As per treatments. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 seed rates : R₁=50, R₂=70 and R₃=90 lb./ac.

(2) 3 sowing dates : D₁=4.11.1959, D₂=19.11.1959 and D₃=4.12.1959.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N₀=0, N₁=20 and N₂=40 lb./ac.

(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=20 and P₂=40 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 32'×15.5'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 378 lb./ac. (ii) (a) 203.4 lb./ac. (b) 83.5 lb./ac. (iii) Main effects of D, N and P and interaction N×P are highly significant. Interactions D×N and D×P are significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	D ₁	D ₂	D ₃	N ₀	N ₁	N ₂	P ₀	P ₁	P ₂	Mean
R ₁	317	383	500	329	376	495	285	415	500	400
R ₂	266	388	478	298	395	439	271	371	490	377
R ₃	242	442	388	322	349	400	256	363	451	357
Mean	275	404	455	316	373	445	271	383	480	378
P ₀	195	254	364	237	278	298				
P ₁	271	417	461	327	386	437				
P ₂	359	541	541	385	456	600				
N ₀	227	371	351							
N ₁	261	395	463							
N ₂	337	446	551							

S.E. of difference of two

- | | |
|---|---------------|
| 1. D or S marginal means | =39.1 lb./ac. |
| 2. N or P marginal means | =16.1 lb./ac. |
| 3. N or P means at the same level of D or S | =27.8 lb./ac. |
| 4. D or S means at the same level of N or P | =45.2 lb./ac. |
| 5. means in the body of D×S table | =67.8 lb./ac. |
| 6. means in the body of N×P table | =27.8 lb./ac. |

Crop :- Wheat (Rabi).**Ref :-Or. 57(MAE).****Site :- M.A.E. Farm, Barpalli.****Type :- 'IM'.**

Object :-Type I—To study the direct response of nitrogen, phosphate and irrigation on Wheat.

1. BASAL CONDITIONS :

- (i) (a) Wheat—Potato—Cotton. (b) Cotton. (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) Oct.—Nov. 1957.
 (iv) (a) 3 ploughings after rain. (b) N.A. (c) 10 lb./ac. (d) and (e) N.A. (v) 5,000 lb./ac. of F.Y.M.
 (vi) N.A. (vii) As per treatments. (viii) 3 weedings and 3 hoeings. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

- (1) 3 frequencies of irrigation : $L_1 = 3$, $L_2 = 4$ and $L_3 = 5$.
 (2) 3 intensities of irrigation : $I_1 = 2''$, $I_2 = 3''$ and $I_3 = 4''$ per irrigation.
 (3) 3 levels of N as A/S : $N_0 = 0$, $N_1 = 30$ and $N_2 = 60$ lb./ac.
 (4) 3 levels of P_2O_5 as Super : $P_0 = 0$, $P_1 = 30$ and $P_2 = 60$ lb./ac.
 Fertilizers applied at the time of sowing by broadcasting.

3. DESIGN :

- (i) 3⁴ Fact. confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Mild attack of loose smut and rust. (iii) Grain yield. (iv) (a) 1957—contd. (b) and (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) Slight damage by stray cattle.

5. RESULTS :

- (i) 653 lb./ac. (ii) 120.0 lb./ac. (iii) Main effect of L is significant, main effect of N is highly significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	L ₁	L ₂	L ₃	I ₁	I ₂	I ₃	Mean
N ₀	550	583	586	539	572	608	553	592	575	573
N ₁	631	642	650	597	675	650	672	586	664	641
N ₂	767	730	742	672	744	822	689	786	764	746
Mean	649	652	659	603	664	693	638	655	668	653
I ₁	597	639	678	597	633	683				
I ₂	653	686	625	583	678	703				
I ₃	697	631	675	628	681	694				
L ₁	617	600	592							
L ₂	647	669	675							
L ₃	683	686	711							

S.E. of any marginal mean =23.1 lb./ac.

S.E. of body of any table =40.0 lb./ac.

Crop :- Wheat (Rabi).**Ref :- Or. 58(MAE).****Site :- M.A.E. Farm, Barpalli.****Type :- 'IM'.**

Object :—Type I—To study the direct response of nitrogen, phosphate and irrigation on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat - Potato - Cotton. (b) Cotton. (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) 3rd week of Dec. (iv) (a) 3 ploughings, 3 harrowing, 3 *bakharings*. (b) N.A. (c) 50 lb./ac. (d) 9"×6". (e) N.A. (v) 5,000 lb./ac. of F.Y.M. (vi) N.P.—718. (vii) As per treatments. (viii) 3 weedings. (ix) N.A. (x) 2nd week of April.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

- (1) 3 frequencies of irrigation : $L_1=5$, $L_2=7$ and $L_3=9$ irrigations.
 (2) 3 intensities of irrigation : $I_1=2''$, $I_2=3''$ and $I_3=4''$ per irrigation.
 (3) 3 levels of N as A/S : $N_0=0$, $N_1=30$ and $N_2=60$ lb./ac.
 (4) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=30$ and $P_2=60$ lb./ac.

3. DESIGN :

(i) 3⁴ Fact. confd. (ii) 9 plots/block ; 9 blocks/ replication. (iii) 1. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (vi) (a) 1957—contd. (b) and (c) N.A. (v) (a) and (b) Nil. (vi) Crop suffered due to heavy hail-storm. Damaged by wild rats and animals.

5. RESULTS :

(i) 517 lb./ac. (ii) 242.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	L_1	L_2	L_3	I_1	I_2	I_3	Mean
N_0	572	617	489	594	567	517	411	606	661	559
N_1	400	467	539	333	478	594	500	339	517	469
N_2	539	533	500	584	450	539	528	556	488	524
Mean	504	539	509	504	498	550	480	517	555	517
I_1	433	495	511	506	506	428				
I_2	506	578	467	461	511	578				
I_3	572	544	550	544	478	644				
L_1	411	589	511							
L_2	533	561	400							
L_3	567	467	617							

S.E. of any marginal mean = 46.7 lb./ac.
 S.E. of body of any table = 81.0 lb./ac.

Crop :- Wheat (Rabi).**Ref :- Or. 59(MAE).****Site :- M.A.E. Farm, Barpalli.****Type :- 'IM'.**

Object :—Type I—To study the direct response of nitrogen, phosphate and irrigation on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) Nov.—Dec. (iv) (a) to (e) N.A. (v) 5,000 lb./ac. of F.Y.M. (vi) N.A. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) Apr. 1, 1960.

2. TREATMENTS and 3. DESIGN :

Same as in experiment no. 58(MAE) above.

4. GENERAL :

(i) Below normal. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1957—contd. (b) and (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 308.4 lb./ac. (ii) 146.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	L ₁	L ₂	L ₃	I ₁	I ₂	I ₃	Mean
N ₀	204.7	366.0	224.5	283.0	248.8	263.4	278.2	312.1	204.8	265.1
N ₁	346.2	273.2	273.3	273.2	317.0	302.5	297.5	258.6	336.6	297.6
N ₂	395.2	326.9	365.9	317.2	341.7	429.3	321.9	424.5	341.7	362.7
Mean	315.4	322.0	287.9	291.1	302.5	331.7	299.2	331.7	294.4	308.4
I ₁	273.1	356.1	268.4	278.0	297.7	321.9				
I ₂	346.2	351.4	297.6	317.2	326.9	351.2				
I ₃	326.9	258.7	297.6	278.1	282.9	322.1				
L ₁	297.5	278.1	297.7							
L ₂	317.0	341.6	248.9							
L ₃	331.7	346.4	317.1							

S.E. of any marginal mean = 28.2 lb./ac.
S.E. of body of any table = 48.8 lb./ac.

Crop :- Ragi.

Centre :- Bolangir (c.f.).

Ref :- Or. 59(SFT).

Type :- 'M'.

Object :—Type A—To study the response of Ragi to levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red soil. (iii) Nil. (iv) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58 (SFT) type A on page 119 conducted at Bolangir on wheat crop.

4. GENERAL :

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

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	255.1	526.6	501.9	551.3	362.1	584.2	493.7	938.1

G.M.=526.6 lb./ac. ; S.E./mean=23.09 lb./ac. and no. of trials=2.

Crop :- Ragi.

Centre :- Bolangir (c.f.).

Ref :- Or. 59(SFT).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite. (iii) Nil. (iv) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58(SFT) Type B on page 122 conducted at Bolangir on wheat crop.

4. GENERAL :

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

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	362	453	568	518	749	839	1053

G.M. = 649 lb./ac. ; S.E./mean = 72.73 lb./ac. and no. of trials = 2.

Crop :- Ragi.

Centre :- Ganjam (c.f.).

Ref :- Or. 58 and 59(SFT).

Type :- 'M'.

Object :- Type A—To study the response of Ragi to levels of N, P_2O_5 and K_2O applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite. (iii) Nil. (iv) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58(SFT) Type A on page 119 conducted at Bolangir on wheat crop.

4. GENERAL :

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

5. RESULTS :

1958

Average response to 20 lb./ac.				Interaction effects				
N	P	K	SE	NP	NK	PK	NPK	SE
1.2	1.1	0.2	0.36	-1.2	-0.3	0.0	0.6	0.26

Number of trials = 7

1959

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	963	1325	1341	1465	1267	1391	1481	1712

G.M. = 1368 lb./ac. ; S.E./mean = 47.74 lb./ac. and no. of trials = 9.

Crop :- Ragi.

Centre :- Ganjam (c.f.).

Ref :- Or. 58 and 59(SFT).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite. (iii) Nil. (iv) to (x) N.A.

2. TREATMENTS :

0 = Control (no manure).

n_1 = 20 lb./ac. of N as A/S.

n_2 = 40 lb./ac. of N as A/S.

n_1' = 20 lb./ac. of N as Urea.

n_2' = 40 lb./ac. of N as Urea.

n_1'' = 20 lb./ac. of N as A.S.N.

n_2'' = 40 lb./ac. of N as A.S.N.

3. DESIGN :

Same as in expt. no. 58(SFT) Type A on page 119 conducted at Bolangir on wheat crop.

4. GENERAL :

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

5. RESULTS :

Treatment	1958						
	0	n ₁	n ₂	n ₁ '	n ₂ '	n ₁ ''	n ₂ ''
Av. yield	724	922	996	823	987	889	996

G.M. = 905 lb./ac. ; S.E./mean = 27.9 lb./ac. and no. of trials=9.

Treatment	1959						
	0	n ₁	n ₂	n ₁ '	n ₂ '	n ₁ ''	n ₂ ''
Av. yield	872	1144	1136	1325	1489	1506	1712

G.M. = 1312 lb./ac. ; S.E./mean = 39.57 lb./ac. and no. of trials=7.

Crop :- Maize (Rabi).

Site :- Agri. Res. Stn., Sambalpur.

Ref :- Or. 59(46).

Type :- 'C'.

Object :- To find out the optimum period of sowing for Maize crop.

1. BASAL CONDITIONS :

(i) Nil. (b) Paddy. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Loamy. (b) N.A. (iii) As per treatments (iv) (a) 6 ploughings and 2 ladderings. (b) Sown in lines. (c) 1.12 lb./ac. (d) 2'×2'. (e) 2 seeds/hcle. (v) 10 C.L./ac. of compost, 20 lb./ac. of N as A/S and 32 lb./ac. of P₂O₅ applied at sowing. (vi) V.L.—21 (hybrid). (vii) Irrigated. (viii) 1 hoeing and 2 weedings. (ix) N.A. (x) 23.12.1959, 20.1.1960, 3.2.1960, 7.3.1960, 21.3.1960 and 26.3.1960.

2. TREATMENTS :

6 sowing dates : D₁=5.10.1959, D₂=20.10.1959, D₃=5.11.1959, D₄=20.11.1959, D₅=5.12.1959 and D₆=20.12.1959.

Top-dressing with 20 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 18'×18'. (b) 14'×14'. (v) One row on all sides. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) No. of cobs/plot. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) 'a' and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 9316 cobs/ac. (ii) 540 cobs/ac. (iii) Treatments differences are highly significant. (iv) Av. number of cobs./ac.

Treatment	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆
Av. yield	10056	9334	9723	9667	8612	8501

S.E./mean = 270 cobs/ac.

Crop :- Bhindi (Kharif).

Site :- Agri. Res. Stn., Bhubaneswar.

Ref :- Or. 59(17).

Type :- 'D'.

Object :- To study the effect of insecticidal dustings in order to control Bhindi jassids.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 17.6.1959. (iv) (a) 2 ploughings with country plough to 3" depth followed by levelling and laddering. (b) Dibbling. (c) N.A. (d) 1'×1'. (e) N.A. (v) 15 C.L./ac. of F.Y.M. (vi) Red. (vii) Irrigated. (viii) 2 weedings, 2 hoeings and earthing up. (ix) N.A. (x) 15.8.1959. to 15.11.1959.

2. TREATMENTS :

5 dustings : D₀=Control, D₁=Parathion (0.02%), D₂=Endrine (0.025%), D₃=Pyrecolloid (1:400).

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 16½'×11'. (v) No. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Fruit borer ; control measures as per treatments. (iii) Population count of fruit borer and yield. (iv) (a) 1959—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2503 lb./ac. (ii) 962 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *bhindi* in lb./ac.

Treatment	D ₀	D ₁	D ₂	D ₃
Av. yield	1968	2547	2681	2816

S.E./mean = 430.2 lb./ac.

Crop :- Brinjal (*Kharif*).

Ref :- Or. 57(12).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'D'.

Object :—To study the effect of different insecticidal dustings in order to control Brinjal *Epilachna*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) Transplanted on 25.6.1959. (iv) (a) 2 ploughings by country plough to 3" depth. (b) Transplanted. (c) N.A. (d) 2½'×2'. (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) Local (black-round). (vii) Irrigated. (viii) Weeding and 2 hoeings. (ix) N.A. (x) 5.9.1959 (weekly pickings).

2. TREATMENTS :

5 dustings : D₀=Control, D₁=D.D.T. (0.11%), D₂=B.H.C. (0.1%), D₃=Malathion (0.1%) and D₄=Endrine (0.05%).

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 22'×8'. (v) No. (vi) Yes.

4. GENERAL :

(i) Average. (ii) *Epilachna* ; control measures as per treatments. (iii) Population count of *Epilachna* and yield of diseased fruit. (iv) (a) 1957—N.A. (b) and (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 5993 lb./ac. (ii) 719 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of brinjal in lb./ac.

Treatment	D ₀	D ₁	D ₂	D ₃	D ₄
Av. yield	4686	6512	4928	6138	7700

S.E./mean = 321.6 lb./ac.

Crop :- Brinjal (*Kharif*).

Ref :- Or. 58(23).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'D'.

Object :—To study the effect of different insecticidal dustings in order to control Brinjal *Epilachna*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Brinjal. (c) 10 C.L./ac. of F.Y.M. (ii) (a) Sandy loam. (b) N.A. (iii) 15.7.1958. (iv) (a) 2 ploughings with country plough to 3' depth and laddering. (b) Transplanted in lines. (c) N.A. (d) $2\frac{1}{2}' \times 2\frac{1}{2}'$. (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) Local (black, round). (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 30.10.1958 to 15.2.1959.

2. TREATMENTS :

4 dustings : D_0 =Control, D_1 =B.H.C. (5%), D_2 =Toxaphene (5%) and D_3 =Dieldrine (1%).

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) $19' \times 7\frac{1}{2}'$. (b) $7\frac{1}{2}' \times 16'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) *Epilachna*; control measures as per treatments. (iii) Population count on *Epilachna* and brinjal yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2233 lb./ac. (ii) 1157 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of brinjal in lb./ac.

Treatment	D_0	D_1	D_2	D_3
Av. yield	1994	1792	3376	1770

S.E./mean = 517 lb./ac.

Crop :- Brinjal (Kharif).

Ref :-Or. 58(25).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'D'.

Object :- To study the effect of different insecticidal dusting in order to control Brinjal *Epilachna*.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Brinjal. (c) 10 C.L./ac. of F.Y.M. (ii) (a) Sandy loam. (b) N.A. (iii) 15.7.1958. (iv) (a) 2 ploughings with country plough to 3' depth. (b) Transplanted. (c) N.A. (d) $2\frac{1}{2}' \times 2'$. (e) 1. (v) 10 C.L./ac. of F.Y.M. (vi) Local (medium). (vii) Irrigated. (viii) 2 weedings, 2 hoeings and twice earthing up. (ix) N.A. (x) 30.10.1958 to 15.2.1959.

2. TREATMENTS :

4 Dusting : D_0 =Control, D_1 =B.H.C. (0.125%), D_2 =Toxaphene (0.125%) and D_3 =Malathion (0.125%)

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) N.A. (b) $17\frac{1}{2}' \times 16'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) *Epilachna*; control measures as per treatments. (iii) Population on *Epilachna* and yield. (iv) (a) N.A. (b) and (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1903 lb./ac. (ii) 953 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of brinjal in lb./ac.

Treatment	D_0	D_1	D_2	D_3
Av. yield.	1743	1294	2557	2018

S.E./mean = 426 lb./ac.

Crop :- Brinjal (Kharif).

Ref :- Or.59(22)

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'D'.

Object : To study the effect of different insecticidal dustings in order to control Brinjal *Eplachna*.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Brinjal. (c) 10. C.L./ac. of F.Y.M. (ii) (a) Sandy loam. (b) N.A. (iii) 22.6.1959. (iv) (a) 2 ploughings with country plough to 3" depth. (b) Transplanted. (c) N.A. (d) 2'×2'. (e) 1. (v) 10 C.L./ac. of F.Y.M. (vi) Local. (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) N.A. (x) 25.9.1959 to 22.2.1960.

2. TREATMENTS :

6 dustings : D₀=Control, D₁=Parathion (0.025%), D₂=Malathion (0.2%), D₃=Endrine (0.04%), D₄=B.H.C. (0.25%) and D₅=Toxaphene (0.25%).

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 28'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) *Epilachna* beetle; control measures as per treatments. (iii) Population of *Epilachna* and yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 6289 lb./ac. (ii) 1230 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of brinjal in lb./ac.

Treatment	D ₀	D ₁	D ₂	D ₃	D ₄	D ₅
Av. yield	5687	7008	7708	7359	6470	3503

S.E./mean = 550 lb./ac.

Crop :- Brinjal (Rabi).

Ref :- Or. 58(11).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'D'.

Object :—To study the effect of insecticidal dustings in order to control Brinjal fruit borer.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sann hemp. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 16.11.1958. (iv) (a) 3 ploughings with country plough 4" to 6" deep. (b) Planted in rows and ridges. (c) 16 plants/plot. (d) 2'×2'. (e) 1 (v) 200 lb./ac. of A/S+200 lb./ac. of Super. (vi) Black beauty. (vii) Irrigated. (viii) Earthing and hoeing. (ix) N.A. (x) Pickings on 10, 19 and 26.3.1959; 9, 17 and 24.4.1959; 5 and 15.5.1959.

2. TREATMENTS :

5 dustings : D₀=Control, D₁=Folidol e.c. 0.04%, D₂=Endrine e.c. 0.04%, D₃=Basudin e.c. 0.04% and D₄=Dieldrine e.c. 0.125%.

Each dusting was performed at 60 gallons/ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 10'×10'. (b) 6'×6'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Brinjal wilt; control measures as per treatments. (iii) Weight of pickings and percentage of affected fruit. (iv) (a) to (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 8742 lb./ac. (ii) 2525 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of brinjal in lb./ac.

Treatment	D ₀	D ₁	D ₂	D ₃	D ₄
Av. yield	9472	7884	7336	9538	9661

S.E./mean = 1262 lb./ac.

Crop :- Potato (Rabi).**Ref :- Or. 59(2).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To study the effect of N, P, K applied with lime and molybdenum on the yield of Potato.

1. BASAL CONDITIONS :

(i) (i) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 14.11.1959. (iv) (a) 6 ploughings (b) Line sowing on flat beds. (c) 346 lb./ac. (d) 24"×9". (e) One seed/hole. (v) 5000 lb./ac. of F.Y.M. (vi) Patna—red. (vii) Irrigated. (viii) One weeding. (ix) 0.51". (x) 7.2.1960!

2. TREATMENTS :**Main-plot treatments :**

6 manurial treatments : T_0 =Control, T_1 =112 lb./ac. of lime, T_2 = T_1 +1¼ lb./ac. of sodium molybdate, T_3 =112 lb./ac. of A/S, T_4 =56 lb./ac. of A/S+56 lb./ac. of Mur. of Pot. and T_5 = T_3 +112 lb./ac. of Mur. of Potash.

Sub-plot treatments :

5 levels of Super : P_0 =Control, P_1 =168, P_2 =336, P_3 =504 and P_4 =672 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 14'×13' (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Crop affected by *Epilachna* ; D.D.T. sprayed. (iii) Tuber yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 4313 lb./ac. (ii) (a) 3064 lb./ac. (b) 953 lb./ac. (iii) Main effect of T alone is significant. (iv) Av. yield of tuber in lb./ac.

	T_0	T_1	T_2	T_3	T_4	T_5	Mean
P_0	3051	4132	3261	5654	4143	5257	4250
P_1	2893	3447	3437	5811	3447	5998	4172
P_2	2198	3694	2528	5332	5130	6103	4164
P_3	3014	3979	3604	6446	4404	6301	4625
P_4	3021	3193	3365	6042	4842	5661	4354
Mean	2835	3689	3239	5857	4393	5864	4313

S.E. of difference of two

- | | |
|-----------------------------------|----------------|
| 1. T marginal means | = 969 lb./ac. |
| 2. P marginal means | = 275 lb./ac. |
| 3. P means at the same level of T | = 674 lb./ac. |
| 4. T means at the same level of P | = 1139 lb./ac. |

Crop :- Potato (Kharif).**Ref :- Or. 55(11).****Site :- Agri. Res. Stn., Sambalpur.****Type :- 'M'.**

Object :—To study the effect of organic and inorganic manures on Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Clay. (b) N.A. (iii) 7.11.1955. (iv) (a) 6 ploughings 4" to 6" deep and 2 ploughings followed by laddering. (b) Sown in flat beds. (c) N.A. (d) 24"×9". (e) 1. (v) Nil. (vi) Patna—red. (vii) Irrigated. (viii) 2 manurings and 2 earthings. (ix) 67.97". (x) 18.2.1956.

2. TREATMENTS :

Main-plot treatments :

3 organic manures : T_0 =Control, T_1 =40 lb./ac. of N as F.Y.M. and T_2 =40 lb./ac. of N as G.N.C.

Sub-plot treatments :

5 inorganic manures : M_0 =Control, M_1 =40 lb./ac. of N as A/S, M_2 =40 lb./ac. of P_2O_5 as Super, M_3 = M_1+M_2 and M_4 = M_3+80 lb./ac. of K_2O as Mur. of Pot.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) $36' \times 9'$. (b) $32' \times 7\frac{1}{2}'$. (v) One row either side. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Virus and ring disease. No control measures adopted. (iii) Tuber yield. (iv) (a) No. (b) and (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 4596 lb./ac. (ii) (a) 1953 lb./ac. (b) 991 lb./ac. (iii) Main effect of M and interaction $M \times T$ are highly significant. (iv) Av. yield of tuber in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean
T_0	2534	4614	3779	5503	5097	4305
T_1	3071	4871	1329	3597	5398	3653
T_2	5089	6639	4643	5761	7017	5830
Mean	3565	5375	3250	4954	5837	4596

S.E. of difference of two

1. T marginal means	= 713 lb./ac.
2. M marginal means	= 467 lb./ac.
3. M means at the same level of T	= 809 lb./ac.
4. T means at the same level of M	= 1015 lb./ac.

Crop :- Potato (Rabi).

Site :- Agri. Res. Stn., Sambalpur.

Ref :- Or. 56(29).

Type :- 'M'.

