INSTITUTE OF AGRICULTURAL RESEARCH STATISTICS

NATIONAL INDEX

OF

AGRICULTURAL

FIELD

EXPERIMENTS

VOL. 6 PART 2

MADHYA PRADESH

1954—59

सत्यमेव जयते

FOREWORD

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

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

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

A. D. PANDIT

Vice-President,

New Delhi,

March 26, 1965.

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 agroclimatic regions, rainfall and cropping pattern followed in each region and agricultural production and area under different crops in the State is given. The experiments reported in each volume have been arranged crop-wise for each State. All the experiments belonging to a particular crop at various research stations are Grouped together. For a particular crop, experiments are arranged according to the following classification :

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

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

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

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

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

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

V.G. PANSE

NEW DELHI,

Statistical Adviser,

March 25, 1965.

Institute of Agricultural Research Statistics (I.C.A.R.).

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

Region and Headquarter	Statistical staff from the Institute of Agricultural Research Statistics.	Regional Supervisors
1. ANDHRA PRADESH (HYDERABAD)	S.K. JILANI P.R. YERI	Dr. MOHD. QUADIRUDDIN KHAN, Joint Director of Agricultural. LATE DR. SYED WAHEEDUDDIN. SHRI MD. KHASIM ADONI, Joint Director of Extension. SHRI N.V. MOHANA RAO, Joint Director, Agricultural Research Institute, Rajendranagar. SHRI L. VENKATARATNAM, Deputy Director of Agriculture (Research).
2. MAHARASHTRA (POONA)	P.D. MEHTA B. RAMAKRISHNAN	SHRI D.S. RANGARAO, Statistician, Department of Agriculture.
3. GUJARAT (AHMEDABAD)	S.P. DOSHI	DR. D. K. DESAI, Deputy Director of Agriculture (Statistics). SHRI J.B. TRIVEDI, Deputy Director of Agriculture (Statistics).
4. UTTAR PRADESH (LUCKNOW)	S.N. BAJPAI M.P. SAXENA G.N. BAHUGUNA A.C. SRIVASTAVA	DR. K. KISHEN, Joint Director of Agriculture (Statistics).
5. MADHYA PRADESH (BHOPAL)	T. LOKESWARA RAO H.C. GUPTA	SHRI A.G. KHARE, Statistician, Department of Agriculture.
6. PUNJAB, JAMMU & KASHMIR & HIMACHAL PRADESH (CHANDIGARH)	A.C. KAISTHA B.L. KAISTHA M.S. BATRA	SHRI PIARA SINGH SAHOTA, Director of Crop Insurance. SHRI MOHINDER SINGH PANNU, Statistician, Department of Agriculture.
7. BIHAR (SABOUR)	M.K. JOSHI P.C. KHOLIA	SHRI G.P. SINGH, Statistician, Department of Agriculture. SHRI R.S. ROY, Principal, Agricultural Research Institute, Sabour.
8. RAJASTHAN (JAIPUR)	B.P. DYUNDI N.K. OHRI	SHRI H.C. KOTHARI, Statistician, Department of Agriculture,
9. ORISSA (BHUBANESWAR)	L.B.S. SOMAYAZULU	SHRI B. MISRA, Deputy Director of Agriculture (Hq.) SHRI D. MISRA, Principal, Uttakal Krushi Mahavidyalaya, Bhubaneswar.
10. WEST BENGAL (CALUTTA)	S.N. NATH	SHRI S.N. MUKERJEE, Statistical Officer, Directorate of Agriculture.

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

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

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

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

Abbreviations adopted for States are as follows :—

1.	A.P.—Andhra Pradesh	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 Bangal

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

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

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

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

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

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

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

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

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

Other abbreviations used in the text of experiments :

Nitro. Phos.—Nitro. Phosphate	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 occurrances, like heavy rains, frost, storm etc., if any. (vii) Any other important information.

TABLE OF CONVERSIONS TO METRIC UNITS

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

GLOSSARY OF VERNACULAR NAMES OF CROPS

Sl. No.	Name of Crop	Botanical Name	Assamese	Bengali	Oriya	Telugu	Tamil	Malayalam	Kannada	Marathi	Gujarati	Hindi	Punjabi
1.	Paddy	*Oryza sativa* L.	Dhan	Dhan	Dhano	Vadlu ; Biyyamu	Nel	Nellu	Bhatta	Bhat	Dangar	Dhan, Chawal	Chaul ; Dhan
2.	Wheat	*Triticum sativum* Lamk. *Triticum aestivum* L.	Gaum ; Ghehu	Gam	Gaham	Godumalu	Kothumai	Gothambu	Godhi	Gahu	Ghahu	Gehon	Kanak
3.	Jowar	*Andropogon sorghum*	—	Jowar	Juara	Jonna	Cholam	Cholam	Jola	Jowari Jondhla	Jowari ; Juar	Jowar ; Jaur	Jowar
4.	Maize	*Zea mays* L.	Gom dhan	Bhutta	Macca	Mokkajonna	Makka-cholam	Cholam Makka-cholam	Musukina Jola	Makka	Makkai	Makka	Makki ; Makayee
5.	Kodo	*Paspalum scrobiculatum* L.	—	Kodo	Kodua	Arikelu ; Arika	Varagu	Varaku	Harka	Kodra	Kodra	Kodon	Kodra
6.	Potato	*Solanum tuberosum* L.	Alooguti	Alu	Bilati Alu	Bangala-dumpa, Urlagadda	Urulai Kizhangu	Urala kizangu	Alu gedde	Batata	Aloo ; Batata	Aaloo	Alu
7.	Tomato	*Lycapersicum esculentum*	Bilahi	Bilati begun	Bilati baigan	Tomato	Thakkali	Thakkali	Tomato	Welwangi ; Tambati	Vilaiti wagan ; Tameta	Tamatter	Tamatar
8.	Cluster bean	*Cyamopsis psoraloides* Dc ; *Cyamopsis*	Thupi Urahi	Guar	Gunar Chhuin	Goruchi-kkudu	Kothavarn-kai Seenia-varaikai	Kothavara	Gori kayi	Guwar	Gavar	Guar	Guara
9.	Cabbage	*Brassica oleracea* L. var. *capitata* L.	Bandhakabi	Bandhakapi	Bandha Kobi	L. Akugobi	Muttaikose	Muttakose	Yele kosu	Kobi	Kobij	Patgobhy	Band gobhi
10.	Bengal gram	*Cicer arietinum* L.	Butmah	Chola	Boot	Senagalu	Kadalai ; Sundal Kadalai	Kadala	Kadale	Harbara	Chana	Chana	Chhole Chana
11.	Black gram	*Phaseaolus mungo* var. *radiatus* Linn.	Matimah	Mashkalai	Biri	Minumulu	Uzhundu	Uzhunnu	Uddu	Udid	Adad, Udad	Urd	Mash, Urd
12.	Tur	*Cajanus cajan* Milsp, *Cajanus indicus* sprengl.	Arhar	Arahar	Harad	Kandulu	Thuvarai	Thuvaran Payaru	Thogari	Tur	Tuver	Arhar	Harhar ; Arhar,
13.	Cowpea	*Vigna catiang* Walp, *Vigna sinensis* Savi	Lasaramah	Barbati	Baragadi	Bobbarlu	Thatapayaru	Mambayar	Alasande	Chavli	Chola, choli	Lobia	Lobia
14.	Green gram (Mung)	*Phaseolus aureus* Roxb.	Magumah	Sonamug	Mung	Pacha-pesalu	Pachaipayru Pasipayaru	Cerupayaru Payaru	Hesaru	Mug	Mag	Moong	Moong, Mug

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Sl. No	Name of Crop	Botanical Name	Assamese	Bengali	Oriya	Telugu	Tamil	Malayalam	Kannada	Marathi	Gujarati	Hindi	Punjabi
15.	Lentil	*Lensesculenta Moench. Lensculnaris Medic*	Masurmah	Musuri	Masur	Chiruse-naga	Masur paruppu	—	Masooru bele	Masur	Masur	Masur	Massar
16.	Sugarcane	*Saccharum officinarum* L.	Kuhiar	Akh	—	Cheruku	Karumbu	Karimbu	Kabbu	Oos	Sherdi	Ganna ; Kamad ; Naishakar	Kamad ; Ganna ; Eakh
17.	Cotton	*Gossypium* spp.	Kapah	Karpas, Tula	Kapa	Pratti	Paruthi	Paruthi	Hatti	Kapus	Kapas	Kapas	Kapah
18.	Groundnut	*Arachis hypogaea* L.	China badam	Cheena badam	China badam	Nelashanga	Nilakadalai	Nilakkadala	Kadala kayi	Bhuimug	Bhoising Magafali	Mungphali	Mungfali
19.	Linseed	*Linum Usitatissimum* L.	Tisi	Tishi	Peshi	Avise	Alivithai	Cherucha-navithu	Agase	Javas ; Alsi	Alsi	Alsi	Alsi
20.	Castor	*Ricinus Communis* L.	Eri	Rehri	Jada	Amudalu	Amanakku	Avanakku	Haralu	Erandi	Diveli Erando	Rehri	Arind ; Harind ; Rind
21.	Chillies	*Capsicum frutescens* L.	Jalakiya	Lanka ; Marich	Lanka	Mirapakaya	Milakai	Mulaku	Menasina Kayi	Mirchi	Marcha	Lalmirch	Lal mirch
22.	Ginger	*Zingiber officinale* Rosc	Ada	Ada	Ada	Allamu	Inji	Inchi	Shunti ; Allu	Ale	Adu	Adrakh	Adrak
23.	Berseem	*Trifolium alexandrinum* L.	—	Berseem	Gini Ghasa	—	—	—	—	Bersim Gavat	Barsim	Berseem	Berseem
24.	Sannhemp	*Crotalaria juncea* L.	San	Shan	Chani	Janumu	Sadambu	Kattu Chanam	Apsenabu	Tag	San	Sann	San

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MAP OF MADHYA PRADESH SHOWING
AGRO-CLIMATIC REGIONS AND AGRI-
CULTURAL RESEARCH STATIONS ETC.
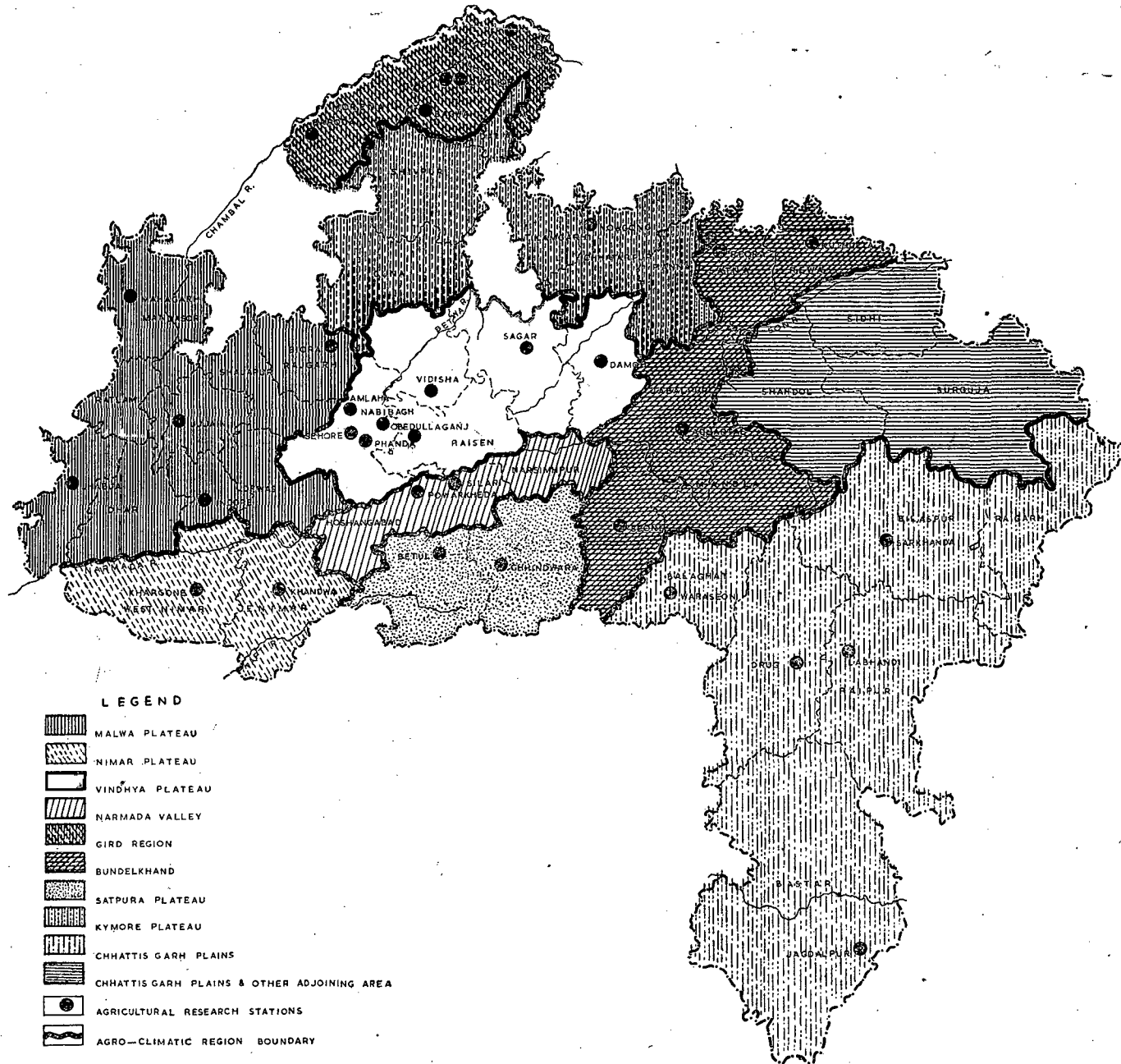
LEGEND

MALWA PLATEAU

NIMAR PLATEAU

VINDHYA PLATEAU

NARMADA VALLEY

GIRD REGION

BUNDELKHAND

SATPURA PLATEAU

KYMORE PLATEAU

CHHATTIS GARH PLAINS

CHHATTIS GARH PLAINS & OTHER ADJOINING AREA

AGRICULTURAL RESEARCH STATIONS

AGRO—CLIMATIC REGION BOUNDARY
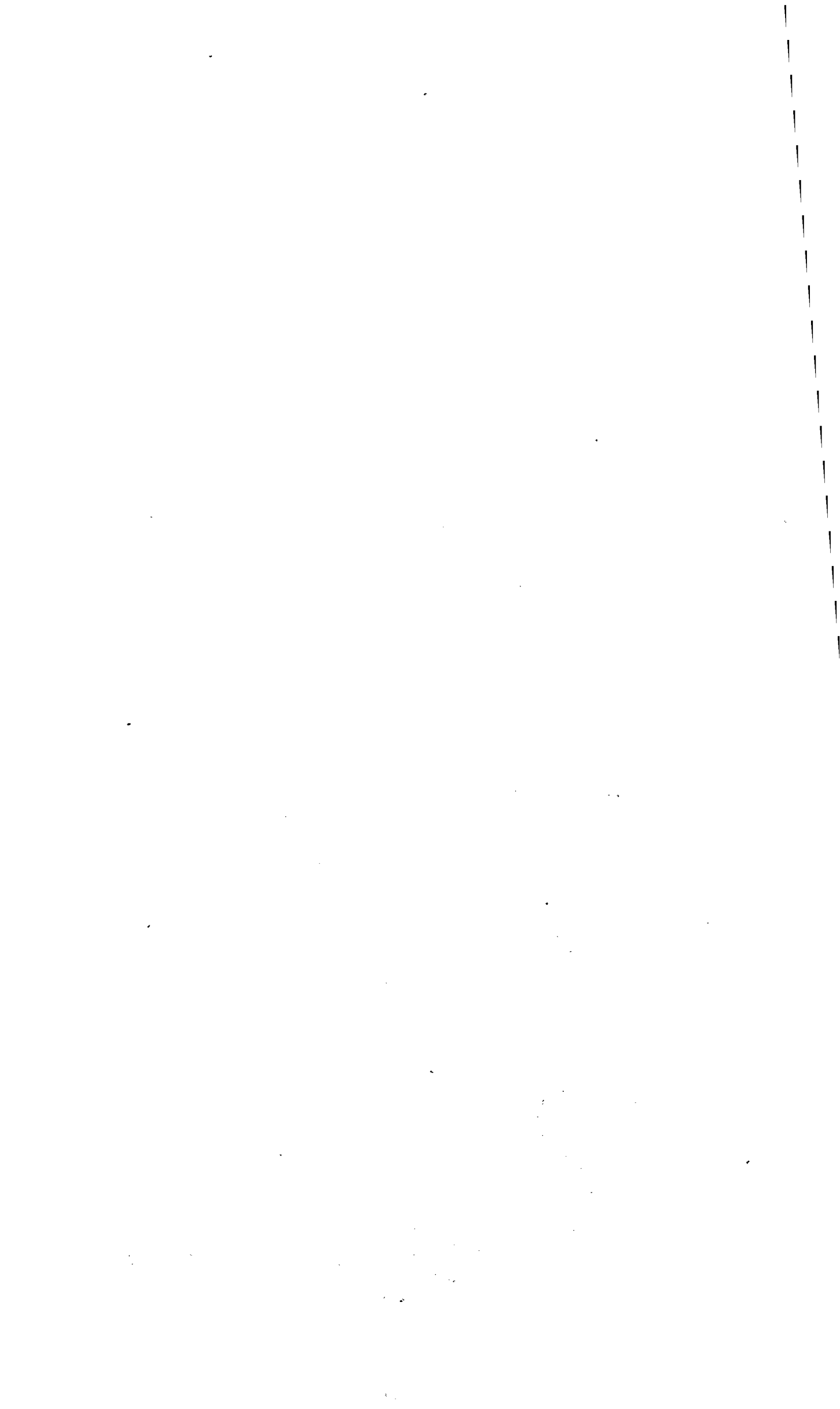
MADHYA PRADESH

1. General :

Madhya Pradesh State comprises of vast stretches of land in the middle of India, having the States of Uttar Pradesh in the north, Andhra Pradesh in the south, Maharashtra and Gujarat in the west and Orissa in the east, with an area of about 171 lakh sq. miles. It extends between 17º 4ゝ' to 26° 52' North latitude and 74° 2' to 84° 24' East longitude. The land utilization statistics of the State are given in table 1 below :

TABLE 1

Land utilization statistics of Madhya Pradesh (1963—64)
(Area in '000 acres)

1.	Total area as per village papers	109,204
2.	Forests	36,027
3.	Land put to non-agricultural uses	4,952
4.	Barren and unculturable land	5,304
5.	Permanent pastures and other grazing lands	10,124
6.	Land under miscellaneous tree crops	905
7.	Culturable waste	6,021
8.	Fallows other than current fallows	2,293
9.	Current fallows	1,850
10.	Net area sown	40,826
11.	Total cropped area	46,316
12.	Area sown more than once	5,490

2. Topography :

The state can be divided into the following broad physical regions :

(a) Gird Region : It is a low lying region covering about 18,370 sq. miles and includes areas north and north-east of Gwalior extending over greater part of Bundelkhand and upto Kaimun hills in Baghelkhand.

(b) Malwa Plateau : It is a wide table land with a mean elevation of about 1,600 ft. above the sea level. It covers an area of about 34,600 sq. miles and is situated between Vindhyan Barrier and points just south of Gwalior.

(c) Satpura Ridge : This ridge stretches across the state from Maikala range in the east towads Nimar in the west with an average elevation of about 2,000 ft. above the sea level. It forms the water shed of the plains lying northwards of the ridge.

(d) Narmada Valley : This is a long and narrow strip of about 200 miles with a width of about 20 miles, lying between Vindhyan and Satpura ranges.

(e) Chhatisgarh Plains : These lie towards east of Satpura range and are fairly level except for a few undulations of Hazaribagh range and Korea Hills.

The Vindhyan range lying north-east, south-west almost runs in the middle of the state. The important rivers towards north of this range are the Chambal, the Betwa and the Sone and towards south the Narmada, the Mahanadi and the Indravati.

3. Soil :

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

The fertile alluvial soil, well supplied with potash and lime but poor in phosphoric acid, nitrogen and humus, is capable of growing a variety of crops such as rice, wheat and sugarcane. It is found in Morena, Bhind and Gwalior. The soil of Sheopur (Morena district) is black in colour, clayey in texture, low in soluble salts, neutral in reaction and have a layer of calcium carbonate at a depth of two to four feet. The soil of Jora (Morena district) is yellowish brown and less clayey while that of Bhind is yellow in colour and lighter in texture. In Gohad (Bhind district) saline and alkaline patches have developed due to improper drainage.

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

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

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

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

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

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

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

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

4. Climate and rainfall :

The climate of the state is dry, cool in winter and hot in summer in the north, cool and breezy in the Malwa plateau and generally wet and humid in the eastern and southern parts with mild winters and hot summers.

A large part of Madhya Pradesh receives rainfall between 30″ to 60″. It is only Bastar and Surguja districts which receive rainfall more than 60 inches. The northern districts of Morena, Gwalior, Bhind and Datia form a dry zone receiving about 30 inches of rainfall. In general the rainfall decreases from south-east to north-west of the state and accordingly the crops also change from rice to wheat and cotton to *jowar*.

Based on the types of soil and the climatic and rainfall conditions obtained, the state can be divided into the agro-climatic regions given in Appendix No. 1.

5. Irrigation :

The State of Madhya Pradesh has a total irrigated area of about 2537 thousand acres which accounts for about 6.3% of the net cropped area. The extent of area irrigated through different sources is given below in table 2.

TABLE 2

Area irrigated through different sources (1963-64)

(Area in '000 acres)

Source	Acreage	% of total irrigated area
1. Government canals	1210.0	47.7
2. Private canals	2.5	0.1
3. Tanks	342.5	13.5
4. Wells	887.9	35.0
5. Other sources	93.9	3.7
	2536.8	100.0

6. Agricultural production and normal cropping pattern :

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

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

The state can be distinctly divided into the following crop zones.

Zone	Districts included
Cotton-*jowar*	Indore, Dhar, Rajgarh, Shajapur, Mandsaur, Ratlam, Ujjain, Dewas, Jhabua, Khandwa and Khargone.
Wheat	Vidisha, Raisen, Sagar, Damoh, Sehore, Hoshangabad, Narsimhapur.
Wheat-*jowar*	Morena, Gwalior, Bhind, Chhatarpur, Tikamgarh, Datia, Shivpuri, Panna, Guna, Betul and Chhindwara.
Wheat-rice	Rewa, Satna Jabalpur, Seoni and Mandla.
Rice	Raipur, Durg, Bilaspur, Balaghat, Raigarh, Bastar, Surguja, Sidhi and Shahdol.

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

<div align="center">TABLE 3</div>

<div align="center">Area, production and average yield per acre of principal crops (1963-64)</div>

Crop	Area in '000 acres	Production in '000 tons	Av. yield in lb./ac.
Paddy	10410	3131	674
Wheat	7957	1845	519
Jowar	5170	1355	587
Bajra	469	136	649
Maize	1226	598	1092
Ragi	33	4	271
Barley	440	106	540
Small millets	3433	342	223
Gram	3687	773	470
Tur	947	221	523
Other pulses	4428	505	255
Sugarcane	133	1322	9.96*
Cotton (lint)	1825	407**	87
Mesta	19	15@	316
Groundnut	1154	298	578
Linseed	1548	113	163
Sesamum	838	54	144
Castor seed	12	2	373
Rape seed and mustard	385	50	291

The above figures are taken from the Publication of Directorate of Economics and Statistics, Ministry of Food and Agriculture.

*Tons/ac.

**Bales of 392 lb. each.

@Bales of 400 lb. each.

7. Experimentation and Agricultural Research :

In all 644 experiments conducted during the period 1954-59 were reported from this state. Besides, 201 experiments conducted under the Model Agronomic and Simple Fertilizer Trial Schemes of the Indian Council of Agricultural Research and the experiments conducted on cultivators' fields by the state are also included in the compendium for this period. Adhartal, Betul, Chhindwara, Durg, Indore, Labhandi, Nabi-bagh, Powarkheda and Reora are the major agricultural research stations of the state. About 48.3% of the experiments are purely manurial type while those with manurial treatments are about 65.4%. Maximum number of trials (35.0%) are conducted on wheat crop followed by paddy (23.7%). The crop and type-wise break up of the experiments is given in Appendix No. II.

About 77% experiments were laid out in randomised blocks and latin squares with one or more factors constituting the treatments. About 13% of the experiments were laid out in split-plots and strip-plots. Experiments with confounding arrangement of factors in randomised blocks or split-plot designs accounted for the remaining 10% of the experiments.

The number of plots per block in randomised block design varied from 2 to 64. In split-plot design the number of main-plots per replication varied from 2 to 12 and number of sub-plots per main-plot varied from 2 to 20. The number of replications in general varied from 1 to 8. The size of net plot in case of randomised block design ranged from 1/1936 of an acre to 1/10 of an acre while in the split-plot design it ranged between 1/453.75 of an acre to 1/30 of an acre.

APPENDIX No. I

Agro-climatic regions in Madhya Pradesh with details regarding climate, soil type and cropping pattern

Region	Districts	Temp. in C° Min.	Temp. in C° Max.	Rainfall in cms.	Soil type	Cropping pattern Kharif	Cropping pattern Rabi
Malwa Plateau	Indore, Dhar, Rajgarh, Shajapur, Mandsaur, Ratlam, Ujjain, Dewa, Jhabua	5	44	75—100	Heavy to medium black soil	Cotton, *Jowar*, Groundnut	Wheat, Gram Linseed
Nimar Plateau	Khandwa, Khargone	5	46	55— 95	Well drained medium black cotton soil. In Khargone light soils are are also found	Cotton, *Jowar*, Groundnut	
Vindhya Plateau	Vidisha, Raisen, Sagar, Damoh, Sehore	8	43	100—135	Deep alluvial deposited soil	*Jowar*	Wheat, Gram, Linseed
Narmada Valley	Hoshangabad and Narsimhapur	10	42	115—125	Deep black	*Jowar*, Sesamum	Wheat, Gram
Gird Region	Morena, Bhind, Gwalior	2	46	65— 75	Alluvial soil subject to erosion	*Jowar*, Bajra	Wheat, Gram, Rape, Mustard
Bundelkhand	Chhatarpur, Tikamgarh, Datia, Shivpuri, Panna, Guna	1	45	70—120	Mixed red and black	*Jowar*, Sesamum	Wheat, Gram
Satpura Plateau	Betul, Chhindwara	8	41	95—110	Shallow black soil	*Jowar*, Groundnut	Wheat, Gram
Kymore Plateau and Satpura hills	Rewa, Satna, Jabalpur, Seoni, Mandla	8	41	110—120	Mixed soils	Rice, *Jowar*	Wheat, Gram
Chhatisgarh Plains	Raipur, Durg, Bilaspur, Balaghat, Raigarh, Bastar	8	45	115—130	Light and sandy yellow soils	Groundnut Rice	Linseed
Chhatisgarh Plateau and other adjoining areas	Sidhi, Surguja, Shahdol	7	42	115—160	Light and sandy yellow soils	Rice, Sesamum	Rape, Mustard

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APPENDIX No. II

Distribution of experiments crop-wise and type-wise

Crop	M	MV	C	CV	CM	CMV	(I+IM+IC+ICMV)	D	Total
Paddy	104	1	16	3	27	—	—	2	153
Wheat	100	6	48	1	37	7	22	4	225
Jowar	26	1	13	—	5	—	—	1	46
Maize	3	—	—	—	—	—	—	—	3
Kodo	—	—	—	—	1	—	—	—	1
Potato	3	—	—	—	—	—	—	5	8
Tomato	6	—	—	—	—	—	—	—	6
Cluster bean	2	—	—	—	—	—	—	—	2
Cabbage	—	1	—	—	—	—	—	—	1
Gram	16	1	15	1	—	—	—	—	33
Urid	—	—	1	—	—	—	—	—	1
Tur	2	—	1	—	—	—	—	—	3
Teora	—	—	4	—	—	—	—	—	4
Lobia	—	—	1	—	—	—	—	—	1
Moong	1	—	1	—	—	—	—	—	2
Masoor	—	—	4	—	—	—	—	—	4
Mixed Pulses	—	—	—	—	—	—	—	—	8
Sugarcane	5	—	2	—	—	—	—	2	9
Cotton	14	2	13	—	—	9	4	—	42
Groundnut	10	—	10	—	—	1	—	—	21
Linseed	12	—	4	—	—	—	—	—	16
Castor	1	—	—	—	—	—	—	—	1
Chillies	4	—	—	—	—	—	—	—	4
Ginger	—	—	—	—	—	—	—	9	9
Berseem	2	—	5	—	—	—	2	—	9
Sannhemp	—	—	1	—	—	—	—	—	1
Mixed cropping *	—	—	—	—	—	—	—	—	23
Rotational	—	—	—	—	—	—	—	—	8
Total	311	12	139	5	70	17	28	23	644

PARTICULARS OF RESEARCH STATIONS AND SOIL ANALYSIS

1. Government Agricultural Research Station, Adhartal.

A. General information :

(i) Jabalpur district, 4 miles from Jabalpur Railway Station. Plain and level land but the fields are not properly levelled. (ii) It represents rice—wheat tract. (iii) Established in 1912. (iv) The farm is having three sections (a) *Adhartal* : It is paddy growing area. A second crop in *rabi* season after paddy is taken. (b) *Kheri*—Haveli tract : *Rabi* crops are grown in the area. (c) College estate : Mainly *rabi* crops are grown. Some area having sandy soils is treated as *kharif* paddy area. (v) Research on different aspects of paddy and wheat crops.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
177	466	441	359	41	31	3	41	2	42	1	23	1630

(The period on which av. rainfall is based is not available).

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation available for paddy and wheat crops for about 100 acres of the farm from Irrigation Department. (ii) No proper drainage system exists.

D. Soil type and soil analysis :

(i) *Sahara* : It is light brown, 4″ deep. *Domatta* : It is brown and 6″ deep. *Kabar* : It is black and 9″ deep. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—28, Wheat—32, Gram—3, Mixed pulse—3, Linseed—1 and Mixed cropping—3, Total=70.

2. Government Seed and Demonstration Farm, Amlaha.

A. General information :

(i) In Ashta taluka of Sehore district, 15 miles from Sehore Railway Station. (ii) It represents medium black cotton soil. (iii) Established in 1934. (iv) *Jowar*, cotton and ground-nut in *kharif* and wheat and gram in *rabi*. (v) Mainly varietal trials on cotton to evolve suitable varieties are conducted.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
52	227	367	447	48	8	6	2	7	8	4	3	1177

(Av. rainfall is based on four year data for the period 1960 to 1963).

C, Irrigation and drainage facilities :

(i) (a) Irrigation through wells. (b) Indegenous *moat* upto 1963 and oil engine pump set afterwards. (ii) No proper drainge system exists.

D. Soil type and soil analysis :

(i) Black soil, clayey in structure upto 1½′ to 2′. (ii) Chemical analysis : pH varies from 7.3 to 7.6, N from 64 to 118 lb./ac., P from 10.4 to 38.4. lb./ac., available K is medium,

organic carbon from 0.32% to 0.59% and available soluble salts are normal. (iii) Mechanical analysis—N.A.·

E. No. of experiments :

Wheat—5, *Jowar*—1, Cotton—2. Total=8.

3. Regional Research Station, Bagwai.

A. General Information :

(i) District Gwalior, the farm is at a distance of 15 miles from Darba Railway Station. The experimental area is comprised of well levelled small size fields with small bunds. (ii) The research station represents Harsi tract of north-west, M.P. with extreme temperatures both in summer and winter (iii) The farm was established in 1940. (iv) Paddy, wheat and sugarcane are the three main crops grown on the station. G.M. (*sanai*),—Sugarcane—*ratoon*—Paddy—wheat or gram is the cropping pattern followed. (v) Conducting varietal, cultural and manurial trials on sugarcane.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
214	270	320	102	51	52	25	—	—	—	—	—	1034

(The period on which av. rainfall is based is not available).

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation by canal is available since 1936. (ii) *Kachcha* drainage have been constructed on the lower side of every field mostly opposite to the irrigation channels.

D. Soil type and soil analysis :

(i) (a) Clayey and clay-loam with good percentage of silt and sandy clay. There are deep soils extending generally up to the depth of 10 ft.to 15ft. They are mostly dark brown or black in colour. The soils are extremely cohesive and form hard clods with a slight neglect in handling them. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—3. Total=3.

4. Government Agricultural Farm, Baroda.

A. General information :

(i) In the district of Morena, 14 miles from Sheopur Kalan Railway Station. Paddy experimental area is levelled and groundnut experimental area is slopy. (ii) It represents *Jowar*—wheat tract. (iii) Established in the year 1955. (iv) (a) G.M.—wheat—gram ; (b) Paddy—gram—paddy. (v) Manurial cultural and irrigational trials on paddy, groundnut, wheat, gram and linseed etc.

B. Normal rainfall in mm.

June	July	Aug.	Sept.	Oct.	Nov.	Dec. to May	Total
18	178	402	91	11	6	—	706

(Period on which the av. rainfall is based in not available).

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation facilities are available from 1960. (ii) There exists a proper drainage system.

D. *Soil type and soil analysis* :

     (i) Clay loam of dark brown to dark grey colour to a depth of 6'. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. *No. of experiments* :

     Wheat—1. Total=1.

5. Government Seed and Demonstration Farm, Betul.

A. *General information* :

     (i) In Betul district, 7 km. from Betul Railway Station. The land is slopy from east to west. The shape of the farm is irregular. It is situated on Itarsi-Nagpur Road. (ii) It represents Satpura tract. (iii) Established in the year 1915. (iv) Fallow—wheat—G.M.—sugarcane. (v) Varietal trials on wheat are conducted.

B. *Normal rainfall in mm.* :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
102	330	502	—	25	34	16	—	5	13	17	5	1049

    (Period on which av. rainfall is based is not available)

C. *Irrigation and drainage facilities* :

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

D. *Soil type and soil analysis* :

     (i) Morand II of black colour and of granular structure to a depth of 6" to 25.33". (ii) Chemical analysis :—pH 7.3 to 7.9, Conductivity 0.01 to 0.1, % Organic Carbon 0.14 to 0.36, available N 58 to 162 lb./ac. and available P_2O_5 9.6 to 44.0. lb./ac. (iii) Mechanical analysis—N.A.

E. *No. of experiments* :

     Wheat—23, Gram—1, Mixed pulse—. Total=25.

6. Government Agricultural Farm, Bhind.

A. *General information* :

     (i) In the district of Bhind, one mile from Bhind Railway Station. The fields are not levelled and it is difficult to irrigate all plots properly. (ii) It represents *jowar*—wheat tract. (iii) Established in 1959. (iv) Cropping pattern are *bajra* and *Jowar* in *kharif* and wheat, gram and linseed in *rabi*. (v) Manurial and varietal trials.

B. *Normal rainfall in mm.* :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan to April	May	Total
72	228	235	316	—	12	4	—	2	869

    (The av. rainfall is for the year 1963—64).

C. *Irrigation and drainage facilities* :

     (i) (a) and (b) Sewage water from 1959. (ii) No drainage system exists. Being a sandy loam soil of the farm, it is already well drained and drainage problem never arises.

D. *Soil type and soil analysis* :

     (i) Sandy loam to loam of yellowish brown colour. (ii) Chemical analysis : pH 7.5, Conductivity 0.3, Organic Carbon 0.16 %, available N 72 lb./ac. and available P 36.48 lb./ac. (iii) Mechanical analysis—N.A.

E. *No. of experiments* :

     Wheat—1 Total=1.

7. Government Seed and Demonstration Farm, Biora.

A. General information :

(i) In the district of Raigarh, 43 miles from Shujalpur Railway Station. Slopy and undulating land.(ii) It represents cotton—*jowar* tract. (iii) Established in the year 1942. (iv) Wheat—followed by gram. (v) Agronomic experiments on wheat, *jowar* etc.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan. to May	Total
755	2644	4211	2378	155	645	130	—	10918

(Period on which the av. rainfall is based is not available).

C. Irrigation and drainage facilities :

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

D, Soil type and soil analysis :

(i) Black and yellow to a depth of 2 ft. to 3 ft. of Morand structure II. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Wheat—3, *Jowar*—6, Mixed cropping—3. Total=12.

8. Government Experimental Station, Chhindwara.

A. General information :

(i) In district Chhindwara, 3 miles from Chhindwara Railway Station. The site of the farm is roughly rectangular. The land gradually slopes from north to south. There is a stream in the middle of the farm. The site is bounded by cultivated land of Chandangaon village in east and south and Chhindwara—Nagpur Road in the west. (ii) It represents Satpura plateau. (iii) Established in the year 1919. (iv) Cropping pattern is Paddy—wheat—*berseem*, groundnut —legumes—vegetable, G.M.—wheat, potato—sugarcane and maize—wheat. (v) Multiplication of seeds and agronomical experiments on different crops.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
50	114	123	121	22	8	7	20	4	5	6	6	477

(The av. rainfall is based on the data of last 5 years).

C. Irrigation and drainage facilities :

(i) (a) and (b) 3 electric motors, one oil engine, and one *rahat* fitted to well. (ii) One *nallah* in the middle of the farm works as a drainage in the rainy season.

D. Soil type and soil analysis .

(i) *Sehra* morand and *kali* of black colour and sandy and granular in structure. (ii) Chemical analysis :

	Sehra	Morand	Kali
N %	0.056	0.0399	0.0735
Available P_2O_5 %	Nil	0.0026	0.0256
Available Potash %	0.024	0.041	0.028

(iii) Mechanical analysis :

Clay %	9.08	39.32	34.80
Fine silt %	6.40	13.31	15.40
Silt %	11.26	16.74	14.99
Fine sand %	24.30	11.00	11.38

Coarse sand %	46.18	9.01	12.35
Moisture %	0.74	6.12	5.07
Loss on ignition %	21.4	4.25	4.96
Calcium carbonate %	0.03	0.11	0.35

E. No. of experiments :

Wheat—16, *Jowar*—1, Kodo—1, Potato—8, Cabbage—1, Gram—2, Mixed pulse—1, Ginger—9, Total—39.

9. Government Seed and Demonstration Farm, Damoh.

A. General information :

(i) In the district of Damoh, 3½ km. from Damoh Railway Station. Slightly slopy. (ii) It represents wheat tract. (iii) Established in the year 1918. (iv) Cropping pattern Wheat—fallow—wheat. (v) Varietal trials on wheat.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
26	167	120	114	—	13	13	2	5	21	—	1	482

(Period on which av. rainfall is based is not available).

C. Irrigation and drainage facilities :

(i) (a) and (b) Nil. (ii) No proper drainage system exists.

D. Soil type and soil analysis :

(i) Black clay structure to a depth of 5'. (ii) Chemical analysis and (iii) Mechanical analaysis—N.A.

E. No. of experiments :

Mixed pulse—3. Total=3.

10. Government Seed and Demonstration Farm, Durg.

A. General information :

(i) District Durg, the farm is at a distance of 3 miles from Durg Railway Station. Paddy block area comprises of 55 ac. is four fourlongs away from the farm building. (ii) Rice tract. (iii) The farm established in 1917. (iv) (1) Paddy after paddy. (2) Paddy followed by wheat and gram. (v) (1) To produce foundation seed for multiplication in development blocks. (2) To demonstrate improved method of cultivation.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
110	354	300	258	92	21	1	5	15	18	13	—	1217

[The period on which av. rainfall is based is from 1949 to 1963 (both inclusive).]

C. Irrigation and drainage facilities :

(i) (a) and (b) Canal irrigation facilities exist. (ii) There are open drainage channels in paddy area.

D. Soil type and soil analysis :

(i) Marshy soil with sandy loam structure and yellowish in colour, *kankar* soil with sticky structure and black colour and *dorsa* soil with black colour and slightly sticky structure. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—26, Gram—1, Linseed—1. Total=28.

11. Central Research Farm, Gwalior.

A. General information :

(i) District Gwalior, the farm is at a distance of one mile from Central Railway Station, Gwalior. More or less levelled and laid out plots of one acre and two acres in size. (ii) *Jowar*—wheat tract. (iii) The farm was established in 1916. (iv. *Jowar*—fallow—wheat, moong—wheat, G.M.-potato, fallow—gram—*berseem* are the crop rotations followed on the farm. (v) Agronomical, entomological and other types of experiments on different crops.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
82	253	252	163	30	4	8	17	7	9	3	7	835

Av. rainfall is based on 40 years rainfall from 1921 to 1960.

C. Irrigation and drainage facilities :

(i) (a) and (b) Two wells (deep bored) fitted with electric motor pumps. The facilities are available from 1956. (ii) Fields are well levelled. There is no need of any special drainage system. In some fields a side drainage channel is laid down.

D. Soil type and soil analysis :

(i) Loam at the depth of 3′ with yellowish brown colour. (ii) Chemical analysis : The soil needs the application of 20 lb./ac. of N and 20 lb./ac. of P_2O_5 every year. Details are not available. (iii) Mechanical analysis—N.A.

E. No. of experiments :

Jowar—1. Total=1.

12. Agriculture College Farm, Gwalior.

A. General information :

(i) District Gwalior, the farm is situated at a distance of one mile from Gwalior Railway Station. Land located near the college is levelled. The new farm has got undulating land. (ii) It represents *jowar*—wheat tract. (iii) Established in the year 1918. (iv) Cropping pattern : N.A. (v) Research work is carried out by postgraduate students.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
445	2200	800	1983	Nil	Nil	20	81	15	31	58	18	5711

(The av. rainfall is based on the rainfall for the year 1962-63.)

C. Irrigation and drainage facilities :

(i) (a) and (b) About 10 acres are irrigated from two wells since 1918. (ii) Proper drainage exists in college farm, while no drainage system in the new farm.

D. Soil type and soil analysis :

(i) Loamy and yellowish brown in colour. (ii) Chemical analysis and (iii) Mechanical analysis —N.A.

E. No. of experiments :

Wheat—6, *Jowar*—2, Gram—2, Tur—1, *Moong*—1, Linseed—2, *Berseem*—9, Mixed cropping—2. Total=25.

13. Regional Agricultural Research Institute, Institute of Plant Industry, Indore.

A. General information :

(i) District Indore, the farm is situated at a distance of 2½ miles from Indore Railway Station. It is situated on the Malwa plateau about 1800 feet high above sea level. (ii) It

represents black cotton soil tract. (iii) The farm was established in 1924. (iv) (1) *Jowar*, cotton and wheat and (2) *Jowar*, groundnut, cotton and wheat is the cropping pattern. (v) Different types of studies on cotton, *jowar*, groundnut, gram and linseed.

B. *Normal rainfall in mm.* :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
92	281	281	321	59	10	4	15	—	2	1	12	1079

(The av. rainfall is based on the rainfall of 10 years from 1953 to 1962).

C. *Irrigation and drainage facilities* :

(i) (a) and (b) Irrigation facility through wells is available. (ii) There is no proper drainage system.

D. *Soil type and soil analysis* :

(i) Clayey soil, black in colour. (ii) Chemical analysis : Total N % 0.073, total K_2O % 0.82, total CaO % 3.63 and total P_2O_5 % 0.07. Available P_2O_5 0.013 and available K_2O 0.005 per 100 gms. of soil. Cat-ion exchange capacity 64 ml./100 gms. of soil. pH 8 to 8.5. (iii) Mechanical analysis : Sand 25.5 %, silt 20.0 % and clay 53.8 %.

E. *No. of experiments* :

Paddy—1, Wheat—11, *Jowar*—12, Sugarcane—2, Cotton—16, Groundnut—2, Mixed cropping—4, Rotational—8. Total=56.

14. Government Seed and Demonstration Farm, Jagdalpur.

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

Details—N.A.

E. *No. of experiments* :

Paddy—5. Total=5.

15. Government Agricultural Research Station, Jhabua.

A. *General information* :

(i) In the district of Jhabua, 11 miles from Meghnagar Railway Station. Undulating sandy land. (ii) It represents cotton—*jowar* tract. (iii) Established in the year 1956. (iv) Cropping pattern is maize—gram and maize—castor. (v) To conduct varietal and cultural trials on different crops sown in the area.

B. *Normal rainfall in mm.* :

June	July	Aug.	Sept.	Oct.	Nov. to May	Total
62	219	254	110	52	—	696

(The av. rainfall is based on rainfall of 1963—64.)

C. *Irrigation and drainage facilities* :

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

D. *Soil type and soil analysis* :

(i) Sandy and undulating to a depth of 0 to 9″ and of grey and slight red colour. (ii) Chemical analysis : % of total P_2O_5 0.65, % of total N 0.08, % of available N 0.017, pH value 7.5. (iii) Mechanical analysis : Sand 65 to 70 %, silt 13 to 45 % and clay 15 to 20 %.

E. *No. of experiments* :

Paddy—1, Maize—2, Gram—5, *Lobia*—1, *Moong*—1, Groundnut—3, Castor—1 and Mixed cropping—4. Total=19.

C. Irrigation and drainage facilities :

(i) (a) and (b) There are two wells and two pump sets. The wells are available since the inception of the farm. (ii) No proper drainage system exists.

D. Soil type and soil analysis :

(i) Black cotton soil and light soil to a depth of 10″ to 2′ and of clay structure.

(ii) Chemical analysis : pH value 7.4 to 8.1, Conductivity 0.02 to 0.31, Organic Carbon % 0.18 to 0.42, available N 81 to 189 lb./ac. and available P_2O_5 2.28 to 30.78 lb./ac. (iii) Mechanical analysis—N.A.

E. No. of experiments :

Wheat—4, *Jowar*—3, Cotton—2, Groundnut—5, Linseed—1, Mixed cropping—3. Total=18.

21. Government Seed and Demonstration Farm, Nabibagh.

A. General information :

(i) In Sehore district, 7 km. from Bhopal Railway Station. Fields are plain. (ii) It represents wheat tract. (iii) Established in the year 1920. (iv) Cropping pattern : Green manuring—wheat, gram—wheat. (v) Programme of research : Wheat varietal trials, fodder research and weed control research.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
54.2	373.4	361.7	337.2	77.4	11.1	2.5	29.0	11.2	8.4	4.2	9.7	1280.0

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation through wells for the last 20 years in an area of 30 acres. (ii) There exists a proper drainage system.

D. Soil type and soil analysis :

(i) Black soil to a depth of 6′. (ii) Chemical analysis and (ii) Mechanical analysis— N.A.

E. No. of experiments :

Wheat—23, *Jowar*—1, Gram—5, Linseed—2. Total=31.

22. Government Seed and Demonstration Farm, Nowgong.

A. General information :

(i) In the district of Chhatanpur, 19 miles from Herpalpur Railway Station. The land is plain. (ii) It represents millet tract. (iii) Established in the year 1948. (iv) Cropping pattern is double cropping. (v) Varietal trials on different crops.

B. Normal rainfall in mm. :

N.A.

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation is available through wells. Since beginning, lift irrigation is available. (ii) Proper drainage system exists.

D. Soil type and soil analysis :

(i) Sandy soil to a depth of 4′ and of granular structure and blackish brown colour. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

F. *No. of experiments* :

Wheat—2, *Jowar*—3, Total=5.

23. Government Seed and Demonstration Farm, Obedullaganj.

A. General information :

(i) In the district of Raisen, 2 furlongs from Obedullaganj Railway Station. In general, the fields are levelled with slight slope from east to south. (ii) It represents wheat tract. (iii) Established in the year 1952. (iv) Cropping pattern : Fallow—wheat and G.M.—wheat. (v) Varietal, manurial and cultural trials on wheat.

B. Normal rainfall in mm. :

N.A.

C. Irrigation and drainage facilities :

(i) and (ii) N.A.

D. Soil type and soil analysis :

(i) Deep black to a depth of 5'. (ii) Chemical analysis : pH 7.4 to 8.3, Conductivity 0.05 to 0.2, Organic carbon % 0.12 to 0.38, available N 45 to 171 lb./ac. and available P_2O_5 2.28 to 36.94 lb./ac. (iii) Mechanical analysis —N.A.

E. No. of experiments :

Wheat—1. Total=1.

24. Government Soil Conservation Research Farm, Phanda.

A. General information :

(i) District Sehore, the farm is at a distance of one furlong from Railway Station, Phanda. The land is slopy. (ii) Type of tract is black cotton soil. (iii) The farm was established in 1953. (iv) Cropping pattern is wheat—gram, *jowar*—gram. (v) Research on soil conservation.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
63	343	417	356	69	6	3	10	10	—	1	2	1281

(The period on which av. rainfall is based is from 1959 to 64).

C. Irrigation and drainage facilities :

(i) (a) and (b) There is one well for irrigation. (ii) No proper drainage system exists.

D. Soil type and soil analysis :

(i) Very deep black in colour and granular in structure. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Wheat—12, *Jowar*—4, Gram—4, *Urid*—1, *Teora*—4, *Masur*—4, Groundnut—3, *Sannhemp*—1, Mixed cropping—1. Total=34.

25. Government Wheat Research Farm, Powarkheda.

A. General information :

(i) In the district of Hoshangabad, 2 miles from Powarkheda Railway Station. The

elevation is 980 ft. above sea level. The land is slopy. (ii) It represents wheat tract. (iii) Established in the year 1903. (iv) Cropping pattern is wheat—wheat—gram. (v) (1) To evolve rust resistant wheat varieties. (2) To multiply nucleus seed (wheat) and (3) To take agronomical and mycological programme of research on wheat.

B. *Normal rainfall in mm.* :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April	May	Total
131	476	394	257	38	21	4	20	5	8	3	7	1364

[The av. rainfall is based on the period 1941 to 1960].

C. *Irrigation and drainage facilities* :

(i) (a) and (b) There are 3 wells and one tube well. (ii) Surface drain system exists.

D. *Soil type and soil analysis* :

(i) Morand no. 1 and morand no. 2 and *maryar* to a depth of more than $1\frac{1}{2}$ ft. and of black colour and silt clay, clay loam and clayey structure. (ii) Chemical analysis : pH 8.2, N 0.0036%, P_2O_5 0.00055% K_2O 0.02%, Conductivity 0.07 and Organic Carbon 0.40%.

(iii) Mechanical analysis :

	Morand 1	Morand 2	*Maryar*
	%	%	%
Coarse sand	0.18	5.75	3.44
Fine sand	8.26	4.55	9.88
Silt	17.12	22.52	15.23
Fine silt	24.07	21.22	16.48
Clay	43.10	35.11	41.55
Mixture	4.05	4.95	6.53
Calcium carbonate	0.72	0.13	0.57

E. *No. of experiments* :

Wheat—41. Total=41.

26. State Mechanised Farm, Reora.

A. *General information* :

(i) In the district of Satna, 11 km. from Satna Railway Station. The land is plain. (ii) It represents wheat tract. (iii) Established in the year 1952. (iv) Paddy—wheat. (v) Agronomical trials on paddy, wheat, linseed and gram.

B. *Normal rainfall in mm.* :

June	July	Aug.	Sept.	Oct.	Nov. to	Feb.	March	April	May	Total
130	211	447	237	22	—		12	18	—	1077

(Period on which av rainfall is based is not available).

C. *Irrigation and drainage facilities* :

(i) (a) and (b) Lift irrigation since the inception of the farm. (ii) Natural drainage.

D *Soil type and soil analysis* :

(i) Red and black mixed to a depth of $1\frac{1}{2}'$ to 10' and of granular structure. (ii) Chemical analysis : pH 6.9, Conductivity 0.1, Organic Carbon 0.34%, N 153 lb./ac. and P_2O_5 6.4%. (iii) Mechanical analysis—N.A.

E. *No. of experiments* :

Paddy—12, Wheat—14, Gram—1, Linseed—1. Total=28.

27. Government Seed and Demonstration Farm, Sagar.

A. General information :

(i) In tne district of Sagar, 5 miles from Sagar Railway Station. The land is almost levelled. (ii) It represents wheat tract.(iii) Established in the year 1919. (iv) Only one crop. in *rabi* season is generally taken up. (v) Manurial and varietal trials on wheat and gram.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	to	May	Total
84	373	813	330	—	—	41	25		—		1666

(The av. rainfall is based on the rainfall for 1961 to 1963 period).

C. Irrigation and drainage facilities :

(i) (a) and (b) Two oil engine pumps for lifting water for irrigation. (ii) There is no proper drainage system.

D. Soil type and soil analysis :

(i) Black cotton soil of black colour to a depth of 15" to 36". (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :
Wheat— 3. Total = 3.

28. Government Agricultural Research Farm, Sarkhanda.

A. General information :

(i) In the District of Bilaspur, 8 km. from Bilaspur Railway Station. (ii) The land is slopy from cast to west and north to south. (ii) It represents rice tract. (iii) Established in the year 1918. (iv) Cropping patterns : Paddy ; paddy—wheat, G.M.—paddy, vegetable/oil-seeds—gram/peas. (v) Agronomical trials on sugarcane, pulses and oilseeds, multiplication of. paddy seed and cultural trials.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
128	371	299	209	55	1	7	16	11	18	16	14	1145.

(Av. rainfall is based on the rainfall for 1960—61).

C. Irrigation and drainage facilities :

(i) (a) and (b) Mostly canal irrigation. (ii) In paddy tract. field to field drainage is made available by cutting, open the bunds when water is not required.' No special drainage is available.

D. Soil type and soil analysis :

(i) Loam, clay loam, sandy loam and sand of grey, blackish, yellowish and reddish. colour. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :
Paddy—17. Total=17.

29. Rafi Ahmad Kidwai Agricultural Research Station, Sehora.

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

Details : N.A.

E. No. of experiments :
Wheat—5, *Jowar*—1, Gram—1, Sugarcane—7. Total=14.

27. Government Seed and Demonstration Farm, Sagar.

A. General information :

(i) In tne district of Sagar, 5 miles from Sagar Railway Station. The land is almost levelled. (ii) It represents wheat tract.(iii) Established in the year 1919.   (iv) Only one crop in *rabi* season is generally taken up.   (v) Manurial and varietal trials on wheat and gram.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	to	May	Total
84	373	813	330	—	—	41	25			—	1666

(The av. rainfall is based on the rainfall for 1961 to 1963 period).

C. Irrigation and drainage facilities :

(i) (a) and (b) Two oil engine pumps for lifting water for irrigation.   (ii) There is no proper drainage system.

D. Soil type and soil analysis :

(i) Black cotton soil of black colour to a depth of 15" to 36".   (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Wheat—3. Total=3.

28. Government Agricultural Research Farm, Sarkhanda.

A. General information :

(i) In the District of Bilaspur, 8 km. from Bilaspur Railway Station. (ii) The land is slopy from cast to west and north to south. (ii) It represents rice tract. (iii) Established in the year 1918. (iv) Cropping patterns : Paddy ; paddy—wheat; G.M.—paddy, vegetable/oil-seeds—gram/peas. (v) Agronomical trials on sugarcane, pulses and oilseeds, multiplication of paddy seed and cultural trials.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
128	371	299	209	55	1	7	16	11	18	16	14	1145.

(Av. rainfall is based on the rainfall for 1960—61).

C. Irrigation and drainage facilities :

(i) (a) and (b) Mostly canal irrigation. (ii) In paddy tract. field to field drainage is made available by cutting, open the bunds when water is not required.' No special drainage is available.

D. Soil type and soil analysis :

(i) Loam, clay loam, sandy loam and sand of grey, blackish, yellowish and reddish. colour. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—17. Total=17.

29. Rafi Ahmad Kidwai Agricultural Research Station, Sehora.

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

Details : N.A.

E. No. of experiments :

Wheat—5, *Jowar*—1, Gram—1, Sugarcane—7. Total=14.

30. Government Research Farm, Seoni.

A. General information :

(i) In the District of Seoni, one furlong from Seoni Railway Station. The land is gradually sloping towards south and east. (ii) It represents Satpura plateau (non—Haveli) tract. (iii) Established in the year 1918. (iv) Cropping pattern : Wheat, gram, sugarcane ; paddy—wheat or *berseem* and G.M.—wheat. (v) Research on fodder and fibre and multiplication and distribution of improved seeds.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
74	132	108	82	15	19	82	19	3	6	5	7	552

(The av. rainfall is based on the period 1953 to 1963).

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation is done by wells being fitted with 3 electric motors and one oil engine. (ii) Partial drainage system exists.

D. Soil type and soil analysis :

(i) Morand I and morand II of black colour and sticky structure.

(ii) Chemical analysis : pH 5.8 to 7.2, Organic Carbon 0.21 to 0.40%, N 67 to 109 lb./ac. and P_2O_5 6 to 88 lb./ac. (iii) Mechanical analysis—N.A.

E. No. of experiments :

Wheat—2. Total=2.

31. Government Vegetable Research Station, Silary.

A. General information :

(i) In Hoshangabad district, one mile from Pipariya Railway Station. Level land with gradual slope. It represents Narmada tract. (iii) Established in 1950. (iv) Double cropping pattern followed. (v) Varietal and manural trials on different vegetable crops.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
91	264	346	289	1	5	18	1	8	2	1	—	1026

(Av. is based on 2 years rainfall).

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation by oil engine fitted in the wells since 1957. (ii) Only ground level drainage exist.

D. Soil type and soil analysis :

(i) Sandy loam to a depth of 9″, brownish in colour and granular in structure. (ii) Chemical analysis : pH 8.1 to 9.0, Conductivity 0.04 to 0.25, Organic Carbon 0.37 to 0.57 %, N 120 to 232 srs./ac. and P_2O_5 44 to 105 srs./ac. (iii) Mechanical analysis—N.A.

E. No. of experiments :

Tomato—6, Cluster beam—2, Chillies—4. Total=12.

32. Central Research Farm, Ujjain.

A. General information :

(i) In the district of Ujjain, 3 miles from Ujjain Railway Station. The land is unlevelled. (ii) It represents Malwa tract. (iii) The farm was established in 1916. (iv) Crops in *rabi* and *kharif* both are grown. (v) Agronomic experiments on different crops.

B. *Normal rainfall in mm.* :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
55	130	140	70	19	4	3	4	9	1	—	4	439

(The period on which the av. rainfall is based is from 1941 to 61).

C. *Irrigation and drainage facilities* :

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

D. *Soil type and soil analysis* :

(i). Heavy black cotton soil with 10 to 12 ft. depth in *rabi* fields and murum with 5 to 6 ft. depth in *kharif* fields. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E *No. of experiments* :

Wheat—1, *Jowar*—1, Cotton—1, Linseed—1. Total=4.

33. Government Experimental Farm, Vidisha.

A. *General information* :

(i) In the District of Vidisha, 3 km. from Vidisha Railway Station. Fields are bunded but are slopy. (ii) Type of tract is black heavy clay soil. (iii) The farm established in 1943. (iv) Normal cropping pattern is paddy, *jowar* in *kharif*, and gram and linseed in *rabi*. (v) To conduct agronomical trials on wheat.

B. *Normal rainfall in mm.* :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
18	82	135	116	11	7	—	6	1	1	7	2	382

(The period on which av. rainfall is based is not available).

C. *Irrigation and drainage facilities* :

(a) There is one existing well since the inception of the farm. (b) There does not exist any proper drainage system.

D. *Soil type and soil analysis* :

(a) Black soil of 7 to 8 ft. depth and compact in strcture. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. *No of experiments* :

Paddy—1, Wheat—11, *Jowar*—4, Gram—2, Groundnut—2, Linseed—2, Mixed cropping—3. Total=25.

34. Government Reserch Farm, Waraseoni.

A. *General information* :

(i) In the district of Balaghat, 2 miles from Waraseoni Railway Station. Most of the cultivated land is well levelled with slightly slopy from west to east. (ii) Rice tract. (iii) The farm established in 1917. (iv) Paddy after paddy and paddy followed by wheat and linseed etc. (v) To conduct Agronomic and manurial experiments on paddy and to produce foundation seed of paddy.

B. *Normal rainfall in mm.* :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
157	446	422	237	72	3	28	15	11	21	8	5	1425

[The period on which av. rainfall is based is from 1949 to 1962].

C. *Irrigation and drainage facilities* :

(i) (a) and (b) Total cultivated area is under the command of government tank Pathari, 2 miles away from the farm. (ii) As this is paddy tract, field-to field drainage is available by cutting open bunds when water is not required.

D. *Soil type and soil analysis* :

(i) Morand of grey colour and sandy loam structure and *sehara* of yellowish colour and clayey loam structure. (ii) Chemical analysis :

	Morand	Sehara
pH	6.9	7.3
Soluble salt	0.45	0.90
Organic matter	0.74	0.97
Available N in lb./ac.	148.0	194.0
Available P_2O_5 in lb./ac.	80.0	20.00

(iii) Mechanical analysis —N.A.

E. *No. of experiments* :

Paddy—18 Total=18.

Crop :- Paddy.   Ref :- M.P. 54(55).

Site :- Govt. Agri. Res. Stn., Adhartal.   Type :- 'M'.

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

1. BASAL CONDITIONS:

   (i) (a) Nil. (b) and (c) N.A. (ii) (a) *Sehra.* (b) N.A. (iii) N.A./3 and 4.8.1954. (iv) *Malwa* ploughing (b) Transplanting. (c) 40 lb./ac. (d) 4" between plants. (e) N.A. (v) 40 lb./ac. of N as F.Y.M. (vi) Paddy no. 17. (vii) Irrigated. (viii) 2 weedings. (ix) 57.67". (x) 9 to 11.11.1954.