Object :- To study the effect of organic and inorganic manures on Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton (*kharif*) in 1956 (failed) and in winter 1955 vegetables and wheat. (c) N.A. (ii) (a) Clay. (b) N.A. (iii) N.A. (iv) (a) 6 ploughings with country plough 4" to 6" deep. (b) Line planting. (c) N.A. (d) $21'' \times 9''$. (e) One tuber/hole. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hoeing and earthing (ix) N.A. (x) 21 to 24.2.1957.

2. TREATMENTS :

Main-plot treatments :

3 organic manures : T_0 =Control, T_1 =40 lb./ac. of N as F.Y.M. and T_2 =40 lb./ac. of N as G.N.C.

Sub-plot treatments :

4 inorganic manures : M_0 =Control, M_1 =40 lb./ac. of N + 80 lb./ac. of P_2O_5 + 40 lb./ac. of K_2O , M_2 =80 lb./ac. of N + 80 lb./ac. of P_2O_5 + 40 lb./ac. of K_2O and M_3 =120 lb./ac. of N + 80 lb./ac. of P_2O_5 + 40 lb./ac. of K_2O .

N applied as A/S, P_2O_5 as Super and K_2O as Pot. Stl.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) $21' \times 11\frac{1}{2}'$. (b) $17\frac{1}{2}' \times 10'$. (v) 1 row around the net plot. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of blight; copper compound sprayed on 10.12.1956. (iii) Tuber yield. (iv) (a) No. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3560 lb./ac. (ii) (a) 1576 lb./ac. (b) 528 lb./ac. (iii) Only main effect of M is highly significant. (iv) Av. yield of tuber in lb./ac.

	M ₀	M ₁	M ₂	M ₃	Mean
T ₀	1804	3220	4340	3956	3330
T ₁	1955	3557	3988	4426	3481
T ₂	2178	4112	3946	5242	3869
Mean	1979	3630	4091	4541	3560

S.E. of difference of two.

1. T marginal means = 642 lb./ac.
2. M marginal means = 249 lb./ac.
3. M means at the same level of T = 431 lb./ac.
4. T means at the same level of M = 744 lb./ac.

Crop :- Potato (Kharif).

Ref :- Or. 58(10).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'M'.

Object :—To study the response of Potato to manuring with N, P and K.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Clay loam. (b) N 266 lb./ac. and P₂O₅ 16.3 lb./ac. %T.S.S. 0.035 ; pH 6.4 and % of organic carbon 0.75. (iii) 21.11.1958. (iv) (a) 6 ploughings 4" to 6" deep. (b) Sowing in flat beds. (c) N.A. (d) 18"×9". (e) 1 tuber/hole. (v) 12 C.L./ac. of F.Y.M., 20 lb./ac. of N as C.A.N. before dibbling, 40 lb./ac. of P₂O₅ as Super and 40 lb./ac. of K₂O. (vi) Patna—red. (vii) Irrigated. (viii) 2 earthings. (ix) N.A. (x) 13.2.1959.

2. TREATMENTS :

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

- (1) 2 levels of N as A/S : N₀=0 and N₁=50 lb./ac.
- (2) 2 levels of P₂O₅ as Super : P₀=0 and P₁=40 lb./ac.
- (3) 2 levels of K₂O as Mur. of Pot. : K₀=0 and K₁=40 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 22'×10'. (b) 20'×6'. (v) One row around the net plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Attack of late blight ; Shell's copper fungicide sprayed. (iii) Tuber yield. (iv) (a) No. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 7004 lb./ac. (ii) 1935 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of tuber in lb./ac.

	N ₀	N ₁	K ₀	K ₁	Mean
P ₀	4691	8366	5988	7070	6529
P ₁	5778	9182	862	6898	7480
Mean	5234	8774	7025	6984	7004
K ₀	4844	9204			
K ₁	5624	8344			

S.E. of any marginal mean = 483.8 lb./ac.

S.E. of body of any table = 967.5 lb./ac.

Crop :- Potato (Rabi).**Ref :- Or. 58(SFT)****Centre :- Dhenkanal (c.f.).****Type :- 'M'.**

Object :- Type A—To study the response of Potato to levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and black. (iii) to (v) N.A. (vi) Oct.—Nov. (vii) Irrigated. (viii) and (ix) N.A. (x) Feb.—March.

2. TREATMENTS :

0 = Control (no manure).

n = 50 lb./ac. of N as A/S.

p = 25 lb./ac. of P₂O₅ as Super.

np = 50 lb./ac. of N as A/S + 25 lb./ac. of P₂O₅ as Super.

k = 50 lb./ac. of K₂O as Mur. of Potash.

nk = 50 lb./ac. of N as A/S + 50 lb./ac. of K₂O as Mur. of Potash.

pk = 25 lb./ac. of P₂O₅ as Super + 50 lb./ac. of K₂O as Mur. of Potash.

npk = 50 lb./ac. of N as A/S + 25 lb./ac. of P₂O₅ as Super + 50 lb./ac. of K₂O as Mur. of Potash.

3. DESIGN :

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

4. GENERAL :

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

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	8665	11380	12359	16400	13083	12343	10557	15634

G.M. = 12553 lb./ac. ; S.E. = 1022 lb./ac. and no. of trials = 5.

Crop :- Potato (Rabi).**Ref :- Or. 59 (SFT).****Centre :- Dhenkanal (c.f.).****Type :- 'M'.**

Object :- Type A—To study the response of Potato to levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no 58 (SFT) Type A above.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	7077	11438	8722	12343	8311	11882	11438	12754

G.M. = 10496 lb./ac. ; S.E. = 1505 lb./ac. and no. of trials = 2.

Crop :- Potato (Rabi).**Ref :- Or. 58(SFT).****Centre :- Ganjam (c.f.).****Type :- 'M'.**

Object :—Type A—To study the response of Potato to levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite. (iii) to (v) N.A. (vi) Oct.—Nov. (vii) Irrigated. (viii) and (ix) N.A. (x) Feb.—March.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58(SFT) Type A on page 138 conducted at Dhenkanal.

4. GENERAL :

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

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	4279	5620	4600	5538	5093	6106	5497	7167

G.M. = 5487.5 lb./ac. ; S.E. = 1119.1 lb./ac. and no. of trials = 4.

Crop :- Potato (Rabi).**Ref :- Or. 59(SFT).****Centre :- Ganjam (c.f.).****Type :- 'M'.**

Object :—Type A—To study the response of Potato to levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A above.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	4682	6270	5595	6385	5176	7480	6558	7694

G.M. = 6230 lb./ac. ; S.E. = 769.6 lb./ac. and no. of trials = 6.

Crop :- Potato (Rabi).**Ref :- Or. 58(SFT).****Centre :- Kalahandi (c.f.).****Type :- 'M'.**

Object :—Type A—To study the response of Potato to levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loam. (iii) to (v) N.A. (vi) Oct.—Nov. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Feb—March.

2. TREATMENTS to 3. DESIGN :

Same as in expt. no. 58(SFT) Type A on page 138 conducted at Dhenkanal.

4. GENERAL :

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

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	1893	5513	5019	9134	3127	6501	6254	12754

G.M. = 6274 lb./ac. ; S.E. = 158.4 lb./ac. ; and no. of trials = 2.

Crop :- Potato (Rabi).**Ref :- Or. 58(SFT).****Centre :- Mayurbhanj (c.f.).****Type :- 'M'.**

Object :—Type A—To study the response of Potato to levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A on page 138 conducted at Dhenkanal.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	7899	9529	8023	11561	8253	10903	11191	13495

G.M. = 10107 lb./ac. ; S.E./mean = 370.3 lb./ac. and no. of trials = 8.

Crop :- Potato.**Ref :- Or. 58(SFT).****Centre :- Puri (c.f.).****Type :- 'M'.**

Object :—Type A—To study the response of Potato to levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red alluvial. (iii) to (v) N.A. (vi) Oct.—Nov. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Feb.—March.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58(SFT) Type A on page 138 conducted at Dhenkanal.

4. GENERAL :

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

5. RESULTS :

Treatment	0	n	p	np	k	rk	pk	npk
Av. yield	3374	5044	4633	5678	4304	5842	8451	6887

G.M. = 5526.6 lb./ac. ; S.E. = 562.8 lb./ac. and no. of trials = 7

Crop :- Potato.**Ref :- Or. 59(SFT).****Centre :- Puri (c.f.).****Type :- 'M'.**

Object :—Type A—To study the response of Potato to levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type A above.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	5974	8171	7258	8656	6682	8574	7792	10030

G.M. = 7892 lb./ac., S.E. = 336.1 lb./ac. and no. of trials = 7.

Crop :- Potato (Rabi).**Ref :- Or. 59(SFT).****Centre :- Balasore (c.f.).****Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers applied at different levels for Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Saline. (iii) to (v) N.A. (vi) Oct.—Nov. (vii) Irrigated. (viii) and (ix) N.A. (x) Feb.—March.

2. TREATMENTS :

0 =Control (no manure).
 n_1 = 50 lb./ac. of N as A/S.
 n_2 =100 lb./ac. of N as A/S.
 n_1' = 50 lb./ac. of N as Urea.
 n_2' =100 lb. ac. of N as Urea.
 n_1''' = 50 lb./ac. of N as C.A.N.
 n_2''' =100 lb./ac. of N as C.A.N.

3. DESIGN :

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

4. GENERAL :

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

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	5925	6583	9216	6418	9710	6089	7159

G.M. =7300 lb./ac. ; S.E. =298.5 lb./ac. and no. of trials =2.

Crop :- Potato (Rabi).**Ref :- Or. 58(SFT).****Centre :- Dhenkanal (c.f.).****Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers applied at different levels for Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and black. (iii) to (v) N.A. (vi) Oct.—Nov. (vii) Irrigated. (viii) and (ix) N.A. (x) Feb.—March.

2. TREATMENTS :

0 =Control
 n_1' = 50 lb./ac. of N as Urea.
 n_2' =100 lb./ac. of N as Urea.
 n_1'' = 50 lb./ac. of N as A/S/N.
 n_2'' =100 lb./ac. of N as A/S/N.
 n_1''' = 50 lb./ac. of N as C.A.N.
 n_2''' =100 lb./ac. of N as C.A.N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 59(SFT) Type B above.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	9339	10574	12137	12055	13413	12261	12178

G.M. =11708 lb./ac. ; S.E. =508.5 lb./ac. and no. of trials =4.

Crop :- Potato (Rabi).**Ref :- Or. 59(SFT).****Centre :- Dhenkanal (c.f.).****Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers applied at different levels for Potato.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 141 conducted at Dhenkanal.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	9463	11849	14400	11150	14729	15799	15182

G.M. = 13225 lb./ac. ; S.E. = 2400 lb./ac. and no. of trials = 3.

Crop :- Potato.**Ref :- Or. 58(SFT).****Centre :- Ganjam (c.f.).****Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers applied at different levels for Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite. (iii) to (v) N.A. (vi) Oct—Nov. (vii) Irrigated. (viii) and (ix) N.A. (x) Feb.—Mar.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58(SFT) Type B on page 141 conducted at Dhenkanal.

4. GENERAL :

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

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	5085	7620	8039	6311	7307	7027	7603

G.M. = 6999 lb./ac. ; S.E. = 520.8 lb./ac. and no. of trials = 4.

Crop :- Potato (Rabi).**Ref :- Or. 59(SFT).****Centre :- Ganjam (c.f.).****Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers applied at different levels for Potato.

1. BASAL CONDITIONS :

Same as in expt. no. 58(SFT) Type B above.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 141 conducted at Dhenkanal.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	4830	8805	10080	7817	8747	6007	5760	7982	8615

G.M. = 7897 lb. ac. ; S.E. = 744.7 lb./ac. for treatments with 6 trials and no. of trials = 6 for 0, n_1 , n_2 , n_1''' , n_2''' ; 4 for n_1' , n_2' and 2 for n_1'' and n_2'' .

Crop :- Potato.**Ref :- Or. 58(SFT).****Centre :- Kalahandi (c.f.).****Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers applied at different levels for Potato.

1. BASAL CONDITIONS

(i) (a) to (c) N.A. (ii) Red loam. (iii) to (v) N.A. (vi) Oct.—Nov. (vii) Irrigated. (vi.i) and (ix) N A. (x) Feb.—March.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 141 conducted at Dhenkanal.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	2469	9627	10615	6171	11520	11191	6254

G.M.=8264 lb./ac. ; S.E.=N.A. and no. of trials=2.

Crop :- Potato.**Ref :- Or. 58(SFT).****Centre :- Mayurbhanj (c.f.).****Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers applied at different levels for Potato.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 141 conducted at Dhenkanal.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	3703	4773	7323	5760	6830	5143	9792

G.M.=6189 lb./ac. ; S.E.=884.4 lb./ac. and no. of trials=4.

Crop :- Potato.**Ref :- Or. 59(SFT).****Centre :- Mayurbhanj (c.f.).****Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers applied at different levels for Potato.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) Type B on page 141 conducted at Dhenkanal.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	11026	12096	14318	14647	15963	15470	17445

G.M.=14424 lb./ac. ; S.E.=441.0 lb./ac. and no. of trials=2.

Crop :- Potato (Rabi).**Ref :- Or. 58(SFT).****Centre :- Puri (c.f.).****Type :- 'M'.**

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers applied at different levels for Potato

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red alluvial. (iii) to (v) N.A. (vi) Oct.—Nov. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Feb.—March.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58 (SFT) Type B on page 141 conducted at Dhenkanal.

4. GENERAL :

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

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	3728	7159	7620	6608	7134	6114	6608

G.M.=6424 lb./ac. ; S.E.=512.0 lb./ac. and no. of trials = 4.

Crop :- Potato (Rabi).

Ref :- Or. 59 (SFT).

Centre :- Puri (c.f.).

Type :- 'M'.

Object :—Type B—To investigate the relative efficiency of different nitrogenous fertilizers applied at different levels for Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red alluvial. (iii) to (v) N.A. (vi) Oct.—Nov. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Feb.—March.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59 (SFT) Type B on page 141 conducted at Balasore.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1''	n_2''
Av. yield	5620	7579	8130	7801	8582	7603	9364

G.M.=7811 lb./ac. ; S.E.=674.9 lb./ac. and no. of trials = 6.

Crop :- Potato (Rabi).

Ref :- Or. 54(17).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'C'.

Object :—To find out the proper size of Potato seeds.

1. BASAL CONDITIONS :

(i) (a) No. (b) *Dhaincha*. (c) Nil. (ii) (a) Clay loam. (b) N and K_2O : quantity N.A. ; pH 6.3 ; % organic carbon : 0.75 ; P_2O_5 9.2 lb./ac. and % T.S.S. 0.3. (iii) 29, 30.10.1954. (iv) (a) 6 ploughings with country plough to 4"—6" depth. (b) Sown in flat beds. (c) N.A. (d) 18"×9". (e) One tuber/hole. (v) 1 sr./plot of A/S sr./plot of Super at the time of sowing (30.10.1954 and 1.11.1954) and 1 sr./plot of A/S on 28/30.11.1954. (vi) N.A. (vii) Irrigated. (viii) 2 earthings. (ix) 0 18". (x) N.A.

2. TREATMENTS :

5 suth size of seed : $S_1=4$, $S_2=5$, $S_3=6$, $S_4=7$ and $S_5=8$ suth.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 55'×9'. (v) One row around the net plot. (vi) Yes.

4. GENERAL :

(i) Germination good ; growth better. (ii) Affected by virus. Measures taken—N.A. (iii) Tuber yield. (iv) (a) to (c) No. (v) (a) and (b) N.A. (vi) 4 suth size is approximately $\frac{1}{2}$ " in diameter. (vii) Nil.

5. RESULTS :

(i) 3901 lb./ac. (ii) 1041 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of tuber in lb./ac.

Treatment	S ₁	S ₂	S ₃	S ₄	S ₅
Av. yield	2664	3302	4325	4413	4802

S.E./mean = 521 lb./ac.

Crop :- Potato (Rabi).

Ref :- Or. 59(50).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'C'.

Object :—To find out the suitable dates of sowing for Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 5 ploughings and trampling. (b) Sowing in lines. (c) N.A. (d) 18"×9". (e) 1 tuber/hole. (v) 80 lb./ac. of N as A/S+60 lb./ac. of P₂O₅ as Super+48 lb./ac. of K₂O and green manuring with sannhemp one month after sowing. (vi) Patna—red. (vii) Irrigated. (viii) 2 hoeings and 1 earthing. (ix) N.A. (x) 17, 24.2.1959; 3, 24.3.1959; 4.4.1959.

2. TREATMENTS :

5 dates of sowing : D₁=25.10.1959, D₂=10.11.1959, D₃=25.11.1959, D₄=10.12.1959 and D₅=25.12.1959.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 28'×16½'. (b) 26½'×15½'. (v) One row around the plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) *Epilachna* beetle—Gammexane sprayed. Early and late blight of potato; Shell copper fungicide sprayed. (iii) Tuber yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1223 lb./ac. (ii) 190 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tuber in lb./ac.

Treatment	D ₁	D ₂	D ₃	D ₄	D ₅
Av. yield	2208	1213	956	1252	487

S.E./mean = 95 lb./ac.

Crop :- Potato (Rabi).

Ref :- Or. 59(45).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'C'.

Object :—To find out suitable spacing and best method of planting for Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sannhemp for seed. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 16.11.1959. (iv) (a) 6 ploughings, 3 ladderings, 1 hoeing and 1 earthing with *deshi* plough. (b) As per treatments (c) N.A. (d) As per treatments. (e) 1. (v) F.Y.M. at 181 mds/ac., 80 lb./ac. of N as A/S., 60 lb./ac. of P₂O₅ as Super and 40 lb./ac. of K₂O as K₂SO₄. (vi) Patna—red. (vii) Irrigated. (viii) One hoeing and earthing up. (ix) N.A. (x) 19.2.1960.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 spacings : S₁=18"×6" and S₂=24"×6".

(2) 3 methods of planting : M₁=In flat beds, M₂=On ridges and M₃=In furrows.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) 80'×16'. (iii) 4. (iv) (a) 16'×12'. (b) N.A. (v) 2 lines and 2 plants of each line 6" apart. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Shell copper fungicide sprayed to prevent early blight. (iii) Tuber yield. (iv) (a) to (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 11622 lb./ac. (ii) 1875 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of tuber in lb./ac.

	M ₁	M ₂	M ₃	Mean
S ₁	12282	11989	10632	11634
S ₂	10750	12094	11988	11611
Mean	11516	12042	11310	11622

S.E. of S marginal mean = 663 lb./ac.

S.E. of M marginal mean = 541 lb./ac.

S.E. of body of table = 938 lb./ac.

Crop :- Tomato (Rabi).

Ref :- Or. 59(18).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'D'.

Object :- To find out the relative toxicities of insecticides to control Nematode wilt of Tomato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Bhindi*. (c) 20 C.L./ac. of F.Y.M. (ii) (a) Sandy loam. (b) N.A. (iii) 25.11.1959. (iv) (a) 2 ploughings with country plough 3" deep. (b) Transplanted. (c) N.A. (d) 1½' between rows. (e) N.A. (v) 20 lb./ac. of N as A/S.+20 lb./ac. of N as G.N.C. (vi) Local (late). (vii) Irrigated. (viii) One weeding. (ix) N.A. (x) 15 pickings at intervals of 3 days.

2. TREATMENTS :

3 dustings : D₀=Control, D₁=Nimagon (0.04%) and D₂=Diazinon (0.04%).

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) 16'×16'. (b) 14'×14'. (v) 1 row on either side. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nematode wilt—control measures as per treatments. Phoma-rot fungus—Copper sulphate sprayed. (iii) Percentage plants affected by wilt and yield. (iv) (a) 1959—Nil. (b) Nil. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 19.01%. (ii) 9.84% (iii) Treatment differences are not significant. (iv) Percentage number of plants affected by wilt.

Treatment	D ₀	D ₁	D ₂
Mean Percentage	24.24	16.88	15.90

S.E./mean = 4.40%

Crop :- Sweet Potato (Kharif).

Ref :- Or. 54(9).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :- To study the effect of N, P and K along with bulky organic manures on Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet Potato. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 27.6.1954 ; 29 to 31.7.1954 ; 1 to 5.8.1954 ; 25 to 27.8.1954 and 11 to 14.9.1954. (iv) (a) 4 ploughings. (b) Planting on ridges. (c) N.A. (d) 3'×1'. (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) Earthing levelling and training of vines. (ix) N.A. (x) 24 to 26, 30, 31.12.1954 ; 1 to 4, 8 to 9, 16 to 18, 28 to 31.1.1955 ; 1, 2.2.1955.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

- (1) 3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.
 (2) 3 levels of K_2O as K_2SO_4 : $K_0=0$, $K_1=80$ and $K_2=160$ lb./ac.

Sub-plot treatments :

2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=80$ lb./ac.

1000 lb./ac. of compost and 2000 lb./ac. of green leaf each was applied to 2 pairs of replications, the third pair was not treated with any manure in basal dressing. Super was applied during 29.7.1954 to 5.8.1954, A/S during 25 to 27.8.1954, K_2SO_4 during 11 to 14.9.1954 and compost and green leaf on 27.6.1954.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 42'×5'. (b) 40'×9'. (v) 1'×3'. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Sweet potato weevil. (iii) Tuber yield. (iv) (a) 1952—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) Replications were treated in pairs with bulky manures and analysis was done accordingly.

5. RESULTS :

(i) 3237 lb./ac. (ii) (a) 1556 lb./ac. (b) 1240 lb./ac. (iii) Main effect of organic manures is highly significant. Main effect of P and K are significant. (iv) Av. yield of tuber in lb./ac.

No manure = 2115, green leaf = 4148 and compost = 3448 lb./ac.

	K_0	K_1	K_2	Mean	P_0	P_1
N_0	2889	3332	3315	3178	2875	3482
N_1	2747	3238	4497	3494	3058	3931
N_2	2376	3377	3363	3039	3008	3070
Mean	2671	3316	3725	3237	2980	3494
P_0	2474	3098	3369			
P_1	2868	3533	4082			

S.E. of difference of two

1. N or K marginal means = 367 lb./ac.
 2. P marginal means = 239 lb./ac.
 3. P means at the same level of N or K = 413 lb./ac.
 4. N or K means at the same level of P = 469 lb./ac.
 5. means of organic manures = 367 lb./ac.
 S.E. of body of N×K table = 449 lb./ac.

Crop :- Sweet Potato.

Ref :- Or. 55(4).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :- To study the effect of N, P and K along with bulky organic manures on Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet potato. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) 6 ploughings and laddering. (b) Planting on ridges. (c) N.A. (d) 3' x 1'. (e) N.A. (v) As per treatments. (vi) N.A. (vii) Unirrigated. (viii) Gap-filling and earthing up. (ix) N.A. (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(9) on page 146.

4. GENERAL :

(i) Poor. (ii) Sweet potato weevil. (iii) Tuber yield. (iv) (a) 1952—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) Replications were treated in pairs with bulky manures and the analysis was done accordingly.

5. RESULTS :

(i) 3352 lb./ac. (ii) (a) 546 lb./ac. (b) 207 lb./ac. (iii) All the effects except interaction P x K are highly significant. (iv) Av. yield of tuber in lb./ac.

No manure = 3810, green leaf = 2100 and compost = 4148 lb./ac.

	K ₀	K ₁	K ₂	Mean	P ₀	P ₁
N ₀	2532	3043	2279	2618	2365	2870
N ₁	2774	3104	4024	3300	3376	3224
N ₂	4457	3387	4573	4139	4004	4275
Mean	3254	3178	3625	3352	3248	3456
P ₀	3207	3030	3508			
P ₁	3301	3326	3742			

S.E. of difference of two

- | | |
|--|---------------|
| 1. N or K marginal means | = 129 lb./ac. |
| 2. P marginal means | = 40 lb./ac. |
| 3. P means at the same level of N or K | = 69 lb./ac. |
| 4. N or K means at the same level of P | = 138 lb./ac. |
| 5. means of organic manures | = 129 lb./ac. |
| S.E. of body of N x K table | = 158 lb./ac. |

Crop :- Sweet Potato.