2. TREATMENTS :

   4 methods of application of manures : M_0=Control, M_1=N+P_2O_5 at transplanting, M_2=N+P_2O_5 mixed with earth and applied as balls and M_3=Roots dipped in N and P_2O_5 solution before trasplanting.

   N applied at 20 lb./ac. as A/S and P_2O_5 at 20 lb./ac. as Super.

3. DESIGN :

   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 51'×23¼. (v) Nil. (vi) Yes.

4. GENERAL :

   (i) Fair. (ii) N.A. (iii) Yield of grain and straw. (iv) (a) 1954—contd. (b) and (c) N.A. (v) (a) Raipur and Waraseoni. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

   (i) 1554 lb./ac, (ii) 246.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1669	1453	1522	1572

   S.E./mean = 110.2 lb./ac.

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Crop :- Paddy.   Ref :- M.P. 55(34).

Site :- Govt. Agri. Res. Stn., Adhartal.   Type :- 'M'.

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

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra.* (b) N.A. (iii) N.A./13 and 16.8.1955. (iv) (a) to (e) N.A. (v) 40 lb./ac. of N as F.YM. before transplanting. (vi) Paddy no. 17. (vii) Irrigated. (viii) 2 weedings. (ix) 64.38". (x) 15.11.1955.

2. TREATMENTS :

   Same as in expt. no. 54(55) above.

3. DESIGN :

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

4. GENERAL :

   (i) Fair. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

   (i) 16.06 lb./ac. (ii) 328.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1256	1795	1801	1570

   S.E./mean = 147.0 lb./ac.

———

Crop :- Paddy.   Ref :- M.P. 56(41).

Site :- Govt. Agri. Res. Stn., Adhartal.   Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Sehra.* (b) N.A. (iii) N.A./25, 26.8.1956. (iv) (a) Ploughing and cross ploughing, plough puddling and levelling. (b) Transplanting. (c) N.A. (d) 4″ to 5″ between plants. (e) 1. (v) 40 lb./ac. of N as F.Y.M. broadcasted before ploughing. (vi) Paddy no. 17. (vii) Irrigated. (viii) 1 weeding. (ix) 68.67″. (x) 20.11.1956.

2. TREATMENTS :

Same as in expt. no. 54(55) on page 1.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 51′×21½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Below normal. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1954—contd. (b) and (c) N.A. (v) (a) Raipur and Durg. (b) N.A. (vi) Continuous rains at ripening and harvest stage damaged the crop. (vii) Nil.

5. RESULTS :

(i) 705 lb./ac. (ii) 206.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	564	844	815	596

S.E./mean = 92.1 lb./ac.

———

Crop :- Paddy.   Ref :- M.P. 58(4).

Site :- Govt. Agri. Res. Stn., Adhartal.   Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra.* (b) N.A. (iii) N.A./9.8.1958. (iv) (a) Ploughing and cross ploughing, puddling and levelling. (b) Transplanting. (c) N.A. (d) 4″ to 5″ between plants. (e) 1. (v) 40 lb./ac. of N as F.Y.M. broadcasted before ploughing. (vi) Paddy no. 17. (vii) Unirri gated. (viii) Nil. (ix) 55.07″. (x) 22.11.1958.

2. TREATMENTS :

Same as in expt. no. 54(55) on page 1.

3. DESIGN :

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

4. GENERAL :

(i) Crop lodged and growth stunted in M_1. (ii) Nil. (iii) Height, av. no. of tillers and yield of grain and straw. (iv) (a) 1954—1958. (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1957 lb./ac. (ii) 321.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1710	2024	2012	2082

S.E./mean = 143.6 lb./ac.

———

Crop :- Paddy.

Ref :- M.P. 54(57).

Site :- Govt. Agri. Res. Stn., Adhartal.

Type :- 'M'.

Object :—To study the effect of bloodmeal as compared to other manures and fertilizers on Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra*. (b) N.A. (iii) 28.7.1954. (iv) (a) 1 *Malwa* ploughing. (b) Transplanting. (c) to (e) N.A. (v) Nil. (vi) Paddy no. 17. (vii) Irrigated. (viii) 2 weedings. (ix) 57.67". (x) 2.11.1955.

2. **TREATMENTS :**

6 manures : M_0=Control, M_1=N as blood meal, M_2=N as F.Y.M, M_3=N as G.N.C, M_4=N as A/S and M_5=N as A/S+P_2O_5 as Super.
N and P_2O_5 applied at 20 lb./ac.

3. **DESIGN :**

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

4. **GENERAL :**

(i) Fair. (ii) N.A. (iii) Yield of grain and straw. (iv) (a) 1951—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

(i) 1790 lb./ac. (ii) 210.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	1663	1831	1640	1816	1812	1976

S.E./mean = 105.0 lb./ac.

Crop :- Paddy.

Ref :- M.P. 55(31).

Site :- Govt. Agri. Res. Stn., Adhartal.

Type :- 'M'.

Object :—To study the effect of bloodmeal as compared to other manures and fertilizers on Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra*. (b) N.A. (iii) 25.7.1955. (iv) (a) Ploughing. (b) Transplanting. (c) to (e) N.A. (v) N.A. (vi) *Nunji* no. E.B. 17 (early). (vii) Irrigated. (viii) 2 weedings. (ix) 64.38". (x) 16.11.1955.

2. **TREATMENTS and 3. DESIGN :**

Same as in expt. no. 54(57) above.

4. **GENERAL :**

(i) Lodging. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1951—contd. (b) Yes. (c) No. (v) (a) Raipur. (b) Nil. (vi) and (viii) Nil.

5. **RESULTS :**

(i) 1714 lb /ac. (ii) 204.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	1587	1811	1393	1702	1902	1937

S.E./mean = 102.4

Crop :- Paddy.   **Ref :- M.P. 54(58).**

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

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

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) (a) *Sehra*. (b) N.A. (iii) 28 and 30.7.1954. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) 40 lb./ac. of N as F.Y.M. applied on 28.5.1954. (vi) *Luchai×Gurmatia* (late). (vii) Irrigated. (viii) 1 weeding. (ix) 57.67". (x) 23 and 24.11.1954.

2. **TREATMENTS :**

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

(1) 2 levels of N as A/S : $N_1=20$ and $N_2=40$ lb./ac.
(2) 2 levels of P_2O_5 as Super : $P_1=20$ and $P_2=40$ lb./ac.
(3) 2 methods of application of N and P : $D_1=$In surface and $D_2=3''$ deep below soil.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) and (b) 33'×33'. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Fair. (ii) N.A. (iii) Biometric observations and yield of grain and straw. (iv) (a) 1954—contd. (b) Yes (c) No. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 708 lb./ac. (ii) 153.2 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	676	740	708	680	736
N_2	656	760	708	732	684
Mean	666	750	708	640	692
D_1	640	772			
D_2	692	728			

S.E. of any marginal mean   =   34.2 lb./ac.
S.E. of body of any table   =   48.4 lb./ac.

Crop :- Paddy.   **Ref :- 55(30).**

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

Object :—To study the effect of deep placement of N and P fert.lizers on Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil (b) Paddy (c) As per treatments. (ii) (a) *Sehra* (sandy). (b) N.A. (iii) N.A./22.7.1955. (iv) (a) 2 ploughings. (b) Transplanting. (c) to (e) N.A. (v) 40 lb./ac of N as F.Y.M. (vi) *Luchai×Gurmatia* (late) (vii) Irrigated. (viii) Weeding. (ix) 64.38". (x) 14.12.1955.

2. **TREATMENTS :**

Same as in expt. no. 54(58) above.

3. **DESIGN :**

(i) Fact. in R.B D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 33'×33'. (b) 27'×27'. (v) 3'×3'. (vi) Yes.

4. **GENERAL :**

(i) Fair. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1954. (b) Yes. (c) No. (v) (a) Raipur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1368 lb./ac.   (ii) 344.7 lb./ac.   (iii) No effect is significant.   (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	1342	1402	1372	1287	1458
N_2	1332	1396	1364	1218	1510
Mean	1337	1399	1368	1252	1484
D_1	1293	1212			
D_2	1381	1587			

S.E. of any marginal mean   =   77.1 lb./ac.
S.E. of body of any table   =   109.0 lb./ac.

Crop :- Paddy.   **Ref :- M.P. 56(49).**

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

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

1. BASAL CONDITIONS :

(i) (a) and (b) Paddy. (c) As per treatments. (ii) (a) *Sehra*. (b) N.A. (iii) N.A./20.7.1956. (iv) (a) Ploughing, cross ploughing, puddling and levelling. (b) Transplanting. (c) N.A. (d) 4″ to 5″ between plants. (e) 1. (v) 40 lb./ac. of N as F.Y.M. broadcasted before ploughing. (vi) *Luchai* × *Gurmatia* (late). (vii) N.A. (viii) Nil. (ix) 68·67″. (x) 17.12.1956.

2. TREATMENTS :

Same as in expt. no. 54(58) on page 4.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 33′×33′. (b) 27′×27′. (v) 3′×3′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—contd. (b) Yes. (c) N.A. (v) (a) Sarkhanda, Raipur and Powarkheda. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1891 lb./ac. (ii) 520.3 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	2056	1930	1993	1849	2137
N_2	1723	1856	1789	1788	1791
Mean	1889	1893	1891	1818	1964
D_1	1822	1815			
D_2	1957	1971			

S.E. of any marginal mean   =   116.3 lb./ac.
S.E. of body of any table   =   164.5 lb./ac.

Crop :- Paddy.

Ref :- M.P. 57(29).

Site :- Govt. Agri. Res. Stn., Adhartal.

Type :- 'M'.

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

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra.* (b) N.A. (iii) N.A./22, 23.8.1957. (iv) (a) Ploughing, cross ploughing, puddling and levelling. (b) Transplanting. (c) N.A. (d) 4″ to 5″ between plants. (e) 1. (v) 40 lb./ac of N as F.Y.M. before ploughing. (vi) *Luchai* × *Gurmatia* (late). (vii) N.A. (viii) 1 hand weeding. (ix) 35.19″. (x) 3.12.1957.

2. **TREATMENTS :**

Same as in expt. no. 54(5 8) on page 4.

3. **DESIGN:**

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 33′×33′. (b) 27′×27′. (v) 3′×3′. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) N.A. (iii) Yield of grain and straw. (iv) (a) 1954—1958. (b) Yes. (c) N.A. (v) (a) Raipur and Sarkhanda. (b) Nil. (vi) Scanty rains. (vii) Nil.

5. **RESULTS :**

(i) 136.8 lb./ac. (ii) 50.0 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	148.5	119.8	134.2	151.6	116.7
N_2	142.7	136.0	139.4	142.7	136.0
Mean	145.6	127.9	136.8	147.2	126.4
D_1	156.7	139.6			
D_2	134.5	118.3			

S.E. of any marginal mean = 11.2 lb./ac.
S.E. of body of any table = 15.8 lb./ac.

Crop :- Paddy.

Ref :- M.P. 58(2).

Site :- Govt. Agri. Res. Stn., Adhartal.

Type :- 'M'.

Object : To study the effect of deep placement of N and P fertilizers on Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra.* (b) N.A. (iii) N.A./13, 14.8.1958. (iv) (a) Ploughing and cross ploughing, puddling and levelling. (b) Transplanting. (c) N.A. (d) 4″ to 5″ between plants. (e) 1. (v) 40 lb./ac. of N as F.Y.M. broadcasted before ploughing. (vi) *Luchai* × *Gurmatia* (late). (vii) Irrigated. (viii) 1 hand weeding. (ix) 55.07″. (x) 27.12.1958.

3. **TREATMENTS :**

Same as in expt. no. 54(58) on page 4.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 33′×33′. (b) 27′×27′. (v) 3′×3′. (vi) Yes.

4. **GENERAL :**

(i) Good. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1954—1958. (b) Yes. (c) N.A. (v) (a) Raipur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2556 lb./ac. (ii) 562.4 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	2575	2449	2512	2362	2662
N_2	2656	2546	2601	2658	2544
Mean	2616	2497	2556	2510	2603
D_1	2561	2459			
D_2	2670	2536			

S.E of any marginal mean   = 125.8 lb./ac.
S.E. of body of any table   = 177.8 lb./ac.

Crop :- Paddy.   **Ref :- M.P. 58(15).**

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

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super. (ii) (a) *Sehra*. (b) N.A. (iii) N.A./12.8.1958. (iv) (a) Ploughing and cross ploughing, puddling and levelling. (b) Transplanting. (c) N A. (d) 4″ to 5″ between plants. (e) 1. (v) 20 lb./ac. of N as A/S, ½ at the time of transplanting and ½ after one month. (vi) *Chatri*. (vii) Unirrigated. (viii) Nil. (ix) 55.07″. (x) 29.11.1958.

2. TREATMENTS :

5 sources of P_2O_5 : S_0=Control, S_1=Stera meal, S_2=Hyper Phos., S_3=B.M. and M_4=Super. P_2O_5 applied at 20 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 49½′×22′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Av. height and av. no. of tillers. Yield of grain and straw. (iv) (a) 1958—contd. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2043 lb./ac. (ii) 428.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4
Av. yield	2154	1868	1787	2206	2202

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

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 59(18).**

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

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

1. BASAL CONDITIONS :

(i)) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra*. (b) N.A. (iii) 27.8.1959. (iv) (a) Ploughing and cross ploughing, puddling and levelling. (b) Transplanting. (c) N.A. (d) 4″ to 5″×4″ to 5″. (e) 1. (v) Nil. (vi) *Chatri*. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 10.12.1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(15) on page 7.

5. RESULTS :

(i) 1546 lb./ac. (ii) 298.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4
Av. yield	1529	1562	1505	1674	1458

S.E./mean = 133.3 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- M.P. 59(16).**

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

Object :—To compare the effect of different Nitrogenous fertilizers on paddy with and without P.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram and peas. (c) Nil. (ii) (a) *Sehra*. (b) N.A. (iii) 25.8.1959. (iv) (a) Ploughing and cross ploughing, puddling and levelling. (b) Transplanting. (c) N.A. (d) 4″ to 5″×4″ to 5″. (e) 1. (v) 3 C.L./ac. of F.Y.M. broadcasted for Reps. IV, V and VI only on 25.8.59. (vi) Paddy no. 17. (vii) Unirrigated. (vii) and (viii) Nil. (ix) N.A. (x) 8.12.1959.

2. TREATMENTS :

All combination of (1) and (2)+control (2 plots)

(1) 4 sources of 20 lb/ac. of N : S_1=A/S, S_2=A/S/N, S_3=Urea and S_4=C/A/N.

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

3. DESIGN :

(i) R.B.D. (ii) 10. (b) N.A. (iii) 6. (iv) (a) 40′×12′. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1959—N.A. (b) and (c) —. (v) to (vii) Nil.

5. RESULTS :

(i) 1976 lb./ac. (ii) 433.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	S_4	Mean
P_0	1911	2034	1938	1982	1966
P_1	1808	1981	1949	1945	1921
Mean	1860	2008	1944	1964	1944

S.E. of P marginal mean = 88.6 lb./ac.

S.E. of S marginal mean = 125.3 lb./ac.

S.E. of body of table = 177.1 lb./ac

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 59(17).**

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

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) A/S at 100 lb./ac. of A/S+F.Y.M. at 25 C.L./ac. (ii) (a) *Sehra.* (b) N.A. (iii) N.A./22.8.1957. (iv) (a) Ploughing and cross ploughing; puddling and levelling. (b) Transplanting. (c) N.A. (d) 4″ to 5″×4″ to 5″. (e) 1. (v) Nil. (vi) Paddy no. 17. (vii) Unirrigated. (viii) Nil. (ix) (62.15″). (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

    (1) 4 levels of N as A/S : $N_0=0$, $N_1=7.5$, $N_2=15$ and $N_3=22.5$ lb./ac.

    (2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=15$ lb./ac.

Fertilizers applied on 22.8.1959.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 35′×15′. (b) 33′×13′. (v) 1′×1′. (vi) Yes.

4. GENERAL :

(i) Good ; lodged by 22.10.1959. (ii) Slight blast disease. (iii) Grain and straw yield. (iv) (a) 1959—N.A. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2432 lb./ac. (ii) 426.4 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	2433	2698	2432	2502	2516
P_1	2205	2401	2438	2344	2347
Mean	2319	2550	2435	2423	2432

S.E. of P marginal mean   =   87 0 lb./ac.

S.E. of N marginal mean   =   123.1 lb./ac.

S.E. of body of table   =   174.1 lb./ac.

Crop :- Paddy.   **Ref :- M.P. 54(56).**

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

Object :—To study the comparative effect of C/N and A/S with and without lime on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra.* (b) N.A. (iii) 26.7.1954 to 4 8.1954. (iv) (a)*Malwa* ploughing. (b) Transplanting. (c) to (e) N.A. (v) Nil. (vi) Paddy no. 17. (vii) Irrigated. (viii) 1 weeding. (ix) 57.67″. (x) 10.11.1954 to 12.11.1954.

2. TREATMENTS :

All combination of (1), (2) and (3)+2 extra treatments

    (1) 2 sources of N : $S_1=$A/S and $S_2=$Sod. Nitrate.

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

    (3) 2 levels of lime : $L_0=0$ and $L_1=200$ lb./ac.

Extra treatments : $T_0=$Control and $T_1=200$ lb./ac. of lime.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) Nil. (iii) 6. (iv) (a) 1/27 ac. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of grain and straw. (iv) (a) 1953—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1923 lb./ac. (ii) 367.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield grain in lb./ac.

$$T_0 = 1539 \text{ and } T_1 = 2015 \text{ lb./ac.}$$

	N_1	N_2	Mean	L_0	L_1
S_1	1918	2126	2022	1900	2144
S_2	1818	1973	1896	1988	1802
Mean	1868	2050	1959	1944	1974
L_0	1802	2086			
L_1	1934	2013			

S.E. of any marginal mean	= 75.0 lb./ac.
S.E. of body of any table	= 106.1 lb./ac.
S.E./T mean	= 150.0 lb./ac.

Crop :- Paddy.　　　　　　　　　　　　　**Ref :- M.P. 55(32).**

Site :- Govt. Agri. Res. Stn., Adhartal.　　　**Tpe :- 'M'.**

Object :—To study the comaprative effects of C/N aud A/S with and without lime on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra.* ; (b) N.A. (iii) 11, 12.8.1955. (iv) (a) 2 ploughing and puddling. (b) Transplanting. (c) to (e) N.A. (v) Nil. (vi) *Nanji* no. E.B. 17 (vii) (early). Irrigated. (viii) 2 weedings. (ix) 64.38". (x) 17 to 19.11.1955.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(56) on page 9.

4. GENERAL :

(i) Lodged. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1953—contd. (b) Yes. (c) No. (v) (a) Raipur and Waraseoni. (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1931 lb./ac. (ii) 320.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

$$T_0 = 1657 \text{ and } T_1 = 1813 \text{ lb./ac.}$$

	N_1	N_2	Mean	L_0	L_1
S_1	1922	2184	2053	2053	2053
S_2	1931	1882	1907	1880	1933
Mean	1927	2033	1980	1967	1993
L_0	1875	2058			
L_1	1978	2008			

S.E. of any marginal mean	= 65.5 lb./ac.
S.E. of any body of table	= 92.6 lb./ac.
S.E./T mean	= 131.0 lb./ac.

Grop :- Paddy.   Ref :- M.P. 56(40).

Site :- Govt. Agri. Res. Stn., Adhartal.   Type :- 'M'.

Object :—To study the comparative effects of C/N and A/S with and without lime on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra*. (b) N.A. (iii) 1.8.1956. (iv) (a) ploughing, cross ploughing, puddling and levelling. (b) Transplanting. (c) N.A. (d) 4" to 5" between plants. (e) 1. (v) Nil. (vi) Paddy no. 17, (vii) Irrigated. (viii) N.A. (ix) 68.67". (x) 21 and 22.11.1956.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(56) on page 9.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (v) (a) Raipur, Sarkhanda and Warseoni. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1358 lb./ac. (ii) 293.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb /ac.

$T_0 = 1138$ lb./ac. $T_1 = 1135$ lb./ac.

	N_1	N_2	Mean	L_0	L_1
S_1	1347	1572	1460	1421	1498
S_2	1311	1421	1366	1408	1324
Mean	1329	1497	1413	1415	1411
L_0	1403	1426			
L_1	1255	1567			

S.E. of any marginal mean   = 59.9 lb./ac.
S.E. of body of any table   = 84.7 lb./ac.
S.E./T mean   = 119.8 lb./ac.

Crop :- Paddy.   Ref :- M.P. 58(3).

Site :- Govt. Agri. Res. Stn., Adhartal.   Type :- 'M'.

Object :—To study the comperative effects of C/N and A/S with and without lime on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra*. (b) N.A. (iii) N.A./8.8.1958. (iv) (a) Ploughing and cross ploughing, puddling and levelling. (b) Transplanting. (c) N.A. (d) 4" to 5" between plants. (e) 1. (v) Nil. (vi) Paddy no. 17. (vii) Unirrigated. (viii) Nil. (ix) 55.07". (x) 17 to 20.11.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(56) on page 9.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1953—1958. (b) Yes. (c) No. (v) (a) Raipur and Sarkhanda. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2124 lb./ac. (ii) 413.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

T_0 = 2134 lb./ac. and T_1 = 2015 lb./ac.

	N_1	N_2	Mean	L_0	L_1
S_1	2069	2446	2258	2194	2321
S_2	1796	2234	2015	1952	2077
Mean	1932	2340	2136	2073	2199
L_0	1880	2266			
L_1	1984	2414			

S.E. of any marginal mean   =   84.3 lb./ac.
S.E. of body of any table   =   119.3 lb./ac.
S.E./T mean   =   168.6 lb./ac.

Crop :- Paddy.

Ref :- M.P. 54(43).

Site :- Reg. Res. Stn., Bagwai.

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Peas. (c) Nil. (ii) Clay loam. (b) N.A. (iii) N.A./10 to 12.8.1954. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) 14 C.L./ac. of F.Y.M. broadcasted before ploughing. (vi) Bankura no. 1. (vii) Irrigated. (viii) 1 weeding. (ix) 33.3". (x) 17 and 18.12.1954.

2. TREATMENTS :

All combinations of (1) and (2) + a control.
     (1) 2 levels of N as A/S : N_1=20 and N_2=40 lb./ac.
     (2) 4 times of applying N : T_1=After watering for transplanting, T_2=30 days after transplanting. T_3=60 days after transplanting and $T_4=\frac{1}{2}$ at T_2 and $\frac{1}{2}$ at T_3.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 76'×18'. (b) 70'×12'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain and bhusa. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 941 lb./ac. (ii) 201.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 693 lb./ac.

	T_1	T_2	T_3	T_4	Mean
N_1	1067	820	905	947	935
N_2	1083	993	1090	870	1009
Mean	1075	907	998	909	972

S.E. of N marginal mean   =   50.5 lb./ac.
S.E. of T marginal mean   =   71.3 lb./ac.
S.E. of body of table or control mean   =   100.9 lb./ac.

Crop :- Paddy *(Kharif)*. **Ref :- M.P. 54(112).**

Site :- Reg. Res. Stn., Bagwai. **Type :- 'M'.**

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

1. BASAL CONDITIONS

(i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 13 to 17.8.1954. (iv) (a) Puddling. (b) Transplanted. (c) N.A. (d) 9" between rows. (e) 4. (v) 10 C.L./ac. of F.Y.M. (vi) T—21 (medium). (vii) Irrigated. (viii) Weeding once. (ix) 33". (x) 10 to 15.12.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N : $N_0=0$, $N_1=20$, $N_2=30$ and $N_3=40$ lb./ac. as A/S.

(2) 4 levels of P_2O_5: $P_0=0$ $P_1=20$, $P_2=30$ and $P_3=40$ lb./ac. as Super.

3. DESIGN :

(i) Balanced Lattice. (ii) (a) 16. (b) 264'×72'. (iii) 5. (iv) (a) 18'×66'. (b) 12'×60'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1737 lb./ac. (ii) 611.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	Mean
N_0	1278	1371	1542	1740	1483
N_1	1414	1798	2057	2064	1833
N_2	1034	1710	2178	2076	1750
N_3	1383	1785	1945	2420	1883
Mean	2277	1666	1931	2075	1737

Crop :- Paddy *(Kharif)*. **Ref :- M.P. 54(101).**

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

Object :—To study the comparative effects of A/S and C/N with and without Lime.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Kanhar.* (b) N.A. (iii) N.A./8.8.1954. (iv) (a) 2 ploughings. (b) Transplanting. (c) N.A. (d) 4"×4". (e) N.A. (v) Nil. (vi) X—116. (vii) Irrigated. (viii) Weeding. (ix) 41.10". (x) 22.11.1954.

2. TREATMENTS :

Same as in expt. no. 54(56) on page 9.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 2. (iv) (a) and (b) 66'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Light attack of tip burn. (iii) Yield of grain. (iv) (a) 1952—1954. (b) N.A. (c) Nil. (v) (a) Raipur, Sarkhanda, Jabalpur and Waraseoni. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2115 lb./ac. (ii) 480.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

$$T_0 = 1850 \text{ lb./ac. and } T_1 = 2260 \text{ lb./ac.}$$

	N_1	N_2	S_1	S_2	Mean
L_0	2105	2070	2230	1945	2088
L_1	2080	2265	2390	1955	2173
Mean	2093	2168	2310	1950	2130
S_1	2305	2315			
S_2	1880	2020			

S.E. of any marginal mean	= 169.8 lb./ac.
S.E. of body of any table	= 240.1 lb./ac.
S.E./T mean	= 339.6 lb./ac.

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Crop :- Paddy *(Kharif).*   **Ref :- M.P. 57(64).**

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

Object :—To study the effect of application of G.L. as manure in Biassi fields.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) N.A. (iii) 25.6.1957. (iv) (a) 2 ploughings. (b) Transplanting. (c) 80 lb./ac. (d) and (e) N.A. (v) Nil. (vi) *Luchai × Gurmatia × Burma.* (vii) Irrigated. (viii) 2 weedings and *Biassi.* (ix) 39.84". (x) 11.12.1957.

2. TREATMENTS :

4 manures : M_0 = Control, M_1 = 2 tons/ac. of G.L. before sowing, M_2 = 2 tons/ac. of G.L. at *Biassi* and M_3 = Sannhemp at 2 tons/ac. spread at *Biassi.*

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 26'×53½'. (b) 22'×49½'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) Raipur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1437 lb./ac. (ii) 57.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1369	1596	1441	1343

S.E./mean = 28.6 lb./ac.

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Crop :- Paddy *(Kharif).*   **Ref :- M.P. 58(70)**

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

Object :—To find out the best method and time of application of G.L. as manure to Biassi fields.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) N.A. (iii) 9.7.1958. (iv) (a) 2 ploughings by deshi plough. (b) Transplanting. (c) 80 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Luchai × Gurmatia × Burma. (vii) Irrigated. (viii) 2 weedings and *Biassi* operation. (ix) 43.79". (x) 17.12.1958.

2. TREATMENTS :

6 manures : M_0=Control, M_1=G.L. at 2 tons/ac. before sowing, M_2=G.L. at 2 tons/ac. during *Biassi*, M_3=Sannhemp at 2 ton/ac. spread during *Biassi*, M_4=20 lb./ac. of N broadcasted at sowing and M_5=20 lb./ac. of N broadcasted during *Biassi*.

3. DESIGN :

(i) R B.D. (ii) (a) 6. (b) N.A. (ii) 4. (iv) (a) 26'+53½'. (b) 22'×49'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Heavy rains during the 2nd week of July affected the germination stightly. (ii) N.A. (iii) Grain yield. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) Raipur. (vi) and (vii) Nil.

5. RESUTS :

(i) 2571 lb./ac. (ii) 375.5 lb./ac. (iii) Treatment differences are not significant (iv) Av. yield grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	2250	2735	2495	2650	2645	2650

S.E./mean = 187.8 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 54(98).**

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

Object :—To find out suitable G.M. crop for Paddy.

1. BASAL CONDITIONS :

(i) a) N A. (b) Paddy. (c) N.A. (ii) (a) *Kanhar.* (b) N.A. (iii) 3.7.1954/9.8.1954. (iv) (a) 2 ploughings. (b) Transplanting. (c) 100 lb./ac. (d) and (e) N.A. (v) F.Y.M. at 40 lb./ac. of N applied on 26.6.1954. (vi) *Luchai × Gurmatia* (late). (vii) Irrigated. (viii) Weeding. (ix) 41.10". (x) 10.12.1954.

2. TREATMENTS :

4 G.M. Crops : M_0=Control, M_1=Sannhamp, M_2=Specioga and M_3=*Barabutti.*
G.M. crops raised alongwith Paddy and burried at *Biassi*.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 49½'×22'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Not satisfactory. (ii) Light attack of grass-hoppers dusting of Gammexane. (iii) Yield of grair. (iv) (a) 1954. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) N.A. (vii) One plot in each repln. was left as fallow.

5. RESULTS :

(i) 1382 lb /ac. (ii) 127.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1310	1472	1385	1360

S.E./means = 63.7 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 59(73).**

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

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

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) *Matasi.* (b) N.A. (iii) N.A. (iv) (a) 2 ploughings. (b) Transplanting. (c) 80 lb./ac. (d) 4″×4″. (e) 1 and 2. (v) Nil. (vi) Luchai×*Gurmatia.* (vii) Irrigated. (viii) Weeding. (ix) 59.17″. (x) N.A.

2. **TREATMENTS .**

All combinations of (1) and (2)
   (1) 4 levels of N as A/S : $N_0 = 0$, $N_1 = 7\frac{1}{2}$, $N_2 = 15$ and $N_3 = 22\frac{1}{2}$ lb./ac.
   (2) 2 levels of P_2O_5 as Super : $P_0 = 0$ and $P_1 = 15$ lb./ac.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 8. (b) 64′×70′. (iii) 6. (iv) (a) and (b) 35′×16′. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Nil, (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 1763 lb./ac. (ii) 457.6 lb./ac. (iii) Only main effect of P is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	15C4	1582	1633	1789	1627
P_1	1841	1815	1673	2178	1899
Mean	1672	1698	1698	1984	1763

S.E. of P marginal mean   =   93.4 lb./ac.
S.E. of N marginal mean   =   132.1 lb./ac.
S.E. of body of table   =   186.8 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 54(99).**
Site :- Govt. Seed and Demons. Farm, Durg.   **Type :- 'M'.**

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

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Kanhar.* (b) N.A. (iii) N.A./13.7.1954. (iv) (a) 2 ploughings. (b) Transplanting by Japanese method. (c) N.A. (d) 9″×9″. (e) N.A. (v) 40 lb./ac. of N as F.Y.M. on 6.6.1954. (vi) Luchai×*Gurmatia* (late). (vii) Tank irrigated by 5 times. (viii) Weeding. (ix) 41.10″. (x) 5 and 6.12.1954.

2. **TREATMENTS :**

All combinations of (1), (2) and (3)
   (1) 2 levels of N as A/S : $N_1 = 20$ and $N_2 = 40$ lb./ac.
   (2) 2 levels of P_2O_5 as Super : $P_1 = 20$ and $P_2 = 40$ lb./ac.
   (3) 2 depths of application of N and P_2O_5 : D_1=at surface, D_2=3″ deep.

3. **DISIGN :**

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Light attack of grass hoppers ; Gammexane dusted. (iii) Yield of grain. (iv) (a) 1954—contd. (b) N.A. (c) Nil. (v) (a) Raipur, Sarkhanda and Waraseoni. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 2149 lb./ac. (ii) 325.6 lb./ac. (iii) Only the N×P interection is significant. (iv) Av. yield of grain in lb./ac.

	N_1	N_2	Mean	P_1	P_2
D_1	2110	2276	2243	2367	2119
D_2	2031	2079	2055	1956	2194
Mean	2121	2178	2149	2161	2137
P_1	2129	2112			
P_2	2192	2163			

S.E. of any marginal mean   = 72.8 lb./ac.
S.E. of body of any table   = 103.0 lb./ac.

Corp :- Paddy *(Kharif)*.   **Ref :- M.P. 55(69).**

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

Object :—To study the effect of deep placement of N and P fertilizers of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Kanhar*. (b) N.A. (iii) 22.6.1955/7.8.1955. (iv) (a) Two ploughings. (b) Transplanting. (c) to (e) N.A. (v) 40 lb./ac. of N as F.Y.M. (vi) *Luchai* × *Gurmatia*. (vii) Irrigated. (viii) 1 *Luchai Gurma* and 1 weeding. (ix) Nil. (x) 13.12.1955.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54 (99) on page 16.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—contd. (b) and (c) No. (v) (a) Adhartal and Lakhandi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3151 lb./ac. (ii) 596.7 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	3188	3040	3114	3036	3192
N_2	3080	3296	3188	3064	3312
Mean	3134	3168	3151	3050	3252
D_1	3088	3012			
D_2	3180	3324			

S.E. any marginal mean   = 133.4 lb./ac.
S.E. of body of any table   = 188.7 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 56(102).**

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

Object :—To find out the effect of deep placement of fertilisers.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Kanhar.* (b) N.A. (iii) N.A. (iv) (a) Two ploughings by *desi* plough. (b) Transplanted. (c) N.A. (d) 9″×9″. (e) 3 to 4. (v) 40 lb./ac. of N as F.Y.M. (vi) *Luchai×Gurmatia.* (vii) Irrigated. (viii) 1 weeding and *Tarchi Gurma.* (ix) 32.55″. (x) N.A.

2. **TREATMENTS and 3. DESIGN :**

Same as in expt. no. 54(99) on page 16.

4. **GENERAL :**

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1956. (b) Yes. (c) Nil. (v) (a) Raipur. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 2215 lb./ac. (ii) 343.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	2169	2229	2199	2074	2324
N_2	2093	2369	2231	2176	2286
Mean	2131	2299	2215	2125	2305
D_1	2073	2177			
D_2	2189	2421			

S.E. of any marginal mean = 76.9 lb./ac.
S.E of body of any table = 108.7 lb./ac.

Crop :- Paddy *(Kharif).*　　　　　　**Ref :- M.P. 54(96).**
Site :- Govt. Seed and Demons. Farm, Durg.　　**Type :- 'M'.**

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

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Kanhar.* (b) N.A. (iii) /-23.7.1954. (iv) (a) 2 ploughings. (b) Transplanting. (c) N.A. (d) 4″×4″. (e) N.A. (v) 40 lb./ac. of N as F.Y.M. on 28.5.1954. (vi) Cross no. 116. (vii) Irrigated. (viii) Weeding. (ix) 41.10″ (x) 17. 18.11.1954.

2. **TREATMENTS :**

4 methods of applying M : B_0=Control, B_1=Mixed with soil at transplanting, B_2=Mixed with soil and applied in the form of balls and B_3=Seedling dipped in solution and transplanted.
M=20 lb./ac. of N+ 20 lb./ac. of P_2O_5.

3. **DESIGN :**

(i) R.B.D. (i) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Light attack of grass hoppers and Gammexane dusted. (iii) Yield of grain. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

(i) 1860 lb./ac. (ii) 444.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	B_0	B_1	B_2	B_3
Av. yield	1880	1850	1832	1678

S.E./mean = 198.6 lb./ac.

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

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

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

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Kanhar.* (b) N.A. (iii) 29.7.1955/3.8.1958. (iv) (a) 2 ploughings. (b) Transplanting. (c) 80 lb./ac. (d) $4'' \times 4''$. (e) N.A. (v) 40 lb./ac. of N as F.Y.M. (vi) Cross no. 116 (early). (vii) Irrigated. (viii) 1 weeding. (ix) 18". (x) 21.11.1955.

2. **TREATMENTS and 3. DESIGN :**

   Same as in expt. no. 54(96) on page 18.

4. **GENERAL :**

   (i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—1956. (b) Yes. (c) Nil. (v) (a) Adhartal and Labhandi. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 2910 lb./ac. (ii) 441.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	B_0	B_1	B_2	B_3
Av. yield	2600	3192	3016	2832

   S.E./mean = 197.4 lb./ac.

———

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 56(103).**

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

Object :—To see the effect of different methods of applying artificial manures to Paddy.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Kanhar.* (b) N.A. (iii) N.A. (iv) (a) Two ploughings by *desi* plough. (b) Transplanted. (c) N.A. (d) $4'' \times 4''$. (e) 1 to 2. (v) 40 lb./ac. of N as F.Y.M. (vi) X—116. (vii) Irrigated. (viii) 1 weeding. (ix) 32.55". (x) N.A.

2. **TREATMENTS and 3. DESIGN :**

   Same as in expt. no. 54(96) on page 18.

4. **GENERAL :**

   (i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1956. (b) Yes. (c) Nil. (v) (a) Raipur. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 1861 lb./ac. (ii) 194.7 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	B_0	B_1	B_2	B_3
Av. yield	1614	1959	2093	1776

   S.E./mean = 87.0 lb./ac.

———

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 57(65).**

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

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) N.A. (iii) 25.6.1957. (iv) (a) 2 ploughings. (b) Transplanting. (c) 80 lb./ac. (d) and (e) N.A. (v) Nil. (vi) *Luchai* × *Gurmatia* × *Burma.* (vii) Irrigated. (viii) *Biassi* on 13.8.1957 and 2 weedings. (ix) 39.84″. (x) 11.12.1957.

2. TREATMENTS :

4 G M. treatments : M_0=Control, M_1=2 tons/ac. of G.L. before sowing+N at *Biassi*, M_2=2 tons/ac. of G.L.+N at *Biassi* and M_3= 2 tons/ac. of Sannhemp+N at *Biassi*.

N applied at 5 lb./ac. as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 26′×53½′. (b) 22′×49½′. (v) 2′×2′. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 15555 lb./ac. (ii) 86.2 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1490	1713	1580	1439

S.E./mean = 43.1 lb./ac.

Crop :- Paddy *(Kharif).*

Site :- Govt. Seed and Demons. Farm, Durg.

Ref :- M.P. 58(71).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Matasi.* (b) N.A. (iii) 10.7.1958./N.A. (iv) (a) Two ploughings by *desi* plough. (b) Transplanting (c) 80 lb./ac. (d) and (e) N.A. (v) Nil. (vi) *Luchai* × *Gurmatia* × *Burma.* (vii) Irrigated. (viii) 2 weedings and *Biassi.* (ix) 43.79″. (x) 18.12.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(65)on page 19.

4. GENERAL :

(i) Not satisfactory. (b) N.A. (iii) Grain yield. (iv) (a) 1957—1958. (b) Yes. (c) Nil. (v) N.A. (vi) Heavy rains in the 2nd week of July. (vii) Nil.

5. RESULTS :

(i) 1891 lb./ac. (ii) 3 0.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1650	2095	1840	1980

S.E./mean = 155.2 lb./ac.

Crop :- Paddy *(Kharif).*

Site :- Instt. of Plant Industry, Indore.

Ref :- M.P. 54(122).

Type :- 'M'.

Object :—To study the effect of sources and levels of N in combination with P_2O_5 on Paddy.

1. **BASAL CONDITIONS:**

   (i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 6.7.1954. (iv) (a) One bakharing. (b) Transplanting. (c) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 weeding and one 1 interculture. (ix) 52.23". (x) 11 and 15.10.1954.

2. **TREATMENT :**

   All combination of (1), (2) and (3) :
   - (1) 2 sources of N : S_1=A/S and S_2=G.N.C.
   - (2) 4 levels of N : N_0=0, N_1=20, N_2=40 and N_3=60 lb./ac.
   - (3) 3 levels of P_2O_5 : P_0=0, P_1=15 and P_2=30 lb./ac. of P_2O_5.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 3. (iv)(a) 45'×9.33'. (b) 40'×4.66' (v) 2.5'×2.33'. (vi) Yes.

4. **GENERAL :**

   (i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) N.A. (vi) Heavy rains in September. (vii) N.A.

5. **RESULTS :**

   (i) 861 lb./ac. (ii) 183.8 lb./ac. (iii) Main effects of N and S and the interaction N×S are significant. Others are not significant. (iv) Av. yield of grain in lb./ac.

   N_0P_0=615, N_0P_1=632, N_0P_2=656 lb./ac.

	N_1	N_2	N_3	P_0	P_1	P_2	Mean
S_1	942	1154	1527	1216	1221	1187	1208
S_2	985	649	764	646	685	667	666
Mean	763	902	1145	931	953	927	937
P_0	743	896	1154				
P_1	789	935	1134				
P_2	758	874	1149				

   S.E. of N or P marginal mean = 43.3 lb./ac.
   S.E. of S marginal mean = 35.4 lb./ac.
   S.E. of body of N×P table or S×P table = 61.3 lb./ac.
   S.E. of body of N×P table or N_0P_0, N_0P_1, or N_0P_2 mean = 75.0 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :-M.P. 59(11).**

Site :- Govt. Seed and Demons. Farm, Jagdalpur. **Type :- 'M'.**

Object :—To compare the effects of A/S and C/A/N with and without Lime.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 11.6.1959./22.7.1959. (iv) (a) 3 ploughings. (b) Transplantation. (c) 350 lb./ac. (d) 4"×5". (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 weeding on 18.9.1959. (ix) 55". (x) 14.11.1959.

2. **TREATMENTS :**

   8 manurial treatments : M_0=Control, M_1=100 lb./ac. of A/S, M_2=M_1+500 lb./ac. of lime, M_3=M_1+1000 lb./ac. of lime, M_4=M_1+1500 lb./ac of lime, M_5=100 lb./ac. of C/A/N, M_6=2 tons/ac. of G.L. and M_7=2 tons/ac. of F.Y.M.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 36'×30' (b) 30'×24'. (v) 3'×3'. (vi) Yes.

4. **GENERAL :**

   (i) Very good stand of crop. (ii) Nil. (iii) Biometric observations and yield of grain and straw. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) Kanker. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3280 lb./ac.   (ii) 484.6 lb./ac.   (iii) Treatment differences are not significant.   (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Av. yield	2803	2965	3590	3751	3832	3126	2944	3226

S.E./mean = 279.8 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 59(12).**

Site :- Govt. Seed and Demons. Farm, Jagdalpur.   **Type :- 'M'.**

Object :—To study the effects of G.L. and A/S on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Loam. (b) N.A. (iii) 11.7.1959/N.A. (iv) 3 ploughings. (b) Transplanting. (c) 80 lb./ac. (d) $4'' \times 5''$. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 hand weeding. (ix) 55". (x) 17.11.1959.

2. TREATMENTS :

Same as in expt. no. 57(65) on page 19.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) $36' \times 30'$. (b) $30' \times 24'$. (v) $3' \times 3'$. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) A light attack of *Banki* rice case worm. Dusted with 5% B.H.C. at 15 lb./ac. (iii) Biometric observations and yield of grain and straw. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) Durg. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2757 lb./ac. (ii) 232.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	2269	3297	2602	2859

S.E./mean = 116.3 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 59(13).**

Site :- Govt. Seed and Demons. Farm, Jagdalpur.   **Type :- 'M'.**

Object :—To study the use of G.L. for Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil (b) Paddy. (c) As per treatments. (ii) (a) Loam. (b) N.A. (iii) 12.7.1959/N.A. (iv) (a) 3 ploughings. (b) Transplanting. (c) 80 lb./ac. (d) and (e) N.A. (v) N.A. (vi) Paddy cross no. 116. (vii) Irrigated. (viii) *Biasi* operation on 16.8.1959 and weeding. (ix) 55". (x) 20.11.1959.

2. TREATMENTS :

7 manurial treatments : M_0=Control, M_1=G.L. at 2 tons/ac. at sowing, M_2=G.L. at 2 tons/ac., at *Biasi*.
M_3=33 lb./ac. of N as A/S before sowing, M_4=33 lb./ac. of N as A/S at *Biasi*,
M_5=Sannhemp sown with paddy at 20 lb./ac.+5 lb./ac. of N as A/S at *Biasi* and
M_6=*Dhaincha* seed sown with paddy at 10 lb./ac.+5 lb./ac. of N as A/S at *Biasi*.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) $36' \times 30'$. (b) $30' \times 24'$. (v) $3' \times 3'$. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Slight attack of *Banki* (rice case worm). Dusting of Gammexane 5% on 31.8.1959. (iii) Biometric observations and yield of grain and straw. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) Durg. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2679 lb./ac. (ii) 289.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	2329	2707	2632	3282	2662	2647	2511

S.E./mean = 144.9 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 59(14).**

Site :- Govt. Seed and Demons. Farm, Jagdalpur.   **Type :- 'M'.**

Object :—To study the effect of concentrated dose of F.Y.M. at different intervals.

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) 8.7.1959/20.8.1959 (iv) (a) 3 ploughings. (b) Transplanting. (c) N.A. (d) 4" to 5"×4" to 5". (e) 2. (v) Nil. (vi) Paddy cross no. 116. (vii) Irrigated. (viii) 1 hand weeding. (ix) 55". (x) 19 11.1959.

2. TREATMENTS :

4 manurial treatments : $M_0=0$, $M_1=2\frac{1}{2}$ C.L./ac. of F.Y.M. every year, $M_2=5$ C.L./ac. of F.Y.M. every alternate year and $M_3=10$ C.L./ac. of F.Y.M. every 5th year.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 36'×30'. (b) 30'×24'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of *Banki* (rice case worm). Dusting of 5% Gammexane. (iii) Biometric observations and yield of grain. (iv) (a) 1959—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2734 lb./ac. (ii) 237.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	2284	2707	2828	3116

S E./mean = 118.9 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 59(15)**

Site :- Govt. Seed and Demons. Farm, Jagdalpur.   **Type :- 'M'.**

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

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) 21.7.1959/ 13.8.1959. (iv) (a) 3 ploughings+one puddling. (b) Transplanting. (c) N.A. (d) 4—5"×4"—5". (e) 2 to 3. (v) Nil. (vi) Paddy *budhia ballo×Burma* no. 1. (vii) 3 tank irrigations on 4.10.1959, 12.10.1959 and 5.11.1959. (viii) 1 hand weeding. (ix) 55". (x) 16.12.1959.

2. TREATMENTS :

All combinations of (1) and (2)

    (1) 4 levels of N as A/S : $N_0=0$, $N_1=7\frac{1}{2}$, $N_2=15$ and $N_3==22\frac{1}{2}$ lb./ac.

    (2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=15$ lb./ac.

3. DESIGN :

(i) R.B D. (ii) (a) 8. (b) No. (iii) 6. (iv) (a) and (b) $16\frac{1}{2}'\times33'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Light attack of Banki (rice case worm) Dusting of B.HC. 5%. (iii) Biometric observations and yield of grain. (iv) (a) 1959—N.A. (b) and (c) Nil. (v) (a) Adhartal. (b) Nil. (vi) Heavy rains and winds in October. (v) Nil.

5. RESULTS :

(i) 1489 lb./ac. (ii) 130.6 lb./ac. (iii) Only main effects of N and P are significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	1093	1347	1569	1673	1420
P_1	1280	1413	1707	1833	1558
Mean	1187	1380	1637	1753	1489

S.E. of P marginal mean   = 26.7 lb./ac.

S.E. of N marginal mean   = 37.7 lb./ac.

S.E. of body of table   = 53.3 lb./ac.

Crop : Paddy *(Kharif)*.

Site :- Govt. Agri. Res. Farm, Kuthulia.

Ref :- M.P. 58(101).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 9.7.1958. (iv) (a) 3 ploughings (b) Board casting. (c) 40 lb./ac. (d) $1'\times1'$. (v) Nil, (vi) N—22. (vii) Unirigated. (viii) Nil. (ix) 39.6". (x) 5.10.1958.

2. TREATMENTS :

4 manurial treatments : M_0=Control, M_1=2 tons/ac. of *Dhak* G.L. added at the time of sowing and plucked in, M_2=2 tons/ac. of *Dhak* G.L. added 4 week before sowing and plucked in at the time of sowing and M_3=*Dhaincha* seed mixed with Paddy seed and sown at the time of sowing of paddy at 10 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) $75'\times14'$. (b) $58'\times9'$. (v) $8.5'\times2.5'$. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1573 lb./ac. (ii) 152.4 lb./ac. (iii) Treatment differences are not signigcant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1609	1599	1427	1909

S.E./mean = 76.2 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 59(136).**

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

Object —To find out the suitable doses of N and P for Paddy.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Clay loam (b) Nil. (iii) 5.7.1959. (iv) (a) 3 ploughings.
   (b) Broadcasting. (c) 40 lb./ac. (d) $12'' \times 12''$. (e) Nil. (v) Nil. (vi) N—22. (vii) Unirrigated.
   (viii Nil. (ix) 44.3". (x) 5.10.1959.

2. **TREATMENTS :**

   All combinations of (1) and (2)

   (1) 4 levels of N as A/S : $N_0=0$, $N_1=7\frac{1}{2}$, $N_2=15$ and $N_3=22\frac{1}{2}$ lb./ac.
   (2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=15$ lb./ac.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) $35' \times 16'$. (v) Nil. (vi) Yes.

4. **GENERAL :**

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

5. **RESULTS :**

   (i) 1053 lb./ac. (ii) 151.1 lb./ac. (iii) Only the main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	933	1082	1095	1186	1074
P_1	907	972	1005	1244	1034
Mean	920	1027	1050	1215	1053

S.E. of N marginal mean	=	43.6 lb./ac.
S.E. of P marginal mean	=	30.8 lb./ac.
S.E. of body of table	=	61.7 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 59(137).**

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

Object :—To study the effect of different times of application at different levels of N in combination with P and K fertilizers on Paddy.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Clay loam (b) N.A. (iii) 6.7.1959. (iv) 3 ploughings. (b) Broadcasting. (c) 40 lb./ac. (d) $12'' \times 12''$ (e) N.A. (v) Nil. (vi) N—22. (vii) Unirrigated. (viii) Nil. (ix) 44.3". (x) 9.10.1959.

2. **TREATMENTS :**

   Main-plot treatments :

   All combinations of (1) and (2)

   (1) 2 levels of N as A/S : $N_1=20$ and $N_2=40$ lb./ac.
   (2) 2 times of application of manures : $T_1=$At *Biassi* and $T_2=\frac{1}{2}$ at *Biassi*$+\frac{1}{2}$ at sowing.

   Sub-plot treatments :

   All combinations of (1) and (2)

   (1) 2 sources of 20 lb./ac. of P_2O_5 : $S_1=$ Super and $S_2=$B.M.
   (2) 2 levels of K_2O : $K_0=0$ and $K_1=20$ lb./ac.

3. DESIGN :

   (i) Split-plot. (ii) (a) 4 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 33'×22'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

   (i) 1281 lb /ac. (ii) (a) 310.4 lb./ac. (b) 225.5 lb./ac. (iii) Only the main effect of N is significant. (iv) Av. yield of grain in lb /ac.

	T_1	T_2	S_1	S_2	K_0	K_1	Mean
N_1	1164	1151	1174	1142	1136	1179	1158
N_2	1491	1318	1449	1359	1451	1357	1404
Mean	1327	1235	1311	1251	1294	1268	1281
K_0	1339	1249	1307	1281			
K_1	1316	1221	1316	1221			
S_1	1378	1245					
S_2	1277	1224					

S.E. of difference of two
   1. T or N marginal means   = 77.6 lb./ac.
   2. S or K marginal means   = 56.4 lb./ac.
   3. S or K means at the same level of N or T   = 159.5 lb./ac.
   4 N or T means at the same level of S or K   = 95.9 lb./ac.

———

Crop :- **Paddy** *(Kharif)*.   Ref :- M.P. 57(67).

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

Object : —To find out the best method and time of application of G.L. and A/S in Biassi fields with lower dose of N.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Kanhar.* (b) Refer soil analysis, Labhandi. (iii) 6.7.1957. (iv) (a) Two ploughings by *desi* plough. (b) Broadcasting. (c) 80 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Cross no. 116. (vii) Irrigated. (viii) One hand weeding and *Biassi* operation. (ix) 36.94". (x) 16.11.1957.

2. TREATMENTS :

   T_0=Control (no manure), T_1=*Karanj* leaves (green) at 2 ton./ac., burried at the time of ploughing before sowing+5 lb./ac. of N as A/S. just before *biassi*, T_2=*Karanj* leaves (green) at 2 ton./ac. spread and ploughed in at the time of *biassi* operation. +5 lb./ac. of N as A/S just after *biassi* operation and T_3=Sannhemp green, at 2 tons./ac. cut and spread at the time of *biassi* operation+5 lb./ac. of N as A/S just after *biassi* operation.

3. DESIGN :

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

4. GENERAL :

   (i) Satisfactory. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

   (i) 2022 lb./ac. (ii) 341.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb/ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	1930	1880	2150	2130

S.E./mean = 170.7 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 59(75).**

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

Object :—To find out the best method and time of application of G.L. as manure for Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) *Matasi.* (b) Refer soil analysis, Labhandi. (iii) 11.7.1959. (iv) (a) Two ploughings by *desi* plough. (b) Broadcasting. (c) 80 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Cross no. 116. (vii) Irrigated. (viii) *Biassi* on 24.8.1959 and weeding by hand and rouging. (ix) 43.17″. (x) 17.11.1959.

2. **TREATMENTS :**

6. manurial treatments : T_0=Control (no. G.L.), T_1=2 tons./ac. of G.L. burried at 1st ploughing, T_2=2 ton./ac. of G.L. cut and spread at the time of *biassi* operation and ploughed in, T_3=2 tons./ac. of sannhemp green, cut and spread at the time of *Biassi* operation, T_4=20 lb./ac. of N as A/S at sowing and T_5=20 lb./ac. of N as A/S at the time of *Biassi.*

3. **DESIGN :**

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 36′×30′. (b) 30′×24′. (v) 3′×3′. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 3112 lb./ac. (ii) 37.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. yield	2760	3070	3554	2904	3184	3199

S E./mean = 18.5 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 59(76).**

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

Object :—To find out best method and time for the application of G.L. as manure for Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) *Matasi.* (b) Refer soil analysis, Labhandi. (iii) N.A. (iv) (a) Two ploughings by *desi* plough. (b) Broadcasting. (c) 80 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Cross no 116. (vii) Irrigated. (viii) *Biassi* on 24.8.1959. and two hand weedings. (ix) 43.17″: (x) N.A.

2. **TREATMENTS :**

6 G.L. treatments : T_0=Control (no manure), T_1=2 tons./ac. of G.L. at sowing+5 lb./ac of N as A/S at *Biassi,* T_2=2 tons./ac. of G.L. at *Biassi*+5 lb./ac. of N as A/S at *Biassi,* T_3=2 ton./ac. of sann cut and spread at *Biassi* + 5 lb./ac. of N as A/S at *Biossi,* T_4=20 lb./ac. of sann seed mixed with paddy and sown + 5 lb./ac. of N as A/S at *Biassi* and T_5=10 lb./ac. of *Dhaincha* seed mixed with paddy and sown + 5 lb./ac of N as A/S at *Biassi.*

3. DESIGN and 4. GENERAL :

Same as in expt. no. 59(75) on page 27.

5. RESULTS :

(i) 2510 lb./ac. (ii) 381.3 lb./ac. (iii) Treatment differences are not significant. (ix) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_2	T_4	T_5
Av. yield	2284	2496	2647	2496	2571	2571

S.E./mean = 190.7 lb./ac.

———

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 57(68).**

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

Object :—To find out the best method and time of application of G.L. as manure for Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Kanhar*. (b) Refer soil analysis, Labhandi. (iii) 8.7.1957. (iv) (a) Two ploughings by *desi* plough. (b) Broadcasting. (c) 80 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Cross no. 116. (vii) Irrigated. (viii) One hand weeding and *Biasi* operation. (ix) 36.94". (x) 16.11.1957.

2. TREATMENTS :

T_0=Control (no manure), T_1=Karanj G.L. at 2 tons/ac., burried at the time of first ploughing, T_2= Karanj G.L. at 2 tons/ac., spread at the time of *Biassi* and ploughed in *Biassi* operation and T_3=Sannhemp G.L. at 2 tons/ac., cut and spread at the time of *Biassi* operation.

3. DESIGN :

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

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2195 lb./ac. (ii) 525.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	2140	1980	2280	2380

S.E./mean =262.5 lb./ac.

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Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 54(108).**

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

Object :—To find out the effect of deep placement of fertilizers on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi*. (b) Refer soil analysis, Labhandi. (iii) N.A /14.8.1954. (iv) (a) Two ploughings by *meston* plough, puddling and trenching. (b) N.A. (c) 50 lb./ac. (d) 4" to 5"× 4" to 5". (e) N.A. (v) Nil. (vi) *Luchai×Gurmatia* (No. 18). (vii) Irrigated. (viii) Nil. (ix) 44.52". (x) N.A.

2, TREATMENTS:

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

(1) 2 levels of N as A/S : N_1=20 and N_2=40 lb./ac.

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

(3) 2 depths of placement of N and P_2O_5 : D_1=At surface and D_2=3" deep.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) and (b) 33'×33'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Few plants are seen affected by blast disease. (iii) Grain weight. (iv) (a) 1954—1958.
(b) No. (c) Nil. (v) (a) Adhartal. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 2123 lb./ac. (ii) 239.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	2064	2096	2080	2016	2144
N_2	2136	2196	2166	2116	2216
Mean	2100	2146	2123	2066	2180
D_1	2056	2076			
D_2	2144	2216			

S.E. of any marginal mean   = 53.6 lb./ac.

S.E. of body of any table   = 75.8 lb./ac.

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Crop :- Paddy.

Site :- Govt. Res. Farm, Labhandi.

Ref :- M.P. 55(21).

Type :- 'M'.

Object :—To find out the effect of deep placement of fertilizers on the yield of Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi* (sandy loam). (b) Refer soil analysis, Labhandi. (iii)
27.6.1955/28.7.1955. (iv) (a) Two ploughings, harrowing with wooden *datari* and levelling. (b) Transplanting. (c) N.A. (d) 4"×4". (e) N.A. (v) Nil. (vi) *Luchai×Gurmatia* (late). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 24.12.1955.

2. TREATMENTS and 3. DESIGN:

Same as in expt. no. 54(108) on page 28.

4. GENERAL:

(i) Good. (ii) N.A. (iii) Weight of grain and straw. (iv) (a) 1954—1958. (b) No. (c) Nil. (v) (a) and
(b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 1953 lb./ac. (ii) 278.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	1972	1980	1976	1964	1988
N_2	1940	1920	1930	1904	1956
Mean	1956	1950	1953	1934	1972
D_1	1972	1896			
D_2	1940	2004			

S.E. of any marginal mean   =   62.23 lb./ac.

S.E. of body of any table   =   88.00 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 56(115).**

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

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Matasi.* (b) Refer soil analysis, Labhandi. (iii) N.A./11.7.1956. (iv) (a) Two ploughings by *desi* plough. (b) Transplanting. (c) 60 lb./ac. (d) 4"×4". (e) 1 to 2. (v) 40 lb./ac. of N as F.Y.M. (vi) *Luchai×Gurmatia* (No. 18). (vii) Irrigated. (viii) 1 hand weeding. (ix) 39.94". (x) 3.12.1956.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(108) on page 28.

4. GENERAL :

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

5. RESULTS :

(i) 2658 lb./ac. (ii) 264.2 lb./ac. (iii) Main effect of P and interaction P×D are highly significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	2512	2752	2632	2632	2632
N_2	2480	2888	2684	2768	2600
Mean	2496	2820	2658	2700	2616
D_1	2416	2984			
D_2	2576	2656			

S.E. of any marginal mean   =   59.1 lb./ac.

S.E. of body of any table   =   83.5 lb./ac.

Crop :- Paddy *(Khrif).*   **Ref :- M.P. 57 (70).**

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

Object :—To find out the effect of deep placement of fertilizers on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) Refer soil analysis, Labhandi. (iii) N.A./15.8.1957. (iv) (a) 2 ploughings, levelling and puddling. (b) Transplanted. (c) 60 lb./ac. (d) 4"×4". (e) 1 to 2. (v) F.Y.M. at 40 lb./ac. of N. (vi) *Luchai× Gurmatia.* (vii) Irrigated. (viii) One weeding by hand. (ix) 36.94". (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(108) on page 28.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1954—1958. (b) No. (c) Nil. (v) Bilaspur. (vi) and (vii) Nil.

5. RESULTS :

(i) 1948 lb./ac. (ii) 296.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	1912	1920	1916	1904	1928
N_2	1912	2048	1980	1876	2084
Mean	1912	1984	1948	1890	2006
D_1	1924	1856			
D_2	1900	2112			

S.E. of any marginal mean   = 66.3 lb./ac.

S.E. of body of any table   = 93.8 lb./ac.

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Crop :- Paddy *(Kharif).*   **Ref :- M.P. 58(76).**

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

Object :—To find out the effect of deep placement of fertilizers on the yield of Paddy.

1. BASAL CONDITIONS :

(i) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) Refer soil analysis, Labhandi. (iii) N.A./9.8.1958. (iv) 2 ploughings, levelling. (b) Transplanted. (c) 60 lb./ac. (d) 4″×4″. (e) 1 to 2. (v) F.Y.M. at 40 lb./ac. of N. (vi) *Luchai×Gurmatia.* (vii) Irrigated. (viii) One hand weeding. (ix) 61.51″. (x) 12.12.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(108) on page 28.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain and Straw yield. (iv) (a) 1954 to 1958. (b) No. (c) Nil. (v) (a) Bilaspur. (b) N.A. (vi) Heavy rains during July. (vii) Nil.

5. RESULTS :

(i) 3201 lb./ac, (ii) 400.9 lb./ac. (iii) Only interaction P×M is significant. (iv) Av. yield of grain in lb /ac.