Ref :- Or. 56(14).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To study the effect of N, P and K along with bulky organic manures on Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet potato. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) 6 ploughings and laddering. (b) Planting on ridges. (c) N.A. (d) 3' x 1'. (e) N.A. (v) As per treatments. (vi) N.A. (vii) Unirrigated. (viii) Gap-fillings and earthing up. (ix) and (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(9) on page 146.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Tuber yield. (iv) (a) 1952—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) Replications were treated in pairs with bulky manures and the analysis was done accordingly.

5. RESULTS :

(i) 666 lb./ac. (ii) (a) 459 lb./ac. (b) 335 lb./ac. (iii) Main effects of N, K and organic manures are highly significant. No other effect is significant. (iv) Av. yield of tuber in lb./ac.

No. Compost = 489 lb./ac. ; Compost = 634 lb./ac. and G.M. = 877 lb./ac.

	K ₀	K ₁	K ₂	Mean	P ₀	P ₁
N ₀	496	919	1115	843	838	849
N ₁	404	662	1087	718	712	723
N ₂	246	509	559	438	400	477
Mean	382	697	920	666	650	683
P ₀	348	753	849			
P ₁	416	641	992			

S.E. of difference of two

1. N or K marginal means = 108 lb./ac.
 2. P marginal means = 64 lb./ac.
 3. P means at the same level of N of K = 112 lb./ac.
 4. N or K means at the same level of P = 134 lb./ac.
 5. means of organic manures = 108 lb./ac.
- S.E. of body of N×K table = 132 lb./ac.

Crop :- Sweet Potato (Kharif).

Ref :- Or. 54(12).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'C'

Object :—To study the effect of spacings and method of planting on Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 5 to 7.7.1954. Gap-filling on 14.8.1954. (iv) (a) N.A. (b) As per treatments. (c) N.A. (d) As per treatments. (e) N.A. (v) 50 lb./ac. of N as A/S and F.Y.M. were applied. (vi) N.A. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) N.A. (x) 14 to 19.12.1954 and 28 and 29.1.1955.

2. TREATMENTS :

Main-plot treatments :

6 combinations of spacing and method of planting : M₁S₁=1', M₁S₂=2' and M₁S₃=3' (spacings between rows with flat beds) ; M₂R₁=2', M₂R₂=3' and M₂R₃=4' (between ridges with ridge planting).

Sub-plot treatments :

3 spacings between plants : D₁=6", D₂=9" and D₃=12".

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a, and (b) 42'×12'. (v) One row on either side of the main-plot and 1'6" at either end (D₁ and D₂) and 2' around (D₃). (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Sweet potato weevil. (iii) Tuber yield. (iv) (a) 1954—N.A. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2231 lb./ac. (ii) (a) 1770 lb./ac. (b) 483 lb./ac. (iii) None of the effects is significant. (iv) Av yield of tuber in lb./ac.

	M ₁ S ₁	M ₁ S ₂	M ₁ S ₃	M ₂ R ₁	M ₂ R ₂	M ₂ R ₃	Mean
D ₁	3276	1511	2685	1564	1870	2786	2282
D ₂	2550	1403	2382	1845	2069	2866	2186
D ₃	3140	1583	1795	1796	1937	3116	2228
Mean	2989	1499	2287	1735	1959	2923	2231

S.E. of difference of two

1. MS or MR marginal means = 723 lb./ac.
2. D marginal means = 139 lb./ac.
3. D means at the same level of MS or MR = 342 lb./ac.
4. MS or MR means at the same level of D = 775 lb./ac.

Crop :- Sweet Potato.**Ref :- Or. 55(6).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'C'.**

Object :—To study the effect of spacing and methods of planting on Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) Ploughings, levelling and laddering. (b) As per treatments. (c) N.A. (d) As per treatments. (e) N.A. (v) 40 lb./ac. of N as A/S+cattle dung. (vi) N.A. (vii) Irrigated. (viii) Weedings and hoeing. (ix) and (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(12) on page 149.

4. GENERAL :

(i) Normal. (ii) Weevil—reduced to 50% compared to previous year by treating the vines with Dieldrine before planting. (iii) Tuber yield. (iv) (a) 1952—contd. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 5951 lb./ac. (ii) (a) 3639 lb./ac. (b) 1387 lb./ac. (iii) Only main effect of D is highly significant. (iv) Av. yield of tuber in lb./ac.

	M ₁ S ₁	M ₁ S ₂	M ₁ S ₃	M ₂ R ₁	M ₂ R ₂	M ₂ R ₃	Mean
D ₁	7525	6636	5450	5958	6829	6936	6556
D ₂	7625	4965	4220	5203	5007	7269	5815
D ₃	5542	5124	4613	5340	5337	6939	5482
Mean	6897	5575	4761	5500	5924	7048	5951

S.E. of difference of two

1. MS or MR marginal means = 1486 lb./ac.
2. D marginal means = 400 lb./ac.
3. D means at the same level of MS or MR = 981 lb./ac.
4. MS or MR means at the same level of D = 1686 lb./ac.

Crop :- Sweet Potato.**Ref :- Or. 56(15).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'C'.**

Object :—To study the effect of spacing and methods of planting on Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 11 to 17.5.1956. (iv) (a) 4 ploughings. (b) As per treatments. (c) N.A. (d) As per treatments. (e) N.A. (v) 40 lb./ac. of N as A/S; F.Y.M. applied on 18.7.1956. (vi) N.A. (vii) Unirrigated. (viii) Two weedings. (ix) N.A. (x) 9.11.1956. to 18.11.1956.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(12) on page 149.

4. GENERAL :

(i) and (ii) N.A. (iii) Tuber yield. (iv) (a) 1952—1956. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1376 lb./ac. (ii) (a) 933 lb./ac. (b) 387 lb./ac. (iii) Main effects of MS and MR are highly significant. (iv) Av. yield of tuber in lb./ac.

	M ₁ S ₁	M ₁ S ₂	M ₁ S ₃	M ₂ R ₁	M ₂ R ₂	M ₂ R ₃	Mean
D ₁	1437	194	419	1959	2034	3077	1520
D ₂	978	257	413	1545	1972	3028	1365
D ₃	846	132	254	1201	2323	2709	1244
Mean	1087	194	362	1568	2110	2938	1376

S.E. of difference of two

1. MS or MR marginal means =381 lb./ac.
2. D marginal means =112 lb./ac.
3. D means at the same level of MS or MR =274 lb./ac.
4. MS or MR means at the same level of D =442 lb./ac.

Crop :- Sweet Potato (*Kharif*).

Ref :- Or. 57(15).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'D'.

Object :—To study the effect of different insecticides in order to control Sweet Potato weevil.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 20.9.1957. (iv) (a) to (c) N.A. (d) 4' between ridges. (e) N.A. (v) 20 C.L./ac. of F.Y.M. (vi) Local. (vii) Unirrigated. (viii) 2 weedings and earthing up. (ix) N.A. (x) 25.1.1958.

2. TREATMENTS :

Main-plot treatments :

2 treatments of insecticide : T₁= spraying and T₂=dipping the seeds and spraying.

Sub-plot treatments :

4 insecticides : D₀=Control, D₁=Aldrine (0.3%), D₂=Endrine (0.08%) and D₃=D.D.T (0.28%)

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 16'×15'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Average. (ii) Weevil attack. Control measures as per treatments. (iii) Count of infested tuber and yield. (iv) (a) 1957—Nil. (b) and (c) N.A. (v) (a) and (b) Nil. (vi) and Nil.

5. RESULTS :

(i) 282 lb./ac. (ii) (a) 343 lb./ac. (b) 173 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of tuber in lb./ac.

	D ₀	D ₁	D ₂	D ₃	Mean
T ₁	357	369	312	150	297
T ₂	261	320	173	318	268
Mean	309	344	242	234	282

S.E. of difference of two

1. T marginal means	= 121.0 lb./ac.
2. D marginal means	= 86.5 lb./ac.
3. D means at the same level of T	= 122.0 lb./ac.
4. T means at the same level of D	= 161.0 lb./ac.

Crop :- Sweet Potato (Rabi).**Ref :- Or. 57(23).****Site :- Agri. Res. Stn., Sambalpur.****Type :- 'D'.**

Object :—To study the effect of different insecticides in order to control Sweet Potato weevil.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 5.10.1956. (iv) (a) N.A. (b) Planted in ridges. (c) 65 cuttings/plot. (d) 2' x 1'. (e) 1. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Hoeing and earthing. (ix) N.A. (x) 25.4.1957.

2. TREATMENTS :

- Control.
- Parathion 0.04%.
- Dieldrine e.c. 0.15%.
- Chlorodine 0.15%.

Insecticides were applied in 2 sprays at 40-60 gallons/ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 15' x 10'. (v) 1' around the net plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Sweet potato weevil; control measures as per treatments. (iii) No. of effected tubers, no. of healthy tubers and yield. (iv) (a) to (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 5853 lb./ac. (ii) 1326 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of tuber in lb./ac.

Treatment	1	2	3	4
Av. yield	6973	5298	5602	5538

S.E./mean = 663 lb/ac.

Crop :- Yam (Kharif).**Ref :- Or. 54(14).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To find out the effect of N, P and K with and without compost as basal dressing on Yam.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 21 and 22.6.1954. (iv) (a) Summer poughing. (b) In pits of 1½' diameter and 1½' depth. (c) N.A. (d) 3' x 3'. (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) Single stalks were given to individual plots after a fortnight, then pendals were erected. (ix) N.A. (x) 30 and 31.12.1954 to 24.1.1955.

2. TREATMENTS :

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

- 2 levels of N of A/S : $N_0=0$ and $N_1=50$ lb./ac.
- 2 levels of P of Super : $P_0=0$ and $P_1=50$ lb./ac.
- 2 levels of K of K_2O : $K_0=0$ and $K_1=80$ lb./ac.

Compost was applied at 4000 lb./ac. in a pair of replications while in the other pairs no compost was given Super, A/S, and K_2O were applied on 24.7.1954, 24.8.1954 and 27.8.1954 respectively

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 12'×12'. (b) 6'×6'. (v) 3' around the net plot. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Tuber yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 13336 lb./ac. (ii) 401 lb./ac. (iii) Treatment differences are highly significant. Effect of N is highly significant. (iv) Av. yie'd of yam in lb./ac.

Compost = 14934 lb./ac. and no compost = 11739 lb./ac.

	P ₀	P ₁	Mean	K ₀	K ₁
N ₀	10264	11371	10818	9064	12570
N ₁	16332	15379	15854	15936	15775
Mean	13298	13375.	13336	12500	14173
K ₀	12493	12507			
K ₁	14103	14243			

S.E. of any marginal mean = 100.3 lb./ac.

S.E. of body of any table = 141.7 lb./ac.

Crop :- Yam.

Site :- Agri. Res. Stn., Bhubaneswar.

Ref :- Or. 56(11).

Type :- 'M'.

Object :—To find out the effect of N, P and K with and without compost as basal dressing on Yam.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) Summer ploughing (b) In pits of 1½' diameter and 1½' depth. (c) N.A. (d) 3'×3'. (e) —. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

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

(1) 2 levels of N : N₀=0 and N₁=50 lb./ac.

(2) 2 levels of P : P₀=0 and P₁=50 lb./ac.

(3) 2 levels of K : K₀=0 and K₁=80 lb./ac.

Compost was applied at 4,000 lb./ac. in a pair of replications while for the other pair no compost was given.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 12'×12'. (b) 6'×6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of tuber. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 13237 lb./ac. (ii) 4295 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of tuber in lb./ac.

Compost=12108 lb./ac. and no compost=14366 lb./ac.

	P ₀	P ₁	Mean	K ₀	K ₁
N ₀	13103	13263	13183	13529	12837
N ₁	12923	13559	13291	13526	13056
Mean	13012	13460	13237	13528	12947
K ₀	13679	13377			
K ₁	12347	13546			

S.E. of any marginal mean = 1074 lb./ac.
 S.E. of body of any table = 1518 lb./ac.

Crop :- Tapioca.**Ref :- Or. 54(11).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :- To study the effect of N, P and K with and without basal dose of compost on Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 24.6.1954. (iv) (a) 3 ploughings and laddering. (b) Planting on ridges. (c) N.A. (d) 3' x 3'. (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) Weeding, hoeing and gap-filling. (ix) N.A. (x) 8.5.1955 to 19.6.1955.

2. TREATMENTS :**Main-plot treatments :**

All combination of (1) and (2)

(1) 3 levels of N : N₀=0, N₁=50 and N₂=100 lb./ac.(2) 3 levels of K₂O : K₀=0, K₁=80 and K₂=160 lb./ac.**Sub-plot treatments :**2 levels of P₂O₅ : P₀=0 and P₁=50 lb./ac.A/S applied on 23.8.1954, Super on 17.8.1954 and K₂SO₄ on 10.9.1954. Compost was applied at 4000 lb./ac. in a pair of replications while for the other pair no compost was given.**3. DESIGN :**

(i) Split-plot. (ii) (a) 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 15' x 9'. (b) 9' x 3'. (v) Double guard rows were left between adjoining plots. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Yield of tapioca. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 9891 lb./ac. (ii) (a) 5485 lb./ac. (b) 3211 lb./ac. (iii) Only N and K effects are highly significant. (iv) Av. yield of tapioca in lb./ac.

Compost=10448 lb./ac. and no compost=9335 lb./ac.

	K ₀	K ₁	K ₂	Mean	P ₀	P ₁
N ₀	5859	6941	6918	6573	5796	7350
N ₁	10506	11423	14323	12084	12802	11368
N ₂	12456	9864	10730	11017	10078	11956
Mean	9607	9409	1057	9891	9559	10225
P ₀	8946	9386	10344			
P ₁	10269	9434	10971			

S.E. of difference of two

1. N or K marginal means	= 1293 lb./ac.
2. P marginal means	= 618 lb./ac.
3. P means at the same level of N or K	= 1070 lb./ac.
4. N or K means at the same level of P	= 1498 lb./ac.
S.E. of body of N×K table	= 1583 lb./ac.

Crop :- Tapioca.**Ref :- Or. 56(12).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To find out the effect of N, P and K with and without basal dose of compost on Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) 4 ploughings and laddering. (b) Planting on ridges. (c) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated (viii) Weeding, hoeing and gap-filling. (ix) N.A. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

- (1) 3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.
 (2) 3 levels of K_2O : $K_0=0$, $K_1=80$ and $K_2=160$ lb./ac.

Sub-plot treatments :2 levels of P_2O_5 : $P_0=0$ and $P_1=50$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) a) 15'×9'. (b) 9'×3'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Yield of tapioca. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 14663 lb./ac. (ii) (a) 6986 lb./ac. (b) 7163 lb./ac- (iii) None of the effects is significant. (iv) Av. yield of tapioca in lb./ac.

	K_0	K_1	K_2	Mean	P_0	P_1
N_0	9392	15471	14026	12963	14010	11517
N_1	15041	17288	16818	16382	15106	16660
N_2	13319	14938	15672	14643	16523	12763
Mean	12584	15899	15505	14663	15546	13780
P_0	13056	16317	17266			
P_1	12113	15432	13746			

S.E. of difference of two

1. N or K marginal means	= 1547 lb./ac.
2. P marginal means	= 1378 lb./ac.
3. P means at the same level of N or K	= 2388 lb./ac.
4. N or K means at the same level of P	= 2562 lb./ac.
S.E. of body of N×K table	= 2017 lb./ac.

Crop :- Tapioca.**Ref :- Or. 54(10).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'C'.**

Object :—To study the effect of different spacings and methods of planting on Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 6 and 7.6.1954. (iv) (a) 4 ploughings and laddering. Ridging sets were cut and coal tar applied to both the ends. (b) As per treatments. (c) N.A. (d) As per treatments. (e) —. (v) F.Y.M. applied. (vi) N.A. (vii) Irrigated. (viii) Gap-filling, weeding and earthing up. (ix) N.A. (x) 19.1.1955 to 4.2.1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 methods of planting : M_1 = In ridges and M_2 = On mounds.(2) 3 spacings : $S_1 = 2' \times 2'$, $S_2 = 4' \times 4'$ and $S_3 = 6' \times 6'$.**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) For S_1 : $30' \times 16'$; for S_2 : $30' \times 20'$ and for S_3 : $30' \times 24'$. (b) $24' \times 12'$ for all. (v) 3' on either side along breadth and 1 row of plants on either side along length. (vi) Yes.

4. GENERAL :

(i) Normal growth. (ii) Damage due to rats. (iii) Yield of tapioca. (iv) (a) 1952—1954. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 10227 lb./ac. (ii) 2833 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of tapioca in lb./ac.

	S_1	S_2	S_3	Mean
M_1	11000	9029	9568	9866
M_2	11409	12007	8347	10588
Mean	11205	10518	8958	10227
S.E. of marginal mean of S				= 1002 lb./ac.
S.E. of marginal mean of M				= 818 lb./ac.
S.E. of body of table				= 1416 lb./ac.

Crop :- Tapioca.**Ref :- Or. 56(13).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'C'.**

Object :—To find out the effect of spacing and methods of planting on Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) 4 ploughings, laddering, ridging sets were cut and coal tar applied to both the ends. (b) As per treatments. (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Gap-filling, weeding and earthing up. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 54(10) above.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $24' \times 12'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1952—1956. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 6479 lb./ac. (ii) 2210 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of tapioca in lb /ac.

	S ₁	S ₂	S ₃	Mean
M ₁	9722	5110	5971	6934
M ₂	5979	6560	5530	6023
Mean	7851	5835	5751	6479

S.E. of marginal mean of S = 781 lb./ac.

S.E. of marginal mean of M = 638 lb./ac.

S.E. of body of table = 1105 lb./ac.

Crop :- Colocasia.

Ref :- Or. 54(13).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To study the effect of N, P, K along with organic manures on Colocasia.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) and (c) N.A. (ii) Sandy loam. (b) N.A. (iii) 28.6.1954. (iv) (a) Ploughing and laddering. (b) N.A. (c) N.A. (d) 2'×1'. (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) Hoeing, weeding and earthing up ; gap-filling on 23.7.1954. (ix) N.A. (x) 11, 19, 25 and 29.1955.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N₀=0, N₁=50 and N₂=100 lb./ac.

(2) 3 levels of K₂O as Pot Sul. : K₀=0, K₁=80, and K₂=160 lb./ac.

Sub-plot treatments :

2 levels of P₂O₅ as Super : P₀=0 and P₁=50 lb./ac.

4000 lb. ac. of compost was applied to a pair of replications and no compost to the other pair. A, S, Super and Pot. Sul. were applied on 23.8.1954, 26.7.1954 and 7.9.1954 respectively.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 18'×12' (main-plot) 12'×9' (sub-plot). (b) 8'×7'. (v) Double guard rows left. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tuber yield. (iv) (a) 1953—contd. (b) and (c) No. (v) (a) and (b) Nil. (vi) Nil. (vii) Replications were treated with bulky manures in pairs and the analysis was done accordingly.

5. RESULTS :

(i) 4372 lb./ac. (ii) (a) 1799 lb./ac. (b) 3985 lb./ac. (iii) Main effect of N is highly significant. Main effect of K is significant. Other effects are not significant. (iv) Av. yield of tuber in lb./ac.

No compost=4312 and compost=4433 lb./ac.

	K ₀	K ₁	K ₂	Mean	P ₀	P ₁
N ₀	2234	2110	2974	2440	2295	2583
N ₁	3894	5573	5672	5046	4236	5856
N ₂	4754	5697	6438	5630	5194	6064
Mean	3627	4460	5028	4372	3908	4834
P ₀	3375	4129	4222			
P ₁	3879	4791	5833			

S.E. of difference of two

1. N or K marginal means	=	519 lb./ac.
2. P marginal means	=	939 lb./ac.
3. P means at the same level of N or K	=	1627 lb./ac.
4. N or K means at the same level of P	=	1262 lb./ac.
5. organic manure means	=	424 lb./ac.
S.E. of body of N×K table	=	636 lb./ac.

Crop :- Colocasia.**Ref :- Or. 55(5).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To study the effect of N, P, K along with organic manures on Colocasia.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) Ploughing and laddering (b) and (c) N.A. (d) 2'×1'. (e) N.A. (v) As per treatments. (vi) N.A. (vii) Unirrigated. (viii) Earthing up. (ix) N.A. (x) N.A.

2. TREATMENTS :

Same as in expt. no 54 (13) on page 157.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block, 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12'×9'. (b) 8'×7'. (v) Double guard rows left. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Tuber yield. (iv) (a) 1953—contd. (b) and (c) No. (v) (a) and (b) Nil. (vi) Nil. (vii) Replications were treated with bulky manures in pairs and the analysis was done accordingly.

5. RESULTS :

(i) 5490 lb./ac. (ii) (a) 2489 lb./ac. (b) 723 lb./ac. (iii) Only interactions N×P and K×P are significant. (iv) Av. yield of tuber in lb./ac.

No compost = 5028 and compost = 5952 lb./ac.

	K ₀	K ₁	K ₂	Mean	P ₀	P ₁
N ₀	4345	5985	6659	5663	5242	6085
N ₁	6058	5171	5001	5410	5514	5306
N ₂	5930	4545	5717	5397	5237	5558
Mean	5444	5234	5792	5490	5331	5650
P ₀	5055	5307	5630			
P ₁	5834	5160	5954			

S.E. of difference of two

1. N or K marginal means	=	719 lb./ac.
2. P marginal means	=	170 lb./ac.
3. P mean at the same level of N or K	=	295 lb./ac.
4. N or K means at the same level of P	=	748 lb./ac.
5. organic manures means	=	587 lb./ac.
S.E. of body of N×K table	=	880 lb./ac.

Crop :- Colocasia.**Ref :- Or. 56(16).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To study the effect of N, P, K along with organic manures on Colocasia.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) Ploughing and laddering. (b) (c) N.A. (v) As per treatments. (vi) N.A. (vii) Unirrigated. (viii) Earthing up. (ix) and (x) N.A.

2. TREATMENTS:

Same as in expt. no. 54(13) on page 157.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Tuber yield. (iv) (a) 1953—contd. (b) and (c) No. (v) (a) and (b) Nil. (vi) Nil. (vii) Replications were treated in pairs with bulky manures and the analysis was done accordingly. As the plot size is not available, means etc. in the results are given in lb./plot.

5. RESULTS :

(i) 7.17 lb./plot. (ii) (a) 2.64 lb./plot. (b) 2.20 lb./plot. (iii) Main effects of N, K and interaction N×K are highly significant. Interaction N×P is significant. (iv) Av. yield of tuber in lb./plot.

No compost = 6.94 lb./plot and compost = 7.40 lb./plot.

	K ₀	K ₁	K ₂	Mean	P ₀	P ₁
N ₀	5.11	6.33	5.36	5.60	5.15	6.05
N ₁	5.31	9.47	8.16	7.64	9.10	6.19
N ₂	6.31	6.90	11.59	8.27	8.32	8.22
Mean	5.58	7.57	8.37	7.17	7.52	6.82
P ₀	5.39	7.71	9.46			
P ₁	5.76	7.43	7.27			

S.E. of difference of two

1. N or K marginal means = 0.76 lb./plot.
2. P marginal means = 0.52 lb./plot.
3. P means at the same level of N or K = 0.90 lb./plot.
4. N or K means at the same level of P = 0.99 lb./plot.
5. means of organic manure = 0.62 lb./plot.
- S.E. of body of N×K table = 0.93 lb./plot.

Crop :- Arrow-root (Kharif).

Ref :- Or. 53(20).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To study the effect of N, P and K manuring on Arrowroot.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Arrow-root. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 13.7.1958. (iv) (a) 3 ploughings with country plough to 3" depth followed by laddering. (b) In flat beds and ridges. (c) N.A. (d) 2'×1'. (e) 1. (v) 5 to 6 C.L./ac. of F.Y.M. (vi) Local. (vii) Irrigated. (viii) 4 hoeings and weeding. (ix) N.A. (x) 18.4.1959.