	P_1	P_2	Mean	D_1	D_2
N_1	3005	3168	3087	3118	3055
N_2	3390	3241	3316	3381	3250
Mean	3198	3205	3201	3250	3152
D_1	3109	3390			
D_2	3286	3019			

S.E. of any marginal mean   = 89.6 lb./ac.

S.E. of body of any table   = 126.8 lb./ac.

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Crop :- Paddy.

Site :- Govt. Res. Farm, Labhandi.

Ref :- M.P. 54(85).

Type :- 'M'.

Object :—To find out the best green manure for Paddy.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) Refer soil analysis, Labhandi. (iii) 14.7.1954./N.A. (iv) (a) P'oughing and cross ploughing. (b) *Biassi.* (c) to (e) N.A. (v) Nil. (vi) *Luchai×Gurmatia* no 18. (late) (vii) Irrigated. (viii) Weeding. (ix) 44.52". (x) 29.11.1954.

2. TREATMENTS :

   5 G.M. crops : G_0=Control (no manure), G_1=*Sann*, G_2=*Dhaincha* G_3=Speciosa and G_4=Barbata. G.M. seeds sown with the seed of paddy and burried at the time of *biassi*.

3. DESIGN :

   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 66'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

   (i) 1298 lb./ac. (ii) 292.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	G_0	G_1	G_2	G_3	G_4
Av. yield	1290	1360	1350	1220	1270

S.E./mean = 146.2 lb./ac.

Crop :- Paddy.

Site :- Govt. Res. Farm, Labhandi.

Ref :- M.P. 54(84).

Type :- 'M'.

Object :—To compare the effect of kotka phosphate with Super on the yield of Paddy.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) Refer soil analysis, Labhandi. (iii) N.A./3.8.1954. (iv) (a) 2 ploughings, puddling and levelling. (b) Transplanted (c) 35 lb./ac. (d) 4" to 5". (e) N.A. (v) (vi) *Luchai × Gurmatia* (late) (vii) Irrigated. (viii) Weeding. (ix) 44.52". (x) 27.11.1954.

2. TREATMENTS :

   4 manurial treatments : M_0=Control (No manure). M_1=20 lb./ac. of N as A/S, M_2=40 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super. and M_3=40 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as kotka phosphate.

3. DESIGN :

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

4. GENERAL :

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

5. RESUSTS ;

   (i) 2420 lb./ac. (ii) 171.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac..

Treatment	M_0	M_1	M_2	M_3
Av. yield	2410	2430	2370	2470

S.E./mean = 85.5 lb./ac.

Crop :- Paddy.　　　　　　　　　　　　　　　**Ref :- M.P. 54(87).**

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

Object :—To study the effect of different methods and time of application of N and P on Paddy.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Kanhar*. (b) Refer soil analysis, Labhandhi. (iii) 14.7.1954. (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c) Nil. (d) and (e) N.A. (v) Nil. (vi) *Luchai* × *Gurmatia* no. 18 (late). (vii) Irrigated. (viii) Weeding. (ix) 44.52". (x) 29.11.1954.

2. TREATMENTS :

   4 methods of application of fertilizers :　M_0=Control (no manure), M_1=Manure applied at transplanting, M_2=Mixed with soil in 1 : 3 ratio in the form of balls and M_3=The roots of the seedlings dipped in the solution of manure and soil.

   20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super applied as manure.

3. DESIGN :

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

4. GENERAL :

   (i) Good. ii) Nil. (iii) Yield of grain. (iv) (a) 1954—1955. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

   (i) 2222 lb./ac. (ii) 393.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_5	M_3
Av. yield	2008	2296	2440	2144

   S.E./mean　=　175.9 lb./ac.

Crop :- Paddy.　　　　　　　　　　　　　　　**Ref :- M.P. 55(23).**

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

Object :—To the study the effect of different methods and time of application of N and P on Paddy.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Matasi*. (b) Refer soil analysis, Labhandi. (iii) 26.6.1955/29.7.1955. (iv) (a) Two ploughings by *meston* plough, harrowing with wooden *datari*. and levelling with *Koper*. (b) Transplanted. (c) N.A. (d) 10"×10". (e) N.A. (v) Nil. (vi) *Luchai* × *Gurmatia* no. 18. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 24.11.1955.

2. TREATMENTS and 3. DESIGN :

   Same as in expt. 54 (87) above.

4. GENERAL :

   (i Good. (ii) Nil. (iii) Weight of grain and straw. (iv) (a) 1954—1955. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

   (i) 1688 lb./ac. (ii) 258.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1552	1816	1576	1808

   S.E./mean　=　115.2 lb./ac.

Crop :- Paddy. **Ref :- M P. 54(86).**

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

Object :—To ascertain the best combination of organic manure and artificial fertilizer for Paddy.

1. **BASAL SCONDITION :**

   (i) (a) Nil. (b) Paddy. (b) N.A. (ii) (a) *Matasi*. (b) Refer soil analysis, Labhandi. (iii) N A./14.7.1954.
   (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c) N.A. (d) Rows 4″—5″ apart. (e) N.A.
   (v) Nil. (vl) *Luchai*×*Gurmatia* no. 18 (late). (vii) Irrigated. (viii) Weeding (ix) 44.52″. (x) 29.11.1954.

2. **TREATMENTS :**

   All combinations of (1), (2) and (3)
   (1) 2 levels of N : N_1=40 and N_2=80 lb./ac.
   (2) 2 sources of N : S_1=A/S, S_2=A/S and F.Y.M. in 1″: 1 ratio.
   (3) 2 levels of P_2O_5 : P_1=40 and P_2=80 lb./ac.
   Time and method of application of manures N.A.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 33′×33′. (v) Nil. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (v) (a) and (b) N.A.
   (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 2324 lb./ac. (ii) 263.6 lb./ac. (ili) None of the effects in significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	Mean	P_1	P_2
N_1	2370	2385	2378	2510	2245
N_2	2220	2320	2270	2280	2260
Mean	2295	2353	23:4	2395	2253
P_1	2345	2445			
P_2	2245	2260			

   S.E. of any marginal mean   = 65.9 lb./ac.
   S.E. of body of any table   = 93.2 lb./ac.

Crop :- Paddy. **Ref :- M.P. 55(24).**

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

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

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Paddy. (c) As per treatments (ii) (a) *Matasi*. (b) Refer soil analysis, Labhandi.
   (iii) 14.7.1955/19.8.1955 (iv) (a) Two ploughings by *meston* plough, harrowing and levelling (b)
   Transplanted. (c) N.A. (d) 4″×4″. (e) N.A. (v) Nil. (vi) *Luchai*×*Gurmatia* no. 18. (vii) Irrigated.
   (viii) Weeding. (ix) N.A. (x) 29.11.1955.

2. **TREATMENTS to 4. GENERAL :**

   Same as in expt. no. 54 (86) above.

5. **RESULTS :**

   (i) 1878 lb./ac. (ii) 225.4 lb./ac. (iii) Main effect of N alone is significant. (vi) Av. yield of grain in lb./ac.

	S_1	S_2	Mean	P_1	P_2
N_1	1920	2050	1985	1920	2050
N_2	1790	1755	1772	1760	1785
Mean	1855	1902	1878	1840	1917
P_1	1900	1780			
P_2	1810	2025			

S.E. of any marginal mean = 56.35 lb./ac.

S.E. of body of any table = 79.69 lb./ac.

Crop :- Paddy *(Kharif)*.
Site :- Govt. Res. Farm, Labhandi.

Ref :- M.P. 56(114).
Type :- 'M'.

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

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi*. (b) Refer soil analysis, Labhandi. (iii) N.A./12.7.1956. (iv) (a) Two ploughings. (b) Transplanted. (c) 60 lb./ac. (d) 4"×4". (e) 1 to 2. (v) Nil. (vi) *Luchai×Gurmatia*. (vii) Irrigated. (viii) Two weedings by hand. (ix) 39.94". (x) 3.12.1956.

2. **TREATMENTS to 4. GENERAL :**

Same as in expt. no. 54(86) on page 34.

5. **RESULTS :**

(i) 2917 lb./ac. (ii) 317.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	Mean	P_1	P_2
N_1	2935	2905	2920	2845	2995
N_2	2850	2980	2915	2960	2870
Mean	2892	2942	2917	2902	2932
P_1	2905	2900			
P_2	2880	2985			

S.E. of any marginal mean = 79.3 lb./ac.

S.E. of body of any table = 112.2 lb./ac.

Crop :- Paddy *(Kharif)*.
Site :- Govt. Res. Farm, Labhandi.

Ref :- M.P. 57(73).
Type :- 'M'.

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

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Matasi*. (b) Refer soil analysis, Labhandi. (iii) 13.8.1957. (iv) (a) Two ploughings by *desi* plough. (b) Transplanted. (c) 60 lb./ac. (d) 4"×4". (e) 1 to 2. (v) Nil. (vi) *Luchai×Gurmatia*. (vii) Irrigated. (viii) One hand weeding. (ix) 36.94". (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(86) on page 34.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1954—1958. (b) Yes. (c) Nil. (v) N.A. (v) and (vi) Nil.

5. RESULTS :

(i) 2314 lb./ac. (ii) 338.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	Mean	P_1	P_2
N_1	2345	2350	2347	2320	2375
N_2	2140	2420	2280	2225	2335
Mean	2242	2385	2314	2272	2355
P_1	2180	2365			
P_2	2305	2405			

S.E. of any marginal mean = 84.6 lb./ac.
S.E. of body of any table = 119.6 lb./ac.

Crop :- Paddy *(Kharif).*　　　　　　　　　　**Ref :- M.P. 58(78).**

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

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Dorsa.* (b) Refer soil analysis, Labhandi. (iii) N.A./5.8.1958. (iv) (a) Two ploughings, levelling and puddling. (b) Transplanted. (c) 60 lb./ac. (d) 4"×4". (e) 1 to 2. (v) Nil. (vi) *Luchai×Gurmatia.* (vii) Irrigated. (viii) Two hand weedings. (ix) 61.51". (x) 11.12.1958.

2. TREATMENTS :

Same as in expt. no. 54(86) on page 34.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 33'×33'. (b) 31'×31'. (v) 1' alround. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1954—1958. (b) No. (c) Nil. (v) N.A. (vi) Heavy rains during July. (vii) Nil.

5. RESULTS :

(i) 2989 lb./ac. (ii) 168.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	Mean	P_1	P_2
N_1	2980	3088	3034	2980	3088
N_2	2873	3014	2943	2952	2935
Mean	2926	3051	2989	2966	3011
P_1	2918	3014			
P_2	2935	3088			

S.E. of any marginal mean = 42.1 lb./ac.
S.E. of body of any table = 59.6 lb./ac.

Crop :- Paddy *(Kharif)*.   Ref :- M.P. 56(112).

Site :- Govt. Res. Farm, Labhandi.   Type :- 'M'.

Object :—To study the effect of different levels and sources of N at different levels of P on the yield of Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) Refer soil analysis, Labhandi. (iii) N.A./12.7.1956. (iv) (a) Two ploughings, levelling and puddling. (b) Transplanted. (c) 60 lb./ac. (d) $6'' \times 6''$. (e) 3. (v) Nil. (vi) *Luchai* $\times$ *Gurmatia.* (vii) Irrigated. (viii) Two weedings by hand. (ix) 39.94″. (x) 1.12.1956.

2. **TREATMENTS :**

All combinations of (1), (2) and (3)+control.
    (1) 2 sources of N : $S_1 = A/C$ and $S_2 = A/S$.
    (2) 2 levels of N : $N_1 = 20$ and $N_2 = 40$ lb./ac.
    (3) 2 levels of P_2O_5 as Super : $P_0 = 0$ and $P_1 = 20$ lb./ac.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/50 ac. (v) N.A. (vi) Yes.

4. **GENERAL :**

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) N.A. (vi) Rainfall was uneven during the season. (vii) Nil.

5. **RESULTS :**

(i) 2468 lb./ac. (ii) 321.4 lb./ac. (iii) Only interaction $P \times S$ is significant. (iv) Av. yield of grain in lb./ac.

Control = 2475 lb./ac.

	P_0	P_1	Mean	S_1	S_2
N_1	2419	2394	2406	2350	2462
N_2	2606	2450	2528	2487	2569
Mean	2512	2422	2467	2418	2516
S_1	2337	2500			
S_2	2687	2344			

S.E. of any marginal mean = 80.4 lb./ac.
S.E. of body of any table = 113.6 lb./ac.
S.E. of control mean = 160.7 lb./ac.

Crop :- Paddy *(Kharif)*.   Ref :- M.P. 57(71).

Site :- Govt. Res. Farm, Labhandi.   Type :- 'M'.

Object :—To find out the effect of different levels and sources of N at different levels of P on the yield of Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) Refer soil analysis, Labhandi. (iiii) N.A./16.8.1957. (iv) (a) Two ploughings, levelling and puddling. (b) Transplanted. (c) 60 lb./ac. (d) $4'' \times 4''$. (e) 1 to 2. (v) Nil. (vi) *Luchai* $\times$ *Gurmatia.* (vii) Irrigated. (viii) One hand weeding. (ix) 36.94″. (x) N.A.

2. **TREATMENTS and 3. DESIGN :**

Same as in expt. no 56(112) above.

4. **GENERAL :**

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 2236 lb./ac. (ii) 488.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 2012 lb./ac.

	P_0	P_1	Mean	S_1	S_2
N_1	2094	2269	2181	2225	2137
N_2	2318	2375	2347	2287	2406
Mean	2206	2322	2264	2256	2272
S_1	2225	2287			
S_2	2187	2356			

S.E. of any marginal mean	= 122.2 lb./ca.
S.E. of body of any table	= 172.8 lb./ac.
S.E. Control mean	= 244.4 lb./ac.

Crop :- Paddy *(Kharif)*.

Site :- Govt. Res. Farm, Labhandi.

Ref :- M.P. 58(74).

Type :- 'M'.

Object :—To study the effect of different sources and leves of N at different levels of P on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Matasi. (b) Refer soil analysis, Labhandi. -(iii) N.A./6.8.1958. (iv) (a) 2 ploughings, levelling and pudling. (b) Transplanted. (c) 60 lb./ac. (d) 4"×4". (e) 1 to 2. (v) Nil. (vi) Luchai×Gurmatia. (vii) Irrigated. (viii) One hand weeding. (ix) 61.51". (x) 12.12.1953.

2. TREATMENTS :

Same as in expt. no. 56(112) on page 37.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 30'×30'. (b) 28'×28'. (v) 1'×1'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) (a) and (b) N.A· (vi) Heavy rains in July. (vii) Nil.

5. RESULTS :

(i) 3082 lb./ac. (ii) 290.5 lb./ac. (iii) Effect of N and interaction N×S are highly significant, effect of P is significant and other effects are not significant. (iv) Av. yield of grain in lb./ac.

Control = 2875 lb./ac.

	P_0	P_1	Mean	S_1	S_2
N_1	2854	3070	2962	2861	3063
N_2	3125	3382	3254	3459	3049
Mean	2990	3256	3108	3160	3056
S_1	2965	3354			
S_2	3014	3097			

S.E. of any marginal mean	= 72.6 lb./ac.
S.E. of body of any table	= 102.7 lb./ac.
S.F. of control mean	= 145.2 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 57(72).**

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

Object :—To find out a suitable method of applying artificial fertilizers to Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) Refer soil analysis, Labhandi. (iii) N.A./17.8.1957. (iv) (a) Two ploughings, levelling and pudding. (b) Transplanted. (c) 60 lb./ac. (d) 4"×4". (e) 1 to 2. (v) F.Y.M. at 40 lb./ac. of N. (vi) *Luchai×Gurmatia.* (vii) Irrigated. (viii) One hand weeding. (ix) 36.94". (x) N.A.

2. TREATMENTS :

4 methods of application of fertilizers : 20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super. M_0=Control (no manure), M_1=On the surface at transplanting, M_2=Mixed with soil, prepared balls and placed under the soil near the plants and M_3=Mixed with soil, prepared into a paste and paddy roots dipped in the paste just before transplanting.

Fertilizers are mixed with soil in 1 :3 ratio.

3. DESIGN :

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

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) 1954—1958. (b) No. (c) Nil. (v) Bilaspur. (vi) Nil. (vii) The expt. was not conducted during 1956.

5. RESULTS :

(i) 2044 lb./ac. (i)) 305.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1984	2024	2112	2056

S.E./mean   = 136.6 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 58(77).**

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

Object :—To find out a suitable method of applying artificial fertilizers to Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) Refer soil analysis, Raipur. (iii) N.A./11.8.1958. (iv) (a) Two ploughings by *desi* plough. (b) Transplanting. (c) 60 lb./ac. (d) 4"×4". (e) 1 to 2. (v) F.Y.M. at 40 lb./ac. of N. (vi) *Luchai×Gurmatia.* (vii) Irrigated. (viii) One hand weeding. (ix) 61.51". (x) 12.12.1958.

2. TREATMENTS :

Same as in expt. no. 57(72) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 33'×33'. (b) 31'×31'. (v) 1'×1'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1954—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Heavy rains during the month of July. (vii) Nil.

5. RESULTS :

(i) 2740 lb./ac. (ii) 286.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	2529	2683	2701	3046

S.E./mean   = 127.9 lb./a .

Crop :- Paddy *(Kharif)*.   Ref :- M.P. 59(82).

Site :- Govt. Res. Farm, Labhandi.   Type :- 'M'.

Object :—To find out a suitable manurial schedule for Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) G.M. (ii) (a) *Kanhar*. (b) Refer soil analysis, Labhandi. (iii) N.A. (iv) (a) Two ploughings by *desi* plough. (b) Seedlings transplanted. (c) 40 lb./ac. (d) $6'' \times 6''$ (e) 2. (v) Nil. (vi) Cross no. 18. (vii) Irrigated. (viii) One weeding by hand. (ix) 43.17.' (x) 16.12.1959.

2. TREATMENTS :

All combinations of (1) anb (2).
(1) 4 levels of N as A/S : $N_0=0$, $N_1=7\frac{1}{2}$, $N_2=15$ and $N_3=22\frac{1}{2}$ lb./ac.
(2) 2 levels of P_2O_5 as Super : $P_0=0$, and $P_1=15$ lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) $16' \times 35'$. (b) $14' \times 33'$. (v) $1' \times 1'$. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain and straw. (iv) (a) 1959—1962. (b) No. (c) Nil. (v) Durg. (vi) Nil. (vii) The expt. is conducted on three different soils on the farm ; *Kanhar, Matasi* and *Dorsa*.

5. RESULTS :

(i) 2559 lb./ac. (ii) 249.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	2333	2498	2758	2577	2542
P_1	2671	2530	2506	2601	2577
Mean	2502	2514	2632	2588	2559

S.E. of P marginal mean   =   50.9 lb./ac.
S.E. of N marginal mean   =   72.0 lb./ac.
S.E. of body of table   =   101.7 lb./ac.

Crop :- Paddy *(Kharif)*.   Ref :- M.P. 59(81).

Site :- Govt. Res. Farm, Labhandi.   Type :- 'M'.

Object :—To find out a suitable manurial schedule for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) G.M. (ii) (a) *Dorsa*. (b) Refer soil analysis, Labhandi (iii) N.A. (iv) (a) Two ploughings by *desi* plough. (b) Transplanting. (c) 40 lb./ac. (d) $6'' \times 6''$. (e) 2. (v) Nil. (vi) Cross no. 18. (vii) Irrigated. (viii) One weeding by hand. (ix) 43.17' (x) 16.12.1959.

r t . \ TMENTS to 4. GENERAL :

Same as in expt. no. 59(82) on page 40.

5. RESULTS :

(i) 2283 lb./ac. (ii) 374.4 lb./ac. (iii) Only main effect of N is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	1862	2176	2648	2381	2267
P_1	2129	2365	2420	2278	2298
Mean	1996	2271	2534	2330	2283

S.E. of N marginal mean   = 108.1 lb./ac.
S.E. of P marginal mean   = 76.4 lb./ac.
S.E. of body of table   = 152.8 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 59(180).**

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

Object :—To find out a suitable manurial schedule for Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Green manuring. (ii) (a) *Matasi.* (b) Refer soil analysis, Labhandi. (iii) N.A. (iv) (a) Two ploughings by *desi* plough. (b) Transplanted. (c) 40 lb./ac. (d) 6″×6″. (e) 2. (v) Nil. (vi) Cross—18. (vii) Irrigated. (viii) One weeding by hand and rouging. (ix) 43.17″, (x) 16.12.1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(82) on page 40.

5. RESULTS :

(i) 1977 lb./ac. (ii) 383.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	1846	1878	2271	1948	1986
P_1	1846	2082	1917	2027	1968
Mean	1846	1980	2094	1988	1977

S.E. of N marginal mean   = 110.6 lb./ac.
S.E. of P marginal mean   = 78.2 lb./ac.
S.E. of body of table   = 156.4 lb.ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 59(79).**

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

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) *Matasi.* (b) Refer soil analysis. Labhandi. (iii) N.A./12.7.1959. (iv) (a) 2 ploughings by *desi* plough. (b) Transplanted. (c) 80 lb./ac. (d) and (e) N.A. (v) Nil. (vi) X—116. (vii) Irrigated. (viii) Weeding by hand and *Biassi* operation. (ix) 43.17″. (x) 26.11.1959.

2. TREATMENTS :

Main-plot treatments :
4 G.M. treatments : T_0=Control T_1=G.L. at 2 tons/ac. before sowing, T_2=Sann hemp seed at 20 lb./ac. sown mixed with Paddy and T_3=*Dhaincha* seed at 10 lb./ac. sown mixed with Paddy.

Sub-plot treatments

2 levels of N as A/S : $N_0 = 0$ and $N_1 = 5$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block, 2 sub-plots/main-plot. (b) N.A. (iii) 8. (iv) (a) 14'×28'. (b) 12'×27' (v) 1'×½'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1959—1962. (b) No. (c) Nil. (v) N.A, (vi) and (vii) Nil.

5. RESULTS :

(i) 2067 lb./ac. (ii) (a) 372.0 lb./ac. (b) 63.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb ac.

	T_0	T_1	T_2	T_3	Mean
N_0	2239	2054	1976	1943	2053
N_1	2264	2063	2016	1981	2081
Mean	2252	2058	1996	1962	2067

S.E. of difference of two

1. T marginal means — 131.5 lb./ac.
2. N marginal means — 15.9 lb./ac.
3. N means at the same level of T = 31.7 lb./ac.
4. T means at the same level of N — 133.4 lb./ac.

————

Crop :- Paddy.

Site :- State Mechanised Farm, Reora.

Ref :- M.P. 55(7).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Paddy—Gram. (b) Gram. (c) Nil. (ii) (a) Mixed red and black soil. (b) N.A. (iii) N.A./ 15.8.1955. (iv) (a) 2 ploughings. (b) Transplanting. (c) N.A. (d) 10" between rows. (e) N.A. (v) 20 lb./ac. of P_2O_5 as Triple Super broadcasted. (vi) T—136 (early). (vii) Unirrigated. (viii) 1 weeding. (ix) 20.50". (x) 29 and 30.10.1955.

2. TREATMENTS :

All combinations of (1) and (2)+a control.
(1) 3 sources of N : S_1=A/S, S_2=A/N and S_3=Nitro chalk.
(2) 3 levels of N : N_1=20, N_2=40 and N_3=60 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 40'×24'. (b) 36'×20'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Mild attack of bug. (iii) Biometric observations and yield of grain. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1065 lb./ac. (ii) 337.0 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

Control = 751 lb./ac.

	N₁	N₂	N₃	Mean
S₁	1019	1141	1387	1182
S₂	852	1100	1137	1030
S₃	1016	1115	1129	1087
Mean	962	1119	1218	1100

S.E. of any marginal mean = 112.3 lb./ac.
S.E. of body of table or control mean = 194.6 lb./ac.

———

Crop :- Paddy.   Ref :- M.P. 54(5)

Site :- State Mechanised Farm, Roora.   Type :- 'M'.

Object :—To study the effect of N obtained from two sources applied at different times on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Gram. (b) Gram. (c) Nil. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 16.8.1954. (iv) (a) N.A. (b) Transplanting. (c)—. (d) 10″×10″. (e) N.A. (v) Triple Super at 20 lb./ac. of P_2O_5 applied before transplanting. (vi) T—43 (medium-late). (vii) Unirrigated. (viii) 2 weedings. (ix) 23.20″. (x) 10.10.1954.

2. TREATMENTS :

All combinations of (1) and (2)+a control.
   (1) 2 sources of N : S₁=A/S and S₂=Urea.
   (2) 7 times of application of N : T₁=30 lb./ac. of N before planting, T₂=30 lb./ac. of N at planting, T₃=30 lb./ac. of N at tillering, T₄=15 lb./ac. of N before planting+ 15 lb./ac. of N at tillering, T₅=15 lb./ac. of N at planting+15 lb./ac. of N at tillering, T₆=10 lb./ac. of N before planting+10 lb./ac. of N at tillering+10 lb./ac. of N a week before flowering and T₇=10 lb./ac. of N at planting+10 lb./ac. of N at tillering+10 lb./ac. of N a week before flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 40′×24′. (b) 36′×20′. (v) 2′×2′. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Slight attack of gundhi bug. Hexidol 5% used at 8 lb./ac. to check the pest. (iii) Biometric observations and yield of grain. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Yield for treatment S₂T₆ in one replication was missing. Data analysed by missing-plot technique.

5. RESULTS :

(i) 986 lb./ac. (ii) 284.9 lb./ac. (iii) Main effect of S and 'control vs. others' are significant. (iv) Av. yield of grain in lb./ac.

Control = 592.0 lb./ac.

	T₁	T₂	T₃	T₄	T₅	T₆	T₇	Mean
S₁	1213	840	950	1666	1222	1041	933	1123
S₂	928	797	794	1059	829	1063	892	906
Mean	1070	818	872	1362	1025	1052	902	1014

S.E. of difference two S marginal means = 89.0 lb./ac.
S.E. of T marginal mean, excluding T₆ = 116.3 lb./ac.
S.E./T₆ mean = 127.4 lb./ac.
S.E. of body of table (excluding S₂T₆) or control mean = 164.5 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 55(3).**

Site :- State Mechanised Farm, Reora.   **Type :- 'M'.**

Object :—To study the effect of N obtained from two sources applied at different times on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Gram. (b) Gram. (c) Nil. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 10, 11.8.1955. (iv) (a) 3 ploughings. (b) Transplanting. (c)—. (d) $10'' \times 0''$. (e) N.A. (v) 20 lb./ac. of P_2O_5 applied before transplanting as Super. (vi) T—43 (medium-late). (vii) Unirrigated. (viii) 1 weeding. (ix) 20.50''. (x) 12, 13.10.1955.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(5) on page 43.

4. GENERAL :

(i) Good. No lodging. (ii) No. (iii) Tillering, height no. of earheads per plant and yield of grain. (iv) 1954—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Plots with treatments S_1T_4 and S_1T_6 were situated at low level as such water could not be let out and due to continuous stay of water yield was poor in these plots. These plots were treated as missing and data was analysed with the help of missing-plot technique.

5. RESULTS :

(i) 754 lb./ac. (ii) 190.0 lb /ac. (iii) Main effect T of and 'control vs. others' are significant. (iv) Av. yield of grain in lb /ac.

Control = 503 lb./ac.

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
S_1	563	890	981	855	759	811	719	797
S_2	691	955	658	830	824	779	487	746
Mean	627	923	819	842	791	795	603	772

S.E. of difference of S marginal means   = 60.2 lb/ac.
S.E. of T marginal mean excluding T_4 and T_6 = 77.6 lb./ac.
S.E. of T_4 or T_6 marginal mean   = 85.0 lb./ac.
S.E. of body of table excluding S_1T_4 and S_1T_6 or control mean = 109.7 lb./ac.
S.E. of S_1T_4 or S_1T_6 mean   = 154.9 lb./ac.

Crop :- Paddy.   **Ref :- M.P. 56(1).**

Site :- State Mechanised Farm, Reora.   **Type :- 'M'.**

Object :—To study the effect of N obtained from two sources applied at different times on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Birra* (wheat+gram). (c) Nil. (ii) (a) Mixed red and black soil. (b) N.A. (iii) N.A./12.8.1956. (iv) (a) 2 ploughings. (b) Transplanting. (c) to (e) N.A. (v) 20 lb./ac. of P_2O_5 as Triple Super before planting, (vi) T—43 (medium-late). (vii) Unirrigated. (viii) 1 weeding. (ix) 30.66''. (x) 6, 7.11.1956.

2. TREATMENTS :

Same as in expt. no. 54(5) on page 43..

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) $33' \times 16\frac{1}{2}'$. (b) $31' \times 14\frac{1}{2}'$. (v) $1' \times 1'$. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Gundhi bug attack—5% Hexidol was used at 5 lb./ac. as a control measure. (iii) Yield of grain (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1211 lb./ac. (ii) 239.4 lb./ac. (iii) Main effects of T, S and control *vs.* others are significant. (iv) Av. yield of grain in lb./ac.

Control = 906 lb./ac.

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
S_1	1244	1229	1526	1149	1173	1159	1155	1234
S_2	1153	1278	1578	1276	1415	804	1122	1232
Mean	1198	1254	1552	1212	1294	982	1138	1233

S.E. of S marginal mean = 52.2 lb./ac.
S.E. of T marginal mean = 97.9 lb./ac.
S.E. of body of table or control mean = 138.2 lb./ac.

Crop :- Paddy.

Site :- State Mechanised Farm, Reora.

Ref :- M.P. 54(8).

Type :- 'M'.

Object :—To study the different doses of N, P and F.Y.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Medium black soil. (b) N.A. (iii) 7.9.1955. (iv) (a) and (b) Discing twice and ploughing once by *desi* plough were given. Paddy sown by tope method and then one more plough was given. (c) to (e) N.A. (v) Nil. (vi) N 22 (early). (vii) Unirrigated. (viii) Two weedings (one in the end of July and the next in the second week of August). (ix) 33.50". (x) 12.10.1955.

2. TREATMENTS:

All combinations of (1), (2), and (3)
3 levels of N as $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
3 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.
3 levels of F.Y.M. : $F_0=0$, $F_1=5$ and $F_2=10$ C.L./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 40'×27'. (b) 36'×23'. (v) 2' all round. (vi) Yes.

4. GENERAL :

(i) Normal with no lodging. (ii) Slight attack of guarding. No control measures were taken. (iii) Plant population, height, tillers per plant and effective tillers plant. (iv) (a) 1954 to 1955. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 891 lb./ac. (ii) 259.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	F_0	F_1	F_2
P_0	763	767	777	769	696	666	945
P_1	846	1034	1062	981	1027	956	959
P_2	902	1035	834	924	645	873	954
Mean	837	945	891	891	889	832	953
F_0	786	971	911				
F_1	762	851	882				
F_2	963	1014	880				

S E. of any marginal mean = 86.6 lb./ac.
S.E. of body of table = 150.1 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 59(146).**

Site :- State Mechanised Farm, Reora.   **Type :- 'M'.**

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

1. **BASAL CONDITIONS :**

   (i) (a) Paddy-Gram. (b) Gram. (c) N.A. (ii) (a) Black soil. (b) N.A. (iii) 27.7.1959. (iv) (a) Two ploughings. (b) Broadcasting. (c) 70 lb./ac. (d) 8" between rows. (e) —. (v) Nil. ¦(vi) N—22. (vii) Unirrigated, (viii) 55.2". (ix) 2 weedings. (x) 25.10.1959.

2. **TREATMENTS :**

   Same as in expt. no. 59(82) on page 40.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 35'×16'. (b) 32'×12'. (v) 1½'×2'. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) Nil. (iii) Grain. (iv) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 875 lb./ac. (ii) 154.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	865	785	837	874	840
P_1	860	912	926	945	911
Mean	862	848	881	909	875

S.E. of N marginal mean   = 44.5 lb./ac.
S.E. of P marginal mean   = 31.5 lb./ac.
S.E. of body of table   = 62.9 lb /ac.

Crop :- Paddy.   **Ref :- M.P. 54(17).**

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

Object :—To study the comparative effects of C/N and A/S with and without lime on Paddy.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 16.6.1954/15,16.7.1954. (iv) (a) 3 ploughings. (b) Transplanting. (c) 30 lb./ac. (d) 4"×5". (e) 2. (v) Nil. (vi) Luchai. (vii) Irrigated. (viii) 2 hand weedings. (ix) 45.18". (x) 1 and 2.12.1954.

2. **TREATMENTS :**

   All combinations of (1), (2) and (3)+2 extra treatments

   (1) 2 sources of N : S_1=A/S and S_2=Sodium Nitrate.
   (2) 2 levels of N : N_1=40 and N_2=60 lb./ac.
   (3) 2 levels of lime : L_0=0 and L_1=300 lb./ac.

   Extra treatments : T_0=Control and T_1=300 lb./ac. of lime.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 10. (b) Nil. (iii) 6. (iv) (a) 72'×22½'. (b) 66'×16½'. (v) 3'×3'. (vi) Yes.

4. **GENERAL :**

   (i) Satisfactory. (ii) Nil. (iii) Height, population count, yield of grain and straw. (iv) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 3460 lb./ac. (ii) 779.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

T_0 = 2875 lb./ac., T_1 = 3715 lb./ac.

	S_1	S_2	Mean	L_0	L_1
N_1	3435	3439	3437	3275	3599
N_2	3319	3812	3566	3416	3715
Mean	3377	3626	3501	3345	3657
L_0	3219	3472			
L_1	3535	3779			

S.E. of any marginal mean	=	159.1 lb./ac.
S.E. of body of any table	=	224.9 lb./ac.
S.E./T mean	=	318.2 lb./ac.

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Crop :- Paddy.　　　　　　　　　　　　　**Ref :- M.P. 55(28).**

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

Object :—To study the comparative effects of C/S and A/S with and without lime on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) *Matasi*. Sandy loam. (b) N.A. (iii) N.A./14.7.1955. (iv) (a) 4 ploughings. (b) Transplanting. (c) 40 lb./ac. (d) 3″ to 4″. between plants. (e) N.A. (v) Nil. (vi) *Luchai* × *Gurmatia* × *Burma* (late). (vii) Unirrigated. (viii) 2 hand weedings. (ix) 54.24″. (x) 18.12.1955.

2. TREATMENTS and 3. DESIGN:

Same as in expt. no. 54 (17) on page 46.

4. GENERAL :

(i) Crop lodged on 25.10.1955 due to strong winds. (iii) Nil. (iii) Plant height, yield of grain and straw. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1800 lb./ac. (ii) 364.5 lb./ac. (iii) Main effects of N and L and interaction N×S are significant. (iv) Av. yield of grain in lb /ac.

T_0 = 2048 lb./ac., T_1 = 2068 lb./ac.

	S_1	S_2	Mean	L_0	L_1
N_1	1514	1738	1626	1501	1751
N_2	1988	1701	1845	1744	1945
Mean	1751	1719	1735	1622	1848
L_0	1627	1617			
L_1	1875	1821			

S E. of any marginal mean	=	74.4 lb./ac.
S.E. of body of table	=	105.2 lb./ac.
S.E./T mean	=	148.8 lb./ac.

———

Crop :- Paddy.   **Ref :- M.P. 56(37).**

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

Object :—To study the comparative effects of C/N and A/S with and without lime on Paddy.

1. **BASAL CONDITIONS :**

   (i) (a) Nil (b) Paddy. (c) Nil. (ii) (a) *Matasi* (sandy loam). (b) N.A. (iii) N.A./14.8 1956. (iv) (a) Ploughing, cross ploughing and levelling. (b) Transplaning. (c) N.A. (d) $4'' \times 4''$. (e) N.A. (v) Nil. (vi) *Luchai* $\times$ *Gurmatia* $\times$ *Burma* (late). (vii) ¡Irrigated. (viii) 1 weeding. (ix) $62.32''$. (x) 26 11.1956.

2. **TREATMENTS :**

   Same as in expt. no. 54 (17) on page 46.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) $16\frac{1}{2}' \times 33'$. (v) Nil. (vi) Yes.

4. **GENERAL :**

   (i) N.A. (ii Attack of *Mapo* Light trap was used to control it. (iii) Yield of grain and straw. (iv, (a) 1954 —contd. (b, and (c) No. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 1137 lb./ac. (ii) 22.6 lb./ac. (iii) Main effects L, N and S and interaction $L \times S$ and $L \times N$ are highly significant. (iv) Av. yield of grain in lb./ac.

$$T_0 = 1066 \text{ lb./ab.,} \quad T_1 = 1040 \text{ lb./ac.}$$

	S_1	S_2	Mean	L_0	L_1
N_1	1123	1163	1143	1086	1200
N_2	1160	1187	1173	1157	1190
Mean	1142	1175	1158	1122	1195
L_0	1083	1160			
L_1	1200	1190			

S.E. of any marginal mean. = 4.6 lb./ac.
S.E. of body of any table   = 6.5 lb./ac.
S.E /T mean   = 9.2 lb./ac.

———

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 58(81).**

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

Object :—To study the comparative effects of C/N and A/S with and without lime on Paddy.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Sandy loam *(Dorsa)*. (b) N.A. (iii) N.A./6.8.1958. (iv) (a) 4 ploughings and levelling. (b) Transplanting. (c) 60 lb./ac. (d) $4'' \times 4''$. (e) 1—2. (v) F.Y.M. at 16 C.L./ac. broadcasted after 2nd ploughing. (vi) *Chhatri*. (vii) Irrigated. (viii) 1 hand weeding. (ix) $48.12''$. (x) 5.11.1958.

2. **TREATMENTS :**

   Same as in expt. no. 54 (17) on page 46.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) N.A. (b) $66' \times 8\frac{1}{4}'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Height, tiller count, yield of grain and straw. (iv) (a) 1954—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1780 lb./ac. (ii) 344.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

$$T_0 = 1760 \text{ lb./ac.} ; T_1 = 1760 \text{ lb./ac.}$$

	S_1	S_2	Mean	L_0	L_1
N_1	1653	1973	1813	2000	1627
N_2	1653	1840	1747	1867	1627
Mean	1653	1907	1780	1933	1627
L_0	1760	2107			
L_1	1547	1707			

S.E. of any marginal mean   = 99.5 lb./ac.
S.E. of body of any table   = 140.7 lb./ac.

Crop :- Paddy.   **Ref :- M.P. 54(41).**

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

Object :—To study the comparative effects of C/N and A/S with and without lime on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane ratoon. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 23.6.1954./24.9.1954. (iv) (a) 2 ploughings 2 *clatari* and one *koper*. (b) Transplanting. (c) 30 lb./ac. (d) 3" to 5" between rows. (e) 1. (a) Nil. (vi) *Gurmatia* (medium) (vii) Irrigated. (viiii) 2 hand weedings. (ix) 45.18". (x) 10.11.1954.

2. TREATMENTS :

All combinations of (1), (2) and (3)+2 extra treatments :
    (1) 2 sources of N : S_1=A/S and S_2= Sodium Nitrate :
    (2) 2 levels of N : N_1=20 and N_2=40 lb./ac.
    (3) 2 levels of lime : L_0=0 and L_1=200 lb./ac.
    Extra treatments : T_0=Control and T_1=200 lb./ac. of lime.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 72'×22½'. (b) 66'×16½'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 2919 lb./ac. (ii) 758.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

$$T_0=3415 \text{ lb./ac., } T_1=3408 \text{ lb./ac.}$$

	S_1	S_2	Mean	L_0	L_1
N_1	2735	2851	2793	2598	2988
N_2	2831	2765	2798	2915	2681
Mean	2783	2808	2796	2757	2835
L_0	2888	2625			
L_1	2678	2991			

| S.E. of any marginal mean | = 154.9 lb./ac. |
| S.E. of body of any table | = 219.0 lb./ac. |

Crop :- Paddy. **Ref :- M.P. 54(18).**

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

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 24 6.1954./26.7.1954. (iv) (a) 3 ploughings, 2 *clatari* and 1 *koper.* (b) Transplanting. (c) 30 lb./ac. (d) 4" to 5" between plants. (e) 2. (v) Nil. (vi) *Luchai*×*Gurmatia.* (late). (vii) Irrigated. (viii) 2 hand weedings. (ix) 45.18". (x) 9.12.1954.

2. TREATMENTS :

4 methods of application of manures : B_0=Control, B_1=M applied at transplanting, B_2= M mixed with earth and applied as balls and B_3=Roots dipped in solution of M before transplanting.

M=20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 66'×16½'. (b) 60'×10¼'. (v) 3'×3'. (vi Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1954—contd. (b) No. c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Expt. failed in 1957.

5. RESULTS :

(i) 5999 lb./ac. (ii) 699.0 lb./ac. (iii) Treatment differences are not significant. (iv) A.. yield of grain in lb./ac.

Treatment	B_0	B_1	B_2	B_3
Av. yield	5822	6306	6002	5864

S.E./mean = 312.6 lb./ac.

Crop :- Paddy. **Ref :- M.P. 55(27).**

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

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Sandy 'oam. (b) N.A. (iii) N.A./12.7.1955. (iv) 'a) 4 ploughings. (b) Transplanting. (c) N.A. (d) 4" between plants. (e) N.A. (v) Nil. (vi) *Luchai*×*Gurmu'ia* (late). (vii) Unirrigated. (viii) 2 hand weedings. (ix) 54.24". (x) 18.12.1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(18) above.

5. RESULTS :

(i) 1825 lb./ac. (ii) 531.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	B_0	B_1	B_2	B_3
Av. yield	1770	1646	2060	1825

S.E./mean = 237.5 lb./ac.

Crop :- Paddy.   **Ref :- M.P. 56(36).**

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

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

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) N.A./14.8.1956. (iv) (a) Ploughing, cross ploughing and levelling. (b) Transplanting. (c) N.A. (d) $4'' \times 4''$. (e) N.A. (v) Nil. (vi) *Luchai* × *Gurmatia* × *Burma* (late). (vii) Irrigated. (viii) 1 weeding. (ix) 62.32". (x) 26.11.1956.

2. **TREATMENTS :**

Same as in expt. no. 54(18) on page 50.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) $16\frac{1}{2}' \times 33'$. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) N.A. (ii) 12% damage caused by *malo* and *efairgai*. (iii) Yield of grain and straw. (iv) (a) 1956— contd. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. failed in 1957.

5. **RESULTS :**

(i) 1128 lb./ac. (ii) 53.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	B_0	B_1	B_2	B_3
Av. yield	1088	1144	1176	1104

S.E./mean = 24.0 lb./ac.

———

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 58(80).**

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

Object :—To find out the best method of applying fertilisers to Paddy crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) *Kanhar*. (b) N.A. (iii) 31.7.1958. (iv) (a) 4 ploughings, levelling by *dhatari* and *kopper*. (b) Transplanting. (c) 60 lb./ac. (d) $4'' \times 4''$. (e) 1 to 2. (v) 16 C.L./ac. of F.Y.M. broadcasted and ploughed. (vi) *Luchai* × *Gurmatia*. (vii) Irrigated. (viii) 1 hand weeding. (ix) 48.12". (x) N.A.

2. **TREATMENTS :**

Same as in expt. no. 54(18) on page 50.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) $11' \times 49\frac{1}{2}'$. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1954—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

(i) 2080 lb./ac. (ii) 415.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	B_0	B_1	B_2	B_3
Av. yield	2420	2120	2120	1660

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

———

Crop :- Paddy.   **Ref :- M.P. 54(19).**

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

Object :—To find out the effect of deep placement of fertilizers on Paddy.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 22.7.1954. (iv) (a) 3 ploughings followed by 2 *clatari* and 1 *koper.* (b) Transplanted. (c) 30 lb./ac. (d) N A. (e) 3. (v) Nil. (vi) *Luchai*×*Gurmatia* (late). (vii) Irrigated. (viii) 2 hand weedings. (ix) 45.18". (x) 9.12.1954.

2. **TREATMENTS :**

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

   (1) 2 levels of N as A/S : $N_1=20$ and $N_2=40$ lb./ac.
   (2) 2 levels of P_2O_5 as Super : $P_1=20$ and $P_2=40$ lb./ac.
   (3) 2 methods of applying of N and P : $D_1=$On surface and $D_2=3"$ deep.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 66'×16½'. (b) 60'×10½'. (v) 3'×3'. (vi) Yes.

4. **GENERAL :**

   (i) Satisfactory. (ii) Nil. (iii) Yield of grain and straw and plant height. (iv) (a) 1954—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 2930 lb./ac. (ii) 829 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_1	N_2	Mean	D_1	D_2
P_1	3008	3008	3008	2925	3091
P_2	2779	2924	2852	2690	3014
Mean	2894	2966	2930	2808	3052
D_1	2696	2918			
D_2	3091	3014			

   S.E. of any marginal mean   = 185.4 lb./ac.
   S.E. of body of any table   = 262.2 lb./ac.

Crop :- Paddy.   **Ref :- M.P. 55(29).**

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

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

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) N.A./11.7.1955. (iv) (a) Ploughing, cross ploughing and levelling. (b) Transplanting. (c) N.A. (d) 3"×3". (e) N.A. (v) Nil. (vi) *Luchai*×*Gurmatia* (late). (vii) Irrigated. (iii) 2 hand weedings and gap-filling. (ix) 54.24". (x) 15.12.1955.

2. **TREATMENTS and** 3. **DESIGN :**

   Same as in expt. no 54(19) above.

4. **GENERAL :**

   (i) Lodged. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1954—1958. (b) No. (c) Nil. (v) (a) Labhandi. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 2554 lb./ac. (ii) 606.0 lb./ac. (iii) Only the main effect of D is significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	2767	2374	2570	2588	2553
N_2	2311	2767	2539	2353	2725
Mean	2539	2570	2554	2470	2639
D_1	2546	2394			
D_2	2532	2746			

S.E. of any marginal mean   =   135.5 lb./ac.
S.E. of body of any table   =   191.6 lb./ac.

Crop :- Paddy.   **Ref :- M.P. 56(38).**

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

Object :—To find out the effect of deep placement of fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) N.A./12.8.1956. (iv) (a) Ploughing, cross ploughing and levelling. (b) Transplanting. (c) N.A. (d) 4″×4″. (e) N.A. (v) 40 lb./ac. of N as F.Y.M. applied before sowing. (vi) *Luchai×Gurmatia.* (vii) Irrigated. (viii) 1 weeding. (ix) 62.32″. (x) 26.11.1956.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(19) on page 52.

4. GENERAL :

(i) Poor. (ii) Attack of *maho, banki* and *efangia.* Light trap kept as control measure. (iii) Yield of grain and straw. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 684 lb./ac. (ii) 115.9 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	710	708	709	704	714
N_2	656	660	658	694	622
Mean	683	684	684	699	668
D_1	714	684			
D_2	652	684			

S.E. of any marginal mean   =   25.9 lb./ac.
S.E. of body of any table   =   36.6 lb./ac.

Crop :- Paddy.   **Ref :- M.P. 57(19).**

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

Object :—To find the effect of deep placement of fertilizers on Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) N.A./29.7.1957. (iv) (a) Ploughing and cross ploughing. (b) Transplanting. (c) N.A. (d) 4″×4″. (e) N.A. (v) Nil. (vi) *Luchai×Gurmatia* (late). (vii) Irrigated. (viii) 1 weeding. (ix) 42.93″. (x) 29.11.1957.

2. **TREATMENTS :**

Same as in expt. no. 54 (19) on page 52.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 8. (b) Nil. (iii) 4. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

5. **GENERAL :**

(i) and (ii) N.A. (iii) Yield of grain and straw. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Labhandi. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 1333 lb./ac. (ii) 151.1 lb./ac. (iii) Main effect of D is highly significant. Main effect of N and interaction N×D are significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	1255	1255	1255	1245	1265
N_2	1360	1450	1405	1260	1550
Mean	1308	1352	1330	1252	1407
D_1	1275	1230			
D_2	1340	1475			

S.E. of any marginal mean = 37.8 lb./ac.
S.E. of body of any table = 53.4 lb./ac.

Crop :- Paddy *((Kharif).*

Site :- Govt. Agri. Res. Farm, Sarkhanda.

Ref :- M.P. 58(79).

Type :- 'M'.

Object:—To find out the effect of deep placement of fertilizers on Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) 10 lb./ac. of N as A/S. (ii) (a) Sandy loam. (b) N.A. (iii) 6.8.1958. (iv) (a) 2 summer ploughings ; 4 ploughings followed by levelling by *Dhatari* and *kopper*. (b) Transplanted. (c) 60. lb./ac. (d) 4″×4″. (e) 1 to 2. (v) Nil. (vi) *Chhatri*. (vii) Irrigated. (viii) 1 hand weeding. (ix) 48.12″. (x) 6.11.1958.

2. **TREATMENTS :**

Same as in expt. no. 54 (19) on page 52.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1954−1958. (b) No. (c) Nil. (v) (a) Durg and Labhandi. (b) Nil. (vi) Nil. (vii) N.A.

5. **RESULTS :**

(i) 1527 lb./ac. (ii) 389.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	1450	1780	1615	1710	1520
N_2	1480	1400	1440	1360	1520
Mean	1465	1590	1527	1535	1520
D_1	1480	1590			
D_2	1450	1590			

S.E. of any marginal mean   = 97.2 lb./ac.
S.E. of body of any table   = 137.5 lb./ac.

———

Crop :- Paddy.   **Ref :- M.P. 56(35).**

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

Object :—To compare the effects of A/C and A/S on Paddy.

1. BASAL CONDITIONS :

  (i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) N.A./12.8.1956. (iv) (a) Ploughing, cross ploughing and levelling. (b) Transplanting. (c) N.A. (d) 4″×4″. (e) N.A. (v) Nil. (vi) *Luchai*×*Gurmatia* (late). (vii) Irrigated. (viii) 1 weeding. (ix) 62.32″. (x) 26.11.1956.

2. TREATMENTS :

  All combinations of (1), (2) and (3)+a control
      (1) 2 sources of N : S_1=A/C and S_2=A/S.
      (2) 2 levels of N : N_1=20 and N_2=40 lb./ac.
      (3) 2 levels of P_2O_5 : P_0=0 and P_1=20 lb./ac. of P_2O_5 as Super.

3. DESIGN :

  (i) R.B.D. (ii) (a) 9. (b) Nil. (iii) 4. (iv) (a) and (b) 66′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

  (i) Crop lodged. (ii) Crop damaged by *Maho* and *efungai*. (iii) Yield of grain of straw. (iv) (a) 1956 — contd. (b) and (c) No. (v) (a) and (b) Nil. (vi) Late rains and strong winds. (vi) Nil.

5. RESULTS:

  (i) 1324 lb./ac. (ii) 114.0 lb./ac. (iii) Main effect of control *vs.* others and interection S×N are highly significant. (iv) Av. yield of grain in lb./ac.

Control=1170.

	N_1	N_2	Mean	P_0	P_1
S_1	1385	1300	1342	1345	1340
S_2	1245	1445	1345	1295	1395
Mean	1315	1373	1344	1320	1368
P_0	1315	1325			
P_1	1315	1420			

S.E. of any marginal mean   = 28.5 lb./ac.
S.E. of body of any table   = 40.3 lb./ac.

———

Crop :- Paddy.   **Ref :- M.P. 57(18).**

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

Object :—To compare the effects of A/C and A/S on Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 29, 30.7.1957. (iv) (a) Ploughing and cross ploughing. (b) Transplanting. (c) N.A. (d) 4"×4". (e) N.A. (v) Nil. (vi) *Luchai*× *Gurmatia* (late). (vii) Irrigated. (viii) 1 weeding. (ix) 42.93". (x) 29.11.1957.

2. **TREATMENTS and 3. DESIGN :**

Same as in expt. no. 56 (35) on page 55.

4. **GENERAL :**

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

5. **RESULTS :**

(i) 1341 lb./ac. (ii) 100.4 lb./ac. (iii) Main effect of P and interaction S×N are highly significant. Control *vs* others and interaction N×P are significant. (iv) Av. yield of grain in lb./ac.

Control=1210

	N_1	N_2	Mean	P_0	P_1
S_1	1425	1270	1348	1330	1365
S_2	1255	1480	1368	1280	1455
Mean	1340	1375	1358	1305	1410
P_0	1330	1280			
P_1	1350	1470			

S.E. of any marginal mean	=	25.1 lb /ac.
S.E. of body of any table	=	35.5 lb./ac.
S.E. of control mean	=	50.2 lb./ac.

Crop :- Paddy (*Kharif.*).

Ref :- M.P 58(82).

Site :- Govt. Agri. Res. Farm, Sarkhanda.

Type :- 'M'.

Object :—To compare the effects of A/C and A/S on Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) 10 lb./ac. of N as A/S. (ii) (a) Sandy loam. (b) N.A. (iii) N.A./7.8.1958. (iv) (a) 6 ploughings and levelling. (b) Transplanting. (c) 60 lb./ac. (d) 9"×9". (e) 3 to 4. (v) Nil. (vi) *Sultoo Gurmatia.* (vii) Irrigated. (viii) 1 hand weeding. (ix) 48 12". (x) 4.11.1958.

2. **TREATMENTS :**

Same as in expt. no. 56 (35) on page 55.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 66'×13'. (v) N A. (vi) Yes.

4. **GENERAL :**

(i) Good. (ii) Nil. (iii) Heigh', tiller count, yield of grain and straw. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) (a) Labhandi. (b) Nil. (vi` and (vii) Nil.

5. **RESULTS :**

(i) 1716 lb./ac (ii) 274 2 lb./ac. (iii) Main effects of N and P and interaction N×P×S are significant. (iv) Av. y.eld of grain in lb /ac.

Control = 1777 lb./ac.

	N_1	N_2	Mean	P_0	P_1
S_1	1840	1574	1707	1599	1815
S_2	1828	1593	1710	1580	1840
Mean	1834	1583	1709	1590	1828
P_0	1653	1517			
P_1	2005	1650			

S.E. of any marginal mean = 68.5 lb./ac.

S.E. of body of any table = 96.9 lb./ac.

S.E. of control mean = 137.0 lb./ac.

Crop :- Paddy. **Ref :- M.P. 54(14).**

Site :- Govt. Expt. Farm, Vidisha. **Type :- 'M'.**

Object :—To study the effect of micro-nutrients on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Heavy clay. (b) N.A. (iii) 12.7.1954/N.A. (iv) (a) N.A. (b) Seeds drilled. (c) 20 lb./ac. (d) 12" between rows. (e) N.A. (v) 10 C.L./ac. of T.C. (vi) *Bhilsa of Ujjain Desi.* (vii) Unirrigated. (viii) Hand weeding and interculturing with hoe. (ix) and (x) N.A.

2. TREATMENTS :

3 levels each of Borax and $CuSO_4$ + a control : T_0 = Control, T_1 = 8, T_2 = 16 and T_3 = 32 ozs./ac. of Borax, T_4 = 4, T_5 = 8 and T_6 = 16 ozs./ac. of $CuSO_4$.

Treatments applied on 6.7.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 20' × 6'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS:

(i) 1967 lb./ac. (ii) 315.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb /ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	2036	1912	1958	1991	1845	2076	1952

S.E/mean = 157.5 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- M.P. 54(90).**

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

Object :—To study the effect of different methods of applying N and P fertilisers on Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Waraseoni. (iii) N.A./ 15.7.1954. (iv) 2 ploughings. (b) Transplanting. (c) to (e) N.A. (v) 40 lb./ac. of N as F.Y.M. (vi) *Luchai* × *Badhia Baku* (late). (vii) Irrigated. (viii) N.A. (ix) 34.42" (x) N.A.

2. TREATMENTS :

Same as in expt. no. 54(18) on page 50.

3. DESIGN :

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

4. GENERAL :

(i) Satisfactory. Patchy growth in treatments B_3. (ii) N.A. (iii) Av. height, no of tillers and yield of grain and straw. (iv) (a) 1954. (b) N.A. (c) Nil. (v) (a) Labhandi and Durg.· (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2612 lb./ac. (ii) 223.7 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	B_0	B_1	B_2	B_3
Av. yield	2770	2827	2408	2442

S.E./mean = 100.0 lb./ac.

Crop :- Paddy *(Kharif)*.   Ref :- M.P. 55(64).

Site :- Govt. Res. Farm. Waraseoni.   Type :- 'M'.

Object :—To study the effect of different methods of applying N and P fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Waraseoni. (iii) N.A./end of July 1955. (iv) (a) 2 ploughings. (b) Transplanting. (c) to (e) N.A. (v) 40 lb./ac. of N as F.Y.M. (vi) *Luchai* × *Badhia Baku* (late). (vii) Irrigated. (viii) 2 weedings. (ix) Nil. (x) Early Dec. 1955.

2. TREATMENTS :

Same as in expt. no. 54(18) on page 50.

3. DESIGN :

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

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Plant height, no. of tillers, yield of grain and straw. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (vii) (a) Labhandi and Durg. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2586 lb./ac. (ii) 331.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	B_0	B_1	B_2	B_3
Av. yield	2526	2441	2465	2911

S.E./mean = 148.4 lb./ac.

Crop :- Paddy *(Kharif)*.   Ref :- M.P. 56(107).

Site :- Govt. Res. Farm, Waraseoni.   Type :- 'M'.

Object :—To study the effect of different methods of applying N and P fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Morand*. (b) Refer soil analysis, Waraseoni. (iii) 20.7.1956. (iv) (a) 2 ploughings. (b) Transplanting. (c) 80 lb./ac. (d) 4"×4". (e) 1 to 2. (v) **40** lb./ac. of N as F.Y.M. (vi) *Luchai×Budiabaku*. (vii) Irrigated. (viii) 1 hand weeding. (ix) 57.07". (x) N.A.

2. TREATMENTS :

Same as in expt. no. 54(18) on page 50.

3. DESIGN :

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

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of grain and straw. (iv) (a) 1954—1956. (b) Yes. (c) Nil. (v) (a) Labhandi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1634 lb./ac. (ii) 201.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	B_0	B_1	B_2	B_3
Av. yield	1850	1495	1575	1615

S.E./mean = 100.9 lb./ac.

Crop :- **Paddy** *(Kharif)*.   Ref :- **M.P. 54(92).**

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

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

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) Sandy loam and loamy. (b) Refer soil analysis, Waraseoni. (iii) N.A./7, 8 8.1954. (iv) (a) 2 ploughings and levelling. (b) Transplanting. (c) to (e) N.A. (v) N.A. (vi) *Luchai×Gurmatia* (late). (vii) Irrigated. (viii) N.A. (ix) 34.42". (x) 12.12.1954.

2. TREATMENTS :

Same as in expt. no. 54(19) on page 52.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 1/57 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) No. of tillers, height, yield of grain and straw. (iv) (a) 1954—contd. (b) N.A. (c) Nil. (v) (a) Labhandi Sarkhanda, Adhartal and Durg. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3156 lb./ac. (ii) 381.8 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	3102	3137	3120	3326	2912
N_2	3185	3198	3192	3172	3211
Mean	3144	3168	3156	3249	3062
D_1	3280	3219			
D_2	3007	3116			

S.E. of any marginal mean   =   95.5 lb /ac.
S.E. of body of any table   = . 135.0 lb./ac.

Crop :- Paddy *(Kharif)*.   Ref :- M.P. 55(65)

Site :- Govt. Res. Farm, Waraseoni.   Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Waraseoni. (iii) N.A./early Aug., 1955. (iv) (a) 2 ploughings. (b) Transplanting. (c) to (e) N.A. (v) 40 lb./ac. of N as F.Y.M. (vi) *Luchai×Gurmatia* (late). (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) Middle December, 1955.

2. TREATMENTS :

Same as in expt. no. 54(19) on page 52.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 1/57 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) No. of tillers , height, yield of grain and straw. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (v) (a) Labhandi, Sarkhanda and Durg. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3260 lb./ac. (ii) 197.7 lb./ac. (iii) Interactions N×D and N×P are significant. (iv) Av. yield of grain in lb./ac.

	P_1	P_2	Mean	D_1	D_2
N_1	3158	3333	3245	3108	3382
N_2	3342	3207	3275	3305	3244
Mean	3250	3270	3260	3207	3313
D_1	3176	3237			
D_2	3324	3302			

S.E. of any marginal mean   = 49.4 lb./ac.
S.E. of body of any table   = 69.9 lb./ac.

Crop :- Paddy *(Kharif)*.   Ref :- M.P. 56(109).

Site :- Govt. Res. Farm, Waraseoni.   Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) *Morand*. (b) Refer soil analysis, Waraseoni. (iii) 10.8.1956. (iv) (a) Ploughing and cross poughing. (b) Transplanting. (c) 80 lb./ac. (d) 4"×4". (e) 2 to 3. (v) N.A. (vi) *Luchai×Gurmatia*. (vii) Irrigated. (viii) 1 hand weeding. (ix) 57.07". (x) N.A.

2. TREATMENTS :

Same as in expt. no. 54(19) on page 52.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Yield of grain and straw. (iv) (a) 1954—1956. (b) No.(c) Nil. (v) (a) Labhandi and Sarkhanda. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1785 lb./ac. (b) 199.0 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	P₁	P₂	Mean	D₁	D₂
N₁	1715	1795	1755	1716	1794
N₂	1800	1832	1816	1767	1865
Mean	1757	1814	1785	1742	1829
D₁	1775	1709			
D₂	1740	1919			

S.E. of any marginal mean = 49.8 lb./ac.

S.E. of body of any table = 70.4 lb./ac.

Crop :- Paddy *(Kharif).*

Site :- Govt. Res. Farm, Waraseoni.

Ref :- M.P. 54(94).

Type :- 'M'.

Object :—To study the comparative effects of C/N and A/S with and without lime on Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Waraseoni. (iii) N.A./ 11, 12.8.1954. (iv) (a) 2 ploughings. (b) Trasnplanting. (c) to (e) N.A. (v) 40 lb./ac. of N as F.Y.M. a day before transplanting. (vi) Cross no. 22 (medium). (vii) Irrigated. (viii) N.A. (ix) 34.42″. (x) 3 to 5.12.1954.

2. TREATMENTS :

Same as in expt. no. 54(41) on page 49.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain and straw. (iv) (a) 1953—contd. (b) N.A. (c) Nil. (v) (a) Labhandi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2338 lb./ac. (ii) 281.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

T_0 = 2283 lb /ac. and T_1 = 2114 lb./ac.

	S₁	S₂	L₀	L₁	Mean
N₁	2320	2233	2307	2246	2277
N₂	2557	2380	2512	2425	2469
Mean	2439	2307	2410	2336	2373
L₀	2439	2380			
L₁	2439	2233			

S.E. of any marginal mean = 57.4 lb./ac.

S.E. of body of any table = 81.2 lb./ac.

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

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 54(95).**

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

Object :—To study the manurial value of Kotka Phos. along with A/S and Super.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Waraseoni. (iii) N.A./ 26.7.1954. (iv) (a) 2 ploughings. (b) Transplanting. (c) to (e) N.A. (v) 40 lb./ac. of N as F.Y.M. (vi) *Luchai×Gurmatia* (late). (vii) Irrigated. (viii) N.A. (ix) 34.42″. (ix) 8.12.1954.

2. TREATMENTS :

   4 manurial treatments : M_0=Control, M_1=20 lb./ac. of N as A/S, M_2=40 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super and M_3=40 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as *Kotka* Phos.

3. DESIGN :

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

4. GENERAL :

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

5. RESULTS :

   (i) 2401 lb./ac. (ii) 235.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb /ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	2550	2234	2359	2460

   S.E./mean = 117.8 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 55(101).**

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

Object :—To find out the effect of different types and doses of phosphatic manures on Paddy.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Morand*. (b) Refer soil analysis, Waraseoni. (iii) N.A./8.8.1955. (iv) (a) 2 ploughings. (b) Transplanting. (c) 80 lb./ac. (d) 4″×4″. (e) 1 to 2. (v) 40 lb./ac. of N as F.Y.M. (vi) *Luchai×Gurmatia×Burma*. (vii) Irrigated. (viii) 1 hand weeding. (ix) 58.07″. (x) N.A.

2. TREATMENTS :

   All combinations of (1) and (2)+2 extra treatments :
       (1) 3 sources of P_2O_5 : S_1=Triple Super, S_2=Ammo. Phos. and S_3=Nitro. Phos.
       (2) 2 levels of P_2O_5 : P_1=20 and P_2=40 lb./ac.
   Extra treatments : T_0=Control (no manure) and T_1=40 lb./ac. of N as A/S.
   40 lb./ac. of N as A/S was given as a basal dose to all the combinations of (1) and (2)

3. DESIGN :

   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/50 ac. (v) N.A. (vi) Yes.

4. GENERAL :

   (i) Good. (ii) N.A. (iii) Yield of grain and straw. (iv) (a) 1955—N.A. (b) and (c) Nil. (v) to (vii) Nil.

5. RESULTS :

   (i) 2922 lb./ac. (ii) 190.7 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

$T_0 = 2656$ lb./ac. and $T_1 = 2906$ lb./ac.

	S_1	S_2	S_3	Mean
P_1	2966	2953	2747	2889
P_2	2969	3134	3050	3051
Mean	2967	3044	2898	

S.E. of P marginal mean = 95.4 lb./ac.
S.E. of S marginal mean = 77.9 lb./ac.
S.E. of body of table or any T mean = 134.8 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 56(105).**

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

Object :—To compare the effects of A/C and A/S with and without Super on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Morand.* (b) Refer soil analysis, Waraseoni (iii) N.A./17.7.1956. (iv) (a) Ploughing and cross ploughing. (b) Transplanting. (c) 80 lb./ac. (d) $4'' \times 4''$. (e) 1 to 2. (v) and (vi) N.A. (vii) Irrigated. (viii) 1 hand weeding. (ix) 57.07". (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)+control.
   (1) 2 sources of N : S_1=A/C and S_2=A/S.
   (2) 2 levels of N : N_1=20 and N_2=40 lb./ac.
   (3) 2 levels of P_2O_5 as Super : P_0=0 and P_1=20 lb./ac.

3. DESIGN:

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

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of grain and straw. (iv) (a) No. (b)—. (c) Nil. (v) ¿o (vii) Nil.

5. RESULTS :

(i) 3537 lb./ac. (ii) 641.5 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

Control = 3250 lb./ac.

	N_1	N_2	Mean	P_0	P_1
S_1	3520	3550	3535	3430	3640
S_2	3822	3400	3611	3572	3650
Mean	3671	3475	3573	3501	3645
P_0	3457	3545			
P_1	3885	3404			

S.E. of any marginal mean = 160.4 lb./ac.
S.E. of body of any table = 226.8 lb./ac.
S.E. of control mean = 320.8 lb./ac.

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

Site :- M.A.E. Farm, Bagwai.　　　　　　**Type :- 'M'.**

Object :—Type II—To study the manurial requirements of Paddy.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A.　(ii) (a) Medium black soil.　(b) N.A.　(iii) 2nd week of June 1957/end of July 1957. (iv) (a) 1 *bakhering*, 2 ploughings, interculture by Japanese hoe and 3—4 spadings.　(b) and　(c) N.A. (d) 9″×9″.　(c) 3.　(v) Nil.　(vi) N.A.　(vii) Irrigated.　(viii) Weeding.　(ix) 34″.　(x) 1st. week of Nov. 1957.

2. **TREATMENTS :**

All combinations of (1), (2), (3) and (4).
 (1) 3 levels of N as A/S : $N_0=0$, $N_1=30$ and $N_2=60$ lb./ac.
 (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=30$ and $P_2=60$ lb./ac.
 (3) 3 levels of K_2O as Pot. Sul.: $K_0=0$, $K_1=30$ and $K_2=60$ lb./ac.
 (4) 2 levels of F.Y.M. : $F_0=0$ and $F_1=5000$ lb./ac.

3. **DESIGN :**

(i) $3^3 \times 2$ confd.　(ii) (a) 9 plots/block ; 6 blocks/replication. (b) N.A.　(iii) 1. (iv) (a) 34′×16′. (b) 32′×14′. (v) 1′×1′.　(vi) Yes.

4. **GENERAL :**

(i) Normal.　(ii) Nil.　(iii) Grain yield. (iv) (a) 1956—contd.　(b) N.A. (c) Nil. (v) (a) Labhandi. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 757 lb./ac.　(ii) 181.4 lb./ac.　(iii) Main effect of N is highly significant. Effect of P and interaction F×N are significant.　(ix) 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	436	609	568	510	502	602	453	623	538
N_1	642	798	815	732	732	792	683	821	752
N_2	856	987	1103	897	946	1103	765	1199	982
Mean	645	798	829	713	727	832	634	881	757
F_0	477	724	700	584	625	693			
F_1	813	872	959	843	829	971			
K_0	609	790	740						
K_1	642	806	733						
K_2	684	798	1014						

S.E. of marginal mean of N, P or K　　　　= 42.8 lb./ac.
S.E. of marginal mean of F　　　　　　　= 34.9 lb./ac.
S.E. of body of N×P, N×K or P×K table　= 74.1 lb./ac.
S.E. of body of N×F, P×F or K×F table　= 60.5 lb./ac.

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

Site :- M.A.E. Farm, Bagwai.　　　　　**Type :- 'M'.**

Object :—Type II—To study the manurial requirements of Paddy.

1. **BASAL CONDITIONS ;**

(i) (a) to (c) N.A.　(ii) (a) Medium black soil.　(b) N.A.　(iii) N.A./4th. week of July, 1959.　(iv) (a) 2 ploughings and 1 *bakhering*.　(b) and　(c) N.A.　(d) 9″×9″.　(e) 3.　(v) Nil.　(vi) N.A.　(vii) Irrigated. (viii) 3 weedings.　(ix) 28″.　(x) 4th. week of Dec. 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(MAE) type II on page 64.

5. RESULTS :

(i) 1599 lb./ac. (ii) 59.9 lb./ac. (iii) Main effects of N, P and interaction $N \times P$, $F \times N$ and $F \times P$ are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	K_0	K_1	K_2	F_0	F_1	Mean
P_0	823	1152	1391	1136	1119	1111	897	1347	1122
P_1	1218	1753	2213	1736	1744	1704	1596	1860	1728
P_2	1407	1942	2493	1983	1958	1900	1777	2117	1947
Mean	1149	1616	2032	1618	1607	1572	1423	1775	1599
F_0	905	1489	1875	1440	1424	1405			
F_1	1393	1743	2189	1796	1790	1739			
K_0	1160	1637	2057						
K_1	1152	1621	2048						
K_2	1135	1590	1991						

S.E. of marginal mean of N, P or K = 14.1 lb./ac,
S.E. of marginal mean of F = 11.5 lb./ac.
S.E. of body of $N \times P$, $N \times K$ or $P \times K$ table = 24.5 lb./ac.
S.E. of body of $N \times F$, $P \times F$ or $K \times F$ table = 20.0 lb./ac.

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

Site :- M.A.E. Farm, Bagwai.   Type :- 'M'.

Object :—Type IV—To study the effect of application of P to legumes on the succeeding Paddy Crop.

1. BASAL CONDITIONS :

(i) (a) Legumes—Paddy. (b) Legumes. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) 4th. week of June 1957/end of July 1957. (iv) (a) 1 *bakhering*, 2 ploughings, interculture by Japanese hoe and 3 - 4 spadings. (b) and (c) N.A. (d) $9'' \times 9''$. (e) 3. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Weeding. (ix) 34". (x) 3rd week of Nov. 1957.

2. TREATMENTS :

Main-plot treatments :
All combinations of (1) and (2)+ a control (no G.M.)
(1) 2 legumes preceding paddy : $L_1 =$ Gram and $L_2 =$ Peas.
(2) 3 levels of P_2O_5 applied to legumes : $P_0 = 0$, $P_1 = 40$ and $P_2 = 80$ lb./ac.
Sub-plot treatments :
3 levels of N as A/S : $N_0 = 0$, $N_1 = 15$ and $N_2 = 30$ lb./ac.
N applied to paddy at puddling. Legumes ploughed in *situ*.

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) (b) $33' \times 13'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS ;

(i) 789 lb./ac. (ii) (a) 286.3 lb./ac. (b) 147.0 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	L_0P_0	L_1P_0	L_1P_1	L_1P_2	L_2P_0	L_2P_1	L_2P_2	Mean
N_0	683	716	420	601	395	716	543	582
N_1	765	872	848	897	658	979	773	827
N_2	930	856	1061	889	749	1143	1069	957
Mean	793	815	776	796	601	946	795	789

S.E. of difference of two

1. LP marginal means   = 134.9 lb./ac.
2. N marginal means   = 45.4 lb./ac.
3. N means at the same level of LP   = 120.0 lb /ac.
4. LP means at the same level of N   = 166.8 lb./ac.

Crop :- Paddy *(Kharif)*.   Ref :- 56(MAE).

Site :- M.A.E. Farm, Bagwai.   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) Medium black soil. (b) N.A. (iii) Last week of July, 1956. (iv) (a) to (c) N.A. (d) 9″×9″. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) Middle of Dec. 1956.

2. TREATMENTS :

All combinations of (1), (2) and (3)+1 control in each block.
(1) 3 sources of P_2O_5 : S_1=Ammo. Phos., S_2=Super and S_3=Dicalcium phosphate.
(2) 2 levels of P_2O_5 : P_1=20 and P_2=40 lb./ac.
(3) 3 methods of applications of P_2O_5 : M_1=Brodcast at puddling, M_2=Dipping the seedling in mud-slush mixed with fertilizer before transplanting and M_3=Placement in pellet form near the roots at planting:

N equalised to 30 lb./ac. by applying A/S.

3. DESIGN :

(i) 2×3^2 fact. confd.+1 control in each block. (ii) (a) 7 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 34′×16′. (b) 32′×14′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) Labhandi. (vi) Nil. (vii) Mean and standard errors for M×S table have been adjusted for block effects.

5. RESULTS :

(i) 2455 lb./ac. (ii) 430.6 lb./ac. (iii) Main effect of P is significant. (iv) Av. yield of grain in lb./ac.

Control = 1690 lb./ac.

	M_1	M_2	M_3	Mean	S_1	S_2	S_3
P_1	2557	2382	2456	2465	2526	2485	2384
P_2	2829	2578	2693	2700	2822	2753	2526
Mean	2693	2480	2575	2583	2674	2619	2455
S_1	2962	2444	2616				
S_2	2732	2444	2682				
S_3	2386	2551	2427				

S.E. of marginal mean of M or S	= 87.9 lb./ac.
S.E. of marginal mean of P	= 71.8 lb./ac.
S.E. of body of M×P or S×P table	= 124.3 lb./ac.
S.E. of body of M×S table	= 162.7 lb./ac.

Crop :- Paddy.   **Ref :- M.P. 59(MAE).**

Site :- M.A.E. Farm, Bagwai.   **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) Medium black soil. (b) N.A. (iii) N.A./4th week of July, 1959. (iv) (a) 2 ploughings and 1 *bakhering*. (b) and (c) N.A. (d) $9'' \times 9''$. (e) 3. (v) Nil. (vi) Patanai—23 (late). (vii) Irrigated. (viii) 3 weedings. (ix) 28″. (x) 4th week of December, 1959.

2. **TREATMENTS :**

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

    (1) 2 sources of P_2O_5 : S_1=Ammo, phos. and S_2=Triple Super.

    (2) 2 levels of P_2O_5 : P_1=25 and P_2=40 lb./ac.

    (3) 3 methods of placement : M_1=Broadcast at pudling, M_2=Dipping the seedlings in mud slush mixed with fetilizer before transplanting and M_3=Placement in pellet form near the roots at planting. N equalised to 30 lb./ac. by appling A/S.

3. **DESIGN :**

(i) $2^2 \times 3$+a control. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) $36' \times 15'$. (b) $34' \times 13'$. (v) $1' \times 1'$. (vi) **Yes.**

4. **GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—Control (modified in 1959. Expt. failed in 1957 and 1958). (b) N.A. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

(i) 2213 lb./ac. (ii) 75.0 lb./ac. (iii) Main effects of P and M, control *vs* others and interactions M×P and M×S×P are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1736 lb./ac.

	M_1	M_2	M_3	Mean	S_1	S_2
P_1	2131	2255	2123	2170	2156	2184
P_2	2576	2345	2090	2337	2329	2345
Mean	2353	2300	2107	2253	2242	2264
S_1	2320	2263	2143			
S_2	2386	2337	2070			

S.E. of marginal mean of S or P	= 17.7 lb./ac.
S.E. of marginal mean of M	= 21.6 lb./ac.
S.E. of body of S×M or P×M table	= 30.6 lb./ac.
S.E. of body of S×P table	= 25.0 lb./ac.

Crop :- Paddy (*Kharif*).   **Ref :- M.P. 56(MAE).**

Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object :—Type VI (TCM) —To find out the residual effect of P on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b Paddy. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) Last week of July, 1956. ,iv) (a) to (c) N.A. (d) $9'' \times 9''$. (e) 3. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) Middle of December, 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	$p_{\frac{1}{2}}$	p_1	p_2
Second year	0	C	C	0	0	p_1	p_2	0	0	$p_{\frac{1}{2}}$	p_1	p_2
Third year	0	C	C	0	0	0	0	p_1	p_2	$p_{\frac{1}{2}}$	p_1	p_2

Treatments are three-course rotation with 11 distinct treatments. Plots under treatment 1 do not receive any fertilizer. Plots under other ten treatments recieve a basal application of N as 5000 lb./ac. of F Y.M. One of the ten treatments consists of the application of basal dose of N only. This treatment which serves as control is applied in two plots in each block.

Various symbols denote : $p_{\frac{1}{2}} = 10$, $p_1 = 20$ and $p_2 = 40$ lb./ac. of P_2O_5.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) $45' \times 24'$. (b) $40' \times 18'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1555 lb./ac. (ii) 312.8 lb./ac. (iii) 'Treated vs control' 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	890	1464	1605	1761	1384	1897	1462	1358	1592	1886	1901

S.E./mean except (2, 3) = 156.4 lb./ac.
S.E./mean for (2, 3) = 129.0 lb /ac.

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

Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object :—Type VI (TCM) To find out the residual effect of P on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) 2nd week of June, 1957 end of July, 1957. (iv) (a) 1 *bakhering*, 2 ploughings, interculture by Japanese hoe and 3-4 spadings. (b) and (c) N.A. (d) $9'' \times 9''$. (e) 3. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Weeding. (ix) 34''. (x) 3 week of November 1957.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56 (M.A.E.) type VI (TCM) on page 67.

4. GENERAL ;

(i) Normal. (ii) Leaf blight attack was observed. No control measures taken. (iii) Grain yield. (iv) (a) 1954—Contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1330 lb./ac. (ii) 325.3 lb./ac. (iii) Treatment differences and 'control vs. others' are highly signifi ant. (vi) Av. yield of grain in lb./ac.

Treatment	1	(2, 3)	4	5	6	7	8	9	10	11	12
Av. yield	729	984	1018	1264	1140	1245	1718	1555	1841	1956	1529

S.E./mean except (2, 3) = 162.6 lb./ac.
S.E./mean for (2, 3) = 115.0 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 58(MAE).**

Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object :—Type VI (TCM)—To find out the residual effect of P on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) N.A./4th week of July, 1958. (iv) (a) 1 ploughing and 1 harrowing. (b) and (c) N.A. (d) 9″×9″. (e) 3. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 3 weedings. (ix) 50″. (x) 4th week of November, 1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt no. 56 (MAE) type VI (TCM) on page 67.

4. GENERAL :

(i) Normal. (ii) Attack of aphids. (iii) Grain yield. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1434 lb./ac. (ii) 222.8 lb./ac. (iii) Main effect of treated and "treated *vs* control" are highly significant. (vi) Av. yield of grain in lb./ac.

Treatment	1	(2, 3)	4	5	6	7	8	9	10	11	12
Av. yield	774	1132	1158	1399	1728	1631	1352	1522	1564	1812	2008

S.E./mean except (2, 3) = 111.4 lb./ac.
S.E./mean for (2, 3) = 91.9 lb./ac.

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

Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object :—Type VI (TCM)—To find out the residual effect of P on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) N.A./4th week of July, 1959. (iv) (a) 2 ploughings and 1 *bakhering*. (b) and (c) N.A. (d) 9″×9″. (e) 3. (v) Nil. (vi) T—9. (vii) Irrigated. (viii) 3 weedings. (ix) 28″. (x) 4th week of October, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56 (MAE) type VI (TCM) on page 67.

5. RESULTS :

(i) 1092 lb./ac. (ii) 51.4 lb./ac. (iii) Treatment differences and "control *vs* others" are 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	403	708	1177	1547	1004	1218	905	1070	1300	1399	1670

S.E./mean except (2, 3) = 25.7 lb./ac.
S.E./mean for (2, 3) = 18.2 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 56(MAE).**

Site :- M.A.E. Farm, Raipur.   **Type :- 'M'.**

Object :—Type II—To study the manurial requirements of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) Middle of June to middle of July, 1956. (iv) (a) and (b) N.A. (c) 40 lb./ac. (d) 4″×4″. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) Second to third week of December, 1956.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(MAE) type II on page 64.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) Bagwai. (vi) and (vii) Nil.

5. RESULTS :

(i) 2197 lb./ac (ii) 302.3 lb./ac. (iii) Main effects of F, N, P and interactions N×F, P×F and N×P×F are significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	K_0	K_1	K_2	F_0	F_1	Mean
P_0	1478	2318	2412	2153	2189	1865	1921	2218	2069
P_1	1936	2302	2675	2226	2283	2404	2125	2484	2304
P_2	1913	2204	2536	2133	2323	2198	2290	2145	2218
Mean	1776	2275	2541	2171	2265	2156	2112	2282	2197
F_0	1747	1974	2615	2101	2221	2013			
F_1	1804	2576	2467	2240	2309	2298			
K_0	1735	2268	2510						
K_1	1805	2360	2629						
K_2	1737	2196	2484						

S.E. of marginal mean of N, P or K	=	50.4 lb./ac.
S.E. of marginal mean of F	=	41.1 lb./ac.
S E. of body of N×P, N×K or P×K table	=	87.3 lb./ac.
S.E. of body of N×F, P×F or K×F table	=	71.3 lb./ac.

Crop :- Paddy *(Kharif)*.

Ref :- M P. 57(MAE).

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

Type :- 'M'.

Object :—Type II—To study the manurial requirements of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N A. (ii) (a) Red loam. (b) N.A. (iii) 17.6.1957/3rd and 4th week of August, 1957. (iv) (a) 1 ploughing. (b) N.A. (c) 40 lb./ac. (d) 4"×4". (e) 1. (v) Nil. (vi) Luchai×Gurmatia no. 18 (late). (vii) Irrigated. (viii) Weeding. (ix) 40". (x) 1st and 2nd week of December, 1957.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(MAE) type II on page 64 (Direct, residual and cumulative effects studied).

4. GENERAL:

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) Bagwai. (vi) Nil. (vii) Analysis pooled over three phases *i.e.* cumulative, direct and residual effect. Phases have been taken in second split.

5. RESULTS :

(i) 2861 lb./ac. (ii) (a) 663.5 lb./ac. (b) 625.9 lb./ac. (c) 344.3 lb./ac.(iii) Main effect of N is highly significant and interaction F×P is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	K_0	K_1	K_2	F_0	F_1	Mean
P_0	2404	2932	3266	2902	2902	2796	2765	2969	2867
P_1	2728	2767	3148	2811	2958	2875	2637	3125	2881
P_2	2342	2971	3196	2871	2840	2798	2935	2738	2836
Mean	2491	2890	3203	2861	2900	2823	2779	2944	2861
F_0	2434	2765	3138	2800	2779	2758			
F_1	2549	3015	3269	2923	3021	2888			
K_0	2479	2947	3158						
K_1	2517	2949	3235						
K_2	2478	2775	3216						

S.E. of difference of two

1. F marginal means   = 104.3 lb./ac.
2. N, P or K marginal means   = 120.5 lb./ac.
3. N, P or K means at the same level of F   = 170.3 lb./ac.
4. F means at the same level of N, P or K   = 173.8 lb./ac.
     S.E. of bo y of $N \times P$, $N \times K$ or $P \times K$ table   = 147.5 lb./ac.

Crop :- Paddy.   **Ref :- M.P. 58(MAE).**

Site :- M.A.E. Farm, Raipur.   **Type :- 'M'.**

Object :—Type II—To study the manurial requirements of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) N.A./4th week of July to 2nd week of August, 1958. (iv) (a) 1 ploughing. (b) N.A. (c) 40 lb./ac. (d) $4'' \times 4''$. (e) 3. (v) Nil. (vi) *Luchai × Gurmatia* no. 18 (late). (vii) Irrigated. (viii) Weeding. (ix) 66". (x) 4th week of November, 1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 57(MAE) type II on page 64 (Direct, residual and cumulative effects studied).

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) Bagwai. (vi) and (vii) Nil.

5. RESULTS :

Cumulative Effect

(i) 2037 lb./ac. (ii) 341.2 lb./ac. (iii) Main effects of N and P alone are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	K_0	K_1	K_2	F_0	F_1	Mean
P_0	1598	1795	2064	1755	1890	1812	1631	2007	1819
P_1	1646	2457	2551	2272	2078	2304	2102	2334	2218
P_2	1832	2017	2370	2090	2027	2102	2103	2043	2073
Mean	1692	2090	2328	2039	1998	2073	1945	2128	2037
F_0	1581	1962	2293	1976	1950	1909			
F_1	1803	2218	2363	2102	2046	2237			
K_0	1562	2056	2499						
K_1	1647	2091	2256						
K_2	1867	2123	2229						

S.E. of marginal mean of N, P or K	= 80.4 lb./ac.
S.E. of marginal mean of F	= 65.7 lb./ac.
S.E. of body of N×P, N×K or P×K table	= 139.3 lb./ac.
S.E. of body of N×F, P×F or K×F table	= 113.7 lb./ac.

Residual Effect

(i) 2070 lb./ac. (ii) 346.3 lb./ac. (iii) Main effect of N is highly significant. Effect of P and interaction N×K are significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	K_0	K_1	K_2	F_0	F_1	Mean
P_0	1707	1864	2127	1877	1761	2059	1790	2008	1899
P_1	1552	2540	2580	2260	2082	2330	2190	2258	2224
P_2	1753	2135	2374	2196	2071	1994	2028	2146	2087
Mean	1671	2180	2360	2111	1971	2128	2003	2137	2070
F_0	1617	2165	2227	2049	2015	1945			
F_1	1725	2195	2492	2173	1927	2311			
K_0	1532	2160	2642						
K_1	1487	2128	2298						
K_2	1994	2252	2139						

S.E. of marginal mean of N, P or K	= 81.6 lb./ac.
S.E. of marginal mean of F	= 66.6 lb./ac.
S.E. of body of N×P, N×K or P×K table	= 141.4 lb./ac.
S.E. of body of N×F, P×F or K×F table	= 115.4 lb./ac.

Direct Effect

(i) 1631 lb./ac. (ii) 377.8 lb./ac. (iii) Interaction N×K alone is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	K_0	K_1	K_2	F_0	F_1	Mean
P_0	1598	1521	1620	1610	1583	1547	1488	1672	1580
P_1	1483	1747	1662	1797	1376	1720	1563	1699	1631
P_2	1695	1568	1784	1611	1443	1992	1807	1557	1682
Mean	1592	1612	1689	1673	1467	1753	1619	1643	1631
F_0	1515	1550	1792	1654	1517	1686			
F_1	1669	1674	1586	1692	1417	1820			
K_0	1514	1492	2013						
K_1	1354	1568	1479						
K_2	1908	1776	1575						

S.E. of marginal mean of N, P or K	= 89.0 lb./ac.
S.E. of marginal mean of F	= 72.7 lb./ac.
S.E of body of N×P, N×K or P×K table	= 154.2 lb./ac.
S.E. of body of N×F, P×F or K×F table	= 125.9 lb./ac.

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

Site :- M.A.E. Farm, Raipur.　　　　　　　　Type :- 'M'.

Object :—Type II—To study the manurial requirements of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) N.A./1st and 3rdweek of August, 1959. (iv) (a) Plough-ing. (b) N.A. (c) 40 lb./ac. (d) 4"×4". (e) N.A. (v) Nil. (vi) *Luchai × Gurmatia* no. 18 (late). (vii) Irrigated. (viii) Weeding. (ix) 42". (x) 3rd week of November, 1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no 57(MAE) type II on page 64 (Direct, residual and cumulaive effects studied).

4. GENERAL :

(i) Satisfactory. (ii) Nil (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) Bagwai. (vi) and (vii) Nil.

5. RESULTS :

Cumulative Effect

(i) 2500 lb./ac. (ii) 351.1 lb./ac. (iii) Main effect of N is highly significant. Interactions P×K and P×P are significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	K_0	K_1	K_2	F_0	F_1	Mean
P_0	2074	2279	2856	2098	2436	2675	2222	2584	2403
P_1	2164	2707	2813	2534	2658	2491	2485	2637	2561
P_2	2156	2567	2888	2641	2378	2592	2641	2433	2537
Mean	2131	2518	2852	2424	2491	2586	2449	2551	2500
F_0	2000	2551	2797	2362	2444	2542			
F_1	2262	2485	2907	2486	2538	2630			
K_0	1942	2592	2738						
K_1	2106	2551	2816						
K_2	2345	2411	3002						

S.E. of marginal mean of N, P or K　　　　= 82.8 lb./ac.
S.E. of marginal mean of F　　　　　　　 = 67.6 lb./ac.
S.E. of body of N×P, N×K or P×K table　 = 143.3 lb./ac.
S.E. of body of N×F, P×F or K×F table　 = 117.0 lb./ac.

Residual Effect

(i) 2153 lb./ac. (ii) 341.9 lb./ac. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	K_0	K_1	K_2	F_0	F_1	Mean
P_0	2065	1983	2345	2016	2123	2254	1991	2271	2131
P_1	2065	2222	2279	2164	2362	2041	2107	2271	2189
P_2	1851	2156	2411	2172	2049	2196	2123	2155	2139
Mean	1994	2120	2345	2117	2178	2164	2074	2232	2153
F_0	1835	2082	2305	1991	2148	2083			
F_1	2153	2158	2385	2243	2208	2245			
K_0	1893	2115	2343						
K_1	1860	2205	2469						
K_2	2230	2040	2222						

S.E. of marginal mean of N, P or K	= 80.6 lb./ac.
S.E. of marginal mean of F	= 65.8 lb./ac.
S.E. of body of N×P, N×K or P×K table	= 139.6 lb./ac.
S.E. of body of N×F, P×F or K×F table	= 114.0 lb./ac.

Direct Effect

(i) 2452 lb./ac. (ii) 302.3 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	K_0	K_1	K_2	F_0	F_1	Mean
P_0	2049	2156	2740	2279	2172	2492	2238	2392	2315
P_1	2148	2617	2781	2567	2559	2419	2444	2586	2515
P_2	1909	2592	3077	2411	2477	2690	2567	2485	2526
Mean	2035	2455	2866	2419	2403	2534	2416	2488	2452
F_0	1950	2444	2854	2271	2485	2492			
F_1	2120	2466	2878	2567	2321	2576			
K_0	1942	2469	2846						
K_1	1893	2427	2889						
K_2	2290	2469	2863						

S.E. of marginal mean of N, P or K	= 71.3 lb./ac.
S.E. of marginal mean of F	= 58.2 lb./ac.
S.E. of body of N×P, N×K or P×K table	= 123.4 lb./ac.
S.E. of body of N×F, P×F or K×F table	= 100.8 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 58(MAE).**

Site :- M.A.E. Farm, Raipur.   **Type :- 'M'.**

Object :—Type IV—To study the effect of application of P to legumes on the succeeding Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Legumes—Paddy. (b) Legumes. (c) As per treatments. (ii) (a) Red loam. (b) N.A. (iii) N.A./ 4th week of July to 2nd week of August, 1958. (iv) (a) 1 ploughing. (b) N.A. (c) 40 lb./ac. (d) 4″×4″. (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vl) Luchai×Gurmatia no. 18 (late). (vii) Irrigated. (viii) Weeding. (ix) 66″. (x) 4th week of November, 1958.

2. TREATMENTS :

Main-plot treatments :

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

(1) 2 legumes preceding paddy : $L_1 = Moong$ and $L_2 = Lakh$.

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

Sub-plot treatments :

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

N applied to paddy at puddling. Legumes ploughed in *situ*.

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 34′×16′. (b) 32′×14′. (v) 1′×1′. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1521 lb./ac. (ii) (a) 353.4 lb./ac. (b) 236.8 lb./ac. (iii) Main effect of N is highly significant and control vs. others is 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	1056	1231	1218	1694	1642	1535	1325	1386
N_1	1396	1442	1555	1646	1646	1649	1370	1529
N_2	1331	1545	1457	1749	1817	2037	1604	1649
Mean	1261	1406	1410	1696	1702	1740	1433	1521

S.E. of difference of two
1. LP marginal means   = 166.6 lb./ac.
2. N marginal means   = 73.1 lb./ac.
3. N means at the same level of LP   = 193.3 lb./ac.
4. LP means at the same level of N   = 229.5 lb./ac.

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

Site :- M.A.E. Farm, Raipur.   **Type :- 'M'.**

Object : Type IV—To study the effect of application of P to legumes on the succeeding Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy—Legumes. (b) Legumes. (c) As per treatments. (ii) (a) Red loam soil. (b) N.A. (iii) N A./1st and 3rd week of August, 1959. (iv) (a) Ploughing. (b) N.A. (c) 40 lb./ac. (d) 4"×4". (e) 3. (v) Nil. (vi) Luchai×Budiabalus no. 4 (late). (vii) Irrigated. (viii) Weeding. (ix) 42". (x) 3rd week of November, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(MAE) type IV on page 74.

5. RESULTS :

(i) 1780 lb./ac. (ii) (a) 487.4 lb./ac. (b) 293.0 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	L_0P_0	L_1P_0	L_1P_1	L_1P_2	L_2P_0	L_2P_1	L_2P_2	Mean
N_0	1448	1506	1572	1399	1506	1580	1753	1538
N_1	1753	1753	2049	1802	1572	1794	2049	1825
N_2	1695	1901	1884	1942	1950	2222	2255	1978
Mean	1632	1720	1835	1714	1676	1865	2019	1780

S.E. of difference of two
1. LP marginal means   = 229.7 lb./ac.
2. N marginal means   = 90.4 lb./ac.
3. N means at the same level of LP   = 131.0 lb./ac.
4. LP means at the same level of N   = 301.6 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 56(MAE).**

Site :- M.A.E. Farm, Raipur.   **Type :- 'M'.**

Object :—Type V—To study the effect of time of application of N to Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) Middle of June to middle of July, 1956. (iv) (a) and (b) N.A. (c) 40 lb./ac. (d) 4"×4". (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) Second to third week of December, 1956.

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, $T_6=\frac{1}{3}$ before planting+$\frac{1}{3}$ at tillering+$\frac{1}{3}$ a week before flowering and $T_7=\frac{1}{3}$ at planting+$\frac{1}{3}$ at tillering+$\frac{1}{3}$ a week before flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 34'×16'. (b) 32'×14'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) Reora. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1451 lb./ac. (ii) 325.4 lb./ac. (iii) 'Control vs. others' effect alone is significant. (iv) Av. yield of grain in lb./ac.

Control = 955 lb./ac.

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
S_1	1289	1349	1368	1315	1386	1603	1512	1403
S_2	1463	1714	1617	1477	1763	1206	1743	1569
Mean	1376	1532	1492	1396	1574	1404	1628	1486

S E. of marginal mean of T	= 132.8 lb./ac.
S.E. of marginal mean of S	= 71.0 lb./ac.
S.E. of body of table or control mean	= 187.9 lb./ac.

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

Site :- M.A.E. Farm, Raipur. **Type :- 'M'.**

Object :—Type V—To study the effect of time of application of N to Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) 17.6.1957/3rd and 4th week of August, 1957. (iv) (a) 1 ploughing. (b) N.A. (c) 40 lb /ac. (d) 4"×4". (e) 1. (v) 5000 lb./ac. of F.Y.M. (vi) Luchai×Gurmatia no. 18. (late) (vii) Irrigated. (viii) Weeding. (ix) 40". (x) 1st and 2nd week of December, 1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(MAE) type V on page 75.

5. RESULTS :

(i) 2428 lb /ac. (ii) 293.7 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in lb./ac.

Control = 2320 lb./ac.

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
S_1	2329	2658	2131	2353	2501	2115	2271	2337
S_2	2172	2592	2715	2526	2576	2543	2625	2536
Mean	2250	2625	2423	2439	2538	2329	2448	2436

S.E. of marginal mean of T	= 119.9 lb./ac.
S.E. of marginal mean of S	= 64.1 lb./ac.
S.E. of body of table or control mean	= 169.6 lb./ac.

Crop :- **Paddy** *(Kharif)*. Ref :- **M.P. 58(MAE).**

Site :- **M.A.E. Farm, Raipur.** Type :- **'M'.**

Object :—Type V—To study the effect of time of application of N to Paddy.

1. BASAL CONDITIONS :

   (i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) N.A./4th week of July to 2nd week of August, 1958. (iv) (a) 1 ploughing. (b) N.A. (c) 40 lb./ac. (d) 4″×4″. (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) *Luchai×Gurmatia* no. 18 (late). (vii) Irrigated. (viii) 1 weeding. (ix) 66″. (x) 4th week of November, 1958.

2. TREATMENTS to 4. GENERAL :

   Same as in expt. no. 56(MAE) type V on page 75.

5. RESULTS :

   (i) 2608 lb /ac. (ii) 345.1 lb./ac. (iii) "Control vs. others" effect alone is highly significant. (iv) Av. yield of grain in lb./ac

Control = 1950 lb./ac.

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
S_1	2637	2600	2723	2393	2723	2777	2593	2635
S_2	2513	2730	2600	2843	2643	2533	2867	2676
Mean	2575	2665	2662	2618	2683	2655	2730	2655

S.E. of marginal mean of T = 140.9 lb./ac.
S.E. of marginal mean of S = 75.3 lb./ac.
S.E. of body of table or control mean = 199.2 lb./ac.

Crop :- **Paddy.** Ref :- **M.P. 59(MAE).**

Site :- **M.A.E. Farm, Raipur.** Type :- **'M'.**

Object :—Type V—To study the effect of time of application of N to Paddy.

1. BASAL CONDITIONS :

   (i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) N.A./1st and 3rd week of August, 1959. (iv) (a) Ploughing. (b) N.A. (c) 40 lb./ac. (d) 4″×4″. (e) N.A. (v) 20 lb./ac. of P_2O_5 as Super. F.Y.M. at 5000 lb /ac. (vi) *Luchai×Gurmatia* no. 18 (late). (vii) Irrigated. (viii) Weeding. (ix) 42″. (x) 3rd week of November, 1959.

2. TREATMENTS to 4. GENERAL :

   Same as in expt. no. 56(MAE) type V on page 75.

5. RESULTS :

   (i) 2848 lb./ac. (ii) 378.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 2666 lb./ac.

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
S_1	2584	2650	2403	3184	2872	2987	2650	2761
S_2	2962	2971	2987	3045	2855	2872	3028	2960
Mean	2773	2810	2695	3114	2863	2930	2839	2861

S.E. of marginal mean of T	=	154.6 lb./ac.
S.E. of marginal mean of S	=	82.6 lb./ac.
S.E. of body of table cr control mean	=	218.6 lb./ac.

Crop :- Paddy *(Kharif)*.

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

Ref :- M.P. 57(MAE).

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) 17.6.1957/3rd and 4th week of August, 1957. (iv) (a) 1 plcughing. (b) N.A. (c) 40 lb./ac. (d) $4'' \times 4''$. (e) 1. (v) Nil. (vi) $Luchai \times Gurmatia$ no. 18 (late). (vii) Irrigated. (viii) Weeding. (ix) $40''$. (x) 1st and 2nd week of December, 1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(MAE) type VI cn page 66.

5. RESULTS :

(i) 1611 lb./ac. (ii) 367.2 lb /ac. (iii) Control *vs.* others effect alone is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1308 lb./ac.

	M_1	M_2	M_3	Mean	S_1	S_2	S_3
P_1	1708	1680	1477	1622	1636	1665	1565
P_2	1652	1853	1598	1701	1798	1625	1679
Mean	1680	1766	1537	1661	1717	1645	1622
S_1	1627	1801	1723				
S_2	1594	1734	1606				
S_3	1818	1764	1283				

S.E. of marginal mean of P	=	61.2 lb./ac.
S.E. cf marginal mean of M or S	=	75.0 lb./ac.
S.E. of body of M $\times$ S table	=	138.8 lb./ac.
S.E. of body of M $\times$ P or S $\times$ P table	=	106.0 lb./ac.

Crop :- Paddy *(Kharif)*.

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

Ref :- M.P.58(MAE).

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) N.A./4th week of July to 2nd week of August, 1958. (iv) (a) 1 ploughing. (b) N.A. (c) 40 lb./ac. (d) $4'' \times 4''$. (e) 3. (v) 5000 lb./ac. of F.Y.M. (vi) $Luchai \times Gurmatia$ no. 18 (late). (vii) Irrigated. (viii) Weeding. (ix) $66''$. (x) 4th week of November, 1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(MAE) type VI on page 66. ;

5. RESULTS :

(i) 3002 lb /ac. (ii) 608.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 2888 lb./ac.

	M$_1$	M$_2$	M$_3$	Mean	S$_1$	S$_2$	S$_3$
P$_1$	3058	3046	2948	3017	3045	2952	3054
P$_2$	3100	3330	2641	3024	3072	3220	2779
Mean	3079	3188	2795	3021	3059	3086	2917
S$_1$	3305	3205	2666				
S$_2$	3119	3097	3041				
S$_3$	2813	3261	2677				

S.E. of marginal mean of S or M	= 124.2 lb./ac.
S.E. of marginal mean of P	= 101.4 lb./ac.
S.E. of body of S×P or M×P table	= 175.6 lb./ac.
S.E. of body of S×M table	= 229.9 lb./ac.

Crop :- Paddy (*Kharif*).

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

Ref :- M.P. 59(MAE).

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) N.A./1st and 3rd week of August, 1959. (iv) (a) Ploughing. (b) N.A. (c) 40 lb./ac. (d) 4″×4″. (e) N.A. (v) Nil. (vi) Luchai×Gurmatia no. 18 (late). (vii) Irrigated. (viii) Weeding. (ix) 42″. (x) 3rd week of November, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56 (MAE) type VI on page 66.

5. RESULTS :

(i) 2722 lb./ac. (iii) 260.3 lb./ac. (iii) Main effect of S is significant and 'control vs. others' is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 2410 lb./ac.

	M$_1$	M$_2$	M$_3$	Mean	S$_1$	S$_2$	S$_3$
P$_1$	2798	2822	2576	2732	2814	2608	2774
P$_2$	2814	2822	2814	2817	2773	2724	2954
Mean	2806	2822	2695	2774	2793	2666	2864
S$_1$	2732	2946	2701				
S$_2$	2617	2683	2698				
S$_3$	3069	2837	2686				

S.E. of marginal mean of M or S	= 53.1 lb./ac.
S.E. of marginal mean of P	= 43.4 lb./ac.
S.E. of body of M×P or S×P table	= 75.1 lb./ac.
S.E. of body of M×S table	= 98.4 lb./ac.

Crop :- Paddy (*Kharif*).   Ref :- M.P. 56(MAE)·

Site :- State Mechanised Farm, Reora.   Type :- 'M'.

Object :—Type V —To study the effect of time of application of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) N.A./7, 8.8.1956. (iv) (a) to (c) N.A. (d) 10"×10". (e) N.A. (v) 20 lb./ac. of P_2O_5 as triple Super. (vi) T—43 (late). (vii) Unirrigated (viii) and (ix) N.A. (x) 29.10.1956.

2. TREATMENTS :

Same as in expt. no. 56 (MAE) type V on page 75.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 33'×16.5'. (b) 29'×12.5'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) Raipur (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1521 lb./ac. (ii) 291.6 lb./ac. (iii) Main effect of T and 'control *vs.* others' are significant. (iv) Av. yield of grain in lb./ac.

Control = 1125 lb./ac.

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
S_1	1431	1586	1559	1675	1756	1250	1393	1579
S_2	1544	1526	1893	1345	1455	1441	1430	1519
Mean	1488	1556	1926	1510	1606	1345	1412	1549

S.E. of marginal mean of T   = 119 0 lb./ac.
S.E. of marginal mean of S   = 63.6 lb./ac.
S.E of body of table or control mean = 168.4 lb./ac.

Crop :- Paddy (*Kharif*).   Ref :- M.P. 58(MAE)

Site :- Stat Mechanised Farm, Reora.   Type :- 'M'.

Object :—Type V—To study the effect of time of application of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) N.A /2nd week of August, 1958. (iv) (a) 1 Puddling. (b) ·nd (c) N.A. (d) 8"×8". (e) 3. (v) Nil. (vi) T—43 (medium). (vii. Irrigated. (viii) 2 weedings. (ix) N.A. (x) 4th week of October, 1958.

2. TREATMENTS :

Same as in expt. no. 56 (MAE) type V on page 75.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/152.3 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Gundi bug attack controlled. (iii) Grain yield. (iv) (a) 1956—cortd. (b) N A. (c) Nil. (v) (a) Raipur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1456 lb./ac. (ii) 420.1 lb./ac. (iii) Main effect of N and 'control *vs.* others' are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 880 lb./ac.

	T₁	T₂	T₃	T₄	T₅	T₆	T₇	Mean
S₁	913	1185	1029	1942	1160	1177	1555	1280
S₂	1127	2074	1563	2049	1185	2353	1646	1714
Mean	1020	1629	1296	1996	1172	1765	1600	1497

S.E. of marginal mean of T = 171.5 lb./ac.
S.E. of marginal mean of S = 91.7 lb./ac.
S.E. of body of table or control mean = 242.6 lb./ac.

————

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

Site :- State Mechanised Farm, Reora.   **Type :- 'M'.**

Object :—Type V—To study the effect of time of application of N to Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) N.A./1st week of August, 1959. (iv) (a) 2 puddlings and 2 levellings. (b) and (c) N.A. (d) 8″×8″. (e) 3. (v) 20 lb./ac. of P_2O_5 as triple Super. (vi) T—43 (late). (vii) Irrigated. (viii) 2 weedings. (ix) 64″. (x) 2nd week of November, 1959.

2. TREATMENTS :

Same as in expt. no. 56 (MAE) type V on page 75.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 33′×13′—9″. (b) 29′×9′—9″. (v) 2′×2′. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Gundi bug attack. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) Labhandi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2334 lb./ac. (ii) 360.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 1950 lb./ac.

	T₁	T₂	T₃	T₄	T₅	T₆	T₇	Mean
S₁	2329	2296	2559	2501	2551	2419	2131	2398
S₂	2205	2362	2320	2246	2288	2477	2370	2324
Mean	2267	2329	2439	2374	2419	2448	2250	2361

S.E. of marginal mean of T = 147.3 lb./ac.
S.E. of marginal mean of S = 78.8 lb./ac.
S.E. of body of table or control mean = 208.4 lb./ac.

————

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

Site :- M.A.E. Farm, Bagwai.   **Tppe :- 'M'.**

Object :—Type I (a)—To study the effect of N and P on Paddy yield.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A.   (ii) (a) Medium black loam.   (b) N.A.   (iii) N.A./June—July.   (iv) to (vi) N.A.   (vii) Irrigated.   (viii) and (ix) N.A.   (x) November—December.

2. **TREATMENTS :**

All combinations of (1). (2) and (3)
   (1) 3 sources of N : $S_1 = A/S$, $S_2 = A/N$ and $S_3 =$ Urea.
   (2) 3 levels of N : $N_0 = 0$, $N_1 = 20$ and $N_2 = 40$ lb./ac.
   (3) 3 levels of P_2O_5 and Super : $P_0 = 0$, $P_1 = 20$ and $P_2 = 40$ lb./ac.
Fertilizer applied just before puddling.

3. **DESIGN :**

(i) 3^3 confd.   (ii) (a) 9 plots/block ; 3 blocks/replication.   (b) N.A.   (iii) 1.   (iv) (a) N.A.   (b) $40' \times 18'$.   (v) N.A.   (vi) Yes.

4. **GENERAL :**

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

5. **RESULTS :**

(i) 1800 lb./ac.   (ii) 285.6 lb./ac.   (iii) Effect of N is highly significant and effect of P is significant   (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3		P_0	P_1	P_2	Mean
N_0	—	—	—		1401	1222	1592	1405
N_1	2023	1941	1857		1652	2095	2073	1940
N_2	2149	2128	1888		1438	2317	2410	2055
Mean	2086	2034	1872		1497	1878	2025	1800
P_0	1546	1502	1442					
P_1	1944	1816	1875					
P_2	2107	2171	1797					

S.E. of N or P marginal mean   = 95.2 lb./ac.
S.E. of body of any table   = 164.9 lb./ac.
S.E. of S marginal means in N×S table   = 116.6 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 55 (TCM).**
Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object :—Type I (a)—To study the effects of N and P on Paddy yield.

1. **BASAL CONDITIONS :**

(i) (a) N.A.   (b) Wheat.   (c) N.A.   (ii) (a) Medium black loam.   (b) N.A.   (iii) N.A./June—July.   (iv) (a) to (e) N.A.   (v) Nil.   (vi) N A.   (vii) Irrigated.   (viii) and (ix) N.A.   (x) November—December.

2. **TREATMENTS :**

Same as in expt. no. 54 (T.C.M.) type I (a) on page 81.

3. **DESIGN :**

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

4. **GENERAL :**

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

5. **RESULTS :**

(i) 2025 lb /ac.   (ii) and (iii) N.A.   (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	P_0	P_1	P_2	Mean
N_0	—	—	—	1466	1698	1832	1665
N_1	2119	2052	2083	1856	1996	2403	2085
N_2	2487	2351	2141	1904	2198	2875	2326
Mean	2303	2202	2112	1742	1964	2370	2025
P_0	1671	1768	1786				
P_1	2089	1846	1958				
P_2	2432	2451	2227				

S.E's = N.A.

Crop :- Paddy *(Kharif)*.

Ref :- M.P. 55(TCM).

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

Type :- 'M'.

Object :—Type V—To study the effect of time of application of N to Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black loam. (b) N.A. (iii) N.A./June to July, 1955. (iv) (a) to (e) N.A. (v) 20 lb./ac. of P_2O_5. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) November—December, 1955.

2. TREATMENTS :

Same as in expt. no. 56(MAE) type V on page 75.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Slight attack of rice-bug. (iii) Grain yield. (iv) (a) 1955—contd. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) N.A. (ii) 218.1 lb./ac. (iii) Main effect of T alone is highly significant. (iv) Av. yield of grain in lb./ac.

Control = N.A.

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
S_1	2503	1986	1883	2135	1963	2316	2160	2135
S_2	2427	2361	1777	2192	2134	2401	2057	2193
Mean	2465	2174	1830	2164	2048	2358	2108	2164

S.E. of marginal mean of T = 89.0 lb./ac.
S.E. of marginal mean of S = 47.6 lb./ac.
S.E. of body of table = 125.9 lb./ac.

Crop :- Paddy *(Kharif)*.

Ref :- M.P. 54(TCM).

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

Type :- 'M'.

Object :—Type VI—To find out the residual effect of P on the yield of Paddy.

1. BASAL CONDITIONS :

   (i) (a) to (c) N.A. (ii) (a) Medium black loam. (b) N.A. (iii) N.A./June-July. (iv) to (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) November-December.

2. TREATMENTS :

   Same as in expt. no. 56(MAE) type VI (TCM) on page 67.

3. DESIGN :

   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 40'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

   (i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

   (i) 2000 lb./ac. (ii) 223.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	(2, 3, 6, 7, 8, 9)	10	4, 11	5, 12
Av. yield	1322	1733	2186	2385	2664

S.E./mean for 1 and 10   = 111.7 lb./ac.
S.E./mean for (2, 3, 6, 7, 8, 9)   — 45.6 lb./ac.
S.E./mean for (4, 11) and (5, 12)   = 79.0 lb./ac.

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

Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object :—Type VI—To find out the residual effect of P on the yield of Paddy.

1. BASAL CONDITIONS :

   (i) (a) to (c) N.A. (ii) (a) Medium black loam. (b) N.A. (iii) N.A./June-July. (iv) to (vi) N.A. (vii) Irrigated. (viii) N.A (ix) N.A. (x) November-December.

2. TREATMENTS :

   Same as in expt. no. 56(MAE) type VI (TCM) on page 67.

3. DESIGN :

   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 40'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

   (i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—contd. (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

   (i) 1713 lb./ac. (ii) 185.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	(2, 3, 8, 9)	4	5	6	7	10	11	12
Av. yield	872	1260	1744	1888	1992	2458	1929	2444	2193

S.E./mean except (2, 3, 8, 9)   = 92.6 lb./ac.
S.E./mean for (2, 3, 8, 9)   = 46.3 lb./ac.

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

Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object : - Type IX—To study the effects of N, P and F.Y.M. on the yield of Paddy.

1. BASAL CONDITIONS :

   (i) (a) to (c) N.A. (ii) (a) Medium black loam. (b) N.A. (iii) N.A./June-July. (iv) to (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) November-December.

2. TREATMENTS :

All combinations of (1), (2) and (3)
  (1) 3 levels of N : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
  (2) 3 levels of P_2O_5 : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.
  (3) 3 levels of F.Y.M. : $F_0=0$, $F_1=10$ and $F_2=20$ C.L./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 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) N.A. (iii) Grain yield. (iv) (a) 1955—1956. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2052 lb./ac. (ii) 511.8 lb./ac. (iii) Effect of P is highly significant and effect of N is significant. (iv) Av. Yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	Mean
F_0	1094	2129	2106	1301	1735	2292	1776
F_1	2013	2098	2624	1745	2343	2647	2245
F_2	1676	2228	2503	1352	2595	2461	2136
Mean	1594	2152	2411	1466	2224	2467	2052
P_0	884	1980	1534				
P_1	1680	2153	2839				
P_2	2218	2323	2860				

S.E. of any marginal mean = 170.6 lb./ac.
S.E. of body of any table = 295.5 lb./ac.

———

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

Site :- M.A.E. Farm, Bagwai.   Type :- 'M'.

Object :—Type X—To study the effect of different sources and levels of N on Paddy

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black loam. (b) N.A. (iii) N.A./June—July. (iv) to (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) November—December.

2. TREATMENTS :

All combinations of (1) and (2)+a control
  (1) 3 sources of N : $S_1=$A/S, $S_2=$Nitro chalk and $S_3=$Ammo. chloride.
  (2) 3 levels of N : $N_1=20$, $N_2=40$ and $N_3=60$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (ii) 4. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Slight attack of rice bug. (iii) Grain yield. (iv) 1955—1956. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 2187 lb./ac. (ii) 227.1 lb./ac. (iii) Main effects of N, S and control *vs.* others are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1479 lb./ac.

	S_1	S_2	S_3	Mean
N_1	2180	2042	1851	2024
N_2	2520	2250	2105	2292
N_3	2613	2719	2116	2483
Mean	2438	2337	2024	2266

S.E. of any marginal mean = 65.6 lb./ac.
S.E. of body of table or control mean = 113.6 lb./ac.

———

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

Site :- M.A.E. Farm, Reora.   **Type :- 'M'.**

Object :—Type II—To study the effect of time of application of N to Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) N.A./Last week of July. (iv) (a) to (e) N.A. (v) 20 lb./ac. of P_2O_5. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 32". (x) October.

2. TREATMENTS :

Same as in expt. no. 56 (MAE) type V on page 75.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 36'×20'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1021 lb./ac. (ii) 297.1 lb./ac. (iii) Main effect of S and 'control vs. others' are significant. (iv) Av. yield of grain in lb./ac.

Control = 610 lb./ac.

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
S_1	955	820	814	1089	853	1094	897	932
S_2	1247	946	978	1714	1257	1071	959	1167
Mean	1101	883	896	1402	1055	1082	928	1050

S.E. of marginal mean of T = 121.3 lb./ac.
S.E. of marginal mean of S = 64.8 lb./ac.
S.E. of body of table or control mean = 171.5 lb./ac.

———

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

Site :- M.A.E. Farm, Reora.   **Type 'M'.**

Object :—Type II—To study the effect of time of application of N to Paddy.

1. BASAL CONDITIONS :

   (i) (a) to (c) N.A.   (ii) (a) Mixed red and black soil.   (b) N.A.   (iii) N.A./June - July.   (iv) (a) to (e) N.A.
   (v) 20 lb./ac. of P_2O_5.   (vi) N.A.   (vii) Unirrigated.   (viii) and (ix) N.A.   (x) November—December.

2. TREATMENTS to 4.   GENERAL.

   Same as in expt. no. 54 (TCM) type II on page 86.

5. RESULTS :

   (i) 766 lb./ac.   (iii) 177.7 lb./ac.   (iii) Main effects of S and T are significant.   (iv) Av. yield of grain in lb./ac.

<div align="center">Control = 503 lb./ac.</div>

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
S_1	691	658	955	829	825	778	486	746
S_2	564	981	1048	848	759	855	718	825
Mean	628	819	1002	838	792	816	602	785

S.E. of marginal mean of T	= 72.5 lb./ac.
S.E. of marginal mean of S	= 38.8 lb./ac.
S.E. of body of table or control mean	= 102.6 lb./ac.

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

Site :- M.A.E. Farm, Reora.   **Type :- 'M'.**

Object :—Type VI—To find out the residual effect of P on the yield of Paddy.

1. BASAL CONDITIONS :

   (i) (a) to (c) N.A.   (ii) (a) Mixed red and black soil.   (b) N.A.   (iii) N.A./16.8.1955.   (iv) and (v) N.A.
   (vi) T—43.   (vii) Unirrigated.   (viii) and (ix) N.A.   (x) November—December.

2. TREATMENTS :

   Same as in expt. no. 56 (MAE) type VI (TCM) on page 67.

3. DESIGN :

   (i) R B.D.   (ii) (a) 12.   (b) N.A.   (iii) 4.   (iv) and (v) N.A.   (vi) Yes.

4. GENERAL :

   (i) Below normal.   (ii) Nil.   (iii) Grain yield.   (iv) (a) 1954—contd.   (b) Yes.   (c) Nil.   (v) to (vii) Nil.

5. RESULTS :

   (i) 475 lb./ac.   (ii) 82.3 lb./ac.   (iii) Treatment differences are highly significant.   (iv) Av. yield of grain
   in lb./ac.

Treatment	1	(2, 3, 8, 9)	4	5	6	7	10	11	12
Av. yield	312	403	393	376	491	608	548	560	797

S.E./mean except (2, 3, 8, 9)	= 41.2 lb./ac.
S.E./mean for (2, 3, 8, 9)	= 20.6 lb./ac.

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

Site :- M.A.E. Farm, Reora.   **Type :- 'M'.**

Object :—Type IX—To study the effects of N, P and F.Y.M. on the yield of Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Gram. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Mixed black and red soil. (b) N.A. (iii) 9.⁷.1955. (iv) (a) N,A. (b) Transplanting. (c) 65 lb./ac. (d) and (e) N.A. (v) Nil. (vi) N—22 (early). (vii) Un-irrigated. (viii) 2 weedings. (ix) 20.50". (x) 12.10.1955.

2. **TREATMENTS :**

All combinations of (1), (2) and (3) :
   (1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac. of N as A/S.
   (2) 3 levels of P_2O_5 as Triple Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.
   (3) 3 levels of F.Y.M. : $F_0=0$, $F_1=60$ and $F_2=120$ mds./ac.

3. **DESIGN :**

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) $40' \times 27'$. (b) $36' \times 23'$. (v) $2' \times 2'$. (vi) Yes.

4. **GENERAL :**

(i) Good. (ii) Nil. (iii) Biometric observations and yield of grain. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) (a) Bagwai. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 891.1 lb./ac. (ii) 254.1 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb /ac.

	P_0	P_1	P_2	F_0	F_1	F_2	Mean
N_0	763.0	846.1	902.1	786.0	761.8	963.5	837.1
N_1	766.2	1033.6	1034.9	971.2	850.5	1012.9	944.9
N_2	777.2	1062.2	834.2	910.8	882.4	880.3	891.2
Mean	768.8	980.7	923.7	889.3	831.6	952.2	891.1
F_0	696.2	1027.0	944.9				
F_1	666.3	955.8	872.6				
F_2	943.8	959.3	953.6				

S.E. of any marginal mean = 84.7 lb./ac.
S.E. of body of any table = 146.7 lb./ac.

Crop :- Paddy *(Kharif)*.

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

Ref :- M.P. 55(TCM).

Type :- 'M'.

Object :—Type X—To study the effect of different sources and levels of N on Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Mixed red and black soil. (b) N.A. (iii) N.A./13.8.1955. (iv) (a) to (e) N.A. (v) 20 lb./ac. of P_2O_5 as Super. (vi) T—136. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) November-December.

2. **TREATMENTS :**

Same as in expt. no. 55(TCM) type X on page 85.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) $40' \times 24'$. (b) $36' \times 20'$. (v) $2' \times 2'$. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—1956 (b) and (c) N.A. (v) (a) Bagwai. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 1056 lb./ac. (ii) 336.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 739 lb./ac.

	S_1	S_2	S_3	Mean
N_1	1019	851	1016	962
N_2	1140	1099	1128	1122
N_3	1399	1137	1129	1222
Mean	1186	1029	1091	1102

S.E. of any marginal mean   = 112.2 lb./ac.
S.E. of body of table or control mean = 194.3 lb./ac.

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

Centre :- Raipur (c.f.).   **Type :- 'M'.**

Object :—Type I—To study the effect of different sources and levels of N on Paddy.

1. BASAL CONDITIONS :

   (i) (a) to (c) N.A. (ii) Red and yellow soil. (iii) to (v) N.A. (vi) N.A./June. (vii) Unirrigated. (viii) and (ix) N.A. (x) Oct-Nov.

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'= 20 lb./ac. of N as Urea.
   Fertilizers broadcast in the last week of August.

3. DESIGN :

   (i) and (ii) For the layout of the expts. in each block, the villages were selected at random and a list of cultivators growing rice crop 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) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

   (i) Normal. (ii) No. (iii) Grain yield. (v) to (vii) Nil.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'
Av. yield	1239	1764	1981	1663	1838

   G.M. = 1698 lb./ac. ; S.E./mean = 64.2 lb..ac. and no. of trials = 24..

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

Centre :- Raipur (c.f.).   **Type :- 'M'.**

Object :—Type I—To study the effect of different sources and levels of N on Paddy.

1. BASAL CONDITIONS to 4. GENERAL :

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

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'
Av. yield	1344	1837	2266	1735	1873

G.M. = 1811 lb./ac. ; S.E./mean = 66.4 lb./ac. and no. of trials = 20.

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

Centre :- Raipur (c f.). **Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) .(a) to (c) N.A. (ii) Red and yellow soil. (iii) to (v) N.A. (vi) N.A./June. (vii) Unirrigated. (viii) and (ix) N.A. (x) Oct.-Nov.