2. TREATMENTS :

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

- (1) 2 levels of N as A/S : N₁=20 and N₂=60 lb./ac.
- (2) 2 levels of P₂O₅ as Super : P₁=20 and P₂=80 lb./ac.
- (3) 2 levels of K₂O as Pot. Sul. : K₁=20 and K₂=60 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) 96'×17'. (iii) 4. (iv) (a) 9'9"×13'. (b) 7'9"×9'. (v) 1'×2" around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tuber yield. (iv) (a) 1957-1958. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 4719 lb./ac. (ii) 1340 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of tuber in lb./ac.

	P ₁	P ₂	Mean	K ₁	K ₂
N ₁	4206	4694	4450	4001	4899
N ₂	4894	5080	4987	4894	5080
Mean	4550	4887	4719	4448	4989
K ₁	4226	4670			
K ₂	4875	5104			

S.E. of any marginal mean = 335 lb./ac.
S.E. of body of any table = 474 lb./ac.

Crop :- Ginger.

Ref :- Or. 56(20).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'C'.

Object :- To determine the optimum spacing and methods of planting for Ginger.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 12.7.1956. (iv) (a) N.A. (b) As per treatments. (c) N.A. (d) As per treatments. (e) N.A. (v) N at 30 lb./ac. P₂O₅ at 60 lb./ac. and K₂O at 60 lb./ac. applied on 14th Aug. and 24th Nov. 1956. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 methods of planting : M₁=Flat beds, M₂=Ridges and M₃=Flat beds converted into ridges.

Sub-plot treatments :

3 spacings : S₁=6", S₂=9" and S₃=12".

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 3'×6'. (b) 2'×3' for 6" spacing, 1½'×3' for 9" spacing and 1'×3' for 12" spacing. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of rhizomes. (iv) (a) 1956-N.A. (b) and (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 4647 lb./ac. (ii) (a) 3474 lb./ac. (b) 1653 lb./ac. (iii) Main effects of M and S and interaction M×S are significant. (iv) Av. yield of ginger in lb./ac.

	S ₁	S ₂	S ₃	Mean
M ₁	2779	2067	2533	2460
M ₂	6069	4563	5634	5422
M ₃	4386	5243	8545	6058
Mean	4411	3958	5571	4647

S.E. of difference of two

1. M marginal means	=	1158 lb./ac.
2. S marginal means	=	551 lb./ac.
3. S means at the same level of M	=	954 lb./ac.
4. M means at the same level of S	=	1396 lb./ac.

Crop :- Arhar (Kharif).**Ref :- Or. 55(13).****Site :- Agri. Res. Stn., Sambalpur.****Type :- 'M'.**

Object :—To find the suitable dose and method of application of phosphatic manures to Arhar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay. (b) N.A. (iii) 11 and 12.7.1955. (iv) (a) 4 ploughings and 2 ladderings to 4" depth by country plough. (b) Sowing in lines. (c) 4 srs/ac. (d) 2' x 1½'. (e) 2. (v) Nil. (vi) A-64 (spreading type). (vii) Unirrigated. (viii) 2 weedings, hoeing and earthing. (ix) 57.97". (x) 28.1.1956.

2. TREATMENTS :**Main-plot treatments :**

2 methods of application : M_1 = Applied in ring around the seed and M_2 = Placing the fertilizers in rows 3" below the soil surface.

Sub-plot treatments :

4 levels of P_2O_5 : $P_0=0$, $P_1=20$, $P_2=40$ and $P_3=60$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 4' x 33', 11' x 33'. (b) 8' x 29'. (v) One row around the net plot. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Height, spread and yield of grain. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 727 lb./ac. (ii) (a) 369.9 lb./ac. (b) 124.37 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	Mean
M_1	689	666	804	713	718
M_2	789	613	822	716	735
Mean	739	640	813	715	727

S.E. of difference of two

1. M marginal means	=	62.14 lb./ac.
2. P marginal means	=	184.9 lb./ac.
3. P means at the same level of M	=	76.13 lb./ac.
4. M means at the same level of P	=	151.3 lb./ac.

Crop :- Biri and Mung (Rabi).**Ref :- Or. 58(40).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To study the direct application of phosphate on legume and the effect of N to the succeeding cereal crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 25.12.1958. (iv) (a) 2 ploughings to 4" depth by iron plough followed by levelling. (b) Broadcasting. (c) 15 lb./ac. (d) and (e) Nil. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Nil. (ix) 3.09". (x) 5.4.1956.

2. TREATMENTS :

Main-plot treatments :

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

(1) 2 legumes : $L_1 = \text{Biri}$ and $L_2 = \text{Mung}$.

(2) 3 levels of phosphate : $P_0 = 0$, $P_1 = 40$ and $P_2 = 80$ lb./ac.

Sub-plot treatments :

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

The succeeding cereal crop was not grown in the same plot, and so the N-treatments were not applied. Hence the expt. is analysed as R.B.D.

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/block ; 3 sub-plots, main-plot. (b) N.A. (iii) 3. (iv) (a) $20'3'' \times 21'6''$. (b) $18'9'' \times 20'$. (v) 9%. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Yield of grain. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 260.8 lb./ac. (ii) 3.3 lb./ac. (iii) L_1 vs. L_2 effect is highly significant. Other effects are not significant. (iv) Av. yield in lb./ac.

	P_0	P_1	P_2	Mean
L_1	614.5	461.2	390.3	488.7
L_2	13.9	38.3	46.5	32.9
Mean	314.2	249.7	218.4	260.8

S.E., mean = 1.9 lb./ac.

Crop :- Mung (*Kharif*).

Ref :- Or. 59(SFT).

Centre :- Balasore (c.f.).

Type :- 'M'.

Object :—Type C—To compare the response of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Saline. (iii) Nil. (iv) and (v) N.A. (vi) June-July. (vii) to (ix) N.A. (x) September.

2. TREATMENTS :

0 = Control (no manure).

p_1 = 30 lb./ac. of P_2O_5 as Super.

p_2 = 60 lb./ac. of P_2O_5 as Super.

p_1' = 30 lb./ac. of P_2O_5 as Dicalcium Phos.

p_2' = 60 lb./ac. of P_2O_5 as Dicalcium Phos.

3. DESIGN :

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

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) Nil.

5. RESULTS :

Treatment	0	P ₁	P ₂	P ₁ '	P ₂ '
Av. yield	823	913	1029	1004	1218

G.M.=997 lb./ac. ; S.E.=56.4 lb./ac. and no. of trials=2.

Crop :- Mung (*Kharif*).

Ref :- Or. 58(SFT).

Centre :- Bolangir (c.f).

Type :- 'M'.

Object :—Type C—To compare the response of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red. (iii) Nil. (iv) and (v) N.A. (vi) June—July. (vii) to (ix) N.A. (x) September.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type C on page 162 conducted at Balasore.

5. RESULTS :

Treatment	0	P ₁	P ₂
Av. yield	831	1317	1522

G.M.=1223 lb./ac. ; S.E./mean=N.A. and no. of trials=2.

Crop :- Mung (*Kharif*).

Ref :- Or. 58(SFT).

Centre :- Dhenkanal. (c.f).

Type :- 'M'.

Object :—Type C—To compare the responses of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and black. (iii) Nil. (iv) and (v) N.A. (vi) June—July. (vii) to (ix) N.A. (x) September.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type C on page 162 conducted at Balasore.

5. RESULTS :

Treatment	0	P ₁	P ₂	P ₁ '	P ₂ '
Av. yield	329.1	436.1	534.9	452.6	501.9

G.M.=450.9 lb./ac. ; S.E.=34.91 lb./ac. and no. of trials=5.

Crop :- Mung (*Kharif*).

Ref :- Or. 59(SFT).

Centre :- Dhenkanal (c.f).

Type :- 'M'.

Object :—Type C—To compare the response of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(SFT) type C above conducted at Dhenkanal.

5. RESULTS:

Treatment	0	P ₁	P ₂	P ₁ '	P ₂ '
Av. yield	872	946	922	905	996

G.M.=928 lb./ac. ; S.E.=40.1 lb./ac. and no. of trials=3.

Crop :- Mung (Kharif).

Ref :- Or. 58(SFT).

Centre :- Ganjam (c.f.).

Type :- 'M'.

Object :—Type C—To compare the response of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and laterite. (iii) Nil. (iv) and (v) N.A. (vi) June—July (vii) to (ix) N.A. (x) September.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type C on page 162 conducted at Balasore.

5. RESULTS :

Treatment	0	P ₁	P ₂	P ₁ '	P ₂ '
Av. yield	246.9	362.1	469.0	395.0	427.9

G.M.=380.2 lb./ac. ; S.E.=N.A. and no. of trials=3.

Crop :- Mung (Kharif).

Ref :- Or. 59(SFT).

Centre :- Ganjam (c.f.).

Type :- 'M'.

Object :—Type C—To compare the response of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no 58 (SFT) Type C above conducted at Ganjam.

5. RESULTS :

Treatment	0	P ₁	P ₂	P ₁ '	P ₂ '
Av. yield	304	494	543	485	576

G.M.=480 lb./ac. ; S.E.=21.5 lb./ac. and no. of trials = 6.

Crop :- Mung (Kharif).

Ref :- Or. 58(SFT).

Centre :- Mayurbhanj (c.f.).

Type :- 'M'.

Object :—Type C—To compare the response of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red. (iii) Nil. (iv) and (v) N.A. (vi) June—July. (vii) to (ix) N.A. (x) September.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59 (SFT) Type C on page 162 conducted at Balasore.

5 RESULTS :

Treatment	0	P ₁	P ₂	P ₁ '	P ₂ '
Av. yield	798	1555	2452	1506	2576

G.M.=1777 lb./ac. ; S.E.=N.A. and no. of trials=3.

Crop :- Mung (*Kharif*).

Ref :- Or. 58(SFT).

Centre :- Sambalpur (c.f.).

Type :- 'M'.

Object :—Type C—To compare the response of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and black. (iii) Nil. (iv) and (v) N.A. (vi) June—July. (vii) to (ix) N.A. (x) September.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type C on page 162 conducted at Balasore.

5. RESULTS :

Treatment	0	P ₁	P ₂	P ₁ '	P ₂ '
Av. yield	296.2	378.5	452.6	386.7	501.9

G.M.=403.2 lb./ac. ; S.E.=93.7 lb./ac. and no. of trials=7.

Crop :- Bengal gram (*Rabi*).

Ref :- Or. 58(SFT).

Centre :- Mayurbhanj (c.f.).

Type :- 'M'.

Object :—Type C—To compare the response of leguminous crops to alternative sources and levels of phosphate.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red soil. (iii) Nil. (iv) and (v) N.A. (vi) October—November. (vii) to (ix) N.A. (x) March—April.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) type C on page 162 conducted at Balasore.

5. RESULTS :

Treatment	0	P ₁	P ₂	P ₁ '	P ₂ '
Av. yield	1810	2436	2757	2501	2896

G.M.=2480 lb./ac. ; S.E.=151.9 lb./ac. and no. of trials=8.

Crop :- Sugarcane.

Ref :- Or. 54(8).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :—To study the effect of organic and inorganic manures applied alone and in combination on Sugarcane yield.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—*ratoon*—paddy. (b) and (c) N.A. (ii) (a) Loam soil. (b) N.A. (iii) 29.3.1954. (iv) (a) 5 to 10 ploughings. (b) Planting in Furrows of 6" depth. (c) N.A. (d) Rows 3' apart. (e)—. (v) 20 C.L./ac. of F.Y.M. (vi) CO—490. (vii) Irrigated. (viii) Hoeing and weeding. (ix) N.A. (x) March 1955.

2. TREATMENTS :

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

(1) 2 levels of N : $N_1=80$ and $N_2=160$ lb./ac.

(2) 3 sources of N : $S_1=$ Til oilcake, $S_2=A/S$ and $S_3=$ Til oilcake+A/S in 1 : 1 ratio of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) $33' \times 40'$. (b) $30' \times 37'$. (v) $1\frac{1}{2}'$ around. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 8.95 tons/ac. (ii) 4.27 tons/ac. (iii) Only control vs. others is highly significant. (iv) Av. yield of sugarcane in tons/ac.

Control = 3.71 tons/ac.

	S_1	S_2	S_3	Mean
N_1	9.06	10.91	10.16	10.04
N_2	8.63	11.30	8.92	9.62
Mean	8.84	11.10	9.54	9.83

S.E. of marginal mean of S = 1.23 tons/ac.

S.E. of marginal mean of N = 1.01 tons/ac.

S.E. of body of table = 1.74 tons/ac.

Crop :- Sugarcane.

Ref :- Or. 59(16).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'M'.

Object :- To study the effect of different types of Nitrogenous fertilizers on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Dhaincha*. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 10.3.1959. to 12.3.1959. (iv) (a) 10 ploughings first with mould board plough and then with country plough. (b) Line planting. (c) 40, 3-budded setts/row. (d) Rows $2\frac{1}{2}'$ apart. (e) —. (v) 20 C.L./ac. of F.Y.M. (vi) CO—881 (early). (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

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

(1) 3 doses of N : $N_1=80$, $N_2=120$ and $N_3=160$ lb./ac.

(2) 3 sources of N : $S_1=A/S$, $S_2=$ Urea and $S_3=C.A.N.$

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) $75' \times 93\frac{1}{2}'$. (iii) 4. (iv) (a) $36' \times 17\frac{1}{2}'$. (b) $36' \times 12\frac{1}{2}'$. (v) One row on either side of length. (vi) Yes.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) to (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 16.32 tons/ac. (ii) 5.08 tons/ac. (iii) Only control vs. others is significant. (iv) Av. yield of sugarcane in tons/ac.

Control = 11.30 tons/ac.

	N ₁	N ₂	N ₃	Mean
S ₁	15.0	18.2	20.7	17.97
S ₂	18.1	17.2	18.4	17.90
S ₃	12.5	17.3	14.5	14.77
Mean	15.20	17.57	17.87	16.88

S.E. of any marginal mean = 1.47 ton/ac.
 S.E. of body of table or control mean = 2.54 tons/ac.

Crop :- Sugarcane.**Ref :- Or. 56(10a).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To study the response of CO-881 variety to high doses of N.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Laterite (sandy). (b) N.A. (iii) 16.12.1956. (iv) (a) 10 ploughings first with mould board plough and later with country plough. (b) 4000 setts/ac. (c) Flat method. (d) 3' row to row. (e) —. (v) 20 C.L./ac. of F.Y.M. (vi) CO—881 (early). (vii) Irrigated. (viii) Earthing and 3 hoeings by bullock driven hoe. (ix) N.A. (x) 4, 5.12.1957.

2. TREATMENTS :

4 doses of N as A/S : N₁=80, N₂=160, N₃=240 and N₄=320 lb./ac.
 N applied in split doses of 80 lb./ac. only.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 3. (iv) (a) 24'×20'. (b) 20'×18'. (v) 3' border. (vi) Yes.

4. GENERAL :

(i) Lodged heavily due to wind on 23.7.1957. (ii) Early shoot-borer. Minimised by earthing and irrigation. (iii) Tiller count, sugarcane yield and analysis of juice. (iv) (a) to (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 36.89 tons/ac. (ii) 3.47 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in lb./ac.

Treatment	N ₁	N ₂	N ₃	N ₄
Av. yield	33.06	38.19	37.56	38.73

S.E./mean = 2.00 ton/ac.

Crop :- Sugarcane.**Ref :- Or. 56 (11a).****Site :- Sugarcane Res. Sub-Stn., Bhubaneswar.****Type :- 'M'.**

Object :—To find out the suitable dose of N for getting the maximum yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 12, 13.10.1956. (iv) (a) Ploughing, levelling and opening up furrows. (b) 17,200, 3-budded setts/ac. (c) Line planting. (d) 3' row to row close planting within lines. (e) Nil. (v) N.A. (vi) CO—421. (vii) Unirrigated. (viii) 6 interculturations, 3 weedings. (ix) N.A. (x) 15.2.1958 to 18.2 1958.

2. TREATMENTS :

5 doses of N : $N_0=0$, $N_1=80$, $N_2=120$, $N_3=160$ and $N_4=200$ lb./ac.
N applied as A/S and G.N.C. in the ratio of 1 : 2 on 27.6.1957.

3. DESIGN :

(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) $39' \times 39'$. (b) $33' \times 33'$. (v) 1 row around. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Germination count, tillering count, yield data. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 21.73 tons/ac. (ii) 1.60 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	N_0	N_1	N_2	N_3	N_4
Av. yield	22.45	22.53	20.89	21.86	20.91

S.E./mean = 0.72 ton/ac.

Crop :- Sugarcane.

Ref :- Or. 55(9a)

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'M'.

Object :—To find out suitable dose of N for sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—G.M. (b) Fallow. (c) Nil. (ii) (a) Loam soil. (b) N.A. (iii) 23.9.1955. (iv) (a) 5 to 10 ploughings, levelling. (b) Planting in furrows of 6" depth. (c) N.A. (d) Rows 3' apart. (e)—. (v) Nil. (vi) CO—421 (medium). (vii) Unirrigated. (viii) 4 weedings and 2 intercultures. (ix) N.A. (x) 12.2.1957 to 18.2.1957.

2. TREATMENTS :

4 doses of N : $N_0=0$, $N_1=80$, $N_2=120$ and $N_3=160$ lb./ac.

3. DESIGN :

(i) L. Sq. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) $39' \times 39'$. (b) $33' \times 33'$. (v) 3' around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) % germination, tiller-height, yield/plot and juice analysis. (iv) (a) 1955—1957. (b) and (c) Yes. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 28.6 tons/ac. (ii) 1.96 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	N_0	N_1	N_2	N_3
Av. yield	27.9	29.5	28.0	29.0

S.E./mean = 0.98 ton/ac.

Crop :- Sugarcane (Ratoon).

Ref :- Or. 57(19).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'M'.

Object :—To find out suitable doses of N for sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) As per treatments. (ii) (a) Loam. (b) N.A. (iii) 12 to 18.2.1957 (harvesting of 1st crop) (iv) (a) 10 ploughings with mould board plough and later with country plough. (b) 20,000, 3-budded setts/ac. (c) Line planting. (d) 3' row to row. (e)—. (v) 120 lb./ac. of N as G.N.C. and A/S in 2 : 1 ratio. (vi) CO—421 (medium). (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 17.1.1958. to 19.1.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 55(9a) on page 168.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Germination %, count of tillers, height and sugarcane yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 9.41 tons/ac. (ii) 1.92 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	N ₀	N ₁	N ₂	N ₃
Av. yield	13.07	8.25	7.46	8.88

S.E./mean = 0.96 tons/ac.

Crop :- Sugarcane (Ratoon).

Ref :- Or. 58(35).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'M'.

Object—To find out suitable dose of N for getting the maximum yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 12, 13.10.1956. Date of harvest of 1st crop is N.A. (iv) (a) ploughing levelling and opening up furrows (b) line planting. (c) 17,200 3-budded setts/ac. (d) 3' row to row, close planting within lines. (e) —. (v) Nil. (vi) CO—421. (vii) Unirrigated. (viii) 3 weedings and intercultures during 3 to 30.7.1958. (ix) N.A. (x) 29 and 31.1.1959.

2. TREATMENTS :

5 levels of N : N₀=0, N₁=80, N₂=120, N₃=160 and N₄=200 lb./ac.
N applied as A/S and G.N.C. in 2 : 1 ratio on 11.7.1958 by pocket method.

3. DESIGN :

(i) (a) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 39'×39'. (b) 33'×33'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Tillers count and sugarcane yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 7.76 tons/ac. (ii) 1.97 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	N ₀	N ₁	N ₂	N ₃	N ₄
Av. yield	7.43	7.79	7.13	8.40	8.03

S.E./mean = 0.88 ton./ac.

Crop :- Sugarcane.

Ref :- Or. 55 (8a).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'M'.

Object :—To study the effect of phosphate in Sugarcane yield.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—G.M. (b) Sannhemp. (c) Nil. (ii) (a) Loam soil. (b) N.A. (iii) 6.10.1955. (iv) (a) Planting in furrows, deep ploughing (b) to (e) N.A. (v) A mixture of A/S and G.N.C. is applied. Details N.A. (vi) CO—421 (medium). (vii) Unirrigated. (viii) Three weedings and one interculture. (ix) N.A. (x) 28.3.1957 to 7.4.1957.

2. TREATMENTS :

4 doses of P₂O₅ as B.M. : P₁=40, P₂=80, P₃=120 and P₄=160 lb./ac.

3. DESIGN :

(i) L. Sq. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 39'×39'. (b) 33'×33'. (v) 3' around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Sugarcane yield. (iv) (a) 1955—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 26.0 tons/ac. (ii) 2.93 tons./ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	P ₁	P ₂	P ₃	P ₄
Av. yield	25.8	27.0	26.2	25.0

S.E./mean = 1.46 tons/ac.

Crop :- Sugarcane (Ratoon).

Ref :- Or. 57(16).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'M'.

Object :-To study the effect of phosphate on Sugarcane yield.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—G.M. (b) Sannhemp. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.10.1955/28.3.1957 to 7.4.1957 (harvest of first crop). (iv) (a) 10 ploughings with mould board plough. (b) Line planting. (c) N.A. (d) 3' between lines. (e)—. (v) 120 lb./ac of N as A/S and G.N.C. in the ratio 2 : 1 of N. (vi) CO—421 (medium). (vii) Unirrigated. (viii) Weeding twice. (ix) N.A. (x) 25.1.1958 to 28.1.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 55(8a) on page 169.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1955—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 6.51 tons/ac. (ii) 0.91 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	P ₁	P ₂	P ₃	P ₄
Av. yield	6.47	6.79	7.56	5.19

S.E./mean = 0.45 tons/ac.

Crop :- Sugarcane.

Ref :- Or. 56(21a).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'M'.

Object :-To find out the optimum dose of phosphate for the maximum yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 5, 6.10.1956. (iv) (a) 10 ploughings, first with mould board plough and then with country plough. (b) Line planting. (c) 17,000, 3-budded setts/ac. (d) 3' row to row. (e)—. (v) 120 lb./ac. of N as G.N.C. and A/S in the ratio of 2 : 1 on N basis. (vi) CO—421. (vii) Unirrigated. (viii) 7 interculturations and 4 weedings. (ix) N.A. (x) 19.2.1958 to 20.2.1958.

2. TREATMENTS :

5 doses of P₂O₅ as Super : P₀=0, P₁=40, P₂=80, P₃=120 and P₄=160 lb./ac.

3. DESIGN :

(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 39'×39'. (b) 33'×33'. (v) One row. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Germination count, no. of tillers and sugarcane yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 18.53 tons/ac. (ii) 1.90 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	P ₀	P ₁	P ₂	P ₃	P ₄
Av. yield	16.16	20.44	17.72	19.52	18.84

S.E./mean = 0.85 ton/ac.

Crop :- Sugarcane (Ratoon).

Ref :- Or. 58(33).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'M'.

Object :—To find out the optimum dose of phosphate for getting the maximum yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 5, 6.10.1956/date of harvest of first crop is 19, 20.2 1958. (iv) (a) 10 ploughings, 1st with mould board plough and then with country plough. (b) Line planting. (c) 17,000 3-budded setts/ac. (d) 3' row to row ; close planting within lines. (e) —. (v) 120 lb./ac. of N as G.N.C. and A/S in the ratio of 2 : 1 on N basis. (vi) CO—421. (vii) Unirrigated. (viii) 3 weedings and 2 intercultures. (ix) N.A. (x) 31.1.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(21a) on page 170.

Super applied at planting in the furrows on 11.7.1958.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Tillers and sugarcane yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 8.01 tons/ac. (ii) 1.71 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	P ₀	P ₁	P ₂	P ₃	P ₄
Av. yield	8.00	8.48	7.53	7.30	8.76

S.E./mean = 0.76 ton./ac.

Crop :- Sugarcane.

Ref :- Or. 58(38a).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'M'.

Object :—To find out suitable time of application of N.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 14.10.1958. (iv) (a) N.A. (b) Line planting. (c) 17000 3-budded setts/ac. (d) 3' between lines, close planting within lines. (e) —. (v) N.A. (vi) CO—517. (vii) Unirrigated. (viii) 3 weedings and 3 intercultures with country plough. (ix) N.A. (x) 19.2.1960 to 23.2.1960.

2. TREATMENTS :

120 lb./ac. of N as A/S and G.N.C. in the ratio of 1 : 2 applied by pocket method at 6 different timings : T₁=All at planting, T₂=G.N.C. at planting and A/S at monsoon, T₃=½ G.N.C. at planting and balance at monsoon, T₄=All at monsoon, T₅ A/S at 30 days after monsoon and G.N.C. at monsoon and T₆=½ G.N.C. at monsoon and balance 30 days after.

3. DESIGN :

(i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 39'×39'. (b) 33'×33'. (v) 3' around. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Germination count, tiller count, no. of millable cane and yield. (iv) (a) 1958—N.A. (b) N.A. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 24.21 tons/ac. (ii) 2.87 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆
Av. yield	23.63	23.29	23.61	25.62	24.31	24.82

S.E./mean = 1.17 tons/ac.

Crop :- Sugarcane.

Ref :- Or. 58(37a).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'M'

Object :—To find out suitable combination of fertilizers for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 4.10.1958. (iv) (a) Ploughing, levelling and opening furrows. (b) Planting in rows. (c) 18,000, 3-budded setts/ac. and 3' between rows. (e)—. (vi) N.A. (vi) CO—617. (vii) Unirrigated. (viii) 4 weedings and 3 interculturings with country plough. (ix) N.A. (x) 18 to 22.1.1960.

2. TREATMENTS :

- Control (no manure).
- 120 lb./ac. of N as A/S and G.N.C. in the ratio of 1 : 2 on N basis.
- 40 lb./ac. of P₂O₅ as triple Super.
- Treatment 2+treatment 3.
- Parry's P.K. mixture+treatment 2.
- Parry's complete mixture (12 : 4 : 4).

Manurial doses as per schedule applied by pocket, method.

3. DESIGN :

(i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 39'×39'. (b) 33'×33'. (v) 3' around. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Germination counts, tiller counts, no. of millable cane and yield of sugarcane. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 25.78 tons/ac. (ii) 2.22 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	1	2	3	4	5	6
Av. yield	22.67	27.44	22.47	26.85	27.42	27.84

S.E./mean = 0.91 ton/ac.

Crop :- Sugarcane.

Ref :- Or. 55(7a).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'M'.

Object :—To study the effect of lime on yield and quality of Sugarcane under the conditions of Rayagada.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 13.10.1955. (iv) (a) 5 to 10 ploughings and levelling. (b) Planting in furrows. (c) N.A. (d) 3' between rows. (e)—. (v) N.A. (vi) CO--421 (medium). (vii) Unirrigated. (viii) 3 weedings and 2 interculturings. (ix) N.A. (x) 8.4.1957 to 16.4.1957

2. TREATMENTS :

4 doses of lime : $L_1=1/3$, $L_2=2/3$, $L_3=1$ and $L_4=4/3$ ton/ac.

3. DESIGN :

(i) L. Sq. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 39'×39'. (b) 33'×33'. (v) 3' around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) % germination, tiller, height, yield/plot and juice analysis. (iv) (a) 1955—contd. (b) and (c) Yes. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 24.09 tons./ac. (ii) 2.72 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	L_1	L_2	L_3	L_4
Av. yield	24.82	23.10	24.36	24.09

S.E./mean = 1.36 tons/ac.

Crop :- Sugarcane (Ratoon).

Ref :- Or. 57(17).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'M'.

Object :—To find the effect of lime on yield and quality of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) As per treatments. (ii) (a) Loam. (b) N.A. (iii) 13.10.1955/ 8 to 16.4.1957, harvest of I crop. (iv) (a) 5 to 10 ploughings with mould board plough. (b) Planting in furrows. (c) N.A. (d) 3' between furrows. (e)—. (v) N.A. (vi) CO.—421. (medium). (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 28.1.1958 to 29.1.1958.

2. TREATMENTS and DESIGN :

Same as in expt. no. 55 (7a) on page 172.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 5.96 tons./ac. (ii) 2.01 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	L_1	L_2	L_3	L_4
Av. yield	5.85	7.15	5.20	5.64

S.E./mean = 1.00 tons/ac.

Crop :- Sugarcane.

Ref :- Or. 56 (20a).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'M'.

Object :—To find out the effect of application of lime on the yield and quality of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 22.10.1956. (iv) (a) Ploughing, levelling and opening of furrows. (b) Line planting. (c) 46,3-budded setts/row. (d) 3' from row to row. (e)—. (v) 120 lb./ac. of N as G.N.C. and A/S in the ratio 2 : 1. (vi) CO.—421 (medium). (vii) Unirrigated. (viii) 5 interculturings and 2 weedings. (ix) N.A. (x) 21,22.2.1958.

2. TREATMENTS

4 doses of lime as Cal. carbide : $L_0=0$, $L_1=1/3$, $L_2=2/3$ and $L_3=1$ ton/ac.

3. DESIGN :

(i) 1. sq. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) $39' \times 39'$. (b) $33' \times 33'$. (v) 3' around. (vi) Yes.

4. GENERAL :

(i) Below normal. (ii) Eriton 1% applied to setts ; Gammexane at 23.5 lb./ac. (iii) Monthly germination count, tillering counts and yield of cane. (iv) (a) 1956--contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 12.66 tons/ac. (ii) 3.87 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	L_0	L_1	L_2	L_3
Av. yield	12.26	11.71	14.76	11.88

S.E./mean = 1.93 tons/ac.

Crop :- Sugarcane (*Ratoon*).

Ref :- Or. 53(32).

Site :- Sugarcane Res. Sub-Strn., Rayagada.

Type :- 'M'.

Object :- To find out the effect of application of lime on the yield and quality of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 22.10.1956, 21, 22.2.1958, harvesting of first crop. (iv) (a) Ploughing, levelling and opening up furrows. (b) Line planting. (c) 46, 3-budded sett. row. (d) 3 row to row. (e)---. (v) 120 lb./ac. of N as G.N.C. and A/S in the ratio of 2 : 1 applied on 10.7.1958, by pocket method. (vi) CO-421. (vii) Unirrigated. (viii) 3 weedings and 2 interculturings. (ix) N.A. (x) 2.3.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(20a) on page 173.

4. GENERAL :

(i) and (c) N.A. (ii) Tillers, yield of sugarcane. (iv) (a) 1956--N.A. (b) N.A. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 4.745 tons/ac. (ii) 1.69 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in tons/ac.

Treatment	L_0	L_1	L_2	L_3
Av. yield	3.55	5.35	4.95	5.13

S.E./mean = 0.85 tons/ac.

Crop :- Sugarcane.

Ref :- Or. 57(31).

Site :- Sugarcane Res. Sub-Strn., Rayagada.

Type :- 'M'.

Object :- To investigate the effect of application of lime on the yield and quality of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 10.10.1957. (iv) (a) Ploughed twice with wooden plough, levelled and furrows opened with country plough. (b) Line planting. (c) N.A. (d) 3' row to row. (e)---. (v) 120 lb./ac. of N as A/S and G.N.C. in the ratio of 2 : 1 on N basis applied by pocket method on 9.7.1958. (vi) CO-427. (vii) Unirrigated. (viii) 6 weedings and 3 interculturings with country plough. (ix) and (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 59(20 a) on page 173.

Treatments applied just before final preparation of the land (9.10.1957.) and afterwards field was ploughed twice with wooden plough.

4. GENERAL :

(i) and (ii) N.A. (iii) Germination count, tillers and yield. (iv) (a) 1956—N.A. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 24.00 tons/ac. (ii) 0.70 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	L ₀	L ₁	L ₂	L ₃
Av. yield	20.79	27.16	25.20	22.84

S.E./mean = 0.35 ton/ac.

Crop :- Sugarcane (Ratoon).

Ref :- Or. 58(36).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'M'.

Object :—To investigate the effect of application of lime on the yield and quality of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 10.10.1957/harvesting dates of 1st crop—N.A. (iv) (a) Ploughed twice with wooden plough, levelled and furrows opened with country plough. (b) Planted in furrows. (c) N.A. (d) 3' row to row. (e) —. (v) 120 lb./ac. of N as G.N.C. and C.A.N. in the ratio of 2 : 1 applied by pocket method. (vi) CO.—421. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 21.12.1959 to 23.12.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(20 a) on page 173.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Tiller count, yield of sugarcane. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 19.05 ton/ac. (ii) 1.39 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	L ₀	L ₁	L ₂	L ₃
Av. yield	16.39	19.15	20.59	20.10

S.E./mean = 0.70 ton/ac.

Crop :- Sugarcane.

Ref :- Or. 57(2).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'M'.

Object :—To study the Nitrogen requirement of Sugarcane crop for maximum production.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) N.A. (ii) (a) Loam. (b) pH 7.5 ; TSS 0.2 millimhos/cm. (iii) 5.3.1957. (iv) (a) 5 ploughings. (b) Planted in furrows. (c) to (e) N.A. (v) F.Y.M. at 10 tons/ac., Super at 40 lb./ac. and Pot. Sul. at 30 lb./ac. (vi) *Kola Bangla* (Local). (vii) Irrigated. (viii) Weeding, hoeing, gap-filling, earthing up, propping and wrapping. (ix) N.A. (x) 10.3.1958.

2. TREATMENTS :

5 doses of N as A/S : N₀=0, N₁=50, N₂=100, N₃=150 and N₄=200 lb./ac.

3. DESIGN :

(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 24'×22'. (b) 18'×20'. (v) 2'×1'. (vi) Yes.

4. GENERAL :

(i) Very good. (ii) White ant attack was checked by spraying Dieldrine. (iii) Height of the millable cane of 10 plants from each plot, girth at the middle of the cane and sugarcane yield. (iv) (a) No. (b) and (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 27.89 tons/ac. (ii) 12.54 tons/ac. (iii) Treatment different are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	N ₀	N ₁	N ₂	N ₃	N ₄
Av. yield	27.21	27.14	28.92	26.94	29.27

S.E./mean = 5.61 tons/ac.

Crop :- Sugarcane.

Ref :- Or. 57(22).

Site :- Agri. Demonstration Farm, Barpalli.

Type :- 'MV'.

Object :—To study the response of different levels of nitrogen to different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 26 to 28.1.1957. (iv) (a) 10 ploughings. (b) Line planting. (c) N.A. (d) 3' between rows. (e) —. (v) 10 C.L./ac. of F.Y.M., 40 lb./ac. of P₂O₅ as Super applied at planting and gammexane at 20 lb./ac. (vi) As per treatments. (vii) N.A. (viii) 3 hoeings and earthing up, wrappings and proppings. (ix) N.A. (x) 13 to 17.4.1958.

2. TREATMENTS :

Main-plot treatments :

12 varieties : V₁=CO. 312, V₂=CO. 880, V₃=CO. 617, V₄=ORB 79, V₅=CO. 421, V₆=ORB 19, V₇=CO. 527, V₈=CO. 419, V₉=CO. 872, V₁₀=CO. 929, V₁₁=CO. 881 and V₁₂=CO. 453.

Sub-plot treatments :

3 levels of N as A/S : N₁=40, N₂=80 and N₃=120 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 12 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) Main-plot : 45'×22'. Sub-plot : 15'×22' (b) 12'×22'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 29.81 tons/ac. (ii) (a) 9.65 tons/ac. (b) 5.13 tons/ac. (iii) Only N effect is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	V ₇	V ₈	V ₉	V ₁₀	V ₁₁	V ₁₂	Mean
N ₁	30.99	36.68	37.07	28.21	38.13	25.58	42.75	29.51	31.45	33.15	33.52	24.19	32.18
N ₂	25.93	37.37	29.12	26.37	29.66	21.34	41.00	26.32	31.23	33.39	27.60	28.51	29.82
N ₃	18.22	27.94	25.88	26.69	30.10	20.43	32.68	32.46	27.35	32.53	29.02	25.83	27.43
Mean	25.04	34.00	29.02	27.09	32.63	22.45	38.81	29.43	30.01	32.03	30.05	26.17	29.81

S.E. of difference of two

1. V marginal means = 4.55 tons/ac.
2. N marginal means = 1.21 tons/ac.
3. N means at the same level of V = 4.19 tons/ac.
4. V means at the same level of N = 5.69 tons/ac.

Crop :- Sugarcane.**Ref :- Or. 58(37).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'MV'.**

Object :—To study the response of three varieties of Sugarcane to application of N.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 4, 5.2.1958. (iv) (a) to (e) N.A. (v) 20 C.L. of F.Y M. applied. 80 lb./ac. of P_2O_5 as Super was applied at the time of planting in furrows. (vi) As per treatments. (vii) Irrigated. (viii) 1 weeding and 2 hoeings. (ix) N.A. (x) 14.1.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 varieties : $V_1=CO-872$, $V_2=CO-881$ and $V_3=CO-897$.(2) 3 levels of N : $N_1=80$, $N_2=160$ and $N_3=240$ lb./ac.

Manures applied on 7.6.1958 and 8.8.1958.

3. DESIGN :(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $30' \times 22'$. (v) One row around. (vi) Yes**4. GENERAL :**

(i) Normal. (ii) Attack of borer. (iii) Germination %, tillering, sugarcane yield, height and % borer attack. (iv) (a) 1958—N.A. (b) N.A. (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 18.51 tons/ac. (ii) 10.31 tons/ac. (iii) Only V effect is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	N_1	N_2	N_3	Mean
V_1	11.30	9.31	12.88	11.16
V_2	22.27	24.15	23.94	23.45
V_3	18.20	23.14	21.44	20.93
Mean	17.26	18.87	19.42	18.51

S.E. of any marginal mean = 2.98 tons/ac.

S.E. of body of table = 5.15 tons/ac.

Crop :- Sugarcane.**Ref :- Or. 59 (3).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'MV'.**

Object :—To find out the optimum dose of N for the recommended red-rot resistant varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Dhaincha*. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 18 and 19.5.1959. (iv) Ploughing, levelling and opening up furrows. (b) 25, 3-budded setts/row. (c) Line planting. (d) Row to row 3'. (e) N.A. (v) 20 C.L./ac. of F.Y.M. (vi) As per treatments. (vii) Irrigated. (viii) 3 weedings, 3 hoeings and earthing up. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 varieties : $V_1=CO-872$, $V_2=CO-881$ and $V_3=CO-897$.(2) 3 levels of N as A/S : $N_1=80$, $N_2=160$ and $N_3=240$ lb./ac.**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 9. (b) $72' \times 108'$. (iii) 3. (iv) (a) $36' \times 22'$. (b) $30' \times 22'$. (v) Two rows one each on either side of length. (vi) Yes.

GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Tillers, yield of cane, juice quality and germination count. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 16.73 tons/ac. (ii) 0.75 tons/ac. (iii) All the effects are highly significant. (iv) Av. yield of sugarcane in tons/ac.

	N ₁	N ₂	N ₃	Mean
V ₁	12.04	12.54	16.64	13.74
V ₂	14.71	12.68	15.00	14.13
V ₃	20.79	23.71	22.46	22.32
Mean	15.85	16.31	18.03	16.73

S.E. of any marginal mean = 0.25 tons/ac.

S.E. of body of table = 0.43 tons/ac.

Crop :- Sugarcane.

Ref :- Or. 58(36).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'C'.

Object :—To find out the effect of quality of seeds taken from plots manured with different doses of N.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 6.12.1957. (iv) (a) to (e) N.A. (v) 40 lb./ac. of N as A/S applied on 27.5.1958. (vi) CO-881. (vii) Irrigated. (viii) One weeding. 2 hoeings and 1 earthing up. (ix) N.A. (x) 9 to 13.3.1959.

2. TREATMENTS :

4 kinds of setts taken from plots manured with : S₁=80, S₂=160, S₃=240 and S₄=320 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 39'×39'. (b) 33'×33'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Germination%, tiller count and yield of sugarcane. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Raw data N.A.

5. RESULTS :

(i) 23.54 tons/ac. (ii) 2.68 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	S ₁	S ₂	S ₃	S ₄
Av. yield	18.05	22.01	24.65	29.44

S.E./mean = 1.34 tons/ac.

Crop :- Sugarcane.

Ref :- Or. 59(41).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'C'.

Object :—To test the effect of different spacings and different seed rates on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 30.10.1958 and 1.11.1958. (iv) (a) N.A. (b) Planting in furrows. (c) and (d) As per treatments. (e)—. (v) 120 lb./ac. of N as G.N.C. and C/A/N in ratio of 2 : 1 by pocket method. (vi) CO-617. (vii) Unirrigated. (viii) 5 weedings and 4 inter-culturing with country plough. (ix) N.A. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 spacings between rows : $S_1=2'$, $S_2=2.5'$ and $S_3=3'$.

Sub-plot treatments :

3 seed rates : $R_1=16,000$, $R_2=20,000$ and $R_3=24,000$ three-budded setts/ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $30' \times 30'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Germination count, tiller count, no. of millable cane and sugarcane yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 27.79 tons/ac. (ii) (a) 2.20 tons/ac. (b) 2.04 tons/ac. (iii) No effect is significant. (iv) Av. yield of sugarcane in tons/ac.

	R_1	R_2	R_3	Mean
S_1	28.40	27.57	27.29	27.75
S_2	27.48	27.90	28.00	27.79
S_3	26.86	28.78	27.85	27.83
Mean	27.58	28.08	27.71	27.79

S.E. of difference of two

- | | |
|-----------------------------------|-----------------|
| 1. S marginal means | = 0.90 tons/ac. |
| 2. R marginal means | = 0.83 tons/ac. |
| 3. R means at the same level of S | = 1.44 tons/ac. |
| 4. S means at the same level of R | = 1.48 tons/ac. |

Crop :- Sugarcane.

Ref :- Or. 55(10).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'CV'.

Object :— To find out the effect of cutting sugarcane stalks on the yield and growth of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 24.9.1955 and 28.9.1955. (iv) (a) N.A. b) Planting in furrows. (c) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) 3 weedings and 1 interculturing. (ix) N.A. (x) 20.2.1957 to 7.3.1957.

2. TREATMENTS :

Main-plot treatments :

2 cultural practices : C_0 =No cutting of the stalk and C_1 =Cutting the stalk.

Sub-plot treatments :

4 varieties : $V_1=CO-419$ (late), $V_2=CO-421$ (medium), $V_3=CO-449$ (medium) and $V_4=CO-527$ (early).

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) $39' \times 39'$. (b) $33 \times 33'$. (v) 3' around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Raw cane weight and juice analysis. (iv) (a) 1955—contd. (b) and (c) Yes. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 24.6 tons/ac. (ii) (a) 2.09 tons/ac. (b) 2.43 tons/ac. (iii) Only V effect is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	V ₁	V ₂	V ₃	V ₄	Mean
C ₀	25.5	26.8	26.6	22.7	25.4
C ₁	27.3	22.8	23.6	21.7	23.8
Mean	26.4	24.8	25.1	22.2	24.5

S.E. of difference of two

1. C marginal means = 0.66 tons/ac.
2. V marginal means = 1.09 tons/ac.
3. V means at the same level of C = 1.54 tons/ac.
4. C means at the same level of V = 1.49 tons/ac.

Crop :- Sugarcane (Ratoon).

Ref :- Or. 57(18).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'CV'.

Object :- To find out the effect of cutting sugarcane stalks on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 24.9.1955/20.2.1957 to 7.3.1957 (date of harvest of first crop). (iv) (a) 10 ploughings with mould board plough. (b) Line planting. (c) N.A. (d) 3' between rows. (e) —. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) 3 weedings. (ix) N.A. (x) 31.1.1958 to 5.2.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 55(10) on page 179.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Sugarcane yield and juice analysis. (iv) (a) 1955—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 9.01 tons/ac. (ii) (a) 1.73 tons/ac. (b) 2.50 tons/ac. (iii) Only V effect is highly significant. (iv) Av. yield of sugarcane in tons/ac.

	V ₁	V ₂	V ₃	V ₄	Mean
C ₀	13.94	4.98	9.30	8.38	9.15
C ₁	13.39	5.64	8.06	8.38	8.87
Mean	13.66	5.31	8.68	8.38	9.01

S.E. of difference of two

1. C marginal means = 0.55 tons/ac.
2. V marginal means = 1.12 tons/ac.
3. V means at the same level of C = 1.58 tons/ac.
4. C means at the same level of V = 1.47 tons/ac.

Crop :- Sugarcane.

Ref :- Or. 57(34).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'CV'.

Object :- To test the effect of cutting cane stalks on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 12.10.1957. (iv) (a) Ploughing, levelling and opening of furrows. (b) Planting in lines. (c) N.A. (d) 3' between rows. (e) —. (v) 120 lb./ac. of N as A/S and powdered oil cake in the ratio 2 : 1 on N basis by pocket method on 9.7.1958. (vi) As per treatments. (vii) Unirrigated. (viii) 4 weedings and 2 interculturings with country plough. (ix) N.A. (x) 19 to 22.2.1959.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 cultural practices : C_0 =No cutting of the stalk and C_1 =Cutting of stalk.
 (2) 4 varieties : V_1 =CO-419, V_2 =CO-421, V_3 =CO-449 and V_4 =CO-527.

3 DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 39'×39'. (b) 33'×33'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Germination count, tiller count and yield. (iv) (a) 1955—N.A. (v) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 22.84 tons/ac. (ii) 3.79 tons/ac. (iii) Both C and V effects are significant. Interaction is not significant. (iv) Av. yield of sugarcane in tons/ac.

	V_1	V_2	V_3	V_4	Mean
C_0	19.40	22.62	25.44	19.25	21.68
C_1	25.13	27.12	25.97	17.79	24.00
Mean	22.26	24.87	25.70	18.52	22.84

S.E. of marginal mean of C = 1.09 tons/ac.

S.E. of marginal mean of V = 1.55 tons/ac.

S.E. of body of table = 2.19 tons/ac.

Crop :- Sugarcane (Ratoon).

Ref :- Or. 59(35).

Site :- Sugarcane Res. Sub-Stn., Raygada.

Type :- 'CV'.

Object :—To test the effect of cutting cane stalks on the yield of different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 12.10.1957/19 to 22.2.1959 (date of harvest of first crop). (iv) (a) Ploughing, levelling and opening of furrows. (b) Line planting. (c) N.A. (d) Rows 3' apart. (e) —. (v) 120 lb./ac. of N as mixture of A/S and G.N.C. in the ratio 1 : 2 by pocket method on 9.7.1958. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 24.12.1959 to 27.12.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(34) on page 180.

4. GENERAL :

(i) and (ii) N.A. (iii) Tillering, germination and yield of cane. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 19.48 tons/ac. (ii) 3.10 tons/ac. (iii) Only V effect is significant. (iv) Av. yield of sugarcane in tons/ac.

	V ₁	V ₂	V ₃	V ₄	Mean
C ₀	20.31	16.43	21.21	18.24	19.05
C ₁	24.63	21.50	19.03	14.47	19.91
Mean	22.47	18.96	20.12	16.35	19.48

S.E. of marginal mean of C = 0.89 tons/ac.
 S.E. of marginal mean of V = 1.27 tons/ac.
 S.E. of body of table = 1.79 tons/ac.

Crop :- Sugarcane.

Ref :- Or. 58(40 a).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'CV'.

Object :—To test the effect of cutting cane stalks on the yield of different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 25.10.1958 to 27.10.1958. (iv) (a) N.A. (b) Planted in rows. (c) N.A. (d) 3' between rows. (e) —. (v) 120 lb./ac. of N as G.N.C. and C/A/N in the ratio of 2 : 1 applied by pocket method on 25, 26.6.1959. (vi) As per treatments. (vii) Unirrigated. (viii) 5 weedings and 4 intercultures with country plough. (ix) N.A. (x) 4.12.1959 to 10.12.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 cultural practices : C₀=No cutting of the stalk and C₁=Cutting of the stalk.