2. TREATMENTS :

0 = Control.

p_1 = 20 lb./ac. of P_2O_5 as Super.

n_1p_1 = 20 lb./ac. of P_2O_5 as Super+20 lb./ac. of N as A/S.

n_2p_1 = 20 lb./ac. of P_2O_5 as Super+40 lb./ac. of N as A/S.

$n_1'p_1$ = 20 lb./ac. of P_2O_5 as Super+20 lb./ac. of N as Urea.

$n_2'p_1$ = 20 lb./ac. of P_2O_5 as Super+40 lb./ac. of N as Urea.

Fertilizers broadcast in the last week of August.

3. DESIGN :

(i) and (ii) For layout of the expts. in each block, the villages were selected at random and a list of culti-vators growing rice crcp 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) (a) and (b) N.A. (iv) Yes.

4. GENERAL:

(i) Normal. (ii) No. (iii) Grain yield. (v) to (vii) Nil.

5. RESULTS :

Treatment	0	p_1	n_1p_1	n_2p_1	$n_1'p_1$	$n_2'p_1$
Av. yield	1477	1758	2055	2254	2015	2265

G.M. = 1971 lb./ac. ; S.E./mean = 79.8 lb./ac. and no. of trials=24.

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

Centre :- Raipur (c.f.). **Type :- 'M'.**

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

1. BASAL CONDITIONS to 4. GENERAL :

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

5 RESULTS :

Treatment	0	p_1	n_1p_1	n_2p_1	$n_1'p_1$	$n_2'p_1$
Av. yield	1551	1921	2159	2520	2047	2209

G.M. = 2068 lb./ac. ; S.E./mean = 61.4 lb./ac. and no. of trials = 23.

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

Centre :- Raipur (c.f.). **Type :- 'M'.**

Object .—Type III—To study the effect of different sources and levels of N and P on Paddy.

1. BASAL CONDITIONS:

Same as in expt. no. 54(TCM) type II on page 90.

2. TREATMENTS:

0   =Control.

n_1 =20 lb./ac. of N as A/S.

n_1p_1 =20 lb /ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.

n_1p_2 =20 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super.

n_1p_1'=20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as B.M.

n_1p_2'=20 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as B.M.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 54(TCM) type II on page 90.

5. RESULTS :

Treatment	0	n_1	n_1p_1	n_1p_2	n_1p_1'	n_1p_2'
Av. yield	1444	1965	2012	2164	2056	2120

G.M. = 1960 lb./ac. ; S.E./mean = 69.4 lb./ac. and no. of trials = 25.

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

Centre :- Raipur (c.f.). **Type :- 'M'.**

Object :—Type III—To study the effect of different sources and levels of N and P on Paddy.

1. BASAL CONDITIONS :

Same as in expt. no. 54(TCM) type II on page 90.

2. TREATMENTS :

0   =Control.

n_1 =20 lb./ac of N as A/S.

n_1p_1 =20 lb./ac. of N as A/S+20 lb /ac. of P_2O_5 as Super.

n_1p_2 =20 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super.

n_1p_1''=20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Dicalcium Phos.

n_1p_2''=20 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Dicalcium Phos.

3. DESIGN to 4. GENERAL :

Same as in expt. no. 54(TCM) type II on page 90.

5. RESULTS :

Treatment	0	n_1	n_1p_1	n_1p_2	n_1p_1''	n_1p_2''
Av. yield	1415	1871	2102	2144	2003	1992

G.M. = 1921 lb./ac. ; S.E./mean = 52.8 lb./ac. and no. of trials = 23.

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

Centre :- Raipur (c.f.). **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 and yellow soil. (iii) to (v) N.A. (vi) N.A./June. (vii) Unirrigated. (viii) and (ix) N.A. (x) October—November.

2. TREATMENTS:

0	=Control.
n_1	=20 lb /ac. of N as A/S.
n_1p_1	=20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super .
n_1p_2	=20 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super.
$n_1p_1k_1$	=20 lb /ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.+20 lb./ac. of K_2O as Pot. Sul.
$n_1p_1k_2$	=20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super+40 lb./ac. of K_2O as Pot. Sul.

3. DESIGN :

(i) and (ii) For the layout of the experiment in each block, the villages were selected at random and a list of cultivators growing rice crop 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) (a) and (b) N.A. (iv) Yes.

4. GENERAL:

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

5. RESULTS :

Treatment	0	n_1	n_1p_1	n_1p_2	$n_1p_1k_1$	$n_1p_1k_2$
Av. yield	1355	1668	1763	1949	1902	1884

G.M. = 1754 lb./ac., S.E./mean 52.6 lb./ac. and no. of trials = 24.

————

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

Centre :- Raipur (c.f.). Type :- 'M'.

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

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 54 (TCM) type IV on page 91.

5. RESULTS :

Treatment	0	n_1	n_1p_1	n_1p_2	$n_1p_1k_1$	$n_1p_1k_2$
Av. yield	1394	1772	1852	2011	2037	2164

G.M. = 1872 lb./ac.. S.E./mean = 47.7 lb./ac. and no. of trials = 23.

————

Crop :- Paddy. Ref :- M.P. 54(6).

Site :- State Mechanised Farm, Reora. Type :- 'MV'.

Object :—To study the effect of different levels of N in combination with P on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Brinzal. (c) Nil. (ii) (a) Mixed red black soil. (b) N.A. (iii) 4.8.1954. (iv) (a) The land was prepared by plough. (b) Broadcasted. (c) N.A. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings. (ix) 23.20". (x) 12.10.1954.

2. TREATMENTS :

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

(1) 3 levels of N : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.

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

(3) 3 varieties : $V_1=T-43$, $V_2=T-126$ and $V_3=Local$ *Karghi.*

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) Nil. (iii) 1. (iv) (a) 40'×24'. (b) 36'×20'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) No lodging. (ii) Nil. (iii) Height and tillering weekly. (iv) (a) 1954—1955. (b) and (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) T—43 suffered very badly as there was no rain during September.

5. RESULTS :

(i) 311 lb./ac. (ii) 88.4 lb./ac. (iii) P effect is significant and V effect is highly significant. No other effect or interaction is significant. (vi) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	V_1	V_2	V_3
P_0	220	221	250	230	129	173	389
P_1	303	381	348	344	219	390	423
P_2	355	342	377	358	263	360	452
Mean	293	315	325	311	204	308	421
V_1	394	434	436				
V_2	274	250	399				
V_3	210	261	140				

S.E. of any marginal mean = 29.5 lb./ac.
S.E. of body of any table = 51.0 lb./ac.

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

Site :- **M.A.E. Farm, Bagwai.** Type :- **'MV'**

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black loam. (b) N.A. (iii) N.A./June—July. (iv) to (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) November—December.

2. TREATMENTS :

All combinations of (1), (2) and (3)
    (1) 3 varieties : V_1=Local, V_2 and V_3=Improved.
    (2) 3 levels of N : N_0=0, N_1=20 and N_2=40 lb./ac.
    (3) 3 levels of P_2O_5 : P_0=0, P_1=20 and P_2=40 lb./ac.
Fertilizers applied just before puddling.

3. DESIGN :

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

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1955—1956. (b) and (c) —. (v) to (vii) Nil.

5. RESULTS :

(i) 1845 lb./ac. (ii) 121.0 lb./ac. (iii) Main effects of V, N and P and interaction N×P are highly significant. Interaction V×P is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
V_1	1178	1916	2072	1722	1526	1813	1827
V_2	1229	2278	2478	1995	1608	2073	2304
V_3	1214	1887	2352	1818	1416	2104	1934
Mean	1207	2027	2301	1845	1517	1997	2022
P_0	1149	1568	1834				
P_1	1071	2262	2658				
P_2	1402	2251	2412				

S.E. of any marginal mean   =   40.3 lb./ac.

S.E. of body of any table   =   69.9 lb./ac.

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

Site :- M.A.E. Farm, Reora.   **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) (a) Mixed red and black soil.   (b) N.A.   (iii) N.A./Last week of July.   (iv) to (vi) N.A.   (vii) Unirrigated.   (viii) N.A.   (ix) 32".   (x) October.

2. **TREATMENTS :**

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

   (1) 3 varieties : V_1=Local, V_2=T—136 and V_3=T—43.

   (2) 3 levels of N : N_0=0, N_1=20 and N_2=40 lb./ac.

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

3. **DESIGN :**

   (i) 3^3 confd.   (ii) (a) 9 plots/block ; 3 blocks/replication.   (b) N.A.   (iii) 1.   (iv) (a) N.A.   (b) 36'×20'. (v) N.A.   (vi) Yes.

4. **GENERAL :**

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

5. **RESULTS :**

   (i) 736 lb./ac. (ii) 209.0 lb./ac. (iii) Main effect of V is highly significant and effect of P is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
V_1	931	1027	1032	997	921	1001	1069
V_2	648	591	945	728	410	923	851
V_3	498	617	332	482	306	519	621
Mean	692	745	770	736	546	814	847
P_0	521	523	594				
P_1	716	903	823				
P_2	839	809	893				

S.E. of any marginal mean   =   69.7 lb./ac.

S.E. of body of any table   =   120.7 lb./ac.

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

Site :- M.A.E. Farm, Reora.   **Type :- 'MV'.**

Object :—Type VIII—To study the effect of N and P on different varieties of Paddy.

1. **BASAL CONDITIONS :**

   (i) to (viii) Same as in expt. no. 54(TCM) type VIII above.   (ix) N.A.   (x) November-December.

2. **TREATMENTS to 4. GENERAL :**

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

5. RESULTS :

(i) 826 lb./ac. (ii) 185.1 lb./ac. (iii) Main effects of V and P are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
V_1	880	982	1116	993	779	1070	1130
V_2	557	599	752	636	472	674	762
V_3	914	835	801	850	360	1047	1143
Mean	784	805	890	826	537	930	1012
P_0	463	496	652				
P_1	921	928	941				
P_2	968	991	1077				

S.E. of any marginal mean   =   61.7 lb./ac.

S.E. of body of any table   =   106.9 lb./ac.

———

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 54(71).**

Site :- Agri Res. Stn., Bagwai.   **Type :- 'C'.**

Object :—To find out the optimum spacing and number of seedlings per hill for Paddy crop under irrigated condition.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 9.8.1954 to 11.8.1954. (iv) (a) and (b) One ploughing by *desi* plough, *bakharing*, puddling before transplantation. (c) N.A. (d) and (e) As per treatments. (v) 20 C.L./ac. of F.Y.M. (vi) T—21 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 32.84". (x) 20.12.1954.

2. TREATMENTS :

Main-plot treatments :
  3 spacings between rows : $R_1=6''$, $R_2=9''$ and $R_3=12''$.
Sub-plot treatments :
  3 spacings between plants : $P_1=3''$, $P_2=6''$ and $P_3=9''$.
Sub-Sub-plot treatments :
  6 no. of seedlings per hole : $S_1=1$, $S_2=2$, $S_3=3$, $S_4=4$, $S_5=5$ and $S_6=6$.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot and 6 sub-sub-plots/sub-plot. (b) N.A. (iii) 6. (iv) (a) Main-plot 72'×24', 72'×27', 72'×30', sub-plot 24'×24', 24'×27', 24'×30' and sub-sub-plot 24'×4', 24'×4½', 24'×5'. (b) 20'×3'. (v) One row on both sides and 2' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Weight of grain and *bhusa*. (iv) (a) 1952—1954. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1630 lb./ac. (ii) (a) 1167.8 lb./ac. (b) 643.6 lb./ac. (c) 858.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	S₁	S₂	S₃	S₄	S₅	S₆	Mean	P₁	P₂	P₃
R₁	1658	1746	1815	1730	1758	1989	1783	1922	1803	1622
R₂	1378	1697	1653	1653	1669	1791	1640	1761	1593	1566
R₃	1320	1299	1471	1517	1637	1555	1466	1577	1466	1356
Mean	1452	1581	1646	1633	1688	1778	1630	1754	1620	1515
P₁	1637	1668	1787	1829	1726	1874				
P₂	1413	1615	1644	1615	1721	1715				
P₃	1306	1459	1507	1455	1617	1746				

S.E. of difference of two

1. R marginal means   = 158.9 lb./ac.   5. R means at the same level of P   = 201.4 lb./ac.
2. P marginal means   = 87.6 lb./ac.   6. S means at the same level on R or P = 286.2 lb./ac.
3. S marginal means   = 165.2 lb./ac.   7. R means at the same level of S   = 305.8 lb./ac.
4. P means at the same level of R   = 151.7 lb./ac.   8. P means at the same level of S   = 275.6 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 54(97).**

Site :- Govt. Seed and Demons. Farm, Durg.   **Type :- 'C'.**

Object :—To compare different methods of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) *Kanhar.* (b) N.A. (iii) As per treatments. (iv) (a) 2 ploughings by country plough. (b) to (e) As per treatments. (v) F.Y.M. at 40 lb./ac. of N on 30.5.1954. (vi) *Gurmatia* (late). (vii) Irrigated. (viii Weeding. (ix) 41.10″. (x) 18.11.1954.

2. TREATMENTS :

T₁ = Broadcast and *biassi* at 100 lb./ac. on 4.7.1954.
T₂ = Sown in lines 9″ apart at 70 lb./ac. on 4.7.1954.
T₃ = Transplantation by Japanese method 9″×9″ on 10 8.1954.

3. DESIGN :

(i) R.B D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 49½′×22′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) A minor attack of gross-hoppers. Controlled by dusting Gammexane. (iii) Weight of grain. (iv) (a) 1954—contd. (b) N.A. (c) Nil. (v) (a) Labhandi. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1771 lb./ac. (ii) 286.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T₁	T₂	T₃
Av. yield	1698	1779	1836

S.E./mean = 116.9 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 55(70).**

Site :- Govt Seed and Demons. Farm, Durg.   **Type :- 'C'.**

Object :—To compare different methods of Paddy cultivation.

1. **BASAL CONDITIONS:** .

(i) (a) Nil. (b) Paddy. (c) F.Y.M. at 20 lb./ac. of N+45 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super. (ii) (a) N.A. (b) *Kanhar.* (iii) N.A. (iv) (a) 2 ploughings by country plough. (b) to (e) As per treatments. (v) F.Y.M. at 20 lb./ac. of N+45 lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super on 24.7.1955 and 24.8.1955. (vi) *Gurmatia.* (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 17.11.1955.

2. **TREATMENTS :**

T_1=Broadcast.
T_2=Sown in lines 9″ apart.
T_3=Transplanted by Japanese method. .

3. **DESIGN:**

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) $49\frac{1}{2}'\times22'$. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. After the application of 2nd dose of the fertilizers, the transplanted and broadcast treatments have shown good growth in comparision to the rest of the treatments. (ii) Nil. (iii) Grain weight. (iv) (a) 1954—oontd. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**

(i) 2313 lb./ac. (ii) 254.4 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	2600	2033	2307

S.E./mean = 103.8 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 56(101).**

Site :- Govt. Seed and Demons. Farm, Durg.   **Type :- 'C'.**

Object :—To compare different methods of Paddy cultivation.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Dorsa.* (b) N.A. (iii) N.A. (iv) (a) 2 ploughings by *desi* plough. (b) As per treatments. (c) 80 lb./ac. (d) and (e) As per treatments. (v) 50 lb./ac. of A/S and 50 lb./ac. of Super. (vi) *Gurmatia.* (vii) Irrigated. (viii) 2 weedings. (ix) 32.55″. (x) N.A.

2. **TREATMENTS :**

T_1=*Biassi* method of paddy cultivation, T_2=Paddy sown in lines 9″ spacing, T_3=Transplanted by Japanese method 9″×9″ spacing and 3-4 seedlings/hole.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) $49\frac{1}{2}'\times22'$. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1958. (b) No. (c) Nil. (v) (a) Labhandi and Sarkhanda . (vi) Nil. (vii) The expt. was not conducted during the year 1957.

5. **RESULTS :**

(i) 2348 lb./ac. (ii) 325.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	2388	2338	2317

S.E./mean = 132.7 lb./ac.

Crop :- Paddy *(Kharif).*　　　　　　　　　　　**Ref :- M.P. 58(73).**

Site :- Govt. Seed and Demons. Farm, Durg.　　　**Type :- 'C'.**

Object :—To compare different methods of Paddy cultivation.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Dorsa. (b) N.A. (iii) 11.7.1958/22.8.1958. (iv) (a) Two ploughings by *desi* plough. (b) As per treatments. (c) 80—100 lb./ac. (d) and (e) As per treatments. (v) 50 lb./ac. of A/S+50 lb./ac. of Super (vi) *Gurmatia.* (vii) Irrigated. (viii) 2 weedings. (ix) 43.79″. (x) 25.11.1958.

2. **TREATMENTS :**

T_1=*Biassi* method of paddy cultivations, T_2=Paddy sown in lines 9″ spacing between lines and T_3= Transplanted by Japanese method : 9″×9″ spacing and 3-4 seedlings/hole.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) 26′×53½′. (b) 22′×49½′. (v) 2′×2′. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1958. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) The expt. was not conducted during the year 1957.

5. **RESULTS :**

(i) 1208 lb./ac. (ii) 234.2 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	1348	1396	880

S.E./mean　　　=　104.7 lb./ac.

Crop :- Paddy *(Kharif).*　　　　　　　　　　　**Ref :- M.P. 57(46).**

Site :- Govt. Agri. Res. Stn., Jhabua.　　　　　　**Type :- 'C'.**

Object :—To find out the most optimum seed rate of Paddy in order to increase the production under local conditions.

1. **BASAL CONDITIONS :**

(i) to (iii) N.A. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N,A. (v) to (x) N.A.

2. **TREATMENTS :**

4 seed rates : R_1=25, R_2=30, R_3=35 and R_4=40 srs./ac.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 24½′×10½. (v) N.A. (vi) Yes.

4. **GENERAL :**

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

5. **RESULTS :**

(i) 3156 lb./ac. (ii) 686 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3	R_4
Av. yield	2715	2829	3551	3538

S.E./mean　　　=　343 lb./ac.

Crop :- Paddy (*Kharif*). Ref :- M.P. 58(100).

Site :- Govt. Agri. Res. Farm, Kuthulia (Rewa). Type :- 'C'.

Object :—To find out the best method of sowing for better yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Wheat. (b) Wheat. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 20.7.1958. (iv) (a) 3 plougings. (b) As per treatments. (c) 40 lb /ac. (d) 9″×9″ for transplanting. (e) N.A. (v) Nil. (vi) T—21. (vii) Unirrigated. (viii) Nil. (ix) 39.6″. (x) 23.10.1958.

2. TREATMENTS :

4 method of sowings : C_1=Broadcasting, C_2=Germinated seed sowing, C_3=Transplanting, C_4=*Biassi* (sowing 1 md. of paddy with 5 sr. *Dhaincha* seed/ac. and plucking *Dhaincha* after 4 weeks of sowing).

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 80′×14′. (v) (a) and (b) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 626 lb./ac. (ii) 187.4 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	C_1	C_2	C_3	C_4
Av. yield	495	400	845	765

S.E./mean = 93.7 lb./ac.

Crop :- Paddy. Ref :- M.P. 54(83).

Site :- Govt. Res. Farm, Labhandi. Type :- 'C'.

Object :—To compare different methods of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi*. (b) Refer soil analysis, Labhandi. (iii) As per treatment. (iv) (a) Ploughing and cross ploughing. (b) As per treatments. (c) to (e) N.A. (v) N.A. (vi) *Gurmatia* (medium). (vii) Irrigated. (viii) Weeding. (ix) 44.52″. (x) N.A.

2. TREATMENTS :

T_1=Sown by broadcasting at 100 lb./ac. on 14.7.1954 and *biassi* on 18.8.1954.
T_2=Drilled in lines 9″ apart at 70 lb./ac.
T_3=Seedlings transplanted on 18.8.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 33′×33′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good growth and no lodging. (ii) Nil. (iii) Weight of grain. (iv) (a) 1952—1955. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1302 lb./ac. (ii) 122.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	1473	893	1540

S.E./mean = 49.8 lb./ac.

Crop :- Paddy.

Site :- Govt. Res. Farm, Labhandi.

Ref :- M.P. 55(26).

Type :- 'C'.

Object : –To compare the effect of different methods of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Kanhar.* (b) Refer soil analysis, Labhandi. (iii) As per treatments. (iv) 2 ploughings and harrowing. (b) and (c) As per treatments. (d) and (e) N.A. (v) 20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super broadcasted at the time of *biassi,* drilled in plots and applied at the time of puddling in case of transplanting. (vi) R—4 *Gurmatia.* (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 26.11.1955.

2. TREATMENTS :

T_1=Paddy sown by broadcast at 100 lb./ac. on 13.7.1955 and *biassi* 18.8.1955.
T_2=Paddy drilled in lines at 50 lb./ac.
T_3=Transplanting on 18.8.1955.

3. DESIGN :

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

4. GENERAL :

(i) Good. No lodging. (ii) and (iii) Nil. (iv) (a) 1952—1955. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1558 lb./ac. (ii) 265.2 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	1434	1400	1841

S.E./mean = 108.2 lb./ac.

Crop :- Paddy *(Kharif).*

Site :- Govt. Res. Farm, Labhandi.

Ref :- M.P. 56(113).

Type :- 'C'.

Object :—To compare different methods of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Kanhar.* (b) Refer soil analysis, Labhandi. (iii) 21.6.1956. (iv) (a) 2 ploughings by *desi* plough. (b) to (e) As per treatments. (v) F.Y.M. at 40 lb./ac. (vi) *Gurmatia.* (vii) Irrigated. (viii) *Biassi* operation in T_1 1 weeding by hand. (ix) 39.94". (x) 11.11.1956.

2. TREATMENTS :

T_1=Paddy sown by broadcasting at 100 lb./ac. and *biassi.*
T_2=Paddy drilled in lines at 50 lb./ac.
T_3=Seedlings transplanted (9"×9" spacing and 4 seedlings/hole).

3. DESIGN :

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

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1952—1956. (b) N.A. (c) Nil. (v) (a) Durg and Waraseoni. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1491 lb./ac. (ii) 129.0 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	1413	1427	1633

S.E./mean = 52.7 lb./ac.

———

Crop :- Paddy *(Kharif)*. **Ref :- M.P. 58(64).**

Site :- State Mechanised Farm, Reora. **Type :- 'C'.**

Object :—To study the effect of different methods of sowing on the yield of Paddy crop.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) As per treatments. (iv) (a) Ploughing by *desi* plough. (b) As per treatments. (c) N.A. (d) Row to row 10″. (e) N.A. (v) 112 lb./ac. of Super+56 lb./ac. of A/S. (vi) T—43. (vii) Unirrigated. (viii) 2 weedings and *biassi* on 4.9.1958. (ix) and (x) N.A.

2. **TREATMENTS :**

4 sowing methods : T_1=Broadcasting on 5.8.1958, T_2=Sowing germinated seed on 5.8.1958, T_3=Transplanting on 11.8.1959 and T_4=*Biassi* on 5.8.1958.

3. **DESIGN :**

(i) R.B D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 26′×17′. (b) 24′×15′. (v) 1′×1′. (vi) Yes.

4. **GENERAL :**

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

5. **RESULTS :**

(i) 1053 lb./ac. (ii) 177.4 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3	T_4
Av. yield	938	968	1391	915

S.E./mean = 72.4 lb./ac.

———

Crop :- Paddy *(Kharif)*. **Ref :- M.P. 59(144).**

Site :- State Mechanised Farm, Reora. **Type :- 'C'.**

Object :—To study the effect of different cultural practices at the time of sowing of Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Paddy—Gram. (b) Gram. (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 28, 29.7.1959. (iv) (a) 2 ploughings. (b) As per treatments. (c) 70 lb./ac. (d) 8″ between rows. (e) N.A. (v) Nil. (vi) EB—17. (vii) Unirrigated. (viii) 2 weedings. (ix) 55.2″. (x) 27.10.1959.

2. **TREATMENTS :**

6 methods of sowing : C_1=Sowing in lines dry, C_2=Transplanting, C_3=(Puddling) *lau* broadcasting, C_4=(Puddling) *lau* in line, C_5=*Biassi* and C_6=Sowing broadcast.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 33′×16½′. (v) Nil. (vi) Yes.

4. **GENERAL :**

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

5. **RESULTS :**

(i) 590 lb./ac. (ii) 257.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	C_1	C_2	C_3	C_4	C_5	C_6
Av yield	480	657	790	480	597	537

S.E /mean = 105.0 lb./ac.

Crop :- Paddy *(Kharif)*.

Site :- State Mechanised Farm, Reora.

Ref :- M.P. 59(145).

Type :- 'C'.

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

1. BASAL CONDITIONS :

(i) (a) Paddy—Gram. (b) Gram. (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 25.7.1959. (iv) (a) 3 ploughings. (b) Broadcasting. (c) 70 lb./ac. (d) and (e) N.A. (v) Nil. (vi) N—22. (vii) Unirrigated. (viii) 2 weedings. (ix) 55.2". (x) 7.10.1960.

2. TREATMENTS :

4 seed rates : $S_1 = 10$, $S_2 = 20$, $S_3 = 30$ and $S_4 = 40$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 38'×18'. (b) 36'×16'. (v) 1'×1'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 751 lb./ac. (ii) 194.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatments	S_1	S_2	S_3	S_4
Av. yield	573	885	825	721

S.E./mean = 70.3 lb./ac.

Crop :- Paddy.

Site :- State Mechanised Farm, Reora.

Ref :- M.P. 59(N.A.).

Type :- 'C'.

Object :—To study the effect of different cultural practices on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy—Gram (b) Gram. (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 27.7.1959. (iv) (a) 3 ploughing. (b) Broadcasting. (c) 70 lb./ac. (d) 8" between rows. (e) N.A. (v) Nil. (vi) N—22. (vii) Unirrigated. (viii) Two weedings. (ix) N.A. (x) 25.10.1959.

2. TREATMENTS :

5 cultural treatments : $T_1 = $No cultivation immediately after harvest, $T_2 = $Cultivation immediately after harvest by *desi* plough once, $T_3 = $Cultivation immediately after harvest by *desi* plough twice (cross), $T_4 = $Cultivation immediately after harvest by light iron plough (once) and $T_5 = $Cultivation immediately after harvest by light iron plough twice (cross).

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 8. (iv) (a) and (b) 14'×60'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) to (vii) N.A.

5. RESULTS :

(i) 587 lb./ac. (ii) 60.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3	T_4	T_5
Av. yield	518	570	603	622	622

S.E./mean = 21.4 lb./ac.

Crop :- Paddy *(Kharif)*. Ref :- M.P. 54(91).

Site :- Govt. Res. Farm, Waraseoni. Type :- 'C'.

Object :—To compare the effect of different methods of Paddy sowing.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) Two types of soils. Sandly loam and loamy. (b) N.A. (iii) 26.6.1954. (iv) (a) Land was pulvarised and levelled. (b) to (e) As per treatments. (v) N.A. (vi) *Luchai*× *Gurmatia* (late) (vii) Irrigated. (viii) N.A. (ix) 34.42". (x) 15.11.1954.

2. TREATMENTS :

T_1=Broadcasting at 100 lb./ac. on 26.6 1954.
T_2=Line sowing ie. hand dibbling at 70 lb./ac. on 26.6.1954.
T_3=Transplantation by Japanese method with spacing 9"×9" on 25.7.1954.

3. DESIGN :

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

4. GENERAL :

(i) and (ii) N.A. (iii) Height, tillering, weight of grain and straw. (iv) (a) 1954—N.A. (b) N.A. (c) Nil. (v) (a) Labhandi and Durg. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1212 lb./ac. (ii) 278.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	969	732	1936

S.E./mean = 113.6 lb./ac.

Crop :- Paddy *(Kharif)*. Ref :- M.P. 59(74)

Site :- Govt. Res. Farm, Waraseoni. Type :- 'C'.

Object :—To compare different methods of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Morand.* (b) N.A. (iii) N.A. (iv) (a) Ploughing and cross ploughing (b) Transplanted. (c) 80 lb./ac. (d) and (e) As per treatments. (v) N.A. (vi) *Bud Bako*× *Burma.* (vii) Irrigated. (viii) One hand weeding and digging. (ix) 49.46". (x) N.A.

2. TREATMENTS :

T_1=Local method of Paddy cultivation : spacing 4"×4" and one seedling/hole
T_2=Japanese method of Paddy cultivation : spacing 9"×9" and 4 seedling/hole.
T_3=Chainese methods of Paddy cultivation : spacing 6"×6" and 2 seedlings/hole.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 2. (iv) (a) T_1=28⅝'×28⅝' ; T_2=26⅔'×26⅔' and T_3=28'×28'. (b) T_1= 1/53 ac., T_2=1/60.6 ac. and T_3=1/55.6 ac. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Very poor. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) No. (v) (a) and (b) N.A. (vi) Nil. (vii) Results taken from annual report.

5. RESULTS :

(i) 1071 lb./ac. (ii) 108.6 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	821	1697	695

S.E/mean = 76.8 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 54(127).**

Site :- Govt. Res. Farm, Labhandi.   **Type :- 'CV'.**

Object :—To study the economics of growing late Paddy alone against medium Paddy followed by Utera crops.

1. BASAL CONDITIONS :

(i) (a) and (b) N.A. (c) Nil. (ii) (a) *Dorsa.* (b) N.A. (iii) Paddy 8, 11, 6.1954/7.8.1954 and Utera crops : 4.11.1954. (iv) (a) 2 ploughings by meston plough, puddling by wooden *datari* and levelling (b) transplanting. (c) Paddy 70 lb./ac. and utera crops N.A. (d) $4'' \times 5''$. (e) N.A. (v) 40 lb./ac. of N as F.Y.M. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 40.19". (x) 25.11.1954.

5. TREATMENTS :

4 treatments : T_1=Paddy cross no. 116 followed by lakh, T_2=Paddy cross no. 116 followed by urid, T_3= Paddy cross no. 116 followed by linseed and T_4=Paddy *Luchai* × *Gurmatia* × *Burma* no. 2 alone.

3. DESIGN :

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

4. GENERAL :

(i) Not satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) N.A. (vii) As the other crops failed yield analysis of Paddy is given.

5. RESULTS :

(i) 1020 lb./ac. (ii) 109.54 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3	T_4
Av. yield	1008	992	1080	1000

S.E./mean = 48.99 lb./ac.

Crop :- Paddy   **Ref :- M.P. 58(75).**

Site :- Govt. Res. Farm, Labhandi.   **Type :- 'CV'.**

Object :—To find out the economics of growing late Paddy alone, against medium Paddy followed by Utera crops.

1. BASAL CONDITIONS :

(i) (a) Utera crops—Paddy. (b) As per treatments. (c) 40 lb./ac. of N as F.Y.M. (ii) (a) *Matasi.* (b) N.A. (iii) 4.8.1958. (iv) 2 ploughings by *desi* plough. (b) Transplanting. (c) 80 lb./ac. (d) $4'' \times 4''$. (e) 1 to 2 seeds/hole. (v) 40 lb./ac. of N as F.Y.M. (vi) As per treatments. (vii) Irrigated. (viii) 1 hand weeding. (ix) 61.51". (x) 10.12.1958.

2. TREATMENTS :

4 treatments : T_1=Paddy cross no. 116 (medium) followed by *lakh*, T_2=Paddy cross no. 116 (medium) followed by urid, T_3=Paddy cross no. 116 (medium) followed by linseed ana T_4=Paddy *Luchai × Gurmatia × Burma* no. 2 (late) alone.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 33'× 33'. (b) 31'×31'. (v) 1'×1'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1953—1958. (b) Yes. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Nil. (vii) For other years, money value analysis of the combined yield of different crops was done and the experiments were given in mixed crop. Here, yields of other crops N.A.

5. RESULTS :

(i) 2774 lb./ac. (ii) 261.69 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	
Av. yield	2611	2584	2656	3245	

S.E./mean = 117.03 lb./ac.

Crop : Paddy

Site :- Govt. Agri. Res. Farm, Waraseoni.

Ref :- M.P. 56(110).

Type :- 'CV'.

Object :—To ascertain the effect of different dates of sowing on different Paddy varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Morand*. (b) N.A. (iii) As per treatments. (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c) 80 lb./ac. (d) 4"×4". (e) 2. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) One weeding by hand. (ix) 57.07". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 dates of transplanting : D_1=10.7.1956 ; D_2=25.7.1956 and D_3=2.8.1956.
(2) 3 varieties : V_1=E.B.—17 ; V_2=cross no. 116 and V_3=*Luchai* (late).

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 ac. (v) and (vi) N.A.

4. GENERAL :

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

5. RESULTS :

(i) 1669 lb./ac. (ii) 166.3 lb./ac. (iii) D effect is highly significant. V effect is significant. Interaction is not significant. (iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	Mean
V_1	1540	1930	1860	1777
V_2	1400	1850	1780	1677
V_3	1520	1710	1430	1553
Mean	1487	1830	1690	1669

S.E of V or D marginal mean = 48.0 lb /ac.
S.E. of body of table = 83 2 lb./ac.

———

Crop :- Paddy.   **Ref :- M.P. 54(59).**

Site :- Govt. Agri. Res. Stn., Adhartal.   **Type :- 'CM'.**

Object : —To find out the economical ratio of N and P and different methods of cultivation on the yield of Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra*. (b) N.A. (iii) M_3 on 2.7.1954, M_1 and M_2 between 13 to 16.7. 1954. (iv) (a) One ploughing. (b) As per treatments. (c) to (e) N.A. (v) N.A. (vi) Paddy no. 17 (early). (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 13.10.1954 to 18.10.1954 and 28.10.1954

2. **TREATMENTS :**

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

(1) 3 methods of sowing : M_1=Transplanting, M_2=*Machewa* and M_3=Broadcasted.
(2) 3 levels of N as A/S : N_0=0, N=15 and N_2=30 lb./ac.
(3) 3 levels of P_2O_5 as Super : P_0=0, P_1=15 and P_2=30 lb./ac.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Fair. (ii) N.A. (iii) Weight of grain and straw. (iv) (a) 1952—1956. (b) Yes. (c) N.A. (v) (a) Labhandi. (b) N.A (vi) and (vii) Nil.

5. **RESULTS :**

(i) 625 lb./ac. (ii) 131.2 lb./ac. (iii) Main effects of M, N and P are highly significant. No interaction is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
M_1	878	971	1098	982	901	997	1048
M_2	350	507	747	525	451	565	588
M_3	253	355	464	357	275	368	429
Mean	494	611	770	625	542	643	688
P_0	455	525	647				
P_1	491	658	781				
P_2	535	650	881				

S.E. of any marginal mean = 21.87 lb./ac.
S.E. of body of any table = 37.87 lb./ac.

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Crop :- Paddy.   **Ref :- M.P. 55(35).**

Site :- Govt. Agri. Res. Stn., Adhartal.   **Type :- 'CM'.**

Object :—To find the economical ratio of N and P and different methods of cultivation on the yield of Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra* (sandy). (b) N.A. (iii) 1, 2, 5.8.1955. (iv) (a) Ploughing. (b) As per treatments. (c) 90 lb./ac. (d) and (e) N.A. (v) F.Y.M at 40 lb./ac. of N. (vi) *Nungi* no. EB—17 (early). (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 10.11.1955.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(59) on page 106.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Grain and straw weight. (iv) (a) 1952—1956. (b) Yes. (c) N.A. (v) (a) Labhandi. (b) N.A (vi) and (vii) Nil.

5. RESULTS :

(i) 1083 lb./ac. (ii) 423.2 lb./ac (iii) M effect is highly significant and N effect is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
M_1	1154	1241	1587	1327	1221	1341	1421
M_2	1047	1080	1127	1085	980	1194	1080
M_3	707	840	960	836	794	740	974
Mean	969	1054	1225	1083	998	1092	1158
P_0	867	1014	1114				
P_1	1047	974	1254				
P_2	994	1174	1307				

S.E. of any marginal mean = 70.5 lb./ac.
S.E. of body of any table = 122.2 lb./ac.

— — —

Crop :- Paddy.   **Ref :- M.P. 56(2).**

Site :- Govt. Agri. Res. Farm, Adhartal.   **Type :- 'CM'.**

Object :—To find the economical ratio of N and P on different methods of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra* (sandy). (b) N.A. (iii) 10.8.1956, 4.8.1956 and 2.8.1956. (iv) (a) 2 ploughings by maston plough and *patia*. (b) As per treatments. (c) 40 lb./ac. for M_1 and lb./ac. for M_2 and M_3. (d) and (e) N.A. (v) Nil. (vi) Paddy no. 17. (vii) Irrigated. (viii) 2 weedings by hand. (ix) and (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(59) on page 106.

4. GENERAL :

(i) Crop growth was below normal. Lodging occurred. (ii) Nil. (iii) Grain and straw weight. (iv) (a) 1952—1956. (b) Yes. (c) Nil. (v) (a) Labhandi. (b) N.A. (vi) Nil. (vii) Experiment conducted by Richhai section.

5. RESULTS :

(i) 618 lb./ac. (ii) 412.1 lb./ac. (iii) M effects alone are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
M_1	1187	1459	1340	1329	1159	1261	1564
M_2	289	380	437	369	332	395	379
M_3	165	147	155	156	187	139	141
Mean	547	662	644	618	560	599	675
P_0	627	432	619				
P_1	569	722	505				
P_2	444	832	808				

S.E. of any marginal mean   = 68.7 lb./ac.
S.E. of body of table   = 119.0 lb./ac.

Crop :- Paddy.   **Ref :- M.P. 54(60).**

Site :- Govt. Agri. Res. Stn., Adhartal.   **Type :- 'CM'.**

Object:—To find out a suitable manurial dose for Paddy sown with different spacings and no. of seedlings/hole.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra.* (b) N.A. (iii) 5 to 12.8.1954. (iv) (a) Ploughing and preparing of land. (b) Transplanting. (c) N A. (d) and (e) As per treatments. (v) F.Y.M. or compost at 10 C.L /ac. (vi) *Luchai×Gurmaiia×Burma* (late). (vii) Irrigated. (viii) N.A. (ix) 57.67". (x) 29 to 31.12.1954.

2. **TREATMENTS :**

Main-plot treatments :

M_1 40 lb./ac. of N+40 lb./ac. of P_2O_5 applied at the time of transplanting, $M_2=$40 lb./ac. of N+ 40 lb./ac. of P_2O_5, $M_3=$60 lb./ac. of N+60 lb./ac. of P_2O_5 and $M_4=$80 lb./ac. cf N+80 lb./ac. of P_2O_5.

N applied as A/S and P_2O_5 as Super. Treatments M_2, M_3 and M_4 applied in two doses half at transplanting and half one month after.

Sub-plot treatments :

All combinations of (1) and (2; +an etxra treatment $D_0S_0=$4"×4" with 1 seedling/hole.

(1) 2 spacings : $D_1=$9"×6" and $D_2=$9"×9".

(2) seedlings/hole : $S_1=$2 and $S_2=$4.

3. **DESIGN :**

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/50 ac. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. **GENERAL :**

(i) Fair. (ii) N.A. (iii) Height, tillers, weight of grain and straw. (iv) (a) 1953—1958. (b) Yes. (c) N.A. (v) (a) Labhandi. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 2213 lb./ac. (ii) (a) 1770.8 lb./ac. (b) 414.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	M_4	Mean
D_0S_0	2080	2720	2120	2340	2315
D_1S_1	2100	2700	2440	2180	2355
D_2S_1	1540	2480	1980	1980	1995
D_1S_2	1800	2460	2180	2480	2230
D_2S_2	1840	2960	2120	1760	2170
Mean	1872	2664	2168	2148	2213

S.E. of difference of two

1. M marginal means   = 560.0 lb./ac.
2. DS marginal means   = 146.5 lb./ac.
3. DS means at the same level of M   = 292.8 lb./ac.
4. M means at the same level of DS   = 618.1 lb./ac.

Crop :- Paddy.   **Ref :- MP. 55(33).**

Site :- Govt. Agri. Res. Stn., Adhartal.   **Type :- 'CM'.**

Object :—To find out a suitable manurial dose for Paddy sown with different spacings and no. of seedlings/ hole.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra* (sandy). (b) N.A. (iii) 26.7.1955 to 29.7.1955. (iv) (a) N.A. (b) Transplanting. .(c) N.A. (d) and (e) As per treatments. (v) N.A. (vi) *Luchai × Gurmatia × Burma* (late). (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 21.12.1955.

2. TREATMENTS and 3. DESIGN :
   Same as in expt. no. 54(60) on page 108.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Weight of grain and straw yield. (iv) (a) 1953—1958. (b) Yes. (c) N.A. (v) (a) Labhandi. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1425 lb./ac. (ii) (a) 392.0 lb./ac. (b) 407.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	M_4	Mean
D_0S_0	1837	1735	1757	1127	1614
D_1S_1	1102	1405	1195	1485	1297
D_1S_2	1579	1207	1447	1675	1477
D_2S_1	1385	1267	1347	1405	1351
D_2S_2	1452	1397	1377	1325	1388
Mean	1471	1402	1425	1403	1425

S.E. of difference of two

1. M marginal means   = 124.0 lb./ac.
2. DS marginal means   = 144.0 lb./ac.
3. DS means at the same level of M   = 288.0 lb./ac.
4. M means at the same level of DS   = 285.8 lb./ac.

Crop :- Paddy.   **Ref :- M.P. 56(50).**

Site :- Govt. Agri. Res. Stn., Adhartal.   **Type :- 'CM'.**

Object :—To find out a suitable manurial dose for Paddy sown with different spacings and no. of seedlings/ hole.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra.* (b) N.A. (iii) 25, 26.7.1956. (iv) (a) Ploughing, cross ploughing, puddling and levelling. (b) Transplanted. (c) N.A. (d) and (e) As per treatments. (v) F.Y.M. at 10 C.L./ac. broadcasted before ploughing. (vi) *Luchai × Gurmatia × Burma* (late). (vii) N.A. (viii) 1 weeding. (ix) 68.67". (x) 28, 29.12.1956.

2. TREATMENTS and 3. DESIGN :
   Same as in expt. no. 54(60) on page 108.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Weight of grain. (iv) (a) 1953—1958. (b) Yes. (c) N.A. (v) (a) Betul and Labhandi. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2206 lb./ac. (ii) (a) 511.0 lb./ac. (b) 483.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	M₁	M₂	M₃	M₄	Mean
D₀S₀	2127	1903	2187	1866	2021
D₁S₁	2192	2087	2367	2123	2192
D₁S₂	1867	1724	2043	2425	2015
D₂S₁	2432	2129	2527	2181	2317
DₛS₂	2353	2223	2521	2846	2486
Mean	2194	2013	2329	2288	2206

S.E. of difference of two

1. M marginal means   = 161.6 lb./ac.
2. DS marginal means   = 170.8 lb./ac.
3. DS means at the same level of M   = 341.6 lb./ac.
4. M means at the same level of DS   = 346.0 lb./ac.

Crop :- Paddy.   **Ref :- M.P. 57(30).**

Site :- Govt. Agri. Res. Stn., Adhartal.   **Type :- 'CM'.**

Object :—To find out a suitable manurial dose for Paddy sown with different spacings and no. of seedlings/hole.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra.* (b) N.A. (iii) 8, 9 and 13.8.1957. (iv) (a) Ploughing, cross ploughing, puddling and levelling. (b) Transplanted. (c) N.A. (d) and (e) As per treatments. (v) F.Y.M. broadcasted before ploughing at 10 C.L./ac. (vi) *Luchai × Gurmatia × Burma* (late). (vii) N.A. (viii) 2 weedings. (ix) 35.19″. (x) 20, 23.12.1957.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(60) on page 108.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Average height and average no. of tillers per plant. Weight of grain and straw. (iv) (a) 1953−1958. (b) Yes. (c) N.A. (v) (a) Betul and Labhandi. (b) N.A. (vi) Nil. (vi) Season is drought.

5. RESULTS :

(i) 1066 lb./ac. (ii) (a) 311.2 lb./ac. (b) 203.2 lb./ac. (iii) Effect of DS is highly significant. (iv) Av. yield of grain in lb./ac.

	M₁	M₂	M₃	M₄	Mean
D₀S₀	1133	1322	1214	1183	1213
D₁S₁	851	1203	973	1023	1012
D₁S₂	876	1313	1117	1276	1146
D₂S₁	972	1210	872	981	1009
D₂S₂	780	1013	805	1205	951
Mean	922	1212	996	1134	1066

S.E. of difference of two

1. M marginal means   = 98.4 lb./ac.
2. DS marginal means   = 71.8 lb./ac.
3. DS means at the same level of M   = 143.7 lb./ac.
4. M means at the same level of DS   = 161.8 lb./ac.

Crop :- Paddy.   **Ref :- M.P. 58(1).**

Site :- Govt. Agri. Res. Stn., Adhartal.   **Type :- 'CM'.**

Object :—To find out suitable manurial dose for Paddy sown by different spacing and no. of seedlings/hole.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Sehra.* (b) N.A. (iii) 16, 18.8.1958. (iv) (a) Ploughing, cross ploughing, puddling and levelling. (b) Transplanted. (c) N.A. (d) and (e) As per treatments. (v) F.Y.M. at 10 C.L./ac. broadcasted before ploughing. (vi) *Luchai × Gurmatia × Burma* (late). (vii) Irrigated. (viii) One hand weeding. (ix) N.A. (x) 20.12.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(60) on page 108.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Weight of grain and straw. (iv) (a) 1953—1958. (b) Yes. (c) N.A. (v) (a) Labhandi. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2443 lb./ac. (ii) (a) 720.3 lb./ac. (b) 476.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	M_4	Mean
D_0S_0	2214	2507	2852	2237	2452
D_1S_1	2754	2213	2401	2160	2382
D_1S_2	2519	2310	2576	2393	2449
D_2S_1	2679	2545	2066	1766	2264
D_2S_2	2611	2599	2824	2637	2668
Mean	2555	2435	2544	2238	2443

S.E. of difference of two
1. M marginal means   = 227.7 lb./ac.
2. DS marginal means   = 168.2 lb./uc.
3. DS means at the same level of M   = 336.5 tb./ac.
4. M means at the same level of DS   = 377.5 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 54(103).**

Site :- Govt. Seed and Demons. Farm, Durg.   **Type :- 'CM'.**

Object :—To find out the effect of spacing and different doses of fertilizers on Paddy grown under Japanese method.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) N.A. (iii) 16.7.1954. (iv) (a) 3 ploughings by country plough. (b) Transplanting. (c) N.A. (d) As per treatments. (e) N.A. (v) F.Y.M. at 40 lb./ac. of N applied on 9.6.1954. (vi) *Luchai* (late). (vii) Irrigated. (viii) Interculturing by *tonchi gurma* and one weeding. (ix) 41.10". (x) 29.11.1954.

2. TREATMENTS :

Main-plot treatments :
3 manurial treatments : $M_1 = 20$ lb./ac. of N+20 lb./ac. of P_2O_5, $M_2 = 40$ lb./ac. of N+40 lb./ac. of P_2O_5 and $M_3 = 60$ lb./ac. of N+60 lb./ac. of P_2O_5.

Sub-plot treatments :
4 spacings : $S_1 = 4'' \times 4''$, $S_2 = 6'' \times 6''$, $S_3 = 9'' \times 6''$ and $S_4 = 9'' \times 9''$.

N applied as A/S and P_2O_5 as Super. Manures applied in two doses half at the time of transplanting and the other half one month after transplanting.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots replication; 4 sub-plots/main-plot (b) N.A. (iii) 4. (iv) (a) 52½'×25' (b) 49½'×22'. (v) 1½'×1½'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) A minor attack of grass hoppers controlled by dusting gammexane. (iii) Grain yield. (vi) (a) 1954—1959. (b) Yes. (c) Nil. (v) (a) Waraseoni. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2754 lb./ac. (ii) (a) 253.8 lb./ac. (b) 338.9 lb./ac. (iii) S effect alone is significant. (iv) Av. yield of grain in lb./ac.

	S₁	S₂	S₃	S₄	Mean
M₁	2635	2645	2902	2730	2728
M₂	2525	3058	2615	2782	2745
M₃	2302	2682	3220	2950	2789
Mean	2488	2795	2912	2821	2754

S.E. of difference of two
1. M marginal means   = 89.7 lb./ac.
2. S marginal means   = 138.4 lb./ac.
3. S means at the same level of M   = 239.7. lb./ac.
4. M means at the same level of S   = 226.1 lb./ac.

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Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 55(72).**

Site :- Govt. Seed and Demons. Farm, Durg.   **Type :- 'CM'.**

Object :—To find out the effect of spacing and different doses of fertilisers on Paddy grown under Japanese method.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Matasi*. (b) N.A. (iii) 23.6.1955/18.8. 1955. (iv) (a) Two ploughings with country plough. (b) Japanese method and transplanting. (c) N.A. (d) and (e) N.A. (v) 40 lb./ac. of N as F.Y.M. (vi) *Luchai*. (vii) Irrigated. (viii) Interculturing *Tonchi gurma*, and one weeding. (ix) N.A. (x) 2.12.1955.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(103) on page 111.

4. GENERAL :

(i) Satisfactory. (ii) Nil, (iii) Grain weight. (iv) (a) 1954—1959. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3503 lb./ac. (ii) (a) 476.4 lb./ac. (b) 623.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	S₁	S₂	S₃	S₄	Mean
M₁	3550	3640	3640	3750	3645
M₂	3400	3230	3170	3220	3255
M₃	3250	3640	3750	3800	3610
Mean	3400	3503	3520	3590	3503

S.E. of difference of two

1. M marginal means   = 168.4 lb./ac.
2. S marginal means   = 254.6 lb./ac.
3. S means at the same level of M   = 441.0 lb./ac.
4. M means at the same level of S   = 417.5 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 56(100).**

Site :- Govt. Seed and Demons. Farm, Durg.   **Type :- 'CM'.**

Object :—To find out the effect of spacing and different doses of fertiliser on Paddy grown under Japanese method.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Matasi.* (b) N.A. (iii) N.A. (iv) (a) 2 ploughings by *desi* plough. (b) Transplanted under Japanese method. (c) 80 lb./ac. (d) As per treatments. (e) 1 to 4. (v) F.Y.M. at 40 lb./ac. of N. (vi) *Luchai.* (vii) Irrigated. (viii) 1 weeding and 1 interculturing by *tonchi gurma.* (ix) 32.55″. (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(103) on page 111.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1959. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2572 lb./ac. (ii) (a) 623.2 lb./ac. (b) 256.9 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
M_1	2256	2407	2354	2336	2338
M_2	2496	2779	2401	2663	2585
M_3	2648	2891	2777	2852	2792
Mean	2467	2692	2511	2617	2572

S.E. of difference of two

1. M marginal means   = 220.3 lb./ac.
2. S marginal means   = 104.9 lb./ac.
3. S means at the same level of M   = 181.7 lb./ac.
4. M means at the same level of S   = 270.7 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 57(66).**

Site :- Govt. Seed and Demons. Farm, Durg.   **Type :- 'CM'.**

Object :—To find out the effect of spacing and different doses of fertiliser on Paddy grown under Japanese method.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Matasi.* (b) N.A. (iii) N.A. (iv) (a) 2 ploughings by *desi* plough. (b) Transplanted by Japanese method. (c) 80 lb./ac. (d) As per treatments. (e) 1 to 4. (v) F.Y.M. at 40 lb./ac. of N. (vi) *Luchai.* (vii) Irrigated. (viii) 1 weeding and interculturing by *tonchi gurma.* (ix) 39.84″. (x) N.A.

2. **TREATMENTS and 3. DESIGN :**

Same as in expt. no. 54(103) on page 111.

4. **GENERAL :**

(i) Poor. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1959. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 1405 lb./ac. (ii) (a) 317.0 lb./ac. (b) 152.0 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
M_1	1430	1465	1549	1536	1495
M_2	1251	1260	1318	1331	1290
M_3	1406	1447	1432	1439	1431
Mean	1362	1391	1433	1435	1405

S.E. of difference of two
1. M marginal means = 112.0 lb./ac.
2. S marginal means = 62.0 lb./ac.
3. S means at the same level of M = 107.5 lb./ac.
4. M means at the same level of S = 145.6 lb./ac.

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Crop :- Paddy *(Kharif).* **Ref :- M.P. 58(72).**

Site :- Govt. Seed and Demons. Farm, Durg. **Type :- 'CM'.**

Object :—To find out the effect of spacing and different doses of fertilisers on Paddy grown under Japanese method.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Matasi.* (b) N.A. (iii) N.A. (iv) (a) 2 ploughings by *desi* plough. (b) Transplanted. (c) 80 lb./ac. (d) As per treatments. (e) 1 to 4. (v) F.Y.M. at 40 lb /ac. of N. (vi) *Luchai.* (vii) Irrigated. (viii) 1 weeding and interculturing by *tonchi gurma*. (ix) 43.79". (x) N.A.

2. **TREATMENTS and 3. DESIGN :**

Same as in expt. no. 54(103) on page 111.

4. **GENERAL :**

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1959. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 1984 lb./ac. (ii) (a) 482.2 lb./ac. (b) 465.4 lb./ac. (iii) M effect alone is significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	S_4	Mean
M_1	2200	1650	2690	2410	2238
M_2	2160	2250	1750	2110	2068
M_3	1730	1550	1680	1630	1648
Mean	2030	1817	2040	2050	1984

S.E. of difference of two

1. M marginal means   = 170.5 lb./ac.
2. S marginal means   = 190.0 lb./ac.
3. S means at the same level of M   = 329.1 lb./ac.
4. M means at the same level of S   = 332.1 lb./ac.

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Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 54(100).**

Site :- Govt. Seed and Demons. Farm, Durg.   **Type :- 'CM'.**

Object :—To find out optimum quantity of N and P for different methods of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) *Kanhar*. (b) N.A. (iii) Broadcasting on 20.6.1954 and *Biassi* and transplanting on 25.7.1954. (iv) (a) 2 ploughings. (b) As per treatments. (c) to (e) N.A. (v) N.A. (vi) Cross no. 116. (vii) Irrigated. (viii) 3 weedings. (ix) 41.10". (x) 15 and 16.11.1954.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S : $N_0=0$, $N_1=15$ and $N_2=30$ lb./ac.
(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=15$ and $P_2=30$ lb./ac
(3) 3 methods of sowing : B_1=Transplanting, B_2=*Biassi* and B_3=Broadcasting.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) and (b) $33' \times 16\frac{1}{2}'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Light attack of gross hoppers. Controlled by dusting B.H.C. (iii) Yield of grain. (iv) (a) 1952—1954. (b) N.A. (c) Nil. (v) (a) Labhandi. (b) N.A. (vi) and (vii) The experiment analysed as R.B.D. because of improper allocation of treatments to blocks.

5. RESULTS :

(i) 2385 lb./ac. (ii) 376.8 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	B_1	B_2	B_3
N_0	2216	2371	2456	2348	2169	2533	2341
N_1	2463	2319	2431	2404	2241	2536	2436
N_2	2319	2516	2374	2403	2524	2299	2386
Mean	2333	2402	2420	2385	2312	2456	2388
B_1	2340	2344	2251				
B_2	2244	2598	2526				
B_3	2414	2264	2484				

S.E. of any marginal mean   =   62.8 lb./ac.
S.E. of body of any table   =   108.5 lb./ac.

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Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 54(102).**

Site :- Govt. Seed and Demons. Farm, Durg.   **Type :- 'CM'.**

Object :—To find out the effect of interculture and different doses of manuring applied at different times to Paddy raised under Japanese method.

1. **BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) *Matasi.* (b) N.A. (iii) 20.7.1954. (iv) (a) 3 ploughings by country plough. (b) Transplanted. (c) N.A. (d) $9'' \times 9''$. (e) N.A. (v) F.Y.M. at 40 lb./ac. of N. (vi) *Luchai* (late). (vii) Irrigated. (viii) As per treatments. (ix) 41.10″. (x) 1.12 1954.

2. **TREATMENTS :**

Main-plot treatments :

$M_1 = 40$ lb./ac. of $N + 40$ lb./ac. of P_2O_5 in one dose before planting, $M_2 = 40$ lb./ac. of $N + 40$ lb./ac. of P_2O_5 in two doses one before planting and the other one month after planting, $M_3 = 20$ lb./ac. of $N + 40$ lb./ac. of P_2O_5 before planting and 20 lb./ac. of $N + 10$ lb./ac. of P_2O_5 one month after planting and $M_4 = 20$ lb./ac. of $N + 30$ lb./ac. of P_2O_5 before planting and 20 lb./ac. of $N + 10$ lb./ac. of P_2O_5 one month after planting.

N applied as A/S and P_2O_5 as Super.

Sub-plot treatments :

3 intercultures : $I_0 = $ No interculture, $I_1 = $ Interculture in one direction and $I_2 = $ Interculture in both directions.

3. **DESIGN :**

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) $66' \times 22'$. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Mild attack of grass hoppers. Controlled by dusting Gammexane. (iii) Grain yield. (iv) (a) 1954—1956. (b) N.A. (c) Nil. (v) (a) Waraseoni. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 2728 lb./ac. (ii) (a) 377.8 lb./ac. (b) 480.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	M_4	Mean
I_0	2740	2642	2598	2848	2707
I_1	2490	2905	2918	2630	2736
I_2	2630	2275	3125	2940	2742
Mean	2620	2607	2880	2806	2728

S.E. of difference of two

1. M marginal means	=	178.0 lb./ac.
2. I marginal means	=	196.1 lb./ac.
3. I means at the same level of M	=	392.2 lb./ac.
4. M means at the same level of I	=	366.4 lb./ac.

Crop :- Paddy *(Kharif)*.

Site :- Govt. Seed and Demons. Farm, Durg.

Ref :- M.P. 55(73).

Type :- 'CM'.

Object :—To find out the effect of interculture and different doses of manuring applied at different times to Paddy raised under Japanese method.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Kanhar.* (b) N.A. (iii) 23.6.1955/22.7.1955. (iv) (a) 2 ploughings with country plough. (b) Transplanted by Japanese method. (c) to (e) N.A. (v) F.Y.M. at 40 lb./ac. of N. (vi) *Luchai.* (vii) Irrigated. (viii) *Tonchi gurma* interculture according to treatments and one weeding. (ix) Nil. (x) 11.12.1955.

2. **TREATMENTS and 3. DESIGN :**

Same as in expt. no. 54(102) on page 115.

4. **GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Grain weight. (iv) (a) 1954—1956. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3187 lb./ac. (ii) (a) 364.9 lb./ac. (b) 374.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	M₁	M₂	M₃	M₄	Mean
I₀	2940	3680	3320	3400	3335
I₁	2870	3000	3130	3060	3015
I₂	3070	3290	2820	3670	3212
Mean	2960	3323	3090	3377	3187

S.E. of difference of two

1. M marginal means   = 172.0 lb./ac.
2. I marginal means   = 152.9 lb./ac.
3. I means at the same level of M   = 305.9 lb./ac.
4. M means at the same level of I   = 303.3 lb./ac.

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 56(104).**

Site :- Govt. Seed and Demons. Farm, Durg.   **Type :- 'CM'.**

Object :—To find out the effect of interculture and different doses of fertilisers applied at different times to Paddy raised under Japanese method.

1. BASAL CONDITIONS :

(i) (a) Nil (b) Paddy. (c) Same expt. was in the field. (ii) (a) *Kanhar.* (b) N.A. (iii) N.A. (iv) (a) Two ploughings by *desi* plough. (b) Transplanted under Japanese method. (c) N.A. (d) 9″×9″. (e) 4. (v) F.Y.M. at 40 lb./ac. of N. (vi) *Luchai.* (vii) Irrigated. (viii) One weeding, interculture as per treatments. (ix) 32.55″. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 54(102) on page 115.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 18′×80.5′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1956. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2355 lb./ac. (ii) (a) 309.2 lb./ac. (b) 396.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	M₁	M₂	M₃	M₄	Mean
I₀	2374	2176	2260	2618	2357
I₁	2554	2260	2235	2245	2323
I₂	2849	2175	2044	2474	2385
Mean	2592	2204	2180	2446	2355

S.E. of difference of two

1. M marginal means   = 145.8 lb./ac.
2. I marginal means   = 162.0 lb./ac.
3. I means at the same level of M   = 323.9 lb./ac.
4. M means at the same level of I   = 302.0 lb./ac.

———

Crop :- Paddy *(Kharif).*   **Ref :- M.P. 54(107).**

Site :- Govt. Res. Farm, Labhandi.   **Type :- 'CM'.**

Object :—To find out a suitable manurial dose for paddy sown with different spacings and no. of seedlings per hole.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Dorsa.* (b) Refer soil analysis, Labhandi. (iii) 11.6.1954 /27.8.1954. (iv) (a) Two ploughings by *meston* plough, puddling and levelling. (b) Transplanting. (c) N.A. (d) and (e) As per treatments. (v) Nil. (vi) *Luchai × Gurmatia × Burma* (vii) Irrigated. (viii) Interculture by *Tonchi, Gurnma.* (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no 54(60) on page 108.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication, 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 1/50 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Crop growth is poor. (ii) Nil. (iii) Grain weight. (iv) (a) 1953—1955. (b) Yes. (c) Nil. (v) (a) Adhartal. (b) N.A. (vi) Nil. (vii) Untimely rains adversely effected the crop in general. Growth of weeds was unchanged by the intermitant long breaks.