(2) 4 varieties : V₁=CO-617, V₂=CO-605, V₃=CO-449 and V₄=CO-453.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 39'×39'. (b) 33'×33'. (v) 3' around. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Germination count, tiller count, no. of millable cane and yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 31.80 tons/ac. (ii) 3.04 tons/ac. (iii) Only V effect is highly significant. (iv) Av. yield of cane in tons/ac.

	V ₁	V ₂	V ₃	V ₄	Mean
C ₀	30.48	34.25	28.20	33.81	31.69
C ₁	30.43	35.08	29.00	33.13	31.91
Mean	30.45	34.66	28.60	33.47	31.80

S.E. of marginal mean of C = 0.68 tons/ac.
 S.E. of marginal mean of V = 0.96 tons/ac.
 S.E. of body of table = 1.36 tons/ac.

Crop :- Sugarcane.

Ref :- Or. 58(39).

Site :- Sugarcane Res. Sub-Stn., Rayagada.

Type :- 'D'.

Object :—To study the effect of pre-treatment of seed setts for resistance to attack of pests on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 2.11.1958. (iv) (a) N.A. (b) Line planting. (c) 17000, 3-budded setts. (d) 3' between lines. (e) —. (v) 120 lb./ac. of N as G.N.C. and C/A/N in the ratio 2 : 1 applied by pocket method on 26, 27.6.1959. (vi) CO-617. (vii) Unirrigated. (viii) 5 weedings and 2 intercultures with country plough. (ix) and (x) N.A.

2. TREATMENTS :

5 soaking treatments for setts : T_1 =soaking in cold water for 15 hrs., T_2 =in Aretan 25% for 12 hrs., T_3 =in lime 1% for 12 hrs., T_4 =in trace elements 20 ppm for 20 hrs and T_5 =in hot water of 52°C for 1 hr.

3. DESIGN :

(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 39'×39'. (b) 33'×33'. (v) 3' around. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attacked by white ants. (iii) Germination count, tiller count, no. of millable cane and yield. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 25.73 tons/ac. (ii) 2.19 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	T_1	T_2	T_3	T_4	T_5
Av. yield	25.56	26.50	25.28	25.17	26.12

S.E./mean = 2.19 tons/ac.

Crop :- Cotton (Kharif).

Ref :- Or. 55(9).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'M'.

Object :—To find out the economic dose of fertilizer for maximum production of Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—Fallow. (b) and (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 26.7.1955. (iv) (a) 6 ploughings by country plough and 3 ladderings. (b) Line sowing. (c) 5 srs./ac. (d) 2'×1½'. (e) 2 seeds/line. (v) Nil. (vi) *Laxmi* (late). (vii) Irrigated. (viii) Weeding, 3 hoeings and earthings. (ix) 67.97%. (x) 6 pickings from 5.3.1956 to 10.5.1956.

2. TREATMENTS :

All combinations of (1) and (2)+an extra treatment.

(1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.

(2) 3 levels P_2O_5 as Super : $P_0=0$, $P_1=50$ and $P_2=100$ lb./ac.

Extra treatment T=40 lb./ac. of N+100 lb./ac. of P_2O_5 +30 lb./ac. of K_2O .

A/S and Super applied on 26.8.1955 ; K_2O as Pot. Sul. applied on 30.11.1955.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 36'×16½'. (b) 32'×13½'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Lodging due to heavy rainfall and wind. (ii) Nil. (iii) No. of bolls/plant and no. of bolls dropped/plant. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1832 lb./ac. (ii) 334.0 lb./ac. (iii) No effect is significant. (iv) Av. yield of *kapas* in lb./ac.

T = 1882 lb./ac.

	P_0	P_1	P_2	Mean
N_0	1708	1952	1720	1793
N_1	1916	1618	1648	1727
N_2	2142	1956	1770	1956
Mean	1922	1842	1713	1826

S.E. of N or P marginal mean = 111.3 lb./ac.
S.E. of body of table = 192.8 lb./ac.

Crop :- Cotton (Rabi).

Ref :- Or. 56(23).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'M'.

Object :—To find out suitable manurial dose for Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—Fallow. (b) Fallow. (c) Nil. (ii) (a) Clay. (b) N.A. (iii) 2, 3.11.1956. (iv) (a) 6 ploughings with country plough and 3 ladderings. (b) Line sowing. (c) 5 srs./ac. (d) 2'×1½'. (e) 2 seeds/hole. (v) Nil. (vi) *Laxmi* (late). (vii) Irrigated. (viii) 2 weedings and one hoeing. (ix) 4.88". (x) 9 and 23.5.1957.

2. TREATMENTS :

Same as in expt. no. 55(9) on page 183.

Super and K₂O applied on 2.11.1956 and A/S on 7.1.1957.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 13½'×33'. (b) 10'×30'. (v) 1 row around the net plot. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1955—1956. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 797 lb./ac. (ii) 180 lb./ac. (iii) Main effect of N and T vs. others are highly significant. (iv) Av. yield of *kapas* in lb./ac.

T = 1227 lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	478	603	511	531
N ₁	710	730	774	738
N ₂	1009	948	982	980
Mean	732	760	756	749

S.E. of N or P marginal mean = 60.0 lb./ac.

S.E. of body of table = 103.9 lb./ac.

Crop :- Cotton.

Ref :- Or. 59(33).

Site :- Cotton Res. and Development Stn., Chakuli.

Type :- 'M'.

Object :—To study the effect of lime in combination with N, P and K on Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 25.11.1959. (iv) (a) 3 ploughings by *desi* plough. (b) Dibbling. (c) 15 srs./ac. (d) and (e) N.A. (v) 3 tons/ac. of compost by broadcasting and green manuring of *Dhaincha*. (vi) N.A. (vii) Irrigated. (viii) 1 weeding, 2 hoeings and earthing. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 levels of lime : L₀=0, L₁=500 and L₂=750 lb./ac.

Sub-plot treatments :

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

(1) 2 levels of N : $N_0=0$ and $N_1=40$ lb./ac.(2) 2 levels of P_2O_5 : $P_0=0$ and $P_1=20$ lb./ac.(3) 2 levels of K_2O : $K_0=0$ and $K_2=20$ lb./ac.

Sources of N, P and K are N.A.

3. DESIGN :(i) Split-plot. (ii) (a) 3 main-plots/block and 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $26' \times 16'$. (v) One row around. (vi) Yes.**4. GENERAL :**

(i) N.A. (ii) Attack of jassids, aphids, thrips and red cotton bugs. 10 oz./ac. of Paramar in 55 gallons of water sprayed thrice. (iii) Yield of cotton, no. of bolls and height of plants. (iv) (a) 1959—N.A. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :(i) 673.8 lb./ac. (ii) (a) 573.8 lb./ac. (b) 206.3 lb./ac. (iii) Main effect of N and interaction $P \times K$ are significant. (iv) Av. yield of *kapas* in lb./ac.

	P_0	P_1	Mean	K_0	K_1	N_0	N_1
L_0	672.5	778.9	725.7	761.4	690.0	665.7	735.7
L_1	604.5	620.1	612.3	623.3	601.3	634.9	589.5
L_2	652.8	694.8	673.8	710.0	637.6	630.5	711.2
N_0	608.0	652.9	630.5	665.9	595.0		
N_1	697.6	736.8	717.2	754.0	680.3		
Mean	652.8	694.8	673.8	710.0	637.7		
K_0	737.4	682.6					
K_1	568.2	707.1					

S.E. of difference of two

1. L marginal means = 143.4 lb./ac.
2. N, P or K marginal means = 42.1 lb./ac.
3. N, P or K means at the same level of L = 73.9 lb./ac.
4. L means at the same level of N, P or K = 152.4 lb./ac.

Crop :- Cotton.**Site :- M.A.E. Farm, Barpalli.****Ref :- Or. 56(MAE).****Type :- 'M'.**

Object :—Type V—To study the most suitable time of application of Urea and A/S to Cotton crop.

1. BASAL CONDITIONS :(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) 1st and 19th Dec. 1956. (iv) (a) 4 to 5 ploughings. (b) N.A. (c) 25 to 50 lb./ac. (d) $24'' \times 12''$ to $18''$. (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) N.A. (vii) Irrigated. (viii) 4 to 6 weedings and 5 to 6 hoeings. (ix) N.A. (x) 8,10.4.1957 and 1.5.1957.**2. TREATMENTS :**

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

(1) 2 sources of 50 lb./ac. of N : $S_1=Urea$ and $S_2=A/S$.(2) 6 times of application of N : $T_1=Full$ at sowing, $T_2=Full$ at trimming, $T_3=Full$ at flowering, $T_4=\frac{1}{2}$ at sowing and $\frac{1}{2}$ at flowering, $T_5=\frac{1}{3}$ at sowing, $\frac{1}{3}$ at thinning and $\frac{1}{3}$ at flowering and $T_6=\frac{1}{2}$ at flowering and $\frac{1}{2}$ one month after flowering.**3. DESIGN :**(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) $33' \times 16.5'$. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cotton yield. (iv) 1956--contd. (v) No. (vi) No. (vii) (a) and (b) N.A. (viii) Nil. (ix) Experiment was not conducted during 1957. Experiment conducted during 1959 completely destroyed on account of acute water-logging caused by continuous rainfall in Sept. 1959.

5. RESULTS :

(i) 341.2 lb./ac. (ii) 77.59 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of cotton in lb./ac.

Control=279.8 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	Mean
S ₁	329.1	353.8	419.7	427.9	296.2	337.4	360.7
S ₂	345.6	279.8	304.5	353.8	312.0	395.5	331.9
Mean	337.4	316.8	362.1	390.9	304.5	366.2	346.3

S.E. of T marginal mean = 31.68 lb./ac.
 S.E. of S marginal mean = 18.29 lb./ac.
 S.E. of body of table in control mean = 44.80 lb./ac.

Crop :- Cotton (Kharif).

Ref :- Or. 58(MAE).

Site :- M.A.E. Farm., Barpalli.

Type :- 'M'.

Object :--Type V--To study the most suitable time of application of Urea and A/S to Cotton crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) Dec. 1958. (iv) (a) 4 to 5 ploughings. (b) N.A. (c) 25 to 50 lb./ac. (d) 24"×12" to 18". (e) N.A. (v) 5000 lb./ac of F.Y.M. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56 (MAE) Type V on page 185.

5. RESULTS :

(i) 186.1 lb./ac. (ii) 53.47 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of cotton in lb./ac.

Control=148.1 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	Mean
S ₁	181.0	213.9	213.9	139.9	288.0	164.6	200.2
S ₂	205.7	123.4	164.6	172.8	189.2	213.9	173.3
Mean	193.4	168.6	189.2	156.3	238.6	189.2	189.2

S.E. of T marginal mean = 21.83 lb./ac.
 S.E. of S marginal mean = 12.60 lb./ac.
 S.E. of body of table or control mean = 30.87 lb./ac.

Crop :- Cotton (Rabi).

Ref :- Or. 57(MAE).

Site :- M.A.E. Farm, Barpalli.

Type :- 'CM'.

Object :--Type VIII--To determine the optimum spacings and dates of sowing for Cotton when different doses of N and P₂O₅ are applied.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) As per treatments. (iv) (a) 3 ploughings after rain. (b) N.A. (c) 12 lb./ac. (d) As per treatments. (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) As per treatments. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

- (1) 3 sowing dates : $D_1=21.10.1957$, $D_2=10.11.1957$ and $D_3=20.11.1957$.
 (2) 3 spacings : $S_1=2' \times 1.5'$, $S_2=2' \times 2'$ and $S_3=2' \times 2.5'$.

Sub-plot treatments :

All combinations of (1) and (2)

- (1) 3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.
 (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=50$ and $P_2=100$ lb./ac.

Fertilizers applied at the time of sowing by broadcasting.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Mild attack of loose smut and rust. (iii) Cotton yield. (iv) (a) 1957—contd. (b) and (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 225 lb./ac. (ii) (a) 24.52 lb./ac. (b) 19.62 lb./ac. (iii) Main effects of S, D, N, P and interaction $D \times N$ are highly significant. Other effects are not significant. (iv) Av. yield of cotton in lb./ac.

	D_1	D_2	D_3	N_0	N_1	N_2	P_0	P_1	P_2	Mean
S_1	250	252	210	200	242	270	227	237	248	237
S_2	248	238	209	205	231	259	226	230	239	232
S_3	224	223	175	182	204	235	200	205	216	207
Mean	241	238	198	196	226	255	218	224	234	225
P_0	233	234	186	190	220	243				
P_1	241	237	195	200	224	249				
P_2	248	242	213	198	233	272				
N_0	211	217	160							
N_1	244	237	196							
N_2	266	259	239							

S.E. of the difference of two

- | | |
|--|----------------|
| 1. D or S marginal means | = 4.72 lb./ac. |
| 2. N or P marginal means | = 3.78 lb./ac. |
| 3. N or P means at the same levels of D or S | = 6.54 lb./ac. |
| 4. D or S means at the same levels of N or P | = 7.13 lb./ac. |
| 5. means in the body of $D \times S$ table | = 6.54 lb./ac. |
| 6. means in the body of $N \times P$ table | = 8.17 lb./ac. |

Crop :- Cotton (*Rabi*).

Site :- M.A.E. Farm, Barpalli.

Ref :- Or. 58(MAE).

Type :- 'CM'.

Object :- Type VIII—To determine the optimum spacing and date of sowing for Cotton when different doses of N and P_2O_5 are applied.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) As per treatments. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 sowing dates : $D_1=10.12.1958$, $D_2=20.12.1958$ and $D_3=30.12.1958$.

(2) 3 spacings : $S_1=2' \times 1.5'$, $S_2=2' \times 2'$ and $S_3=2' \times 2.5'$.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=50$ and $P_2=100$ lb./ac.

3. DESIGN :

Same as in expt. no. 57(MAE) on page 187.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Cotton yield. (iv) (a) 1957—contd. (b) and (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 137.9 lb./ac. (ii) (a) 63.2 lb./ac. (b) 63.1 lb./ac. (iii) Only $S \times N$ interaction is highly significant. (iv) Av. yield of cotton in lb./ac.

	D_1	D_2	D_3	N_0	N_1	N_2	P_0	P_1	P_2	Mean
S_1	115.3	158.0	154.3	142.3	121.6	163.7	162.7	134.4	130.5	142.5
S_2	142.1	113.1	125.3	129.7	134.9	115.9	119.8	127.7	133.1	126.8
S_3	134.9	155.4	142.2	104.1	186.5	141.9	143.0	135.3	154.2	144.2
Mean	130.8	142.2	140.6	125.4	147.7	140.5	141.8	132.5	139.3	137.9
P_0	138.8	142.1	144.6	127.4	145.8	152.3				
P_1	118.1	153.0	126.3	125.6	146.1	125.7				
P_2	135.5	131.5	150.9	123.1	151.2	143.6				
N_0	121.9	138.0	116.2							
N_1	135.9	144.1	163.0							
N_2	134.5	144.5	142.5							

S.E. of the difference of two

1. D or S marginal means = 12.16 lb./ac.
2. N or P marginal means = 12.14 lb./ac.
3. N or P means at the same level of D or S = 21.03 lb./ac.
4. S or D means at the same level of N or P = 21.04 lb./ac.
5. means in the body of $D \times S$ table = 21.03 lb./ac.
6. means in the body of $N \times P$ table = 21.07 lb./ac.

Crop :- Cotton.

Ref :- Or. 59(32).

Site :- Cotton Res. and Development Stn., Chakuli.

Type :- 'CMV'.

Object :- To find out the effect of different spacings and doses of N on different varieties of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) G.M. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 23.11.1959. (iv) (a) 4 ploughings with *desi* plough to 4"—5" depth and laddering. (b) Dibbling. (c) 15 srs./ac. (d) As per treatments. (e) N.A. (v) 3 tons/ac. of compost, 40 lb./ac. of P_2O_5 . Green manuring by *dhaincha*. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings and 2 earthings. (ix) N.A. (x) 1st picking—10.5.1960 ; 2nd picking—29.5.1960.

2. TREATMENTS :

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

(1) 3 spacings : $D_1=2' \times 2'$, $D_2=1\frac{1}{2}' \times 1\frac{1}{2}'$ and $D_3=1' \times 1'$.

(2) 2 levels of N as C/A/N : $N_0=0$ and $N_1=40$ lb./ac.

(3) 2 varieties : $V_1=P$ 216.F (late) and $V_2=Laxmi$ (medium).

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) $37' \times 21'$. (b) N.A. (v) 1 row on all sides. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Jassids and aphids attack ; Paramar sprayed twice. (iii) Cotton yield no of bolls and height. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 667.7 lb./ac. (ii) 201.82 lb./ac. (iii) Effect of N alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	Mean	V_0	V_1
D_1	533.2	733.4	633.3	575.7	690.9
D_2	590.4	864.4	727.4	735.5	719.3
D_3	547.0	737.6	642.3	665.9	618.7
Mean	556.9	778.5	667.7	659.0	676.3
V_0	513.8	804.2			
V_1	599.9	752.8			

S.E. of D marginal mean = 41.19 lb./ac.
 S.E. of N or V marginal mean = 33.64 lb./ac.
 S.E. of body of $D \times N$ or $D \times V$ table = 58.26 lb./ac.
 S.E. of body of $N \times V$ table = 47.57 lb./ac.

Crop :- Cotton.

Ref :- Or. 59(34).

Site :- Cotton Res. and Development Stn., Chakuli.

Type :- 'D'.

Object :—To find out a suitable insecticide to control attack of jassids on Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) G.M. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 14.11.1959. (iv) (a) 3 ploughings with *desi* plough and laddering. (b) Line sowing by dibbling. (c) 12 srs./ac. (d) $2' \times 1'$. (e) N.A. (v) 3 tons/ac. of compost and Super at 40 lb./ac. of P_2O_5 broadcast at the time of field preparation. Top dressing C/A/N at 40 lb./ac. of N at hoeing. (vi) P-216-F (late). (vii) Irrigated. (viii) 2 hoeings, earthings and weeding. (ix) N.A. (x) 13, 27.5.1960.

2. TREATMENTS :

10 insecticidal treatments : D_1 =Control, D_2 =Water sprayed, D_3 =Endrine 0.04 %, D_4 =Endrine 0.08 %, D_5 =Paramar 0.025 %, D_6 =Paramar 0.05 %, D_7 =Malathion 0.05 %, D_8 =Malathion 0.1 %, D_9 =DDT+BHC 0.1 % and D_{10} =DDT+BHC 0.25%.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 45'×18'. (b) 41'×14'. (v) 1 row on all sides. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of red cotton bugs and aphids—control measures as per treatments. (iii) Yield of cotton, % count of jassids population before and after spraying. (iv) (a) No. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 249.6 lb./ac. (ii) 90.78 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cotton in lb./ac.

Treatment	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀
Av. yield	261.2	254.7	285.9	289.3	236.7	283.6	276.4	246.3	156.6	205.7

S.E./mean = 45.39 lb./ac.

Crop :- Jute (*Kharif*).

Ref :- Or. 59(12).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'C'.

Object :—To find out the optimum period of sowing Jute under irrigated conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Clay. (b) N.A. (iii) As per treatments. (iv) (a) 6 ploughings, 2 ladderings and breaking of clods. (b) Line sowing. (c) 10 lb./ac. (d) 9' apart. (e) 15 C.L./ac. of compost mixed in the soil before sowing seeds, 20 lb./ac. of N as A'S and 24 lb./ac. of P₂O₅ applied in the line. (vi) C—442 ; Kf—321. (vii) Irrigated. (viii) 6 hoeings and weedings. (ix) 24.4" (till Aug.). (x) 7, 17 and 19.8.1959.

2. TREATMENTS :

6 sowing dates : D₁=1.4.1959, D₂=15.4.1959, D₃=1.5.1959, D₄=15.5.1959, D₅=1.6.1959 and D₆=15.6.1959.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 51'×25½'. (iii) 4. (iv) (a) 16'×12'. (b) 14'×10½'. (v) 12'×9'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Mild attack of semi-looper and Endrine was sprayed. (iii) Yield of fibre. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1108 lb./ac. (ii) 178 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fibre in lb./ac.

Treatment	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆
Av. yield	1304	1280	1221	1129	10+6	664

S.E./mean = 89 lb./ac.

Crop :- Tobacco (*Rabi*).

Ref :- Or. 55(8)

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'M'.

Object :—To find out the optimum dose of N and K₂O for bidi Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 9.12.1955. and 10.12.1955. (iv) (a) 6 ploughings with country plough. (b) Line planting. (c) One seedling hole. (d) 3'×2'. (e) N.A. (v) Nil. (vi) K—49 and K—20. (vii) Irrigated. (viii) Two hoeings and 1 earthing. (ix) 0.15'. (x) N.A.

2. TREATMENTS :

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

(1) 3 levels of N as A/S : $N_1=40$, $N_2=60$ and $N_3=80$ lb./ac.

(2) 3 levels of K_2O as Pot. Sul. : $K_0=0$, $K_1=100$ and $K_2=150$ lb./ac.

Treatments applied on 31.12.1955.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) $18' \times 10'$. (b) $15' \times 7\frac{1}{2}'$. (v) One row around. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Weight of dry leaf. (iv) (a) 1955—1956. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 274.2 lb./ac. (ii) 77.4 lb./ac. (iii) Control vs others is significant. Other effects are not significant. (iv) Av. yield of tobacco in lb./ac.

Control=259.4 lb./ac.

	K_0	K_1	K_2	Mean
N_1	294.3	313.6	255.6	287.8
N_2	259.4	329.1	228.4	272.3
N_3	232.3	286.5	282.7	267.2
Mean	262.0	309.7	255.6	275.8

S.E. of N or K marginal means = 25.8 lb./ac.

S.E. of body of table = 44.7 lb./ac.

Crop :- Tobacco (Rabi).

Site :- Agri. Res. Stn., Sambalpur.

Ref :- Or. 56(24).

Type :- 'M'.

Object :—To find out the optimum dose of N and K_2O for bidi Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Clay. (b) N.A. (iii) 25.12.1956. (iv) (a) 6 ploughings. (b) Line planting. (c) N.A. (d) $3' \times 2'$. (e) One seedling/hole. (v) Nil. (vi) K—49. (vii) Irrigated. (viii) Hoeing and earthing up. (ix) $4.88''$. (x) 3 pickings from 16.4.1957 to 2.5.1957.

2. TREATMENTS :

Same as in expt. no. 55(8) on page 190.

Treatments applied on 23.1.1956.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) $18' \times 12'$. (b) $12' \times 8'$. (v) 1 row around. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Weight of dry leaf. (iv) (a) to (c) No. (v) (a) and (b) N.A. (vi) and (vii) N.A.

5. RESULTS :

(i) 914.7 lb./ac. (ii) 267.7 lb./ac. (iii) Control vs treated is highly significant. Interaction $N \times K$ is significant. (iv) Av. yield of tobacco in lb./ac.

Control=508.2 lb./ac.

	K ₀	K ₁	K ₂	Mean
N ₁	662.5	1143.4	912.0	906.0
N ₂	1125.3	921.1	930.2	992.2
N ₃	1148.0	735.1	1061.8	981.6
Mean	978.6	933.2	968.0	959.9

S.E. of N or K marginal mean = 89.23 lb./ac.
S.E. of body of table = 154.6 lb./ac.

Crop :- Turmeric (Kharif).**Ref :- Or. 54(3).****Site :- Turmeric Res. Stn., G. Udaygiri.****Type :- 'M'.**

Object :—To find out a substitute for leaf mulch among other kinds of organic manures for Turmeric.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Laterite. (b) N.A. (iii) 6 to 7.6.1954. (iv) (a) N.A. (b) Sowing in furrows. (c) N.A. (d) 9"×9". (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) 3 weedings. (ix) 47.35". (x) N.A.