5. RESULTS :

(i) 3076 lb./ac. (ii) (a) 347.3 lb./ac. (b) 251.0 lb./ac. (iii) Sub-plot treatment differences alone are highly significant. (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	M_4	Mean
D_0S_0	2960	2960	2800	3120	2960
D_1S_1	2800	2960	3600	3360	3180
D_1S_2	2960	3600	3040	3440	3260
D_2S_1	2640	2400	2960	2960	2740
D_2S_2	3120	3360	3200	3280	3240
Mean	2896	3056	3120	3232	3076

S.E. for the difference of two

1. M marginal means   = 109.8 lb./ac.
2. DS marginal means   = 88.7 lb./ac.
3. DS means at the same level of M   = 177.4 lb./ac.
4. M means at the same level of DS   = 193.0 lb./ac.

———

Crop :- Paddy   **Ref :- M.P. 55(25).**

Site :- Govt. Res. Farm, Labhandi.   **Type :- 'CM'.**

Object :—To find out a suitable manurial dose for paddy sown with different spacings and no. of seedlings per hole.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) *Matasi*. (b) Refer soil analysis, Labhandi. (iii) 29.6.1955. (iv) (a) Two ploughings by *meston* plough. Harrowing with wooden harrow and levelling with *koper*. (b) Transplanted. (c) N.A. (d) and (e) As per treatments. (v) Nil. (vi) *Luchai* × *Gurmatia* × *Burma*. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 10.12.1955.

2. TREATMENTS :

Same as in expt. no. 54(60) on page 108.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/50 ac. (b) 1/80 ac. (v) 3 rows of border plants. (vi) Yes. -

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1953 to 1955. (b) Yes. (c) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 4128 lb./ac. (ii) (a) 638.4 lb./ac. (b) 384.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	M_4	Mean
D_0S_0	4160	4040	4160	4320	4170
D_1S_1	4300	3940	4460	4140	4210
D_1S_2	3840	3940	4160	4240	4045
D_2S_1	3900	4060	3860	4400	4055
D_2S_2	4040	4160	4180	4260	4160
Mean	4048	4028	4164	4272	4128

S.E. of difference of two
1. M marginal means   = 201.9 lb./ac.
2. DS marginal means   = 136.0 lb./ac.
3. DS means at the same level of M   = 272.1 lb./ac.
4. M means at the same level of DS   = 346.4 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 59(77).**

Site :- Govt. Res. Farm, Labhandi.   **Type :- 'CM'.**

Object :- To find out the effect of deep digging, close planting and very heavy manuring on the yield of Paddy.   o

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) F.Y.M. at 10 C.L./ac. *(ii)* (a) *Matasi*. (b) Refer soil analysis, Labhandi. (iii) N.A. (iv) (a) As per treatments. (b) Transplanted. (c) 80 to 100 lb./ac. (d) and (e) As per treatments. (v) Nil. (vi) Cross—18. (vii) Irrigated. (viii) One hand weeding. (ix) 43.17". (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 4 diggings : D_0 = Normal ploughing, D_1 = 1', D_2 = 2' and D_3 = 3' deep digging.
(2) 2 spacings : S_1 = 9" × 9", 4 seedlings/hole and S_2 = Very close planting.
(3) 2 levels of F.Y.M. : F_1 = 5,000 and F_2 = 10,000 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 2. (iv) (a) 10.5' × 13.5'. (b) 9' × 12'. (v) ¾' × ¾'. (vi) Yes.

4. GENERAL :

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

5. RESULTS:

(i) 3089 lb./ac. (ii) 375.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of rain 3in lb./ac.

	S₁	S₂	Mean	F₁	F₂
D₀	3050	2650	2850	2900	28C0
D₁	3550	3020	3285	3425	3145
D₂	3300	3050	3175	3075	3275
D₃	2950	3150	3050	3000	3100
Mean	3212	2968	3090	3100	3080
F₁	3150	3050	3100		
F₂	3275	2887	3081		

S.E. of D marginal mean   =   132.6 lb./ac.
S.E. of F or S marginal mean   =   93.7 lb./ac.
S.E. of body of D×S or D×F table   =   187.5 lb./ac.
S.E. of body of S×F table   =   132.6 lb./ac.

Crop :- Paddy *(Kharif)*.   **Ref :- M.P. 59(78).**

Site :- Govt. Res. Farm, Labhandi.   **Type :- 'CM'.**

Object :—To determine relative merits of ordinary Biasi and improved Biasi.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi*. (b) Refer soil analysis, Labhandi. (iii) 12.7.1959. (iv) (a) 2 ploughings by *desi* plough. (b) Broadcasting. (c) 80 lb./ac. (d) and (e)—. (v) Nil. (vi) Cross—116. (vii) Irrigated. (viii) As per treatments. (ix) 43.17″. (x) 27.11.1959.

2. TREATMENTS :

4 methods of improved cultivation :

C₁ : 1. 2 tons/ac. of *Sannhemp* G.L.+5 lb./ac. of N as A/S before sowing and p'oughing for incorporation of leaf in the soil.

    2. (i) 20 lb. ac. of P₂O₅ as Super+10 lb /ac. of N as A/S, to be given just before sowing.

    (ii) 80 lb./ac. of paddy seed treated with saline water and Agrosone G.N.

    (iii) *Biassi* operations.

    (iv) *Challai* after a week.

    (v) 10 lb./ac. of N to be given after *Challi*.

    (vi) Weeding and weeds to be burried in the field.

C₂ : (i) Ploughing and appplication of *sannhemp* G.L.+20 lb./ac. of P₂O₅ as Super+10 lb./ac. of N of as A/S.

    (ii) Sowing 80 lb./ac. of treated seed ; mixed with 1/5th of gram seed.

    (iii) *Biassi* operat·on.

    (iv) *Challai* after a week.

    (v) Application of 10 lb./ac. of N as A/S.

    (vi) Weeding and weeds to be burried in the field.

C₃ : In place of sannhemp seed, *Dhaincha* seed at 10 lb./ac. to be used. Rest of the items to be the same as under C₂.

C₄ : Control (ordinary *Biassi*) :

    (i) Seed rate 80 lb./ac. untreated.

    (ii) No *Challi*.

    (iii) No burrying of weeds.

    (iv) Application of 20 lb./ac. of N as usual after *Biassi* operation.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 18′×54′. (b) 16′×52′. (v) 1′×1′. (vi) Yes.

4. GENERAL

(i) Good. (ii) N A. (iii) Grain and straw yield. (iv) (a) 1959—1962. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2038 lb./ac. (ii) 174.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	C_1	C_2	C_3	C_4
Av. yield	2141	2037	2089	1885

S.E./mean = 78.2 lb./ac.

Crop :- Paddy *(Kharif).*

Site :- Govt. Res. Farm, Waraseoni.

Ref :- M.P. 54(89).

Type :- 'CM'.

Object :—To find the effect of spacing and different doses of fertilizers grown under Japanese method.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) *Morand.* (b) Refer soil analysis, Waraseoni. (iii) 18.8.1954. (iv) (a) Ploughing, cross ploughing and levelling. (b) Transplanted. (c) to (e) N.A. (v) N.A. (vi) *Luchai* (late). (vii) Irrigated. (viii) N.A. (ix) 34.42″. (x) 20.12.1954.

2. TREATMENTS :

Main-plot treatments :

3 manures : M_1=20 lb./ac. of N+20 lb./ac. of P_2O_5, M_2=40 lb./ac. of N+40 lb./ac. of P_2O_5 and M_3=60 lb./ac. N+60 lb./ac. of P_2O_5.

Sub-plot treatments :

4 spacings : S_1=4″×4″, S_2=6″×6″, S_3=9″×6″ and S_4=9″×9″.

Fertilizers applied in two doses half at transplanting and the other half one month after transplanting. N applied as A/S and P_2O_5 as Super.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N A. (b) 45′×12′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N A. (iii) Height, tillering, weight of grain and straw. (iv) (a) 1954—1956. (b) Yes. (c) Nil. (v) (a) Durg. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3332 lb./ac. (ii) (a) 493.9 lb./ac. (b) 298.4 lb./ac. (iii) M and S effects are highly significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	S_4	Mean
M_1	2871	3132	2982	2391	2844
M_2	3534	3491	3260	2949	3308
M_3	3709	3975	3999	3695	3844
Mean	3371	3533	3414	3012	3332

S.E. of difference of two
1. M marginal means = 174.6 lb./ac.
2. S marginal means = 121.8 lb./ac.
3. S means at the same level of M = 211.0 lb./ac.
4. M means at the same level of S = 252.7 lb./ac.

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

Site :- Govt. Res. Farm, Waraseoni. **Type :- 'CM'.**

Object :—To find out the effect of spacing with different doses of fertilizers on paddy grown under Japanese method.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) As under treatments. (ii) (a) Morand. (b) Refer soil analysis, Waraseoni. (iii) 17.7.1955. (iv) Ploughing and cross ploughing. (b) Transplanted under Japanese method. (c) 80 lb./ac. (d) As per treatments. (e)1 to 4. (v) F.Y.M. at 40 lb./ac. of N. (vi) Luchai. (vii) Irrigated. (viii) Tonchi gurma. (ix) 58 07".(x) N.A.

2. **TREATMENTS :**

Same as in expt. no. 54(89) on page 121.

3. **DESIGN :**

(i) Split-plot. (ii) 3 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N A. (vi) Yes.

4. **GENERAL :**

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) Durg. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 2619 lb./ac. (ii) (a) 396.7 lb./ac. (b) 377.6 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
M$_1$	2288	2895	2642	2630	2614
M$_2$	2690	2420	2787	2541	2610
M$_3$	2530	2868	2508	2623	2632
Mean	2503	2728	2646	2598	2619

S.E. of difference of two

1. M marginal means = 140.2 lb./ac.
2. S marginal means = 154.2 lb./ac.
3. S means at the same level of M = 267.0 lb./ac.
4. M means at the same level of S = 270.4 lb./ac.

Crop :- Padday (Kharif). **Ref :- M.P. 56(106).**

Site :- Govt. Res. Farm, Waraseoni. **Type :- 'CM'.**

Object :—To find out the effect of spacing with different doses of fertilisers on paddy grown under Japanese method.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (iii) As under treatments. (ii) (a) Morand (b) Refer soil analysis, Waraseoni. (iii) 27.7.1956. (iv) (a) Ploughing and cross ploughing. (b) Transplanted under Japanese method. (c) (c) 80 lb./ac. (d) As per treatments. (e) 1—4. (v) F.Y.M. at 40 lb./ac. of N. (vi) Luchai. (vii) Irrigated. (viii) Hoeing by Tonchi Gurma. (ix) and (x) N.A.

2. **TREATMENTS :**

Same as in expt no. 54(89) on page 121.

3. **DESIGN :**

(i) Split-plot. (ii) (a) 3 main-plots/replication. 4 Sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL ;

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) Durg. (b) Nil. (vi) Nil. (vii) There are only three replications during this year.

5. RESULTS :

(i) 1875 lb./ac. (ii) (a) 144.2 lb./ac. (b) 156.6 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
M_1	2053	1867	1893	1920	1933
M_2	1867	2053	1733	1840	1873
M_3	2000	1653	1760	1867	1820
Mean	1973	1858	1795	1875	1875

S.E. of difference of two

1. M marginal means   = 58.9 lb./ac.
2. S marginal means   = 73.8 lb/ac.
3. S means at the same level of M = 127.8 lb./ac.
4. M means at the same level of S = 125.4 lb./ac.

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

Site :- Govt. Res. Farm, Waraseoni.   **Type :- 'CM'.**

Object :—To find out the effect of interculture with different doses of manuring applied at different times to Paddy crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) N.A. (b) Refer soil analysis, Waraseoni. (iii) 14.8.1954. (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c) to (e) N.A. (v) N.A. (vi) *Luchai* (late). (vii) Irrigated. (viii) N.A. (ix) 34.42". (x) 20.12.1954.

2. TREATMENTS :

Same as in expt. no. 54(102) on page 115.

3. DESIGN :

(i) Spilt-plot. (ii) (a) 4 main plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 1/40 ac. (b) N.A. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Height, weight of grain and straw. (iv) (a) 1954—1956. (b) No. (c) N.A. (v) (a) Durg. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3781 lb./ac. (ii) (a) 366.8 lb./ac. (b) 464.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	M_4	Mean
I_0	3928	3955	4081	4149	4028
I_1	3802	3856	3664	2125	3362
I_2	4093	3816	3702	4199	3952
Mean	3941	3876	3816	3491	3781

S.E. of difference of two

1. M marginal means	=	172.9 lb./ac.
2. I marginal means	=	189.5 lb./ac.
3. I means at the same level of M	=	379.0 lb./ac.
4. M means at the same level of I	=	354.4 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- M.P. 55(103).**

Site :- Govt. Res. Farm, Waraseoni. **Type :- 'CM'.**

Object : — To find out the effect of interculture, with different doses of manures applied at different times to Paddy crop raised under Japanese method.

1. **BASAL CONDITIONS :**

(i) (a Nil. (b) Paddy. (e) N.A. (ii) (a) *Morand.* (b) Refer soil analysis, Waraseoni. (iii) 13.7.1955. (iv) (a) Plough ng and cross ploughing. (b) Transplanted. (c) 80 lb /ac. (d) $9'' \times 9''$. (e) 4. (v) N.A. (vi) *Luchai.* (vii) Irrigated. (viii) Hoeing by *Tonchi Gurma.* (ix) $58.07''$. (x) N.A.

2- **TREATMENTS :**

Same as in expt. no. 54(102) on page 115.

3. **DESIGN :**

(i) Split-plot. (ii) (a) 4 main-plots/replication, 3 sub-plots/main-plot. (b) —. (iii) 3. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. **GENERAL:**

(i) Good. (i) N A. (iii) Grain and straw yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) Durg. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 2815 lb./ac. (ii) (a) 626.2 lb./ac. (b) 342.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb /ac.

	M_1	M_2	M_3	M_4	Mean
I_0	2785	2667	3272	2710	2858
I_1	3040	2753	2860	2528	2795
I_2	2987	2511	2932	2737	2792
Mean	2937	2644	3021	2658	2815

S.E. of difference of two

1. M marginal means	=	295.2 lb./ac.
2. I marginal means	=	139.7 lb./ac.
3. I means at the same level of M	=	279.4 lb./ac.
4. M means at the same level of I	=	373.0 lb./ac.

Crop :- Paddy *(Kharif).* **Ref :- M.P. 56(108).**

Site :- Govt. Res. Farm, Waraseoni. **Type :- 'CM'.**

Object :— To find out the effect of interculture with different doses of manures applied at different times to Paddy crop raised under Japanese method.

1. **BASAL CONDITIONS:**

(i) (a) Nil. (ii) Paddy. (c) N.A. (ii) (a) *Murand.* (b) Refer soil analysis, Waraseoni. (iii) 26.7.1956. (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c) 80 lb./ac. (d) $9'' \times 9''$. (e) 4. (v) N A. (vi) *Luchai.* (vii) Irrigated. (viii) Hoeing by *Tonchi Gurma.* (ix) $57.07''$ (x) N A.

2. TREATMENTS :

Same as in expt. no. 54(102) on page 115.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) Durg. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1985 lb./ac. (ii) (a) 169.5 lb./ac. (b) 187.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	M_4	Mean
I_0	1970	1890	1760	1940	1890
I_1	1970	2010	2020	2050	2012
I_2	1910	2130	2010	2160	2052
Mean	1950	2010	1930	2050	1985

S.E. of difference of two

1. M marginal means   = 69.2 lb./ac.
2. I marginal means   = 66.3 lb./ac.
3. I means at the same level of M   = 132.5 lb./ac.
4. M means at the same level of I   = 128.4 lb./ac.

— — —

Crop :- Paddy.

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

Ref :- M.P. 57(MAE)

Type :- 'CM'.

Object :—Type VII—To study the effect of cultural practices and manuring on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) As per treatments. (iv) (a) 1 *bakhering*, 2 ploughings, interculture with Japanese hoe and 3—4 spadings. (b) and (c) N.A. (d) and (e) As per treatments. (v) 5000 lb./ac of F Y.M. (vi) N.A. (vii) Irrigated. (viii) Weeding. (ix) 34". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

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

     (1) 3 dates of sowing : $D_1 = 15$ days before normal, $D_2 =$ Normal and $D_3 = 15$ days after normal.
     (2) 3 spacings : $S_1 = 6'' \times 6''$, $S_2 = 8'' \times 8''$ and $S_3 = 10'' \times 10''$.
     (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 : $P_0 = 0$ and $P_1 = 40$ lb./ac.

3. DESIGN :

(i) Split-plot confd. (ii) (a) 3 blocks/replication ; 9 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 1/97.2 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Leaf blight attack was observed. No control measures taken. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) Raipur and Reora. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1359 lb./ac. (ii) (a) 356.5 lb./ac. (b) 208.9 lb./ac. (iii) Main effects of D, N, P and interaction N×P are highly significant. Main effects of R, S and interactions D×N, D×S×N, D×R×P and S×P 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	1711	1520	1589	1479	1849	1493	1223	1990	1352	1861	1607
D_2	1549	1249	1397	1538	1412	1243	1074	1723	1142	1655	1398
D_3	1302	950	959	777	1337	1098	828	1312	753	1338	1071
Mean	1521	1240	1315	1265	1533	1278	1042	1675	1082	1635	1359
P_0	1277	1007	963	974	1244	1023	836	1328			
P_1	1765	1473	1128	1555	1822	1528	1247	2022			
N_0	1188	922	1014	989	1183	954					
N_1	1853	1557	1616	1542	1882	1602					
R_1	1339	1284	1171								
R_2	1696	1308	1594								
R_3	1527	1127	1180								

S.E. of difference of two

1. D, S or R marginal means   = 84.0 lb./ac.
2. P or N marginal means   = 40.2 lb./ac.
3. P or N means at the same level of D, S or R   = 69.6 lb./ac.
4. D, S or R means at the same level of P or N   = 97.4 lb./ac.
   S.E. of body of D×S, D×R or S×R table   = 102.9 lb./ac.
   S.E. of body of N×P table   = 40.2 lb./ac.

Crop :- Paddy *(Kharif)*.

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

Ref :- M.P. 58(MAE).

Type :- 'CM'.

Object :—Type VIII—To study the effect of cultural practices and manuring on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) As per treatments. (iv) (a) 1 ploughing and 1 harrowing. (b) and (c) N.A. (d) and (e) As per treatments. (v) 5000 lb./ac. of F.Y.M. (vi) N.A. (vii) Irrigated. (viii) 3 weedings. (ix) 50". (x) 4th week of November, 1958.

2. TREATMENTS :

Main-plot treatments :
All combinations of (1), (2) and (3)

    (1) 3 dates of sowing : D_1=20.7.1958, D_2=4.8.1958 and D_3=19.8.1958.

    (2) 3 spacings : S_1=6"×6", S_2=8"×8" and S_3=10"×10".

    (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) Split-plot confd. (ii) (a) 3 blocks/replication ; 9 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 1 (iv) (a) N.A. (b) 1/97.2 ac. (v) N.A. (vi) Yes.

4. GENERAL :

  (i) Normal. (ii) Aphids controlled. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. **(v)** (a) Raipur and Reora. (b) N A. (vi) and (vii) Nil.

5. RESULTS :

  (i) 1887 lb./ac. (ii) (a) 312.4 lb./ac. (b) 205.0 lb./ac. (iii) Main effects of D, N, P and interaction D×P 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	2157	2057	2003	2094	2097	2026	1806	2339	1923	2221	2072
D_2	1913	1870	2024	1764	2006	2057	1754	2131	1672	2213	1942
D_3	1653	1673	1614	1701	1608	1631	1480	1814	1361	1932	1647
Mean	1914	1867	1880	1853	1904	1905	1650	2095	1652	2122	1887
P_0	1712	1605	1639	1646	1646	1665	1483	1821			
P_1	2117	2128	2121	2060	2162	2144	1876	2368			
N_0	1689	1656	1695	1652	1687	1720					
N_1	2140	2078	2066	2074	2121	2089					
R_1	1938	1838	1783								
R_2	1910	1846	1955								
R_3	1895	1916	1903								

S.E. of difference of two
1. D, S or R marginal means = 73.6 lb./ac.
2. P or N marginal means = 39.5 lb./ac.
3. P or N means at the same level of D, S or R = 68.3 lb /ac.
4. D, S or R means at the same level of P or N = 88.1 lb./ac.
   S.E. of body of D×S D×R or S×R table = 90.2 lb /ac.
   S.E. of body of N×P table = 39.5 lb./ac.

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

Site :- M.A.E. Farm, Bagwai.   **Type :- 'CM'.**

Object :—Type VII—To study the effect of cultural practices and manuring on the yield of Paddy.

1. BASAL CONDITIONS :

  (i) (a) to (c) N A. (ii) (a) Medium black soil. (b) N.A. (iii) As per treatments. (iv) (a) 2 ploughings and 1 *bakhering*. (b) and (c) N.A. (d) and (e) As per treatments. (v) 5000 lb./ac. of F.Y.M. (vi) T—9 (late). (vii) Irrigated. (viii) 3 weedings. (ix) 28". (x) 4th week of December, 1959.

2. TREATMENTS :

  Main-plot treatments :
  All combination of (1), (2) and (3)
      (1) 3 dates of sowing : D_1=21.7.1959, D_2=5.8.1959 and D_3=20.8.1959.
      (2) 3 spacings : S_1=6"×6", S_2=8"×8" and S_3=10"×10".
      (3) No. of seedlings/hole : R_1=2, R_2=4 and R_3=6.
  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) Split-plot confd. (ii) (a) 3 blocks/replication ; 9 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 30'×18'. (b) 28'×16'. (v) 1'×1'. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) Labhandi and Reora. (b) N A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1653 lb./ac. (ii) (a) 272.7 lb./ac. (b) 123.7 lb./ac. (iii) Main effects of D, N, P and interactions $R \times S \times N$, $D \times P$ are highly significant. Effect of S and interactions $R \times S$, $D \times R \times N$, $D \times S \times N$ and $N \times P$ 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	1810	2074	1687	1695	1909	1967	1580	2135	1720	1994	1857
D_2	1555	1679	1415	1588	1555	1506	1234	1866	1366	1734	1550
D_3	1531	1662	1465	1646	1531	1481	1308	1799	1317	1789	1553
Mean	1632	1805	1522	1643	1665	1651	1374	1933	1468	1839	1653
P_0	1440	1646	1317	1465	1473	1466	1218	1718			
P_1	1824	1964	1728	1822	1858	1837	1531	2148			
N_0	1325	1530	1267	1399	1382	1341					
N_1	1940	2081	1778	1888	1949	1961					
R_1	1539	1858	1522								
R_2	1588	1679	1728								
R_3	1769	1868	13.7								

S.E. of difference of two
1. D, S or R marginal means = 64.3 lb./ac.
2. N or P marginal means = 23.8 lb./ac.
3. N or P means at the same level of D, S or R = 41.2 lb./ac.
4. D, S or R means at the same level of N or P = 70.6 lb./ac.
   S.E. of body of $D \times S$, $D \times R$ or $S \times R$ table = 78.7 lb./ac.
   S.E. of body of $N \times P$ table = 23.8 lb./ac.

Crop :- Paddy *(Kharif).*

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

Ref :- M.P. 56(MAE).

Type :- 'CM'.

Object :—Type VII—To study the effect of cultural practices and manuring on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) and (b) N.A. (c) 40 lb./ac. (d) and (e) As per treatments. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) Second to third week of December, 1956.

2. TREATMENTS :

Main-plot treatments :
All combinations of (1), (2) and (3)
   (1) 3 dates of planting : D_1=15.7.1956, D_2=1.8.1956 and D_3=15.8.1956.
   (2) 3 spacings : S_1=6″×6″, S_2=8″×8″ and S_3=10″×10″.
   (3) No of seedlings/hole : R_1=2, R_2=4 and R_3=6

Sub-plot treatments :
All cominations 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) Split-plot confd. (ii) 9 main-plots/block ; 3 blocks/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 1.
(iv) (a) N.A. (b) 32'×14'. (v) N.A. (vi) Yes.

4 . GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) Bagwai and Reora.
(vi) and (vii) Nil.

5. RESULTS :

(i) 1989 lb./ac. (ii) (a) 574.2 lb./ac. (b) 317.9 lb./ac. (iii) Main effect of N is highly significant. Effect
of P and interactions P×D, P×R and P×D×R are significant. (iv) Av. yield of grain in lb./ac.

	S₁	S₂	S₃	R₁	R₂	R₃	N₀	N₁	P₀	P₁	Mean
D₁	2352	2297	1724	2176	2082	2114	1879	2369	1874	2374	2124
D₂	2148	2032	2062	2132	2135	1976	1911	2251	2023	2139	2081
D₃	1908	1624	1755	1595	1691	2000	1655	1869	1825	1699	1762
Mean	2136	1984	1847	1968	1969	2030	1815	2163	1907	2071	1989
P₀	2040	1894	1787	1745	2001	1975	1763	2051			
P₁	2232	2074	1907	2191	1937	2085	1867	2275			
N₀	1967	1770	1708	1798	1743	1904					
N₁	2305	2198	1986	2138	2195	2156					
R₁	2246	1849	1809								
R₂	2116	1990	1801								
R₃	2046	2113	1931								

S.E. of difference of two

1.	D, S or R marginal means	= 135.3 lb./ac.
2.	N or P marginal means	= 61.2 lb./ac.
3.	N or P means at the same level of D, S or R	= 106.0 lb./ac.
4.	D, S or R means at the same level of N or P	= 154.7 lb./ac.
	S.E. of body of D×S, D×R or S×R table	= 165.8 lb./ac.
	S.E. of body of N×P table	= 61.2 lb./ac.

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

Site :- M.A.E. Farm, Raipur.   Type :- 'CM'.

Object : Type VII :—To study the effect of cultural practices and manuring on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) As per treatments. (iv) One ploughing. (b) N.A.
(c) 40 lb./ac (d) and (e) As per treatments. (v) 5000 lb./ac. of F.Y.M. (vi) *Luchai×Gurmatia* no. 18
(late). (vii) Irrigated. (viii) Weeding. (ix) 40". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1), (2) and (3)
(1) 3 dates of planting : D₁=15 days before normal, D₂=Normal and D₃=15 days after normal.
(2) 3 spacings :. S₁=6"×6", S₂=8"×8" and S₃=10"×10".
(3) No. of seedlings/hole : R₁=2, R₂=4 and R₃=6.

Sub-plot treatments :
(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 :

(i) Split-plot confd. (ii) (a) 3 blocks/replication, 9 main-plots/block ; 4 sub-plots/main-plot. (b) N-A. (iii) 1. (iv) (a) N.A. (b) 32'×14'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

2355 lb./ac. (ii) (a) 435.4 lb./ac. (b) 469.3 lb./ac. (iii) Main effects of D, N and P are highly significant. Effects of R, S and interactions D×N, D×P 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	3221	2503	2550	2765	2563	2946	2355	3161	2730	2786	2758
D_2	2385	2051	2450	1967	2515	2405	2056	2535	2026	2565	2296
D_3	2186	1947	1899	1639	2052	2341	1904	2118	1648	2374	2011
Mean	2597	2167	2300	2124	2377	2564	2105	2605	2135	2575	2355
P_0	2348	1868	2188	1885	2082	2437	1942	2327			
P_1	2847	2466	2411	2362	2671	2691	2268	2882			
N_9	2378	1925	2011	1907	2108	2299					
N_1	2817	2409	2588	2340	2645	2829					
R_1	2249	1721	2400								
R_2	2762	2233	2135								
R_3	2781	2547	2364								

S.E. of difference of two
1. D, S or R marginal means = 102.6 lb./ac.
2. N or P marginal means = 90.3 lb./ac.
3. N or P means at the same level of D S, or R = 156.4 lb./ac.
4. D, S or R means at the same level of N or P = 150.9 lb./ac.
   S.E of body D×S, D×R or S×R table = 125.7 lb /ac.
   S.E. of body of N×P table = 90.3 lb./ac.

———

Crop :- Paddy *(Kharif).*

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

Ref :- M.P. 58(MAE).

Type :- 'CM'.

Object : Type VII :—To study the effect of cultural practices and manuring on the yield of Paddy.

1 BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N A. (iii) As per t eatments. (iv) (a) 1 ploughing. (b) N.A. (c) 40 lb./ac. (d) and (e) As per treatments (v) 5000 lb./ac. of F.Y.M. (vi) *Luchai × Gurmatia* no. 18 (late). (vii) Irrigated. (viii) 1 weeding. (ix) 66". (x) 4th week of November, 1958.

2. TREATMENTS :

Main-plot treatments :
All combinations of (1), (2) and (3)
    (1) 3 dates of sowing: $D_1=15.7.1958$, $D_2=1.8.1958$ and $D_3=15.8.1958$.
    (2) 3 spacings : $S_1=6'' \times 6''$, $S_2=8'' \times 8''$ and $S_3=10'' \times 10''$.
    (3) No. of seedlings/hole : $R_1=2$, $R_2=4$ and $R_3=6$.
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) Split-plot confd. (ii) (a) 9 main plots/block ; 3 blocks/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) Bagwai and Reora. (vi) and (vii) Nil.

5. RESULTS : ·

(i) 2230 lb./ac. (ii) (a) 1131.0 lb./ac. (b) 349.0 lb./ac. (iii) Main effect of P is highly significant and interaction $D \times N \times P$ is 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	2592	2402	2506	2566	2464	2470	2528	2472	2354	2646	2500
D_2	2305	2569	1967	2307	2240	2294	2256	2304	2154	2407	2280
D_3	1912	2065	1752	1857	1820	2052	1825	1995	1763	2057	1910
Mean	2270	2345	2075	2243	2175	2272	2203	2257	2090	2370	2230
P_0	2086	2246	1939	2026	2013	2233	2104	2077			
P_1	2454	2444	2211	2461	2337	2312	2303	2437			
N_0	2280	2262	2068	2203	2132	2274					
N_1	2260	2429	2082	2284	2217	2270					
R_1	2227	2324	2178								
R_2	2146	2408	1970								
R_3	2437	2303	2077								

S.E. of difference of two

1. D, S or R marginal means = 267 lb./ac.
2. P or N marginal means = 67 lb./ac.
3. P or N means at the same level of D, S or R = 116 lb./ac.
4. D, S or R means at the same level of P or N = 279 lb./ac.
   S.E. of body $D \times S$, $D \times R$ or $S \times R$ table = 326 lb./ac.
   S.E. of body $N \times P$ table = 67 lb./ac.

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

Site :- M.A.E. Farm, Raipur. Type :- 'CM'.

Object: Type VII :—To study the effect of cultural practices and manuring on the yiled of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) As per treatments. (iv) (a) Ploughing. (b) N.A. (c) 40 lb /ac. (d) and (e) As per treatments. (v) 5000 lb./ac. of F.Y.M. (vi) *Luchai × Gurmatia* no. 18 (late). (vii) Irrigated. (viii) Weeding. (ix) 42″. (x) 3rd week of November, 1959.

2. TREATMENTS :

Main-plot treatments :
All combinations of (1), (2) and (3)
  (1) 3 dates of sowing : D_1=2.8.1959, D_2=18.8.1959 and D_3=2.9.1959.
  (2) 3 spacings : S_1=6″×6″, S_2=8″×8″ and S_3=10″×10″.
  (3) No. of seedlings/hole : R_1=2, R_2=4 and R_3=6.
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) Split-plot confd. (ii) (a) 3 blocks/replication ; 9 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (i) 1. (iv) (a) 34'×16'. (b; 32'×14'. (v) 1'×1'. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (v) 1956—contd. (b) N.A. (c) Nil. (vi) Bagwai and Reora. (vi) and (vii) Nil.

5. RESULTS :

(i) 2765 lb./ac. (ii) (a) 580.8 lb./ac. (b) 416.3 lb./ac. (iii) Main effect of N is highly significant. Interactions D×N, S×N and N×P 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	3209	2962	2699	2929	2954	2988	2608	3306	2962	2952	2957
D_2	3119	2905	2929	2971	2962	3019	2765	3203	2872	3096	2984
D_3	2518	2230	2312	2164	2419	2476	2271	2435	2419	2287	2353
Mean	2949	2699	2647	2688	2778	2828	2548	2981	2751	2778	2765
P_0	3003	2715	2536	2650	2814	2789	2600	2902			
P_1	2895	2683	2757	2726	2742	2866	2496	3060			
N_0	2872	2477	2296	2477	2534	2633					
N_1	3026	2921	2997	2899	3022	3022					
R_1	2962	2551	2552								
R_2	2798	2839	2698								
R_3	3087	2707	2690								

S.E. of difference of two

1. D, S or R marginal means   = 136.9 lb./ac.
2. N or P marginal means   = 80.1 lb./ac.
3. N or P means at the same level of D, S or R   = 138.8 lb /ac.
4. D, S or R means at the same level of N or P   = 168.4 lb./ac.
    S.E. of body of D×S, D×R or S×R table   = 167.7 lb./ac.
    S.E. of body of N×P table   = 80.1 lb /ac.

Crop :- Paddy *(Kharif)*.

Site :- State Mechanised Farm, Reora.

Ref :- M.P. 58(MAE).

Type :- 'CM'.

Object : Type VII :—To study the effect of cultural practices and manuring on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) As.per treatments. (iv) (a) 1 puddling. (b) and (c) N.A. (d) and (e) As per treatments. (v) Nil. (vi) T—43 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 4th week of October, 1958.

2. TREATMENTS :

Main-plot treatments :
All combinations of (1), (2) and (3)
    (1) 3 dates of sowing : D_1=27.7.1958, D_2=8.8.1958 and D_3=20.8.1958.
    (2) 3 spacings : S_1=6"×6", S_2=8"×8" and S_3=10"×10".
    (3) 3 No. of seedlings/hole : R_1=2, R_2=4 and R_3=6.

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 as Super : P_0=0 and P_1=40 lb./ac.

3. DESIGN :

(i) Split-plot confd. (ii) (a) 3 blocks/replication ; 9 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 1/136.5 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Gundibug attacks. Control measure N.A. (iii) Grain yield. (iv) (a) 1956—contd. Experiment failed in 1956 and 1957. (b) N.A. (c) Nil. (v) Bagwai and Raipur. (vi) and (vii) Nil.

5. RESULTS :

(i) 1276 lb./ac. (ii) (a) 433.3 lb./ac. (b) 285.3 lb./ac. (iii) Main effects of D, N and P are highly significant. Main effect of S and interaction D×R are significant. (vi) 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	1377	2028	1301	1255	1305	2146	1344	1793	1433	1704	1569
D_2	1403	1307	970	1182	1206	1292	1057	1396	1118	1335	1227
D_3	1210	903	986	1124	1044	931	771	1296	897	1169	1033
Mean	1330	1413	1086	1187	1185	1456	1057	1495	1149	1403	1276
P_0	1220	1262	966	1030	1108	1310	960	1339			
P_1	1440	1564	1205	1345	1262	1602	1155	1651			
N_0	1070	1274	827	1005	909	1257					
N_1	1590	1552	1344	1369	1461	1656					
R_1	1209	1356	997								
R_2	1405	1225	925								
R_3	1376	1658	13`5								

S.E. of difference of two

1. D, S or R marginal means = 102.1 lb./ac.
2. P or N marginal means = 54.9 lb./ac.
3. P or N means at the same level of D, S or R = 95.1 lb./ac.
4. D, S or R means at the same level of P or N = 122.3 lb./ac.
   S.E. of body of D×S, D×R or S×R table = 125.1 lb./ac.
   S.E. of body of N×P table = 54.9 lb./ac.

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Crop :- Paddy *(Kharif).*

Site :- State Mechanised Farm, Reora.

Ref :- M.P. 59(MAE).

Type :- 'CM'.

Object :—Type VII—To study the effect of cultural practices and manuring on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) As per treatments. (iv) (a) 2 puddlings and 2 levellings. (b) and (c) N.A. (d) and (e) As per treatments. (v) Nil. (vi) T—43(late). (vii) Unirrigated. (viii) 2 weedings. (ix) 64″. (x) 2nd week of November, 1959.

2. TREATMENTS :

Main-plot treatments :
All combinations of (1), (2) and (3)
(1) 3 dates of sowing : D_1=27.7.1959, D_2=8.8 1959 and D_3=20.8.1959.
(2) 3 spacings : S_1=6″×6″, S_2=8″×8″ and S_3=10″×10″.
(3) No. of seedlings/hole : R_1=2, R_2=4 and R_3=6.
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) Split-plot confd. (ii) (a) 3 blocks'replication ; 9 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 27.5′×13.75′. (b) 23.5′×9.75 . (v) 2′×2′. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) *Gundibug* attack. (iii) Grain yield. (iv) (a) 1956—contd. (expt. failed in 1956 and 1957). (b) N.A. (c) Nil. (v) (a) Bagwai and Satna. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1627 lb./ac. (ii) (a) 982.4 lb./ac. (b) 477.9 lb./ac. (iii) Main eff.ct of N and P are highly significant. Interaction D×R×N is 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	1967	2098	1596		1374	2337	1950		1605	2169		1440	2334	1887
D_2	1860	1802	1629		1531	1901	1860		1654	1874		1374	2154	1764
D_3	1292	1325	1070		1144	1210	1333		1193	1265		955	1503	1229
Mean	1706	1742	1432		1350	1816	1714		1484	1769		1256	1997	1627
P_0	1292	1333	1144		946	1456	1366		1185	1327				
P_1	2120	2151	1720		1754	2176	2062		1783	2211				
N_0	1596	1613	1243		1201	1670	1582							
N_1	1816	1871	1620		1499	1962	1847							
R_1	1473	1580	997											
R_2	1893	1958	1596											
R_3	1752	1688	1702											

S.E. of difference of two

1. D, S or R marginal means	= 231.6 lb./ac.
2. N or P marginal means	= 92.0 lb./ac
3. N or P means at the same level of D, S or R	= 159.3 lb./ac.
4. D, S or R means at the same level of N or P	= 257.5 lb./ac.
S.E. of body of D×S, D×R or S×R table	= 283.6 lb./ac.
S.E. of body of N×P table	= 92.0 lb./ac.

Crop :- Paddy *(Kharif)*.

Site :- Govt. Agri. Res. Farm, Rewa.

Object :—To study the effect of weedicides on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy—Wheat. (b) Wheat. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 2.7.1959. (iv) 3 ploughings. (b) Broadcasting. (c) 40 lb./ac. (d) and (e) N.A. (v) Nil. (vi) T—43. (vii) Unirrigated. (viii) Nil. (ix) 44.3″. (x) 7.10.1959.

2. TREATMENTS :

9 weedicides : D_0=No weeding (control), D_1=Hand weeding, D_2=½ lb./ac. of 2—4—D in 100 gallons of water, D_3=1 lb./ac. of 2—4—D in 100 gallons of water, D_4=1½ lb./ac. of 2—4—D in 100 gallons of water, D_5=½ lb./ac. of 2—4—D in 2 of gallons diesel/ac., D_6=1 lb./ac. of 2—4—D in 2 gallons of diesel/ac., D_7=1½ lb./ac. of 2—4—D in 2 gallons of diesel/ac. and D_8=1½ lb./ac. 2—4—D in A/S and SO_4.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 35′×12′. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1355 lb./ac. (ii) 259 3 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	D_0	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8
Av. yield	1724	1283	1115	1193	1400	1465	1232	1167	1615

S.E./mean = 129.7 lb./ac.

Crop :- Paddy *(Kharif)*,   **Ref :- M.P. 56(72).**

Site :- Govt. Agri. Res. Stn., Adhartal.   **Type :- 'D'.**

Object :—To study the effect of insecticides against Rice stem borer on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Sehra.* (Sandy) (b) N.A. (iii) N.A. (iv) (a) Ploughing by Malwa plough. Puddling by *datari* and *patiya.* (b) Transplanted by Japanese method. (c) and (d) N.A. (e) 1. (v) F.Y.M. at 20 C.L./ac. Ammo. phos. at 200 lb./ac. on 10, 11.7.1956 and Ammo. phos. at 200 lb./ac. on 20, 21.7.1956. (vi) *Chhattri.* (vii) Irrigated. (viii) 1 weeding. (ix) and (x) N.A.

2. TREATMENTS :

T_1=Endrine 1% at 20 lb./ac.
T_2=Dieldrine 1½% at 13⅓ lb./ac.
T_3=D.D. T. 5% at 10 to 12 lb./ac.
T_4=B.H C. 5% at 10 to 12 lb./ac.
T_5=Control
Insecticides were applied on 9.9.1956 and 9.10.1956.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 1/10 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of stem borer. (iii) Grain yield. (iv) (a) 1956. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1405 lb./ac. (ii) 495.5 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	1363	1660	1338	1120	1543

S.E./mean = 247.8 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 55(44).**

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

Object :—To find the residual effect of Super applied to the previous Gram crop on Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Gram—Wheat—Gram. (b) Gram. (c) As per treatments. (ii) (a) *Kabar II.* (b) N.A. (iii) 1.12.1955. (iv) (a) N.A. (b) Drilling. (c) 100 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Hy—25 (early). (vii) Unirrigated. (viii) N.A. (ix) 64.66″. (x) 3.4.1956.

2. **TREATMENTS :**

   5 levels of P_2O_5 as Super : $P_0=0$, $P_1=15$, $P_2=20$, $P_3=25$ and $P_4=30$ lb./ac.
   Super was applied to the previous gram crop.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 66′×16½′ (v) Nil. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—contd. (b) As per treatments. (c) No. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 168 lb./ac. (ii) 26.8 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2	P_3	P_4
Av. yield	204	186	139	168	144

   S.E./mean $=$ 13.4 lb./ac.

   ———

   Crop :- Wheat *(Rabi).* **Ref :- M.P. 56(75).**

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

   Object :—To study the effect of G.M., N and P fertilizers on Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) Sandy. (b) N.A. (iii) 27.11.1956. (iv) (a) Burrying the G.M. as per treatments. (b) N.A. (c) Sannhemp : 80 lb./ac., cowpea : 40 lb./ac. and wheat : 100 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Hy—65. (vii) Irrigated. (viii) N.A. (ix) Nil. (x) 10 and 11.4.1957.

2. **TREATMENTS :**

   Main-plot treatments :
   2 G.M. crops : G_1=Sannhemp and G_2=Cowpea.
   Sub-plot treatments :
   7 manurial treatments : M_0=Only G.M., M_1=M to wheat, M_2=M to G.M. at sowing, M_3=M at burrying the G.M., M_4=M' to wheat, M_5=M' to G.M. at sowing and M_6=M' at burrying the G.M.
   M=20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super and M'=40 lb./ac. of N as A/S+40 lb./ac. cf P_2O_5 as Super.

3. **DESIGN :**

   (i) Split-plot. (ii) (a) 2 main-plots/replication ; 7 sub-plots/main-plot. (b) N.A. (iii) No. (iv) (a) and (b) 40′×18′. (v) Nil. (vi) Yes.

4. **GENERAL :**

   (i) Not satisfactory. (ii) Attack of black and brown rust limitted to leaves only. (iii) Grain and straw yield. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 374 lb./ac. (ii) (a) 143.3 lb./ac. (b) 147.8 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	M_4	M_5	M_6	Mean
G_1	486	242	320	504	443	337	324	379·
G_2	392	366	396	418	435	348	285	370
Mean	439	304	333	461	439	342	304	374

S.E. of difference of two

1. G marginal means   =   38.3 lb./ac.
2. M marginal means   =   73.9 lb./ac.
3. M means at the same level of G   =   104.5 lb./ac.
4. G means at the same level of M   =   104.1 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 56(74).**

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

Object :—To study the effect of N with and without P on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) *Kabar-2.* (b) N.A. (iii) 25.10.1956. (iv) (a) *Raja* cutting and *kans* eradication. Cleaning the bunds. (b) to (e) N.A. (v) Nil. (vi) Hy—38. (v.i) Unirrigated. (viii) Weeding. (ix) No. (x) 27.4.1957.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M. : $F_0 = 0$ and $F_1 = 8$ to 10 C.L. /ac. every third year.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 4 sources of 15 lb./ac. of N : $S_0 =$ Control, $S_1 =$ A/S, $S_2 =$ A/S/N and $S_3 =$ Urea.
(2) 2 levels of P_2O_5 as Super : $P_0 = 0$ and $P_1 = 15$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication, 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 50′×22′. (b) 48′×20′. (v) 1′×1′. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 429 lb./ac. (ii) (a) 150.3 lb./ac. (b) 83.1 lb./ac. (iii) Main effect of S is significant. (iv) Av. yield of grain in lb./ac.

	S_0	S_1	S_2	S_3	Mean	P_0	P_1
F_0	316	456	420	435	407	395	418
F_1	335	557	468	440	450	461	439
Mean	326	506	444	438	429	428	429
P_0	312	549	442	409			
P_1	339	464	446	466			

S.E. of diff reace of two

1. F marginal means   =   37.6 lb./ac.
2. S marginal means   =   20.8 lb./ac.
3. P marginal means   =   29.4 lb./ac.
4. P means at the same level of F   =   29.4 lb./ac.
5. S mean at the same level of F   =   41.6 lb./ac.
6. F means at the same level of P   =   85.9 lb./ac.
7. F means at the same level of S   =   73.6 lb./ac.
   S.E. of body of S×P table   =   29.4 lb./ac.

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

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

Object :—To compare the effects of blood meal and other fertilizers on Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) *Kobar—2.* (b) N.A. (iii) 8.11.1954. (iv) (a) *Bakhering.* (b) Drilling. (c) 80 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Hy—11 (early). (vii) Unirrigated. (viii) *Kans* cutting and weeding. (ix) 4.59*. (x) 11 4.1955.

2. **TREATMENTS :**

   5 sources of 20 lb./ac. of N : S_0=Control, S_1=F.Y.M, S_2=Bloodmeal, S_3=G.N.C. and S_4=A/S.

3. **DESIGN :**

   (1) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 66'×16½'. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. **GENERAL :**

   (i) Fair. (ii) N.A. (iii) Yield of grain and straw. (iv) (a) 1951—1954. (b) Yes. (c) No. (v) (a) Powar—kheda. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 190 lb./ac. (ii) 104 8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4
Av. yield	139.8	189.8	185.0	187.4	249.6

   S.E./mean = 52.4 lb./ac.

Crop :- Wheat.

Site :- Govt. Agri. Res. Stn., Adhartal.

Ref :- M.P. 55(39).

Type :- 'M'.

Object —To study the effect of N and different sources of P on Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) *Kabar—2.* (b) N.A. (iii) 12.11.1955. (iv) (a) N.A. (b) Drilling. (c) 100 lb./ac. (d) and (e) N.A. (v) Nil. (vi) A O. 90 (local). (vii) Unirrigated. (viii) Nil. (ix) 64.66*. (x) 24.4.1956.

2. **TREATMENTS :**

   All combinations of (1) and (2)+2extra treatments

   (1) 3 sources of P_2O_5 : S_1=Triple Super, S_2=Ammo. Phos. and S_3=Nitro. Phos.
   (2) 2 levels of P_2O_5 : P_1=20 and P_2=40 lb./ac.
   Extra treatments : T_0=Control and T_1=40 lb./ac. of N as A/S.
   T_1 given to all the combinations of (1) and (2).

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 45'×24'. (b) 39'×18'. (v) 3'×3'. (vi) Yes.

4. **GENERAL :**

   (i) Normal. (i) Nil. (iii) Yield of grain. (iv) (a) 1955—contd. (b) and (c) N.A. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 260 lb./ac. (ii) 97.8 lb./ac. (iii) Main effect of S and "control vs. others" are highly significant. (iv) Av. yield of grain in lb./ac.

   T_0=83 lb./ac. and T_1=318 lb./ac.

	S_1	S_2	S_3	Mean
P_1	306	416	155	292
P_2	281	372	150	268
Mean	294	394	152	280

S.E. of P marginal mean	= 28.2 lb /ac.
S.E. of S marginal mean	= 34.6 lb./ac.
S.E. of body of table or extra treatment mean	= 48.9 lb./ac.

Crop :- Wheat.

Site :- Govt. Agri. Res. Stn., Adhartal.

Ref :- M.P. 56(42).

Type :- 'M'.

Object :—To study the effect of N and different sources of P on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) Sehra. (b) N.A. (iii) 26 10.1956. (iv) (a) Bakhering. (b) Drilling. (c) 100 lb./ac. (d) and (e) N.A. (v) Nil. (vi) A.O. 90 (local). (vii) Unirrigated. (viii) 1 hand weeding. (ix) 68.67". (x) 19.4.1957.

2. TREATMENTS :

All combinations of (1) and (2)+2 extra treatments
     (1) 2 sources of P_2O_5 : S_1 = Triple Super and S_2 = Ammo. Phos.
     (2) 2 levels of P_2O_5 : P_1 = 20 and P_2 = 40 lb./ac.
Extra treatments : T_0 = Control and T_1 = 40 lb./ac. of N as A/S.
T_1 is also given to all combinations of (1) and (2).

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 45'×24'. (b) 39'×18'. (v) 3 ×3'. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Sulphur dusting done to check rust. (iii) Yield of grain. (iv) (a) 1955—contd. (b) and (c) Yes. (v) (a) and (b) N.A. (vi) Heavy rains at sowing and harvesting. It was therefore re-sown on 15.11 1956. (vii) Nil.

5. RESULTS :

(i) 535 lb./ac. (ii) 171.8 lb./ac. (iii) Effect of "control vs. others" and "T_1 vs. all combinations of (1) and (2)" are significant. (iv) Av. yield of grain in lb./ac.

$$T_0 = 187 \text{ lb./ac. and } T_1 = 438 \text{ lb./ac.}$$

	S_1	S_2	Mean
P_1	606	641	624
P_2	666	671	669
Mean	636	656	646

S.E. of any marginal mean   = 60.7 lb./ac.
S.E. of body of table or extra treatment mean = 85.9 lb /ac.

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Crop :- Wheat.

Site :- Govt. Agri. Res. Stn., Adhartal.

Ref :- M.P. 54(51)

Type :- 'M'.

Object :—To find out suitable source and dose of N for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Kabar-2. (b) N.A. (iii) 22.10.1954. (iv) (a) Bakhering. (b) Drilling. (c) 100 lb./ac. (d) and (e) N A. (v) Nil. (vi) A.O.90 (local). (vii) Unirrigated. (viii) Border cleaning and Kans cutting. (ix) 4.59". (x) 12.4.1955

2. TREATMENES :

All combinations of (1) and (2)+control (3 plots)
     (1) 3 sources of N : S_1 = A/S, S_2 = A/N and S_3 = Urea.
     (2) 2 levels of N : N_1 = 20 and N_2 = 40 lb./ac.

8. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 45'×24'. (b) 39'×18'. (v) 3'×3'. (vi) Yes.

4. GENERAL

(i) Fair. (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—contd. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 425 lb./ac. (ii) 112.9 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

Control = 393 lb./ac.

	S_1	S_2	S_3	Mean
N_1	346	446	417	403
N_2	533	531	376	480
Mean	440	489	397	442

S.E. of N marginal or control mean	= 32.6 lb./ac.
S.E. of S marginal mean	= 39.9 lb./ac.
S.E. of body of the table	= 56.4 lb./ac.

Crop : Wheat.   **Ref :- M.P. 54(54).**

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

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

1   BASAL CONDITIONS :

(i) (a) Nil   (b) Wheat. (c) As per treatments. (ii) (a) *Kabar—2* (b) N.A. (iii) 24.10.1954 (iv) (a) *Bakhering* (b) Drilling. (c) to (e) N.A. (v) Nil   (vi) A.O. 90 (local). (vii) Unirrigated. (viii) Cleaning. (ix) 4.59". (x) 6 and 7.4.1955.

2.   TREATMENTS :

All combinations of (1) and (2)

     (1) 3 levels of N as A/S : $N_0=0$, $N_1=15$ and $N_2=30$ lb./ac.
     (2) 5 levels of P_2O_5 as Super : $P_0=0$, $P_1=15$, $P_2=30$, $P_3=45$ and $P_4=60$ lb./ac.

3.   DESIGN :

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

4.   GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of grain. (iv) (a) 1951—contd. (b) Yes. (c) No. (v) (a) Powarkheda. (b) Nil. (vi) and (vii) Nil.

5.   RESULTS :

(i) 686 lb./ac. (ii) 166.6 lb./ac. (iii) Only the main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	500	497	520	578	653	548
N_1	707	793	683	650	871	742
N_2	670	760	847	797	763	767
Mean	626	683	683	675	764	686

S.E. of N marginal mean	= 43 0 lb./ac.
S.E. of P marginal mean	= 55.5 lb./ac.
S.E. of body of table	= 96.2 lb./ac.

Crop :- Wheat. Ref :- M.P. 55(37).

Site :- Govt. Agri. Res. Stn., Adhartal. Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) *Kabar*-2 (b) N.A. (iii) 8.11.1955. (iv) (a) N.A. (b) Drilling. (c) 100 lb./ac. (d) and (e) N.A. (v) Nil. (vi) A.O. 90 (local). (vii) Unirrigated. (viii) Nil. (ix) 64.66″. (x) 9.4.1956.

2. TREATMENTS and 3 DESIGN :

Same as in expt. no. 54(54) on page 140.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1951—contd. (b) Yes. (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 401 lb./ac. (ii) 108.0 lb./ac. (iii) Only the main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	353	302	257	287	338	307
N_1	460	535	417	397	510	464
N_2	413	467	345	485	445	431
Mean	409	434	339	390	431	401

S.E. of N marginal mean = 27.9 lb./ac.
S.E. of P marginal mean = 36.0 lb./ac.
S.E. of body of table = 62.4 lb./ac.

Crop :- Wheat. Ref :- M.P. 56(46).

Site :- Govt. Agri. Res. Stn., Adhartal. Type :- 'M'.

Object :—To study the effect of N and P fertilizers on Wheat

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) *Kabar*-2. (b) N.A. (iii) 29.10.1956. (iv) (a) *Bakhering.* (b) Drilling. (c) 10 lb./ac. (d) and (e) N.A. (v) Nil. (vi) A.O. 90 (local). (vii) Unirrigated. (viii) 1 hand. weeding. (ix) 68.67″. (x) 23.4.1957.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(54) on page 140.

4. GENERAL :

(i) Good. (ii) Rust attack—sulpher dusted. (iii) Av. no. of tillers, Av. height and yield of grain. (iv) (a) 1951—contd. (b) Yes. (c) No. (v) (a) Powarkheda. (b) N.A. (vi) Continuous rains damaged the crop. Re-sown on 16.11.1956. (vii) Nil.

5. RESULTS :

(i) 605 lb./ac. (ii) 101.8 lb./ac. (iii) Only the main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	544	561	584	408	417	503
N_1	537	692	652	678	700	652
N_2	625	605	727	715	623	659
Mean	569	619	654	600	580	605

S.E. of N marginal mean	=	26. 3lb./ac.
S.E. of P marginal mean	=	33.9 lb./ac.
S.E of body of table	=	58.8 lb./ac.

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Crop :- Wheat.   **Ref :- M.P. 56(47).**

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

Object :—To study the effect of A/S and A/C with and without P_2O_5 on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Kabar*-2. (b) N.A. (iii) 24.10.1956. (iv) (a) Harrowing. (b) Drilling. (c) 100 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Hy—11 (early). (vii) Unirrigated. (viii) 1 hand weeding. (ix) 68.67". (x) 3.4.1957.

2. TREATMENTS :

All combinations of (1), (2) and (3)+control.

(1) 2 sources of N : S_1=A/C and S_2=A/S.
(2) 2 levels of N : N_1=20 and N_2=40 lb./ac.
(3) 2 levels of P_2O_5 as Super : P_0=0 and P_1=20 lb./ac.

3. DESIGN :

(i) R.B.D (ii) (a) 9 (b) N.A. (iii) 4. (iv) (a) and (b) 66'×33'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Rust attack—dusting with sulpher. (iii) Av. no. of tillers, Av. height and yield of grain. (iv) (a) 1956—contd. (b) Yes. (c) No. (v) (a) and (b) N.A. (vi) Continuous rains at sowing, ripening and harvest. Crop resown on 29.11.1956. (vii) Nil.

5. RESULTS :

(i) 436 lb./ac. (ii) 129.8 lb./ac. (iii) Main effect of N and control *vs.* others are highly significant. (iv) Av. yield of grain in lb./ac.

Control   =   257.6 lb./ac.

	N_1	N_2	Mean	P_0	P_1
S_1	353	577	465	470	460
S_2	348	555	452	471	432
Mean	355	566	458	470	446
P_0	384	556			
P_1	317	576			

S.E. of any marginal mean	=	45.9 lb /ac.
S.E. of body of any table	=	64.9 lb./ac.
S.E. of control mean	=	91.8 lb./ac.

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Crop :- Wheat.   **Ref :- M.P. 58(6).**

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

Object :—To study the effect of A/S and A/C with and without P_2O_5 on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) *Kabar*—2. (b) N.A. (iii) 7.11.1958. (iv) (a) Harrowing and ploughing. (b) Drilling. (c) 100 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Hy.—11. (vii) Unirrigated. (viii) Nil. (ix) 55.07". (x) 21.3.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(47) on page 142.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956—1958. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Crop had fai ed during, 1957.

5. RESULTS :

(i) 397 lb./ac. (ii) 107.2 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac

Control = 297.2 lb./ac.

	N₁	N₂	Mean	P₀	P₁
S₁	393	420	·407	417	396
S₂	424	402	413	353	472
Mean	409	411	410	385	434
P₀	379	391			
P₁	438	430			

S.E. of any marginal mean = 26.8 lb./ac.
S.E. of body of any table = 37.9 lb./ac.
S.E. of control mean = 53.6 lb./ac.

Crop :- **Wheat.**   Ref :- **M.P. 54(48).**

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

Object :—To study the effect of different methods of application of N and P fertilizers on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N A. (c) N A. (ii) (a) Sehra. (b) N.A. (iii) 13.11.1954. (iv) (a) Ploughing and *bakhering*. (b) As per treatments. (c) to (e) N.A. (v) N.A. (vi) Hy—38 (early). (vii) Irrigated. (viii) 1 weeding. (ix) 4.59". (x) 4.4.1955.

2. TREATMENTS :

6 methods of application of manure : M₀=Control, M₁=M broadcasted and mixed by plough, M₂=M drilled with seed, M₃=M placed an inch below the seed by *Nari*, M₄=M applied by hand by the sides of furrows and M₅ = M dissolved in 100 gallons of water and applied in furrows.

M=15 lb./ac. of N as A/S+15 lb./ac. of P₂O₅ as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 1/58.08 ac. (b) 1/79.78 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—contd. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 1073 lb./ac. (ii) 186.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M₀	M₁	M₂	M₃	M₄	M₅
Av. yield	954	1038	1008	1158	1187	1092

S.E./mean = 76.2 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 56(77).**

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

Object :—To study the effect of different methods of application of N and P fertilizers on Wheat.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Kabar*—2. (b) N.A. (iii) 1.12.1956. (iv) (a) *Bakhering, Reja* cutting and *Kans* eradication. (b) to (e) N.A. (v) Nil. (vi) Hy—38. (vii) Unirrigated. (viii) and (ix) N.A. (x) 24.4.1957.

2. TREATMENTS :

   Same as in expt. no. 54(48) on page 143.

3. DESIGN :

   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 35'×30'. (b) 30'×25'. (v) 2½'×2½'. (vi) Yes.

4. GENERAL :

   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—contd. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS :

   (i) 453 lb./ac. (ii) 118.1 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	304	475	557	515	390	479

   S.E /mean = 48.2 lb./ac.,

Crop :- Wheat.   **Ref :- M.P. 58(7).**

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

Object :—To see the effect of A/S and Super on Wheat under dry conditions.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) *Kabar*—2. (b) N.A. (iii) 13.11.1958. (iv) (a) Harrowing. (b) Drilling. (c) 100 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Hy—11. (vii) Unirrigated. (viii) Nil. (ix) 55.07". (x) 20.3.1959.

2. TREATMENTS :

   4 manurial treatments : M_0= Control, M_1=10 lb./ac. of A/S+20 lb./ac. of Super, M_2=50 lb./ac. of A/S+ 62 lb./ac. of Super and M_3=100 lb./ac. of A S+125 lb./ac. of Super.

3. DESIGN :

   (i) R.B.D. (ii) (a) 4. (b) 66'×33'. (iii) 2. (iv) (a) and (b) 33'×16½'. (v) N.A. (vi) Yes.

4. GENERAL :

   (i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) and (b) N.A. (c) Nil. (v) (a) Amlaha. (b) Nil. (vi) Nil. (vii) Crop had failed during 1957.

5. RESULTS :

   (i) 507 lb./ac. (ii) 123.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	386	416	615	610

   S.E./mean = 87.5 lb./ac.

Crop :- Wheat.　　　　　　　　　　　　　　　　**Ref :- M.P. 54(50).**

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

Object :—To study the effect of treating the seed prior to sowing on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) *Kabar*—2. (b) N.A. (iii) 21.10.1954. (iv) (a) *Bakhering*. (b) Drilling. (c) to (e) N.A. (v) 10 C.L./ac. of compost. (vi) A.O. 90 (local). (vii) Unirrigated. (viii) Border cleaning. (ix) 4.59". (x) 25.3.1955, 26.3.1955 and 28.3.1955.

2. TREATMENTS :

3 manurial treatments : M_1=Dry seed, M_2=Seed soaked in pure water for 24 hours and M_3=Seed soaked in one molar solution of A/S for 24 hours.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 45'×24'. (b) 39'×18'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Weight of grain. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 440 lb./ac. (ii) 79.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_1	M_2	M_3
Av. yield	496	422	402

S.E./mean = 32.3 lb./ac.

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Crop :- Wheat *(Rabi)*.　　　　　　　　　　　　**Ref :- M.P. 55(8).**

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

Object :—To study the effect of treating the seed prior to sowing on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) *Kabar*—2. (b) N.A. (iii) 17.11.1955. (iv) (a) *Bakhering* ihwt blade harrow. (b) Sown by *Nari* plough. (c) 100 lb./ac. (d) Between lines 1'. (e) N.A. (v) N.A. (vi) A.O. 90. (vii) Unirrigated. (viii) Border cleaning. (ix) N.A. (x) 18.4.1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(50) above

5. RESULTS :

(i) 197 lb./ac. (ii) 77.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_1	M_2	M_3
Av. yield	204	192	195

S.E./mean = 31.5 lb./ac.

———

Crop :- Wheat *(Rabi)*.　　　　　　　　　　　　**Ref :- M.P. 56(68).**

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

Object :—To study the effect of treating the seed prior to sowing on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Kabar—2.* (b) N.A. (iii) 21.11.1956. (iv) (a) *Bakhering* with blade harrow. (b) N.A. (c) 100 lb./ac. (d) Between lines : 1'. (e) N.A. (v) Nil. (vi) Wheat : A.O. 90. (vii) Unirrigated. (viii) and (ix) N.A. (x) 24.4.1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(50) on page 145,

5. RESULTS :

(i) 220 lb./ac. (ii) 61.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_1	M_2	M_3
Av. yield	222	218	221

S.E./mean $=$ 25.2 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 54(46).**

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

Object :—To study the comparative effects of Sodium Nitrate and A/S with and without lime on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Kabar—2.* (b) N.A. (iii) 24 and 25 10.1954 and 2.11.1954. (iv) (a) *Bakhering.* (b) Drilling. (c) to (e) N.A. (v) N.A. (vi) A.O. 90 (local). (vii) Unirrigated. (viii) Border cleaning and *Kans* cutting. (ix) 4.59". (x) 12 and 13.4.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)+2 extra treatments.

(1) 2 sources of N : S_1=A/S and S_2=Sodium Nitrate.
(2) 2 levels of N : N_1=20 and N_2=40 lb./ac.
(3) 2 levels of lime : L_0=0 and L_1=200 lb./ac.

Extra treatments : T_0=Control and T_1=200 lb./ac. of lime.
T_1 applied to all the plots excepting the control plots.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 66'×24½'. (b) 60'×18'. (v) 3'×3¼'. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (v) (a) Powarkheda. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 467 lb./ac. (ii) 117.7 lb./ac. (iii) Only the "lime *vs.* other combinations" effect is significant. (iv) Av. yield of grain in lb./ac.

T_0 $=$ 419 lb./ac. and T_1 $=$ 372 lb./ac.

	N_1	N_2	Mean	L_0	L_1
S_1	457	522	490	487	493
S_2	458	502	480	480	480
Mean	458	512	485	484	480
L_0	445	522			
L_1	470	502			

S.E. of any marginal mean $=$ 24.0 lb./ac.
S.E. of body of any table $=$ 34.0 lb./ac.

Crop :- Wheat.

Site :- Govt. Agri. Res. Stn., Adhartal.

Ref :- M.P. 55(40).

Type :- 'M'.

Object :—To study the comparative effects of Sodium Nitrate and A/S with and without lime on Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) *Kabar*—2. (b) N.A. (iii) 4 and 6.11.1955. (iv) (a) N.A. (b) Drilling. (c) 100 lb./ac. (d) and (e) N.A. (v) Nil. (vi) A O. 90. (vii) Unirrigated. (viii) N.A. (ix) 64.66". (x) 5 and 26.4.1956.

2. **TREATMENTS to 4. GENERAL :**

   Same as in expt. no 54 (46) on page 146.

5. **RESULTS :**

   (i) 229 lb./ac. (ii) 75.0 lb./ac. (iii) Interactions S×N and L×S are significant. (iv) Av. yield of grain in lb./ac.

$$T_0 = 159 \text{ lb./ac. and } T_1 = 141 \text{ lb./ac.}$$

	N_1	N_2	Mean	L_0	L_1
S_1	232	293	263	265	260
S_2	246	225	235	215	256
Mean	239	259	249	240	258
L_0	220	260			
L_1	258	258			

S.E. of any marginal mean   = 15.3 lb./ac.

S.E. of body of any table   = 21.6 lb./ac.

———

Crop :- Wheat.

Site :- Govt. Agri. Res. Stn., Adhartal.

Ref :- M.P. 56(43).

Type :- 'M'.

Object :—To study the comparative effects of Sodium Nitrate and A/S with and without lime on Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) *Sehra.* (b) N.A. (iii) 25.10.1956. (iv) (a) Harrowing. (b) Drilling. (c) 100 lb./ac. (d) and (e) N.A. (v) Nil. (vi) A.O. 90 (local). (vii) Unirrigated. (viii) Nil. (ix) 68.67". (x) 16 and 17.4.1957.

2. **TREATMENTS :**

   Same as in expt. no. 54 (46) on page 146.

3. **DESIGN :**

   (i) R.R D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 66'×24'. (b) 60'×18'. (v) 3'×3'. (vi) Yes.

4. **GENERAL :**

   (i) Slightly patchy growth after heavy rains. (ii) Rust at earhead formation stage—Sulphur dusted. (iii) Yield of grain. (iv) (a) 1954—contd. (b) Yes. (c) Nil (v) (a) Powarkheda. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 488 lb./ac. (ii) 129.1 lb./ac. (iii) "Control *vs.* others" and "lime *vs.* other combinations" are highly significant. (iv) Av. yield of grain in lb./ac.

$T_0 = 255$ lb./ac. and $T_1 = 285$ lb./ac.

	N_1	N_2	Mean	L_0	L_1
S_1	443	688	565	565	565
S_2	459	582	521	504	537
Mean	451	635	543	535	551
L_0	445	625			
L_1	457	645			

S.E. of any marginal mean   = 26.4 lb./ac.
S.E. of body of any table   = 37.3 lb./ac.

Crop :- Wheat *(Rabi)*.
Site :- Govt. Seed and Demons. Farm, Amlaha.

Ref :- M.P. 55(55).
Type :- 'M'.

Object :—To study the effect of N and P ferti izers on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Follow—Wheat. (b) Wheat. (b) N.A. (ii) (a) *Kabar*. (b) Refer soil analysis, Amlaha. (iii) 13.11.1955. (iv) (a) 5 *bakherings*. (b) Drilled. (c) 40 srs./ac. (d) and (e) N.A. (v) N.A. (vi) C—591. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

11 manurials treatments : M_0=Control, M_1=50 lb./ac. of A/S, M_2=M_1+31 lb./ac. of Super, M_3=M_1+62 lb./ac. of Super, M_4=M_1+93 lb./ac. of Super, M_5=M_1+124 lb./ac. of Super, M_6=100 lb./ac. of A/S, M_7=M_6+62 lb./ac. of Super, M_8=M_6+124 .b./ac. of Super, M_9=M_6+186 lb./ac. of Super and M_{10}=M_6+248 lb./ac. of Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 33'×33'. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Av. height and yield of grain. (iv) (a) 1954—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 465 lb./ac. (ii) 19.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
Av. yield	324	382	391	432	439	464	493	528	550	539	571

S.E./mean   = 9.6 lb./ac.

Crop :- Wheat *(Rabi)*.
Site :- Govt. Seed and Demons. Farm, Amlaha.

Ref :- M.P. 55(58).
Type :- 'M'.

Object :—To study the effect of different sources and levels of N under dry conditions on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Kabar*. (b) Refer soil analysis, Amlaha. (iii) 26.11.1955. (iv) (a) 5 *bakherings*. (b) Drilling. (c) 40 srs /ac. (d) and (e) N.A. (v) N.A. (vi) C—591. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:

11 manurial treatments : M_0=Control, M_1=50 and M_2=100 lb./ac. of A/S, M_3=39 and M_4=77 lb./ac. of A/S/N, M_5=30 and M_6=60 lb./ac. of A/N, M_7=65 and M_8=130 lb./ac. of C/N, M_9=22 and M_{10}=44 lb./ac. of Urea.

Manures drilled with seed.

3. DESIGN :

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

4. GENERAL:

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

5. RESULTS:

(i) 347 lb./ac. (ii) 112.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
Av. yield	330	362	314	303	302	352	418	321	368	410	341

S.E./mean = 56.4 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 57(31).**

Site :- Govt. Seed and Demons. Farm, Amlaha.   **Type :- 'M'.**

Object :—To study the effect of A/s and Super on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) *Kabar.* (b) Refer soil analysis, Amlaha. (iii) 11.10.1957. (iv) (a) *Bakhering.* (b) Drilling. (c) to (e) N.A. (v) N.A. (vi) C—591. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) N.A. (x) 18.3.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58(7) on page 144.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—1958. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 213 lb./ac. (ii) 7.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	144	226	226	257

S.E./mean = 5.4 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 58(10).**

Site :- Govt. Seed. and Demons. Farm, Amlaha.   **Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Kabar.* (b) Refer soil analysis, Amlaha. (iii) 2.11.1958. (iv) (a) *Bakherings.* (b) Drilling. (c) 40 srs./ac. (d) 15" between rows. (e) N.A. (v) N.A. (vi) C—591. (vii) Unirrigated. (viii) and (ix) N A. (x) 21.3.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58(7) on page 144.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—1958. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 586 lb./ac. (ii) 145.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	493	566	678	607

S.E./mean = 102.6 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 54(39).**

Site :- Govt. Seed and Demons. Farm, Betul.   **Type :- 'M'.**

Object :—To study the effect of treating the seed before sowing on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Morand-2.* (b) Refer soil analysis, Betul. (iii) 4.11.1954. (iv) (a) *Bakherings.* (b) to (e) N.A. (v) N.A. (vi) Hy—65 (early). (vii) Unirrigated. (viii) and (ix) N.A. (x) 25.3.1955.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54 (50) on page 145.

5. RESULTS :

(i) 885 lb./ac. (ii) 147.4 lb./ac. (iii) Treatment ¨differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_1	M_2	M_3
Av. yield	868	919	868

S.E./mean = 60.1 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 56(25).**

Site :- Govt. Seed and Demons. Farm, Betul.   **Type :- 'M'.**

Object :—To study the effect of treating the seed prior to sowing on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Morand-2.* (b) Refer soil analysis, Betul.] (iii) 28.11.1956. (iv) (a) 4 *Bakhering* as per local practice. (b) to (e) N.A. (v) N.A. (vi) Hy—65. (vii) Irrigated. (viii) and (ix) N.A. (x) 9.4.1957.

2. TREATMENTS :

Same as in expt. no. 54 (50) on page 145.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 1/40 ac. (b) 1/62 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Black rust. (iii) Yield of grain. (iv) (a) 1954—1956. (b) and (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 1865 lb./ac. (ii) 178.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_1	M_2	M_3
Av. yield	1829	1891	1876

S.E./mean = 89.3 lb./ac.

Crop :- Wheat.

Site :- Govt. Seed and Demons. Farm, Betul.

Ref :- M.P. 54 (40).

Type :- 'M'.

Object :—To study the effect of different levels of A/S, C/N and lime alone and in combination on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) *Morand—2.* (b) Refer soil analysis, Betul. (iii) 1.11.1954. (iv) (a) 4 *Bakherings.* (b) to (e) N.A. (v) N.A. (vi) No. 11 (local). (vii) Irrigated. (viii) and (ix) N.A. (x) 21.3.1955.

2. TREATMENTS :

Same as in expt. no. 54 (46) on page 146.

3. DESIGN ;

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 1/30 ac. (b) 1/40. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1953—1954. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 583 lb./ac. (ii) 176·5 lb./ac. (iii) Main effect of L alone is highly significant. (iv) Av. yield of grain in lb./ac.

$$T_0 = 567 \text{ and } T_1 = 547 \text{ lb./ac.}$$

	S_1	S_2	Mean	L_0	L_1
N_1	547	587	567	660	474
N_2	534	687	611	664	557
Mean	541	637	589	662	518
L_0	604	671			
L_1	427	603			

S.E. of any marginal mean = 36.0 lb./ac.

S.E. of body of any table = 50.9 lb./ac.

Crop :- Wheat *(Rabi).*

Site :- Govt. Seed and Demons. Farm, Betul.

Ref :- M.P. 59(95).

Type :- 'M'.

Object :—To find out the effect of G.M. crops with and without P on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Morand—2.* (b) Refer soil analysis, Betul. (iii) 4.11.1959. (iv) 2 ploughings, 2 harrowings and 2 *bakherings.* (b) Drill by *Dufan.* (c) 80 lb./ac. (d) 9"×4". (e) N.A. (v) Nil. (vi) Hy—65. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 23.4.1960.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 5 G.M. crops : G_0=Control, G_1=Moong, G_2=*Palas* leaves, G_3=*Tarota* and G_4=Cowpea.

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

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 40'×13'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—not contd. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 301 lb./ac. (ii) 92.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	G_0	G_1	G_2	G_3	G_4	Mean
P_0	288	372	330	251	293	307
P_1	288	387	251	283	272	296
Mean	288	379	290	267	283	301

S.E. of G marginal mean   = 32.6 lb./ac.

S.E. of P marginal mean   = 20.6 lb./ac.

S.E. of body of table   = 46.1 lb./ac.

————

Crop :- Wheat.   **Ref :- M P. 54(35).**

Site :- Govt. Seed and Demons. Farm, Betul.   **Type :- 'M'.**

Object :—To study the effect of leguminous crops on Wheat in comparison with green manures and other fertilisers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) As per treatments. (ii) (a) *Morand*-2. (b) Refer soil analysis, Betul. (iii) 28.10.1954. (iv) (a) to (e) N.A. (v) N.A. (vi) Hy—65. (vii) Irrigated. (viii) N.A. (ix) 42.69". (x) 15.3.1955.

2. TREATMENTS :

8 manurial treatments : M_0=Control, M_1=G.M. with 4 week old *Sannhemp*. (20 .b /ac. of P_2O_5 applied to *Sannhemp*). M_2=Early variety of *moong* to which 40lb./ac. of P_2O_5 is applied, M_3=40 lb./ac. of N as F.Y.M. in summer before rains, M_4=20 lb./ac. of N as G.N C. one month before sowing, M_5=20 lb./ac. of N as A/S at sowing, M_6=20 lb./ac. of N as Ammo. Phos. one month before sowing and M_7=20 lb./ac. of N as Ammo. Phos. at sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 24'×45'. (b) 18'×39'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1467 lb./ac. (ii) 344.4 lb./ac (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Av. yield	1411	1566	1256	1241	1566	1613	1458	1629

S.E./mean   = 172.2 lb./ac.

————

Crop :- Wheat.   **Ref :- M.P. 55(17).**

' **Site :- Govt. Seed and Demons. Farm, Betul.**   **Type :- 'M'.**

Object :— To study the residual effect of different levels of P to *Rabi* legumes on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) As per treatments. (ii) (a) *Morand*-2. (b) Refer soil analysis, Betul. (iii) 14 11.1955. (iv) (a) 4 *bakherings*. (b) to (e) N.A. (v) N.A. (vi) Hy—65. (vii) Irrigated. (viii) N.A. (ix) 44 12". (x) 3.4.1956.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 legumes : L_1=Gram, L_2=*Teora*, L_3=*Masoor* and L_4=*Peas*.

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

3. DESIGN :

(i) Fact. in R.B D. (ii) (a) 12. (b) N.A. (iii) 5. (iv) (a) 1/40 ac. (b) 1/62 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 548 lb./ac. (ii) 113.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	L_1	L_2	L_3	L_4	Mean
P_0	576	672	528	528	576
P_1	512	504	584	520	530
P_2	464	576	544	568	538
Mean	517	584	552	539	548

S.E. of L marginal mean   = 29.3 lb./ac.
S.E. of P marginal mean   = 25.4 lb./ac.
S.E. of body of table   = 50.8 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 54(34).**

Site :- Govt. Seed and Demons. Farm, Betul.   **Type :- 'M'.**

Object :— To find the suitable dose of N and P for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 40 C.L./ac. of F.Y.M. (ii) (a) *Morand*-2. (b) Refer soil analysis, Betul. (iii) 30 10.1954. (iv) 4 *bakherings*. (b) to (e) N.A. (v) 40 C.L./ac. of F.Y.M. (vi) Hy—65. (vii) Irrigated. (viii) N A. (ix) 42.69". (x) 11.4.1955.

2. TREATMENTS :

All combinations of (1) and (2)+extra treatment (E)

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

(2) 5 levels of P_2O_5 as Super : P_0=0, P_1=15, P_2=30, P_3=45 and P_4=60 lb./ac.

E=20 lb./ac. of G.N.C.+2 mds./ac. of A/S and 20 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2195 lb./ac. (ii) 248.0 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

E = 2106 lb./ac.

	P₀	P₁	P₂	P₃	P₄	Mean
N₀	1733	1786	1920	1893	1573	1781
N₁	2293	2266	2160	2320	2080	2224
N₂	2746	2693	2480	2640	2426	2597
Mean	2257	2248	2187	2284	2026	2201

S.E. of P marginal mean = 82.7 lb./ac.
S.E. of N marginal mean = 64.0 lb./ac.
S.E. of body of table or control mean = 143.1 lb./ac.

Crop :- Wheat.

Site :- Govt. Seed. and Demons. Farm, Betul.

Ref :- M.P. 55(19).

Type :- 'M'.

Object :— To determine the suitable dose of N and P for Wheat.

1. BASAL CONDITIONS :

(i) a) Nil. (b) Wheat. (c) 40 C.L./ac. of F.Y.M. (ii) (a) *Morand* II. (b) Refer soil analysis, Betul. (iii) 22.11.1955. (v) (a) 4 *Bakherings.* (b) and (c) N.A. (d) 9". (e) N.A. (v) 40 C.L./ac. of F.Y.M. in summer. (vi) Hy—65. (early). (vii) Irrigated. (viii) and (ix) N.A. (x) 15.4.1956.

2. TREATMENTS :

Same as in expt. no. 54(34) on page 153

2. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) 22½'×72'. (b) 16½'×66'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1953—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5: RESULTS :

(i) 1638 lb./ac. (ii) 316.4 (iii) Main [effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

S.E. = 1680 lb./ac.

	P₀	P₁	P₂	P₃	P₄	Mean
N₀	1253	1093	1546	1333	1200	1285
N₁	1680	1706	1520	1520	1306	1546
N₂	1973	2053	2159	2026	2159	2074
Mean	1635	1617	1742	1626	1555	1635

S.E. of N marginal mean = 81.7 lb./ac.
S.E. of P marginal mean = 105.5 lb./ac.
S.E. of body of table or control mean = 182.6 lb./ac.

Crop :- Wheat *(Rabi).*   Ref :- M.P. 57(82).

Site :- Govt. Seed and Demons. Farm, Betul.   Type :- 'M'.

Object :—To find out suitable time of application of N and P_2O_5 to Wheat under irrigated conditions.

1. **BASAL CONDITIONS:**

   (i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Morand II.* (b) Refer soil analysis, Betul. (iii) 17.10.1957. (iv) (a) 2 ploughings ; 2 *bakherings*, and harrowings. (b) Drilled by *Nari.* (c) 80 lb./ac. (d) 9"×4". (e) N.A. (v) Nil. (vi) Hy—65. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 17.3.1958.

2. **TREATMENTS :**

   4 times of application of fertilizers : T_1=Full dose at sowing, T_2=Half at sowing and half at first irrigation, T_3=Full dose at 1st irrigation and T_4=Half at 1st irrigation and half at 2nd irrigation.

   Fertilizers used = 30 lb./ac. of N as A/S + 30 lb./ac. of P_2O_5 as Super.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 33'×16½'. (v) Nil. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 1112 lb./ac. (ii) 218.9 lb./ac. (iii) Treatments differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3	T_4
Av. yield	1280	1060	1090	1020

   S.E./mean = 109.5 lb./ac.

———

Crop :- Wheat *(Rabi).*   Ref :- M.P. 58(97).

Site :- Govt. Seed and Demons. Farm, Betul.   Type :- 'M'.

Object :—To find out suitable time of application of N and P_2O_5 to Wheat under irrigated conditions.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Marand II.* (b) Refer soil analysis, Betul. (iii) 12.11.1958. (iv) (a) 2 ploughings ; 2 harrowings and 2 *bakherings*. (b) Drilled by *Nari.* (c) 80 lb./ac. (d) 9"×4". (e) N.A. (v) Nil. (vi) Hy—65. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 29.3.1959.

2. **TREATMENTS to 4. GENERAL :**

   Same as in expt. no. 57(82) above.

5. **RESULTS :**

   (i) 1806 lb./ac. (ii) 281.1 lb./ac. (iii) Treatments differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3	T_4
Av. yield	1587	1698	2005	1935

   S.E./mean = 140.6 lb./ac.

———

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(31).**

Site :- Govt. Seed and Demons. Farm, Biora   **Type :- 'M'.**

Object :—To study the effect of different G.M. crops with and without P_2O_5 on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 30 lb./ac. of N+30 lb./ac. of P_4O_5. (ii) (a) Clay loam. (b) N.A. (iii) 12.11.1959. (iv) (a) 2 ploughings and 2 *bakherings*. (b) Drilling by *Nari*. (c) 80 lb./ac. (d) 12" between lines. (e) N.A. (v) Nil. (vi) Hy—65. (vii) Irrigated. (viii) Nil. (ix) 45.64". (x) 25.3.1960.

2. TREATMENTS :

All combinations of (1) and (2)
   (1) 5 G.M. crops : G_0=Control, G_1=*Moong*, G_2=G.L., G_3=*Sannhemp* and G_4=Cowpea.
   · (2) 2 levels of P_2O_5 : P_0=0 and P_1=20 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 15'×40'. (b) 11'×36'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1928 lb./ac. (ii) 294.8 lb./ac. (iii) Main effect of G alone is significant. (iv) Av. yield of grain in lb./ac.

	G_0	G_1	G_2	G_3	G_4	Mean
P_0	1683	1903	1863	1843	2269	1912
P_1	1667	1956	1875	2028	2193	1944
Mean	1675	1930	1869	1935	2231	1928

S.E. of P marginal mean   = 66.0 lb./ac.
S.E. of G marginal mean   = 104.2 lb./ac.
S.E of body of table   = 147.4 lb /ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(33).**

Site :- Govt. Seed and Demons. Farm, Biora.   **Type :- 'M'.**

Object :—To find out proper manurial schedule for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) *Sannhemp* for G.M. (ii) (a) Clay. (b) N.A. (iii) 28.11.1959. (iv) (a) 2 ploughings and 2 *bakherings*. (b) Drilling *(Nari)*. (c) 80 ib./ac. (d) 12" between lines. (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Nil. (ix) 45 64". (x) 21.4.1960.

2. TREATMENTS :

All combinations of (1) and (2)
   (1) 3 levels of N as A/S : N_0=0, N_1=10 and N_2=20 lb./ac.
   (2) 3 levels of P_2O_5 as Super : P_0=0, P_1=10 and P_2=20 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 39'×22½'. (b) 33'×16½'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 885 lb./ac. (ii) 292.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	709	679	849	746
N_1	670	1114	1048	944
N_2	872	875	1153	967
Mean	750	889	1017	885

S.E. of any marginal mean = 84.5 lb./ac.
S.E. of body of table = 146.4 lb./ac.

/ ———

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 58(58).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'M'.**

Object :—To find out the suitable manurial schedule for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Heavy black soil. (b) Refer soil analysis, Chhindwara. (iii) 4.11.1958. (iv) (a) *Bakhering* and ploughing. (b) Line sowing by *Nari*. (c) 80 lb./ac. (d) 12″ between rows. (e) N.A. (v) N.A. (vi) Hy—65. (vii) Irrigated. (viii) N.A. (ix) 2.29″. (x) 30.3.1959.

2. TREATMENTS :

4 manurial treatments : M_0=Control (no manure), M_1=20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super, M_2=2 times of M_1 and M_3=3 times of M_1.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 33′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 2538 lb./ac. (ii) 306.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1622	2300	2857	3373

S.E/mean = 124.9 lb./ac.

———

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 59(101).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'M'.**

Object :—To find out the suitable manurial dose for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Moong*. (c) N.A. (ii) (a) Heavy soil. (b) Refer soil analysis, Chhindwara. (iii) 31.10.1959. (iv) (a) 1 ploughing and 3 *bakherings*. (b) Drilled with *Nari*. (c) 85 lb./ac. (d) 9″×3″. (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) Hy—65. (vii) Irrigated. (viii) Nil. (ix) 8.39″. (x) 10.5.1960.

2. TREATMENTS to 4. GENERAL :

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

5. RESULTS :

(i) 1978 lb./ac. (ii) 180.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	1363	2020	2220	2310

S.E./mean = 73.5 lb./ac.

———

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 58(61).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'M'.**

Object :—To compare the effect of G.M. with other manures and fertilizers on Wheat yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) G.M. with *Sannhamp*. (ii) (a) Heavy black soil. (b) Refer soil analysis, Chhindwara. (iii) 6.11.1958. (lv) *Bakhering* and ploughing. (b) Line sowing by *Nari*. (c) 80 lb./ac. (d) Row to row 12". (e) N.A. (v) As per treatments. (vi) Hy—65. (vii) Irrigated. (viii) N.A. (ix) 2.29". (x) 1.4.1959.

2, TREATMENTS :

6 manurial treatments : M_1=G.M with Sannhamp, M_2=G.M. with *Urid*, M_3=G.M. with *Moong*, M_4= 30 C.L./ac. of F.Y.M. in middle of August, M_5=30 C.L./ac of F.Y.M.at monsoon break and M_6=20 lb./ac. of N as A/S at sowing.

25 lb./ac. of P_2O_5 applied with G.M. in M_1, M_2 and M_3 and at sowing in M_4, M_5 and M_6.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 33'×33'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain and Straw yield, height and no. of tillers. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1217 lb./ac. (ii) 202.3 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb /ac.

Treatment	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	1207	1396	1179	976	1065	1478

S.E./mean = 101.2 lb./ac.

———

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 57(56).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'M'.**

Object :—To find out the effect of different levels of N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super. (ii) (a) Heavy black soil. (b) Refer soil analysis, Chhindwara. (iii) 1.11.1967. (iv) *Bakhering* and ploughing. (b) Line sowing by *Nari*. (c) 80 lb./ac. (d) 9"×3". (e) N.A. (v) 25 C.L./ac. of F.Y.M.+140 lb./ac. of P_2O_5 as Super. (vi) Hy−65. (vii) Irrigated. (viii) N.A. (ix) 2.70". (x) 3.4.1958.

2. TREATMENTS :

4 levels of N as A/S at sowing : N_0=0, N_1=20, N_2=40 and N_3=60 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 38'×18½'. (b) 34'×16½'. (v) 2'×1'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 2276 lb./ac. (ii) 80.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	N_0	N_1	N_2	N_3
Av. yield	1721	2155	2511	2718

S.E./mean = 32.8 lb./ac.

———

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 57(57).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'M'.**

Object :— To find out the effect of different levels of N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Refer soil analysis, Chhindwara. (ii) (a) Medium black soil. (b) Refer soil analysis, Chhindwara. (iii) 20.10.1957. (iv) *Bakhering* and ploughing. (b) Line sowing by *Nari*. (c) 80 lb./ac. (d) Row to row 9". (e) Nil. (v) 15 lb./ac. of P_2O_5 as Super+5 C.L./ac. of F.Y.M. at sowing. (vi) Hy—65. (vii) Unirrigated. (viii) N.A. (ix) 2.70". (x) 21.3.1958.

2. TREATMENTS :

5 levels of N as A/S at sowing : $N_0=0$, $N_1=5$, $N_2=10$, $N_3=15$ and $N_4=20$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 3. (iv) (a) and (b) 30'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 722 lb./ac. (ii) 8.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	N_0	N_1	N_2	N_3	N_4
Av. yield	620	678	766	770	778

S E./mean = 5.0 lb./ac.

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Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 58(59).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'M'.**

Object :— To find out suitable manurial schedule for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Moong*. (c) N.A. (ii) (a) Medium black soil. (b) Refer soil analysis, Chhindwara. (iii) 1.11.1958. (iv) *Bakhering* and ploughing. (b) Line sowing by *Nari*. (c) 80 lb./ac. (d) Row to row 12". (e) N.A. (v) Nil. (vi) Hy—65. (vii) Unirrigated. (viii) N.A. (ix) 2.29". (x) N.A.

1. TREATMENTS :

4 manurial treatments : M_0=Control (no manure), M_1=7½ lb./ac. of N as A/S+7½ lb./ac. of P_2O_5 as Super, M_2=2 times M_1 and M_3=3 times M_1.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 36'×20½'. (b) 33'×16½'. (v) 1½'×2'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1958—1962. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1056 lb./ac. (ii) 71.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	824	1029	1143	1227

S.E./mean = 29.2 lb./ac.

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Crop :- Wheat *(Rabi).*　　　　　　　　　**Ref :- M.P. 59(106).**

Site :- Govt. Exptl. Stn., Chhindwara.　　　**Type :- 'M'.**

Object :—To find out the suitable dose of manure for dry Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Moong.* (c) Nil. (ii) (a) Medium soil. (b) Refer soil analysis, Chhindwara. (iii) 24.10.1959. (iv) (a) One ploughing and *bakherings.* (b) Drilled by *Nari.* (c) 80 lb./ac. (d) 9"×9". (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) Hy—65. (vii) Unirrigated. (viii) Nil. (ix) 8.0". (x) 29.3.1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58 (59) on page 159.

5. RESULTS :

(i) 1026 lb./ac. (ii) 74.8 lb/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	875	945	1083	1201

S.E./mean = 30.5 lb./ac.

———

Crop :- Wheat *(Rabi).*　　　　　　　　　**Ref :- M.P. 59(114).**

Site :- Govt. Exptl. Stn., Chhindwara.　　　**Type :- 'M'.**

Object :—To find out the best G.M. for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) G.M. crops (c) Nil. (ii) (a) *Morand—2.* (b) Refer soil analysis, Chhindwara. (iii) 31.10.1959. (iv) (a) One ploughing and 3 *bakherings.* (b) Drilled with *Nari.* (c) 80 lb./ac. (d) 9"×3". (e) N.A. (v) 10 C.L /ac. of F.Y.M. (vi) Hy—65. (vii) Irrigated. (viii) Nil. (ix) 8.4". (x) 5.5.1960.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 5 G.M. crops : G_0=Control, G_1=Moong, G_2=*Tarota* G_3= *Urid* and G_4=*Guar.*
(2) 2 levels of P_2O_5 : P_0=0, and P_1=20 lb./ac.

3. DESIGN :

(i) Fact in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 46'×19'. (b) 40'×15'. (v) 3'×2'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil (iii) Grain yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1251 lb./ac. (ii) 126.8 lb./ac. (iii) Main effect of G alone is significant. (iv) Av. yield of grain in lb./ac.

	G_0	G_1	G_2	G_3	G_4	Mean
P_0	1336	1277	1266	1361	1114	1271
P_1	1264	1304	1268	1193	1126	1231
Mean	1300	1291	1267	1277	1120	1251

S.E. of G marginal mean   = 44.8 lb./ac.
S.E. of P marginal mean   = 28.4 lb./ac.
S.E. of body of P×G table   = 63.4 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 54(29).**

Site :- Agri. College Farm, Gwalior.   **Type :- 'M'.**

Object :—To find out the best fertilizers for Wheat crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) *Moong.* (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) Deep cultivation in summer. G.M. with *moong.* (b) 12″ between rows. (c) to (e) N.A. (v) G.M. with *moong.* (vi) NP—710. (vii) Irrigated. (viii) N.A. (ix) 3.57″. (x) N.A.

2. **TREATMENTS :**

Main-plot treatments :
    3 levels of P_2O_5 : $P_0=0$, $P_1=30$ and $P_2=60$ lb./ac.

Sub-plot treatments :
    2 methods of applying A/S : M_1=At the time of irrigation and M_2=Half dose at the time of first irrigation and half at flowering stage.

Sub-sub-plot treatments :
    5 levels of N as A/S : $N_0=0$, $N_1=20$, $N_2=40$, $N_3=60$ and $N_4=80$ lb./ac.

3. **DESIGN :**

(i) Split-split-plot. (ii) (a) 3 main-plots/replication ; 2 sub-plots/main-plot and 5 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) 32′×14′. (b) 27′×10′. (v) 2½′×2′. (vi) Yes.

4. **GENERAL:**

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

RESULTS :

(i) 1695 lb./ac. (ii) (a) 605.2 lb./ac. (b) 210.4 lb./ac. (c) 255.8 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	N_4	Mean		P_0	P_1	P_2
M_1	1376	1673	1839	1904	1823	1723		1662	1655	1852
M_2	1461	1590	1828	1669	1781	1666		1745	1477	1775
Mean	1419	1632	1833	1786	1802	1695		1704	1566	1814
P_0	1345	1645	1932	1787	1808					
P_1	1362	1528	1784	1538	1618					
P_2	1549	1722	1784	2033	1981					

S.E. of difference of two

1. P marginal means   = 156.3 lb./ac.
2. M marginal means   = 44.4 lb./ac.
3. N marginal means   = 85.3 lb./ac.
4. N means at the same level of M   = 120.5 lb./ac.
5. N means at the same level of P   = 147.7 lb./ac.

6. M means at the same level of N   = 116.6 lb./ac.
7. P means at the same level of N   = 204.7 lb./ac.
8. P means at the same level of M   = 165.5 lb./ac.
9. M means at the same level of P   = 76.7 lb./ac.

Crop :- Wheat.

Site :- Agri. College Farm, Gwalior.

Ref :- M.P. 54(32).

Type :- 'M'.

Object :—To find out suitable G.M. crop for Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) G.M. crop. (c) Nil. (ii) Sandy loam. (b) N.A. (iii) 21.10.1954. (iv) (a) Deep cultivation by *sabul* plough in summer. (b) N.A. (c) 40 srs./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) NP—710. (vii) Irrigated. (viii) Intercultivation. (ix) 3.57″. (x) N A.

2. **TREATMENTS :**

   7 manures : G_0=Control, G_1=G.M. with *Urid*, G_2=G.M. with *Moong*, G_3=G M. with *Guar*, G_4=G.M. with *Soyabean*, G_5=G.M. with *Sannhemp* and G_6=10 C.L./ac. of F.Y.M.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) 166′×12′. (b) 108′×6′. (v) 4′×3′. (vi) Yes.

4. **GENERAL :**

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

5. **RESULTS :**

   (i) 1551 lb./ac. (ii) 395.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	G_0	G_1	G_2	G_3	G_4	G_5	G_6
Av. yield	1690	1426	1514	1704	1492	1583	1445

   S.E./mean = 176.6 lb./ac.

Crop :- Wheat.

Site :- Agri. College Farm, Gwalior.

Ref :- M.P. 56(13).

Type :- 'M'.

Object :—To study the effect of different levels of N and P on the yield of Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Legume—Wheat. (b) Cowpea. (c) Nil. (ii) (a) Light sandy loam. (b) N.A. (iii) 11.11.1956. (iv) (a) Discing. (b) Drilled. (c) 30 lb./ac. (d) Rows 18″ between rows. (e) N.A. (v) No. (vi) NP—710. (vii) Irrigated. (viii) 1 weeding and 1 interculturing. (ix) 8.38″. (x) 10, 11.4.1957.

2. **TREATMENTS :**

   All combinations of (1) and (2)

   (1) 4 levels of P_2O_5 as Super : P_0=0, P_1=20, P_2=40 and P_3=60 lb./ac.
   (2) 4 levels of N as A/S : N_0=0, N_1=10, N_2=20 and N_3=30 lb./ac.
   N as top dressing and P_2O_5 drilled with the seed.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) and (b) 30′×19′. (v) Nil. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) Slight incidence of rust. (iii) Plant population, height, tillering and grain yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 2040 lb./ac. (ii) 84.1 lb./ac. (iii) All the effects are highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	Mean
N_0	1925	2125	1863	2080	1998
N_1	2080	1994	2226	2152	2113
N_2	1794	2016	2113	2025	1987
N_3	2125	1896	2242	1977	2060
Mean	1981	2008	2111	2059	2040

S.E. of N or P marginal mean = 21.0 lb./ac.
S.E. of body of table = 42.0 lb./ac.

Crop :- Wheat. **Ref :- M.P. 56(17).**

Site :- Agri. College Farm, Gwalior. **Type :- 'M'.**

Object :—To study the response of different levels of P and N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Legume—Wheat. (b) *Lobia*—1. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 21.11.1957. (iv) (a) 2 ploughings by soil turning plough, 4 times discing and planking. (b) Drilling. (c) 30 srs./ac. (d) 18". (e) N.A. (v) Nil. (vi) NP—710 (medium). (vii) Irrigated. (viii) 1 weeding and 2 interculturings. (ix) Nil. (x) 25 to 28.3.1958.

2. TREATMENTS :

Same as in expt. no. 56(13) on page 162.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 30'×19'. (b) 26'×15'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain weight. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1757 lb./ac. (ii) 478.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P₀	P₁	P₂	P₃	Mean
N₀	1560	1839	1742	1444	1646
N₁	1522	1771	1775	1738	1702
N₂	1957	1429	2041	1946	1843
N₃	1501	1957	2273	1609	1835
Mean	1635	1749	1958	1684	1757

S.E. of any marginal mean = 120 lb./ac.
S.E. of body of N×P table = 239 lb./ac.

Crop :- Wheat (Rabi). **Ref :- M.P. 59(126).**

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

Object :—To find out the suitable time of application of G.M. and suitable doses of P for higher yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 15.10.1959. (iv) (a) 1 ploughing and 1 harrowing. (b) Drilling. (c) 65 lb./ac. (d) 14"×5". (e) N.A. (v) 30 lb./ac. of P₂O₅. (vi) C—591. (vii) Irrigated. (viii) 2 weedings. (ix) 7.9". (x) 27.3.1960.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 6 times of applying G.M : T₀=Fallow, T₁=Every year, T₂=Once in 3 years, T₃=Alternate years T₄=G.M. in first two years only and T₅=Continuously for 3 year.
(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=40 and P₂=80 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D.   (ii) (a) 18.   (b) N.A.   (iii) 4.   (iv) (a) 40'×21'.   (b) 35'×17'.   (v) 2.5'×2'.   (vi) Yes.

4. GENERAL:

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

5. RESULTS :

(i) 728 lb./ac.   (ii) 93.1 lb./ac.   (iii) Main effect of T is highly significant and of P is significant.   (iv) Av. yield of grain in lb./ac.

	T_0	T_1	T_2	T_3	T_4	T_5	Mean
P_0	628	694	661	671	717	748	686
P_1	692	783	711	716	817	772	748
P_2	660	860	663	647	810	854	749
Mean	660	779	678	678	781	791	728

S.E. of T marginal mean	= 26.9 lb./ac.
S.E. of P marginal mean	= 19.0 lb./ac.
S.E. of body of table	= 46.6 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(138).**

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

Object :—To study the effect of G.M. and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) G.M.—Wheat.   (b) G.M. crops.   (c) N.A.   (ii) (a) Clay loam.   (b) N.A.   (iii) 4.11.1959.   (iv) (a) 4 ploughings.   (b) Line sowing.   (c) 80 lb./ac.   (d) 9" between rows.   (e) N.A.   (v) Nil.   (vi) C—591.   (vii) Unirrigated.   (viii) Nil.   (ix) 1.81".   (x) 28.3.1960.

2 TREATMENTS :

All combinations of (1) and (2)

(1) 5 G.M crops : G_0=No G.M, G_1=*Moong*, G_2=G.L., G_3=*Tarota* and G_4=*Cowpea*.

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

3. DESIGN :

(i) R.B.D.   (ii) (a) 10.   (b) N.A.   (iii) 4.   (iv) (a) 40'×12'.   (b) 36'×10'.   (v) 2'×1'.   (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1274 lb./ac.   (ii) 152.1 lb./ac.   (iii) None of the effects is significant.   (iv) Av. yield of grain in lb./ac.

	G_0	G_1	G_2	G_3	G_4	Mean
P_0	1299	1361	1326	1232	1315	1307
P_1	1216	1209	1333	1252	1201	1242
Mean	1257	1285	1329	1242	1258	1274

S.E. of G marginal mean	= 53 8 lb./ac.
S.E. of P marginal mean	= 34.0 lb./ac.
S.E. of body of table	= 76.0 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 54(88).**

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

Object :—To study the effect of treating the seed before sowing on the yield of Wheat.

1. **BASAL CONDITIONS:**

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Kanhar.* (b) Refer soil analysis, Labhandi. (iii) 5.11.1959. (iv) (a) to (e) N.A. (v) N.A. (vi) A—115 (local). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 5.3.1955.

2. **TREATMENTS**

3 manurial treatments : T_1=Dry seed, T_2=Seed soaked in pure water for 24 hours and T_3=Seed soaked in 13.2% solution of A/S.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 45'×24'. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1953—1955. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

(i) 360 lb./ac. (ii) 84.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	320	397	364

S.E./mean = 34.5 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 55(22).**

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

Object :—To study the effect of treating the seed before sowing on the yield of Wheat.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Kanhar.* (b) Refer soil analysis, Labhandi. (iii) 12.12.1955. (iv) (a) Ploughing. (b) Drilling. (c) to (e) N.A. (v) Nil. (vi) A—115 (local). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 4.4.1956.

2. **TREATMENTS** to 4. **GENERAL :**

Same as in expt. no. 54(88) above.

5. **RESULTS :**

(i) 230 lb./ac. (ii) 34.8 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	247	250	193

S.E./mean = 14.2 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 58(18).**

Site :- Govt. Seed and Demons. Farm, Mahagarh.   **Type :- 'M'.**

Object :—To find out the most suitable manurial schedule for Wheat under local conditions.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) *Urid.* (c) Nil. (ii) (a) Medium black soil. (b) Refer soil analysis, Mahagarh. (iii) 21.11.1958. (iv) (a) N.A. (b) Seeds drilled. (c) to (e) N.A. (v) Nil. (vi) U. No. 6. (vii) to (ix) N.A. (x) 14.4.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.

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

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 1/60.5 ac. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 616 lb./ac. (ii) 98.0 lb./ac. (iii) Main effect of P alone is significant., (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	543	586	611	580
N_1	607	688	662	652
N_2	522	596	736	618
Mean	557	623	669	616

S.E. of any marginal mean   = 28.3 lb./ac.

S.E. of body of table   = 49.0 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 54(65).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).   **Type :- 'M'.**

Object :—To find out the effect of G.N.C. and A/S on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 18.11.1954. (iv) (a) Harrowing by disc followed by 3 *bakherings* and one more discing. (b) Seeds drilled. (c) 40 srs./ac. (d) Rows 12" apart. (e) N.A. (v) 1 bag/ac. of fertilizer mixture. (vi) C—591 (late). (vii) Irrigated., (viii) to (x) N.A.

2. TREATMENTS :

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

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

(2) 2 levels of N : $N_1=15$ and $N_2=30$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 33'×33'. (b) 27'×27'. (v) 3'×3'. (vi) Yes.

4, GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Av. height, number of tillers per plant and weight of grain. (iv) (a) No. (b) and (c)—. (v) to (vii) Nil.

5, RESULTS :

(i) 780 lb./ac. (ii) 83.8 lb./ac. (iii) "control *vs.* others" is highly significant and interaction N×S significant. (iv) Av. yield of grain in lb./ac.

Control = 638 lb./ac.

	S_1	S_2	S_3	Mean
N_1	760	718	833	770
N_2	837	816	863	839
Mean	798	767	848	804

S.E. of S marginal mean = 29.6 lb./ac.
S.E. of N marginal mean = 24.2 lb./ac.
S.E. of body of table or control = 41.9 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P.54(64).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).   **Type :- 'M'.**

Object :—To find a suitable dose and source of N for unirrigated Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 7.11.1954. (iv) (a) Harrowing by disc followed by 3 *bakherings* and 1 more discing. (b) Drilled. (c) 35 srs./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) C—591 (late). (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2) + control.
    (1) 5 sources of N : S_1=A/S, S_2=A/S/N, S_3=A/N, S_4=NaNO$_3$ and S_5=Urea.
    (2) 2 levels of N : N_1=10 and N_2=20 lb./ac.
Fertilizers mixed with seed and drilled.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 3. (iv) (a) 33′×33′. (b) 27′×27′. (v) 3′×3′. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Height of plants and yield of grain. (iv) to (vii) Nil.

5. RESULTS :

(i) 460 lb./ac. (ii) 39.6 lb./ac. (iii) Only "control *vs*, others" is significant. (iv) Av. yield of grain in lb./ac.

Control = 402 lb./ac.

	S_1	S_2	S_3	S_4	S_5	Mean
N_1	473	484	468	428	411	453
N_2	472	503	494	449	475	479
Mean	473	494	481	439	443	466

S.E. of N marginal mean = 10.2 lb./ac.
S.E. of S marginal mean = 16.2 lb./ac.
S.E. of body of table or control mean = 22.9 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 54(66).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).   **Type :- 'M'.**

Object :—To find a suitable dose and source of N for irrigated Wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Sannhemp.* (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 31.10.1954. (iv) (a) 2 times disc harrowing followed by 2 *bakherings* and two ploughings. (b) Drilled. (c) 12″ between rows. (e) N.A. (v) G.M. with *sannhemp* + 1 bag/ac. of fertilizer mixture mixed with soil at the last *bakhering*. (vi) C—591 (late). (vii) Irrigated. (viii) N.A. (ix) and (x) N.A.

2. TREATMENTS:

All combinations of (1) and (2)+control.
  (1) 5 sources of N : S_1=A/S, S_2=A/S/N, S_3=A/N, S_4=Na NO_3 and S_5=Urea.
  (2) 2 levels of N : N_1=20 and N_2=30 lb./ac.
Fertilizers mixed with seed and drilled.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 54(64) on page 167.

5. RESULTS :

(i) 898 lb./ac. (ii) 74.6 lb./ac. (iii) Only N effect is significant. (iv) Av. yield of grain in lb./ac.

Control = 910 lb./ac.

	S_1	S_2	S_3	S_4	S_5	Mean
N_1	867	836	879	805	935	865
N_2	978	922	1016	866	865	930
Mean	923	879	948	836	900	897

S.E. of N marginal mean = 19.3 lb./ac.
S.E. of S marginal mean = 30.4 lb./ac.
S.E. of body of table or control mean = 43.1 lb./ac.

———

Crop :- Wheat.   Ref :- M.P. 54(63).

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).   Type :- 'M'.

Object :—To study the effect of different levels of A/S and Super on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—*moong*. (b) *Moong*. (c) Nil. (ii) (a) Black cotton soil. (b) Nil. (iii) N.A. (iv) (a) Harrowing by disc followed by 3 *bakhering* and one discing. (b) Drilled. (c) 35 srs./ac. (d) 12″ between rows. (e) N.A. (v) G.M. by *Moong* 1 bag per acre of fertilizer mixture was added in October, 1954 and mixed in the soil in the last *bakhering*. (vi) C—591 (late). (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+Control
  (1) 2 levels of N as A/S : N_1=20 and N_2=30 lb./ac.
  (2) 5 levels of P_2O_5 as Super : P_0=0, P_1=10, P_2=20, P_3=30 and P_4=40 lb./ac.

3. DESIGN :

Same as in expt. no. 54 (64) on page 166.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Height of plants, number of tillers and weight of grain. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 817 lb./ac. (ii) 63.2 lb./ac. (iii) Effects of N, P and "control vs. others" are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 591 lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_1	666	790	829	829	829	789
N_2	777	868	910	933	963	890
Mean	722	829	870	881	896	840

S.E. of N marginal mean	= 16.3 lb./ac.
S.E. of P marginal mean	= 25.8 lb./ac.
S.E. of body of table or control mean	= 36.5 lb./ac.

————

Crop :- Wheat.   **Ref :- M.P. 55(47).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).   **Type :- 'M'.**

Object :—To see the effect of different levels of N and P on Wheat.

1. **BASAL CONDITIONS :**

    (i) (a) Wheat—*Sannhemp.* (b) *Sannhamp.* (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 23, 25.11.1955. (iv) (a) 4 *bakherings* and 2 wooden ploughings. (b) Drilled. (c) N.A. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Unirrigaed. (viii) N.A. (ix)11.52″. (x) N.A.

2. **TREATMENTS :**

    11 manurial treatments : M_0=Control, M_1=10 lb./ac. of N, M_2=M_1+5 lb./ac. of P_2O_5. M_3=M_1+ 10 lb./ac. of P_2O_5, M_4=M_1+15 lb./ac. of P_2O_5, M_5=M_1+20 lb./ac. of P_2O_5, M_6=2 times M_1, M_7=2 times M_2, M_8=2 times M_3, M_9=2 times M_4 and M_{10}=2 times M_5.

    P_2O_5 applied as Super and N as A/S.

3. **DESIGN :**

    (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 3. (iv) (a) 33′×33′. (b) 27′×27′. (v) 3′×3′. (vi) Yes.

4. **GENERAL :**

    (i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

    (i) 661 lb./ac. (ii) 64.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
Av. yield	463	545	655	658	655	668	619	742	752	778	737

S.E./mean = 36.9 lb./ac.

————

Crop Wheat.   **Ref :- M.P. 56(55).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).   **Type :- 'M'.**

Object :—To see the effect of different levels of N and P on Wheat under dry conditions.

1. **BASAL CONDITIONS :**

    (i) Nil. (b) Wheat. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 18.11.1956. (iv) (a) 6 harrowings. (b) Dilled. (c) N.A. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Unirrigated. (viii) N.A. (ix) 7.18″. (x) N.A.

2. **TREATMENTS :**

    Same as in expt. no. 55(47) above.

3. **DESIGN :**

    (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 24′×30′. (b) 20′×24′. (v) 2′×3′. (vi) Yes.

4. **GENERAL :**

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

5. **RESULTS :**

    (i) 976 lb./ac. (ii) 120.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
Av. yield	750	828	826	948	930	1038	860	1082	1143	1085	1243

S.E./mean = 60.2 lb./ac.

————

Crop :- Wheat. **Ref :- M.P. 55(48).**

Site :- Govt. Seed and Demons. Farm Nabi-bagh (Bhopal). **Type :- 'M'.**

Object :—To see the effect of different levels of N and P on the yield of Wheat under irrigated conditions.

1. BASAL CONDITIONS :

   (i) Nil. (b) Fallow. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 16.11.1960. (iv) (a) 7 *blakherings.* (b) Drilled. (c) N.A. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) NP—710 (medium). (vii) Irrigated. (viii) NA. (ix) 11.52″. (x) N.A.

2. TREATMENTS :

   11 manurial treatments : M_0=Control, M_1=20 lb./ac. of N, M_2=M_1+10 lb./ac. of P_2O_5, M_3=M_1+20 lb./ac. of P_2O_5, M_4=M_1+30 lb./ac. of P_2O_5, M_5=M_1+40 lb./ac. of P_2O_5, M_6=30 lb./ac. of N, M_7=M_6+15 lb./ac. of P_2O_5, M_8=M_6+30 lb./ac. of P_2O_5, M_9=M_6 + 45 lb./ac. of P_2O_5 and M_{10}=M_6+60 lb./ac. of P_2O_5.

   P_2O_5 applied as Super and N as A/S.

3. DESIGN and 4. GENERAL :

   Same as in expt. no. 55 (47) on page 168.

5. RESULTS :

   (i) 1346 lb./ac. (ii) 110.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
Av. yield	921	1229	1438	1416	1234	1252	1529	1444	1441	1447	1456

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

————

Crop :- Wheat. **Ref :- M.P. 56(56).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal). **Type :- 'M'.**

Object :—To see the effect of different levels of N and P on irrigated Wheat.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) *Maize.* (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 7.11.1956. (iv) (a) Two *bakherings,* two ploughing and two harrowings. (b) Drilled. (c) 30 sers./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) NP—710. (vii) Irrigated. (viii) N.A. (ix) 7.18″. (x) N.A.

2. TREATMENTS :

   Same as in expt. no. 55(48) above.

3. DESIGN :

   (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 24′×30′. (b) 20′×24′. (v) 2′×3′. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

   (i) 1617 lb./ac. (ii) 251 2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
Av. yield	995	1365	1639	1488	1493	1523	1692	1747	1928	1935	1992

S.E./mean = 125.6 lb./ac.

————

Crop :- Wheat *(Rabi).*　　　　　　　　　　　　　　**Ref :- M.P. 59(62).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).　Type :- 'M'.

Object :—To see the effect of different G.M. crops with and without P_2O_5 on the yield of Wheat crop.

1. **BASAL CONDITIONS :**

(i) G.M.—Wheat.　(b) and (c) As per treatments.　(ii) (a) Medium black soil.　(b) N.A.　(iii) 23.11.1959. (iv) (a) *Bakhering by bakher.* (b) Drilling.　(c) 80 lb./ac.　(d) Between rows 12″.　(e) N.A.　(v) 15 lb./ac. of N as A/S + 15 lb./ac. of P_2O_5 as Super.　(vi) C—591.　(vii) Unirrigated.　(viii) Nil.　(ix) N.A.　(x) 12.4.1960.

2. **TREATMENTS :**

All combinations of (1) and (2)

(1) 5 G.M. crops : G_0 = Control (No G.M.), G_1 = *Moong*, G_2 = G.L., G_3 = *Dhaincha* and G_4 = Cowpea.

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

3. **DESIGN :**

(i) Fact. in R.B.D.　(ii) (a) 10.　(b) 75′×80′.　(iii) 4.　(iv) (a) 40′×15′.　(b) 38′×13′.　(v) 1′×1′.　(vi) Yes.

4. **GENERAL :**

(i) Satisfactory.　(ii) N.A.　(iii) No. of tillers, height of plants and grain yield.　(iv) 1959—contd.　(b) No. (c) Nil.　(v) to (vii) Nil.

5. **RESULTS :**

(i) 695 lb./ac.　(ii) 161.7 lb./ac.　(iii) None of the effects is significant.　(iv) Av. yield of grain in lb./ac.

	G_0	G_1	G_2	G_3	G_4	Mean
P_0	652	632	703	844	788	724
P_1	777	626	708	617	604	666
Mean	714	629	706	731	696	695

S.E. of G marginal mean　　　　　= 58.2 lb./ac.

S.E. of P marginal mean　　　　　= 36.8 lb./ac.

S.E. of body of G×P table　　　　= 82.4 lb./ac.

Crop :- Wheat *(Rabi).*　　　　　　　　　　　　　**Ref :- M.P. 59(65).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).　Type :- 'M'.

Object :—To find out the effect of different methods of applying G.M. with and without P_2O_5.

1. **BASAL CONDITIONS :**

(i) (a) G.M.—Wheat.　(b) G.M.　(c) As per treatments.　(ii) (a) Medium black soil.　(b) N.A.　(iii) 11.11.1959. (iv) (a) 2 *bakherings.*　(b) Drilled.　(c) 80 lb./ac.　(d) Between rows 12″.　(e) N.A.　(v) Nil.　(vi) C– 591. (vii) Irrigated.　(viii) Nil.　(ix) N.A.　(x) 20.4.1960.

2. **TREATMENTS :**

All combinations of (1) and (2)+4 extra treatments.

(1) 3 methods of burrying *Sannhemp* : M_1 = By ploughing in the soil, M_2 = Cut and remove for composting and M_3 = Cut and allowed to remain in the field as cover.

(2) 3 sources of P_2O_5 : S_0 = Control, S_1 = 30 lb./ac. of P_2O_5 as Super and S_2 = 30 lb./ac. of P_2O_5 as B.M. Extra treatments : F_0 = Control, F_1 = 30 lb./ac. of P_2O_5 as Super F_2 = Compost and Super in 1 : 1 ratio and F_3 = Compost and B.M. in 1 : 1 ratio

3. **DESIGN :**

(i) R.B.D.　(ii) (a) 13.　(b) N.A.　(iii) 4.　(iv) (a) 33′×11′.　(b) 33′×8½′.　(v) 1½′ along length on both sides.　(vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—1960. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 984 lb./ac. (ii) 219.5 lb./ac. (iii) 'Extra treatments $vs.$ others' is highly significant. (iv) Av. yield of grain in lb./ac.

$$E_0 = 797 \text{ lb./ac. ; } E_1 = 797 \text{ lb./ac., } E_2 = 766 \text{ lb./ac. and } E_3 = 833 \text{ lb./ac.}$$

	S_0	S_1	S_2	Mean
M_1	1141	1182	926	1083
M_2	1290	1177	869	1112
M_3	940	1003	1075	1006
Mean	1124	1121	957	1067

S.E. of any marginal mean = 63.4 lb./ac.
S.E. of body of table or E mean = 109.8 lb./ac.

Crop :- Wheat. Ref :- M.P. 54(61).

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal). Type :- 'M'.

Object :—To determine the optimum dose of N and P for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Black cotton soil. (b) N A. (iii) N.A. (iv) (a) Harrowing by disc followed by 3 *bakherings* and one discing. (b) Drilled. (c) 40 srs./ac. (d) 12" between rows. (e) N.A. (v' Nil. (vi) C—591 (late). (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+control.
(1) 2 levels of N as A/S : $N_1 = 10$ and $N_2 = 20$ lb./ac.
(2) 5 levels of P_2O_5 as Super : $P_0 = 0$, $P_1 = 5$, $P_2 = 10$, $P_3 = 15$ and $P_4 = 20$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 3. (iv) (a) 33'×33'. (b) 27'×27'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 509 lb./ac. (ii) 40.4 lb./ac. (iii) Main effect of N and "control $vs.$ others" is highly significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

Control = 409 lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_1	488	446	509	461	525	486
N_2	512	539	559	558	592	552
Mean	500	493	534	510	559	519

S.E. of N marginal mean = 10.4 lb./ac.
S.E. of P marginal mean = 16.5 lb./ac.
S.E. of body of N×P table or control mean = 23.3 lb./ac.

— = — —

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 58(105).**

Site :- Govt. Seed and Demons. Farm, Nowgong.   **Type :- 'M'.**

Object :—To find out the suitable G.M. crop for Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) G.M.—Wheat. (b) G.M. (c) N.A. (ii) (a) Heavy black soil. (b) N.A. (iii) 31.10.1958. (iv) (a) 2 ploughings and 1 *bakhering.* (b) Line sowing. (c) 40 srs./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) C—591. (vii) Unirrigated. (viii) 1 weeding. (ix) 9.39″. (x) 12.4.1959.

2. **TREATMENTS :**

   6 G.M. crops : G_0=Control (no G.M.), G_1=*Sanai,* C_2=*Lobia,* G_3=*Moong,* G_4=*Guar* and G_5=*Dhak* leaves.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 50′×15′. (v) Nil. (vi) Yes.

4. **GENERAL :**

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

5. **RESULTS :**

   (i) 1956 lb./ac. (ii) 265.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	G_0	G_1	G_2	G_3	G_4	G_5
Av. yield	2106	1911	2046	1986	1941	1747

   S.E./mean = 132.5 lb./ac.

———

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 56(61).**

Site :- Govt. Seed and Demons. Farm, Obedullaganj.   **Type :- 'M'.**

Object :—To find the optimum dose of N and P for Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Wheat. (c) 10 lb./ac. of N as A/S. (ii) (a) Deep black soil. (b) Refer soil analysis, Obedullaganj. (iii) 6.11.1956. (iv) (a) *Bakhering.* (b) Drilling. (c) 70 lb./ac. (d) 10″ between rows. (e) N.A. (v) Nil. (vi) NP—710 (early). (vii) Irrigated. (viii) Nil. (ix) 6.75″. (x) 28.3.1957.

2. **TREATMENTS :**

   All combinations of (1) and (2)+control.
   - (1) 2 sources of 15 lb./ac. of N : S_1=A/S and S_2=A/C.
   - (2) 4 levels of P_2O_5 as Super : P_0=0, P_1=7½, P_2=15 and P_3=30 lb./ac.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 9. (b) 214′×33′. (iii) 3. (iv) (a) and (b) 22′×33′. (v) Nil. (vi) Yes.

4. **GENERAL :**

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

5. **RESULTS :**

   (i) 913 lb./ac. (ii) 143.2 lb./ac. (iii) Main effect of S is significant and 'control *vs.* others' effect is highly significant. (iv) Av. yield of grain in lb./ac.

   Control = 519 lb./ac.

	P_0	P_1	P_2	P_3	Mean
S_1	1062	1075	982	961	1020
S_2	761	897	956	1000	904
Mean	912	986	969	980	962

S.E. of S marginal mean   = 41.3 lb./ac.

S.E. of P marginal mean   = 58.5 lb./ac.

S.E. of body of table or control mean   = 82.7 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 55(85).**

Site :- Govt. Soil Cons. and Res. Stn. Phanda.   **Type :- 'M'.**

Object :—To find out the effect of Boron and Manganese on the growth and yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Black cotton soil. (b) N.A. (iii) 17.11.1955. (iv) (a) and (b) N.A. (c) 80 lb./ac. (d) Row to row 12". (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) N A, (ix) 0.70". (x) 8.4.1956.

2. TREATMENTS :

9 manurial treatments : $M_1=3$ lb./ac. of of Boron, $M_2=2$ times M_1, $M_3=3$ times M_1, $M_4=3$ lb./ac. of $MnSO_4$, $M_5=2$ times M_4, $M_6=3$ times M_4, $M_7=M_1+M_4$, $M_8=M_2+M_5$ and $M_9=M_3+M_6$.