2. TREATMENTS :

7 sources to give 112 lb./ac. of N : S₁=F.Y.M., S₂=Fresh cattledung, S₃=Compost, S₄=Castorcake, S₅=Niger cake, S₆=Soil dust mulch and S₇=Sal leaf mulch (control).

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 64'×6'. (b) 62'×4½'. (v) 9"×9". (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of raw turmeric. (iv) (a) 1952—1954. (b) N.A. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 9914 lb./ac. (ii) 840 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of raw turmeric in lb./ac.

Treatment	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇
Av. yield	11749	10617	9797	8860	9797	8431	10148

S.E./mean = 420 lb./ac.

Crop :- Turmeric.**Ref :- Or. 54(6).****Site :- Turmeric Res. Stn., G. Udaygiri.****Type :- 'M'.**

Object :—To study the effect of different doses and sources of N and their residual effect on Paddy.

1. BASAL CONDITIONS :

(i) to (c) N.A. (ii) (a) Laterite. (b) N.A. (iii) 27, 28.5.1954. (iv) (a) to (c) N.A. (d) 9"×12". (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) 2 weedings. (ix) 47.35". (x) N.A.

2. TREATMENTS :

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

(1) 2 sources of N : S₁=A/S and S₂=Niger oil cake.

(2) 3 levels of N : N₁=60, N₂=90 and N₃=120 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) $64' \times 7\frac{1}{2}'$. (b) $62' \times 5\frac{1}{2}'$. (v) $9'' \times 12''$. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of raw turmeric. (iv) (a) 1952—1954. (b) N.A. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 8745 lb./ac. (ii) 1979 lb./ac. (iii) Treatment differences are highly significant. Control vs. others is significant. (iv) Av. yield of raw turmeric in lb./ac.

Control=6821 lb./ac.

	N ₁	N ₂	N ₃	Mean
S ₁	10883	11369	12314	11522
S ₂	6949	6310	6566	6608
Mean	8916	8839	9440	9065

S.E. of S marginal mean = 511 lb./ac.
 S.E. of N marginal mean = 626 lb./ac.
 S.E. of body of table or control mean = 885 lb./ac.

Crop :- Turmeric.

Ref :- Or. 54(5).

Site :- Turmeric Res. Stn., G. Udaygiri.

Type :- 'C'.

Object :—To study the optimum depth and time of planting for Turmeric.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Laterite. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) Planted in furrows. (c) to (e) N.A. (v) N.A. (vi) Local. (vii) Unirrigated. (viii) Weeding on 15, 16.7.1954. (ix) 47.35". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

6 dates of sowing : D₁=15.4.1954, D₂=30.4.1954, D₃=15.5.1954, D₄=30.5.1954, D₅=14.6.1954 and D₆=29.6.1954.

Sub-plot treatments :

4 depths of sowing : S₁=1½", S₂=3", S₃=4½" and S₄=6".

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) and (c) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Weight of raw turmeric. (iv) (a) 1952—1954. (b) N.A. (c) No. (v) (a) and (b) Nil. (vi) One of the replications was discarded. (vii) Nil.

5. RESULTS :

(i) 66.18 lb./plot. (ii) (a) 15.25 lb./plot. (b) 10.66 lb./plot. (iii) Only D effect is significant. (iv) Av. yield of raw turmeric in lb./plot.

	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	Mean
S ₁	81.25	76.00	89.25	74.50	48.25	35.25	67.42
S ₂	86.00	69.50	82.25	66.75	48.00	31.50	64.00
S ₃	83.00	72.25	78.25	80.80	54.75	37.00	67.58
S ₄	78.75	81.00	77.50	77.75	45.50	33.50	65.67
Mean	82.25	74.69	81.81	74.90	49.12	34.31	66.18

S.E. of difference of two

1. D marginal means = 5.39 lb./plot.
2. S marginal means = 3.08 lb./plot.
3. S means at the same level of D = 7.54 lb./plot.
4. D means at the same level of S = 8.47 lb./plot.

Crop :- Turmeric (Kharif).**Ref :- Or. 54(7).****Site :- Turmeric Res. Stn., G. Udaygiri.****Type :- 'C'.**

Object :—To study the merits of planting mother rhizomes vs daughter rhizomes with different spacings for Turmeric.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Laterite. (b) N.A. (iii) 6.5.1954. (iv) (a) N.A. (b) Sowing in furrows. (c) N.A. (d) As per treatments. (e) 1 rhizome/hole. (v) N.A. (vi) Local. (vii) Unirrigated. (viii) Weeding. (ix) 47.35". (x) 13 to 16.2.1955.

2. TREATMENTS :**Main-plot treatments :**

6 spacings : $S_1=6'' \times 6''$, $S_2=9'' \times 6''$, $S_3=9'' \times 9''$, $S_4=12'' \times 9''$, $S_5=12'' \times 12''$ and $S_6=18'' \times 12''$.

Sub-plot treatments :

2 types of seed material : T_1 = Daughter rhizomes and T_2 = Mother rhizomes.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) S_1 and $S_2=15' \times 9'$; $S_3=15' \times 9\frac{1}{2}'$; S_4 and $S_5=15' \times 7\frac{1}{2}'$ and $S_6=15' \times 7'$. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL

(i) N.A. (ii) N.A. (iii) Yield of raw turmeric. (iv) (a) 1945—1954 (with modifications). (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS

(i) 48.35 lb./plot. (ii) (a) 9.53 lb./plot. (b) 8.67 lb./plot. (iii) Only T effect is highly significant. (iv) Av. yield of raw turmeric in lb./plot.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean
T_1	30.00	37.25	38.75	35.25	33.50	31.75	34.42
T_2	55.25	53.00	53.50	63.25	67.00	81.75	62.29
Mean	42.63	45.13	46.13	49.25	50.25	56.75	48.35

S.E. of difference of two

1. S marginal means = 4.76 lb./plot.
2. T marginal means = 2.51 lb./plot.
3. T means at the same level of S = 6.14 lb./plot.
4. S means at the same level of T = 9.11 lb./plot.

Crop :- Turmeric.**Ref :- Or. 55(2).****Site :- Turmeric Res. Stn., G. Udaygiri.****Type :- 'C'.**

Object :—To find out the effect of mixed cropping of Turmeric with castor and sannhemp.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Laterite. (b) N.A. (iii) 30.5.1955. (iv) (a) to (e) N.A. (v) N.A. (vi) Local. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 68.53". (x) N.A.

2. TREATMENTS :

1. Turmeric alone.
2. Turmeric+castor.
3. Turmeric+sannhemp.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 30'×12'. (b) 27½'×10½'. (v) 1½'×1½'. (vi) Yes.

GENERAL :

(i) Good. (ii) Nil. (iii) Weight of sannhemp seed and raw turmeric. (iv) (a) No. (b) Nil. (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 6402 lb./ac. (ii) 1435 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of raw turmeric in lb./ac.

Treatment	1	2	3
Av. yield	5733	5632	7845.

S.E./mean = 585.8 lb./ac.

Crop :- Turmeric.

Ref :- Or. 54(4).

Site :- Turmeric Res. Stn., G. Udaygiri.

Type :- 'C'.

Object :—To study the effect of mixed cropping of Turmeric with ragi, dhaincha and sannhemp.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Laterite. (b) N.A. (iii) 8.6.1954. (iv) (a) N.A. (b) Sowing in furrows. (c) N.A. (d) 9"×9". (e) N.A. (v) N.A. (vi) Local. (vii) Unirrigated. (viii) Weeding. (ix) 47.35". (x) Sannhemp : 13.9.1954.

2. TREATMENTS :

1. Turmeric alone.
2. Turmeric+Ragi.
3. Turmeric+Dhaincha.
4. Turmeric+Sannhemp.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 32'×15'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of raw turmeric. (iv) (a) 1952—1954. (b) N.A. (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 5880 lb./ac. (ii) 801 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of raw turmeric in lb./ac.

Treatment	1	2	3	4
Av. yield	7562	2904	8410	4644

S.E./mean = 327 lb./ac.

Crop :- Turmeric.

Ref :- Or. 56(5).

Site :- Turmeric Res. Stn., G. Udaygiri.

Type :- 'C'.

Object :—To study the effect of mixed cropping of Turmeric with ragi, dhaincha and sannhemp.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Niger. (c) N.A. (ii) (a) Laterite. (b) N.A. (iii) 12.7.1956. (iv) (a) N.A. (b) Sown behind the plough. (c) and (d) N.A. (c) One finger/hole. (v) 3 C.L./ac. of F.Y.M. at the time of ploughing. (vi) *Guttama* (local). (vii) Unirrigated. (viii) Weeding. (ix) 90.00%. (x) 3.1.1957.

2. TREATMENTS :

1. Guar+Turmeric.
2. Teosinte +Turmeric.
3. Cow-pea+Turmeric.
4. Turmeric alone.

3. DESIGN :

(i) L. Sq. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 15'×15'. (v) No border left. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of raw turmeric. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 12814 lb./ac. (ii) 1895 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of raw turmeric in lb./ac.

Treatment	1	2	3	4
Av. yield	15101	9970	10938	15246

S E./mean = 947.5 lb./ac.

Crop :- Groundnut (*Rabi*).

Ref :- Or. 59(48).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'M'.

Object :—To study the response of Groundnut to lime with different combinations of N, P and K.

1. BASAL CONDITIONS :

(i) (a) Nil (b) Fallow in *kharif*. (c) Nil. (ii) (a) Sandy soil. (b) pH 5.9, organic carbon 0.27%, Tss% 0.49, available P 132 lb./ac., available K 54 lb./ac. and available N 210 lb./ac. (iii) 12.12.1959. (iv) (a) N.A. (b) Line sowing. (c) 1 md./ac. (d) 6'×6'. (e) Two. (v) Nil. (vi) T.M.V. 2 (vii) Irrigated. (viii) Hoeing and weeding. (ix) N.A. (x) 7.5.1960.

2. TREATMENTS :

Main-plot treatments :

3 levels of lime : $L_0=0$, $L_1=500$ and $L_2=750$ lb./ac.

Sub-plot treatments :

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

(1) 2 levels of N as A/S : $N_0=0$ and $N_1=20$ lb./ac.

(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=30$ lb./ac.

(3) 2 levels of K_2O as Pot. Sul. : $K_0=0$ and $K_1=30$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6'×6'. (b) 5 3'×5 3'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of pod. (iv) (a) 1959—N.A. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1883 lb./ac. (ii) (a) 696 lb./ac. (b) 623 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of pod in lb./ac.

	N ₀	N ₁	P ₀	P ₁	K ₀	K ₁	Mean
L ₀	1684	1893	1798	1778	1719	1857	1788
L ₁	1664	1723	1542	1845	1727	1660	1693
L ₂	2122	2216	2046	2291	2070	2267	2169
Mean	1823	1944	1795	1971	1839	1928	1883
K ₀	1759	1919	1782	1895			
K ₁	1887	1969	1808	2048			
P ₀	1661	1929					
P ₁	1985	1958					

S.E. of difference of two

1. L marginal means = 174 lb./ac.
2. N, P or K marginal means = 127 lb./ac.
3. N, P or K means at the same level of L = 220 lb./ac.
4. L means at the same level of N, P or K = 447 lb./ac.
5. means in the body of N×P, N×K or P×K tables = 180 lb./ac.

Crop :- Groundnut.**Ref :- Or. 59(SFT).****Centre :- Mayurbhanj (c.f.).****Type :- 'M'.**

Object :—Type A—To study the response of oilseeds to levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red. (iii) Nil. (iv) and (v) N.A. (vi) July 1959. (vii) to (ix) N.A. (x) November, 1959.

2. TREATMENTS :

0 =Control (no manure).

n =20 lb./ac. of N as A/S.

p =30 lb./ac. of P₂O₅ as Super.

np =20 lb./ac. of N as A/S+30 lb./ac. of P₂O₅ as Super.

k =30 lb./ac. of K₂O as Muriate of Potash.

nk =20 lb./ac. of N as A/S+30 lb./ac. of K₂O as Muriate of Potash.

pk =30 lb./ac. of P₂O₅ as Super+30 lb./ac. of K₂O as Muriate of Potash.

npk=20 lb./ac. of N as A/S+30 lb./ac. of P₂O₅ as Super+30 lb./ac. of K₂O as Muriate of Potash.

3. DESIGN :

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

4. GENERAL :

(i) Good. (ii) N.A. (iii) Pod yield. (iv) (a) 1959—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) N.A.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	2172	2633	2831	3621	2773	3489	3851	4641

G.M.=3251 lb./ac. ; S.E.=100.9 lb./ac. and no. of trials=6.

Crop :- Groundnut.**Ref :- Or. 59(SFT).****Centre :- Sambalpur (c.f.).****Type :- 'M'.**

Object :—Type A—To study the response of oilseeds to levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and black. (iii) Nil. (iv) and (v) N.A. (vi) July 1959. (vii) to (ix) N.A. (x) November 1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 59(SFT) Type A on page 197 conducted at Mayurbhanj.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Pod yield. (iv) (a) 1959—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) Nil.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	667	889	1226	1234	757	1070	1152	1695

G.M.=1086 lb./ac. ; S.E./mean=177.0 lb./ac. and no. of trials=2.

Crop :- Groundnut.**Ref :- Or. 59(SFT).****Centre :- Dhenkanal (c.f.).****Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and black. (iii) to (v) N.A. (vi) July 1959. (vii) to (ix) N.A. (x) November 1959.

2. TREATMENTS :

0 = Control

n₁' = 20 lb./ac. of N as Urea.

n₂' = 40 lb./ac. of N as Urea.

n₁'' = 20 lb./ac. of N as A/S/N.

n₂'' = 40 lb./ac. of N as A/S/N.

n₁''' = 20 lb./ac. of N as C/A/N.

n₂''' = 40 lb./ac. of N as C/A/N.

3. DESIGN :

Same as in expt. no. 59(SFT) Type A on page 197 conducted at Mayurbhanj.

4. GENERAL :

(i) and (ii) N.A. (iii) Pod yield. (iv) (a) 1959—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) N.A.

5. RESULTS :

Treatment	0	n ₁ '	n ₂ '	n ₁ ''	n ₂ ''	n ₁ '''	n ₂ '''
Av. yield	592	856	675	642	938	880	1020

G.M.=800 lb./ac. ; S.E.=N.A. and no. of trials=3.

Crop :- Groundnut.**Ref :- Or. 59(SFT).****Centre :- Mayurbhanj (c.f.).****Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red. (iii) to (v) N.A. (vi) July 1959. (vii) to (ix) N.A. (x) November 1959

2. TREATMENTS and 3. DESIGN :

Same as in expt. no 59(SFT) Type B on page 198 conducted at Dhenkanal.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Pod yield. (iv) (a) 1959—contd. (b) No. (c) N.A. (v) As per design. (vi) and (vii) Nil.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	2107	2666	3415	2419	3390	2913	4016

G.M.=2989 lb./ac. ; S.E.=165.2 lb./ac. and no. of trials=4.

Crop :- Groundnut.

Ref :- Or. 59(SFT).

Centre :- Sambalpur (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and black. (iii) to (v) N.A. (vi) July 1959. (vii) to (ix) N.A. (x) Nov. 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) Type B on page 198 conducted at Dhenkanal.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	848	971	1210	1251	1415	1152	1160

G.M.=1144 lb./ac. S.E./plot=51.8 lb./ac. and no. of trials=4.

Crop :- Groundnut (Kharif).

Ref :- Or. 59(13).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'C'.

Object :—To find out the optimum spacing for Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy soil. (b) N.A. (iii) 14.7.1959. (iv) (a) 4 ploughings and 2 ladderings. (b) Line sowing. (c) 30 srs/ac. (d) As per treatments. (e) 2. (v) Top-dressing with 32 lb./ac. of P_2O_5 as Super and 20 lb./ac. of N as A/S. (vi) Baripada (local). (vii) Unirrigated. (viii) Hoeing and manuring on 16.8.1959. (ix) 37.9". (x) 29.10.1959.

2. TREATMENTS :

5 spacings : $S_1=18'' \times 9''$, $S_2=15'' \times 9''$, $S_3=12'' \times 9''$, $S_4=9'' \times 9''$ and $S_5=6'' \times 9''$.

3. DESIGN :

(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) $18' \times 10\frac{1}{2}'$. (b) $18' \times 10\frac{1}{2}'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of groundnut. (iv) (a) 1959—N.A. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) Trial conducted at Paramanpur sub-station. (vii) Nil.

5. RESULTS :

(i) 992 lb./ac. (ii) 184 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of pod in lb./ac.

Treatment	S ₁	S ₂	S ₃	S ₄	S ₅
Av. yield	786	800	1051	1076	1249

S.E./mean = 82.3 lb./ac.

Crop :- Groundnut (*Rabi*).

Ref :- Or. 59(47).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'C'.

Object :—To find out the optimum period of sowing for Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 5 ploughings with country plough, laddering in between two ploughings. (b) Line sowing. (c) N.A. (d) 1'×6". (e) 2. (v) Green manuring with sannhemp, 25 lb./ac. of P₂O₅ as Super and 40 lb./ac. of K₂O as Pot. Sul. (vi) T.M.V.—2. (vii) Irrigated. (viii) and (ix) N.A. (x) 7, 25.3.1960, 7, 24.4.1960, and 1, 4.5.1960.

2. TREATMENTS :

6 dates of sowing : D₁=25.10.1959, D₂=10.11.1959, D₃=25.11.1959, D₄=10.12.1959, D₅=25.12.1959 and D₆=10.1.1960.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 28'×14'. (b) 26'×13'. (v) One line on each side. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of pod. (iv) (a) 1959—N.A. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 623 lb./ac. (ii) 410 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of pod in lb./ac.

Treatment	D ₁	D ₂	D ₃	D ₄	D ₅
Av. yield	826	1026	193	568	524

S.E./mean = 205 lb./ac.

Crop :- Groundnut (*Kharif*).

Ref :- Or. 58(24).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'CV'.

Object :—To find out suitable method of planting different varieties of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 4.7.1958. (iv) (a) 3 ploughings with country plough to 3" depth. (b) As per treatments. (c) N.A. (d) 2'×1'. (e) One. (v) 5 C.L./ac. of F.Y.M, 20 lb./ac. of N as A/S and 30 lb./ac. of P₂O₅ as Super. (vi) As per treatments. (vii) Irrigated. (viii) 4 to 5 weedings and hoeing. (ix) N.A. (x) 30.11.1958.

2. TREATMENTS :

Main-plot treatments :

3 varieties : V₁=A.H. 477, V₂=Pb. (erect) and V₃=Pb. 648/4.

Sub-plot treatments :

4 methods of planting : M₁=Sowing in flat beds, M₂=Sowing in flat beds and ridging, M₃=Sowing in ridges and M₄=Sowing in ridges and ridging once again.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plot/main-plot. (b) 43'×92'. (iii) 3. (iv) (a) 43'×27'. (main-plot) ; 10'×27' (sub-plot). (b) 25'×6'. (v) One guard row around the net-plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) %Germination, height, population count of plants, no. of branches and pods, no. of root nodules and yield in ozs/plot. (iv) (a) 1957—1959. (b) N.A. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 153 lb./ac. (ii) (a) 205.5 lb./ac. (b) 114.7 lb./ac. (iii) None of the effects is significant. (v) Av. yield of pod in lb./ac.

	M ₁	M ₂	M ₃	M ₄	Mean
V ₁	43.02	139.21	193.66	108.90	121.20
V ₂	205.64	142.11	96.74	123.96	142.11
V ₃	139.21	272.25	197.83	173.70	195.75
Mean	129.29	184.52	162.74	135.52	153.02

S.E. of difference of two

1. V marginal means = 83.89 lb./ac.
2. M marginal means = 54.08 lb./ac.
3. M means at the same level of V = 93.71 lb./ac.
4. V means at the same level of M = 116.68 lb./ac.

Crop :- Groundnut (*Kharif*).

Ref :- Or. 56(28).

Site :- Agri. Res. Stn., Sambalpur.

Type :- 'D'.

Object :- To study the effect of fungicidal spray on the incidence of cerco-spora leaf-spot and stem-rot diseases.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Clay loam. (b) N.A. (iii) 15.7.1956. (iv) (a) to (e) N.A. (v) 20 lb./ac. of N as A/S and 40 lb./ac. of P₂O₅ as Super. (vi) Local. (vii) N.A. (viii) 3 weedings, hoeing and gap-filling. (ix) N.A. (x) 26.12.1956.

2. TREATMENTS :

8 fungicides : F₀=Control, F₁=Formalin at 1 oz/sq. yard, F₂=Crag potato fungicide (0.3%), F₃=Perenox (0.4%), F₄=Cupravit (0.4%), F₅=Wittable sulphur (0.5%), F₆=Cupramer (0.35%) and F₇=Copper Sandoz (0.35%).

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 20'×7½'. (b) 20×7½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Stem-rot and *tikka* disease. (iii) Yield of pod. (iv) (a), (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1331 lb./ac. (ii) 299 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of pod in lb/ac.

Treatment	F ₀	F ₁	F ₂	F ₃	F ₄	F ₅	F ₆	F ₇
Av. yield	1285	1466	1194	1607	1439	1171	1212	1276

S.E./mean = 149 lb./ac.

Crop :- Mustard.
Centre :- Dhenkanal (c.f.).

Ref :- Or. 59(SFT).
Type :- 'M'.

Object :—Type A—To study the response of oilseeds to levels of N, P_2O_5 and K_2O , applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and black. (iii) Nil. (iv) and (v) N.A. (vi) Oct. (vii) to (ix) N.A. (x) Feb.—March.

2. TREATMENTS :

0 = Control (no manure).

n = 20 lb./ac. of N as A/S.

p = 20 lb./ac. of P_2O_5 as Super.

np = 20 lb./ac. of N as A/S + 20 lb./ac. of P_2O_5 as Super.

k = 20 lb./ac. of K_2O as Muriate of Potash.

nk = 20 lb./ac. of N as A/S + 20 lb./ac. of K_2O as muriate of Potash.

pk = 20 lb./ac. of P as Super + 20 lb./ac. of K_2O as Muriate of Potash.

npk = 20 lb./ac. of N as A/S + 20 lb./ac. of P_2O_5 as Super + 20 lb./ac. of K_2O as Muriate of Potash.

3. DESIGN :

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

4. GENERAL :

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

5. RESULTS :

Treatment	0	n	p	np	k	nk	p	rpk
Av. yield	773	971	773	971	683	955	1045	1218

G.M. = 924 lb./ac. ; S.E. = 39.28 lb./ac. and no. of trials = 4.

Crop :- Linseed (Rabi).
Site :- Agri. Res. Stn., Bhubaneswar.

Ref :- Or. 57(36).
Type :- 'IM'.

Object :—To study the response to manuring with N and P irrigation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 17.11.1957. (iv) (a) 3 ploughings, harrowing and levelling. (b) N.A. (c) 5 srs./ac. (d) 9' between lines. (e) N.A. (v) Nil. (vi) N.A. (vii) As per treatments. (viii) Weeding and hoeing. (ix) 6.04%. (x) 9.3.1958.

2. TREATMENTS :

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

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

(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.

(3) 3 levels of irrigation : $I_0=$ No irrigation, $I_1=$ One irrigation after hoeing and application of A/S and $I_2=$ Two irrigations—once as in I_1 and the other before flowering.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9. (b) N.A. (iii) 1. (iv) (a) 22' × 9'. (b) 20½' × 7½'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Average. (ii) N.A. (iii) Height, tiller count and yield of grain. (iv) (a) No. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 177.7 lb./ac. (ii) 78.42 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean	I ₀	I ₁	I ₂
N ₀	123.9	141.6	165.2	143.6	123.9	188.8	118.0
N ₁	165.2	159.3	177.0	167.2	206.5	147.5	147.5
N ₂	182.9	236.0	247.8	222.2	182.9	253.7	230.1
Mean	157.3	179.0	196.7	177.7	171.1	196.7	165.2
I ₀	153.4	159.3	200.6				
I ₁	159.3	218.3	212.4				
I ₂	159.3	159.3	177.0				

S.E. of any marginal mean = 26.14 lb./ac.

S.E. of body of any table = 45.28 lb./ac.

Crop :- Gingelly.

Ref :- Or. 59(SFT).

Centre :- Ganjam (c.f.).

Type :- 'M'.

Object :—Type A—To study the response of oilseeds to levels of N, P₂O₅ and K₂O applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and laterite. (iii) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) Type A on page 202 conducted at Dhenkanal.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	255.1	345.6	279.8	362.1	312.7	345.6	312.7	403.2

G.M.=327.1 lb./ac. ; S.E.=38.21 lb./ac. and no. of trials =2.

Crop :- Gingelly.

Ref :- Or. 59(SFT).

Centre :- Kalahandi (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red. (iii) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) Type A on page 202 conducted at Dhenkanal.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	205.7	617.1	543.1	1201.4	543.9	1045.0	633.6	979.2

G.M.=721.1 lb./ac. ; S.E.=106.5 lb./ac. and no. of trials=2.

Crop :- Gingelly.

Ref :- Or. 59(SFT).

Centre :- Puri (c.f.).

Type :- 'M'.

Object :—Type A—To study the response of oilseeds to levels of N, P₂O₅ and K₂O, applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Coastal. (iii) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(SFT) Type A on page 202 conducted at Dhenkanal.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	172.8	246.9	189.3	263.3	181.0	222.2	205.7	279.3

G.M = 220.1 lb./ac. ; S.E /mean=37.65 lb./ac. and no. of trials = 2.

Crop :- Gingelly.

Ref :- Or. 59(SFT).

Centre :- Ganjam (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and laterite. (iii) to (x) N.A.

2. TREATMENTS :

- 0 = Control (no manure).
- n₁ = 20 lb./ac. of N as A/S.
- n₂ = 40 lb./ac. of N as A/S.
- n₁' = 20 lb./ac. of N as Urea.
- n₂' = 40 lb./ac. of N as Urea.
- n₁''' = 20 lb./ac. of N as C/A/N.
- n₂''' = 40 lb./ac. of N as C/A/N.

3 DESIGN and 4. GENERAL :

Same as in expt. no. 59(SFT) Type B on page 193 conducted at Dhenkanal.

5. RESULTS :

Treatment	0	n ₁	n ₂	n ₁ '	n ₂ '	n ₁ '''	n ₂ '''
Av. yield	263.3	362.1	419.7	345.6	427.9	312.7	362.1

G.M.=356.2 lb./ac. ; S.E.=19.20 lb./ac. and no. of trials=2.

Crop :- Gingelly.

Ref :- Or. 59(SFT).

Centre :- Puri (c.f.).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Coastal. (iii) to (x) N.A.

2. TREATMENTS :

0 = Control (no manure)

n₁ = 20 lb./ac. of N as A/S.n₂ = 40 lb./ac. of N as A/S.n₁' = 20 lb./ac. of N as Urea.n₁' = 40 lb./ac. of N as Urea.n₁'' = 20 lb./ac. of N as A/S/N.n₂'' = 40 lb./ac. of N as A/S/N.n₁''' = 20 lb./ac. of N as C/A/N.n₂''' = 40 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 59(SFT) Type B on page 202 conducted at Dhenkanal.

5. RESULTS :

Treatment	0	n ₁	n ₂	n ₁ '	n ₂ '	n ₁ ''	n ₂ ''	n ₁ '''	n ₂ '''
Av. yield	172.8	98.7	90.5	213.9	238.6	98.7	98.7	213.9	255.1

G.M.=164.5 lb./ac., S.E.=N.A. and no. of trials=2.

Crop :- Gingelly (Kharif).**Ref :- Or. 57(35).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'IM'.**Object :—To study the effect of N and P₂O₅ with different irrigation levels on Gingelly crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Rauwolfia Serpentina*. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 27.9.1957. (iv) (a) 2 ploughings with *deshi* plough. (b) Line sowing. (c) 4 srs/ac. (d) 9" between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) As per treatments. (viii) Hoeing and weeding. (ix) 4.0". (x) About 5.1.1958.

2. TREATMENTS :

Same as in expt. no. 57(36) on page 202.

3. DESIGN :

(i) 3³ confd. (ii) (a) 9. (b) N.A. (iii) 1. (iv) (a) 21'×9'. (b) 20½'×7½'. (v) One row either side and 9" across rows. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Attack of mildew disease, leaf-webbers *leaf-spot* (cerco-spora and sooty-mould disease. Dusting of Gammexane. (iii) Yield of gingelly. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 320.4 lb./ac. (ii) 43.9 lb./ac. (iii) No effect is significant. (iv) Av. yield of gingelly in lb./ac.

	P ₀	P ₁	P ₂	Mean	I ₀	I ₁	I ₂
N ₀	310.6	316.5	310.6	312.6	323.6	287.1	327.1
N ₁	318.1	340.1	309.2	322.4	294.5	327.1	345.7
N ₂	360.4	301.9	316.3	326.2	316.3	287.2	375.1
Mean	329.7	319.5	312.1	320.4	311.4	300.5	349.3
I ₀	301.6	345.7	287.1				
I ₁	332.8	267.1	301.6				
I ₂	354.8	345.7	347.5				

S.E. of any marginal mean

= 14.63 lb./ac.

S.E. of body of any table

= 25.34 lb./ac.

Crop :- Gingelly (Rabi).**Ref :- Or. 59(31).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'IM'.**

Object :- To study the effect of different levels of N and P_2O_5 against different levels of irrigation on Gingelly.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 12.2.1959. (iv) (a) 2 ploughings by *desi* plough. (b) Broadcasting. (c) N.A. (d) 6" between lines. (e) N.A. (v) Nil. (vi) Local. (vii) As per treatments. (viii) Weeding and gap-filling. (ix) N.A. (x) 25, 26.4.1959.

2. TREATMENTS :

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

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

(2) 3 levels of P_2O_5 as Super: $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.

(3) 3 levels of irrigation: I_1 =irrigation 3 weeks after germination, $I_2=I_1$ and one more irrigation 3 weeks afterwards, $I_3=I_2$ and one irrigation just after flowering.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) $22' \times 9'$. (b) $21' \times 8'$. (v) 2 lines on either side and 6" across. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of gingelly. (iv) (a) 1955—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 349.2 lb./ac. (ii) 150.1 lb./ac. (iii) No effect is significant. (iv) Av. yield of gingelly in lb./ac.

	P_0	P_1	P_2	Mean	I_1	I_2	I_3
N_0	274.2	283.4	294.6	284.1	283.0	297.8	271.4
N_1	497.0	346.4	370.5	404.6	392.8	404.8	416.4
N_2	309.4	350.1	416.8	358.8	332.5	379.3	364.5
Mean	360.4	326.7	360.6	349.2	336.1	360.6	350.8
I_1	338.1	346.4	323.7				
I_2	326.5	373.3	382.1				
I_3	415.9	260.3	376.1				

S.E. of any marginal mean = 50.0 lb./ac.

S.E. of body of any table = 86.6 lb./ac.

Crop :- Gingelly (Rabi).**Ref :- Or. 59(28).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'IM'.**

Object :- To study the effect of different levels of N and P_2O_5 against different levels of irrigation on Gingelly.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gingelly. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 21.12.1959. (iv) (a) to (c) N.A. (v) F.Y.M. at 10,000 lb./ac. (vi) Local. (vii) As per treatments. (viii) One hoeing with weeding after 1st irrigation. (ix) 1.77". (x) 21.3.1960.

2. TREATMENTS :

Same as in expt. no. 59(31) above.

3. DESIGN :

(i) 3^3 partially confd. (ii) (a) 9 plots/blocks; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) $22' \times 9'$. (b) $21' \times 8'$. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Attack of antic diseases. Endrex sprayed. (iii) Height and yield of gingelly. (iv) (a) 1958—contd. (b) and (c) Yes. (v) (a) and (b) Nil. (vi) Yield was low due to antic diseases and heavy rains. (vii) Nil.

5. RESULTS :

(i) 122.8 lb./ac. (ii) 61.95 lb./ac. (iii) No effect is significant. (iv) Av. yield of gingelly in lb./ac.

	P ₀	P ₁	P ₂	Mean	I ₁	I ₂	I ₃
N ₀	123.0	120.8	129.4	124.3	159.0	86.0	123.3
N ₁	108.9	114.4	175.7	132.9	115.5	138.5	144.8
N ₂	104.7	133.4	95.2	111.1	135.4	103.2	54.6
Mean	112.2	122.8	133.4	122.8	136.7	109.1	122.6
I ₁	123.9	147.0	139.1				
I ₂	99.9	103.6	124.1				
I ₃	112.9	117.7	137.1				

S.E. of any marginal mean = 20.65 lb./ac.
S.E. of body of any table = 35.76 lb./ac.

Crop :- Niger.

Site :- Agri. Farm, Barpalli.

Ref :- Or. 57(38).

Type :- 'IM'.

Object :—To study the effect of N and P along with different levels of irrigation on Niger crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) and (b) N.A. (iii) 4.11.1957. (iv) (a) Two ploughings and levelling, *desi* ploughing to 4" depth. (b) Dibbling. (c) 4 srs/ac. (d) Lines 9" apart. (e) N.A. (v) Nil. (vi) N.A. (vii) As per treatments. (viii) Weeding and hoeing. (ix) and (x) N.A.

2. TREATMENTS :

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

(1) 3 levels of N as A/S : N₀=0, N₁=30 and N₂=60 lb./ac.

(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=25 and P₂=50 lb./ac.

(3) 2 levels of irrigation : I₁=One irrigation 3 weeks after planting and I₂=I₁+one irrigation before flowering.

3. DESIGN :

(i) $3^2 \times 2$ fact. confd. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) $18' \times 11'$. (b) $16\frac{1}{2}' \times 9\frac{1}{2}'$. (v) One row on either side and 9" across either side. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Niger yield. (iv) (a) to (c) Nil. (v) (a) Bhubaneswar. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 662.5 lb./ac. (ii) 190.5 lb./ac. (iii) Effect of I and interaction NPI are highly significant. P effect is significant. Other effects are not significant. (iv) Av. yield of niger in lb./ac.

	P ₀	P ₁	P ₂	Mean	I ₁	I ₂
N ₀	566.1	686.7	651.7	634.8	558.3	737.4
N ₁	739.2	651.7	581.3	657.4	494.4	829.8
N ₂	741.1	731.4	613.9	695.4	552.3	792.5
Mean	682.1	689.9	615.6	662.5	535.0	786.5
I ₁	540.7	584.0	480.3			
I ₂	849.7	833.0	676.9			

S.E. of N or P marginal mean	=	38.89 lb./ac.
S.E. of I marginal mean	=	31.75 lb./ac.
S.E. of body of N×P table	=	72.00 lb./ac.
S.E. of body of N×I or P×I table	=	54.99 lb./ac.

Crop :- Niger (Kharif).

Ref :- Or. 57(37).

Site :- Agri. Res. Stn., Bhubaneswar.

Type :- 'IM'.

Object :—To study the effect of N and P along with different levels of irrigation on Niger crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy seed beds. (c) A/S applied. Quantity N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 5.11.1957. (iv) (a) Ploughing and levelling. (b) Dibbling. (c) 4 srs./ac. (d) Lines 9' apart. (e) N.A. (v) Nil. (vi) N.A. (vii) As per treatments. (viii) Gap-filling, pot watering, hoeing and thinning. (ix) N.A. (x) 29.1.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(38) on page 237.

4. GENERAL :

(i) and (ii) N.A. (iii) Niger yield. (iv) (a) 1957—1958. (b) and (c) No. (v) (a) Barpali. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 186.4 lb./ac. (ii) 61.97 lb./ac. (iii) N effect alone is highly significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean	I ₁	I ₂
N ₀	115.3	118.1	164.4	132.6	138.3	126.9
N ₁	222.8	196.4	188.0	202.4	208.1	196.7
N ₂	182.0	231.1	259.8	224.3	250.4	198.2
Mean	173.4	181.9	204.1	186.4	198.9	173.9
I ₁	177.2	202.2	217.4			
I ₂	169.5	161.5	190.8			

S.E. of N or P marginal mean	=	14.61 lb./ac.
S.E. of I marginal mean	=	11.93 lb./ac.
S.E. of body of N×P table	=	27.05 lb./ac.
S.E. of body of N×I or P×I table	=	20.66 lb./ac.

Crop :- Niger.**Ref :- Or. 59(30).****Site :- Agri. Res. Stn., Bhubaneswar.****Type :- 'IM'.**

Object—To study the effect of N and P along with different levels of irrigation on Niger crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 20.1. '59. (iv) (a) 2 ploughings by *deshi* plough to 4" depth and levelling. (b) Sowing in lines. (c) 15 lb./ac. 6" between lines. (e) N.A. (v) Nil. (vi) Local. (vii) As per treatments. (viii) 2 weedings. (ix) 21.4.1959.

2. TREATMENTS :

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

(1) 3 levels of N : $N_0=0$, $N_1=30$ and $N_2=60$ lb./ac.(2) 3 levels of P : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.(3) 3 irrigations : I_1 =One irrigation 21 days after germination, I_2 =Two irrigations first as in I_1 and second 42 days after germination and I_3 =Twice as in I_2 and 3rd just after flowering.**3. DESIGN :**

(i) 3³ confd. (ii) (a) 9. (b) N.A. (iii) 2. (iv) (a) 20'×9'. (b) 19'×8'. (v) One row on either side and 6" across either side. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—1959. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 62.95 lb./ac. (ii) 20.53 lb./ac. (iii) Effect of N is highly significant and effects of I and P are significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	I_0	I_1	I_2
N_0	44.20	49.22	55.81	49.74	38.83	58.82	51.68
N_1	60.33	72.50	85.97	72.93	61.76	79.38	77.59
N_2	54.02	73.44	71.07	66.18	54.02	82.11	62.40
Mean	52.85	65.05	70.95	62.95	51.54	73.44	63.88
I_0	44.78	48.93	60.90				
I_1	67.49	79.38	73.44				
I_2	46.28	66.84	78.52				

S.E. of any marginal mean = 4.84 lb./ac.

S.E. of body of any table = 8.38 lb./ac.

Crop :- Berseem (Rabi).**Ref :- Or. 59(51).****Site :- Agri. Res. Stn., Sambalpur.****Type :- 'M'.**

Object :—To find out the effect of minor elements on the growth and yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Jute. (c) N.A. (ii) (a) Sandy loam. (b) pH 5.6. (iii) 17.12.1959. (iv) (a) 5 ploughings with *deshi* plough to 6" depth. (b) Broadcasting. (c) 16 lb./ac. (d) and (e) N.A. (v) 10 C.L./ac. of F.Y.M. and 32 lb./ac. of P_2O_5 as Super applied at broadcasting. (vi) N.A. (vii) Irrigated. (viii) 2 weedings and 1 hoeing. (ix) Nil. (x) 2 cuttings on 19.2.1960 and 4.3.1960.

2. TREATMENTS :

- Molybdenum as Sodium molybdate at 2 lb./ac.+Inoculum.
- Boron as Boric acid at 20 lb./ac.+Inoculum.
- Magnesium as Mag. Sulphate at 20 lb./ac.+Inoculum.
- Zinc as Zinc Sulphate at 20 lb./ac.+Inoculum.
- Calcium as Cal. Hydroxide at 500 lb./ac.+Inoculum.
- Calcium+Molybdenum+Inoculum.
- Calcium+Boron+Inoculum.
- Calcium+Magnesium+Inoculum.
- Calcium+Zinc+Inoculum.
- Inoculum
- Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 12'×8'. (b) 12'×8'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Not good. (ii) Nil. (iii) Yield of green fodder. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 5731 lb./ac. (ii) 513 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in lb./ac.

Treatment	1	2	3	4	5	6	7	8	9	10	11
Av. yield	4693	2492	4179	5969	7500	10195	8819	8705	6877	2155	1460

S.E./mean = 256.5 lb./ac.

Crop :- Nagpur Orange.

Ref :- Or. 54(2).

Site :- Citrus Fruit Res. Stn., Angul.

Type :- 'M'.

Object :—To study the response of Nagpur Orange to manuring with N, P and K.

1. BASAL CONDITIONS :

(i) Fallow. (ii) (a) Black cotton. (b) N.A. (iii) Budding. (iv) Nagpur orange. (v) July 1950, 20'×20' spacing. (vi) One year. (vii) G.M. with *dhaincha* at 30 lb./ac. applied before rains. (viii) 3 ploughings. (ix) Nil. (x) Irrigated. (xi) 42.36'. (xii) —.

2. TREATMENTS :

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

- (1) 3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.
 (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=40$ and $P_2=80$ lb./ac.
 (3) 3 levels of K_2O as Pot. Sul. : $K_0=0$, $K_1=40$ and $K_2=80$ lb./ac.

3. DESIGN :

(i) (a) 3³ partially confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) 4. (v) One tree on all sides. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nematodes and fusariums inside the roots. Plants replaced after fumigation. (iii) Diameter of stock, scion and height. (iv) (a) and (b) 1953—contd. (v) and (vi) Nil.

5. RESULTS :

(i) 14.79 inches. (ii) 1.37 inches. (iii) None of the effects is significant. (iv) Mean girth in inches/tree.

	P_0	P_1	P_2	K_0	K_1	K_2	Mean
N_0	14.32	14.44	15.41	14.59	15.26	14.32	14.79
N_1	14.81	15.41	14.55	14.73	15.04	15.01	14.92
N_2	15.26	14.64	14.26	14.62	14.68	14.87	14.72
Mean	14.80	14.83	14.74	14.65	14.99	14.73	14.79
K_0	14.54	14.94	14.46				
K_1	15.00	15.02	14.95				
K_2	14.85	14.53	14.82				

S.E. of any marginal mean = 0.32 inches.

S.E. of body of any table = 0.56 inches.

Crop :- Nagpur Orange.**Ref :- Or. 55(3).****Site :- Citrus Fruit Res. Stn., Angul.****Type :- 'M'.**

Object :—To study the response of Nagpur Orange to manuring with N, P and K.

1. BASAL CONDITIONS :(i) Fallow. (ii) (a) Black cotton type. (b) N.A. (iii) Budding. (iv) Nagpur orange on *khandia (local)*. (v) July 1950, 20'×20' spacing. (vi) One year. (vii) G.M. with *dhaincha* at 30 lb./ac. applied before rains. (viii) 3 ploughings. (ix) Nil. (x) Irrigated. (xi) 76.54%. (xii) Nov. 1955 to Feb. 1956.**2. TREATMENTS and 3. DESIGN :**

Same as in expt. no. 54(2) on page 210.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Diameter and height of stock and scion and yield of fruit. (iv) (a) 1953—contd. (b) Nil. (v) and (vi) N.A.

5. RESULTS :

(i) 213 fruit/tree. (ii) 74 fruit/tree. (iii) Effect of K is highly significant. Effect of N and interaction N×P and N×K are significant. (iv) Av. no. of fruit/tree

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	Mean
N ₀	79	163	279	167	178	177	174
N ₁	115	228	326	232	196	240	223
N ₂	137	176	415	236	296	196	243
Mean	111	189	340	212	223	204	213
K ₀	109	199	327				
K ₁	116	189	365				
K ₂	107	179	327				

S.E. of any marginal mean

= 17 fruit/tree.

S.E. of body of any table

= 30 fruit/tree.

Crop :- Nagpur Orange.**Ref :- Or. 55(2).****Site :- Citrus Fruit Res. Stn., Angul.****Type :- 'IM'.**

Object :—To find out the effect of different doses of organic manures and methods of irrigation on Nagpur Orange.

1. BASAL CONDITIONS :(i) Fallow. (ii) (a) Black cotton (b) N.A. (iii) Budding. (iv) Nagpur *santra* on *kharna khatta*. (v) June, 1950 at a spacing of 20' both ways. (vi) One year. (vii) *Dhaincha* as G.M. at 30 lb./ac. (viii) 3 ploughings. (ix) Nil. (x) Irrigated. (xi) and (xii) N.A.**2. TREATMENTS :****Main-plot treatments :**4 levels of N : N₀=0, N₁=40, N₂=60 and N₃=80 lb./ac.**Sub-plot treatments :**2 methods of irrigation : M₁=Ring irrigation and M₂=Furrow irrigation.**3. DESIGN :**

(i) Split-plot. (ii) (a) 4 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) 3. (v) One tree around the plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N A. (iii) Diameter and height of stalk and scion and fruit yield. (iv) (a) 1952—contd. (b) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 195 fruit/tree. (ii) (a) 120 fruit/tree. (b) 139 fruit/tree. (iii) Only N effect is highly significant. (iv) Av. no. of fruit/tree.

	N ₀	N ₁	N ₂	N ₃	Mean
M ₁	84	113	290	347	209
M ₂	62	180	204	275	180
Mean	73	147	247	311	195

S.E. of difference of two

1. N marginal means = 60 fruit/tree.
2. M marginal means = 49 fruit/tree.
3. M means at the same level of N = 98 fruit/tree.
4. N means at the same level of M = 92 fruit/tree.

Crop :- Nagpur Orange.

Ref :- Or. 57(1).

Site :- Citrus Fruit Res. Stn., Angul.

Type :- 'IM'.

Object :- To find out the effect of different doses of organic manures and methods of irrigation on Nagpur Orange.

1. BASAL CONDITIONS :

(i) Fallow. (ii) (a) Clay soil (b) N.A. (iii) Budding. (iv) Nagpur orange (medium). (v) June 1950 ; at a spacing of 20' both sides. (vi) 1½ years. (vii) Nil. (viii) Green manured with 15 lbs. of *d'raincha* seed and turning it under soil before maturity. (ix) Nil. (x) Irrigated. (xi) 8.95". (xii) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 55 (2) on page 211.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Diameter of stock, diameter of scion, circumference of spread, height of plants and yield of fruit. (iv) (a) 1952—contd. (b) Nil. (v) and (vi) Date for 1955 N.A.

5. RESULTS :

(i) 88 fruit/tree. (ii) (a) 104 fruit/tree. (b) 36 fruit/tree. (iii) Only M effect is highly significant. (iv) Av. no. of fruit/tree.

	N ₀	N ₁	N ₂	N ₃	Mean
M ₁	64	54	67	55	60
M ₂	132	96	113	123	116
Mean	98	75	90	89	88

S.E. of difference of two

1. N marginal means = 52 fruit/tree.
2. M marginal means = 13 fruit/tree.
3. M means at the same level of N = 25 fruit/tree.
4. N means at the same level of M = 56 fruit/tree.

Crop :- Nagpur Orange.**Ref :- Or. 59(1).****Site :- Citrus Fruit Res. Stn., Angul.****Type :- 'IM'.**

Object :—To find out the effect of different doses of organic manures and methods of irrigation on Nagpur Orange.

1. BASAL CONDITIONS :

(i) Fallow. (ii) (a) Clay soil. (b) N.A. (iii) Budding. (iv) Nagpur Orange. (v) June 1950 at 20' × 20' spacing. (vi) 1½ years. (vii) to (ix) Nil. (x) Irrigated. (xi) and (xii) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 55 (2) on page 211.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Diameter of stock, diameter of scion, circumference of spread, height of plants and yield. (iv) (a) 1952—contd. (b) Nil. (v) and (vi) Yield data for 1958—N.A.

5. RESULTS :

(i) 832 fruit/tree. (ii) (a) 411 fruit/tree. (b) 229 fruit/tree. (iii) None of the effects is significant. (iv) Av. no. of fruit/tree.

	N ₀	N ₁	N ₂	N ₃	Mean
M ₁	849	829	694	882	814
M ₂	750	1020	655	975	850
Mean	800	925	675	929	832

S.E. of difference of two

1. N marginal means = 206 fruit/tree.
2. M marginal means = 81 fruit/tree.
3. M means at the same level of N = 162 fruit/tree.
4. N means at the same level of M = 235 fruit/tree.