3. DESIGN :

(i) R.B.D. (ii) 9. (b) 151'×37'. (iii) 4. (iv) (a) 37'×15'. (b) 33'×11'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 419 lb./ac. (ii) 115.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9
Av. yield	324	401	447	390	401	505	397	509	397

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

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 55(84).**

Site :- Govt. Soil Cons. and Res. Stn., Phanda.   **Type :- 'M'.**

Object :—To find out the effect of organic manures on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 12.11.1955. (iv) (a) and (b) N.A. (c) 80 lb./ac. (d) Row to row 12". (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 0.70". (x) 22.3.1956.

2. TREATMENTS :

4 manurial treatments : $M_1=$ G.M. with *Sannhemp*, $M_2=$ G.M. with *Gwar*, $M_3=3$ tons/ac. of compost, $M_4=$ G.N.C. at 400 lb./ac. and $M_5=200$ lb./ac. of G.N.C. with Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 110.5'×37'. (iii) 4. (iv) (a) 37'×20½'. (b) 33'×16½'. (vi) 2'×2'. (v) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Height, no. of tillers, length of earhead, grain and straw yield. (iv) (a) No. (b) and (c) —. (v) to (vii) Nil.

5. RESULTS :

(i) 90 lb./ac. (ii) 58.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_1	M_2	M_3	M_4	M_5
Av. yield	165	82	77	62	62

S.E./mean = 29.1 lb./ac.

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Crop :- Wheat *(Rabi).*   **Ref :- M.P. 54(79).**

Site :- Govt. Soil Cons. and Res. Stn., Phanda.   **Type :- 'M'.**

Object :—To find out the effect of different doses of A/S and Super for Wheat crop.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 7.11.1954. (iv) (a) *Bakhering* (b) Drilling. (c) 80 lb./ac. (d) and (e) N.A. (v) N.A. (vi) C—591. (vii) Unirrigated. (viii) **Rouging** on 3.2.1955. (ix) and (x) N.A.

2. **TREATMENTS :**

   11 manurial treatments . M_0=Control, M_1=50 lb./ac. of A/S, M_2=M_1+31 lb./ac. of Super, M_3=M_1+62 lb./ac. of Super, M_4=M_1+93 lb./ac. of Super, M_5=M_1+124 lb./ac. of Super, M_6=2 times M_1, M_7=2 times M_2, M_8=2 times M_3, M_9=2 times M_4 and M_{10}=2 times M_5.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 11. (b) 37'×165'. (iii) 4. (iv) (a) 37'×15'. (b) 33'×11'. (v) 2'×2'. (vi) Yes,

4. **GENERAL :**

   (i) N.A. (ii) A few plants were affected by smut—they were removed and burnt. (iii) Average height, average number of tillers. Weight of grain and straw. (iv) (a) No. (b) —. (c) Nil. (v) (a) Nabi-Bagh. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 869 lb./ac. (ii) 74.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
Av. yield	683	796	879	813	865	914	765	926	925	937	1060

S.E./mean = 37.1 lb./ac.

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Crop :- Wheat *(Rabi).*   **Ref :- M.P. 54(80).**

Site :- Govt. Soil Cons. and Res. Stn., Phanda.   **Type :- 'M'.**

Object :—To find out suitable dose and source of N for Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) *Jowar.* (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 6.11.1954. (iv) (a) *Bakherings* (b) Drilling. (c) 90 lb./ac. (d) and (e) N.A. (v) Nil. (vi) C—591. (vii) Unirrigated. (viii) **Rouging.** (ix) and (x) N.A.

2. **TREATMENTS :**

   11 manurial treatments : M_0=Control, M_1=50, M_2=100 lb./ac. of A/S, M_3=39, M_4=77, lb./ac. of A/S /N, M_5=30, M_6=60 lb./ac of A/N, M_7=65, M_8=130 lb./ac. of C/N, M_9=22 and M_{10}=44 lb./ac. of Urea.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 11. (b) 264'×42'. (iii) 4. (iv) (a) 42'×24'. (b) 40'×22'. (v) 1'×1'. (vi) Yes,

4. GENERAL :

(i) N.A. (ii) Slight attack of Smut—affected plants removed. (iii) No. of tillers, no. of ear-bearing tillers, plant height, yield of grain and straw. (iv) (a) No. (b) and (c) —. (v) (a) Nabi-bagh. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 521 lb./ac. (ii) 18.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
Av. yield	415	566	673	534	630	523	632	458	447	439	418

S.E./mean — 9.3 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(119).**

Site :- Govt. Soil Cons. and Res. Stn., Phanda.   **Type :- 'M'.**

Object :—To find out the best G.M. crop for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) —. (ii) (a) Black cotton soil. (b) N.A. (iii) 30.10.1959. (iv) (a) One plough- ing and 4 *bakherings.* (b) Drilled. (c) 80 lb./ac. (d) $12'' \times 3''$. (e) N.A. (v) Nil. (vi) C—591. (vii) Dry. (viii) Nil. (ix) 6.82″. (x) 8.4.1960.

2. TREATMENTS :

6 G.M. treatments : G_0=Control (no G.M.), G_1=*Sanai*, G_2=Cowpea, G_3=*Moong*, G_4=*Palas* leaf at 5000 lb./ac. and G_5=5000 lb./ac. of *Ipomla Cornea* leaf.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) $37' \times 20\frac{1}{2}'$. (b) $33' \times 16\frac{1}{2}'$. (v) $2' \times 2'$. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 663 lb./ac. (ii) 97.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	G_0	G_1	G_2	G_3	G_4	G_5
Av. yield	769	661	596	694	640	617

S.E./mean = 48.6 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(117).**

Site :- Govt. Soil Cons. and Res. Stn., Phanda.   **Type :- 'M'.**

Object :—To find out the best dose of manure for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 18.11.1959. (iv) (a) 1 ploughing and 4 *bakherings.* (b) Drilling. (c) 80 lb./ac. (d) $12'' \times 3''$. (e) N.A. (v) Nil. (vi) Hy—65. (vii) Unirrigated. (viii) Nil. (ix) 1.1″. (x) 2.4.1960.

2. TREATMENTS :

3 manurial treatments : M_0=Control, M_1=50 lb./ac. of N as A/S+60 lb./ac. of P_2O_5 as Super and M_2=2 times M_1.

3. DESIGN :

(i) R.B.D. (ii) 3. (b) N.A. (iii) 6. (iv) (a) 37'×20½'. (b) 33'×16½. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iiii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 856 lb./ac. (ii) 175.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2
Av. yield	687	835	1047

S.E./mean = 71.5 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 54(11).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'M'.**

Object :—To study the effect of treating the seed before sowing on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 15 lb./ac. of N as A/S+15 lb./ac. of P_2O_5 as Super. (ii) (a) Clay loam. (b) Refer soil analysis, Powarkheda. (iii) 7.11.1954. (iv) (a) Bakhering. (b) Sown with Nari. (c) 80 lb./ac. (d) Between lines 12". (e) N.A. (v) Nil. (vi) Hy 11—Improved (medium). (vii) Unirrigated. (viii) Nil. (ix) 1.83". (x) 17.3.1955.

2. TREATMENTS :

3 seed treatments : T_1=No soaking, T_2=Soaking in pure water for 24 hours before sowing and T_3= Soaking in 13.2% solution of A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 24'×45'. (b) 18'×39'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 340 lb./ac. (ii) 59.4 lb./ac. (iii) Treatments differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	353	374	293

S.E./mean = 24.2 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 55(9).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'M'.**

Object : —To study the effect of treating the seed before sowing on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 15 lb./ac of N+15 lb./ac. of P_2O_5. (ii) (a) Clay loam. (b) Refer soil analysis, Powarkheda. (iii) 7.11.1955. (iv) (a) Bakhering. (b) Sown with Nari. (c) 80 lb./ac (d) Between lines 12". (e) N.A. (v) No. (vi) Hy 11—Improved (medium). (vii) Unirrigated. (viii) Nil. (x) 0.93". (x) 28.4.1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt no. 54(11) above.

5. RESULTS :

(i) 334 lb./ac. (ii) 42.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	321	340	340

S.E./mean = 17.2 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 56(3).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'M'.**

Object :—To study the effect of treating the seed before sowing on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, Powarkheda. (iii) 9.11.1956. (iv) (a) *Bakhering*. (b) Sowing by *Nari* plough. (c) 80 lb./ac. (d) Between lines 12". (e) N.A. (v) Nil. (vi) Hy 11—Improved (medium). (vii) Unirrigated. (viii) Nil. (ix) 5.92". (x) 25.4.1957.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(11) on page 177.

4· GENERAL :

(i) Good. (ii) Severe hail storm just before harvest. (iii) Grain yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 403 lb./ac. (ii) 76.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	377	433	398

S.E./mean = 31.4 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 57(35).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'M'.**

Object :—To study the effect of different levels of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, Powarkheda. (iii) 30, 31.10.1957. (iv) (a) *Bakhering*. (b) Sown with *Nari*. (c) 80 lb./ac. (d) Between rows 12". (e) N.A. (v) Nil. (vi) Hy 11 - (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.9". (x) 7.4.1958.

2. TREATMENTS :

All combinations of (1) and (2)

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

    (2) 5 levels of P_2O_5 as Super : $P_0=0$, $P_1=15$, $P_2=30$, $P_3=45$ and $P_4=60$ lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) $16\frac{1}{2}'\times33'$. (b) $14\frac{1}{2}'\times30'$. (v) $1'\times1\frac{1}{2}'$. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Germination in general was poor.

5. **RESULTS:**

(i) 491 lb./ac. (ii) 140.8 lb./ac. (iii) Main effects of N and P are significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	536	540	540	468	361	489
N_1	643	565	634	561	438	568
N_2	440	528	482	321	303	415
Mean	540	544	552	450	367	491

S.E of P marginal mean $=$ 46.9 lb./ac.
S.E. of N marginal mean $=$ 36.3 lb./ac.
S.E. of body of N×P table $=$ 81.3 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- M.P. 58(41).**

Site :- Govt. Wheat Res. Farm, Powarkheda. **Type :- 'M'.**

Object :—To study the effect of different levels of N and P on Wheat.

1. **BASAL CONDITIONS :**

(i) (a) and (b) N.A. (c) Nil. (ii) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 8.11.1958. (iv) (a) Crossed *bakherings.* (b) Line sowing by *Nari.* (c) 80 lb./ac. (d) 12" line to line. (e) N.A. (v) Nil. (vi) Hy. 11 (mid late). (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 17.3.1959.

2. **TREATMENTS :**

Same as in expt. no. 57(35) on page 178.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 33'×16½'. (b) 31'× 14'. (v) 1'×1¼'. (v) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) to (vii) N.A.

5. **RESULTS :**

(i) 1151 lb./ac. (ii) 148.9 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.:

	P_0	P_1	P_2	P_3	P_4	Mean
N_0	956	962	1004	987	905	963
N_1	1225	1152	1320	1309	1196	1240
N_2	1142	1177	1282	1365	1276	1248
Mean	1108	1097	1202	1220	1126	1151

S.E. of N marginal mean $=$ 38.4 lb./ac.
S.E. of P marginal mean $=$ 49.6 lb./ac.
S.E. of body of table $=$ 85.9 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 54(82).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'M'.**

Object :—To study the effect of nitrogenous fertilizers alone with and without lime on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 15 lb./ac. of N + 15 lb./ac. of P_2O_5. (ii) (a) Clay loam. (b) Refer soil analysis, Powarkheda. (iii) 5.11.1954. (iv) (a) *Bakherings*. (b) Sown with *Nari*. (c) 80 lb /ac. (d) Between rows 1'. (e) Nil. (v) Nil. (vi) Hy. 11 improved (medium). (vii) Unirrigated. (viii) Nil. (ix) 1.83". (x) 20.3.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)+two extra treatments.
    (1) 2 doses of N : N_1=20 and N_2=40 lb./ac.
    (2) 2 sources of N : S_1=A/S and S_2=$NaNO_3$.
    (3) 2 levels of lime : L_0=0 and L_1=200 lb./ac.
Extra treatments : E_0=Control and E_1=200 lb./ac. of lime.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 72'×22½'. (b) 66'×16½'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) Good. (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) 375 lb./ac. (ii) 200.8 lb./ac. (iii) No effect is significant. (iv) Av. yield cf grain in lb./ac.

E_0=414 lb./ac. and E_1 = 340 lb /ac.

	S_1	S_2	L_0	L_1	Mean
N_1	429	348	407	370	389
N_2	409	312	398	324	361
Mean	419	330	403	347	375
L_0	443	362			
L_1	395	298			

S.E. of any N marginal mean   = 41.9 lb./ac.
S.E. of body of any table   = 58.0 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 54(12).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'M'.**

Object :—To compare the effects of leguminous crops on the following crop of Wheat with G.M. and other fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 15 lb /ac. of N+15 lb./ac. of P_2O_5 (ii) (a) Clay loam. (b) Refer soil analysis, Powarkheda. (iii) 5.11.1954. (iv) (a) *Bakherings*. (b) Sown with *Nari* plough. (c) 80 lb./ac. (d) 1' between rows. (e) N.A. (v) Nil. (vi) Hy. 11 improved (medium). (viii) Unirrigated. (viii) Nil. (ix) 1.83". (x) 17.3.1955.

2. TREATMENTS :

8 manurial treatments : M_0=Control, M_1=G.M. with *Sanai* after 4 weeks, M_2=G.M. with *Moong*, M_3=40 lb./ac. of F.Y.M. before rains, M_4=G.N.C. at 20 lb./ac. 1 month before sowing, M_5=20 lb./ac. of N as A/S with seed at sowing, M_6=20 lb./ac. of Ammo. Phos. 1 month before sowing and M_7=20 lb./ac. of Ammo. Phos. drilled with seed.
20 lb./ac. of P_2O_5 as Super applied to *Sanai* and *moong* crops at sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 24'×45'. (b) 18'×39'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—contd. (c) Nil. (b) No. (v) to (vii) Nil.

5. RESULTS :

(i) 459 lb./ac. (ii) 99.8 lb./ac. (iii) Treatment differences are not significant. (vi) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Av. yield	427	422	495	437	406	535	450	501

S.E./mean = 49.9 lb./ac.

Crop :- Wheat.   Ref :- M.P. 55(11).

Site :- Govt. Wheat Res. Farm, Powarkheda.   Type :- 'M'.

Object :—To compare the effects of leguminous crops on the following crop of Wheat with G.M. and other fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 15 lb./ac. of N+15 lb./ac. of P_2O_5. (ii) (a) Clay loam. (b) Refer soil analysis, Powarkheda. (iii) 8.11.1955. (iv) (a) *Bakherings* (b) Sown with *Nari*. (c) 80 lb./ac. (d) Row to row 1'. (e) N.A. (v) Nil. (vi) Hy. 11 improved (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.93". (x) 28.4.1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(12) on page 180.

5. RESULTS :

(i) 348 lb./ac. (ii) 79.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Av. yield	371	380	338	388	277	371	357	355

S.E./mean = 39.7 lb./ac.

Crop :- Wheat.   Ref :- M.P. 57(36).

Site :- Govt. Wheat Res. Farm, Powarkheda.   Type :- 'M'.

Object :—To compare the effects of leguminous crops on the following crop of Wheat with G.M. and other fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil (ii) (a) Clay loam. (b) Refer soil analysis, Powarkheda. (iii) 16.10.1957. (iv) (a) *Bakhering*. (b) Sown with *nari*. (c) 80 lb./ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Hy. 11 (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.9". (x) 30.3.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54 (12) on page 180.

5. RESULTS :

(i) 224 lb./ac. (ii) 103.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Av. yield	112	299	292	180	170	325	190	224

S.E./mean = 51.7 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 58(51).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Typ :- 'M'.**

Object :—To compare the effects of leguminous crops on the following crop of Wheat with G.M. and other fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) N.A. (ii) (a) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 7.11.1958. (iv) (a) *Bakhering.* (b) Line sowing by *nari.* (c) 80 lb./ac. (d) Between lines 12". (e) N.A. (v) N.A. (vi) Hy. 11 (medium). (vii) Unirriged. (viii) Nil. (ix) 2.2". (x) 18.3.1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(12) on page 180.

5. RESULTS :

(i) 471 lb./ac. (ii) 99.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Av. yield	391	345	495	509	469	692	440	428

S.E./mean = 49.9 lb./ac.

Crop :- Wheat. *(Rabi).*   **Ref :- M.P. 59(54).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :. 'M'.**

Object :—To study the effects of leguminous crops on the following crop of Wheat with G.M. and other fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 25.10.1959. (iv) (a) Crossed *bakhering.* (b) Line sowing by *Nari.* (c) 80 lb./ac. (d) Row to row 12". (e) N.A. (v) Nil. (vi) Hy. 11 (medium) (vii) Unirrigated. (viii) Nil. (ix) 4.45". (x) 21.3.1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(12) on page 280.

5. RESULTS :

(i) 646 lb./ac. (ii) 76.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Av. yield	573	685	706	597	574	885	595	551

S.E./mean = 38.1

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 58(49).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'M'.**

Object :—To compare the effect of different G.M. crops with and without P on the yield of Wheat.

1. **BASAL CONDITIONS :**
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 7.11.1958
   (iv) (a) Crossed *bakhering.* (b) Line sowing by *Nari.* (c) 80 lb./ac. (d) Row to row 12". (e) N.A.
   (v) Nil. (vi) Hy. 11 (medium). (vii) Unirrigated. (viii) Nil. (ix) 2.19". (x) 18.3.1959.

2. **TREATMENTS :**
   All combinations of (1) and (2)
   (1) 4 G.M. crops : G_1=*Sannhemp*, G_2=*Dhaincha*, G_3=*Tarota* and G_4=*Palas leaves.*
   (2) 2 levels of P_2O_5 as Super : P_0=0, and P_1=10 lb./ac.
   P_2O_5 applied at sowing of G.M.

3. **DESIGN :**
   (i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) $16\frac{1}{2}' \times 33'$. (b) $14' \times 31'$. (v) $1\frac{1}{4}' \times 1'$. (vi) Yes.

4. **GENERAL :**
   (i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1958—1961. (b) No. (c) Nil. (v) (a) N.A.
   (b) Nil. (vi) Nil. (vii) Sowing of G.M. crops on 15.7.1958, and burrying on 18.8.1958.

5. **RESULTS :**
   (i) 552 lb./ac. (ii) 121.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	G_1	G_2	G_3	G_4	Mean
P_0	469	611	613	547	560
P_1	477	547	665	491	545
Mean	473	579	639	519	552

S.E. of P marginal mean = 30.5 lb./ac.
S.E. of G marginal mean = 43.1 lb./ac.
S.E. of body of P×G table = 60.9 lb./ac.

Crop :- Wheat *(Rabi).*　　　　　　　　　　**Ref :- M.P. 59(52).**

Site :- Govt. Wheat Res. Farm, Powarkheda.　　**Type :- 'M'.**

Object :—To compare the effect of different G.M. crops with and without P on the yield of Wheat.

1. **BASAL CONDITIONS :**
   (i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 2.11.1959.
   (iv) (a) Crossed *bakhering.* (b) Line sowing by *Nari.* (c) 80 lb./ac. (d) Row to row 12". (e) N.A. (v)
   Nil. (vi) Hy. 11 (mid-late). (vii) Unirrigated. (viii) Nil. (ix) 5.16". (x) 24.3.1960.

2. **TREATMENTS :**
   Same as in expt. no. 58(49) on page 182 with one control plot.

3. **DESIGN :**
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) $16\frac{1}{2}' \times 33'$. (b) $14' \times 31'$. (v) $1\frac{1}{4}' \times 1'$. (vi) Yes.

4. **GENERAL :**
   (i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) 1958—1961. (b) No. (c) Nil. (v) and (vi) N.A.
   (vii) Sowing of G.M. crop on 7.7.1959.

5. **RESULTS :**
   (i) 914 lb./ac. (ii) 107.8 lb /ac. (iii) Effect of G and "control vs. others" is significant. (iv) Av. yield of
   grain in lb./ac.

Control = 797 lb./ac.

	G_1	G_2	G_3	G_4	Mean
P_0	984	886	990	883	936
P_1	1098	833	855	897	921
Mean	1041	859	922	890	928

S.E. of P marginal mean	= 26.9 lb./ac.
S.E. of G marginal mean	= 38.1 lb./ac.
S.E. of body of table	= 53.9 lb./ac.

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Crop :- Wheat *(Rabi).* **Ref :- M.P. 58(47).**

Site :- Govt. Wheat Res. Farm, Powarkheda. **Type :- 'M'.**

Object :—To study the effect of different seed dressing chemicals on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 9.11.1958. (iv) (a) Crossed *bakhering.* (b) Line sowing by *Nari.* (c) 80 lb./ac. (d) Row to row 12″. (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) Nil. (ix) 2.19″. (x) N.A.

2. TREATMENTS :

o treatments of dressing with chemicals : T_0=Control, T_1=Ceresan at 2 ozs./80 lb. of seed, T_2=Fernasan D at 12 ozs./112 lbs. of seed, T_3=Fernasan 75w at 6 ozs./100 lbs. of seed, T_4=Aldrane 30 at 24 ozs./40 gallons of water, and T_6=Agrosan GN at 2 ozs./80 lb. of seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) $16\frac{1}{2}'×33'$. (b) $14'×31'$. (v) $1\frac{1}{4}×1'$. (vi) Yes.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

1. RESULTS :

(i) 586 lb./ac. (ii) 75.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_6
Av. yield	631	544	640	619	514	566

S.E./mean = 37.9 lb./ac.

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Crop :- Wheat *(Rabi).* **Ref :- M.P. 58(66).**

Site :- State Mechanised Farm, Reora. **Type :- 'M'.**

Object: —To study the effect of different G.M. crops on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 30.11.1958. (iv) (a) Ploughing by *desi* plough. (b) Sown by *Nari.* (c) 32 srs./ac. (d) Line to line 10″. (e) N.A. (v) Nil. (vi) Hy.—65. (vii) Irrigated. (viii) and (ix) N.A. (x) 23.4.1959.

2. TREATMENTS :

4 G.M. crops : G_0=Control (no G.M.), G_1=*Dhaincha*, G_2=*Sanai* and G_3=*Dhak* green leaves each at 60 mds./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) $50'×15'$. (b) $43\frac{1}{2}'×10'$. (v) $3\frac{1}{4}'×2\frac{1}{4}'$. (vi) Yes.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1958—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1853 lb./ac. (ii) 261.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	G_0	G_1	G_2	G_3
Av. yield	1836	2012	1894	1669

S.E./mean = 106.7 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 54(7).**

Site :- State Mechanised Farm, Reora.   **Type :- 'M'.**

Object :—To find the dose of N, P and K for Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Nil (b) Paddy. (c) F.Y.M. at 5 C.L./ac. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 5.11.1954. (iv) (a) Two discings by tractor and two ploughings by *desi* plough. (b) *Pora* method. (c) N.A. (d) Row to row 10″. (e) N.A. (v) Nil. (vi) C—591 (medium-late). (vii) Unirrigated. (viii) Nil. (ix) 3.50″. (x) 26.4.1955.

2. **TREATMENTS :**

   All combinations of (1), (2) and (3)
   - (1) 3 levels of N : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
   - (2) 3 levels of P_2O_5 : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.
   - (3) 3 levels of K_2O : $K_0=0$, $K_1=20$ and $K_2=40$ lb./ac.

3. **DESIGN :**

   (i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 40′×27′. (b) 36′×23′. (v) 2′×2′. (vi) Yes.

4. **GENERAL :**

   (i) Poor. (ii) Nil. (iii) Height, tillering, yield of grain and straw, no. of earheads, grains per earhead and weight of 1000 grains. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 703 lb./ac. (ii) 236.7 lb./ac. (iii) Main effect of P alone is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	K_0	K_1	K_2
P_0	647	341	424	471	515	397	500
P_1	670	771	744	728	706	806	673
P_2	647	937	1150	911	817	959	958
Mean	655	683	773	703	679	721	710
K_0	594	626	818				
K_1	738	601	823				
K_2	631	822	677				

S.E. of any marginal mean   = 78.9 lb./ac.
S.E. of body of table   = 136.7 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 54(9).**

Site :- State Mechanised Farm, Reora.   **Type :- 'M'.**

Object :—To study the effect of dose, source and method of application of P on Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Paddy. (c) F.Y.M. at 15 C.L./ac. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 16.11.1954. (iv) (a) 2 discings and 2 ploughings followed by *Nari* plough. (b) By *Nari* plough. (c) 32 srs./ac. (d) 10″ between rows. (e) N.A. (v) 30 lb./ac. of N as A/S before sowing. (vi) C—591 (medium-late). (vii) Unirrigated. (viii) Nil. (ix) 3.00″. (x) 25, 26.4.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)+control (2 plots in each block).
(1) 2 sources of P_2O_5 : S_1=Triple Super and S_2=Ammo. Phos.
(2) 2 levels of P_2O_5 : P_1=20 and P_2=40 lb./ac.
(3) 3 methods of application of P_2O_5 : M_1=Brcadcasting, M_2=Band placement and M_3=2½" below the seed.

3. DESIGN :

(i) R.B D. (ii) (a) 14. (b) N.A. (iii) 3. (iv) (a) 40'×24'. (b) 36'×20'. (v) 2' alround the net plot. (vi) Yes.

4. GENERAL :

(i) Satisfactcry. (ii) Nil. (iii) Plant height, no. of tillers/plant, no. of grains/earhead and yield of grain. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (v i) Nil.

5. RESULTS :

(i) 793 lb./ac. (ii) 183.9 lb./ac. (iii) Main effect of P alone is significant. (iv) Av. yield of grain in lb./ac.

Control = 313 lb./ac.

	S_1	S_2	P_1	P_2	Mean
M_1	821	799	749	872	810
M_2	818	1001	877	942	910
M_3	854	943	768	1029	899
Mean	831	914	798	948	873
P_1	798	798			
P_2	863	1031			

S.E. of S or P marginal mean = 43.3 lb./ac.
S.E. of M marginal mean = 53.1 lb./ac.
S.E. of body of S×M or P×M table = 75.1 lb./ac.
S.E. of body of S×P table = 61.3 lb./ac.

Crop :- Wheat. **Ref :- M.P. 55(5).**
Site :- State Mechanised Farm, Reora. **Type :- 'M'.**

Object :—To study the effect of dose, source and method of application of P on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 21.11.1955 (iv) (a) 2 discings by tractor and 2 ploughings by *desi* plough. (b) *Pora* method. (c) 32 srs./ac. (d) and (e) N.A. (v) N as A/S at 30 lb./ac. (vi) C—591 (medium). (vii) Unirrigated. (viii) Nil. (ix) 1.6". (x) 28.4.1956.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54,9) on page 185.

4. GENERAL :

(i) Good stand. (ii) Slight attack of brown rust—early maturing plants got rid of it. (iii) Weight of grain, height and no. of tillerings, no. of grains/earhead and weight of 1000 grains. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 546 lb./ac. (ii) 117.4 lb./ac. (iii) Main effects of M and P are significant. (iv) Av. yield of grain in lb./ac.

Control = 372 lb./ac.

	S₁	S₂	P₁	P₂	Mean
M₁	494	462	431	·525	·478
M₂	564	653	576	641	609
M₃	558	718	602	674	638
Mean	539	611	536	613	575
P₁	513	560			
P₂	564	662			

S.E. of S or P marginal mean	= 27.7 lb./ac.
S.E. of M marginal mean	= 33.9 lb./ac.
S.E. of body of S×M or P×M table	= 47.9 lb./ac.
S.E. of body of S×P table	= 39.1 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 56(2).**

Site :- State Mechanised Farm, Reora.   **Type :- 'M'.**

Object :—To study the effect of dose, source and method of application of P on Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Paddy. (c) F.Y.M. at 5 C.L./ac. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 30.11.1956. (iv) (a) Double discing done by tractor and then double ploughing by *desi* plough. (b) Sown by *Sarta*. (c) N.A. (d) 10″ between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Unirrigated. (viii) Nil. (ix) 1.55″. (x) 25, 26 4 1957.

2. **TREATMENTS :**

   Same as in expt. no. 54(9) on page 185.
   Instead of two control plots only one is kept in each block.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) 40′×24′. (b) 36′×20′. (v) 2′×2′. (vi) Yes.

4. **GENERAL :**

   (i) No lodging. (ii) Brown rust appeared at the time of maturity. (iii) Height, t llering. no. of earheads per plot, weight of 1000 grains and length of earhead. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 909 lb./ac. (ii) 53.7 lb./ac. (iii) Main effects of M and P are significant. (iv) Av. yield of grain in lb./ac.

Control = 404 lb./ac.

	S₁	S₂	P₁	P₂	Mean
M₁	654	748	589	813	701
M₂	1206	1014	1052	.1168	1110
M₃	1120	966	970	1117	1043
Mean	993	909	870	1033	951
P₁	918	823			
P₂	1069	996			

S.E. of S or P marginal mean	= 36.2 lb./ac.
S.E. of M marginal mean	= 44.4 lb./ac.
S.E. of body of S×M or P×M table	= 62.7 lb./ac.
S.E. of body of S×P table	= 51.2 lb./ac.

———

Crop :- Wheat. **Ref :- M.P. 54(10)**

Site :- State Mechanised Farm, Reora. **Type :- 'M'.**

Object :—To study the effect of different levels of N, P and F.Y.M. on Wheat crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 5.11.1954. (iv) (a) 2 discings and 2 ploughings by *desi* plough. (b) *Pora* method. (c) 32 srs./ac. (d) N.A. (e) N A. (v) Nil. (vi) C—591 (medium). (vii) Unirrigated. (viii) Nil. (ix) 3.0". (x) 13.4.1955.

2. **TREATMENTS :**

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

(1) 3 levels of N as A/S : $N_0=0$, $N_1=2\frac{1}{2}$ and $N_2=5$ lb./plot.

(2) 3 levels of F.Y.M. : $F_0=0$, $F_1=5,000$ and $F_2=10,000$ lb./ac.

(3) 3 levels of P_2O_5 as Triple Super : $P_0=0$, $P_1=1$ lb. $1\frac{1}{2}$ ozs. and $P_2=2$ lb. 3 ozs./plot.

3. **DESIGN :**

(i) 3^3 confd. (ii) (a) 9 plots block ; 3 blocks/replication. (b) N.A. (iii). 1. (iv) (a) 40'×27'. (b) 36'×23'. (v) 2'×2 . (vi) Yes.

4. **GENERAL :**

(i) Good. (ii) Slight attack of brown rust. (iii) Height, tillering, length of earhead, no. of earheads, yield of grain and straw. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

(i) 566 lb./ac. (ii) 116.3 lb./ac. (iii) Main effect of P alone is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	F_0	F_1	F_2
P_0	212	327	345	294	301	297	285
P_1	503	662	794	653	660	662	637
P_2	706	756	791	751	786	797	670
Mean	474	582	643	566	582	585	531
F_0	445	614	688				
F_1	461	611	587				
F_2	514	521	657				

S.E. of any marginal mean	= 38.8 lb./ac.
S.E. of body of any table	= 67.1 lb./ac.

———

Crop :- Wheat. **Ref :- M.P. 55(6).**

Site :- State Mechanised Farm, Reora. **Type :- 'M'.**

Object :—To study the effect of different levels of N, P and F.Y.M. on Wheat crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 21.11.1955. (iv) (a) Preparing the land by tractors and *desi* plough. (b) N.A. (c) 32 srs./ac. (d) and (e) N.A. (v) Nil. (vi) C—591. (medium). (vii) Unirrigated. (viii) Nil. (ix) 3 50". (x) 10.4.1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54 (10) on page 188.

5. RESULTS :

(i) 611 lb./ac. (ii) 53.7 lb./ac. (iii) Main effect of P alone is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_3	Mean	F_0	F_1	F_2
P_0	479	545	525	516	490	575	483
P_1	585	648	670	634	656	615	682
P_2	664	671	715	683	611	715	725
Mean	576	621	637	611	569	635	630
F_0	544	591	572				
F_1	613	588	705				
F_3	573	685	632				

S.E. of any marginal mean = 17.9 lb./ac.
S.E. of body of any table = 31.0 lb./ac.

Crop :- Wheat.   Ref :- M.P. 57 (5).

Site :- R.A.K. Agri. Res. Instt., Sehore.   Type :- 'M'.

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

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 6.11.1957. (iv) (a) Ploughing by country plough and harrowings. (b) Drilled. (c) 40 srs./ac. (d) 12" between rows. (e) —. (v) Nil. (vi) C—591 (medium). (vii) Unirrigated. (viii) Weeding. (ix) Nil. (x) 26.3.1958.

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=30 lb./ac.
   (3) 2 levels of K_2O as Pot. Sul : K_0=0 and K_1=30 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 37'×20½'. (b) 33'×16½'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Germination, height of plants, tiller count, yield of grain and straw. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 315 lb./ac. (ii) 112 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	K_0	K_1	Mean
N_0	295	327	310	312	311
N_1	307	332	350	290	320
Mean	301	329	330	301	315
K_0	332	327			
K_1	270	332			

S.E. of any marginal mean	=	28.0 lb./ac.
S.E. of body of any table	=	39.6 lb./ac.

Crop :- Wheat *(Rabi).*

Site :- Govt. Res. Farm, Seoni.

Ref :- M.P. 58(99).

Type :- 'M'.

Object :—To find out suitable combination of N and P for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 8 mds./ac. of G.N.C. (ii) (a) *Morand I.* (b) Refer soil analysis, Seoni. (iii) 7.11.1958. *(iv)* (a) 5 *bakherings.* (b) Drilling. (c) 80 lb./ac. (d) $9'' \times 9''$. (e) —. (v) 10 C.L./ac. of F.Y.M. (vi) Hy. 65. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 4.5.1959.

2. TREATMENTS :

5 manurial treatments : M_0 = Control, M_1 = 15 lb./ac. of N as A/S and 15 lb./ac. of P_2O_5 as Super, M_2 = 20 lb./ac. of N as A/S and 20 lb./ac. P_2O_5 as Super M_3 = 2 times M_1 and M_4 = 2 times M_2.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) N.A. (b) $16\frac{1}{2}' \times 16\frac{1}{2}'$. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 633 lb./ac. (ii) 224.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4
Av. yield	412	686	646	722	698

S E./mean = 100.3 lb./ac.

Crop :- Wheat.

Site :- Govt. Exptl. Farm, Vidisha.

Ref :- M.P. 57(11).

Type :- 'M'.

Object :—To find out the most suitable manurial schedule for unirrigated Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy—clay. (b) N.A. (iii) 20.10.1957. (iv) (a) 6 *bakherings.* (b) Drilled. (c) to (e) N.A. (v) Nil. (vi) Ujjain no. 22. (vii) Unirrigated. (viii) Nil. (ix) 0 70". (x) 19.3.1958.

2. TREATMENTS :

Main-plot treatments :
  3 levels of N as A/S : N_0 = 0, N_1 = 20 and N_2 = 40 lb./ac.
Sub-plot treatments :
  3 levels of P_2O_5 as Super : P_0 = 0, P_1 = 25 and P_2 = 50 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) $48' \times 15'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 772 lb./ac. (ii) (a) 211.1 lb./ac. (b) 87.1 lb./ac. (iii) Main effect of P alone is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	721	941	873	845
N_1	696	770	705	724
N_2	710	823	707	747
Mean	709	845	762	772

S.E. of difference of two

1. N marginal means   = 86.2 lb./ac.
2. P marginal means   = 35.6 lb./ac.
3. P means at the same level of N   = 61.6 lb./ac.
4. N means at the same level of P   = 95.2 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 58(40).**

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

Object : —To find out the most suitable manurial schedule for Wheat crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Heavy clay. (b) N.A. (iii) 19, 20.11.1958. (iv) (a) Two *bakherings.* (b) Line sowing. (c) 1 md./ac. (d) 12″ between rows. (e) N.A. (y) Nil. (vi) NP—718. (vii) Unirrigated. (viii) 1 weeding. (ix) 3.66″. (x) 1.4.1959.

2. **TREATMENTS :**

All combinations of (1) and (2).
     (1) 3 levels of N as A/S : $N_0 = 0$, $N_1 = 20$ and $N_2 = 40$ lb./ac.
     (2) 3 levels of P_2O_5 as Super : $P_0 = 0$, $P_1 = 25$ and $P_2 = 50$ lb./ac.
Manures applied on 19.11.1958.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 40′×18′. (b) 36′×14′. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Germination, tiller count, plant height, no. of ear bearing tillers/plant, grain and straw yield. (iv) (a) 1957—1960. (b) No. (c) N.A. (v) to (vii) Nil.

5. **RESULTS :**

(i) 1345 lb./ac. (ii) 188.0 lb./ac. (iii) All the effects are highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	925	1018	938	960
N_1	1098	1422	1563	1361
N_2	1376	1685	2083	1715
Mean	1133	1375	1528	1345

S.E. of any marginal mean   = 44.3 lb./ac.
S.E. of body of table   = 76.7 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 59(37).**

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

Object : —To find out the most suitable manurial schedule for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 10 C.L /ac. of F.Y.M. (ii) (a) Heavy clay. (b) N.A. (iii) 13.11.1959. (iv) (a) 3 *bakherings*. (b) Seed drilled by *doofan*. (c) 80 lb./ac. (d) Between lines 12″. (e) N A. (v) Nil. (vi) NP—718 (medium). (vii) Unirrigated. (viii) Nil. (ix) 4.48″. (x) 29.3.1960.

2. TREATMENTS :

Same as in expt. no. 58(40) on page 191.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N A. (iii) 6. (iv) (a) 36.3′×15′. (b) 33.3′×13′. (v) 1½′×1′. (vi) Yes.

4. GENERAL :

(i) Satisfactory and germination good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1957—1960. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Manures applied on 13 11.1959.

5. RESULTS :

(i) 881 lb /ac. (ii) 167.4 lb./ac. (iii) Main effect of N and P are highly significant. (iv) Av. yield of grain in lb /ac.

	N_0	N_1	N_2	Mean
P_0	643	649	750	681
P_1	691	1043	992	909
P_2	892	1124	1145	1054
Mean	742	938	962	881

S.E. of any marginal mean = 39.5 lb./ac.
S.E. of body of any table = 68.3 lb./ac.

Crop :- Wheat *(Rabi).*   Ref :- M.P. 59(40).

Site :- Govt. Exptl. Farm, Vidisha.   Type :- 'M'.

Object :—To study the effect of different doses and methods of application of P on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) G.M. crop *Lobia*. (c) As per treatments. (ii) (a) Heavy clay. (b) N.A. (iii) 8.11.1959. (iv) (a) 2 *bakhering* . (b) In lines by *doofan*. (c) 80 lb./ac. (d) Between lines 12″. (e) N.A. (v) G.M. with *Lobia*. (vi) NP—718 (medium). (vii) Unirrigated. (viii) N.A. (ix) 4.48″. (x) 2.4.1960.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of P_2O_5 as Super : $P_0=0$, $P_1=25$, $P_2=50$ and $P_3=75$ lb./ac.

(2) 4 methods of application of P_2O_5 : M_1=Full dose at sowing G.M. crop, M_2=½ dose at sowing and ½ at burrying G.M., M_3= Full dose at burrying G.M. and M_4=Full dose at sowing Wheat.

3. DESIGN :

(i) Fact. in R.B D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 36′×24′. (b) 30′×18′. (v) 3′×3′. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) and (iii) N A. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 629 lb./ac. (ii) 120.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 580 lb./ac.

	P₁	P₂	P₃	Mean
M₁	530	610	671	604
M₂	590	572	696	619
M₃	703	628	703	678
M₄	701	658	686	682
Mean	631	617	689	646

S.E. of P marginal or control mean = 30.1 lb./ac.
S.E. of M marginal mean = 34.7 lb./ac.
S.E. of body of table = 60.2 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- M.P. 56(MAE).**

Site :- M.A.E. Farm, Bagwai. **Type :- 'M'.**

Object :—Type III—To study the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—Wheat—Pea. (b) Sugarcane. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) 6.12.1956. (iv) (a) 2 harrowings with *bakhering*, 1 ploughing with *desi* plough followed by planking. (b) N.A. (c) 62 lb./ac. (d) 10″ between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 3.27″. (x) 6 to 18.4.1957.

2. TREATMENTS :

Treatment	1	2	3	4	5	6	7	8
1st year	M	M	M	M	O	O	O	O
2nd year	M	M	O	O	M	M	O	O
3rd year	M	O	M	O	M	O	M	O

O = Control (no manure), M = 30 lb./ac. of N + 30 lb./ac. of P₂O₅.

3. DESIGN :

(i) R.B.D. (three course rotation). (ii) (a) 8. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 34′×13′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Mild attack of stem-borer at seedling stage. Control measures taken. (iii) Grain yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) Powarkheda. (b) Nil. (vi) Slight damage due to hail-storm. (vii) Nil.

5. RESULTS :

(i) 649 lb./ac. (ii) 104.1 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	O	M
Av. yield	503	795

S.E./mean = 36.8 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- M.P. 58 (MAE).**

Site :- M.A.E. Farm, Bagwai. **Type :- 'M'.**

Object :—Type III—To study the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—Wheat—Pea. (b) Sugarcane. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) 3rd and 4th week of November, 1958. (iv) (a) 2 ploughings and 1 *bakhering*. (b) N.A. (c) 70 lb./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) NP—710 (medium). (vii) Irrigated. (viii) Nil. (ix) 6″. (x) 1st and 2nd week of April, 1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(MAE) type III on page 193.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) Powarkheda. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 954 lb./ac. (ii) 144.2 lb./ac. (iii) Treatments and "control *vs.* others" are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	MM	MO	OM	OO
Av. yield	1358	675	1201	584

S.E./mean = 72.1 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 59(MAE).**

Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object :—Type III—To study the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—Wheat—Pea. (b) Sugarcane. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) December, 1959. (iv) (a) 3 ploughings. (b) N.A. (c) 70 lb./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) NP—710 (early). (vii) Irrigated. (viii) N.A. (ix) 2″. (x) 1st week of April, 1960.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(MAE) type III on page 193.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) Powerkheda. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 852 lb./ac. (ii) 37.0 lb./ac. (iii) Treatment differences and "control *vs.* others" are highly significant. (iv) Av.yield of grain in lb./ac.

Treatment	OOO	OMO	MOO	MMO	OOM	OMM	MOM	MMM
Av. yield	469	568	444	617	1061	1234	1061	1358

S.E./mean = 26.2 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 57(MAE).**

Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object :—IV—To study the direct effect of N and residual effect of P on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Legume. (b) *Moong* and groundnut. (c) As per treatments. (ii) (a) Medium black soil. (b) N A. (iii) 28.11.1957. (iv) (a) 2 ploughings with *desi* plough and 1 *bakhering* followed by *pata* each time. (b) Sowing done by Bamboo *nari* attached with *desi* plough. (c) 70 lb./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) Nil. (x) 2nd week of April, 1958.

2. TREATMENTS:

Main-plot treatments:

All combinations of (1) and (2)+control (fallow plot L_0P_0).
    (1) 2 previous legume crops: $L_1 = Moong$ and $L_2 = $ Groundnut.
    (2) 3 levels of P_2O_5 as Triple Super applied to legumes: $P_0 = 0$, $P_1 = 40$ and $P_2 = 80$ lb./ac.

Sub-plot treatments:

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

3. DESIGN:

(i) Split-p'ot. (ii) (a) 7 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/97.23 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) and (c)—. (v) (a) Powerkheda and Ujjain. (b) Nil. (vi) Yield was poor due to dry weather and insufficient irrigation. (vii) Nil.

5. RESULTS:

(i) 692 lb./ac. (ii) (a) 183.8 lb./ac. (b) 152.7 lb./ac. (iii) Main effects of L, P, "control vs. others" and N are highly significant. Interaction $N \times P$ is 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	502	609	708	938	387	560	625	618
N_1	477	502	782	1168	420	510	856	674
N_2	453	568	971	1399	411	708	971	783
Mean	477	560	820	1168	406	593	817	692

S.E. of difference of two
    1. LP marginal means   = 86.6 lb./ac.
    2. N marginal means   = 47.1 lb./ac.
    3. N means at the same level of LP   = 124.7 lb./ac.
    4. LP means at the same level of N   = 133.7 lb./ac.

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Crop :- Wheat *(Rabi).*   **Ref :- M.P. 56(MAE).**

Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object :—Type V—To study the effect of different sources and time of application of N to Wheat.

1. BASAL CONDITIONS :-

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 6.12.1956. (iv) (a) 2 harrowings with *bakher*, 1 *desi* ploughing followed by ploughing. (b) N.A. (c) 62 lb./ac. (d) 10″ between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 3.27″. (x) 6 to 18.4.1957.

2. TREATMENTS:

All combinations of (1), (2) and (3)+control (3 plots)
    (1) 3 sources of N: $S_1 = $ A/S, $S_2 = $ A/N and $S_3 = $ Urea.
    (2) 2 levels of N: $N_1 = 20$ and $N_2 = 40$ lb./ac.
    (3) 3 times of application of N: $T_1 = $ At sowing, $T_2 = $ At first irrigation and $T_3 = \frac{1}{2}$ at sowing$+\frac{1}{2}$ at first irrigation.

3. DESIGN:

(i) $3^2 \times 2 + 3$ fact. in R.B.D. (ii) (a) 21. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/100.8 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Mild attack of stem-borer at seedling stage. Control measures taken. (iii) Grain yield. (iv) (a) No. (b) and (c) —. (v) (a) Obedullaganj, Powerkheda and Ujjain. (b) Nil. (vi) Slight damage due to hail-storm (vii) Nil.

5. RESULTS :

(i) 959 lb./ac. (ii) 137.5 lb./ac. (iii) Main effects of S and N and interactions T×S, S×N, T×S×N and "control *vs.* others" are highly significant. Interaction T×N is significant. (iv) Av. yield of grain in lb /ac.

Control = 732 lb./ac.

	T_1	T_2	T_3	Mean	S_1	S_2	S_3
N_1	873	899	960	911	950	882	901
N_2	1163	1047	1042	1084	914	1116	1221
Mean	1018	973	1001	997	932	999	1061
S_1	1016	867	913				
S_2	1026	1054	917				
S_3	1012	999	1172				

S.E. of marginal mean of T or S	= 28.1 lb./ac.
S.E. of marginal mean of N	= 22.9 lb./ac.
S.E. of body of S×N or T×N table or control mean	= 39.7 lb./ac.
S.E. of body of S×T table	= 48.6 lb./ac.

Crop :- Wheat *(Rabi)*.

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

Ref :- M.P. 58(MAE).

Type :- 'M',

Object :—Type VI—To study the effect of different sources and levels of P and their method of applications.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 3rd and 4th week of Nov. 1958. (iv) (a) 2 ploughings and/*bakhering*. (b) N.A. (c) 70 lb./ac. (d) 12″ between rows. (e) N.A. (v) N equalized by applying A/S to make up 30 lb./ac. N at sowing. (vi) NP—710 ,(medium). (vii) Irrigated. (viii) Nil. (ix) 6″. (x) 1st and 2nd week of April 1959.

2. TREATMENTS :

All combinations of (1), (2) and (3)+a control.

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

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

    (3) 3 methods of placement : M_1=Broadcast, M_2=2½″ below seed and M_3=Band placement.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 34′×13′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) N.A. (c) Nil. (v) (a) Obedullaganj, Powarkheda, Reora and Ujjain. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1519 lb./ac. (ii) 173.0 lb./ac. (iii) Main effect of P is significant. "Control *vs.* others" is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1094 lb./ac.

	M₁	M₂	M₃	Mean	P₁	P₂
S₁	1481	1563	1654	1566	1478	1654
S₂	1563	1555	1506	1541	1502	1580
Mean	1522	1559	1580	1554	1490	1617
P₁	1509	1498	1465			
P₂	1535	1621	1695			

S.E. of marginal mean of S or P	= 40.8 lb./ac.
S.E. of marginal mean of M	= 49.9 lb./ac.
S.E. of body of S×M or P×M table	= 70.6 lb./ac.
S.E. of body of S×P table	= 57.7 lb./ac.
S.E. of control mean	= 99.8 lb./ac.

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Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 59(MAE).**

Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object:— Type VI—To study the effect of different sources and levels of P and their method of application.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) Dec. 1959. (iv) (a) 3 ploughings. (b) N.A. (c) 70 lb./ac. (d) 12". (e) N.A. (v) Nil. (vi) MP—710 (medium) (vii) Irrigated. (viii) N.A. (ix) 2". (x) 1st week of April, 1960.

2. **TREATMENTS to 4. GENERAL :**

   Same as in expt. no. 58(MAE) type VI on page 196.

5. **RESULTS :**

   (i) 1301 lb./ac. (ii) 54.1 lb./ac. (iii) Main effects of P, M and interactions P×S and S×M and "control vs. others" are highly significant. Interaction P×M×S is significant. (iv) Av. yield of grain in lb./ac.

Control = 828 lb./ac.

	M₁	M₂	M₃	Mean	P₁	P₂
S₁	1267	1481	1292	1347	1284	1410
S₂	1234	1349	1415	1333	1341	1325
Mean	1251	1415	1354	1340	1312	1367
P₁	1251	1360	1325			
P₂	1251	1468	1382			

S.E. of marginal mean of S or P	= 12.8 lb./ac.
S.E. of marginal mean of M	= 15.6 lb./ac.
S.E. of body of S×M or P×M table	= 22.1 lb./ac.
S.E. of body of S×P table	= 18.0 lb./ac.
S.E. of control mean	= 31.2 lb./ac.

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Crop :- Wheat *(Rabi).*   Ref :- M.P. 56(MAE).

Site :- M.A.E. Farm, Obedullagan j.   Type :- 'M'.

Object :— Type III—To study the effect of N and P on Wheat.

1. **BASAL CONDITIONS :**

(i) (a) Wheat—Fallow—Pea. (b) Pea. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) 23 to 29.10.1956. (iv) (a) 4 to 5 harrowings with *bakher.* (b) N.A. (c) 70 lb./ac. (d) 10″ between rows. (e) N.A. (v) 5000 lb./ac. of compost. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 6.75″. (x) 27 to 31.3.1957.

2. **TREATMENTS :**

Treatments	1.	2.	3.	4.
1st year	M	O	M	O
2nd year	M	M	O	O

O=No manure. M=30 lb./ac. of N as A/S+30 lb./ac. of P_2O_5 as Super.

3. **DESIGN :**

(i) R.B.D. (Two-course rotation). (ii) (a) 4. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 14′—4″×30′—4″. (v) N.A. (vi) Yes.

4. **GENERAL :**

(i) Crop lodged. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

(i) 1363 lb./ac. (ii) 238.2 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	O	M
Av. yield	1091	1635

S.E./mean = 119.1 lb./ac.

———

Crop :- Wheat *(Rabi).*   Ref :- M.P. 57(MAE).

Site :- M.A.E. Farm, Obedullaganj.   Type :- 'M'.

Object :—Type III —To study the effect of N and P on Wheat.

1. **BASAL CONDITIONS :**

(i) (a) Wheat—Follow—Pea. (b) Pea. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) 2nd week of October, 1957. (iv) (a) 5 to 6 *bakherings.* (b) N.A. (c) 70 lb./ac. (d) 10″ between rows. (e) N.A. (v) 5000 lb./ac. of compost. (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) Nil. (x) 2nd week of March, 1958.

2. **TREATMENTS to 4. GENERAL :**

Same as in expt. no. 56(MAE) type III above

5. **RESULTS :**

(i) 1198 lb./ac. (ii) 93 7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	OO	OM	MM	MO
Av. yield	1332	1090	1313	1059

S.E./mean = 54.1 lb./ac.

———

Crop :- Wheat.   **Ref :- M.P. 58(MAE).**

Site :- M.A.E. Farm, Obedullaganj.   **Type :- 'M'.**

Object :—Type III—To study the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Fallow—Pea. (b) Pea. (c) As per treatments. (iii) Medium black soil. (b) N.A. (iii) Last week of October to 1st week of November, 1958. (iv) (a) 6 *bakherings*. (b) N.A. (c) 70 lb./ac. (d) 10" between rows. (e) N.A. (v) 5000 lb./ac. of compost. (vi) C—591 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 3". (x) Last week of March, 1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56 (MAE) type III on page 198.

5. RESULTS :

(i) 1498 lb./ac. (ii) 428.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	OOO	OMO	MOM	MMM
Av. yield.	1111	1218	1761	1901

S.E./mean = 247.6 lb./ac.

= — — —

Crop :- Wheat.   **Ref :- M.P. 59(MAE).**

Site :- M.A.E. Farm, Obedullaganj.   **Type :- 'M'.**

Object :—Type III—To study the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Fallow—Pea. (b) Pea. (c) As per treatments, (ii) (a) Medium black soil. (b) N.A. (iii) 3rd week of November, 1959. (iv) (a) 6 *bakherings*. (b) N.A. (c) 70 lb./ac. (d) 10" between rows. (e) N.A. (v) 5000 lb./ac. of compost. (vi) C—591 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 7". (x) March—April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(MAE) type III on page 198.

5. RESULTS :

(i) 1152 lb./ac. (ii) 192.9 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	OO	OM	MO	MM
Av. yield	880	1473	930	1325

S.E./mean = 111.4 lb./ac.

— — —

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 56(MAE).**

Site :- M.A.E. Farm, Obedullaganj.   **Type :- 'M'.**

Object :—Type V—To study the effect of different sources and time of application of N to Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N A. (ii) (a) Medium black soil. (b) N.A. (iii) 23 to 29.10.1956. (iv) (a) 4 to 5 harrowings with *bakher*. (b) N.A. (c) 70 lb./ac. (d) 10" between rows. (e) N.A. (v) 5000 lb./ac. of compost. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 6.75". (x) 27 to 31.3.1957.

2. TREATMENTS :

All combinations of (1), (2) and (3) + control.

(1) 3 sources of N : S_1=A/S, S_2=A/N and S_3=Urea.

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

(3) 3 times of application of N : T_1=At sowing, T_2=At 1st irrigation and T_3=½ at sowing + ½ at 1st irrigation

3. DESIGN:

(i) $3^2 \times 2+3$ confd. (ii) (a) 7 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 16'×34'4". (b) 14'4"×30'3". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Crop lodged. (ii) Severe attack of rust but grain was not effected. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) Bagwai, Powerkheda and Ujjain. (b) N.A. (vi) Hail-storm and heavy rain fall damaged the crop. (viii) Means in S×T table and their corresponding S.E's are unadjusted for block effects.

5. RESULTS :

(i) 1580 lb./ac. (ii) 316.4 lb./ac. (iii) "Control vs. others" alone is highly significant. (iv) Av. yield of grain in lb./ac.

Control mean = 1149 lb./ac.

	T_1	T_2	T_3	Mean	S_1	S_2	S_3
N_1	1640	1552	1542	1578	1536	1538	1659
N_2	1796	1659	1724	1726	1767	1634	1778
Mean	1718	1606	1633	1652	1651	1586	1719
S_1	1749	1449	1756				
S_2	1663	1684	1412				
S_3	1743	1684	1730				

S.E. of marginal mean of S or T	= 64.6 lb./ac.
S.E. of marginal mean of N	= 52.7 lb./ac.
S.E. of body of S×N or T×N table or control mean	= 91.3 lb./ac.
S.E. of body of S×T table	= 111.9 lb./ac.

Crop :- Wheat *(Rabi)*.

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

Ref :- M.P. 57(MAE).

Type :- 'M'.

Object :—Type V—To study the effect of different sources and time of application of N to Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 2nd week of October, 1957. (iv) (a) 5 to 6 *bakherings*. (b) N.A. (c) 70 lb./ac. (d) 10" between rows. (e) N.A. (v) 5000 lb./ac. of compost. (vi) N.A. (vii) Irrigated (viii) 1 weeding. (ix) Nil. (x) 2nd week of March, 1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56 (MAE) type V on page 199.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956 –contd. (b) N.A. (c) Nil. (v) (a) Bagwai, Powarkheda and Ujjain. (b) Nil. (vi) Nil. (vii) Means in S×T table and the corresponding S.E. are unadjusted.

5. RESULTS :

(i) 881 lb /ac. (ii) 140.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 880 lb./ac.

	T_1	T_2	T_3	Mean	S_1	S_2	S_3
N_1	949	933	853	912	887	954	894
N_2	873	835	843	850	896	822	833
Mean	911	884	848	881	892	888	863
S_1	894	942	839				
S_2	962	852	851				
S_3	876	858	855				

S.E. of marginal mean of S or T = 28.7 lb./ac.

S.E. of marginal mean of N = 23.4 lb./ac.

S.E of body of S×N or N×T table or control mean = 40.5 lb./ac.

S.E. of body of S×T table = 49.6 lb./ac.

— — —

Crop :- Wheat *(Rabi)* .

Site .- M.A.E. Farm, Obedullaganj.

Ref :- M.P. 58(MAE).

Type :- 'M'.

Object :—Type V—To study the effect of different sources and time of application of N for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) October—November, 1958. (iv) (a) 6 *bakherings.* (b) N.A. (c) 70 lb./ac. (d) 10″. (e) N.A. (v) 20 lb./ac. of P_2O_5 as Super+5000 lb /ac. of F.Y.M. (vi) C—591 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 3″. (x) Last week of March, 1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56 (MAE) type V on page 199.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) Bagwai, Powarkheda and Ujjain. (b) Nil. (vi) Nil. (vii) Means in S×T table and the corresponding S.E. have been adjusted for block effects.

5. RESULTS :

(i) 1719 lb./ac. (ii) 292.6 lb./ac. (iii) 'Control *vs.* others' alone is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1467 lb./ac.

	T_1	T_2	T_3	Mean	S_1	S_2	S_3
N_1	1794	1819	1810	1808	1819	1744	1861
N_2	1634	1687	1822	1714	1687	1684	1771
Mean	1714	1753	1816	1761	1753	1714	1816
S_1	1679	1786	1794				
S_2	1744	1596	1802				
S_3	1720	1876	1851				

S.E. of marginal mean of S or T	= 59.7 lb./ac.
S.E. of marginal mean of N	= 48.8 lb./ac.
S.E. of body of S×N or T×N table or control mean	= 84.5 lb./ac.
S.E. of body of S×T table	= 110.6 lb./ac.

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Crop :- Wheat *(Rabi)*.　　　　　　　　　**Ref :- M.P. 59(MAE).**

Site :- M.A.E. Farm, Obedullaganj.　　　**Type :- 'M'.**

Object :—Type V—To study the effect of different sources and time the of application of N for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 3rd week of November, 1959. (iv) (a) 6 bakherings (b) N.A. (c) 70 lb./ac (d) 10″ between rows. (e) N.A. (v) 5000 lb./ac. of compost. (vi) C—591 ('ate). (vii) Irrigated. (viii) 1 weeding. (ix) 7″. (x) March—April, 1960.

2. TREAMENTS and 3. DESIGN :

Same as in expt no. 56 (MAE) type V on page 199.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) Bagwai, Pawarkheda and Ujjain. (b) Nil. (vi) Nil. (vii) Means in S×T table and the corresponding S.E. are adjusted for block effects.

5. RESULTS :

(i) 1070 lb./ac. (ii) 174.4 lb./ac. (iii) Main effect of N and 'control vs. others' are high'y significant. Effect of S is significant. (iv) Av. yield of grain in lb./ac.

Control = 724 lb /ac.

	T_1	T_2	T_3	Mean	S_1	S_2	S_3
N_1	1078	996	1004	1026	1037	971	1070
N_2	1226	1170	1294	1230	1141	1200	1350
Mean	1152	1083	1149	1228	1089	1086	1210
S_1	1078	1086	1103				
S_2	1201	1004	1053				
S_3	1177	1160	1292				

S.E. of marginal mean of S or T	= 35.6 lb./ac.
S.E. of marginal mean of N	= 29.1 lb./ac.
S.E. of body of S×N or T×N table or control mean	= 50.3 lb./ac.
S.E. of body of S×T table	= 65.9 lb /ac.

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Crop :- Wheat *(Rabi)*.　　　　　　　　　**Ref :- M.P. 57(MAE).**

Site :- M.A.E. Farm, Obedullaganj.　　　**Type :- 'M'.**

Object :—Type VI —To study the effect of different sources and levels of P and their method of application.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 2nd week of October, 1957. (iv) (a) 5 to 6 bakherings. (b) N A. (c) 70 lb./ac. (d) 10″ between rows. (e) N.A. (v) 5000 lb./ac. of compost. (vi) C—591 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) Nil. (x) 2nd week of March, 1958.

2. TREATMENTS :

All combinations of (1), (2) and (3)+a control.

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

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

    (3) 3 methods of application : M_1=Broadcast before final cultivation M_2=$2\frac{1}{2}''$ below seed and M_3= Band placement.

3. DESIGN :

(i) 3×2^2+a control. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) $16' \times 31'4''$. (b) $14'4'' \times 30'4''$. (v) $10'' \times 6''$. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) N.A. (c) Nil. (v) (a) Bagwai, Powarkheda, Reora and Ujjain. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 897 lb./ac. (ii) 113.2 lb./ac. (iii) Main effect of M alone is significant. (iv) Av. yield of grain in lb./ac.

<div align="center">Control = 835 lb./ac.</div>

	M_1	M_2	M_3	Mean	P_1	P_2
S_1	784	858	967	870	896	843
S_2	902	946	969	939	936	942
Mean	843	902	968	904	916	892
P_1	859	930	959			
P_2	827	874	976			

S.E. of marginal mean of S or P   = 26.7 lb./ac.
S.E. of marginal mean of M   = 32.7 lb./ac.
S.E. of body of P×M or S×M table   = 46.2 lb./ac.
S.E. of body of S×P table   = 37.7 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 58(MAE).**

Site :- M.A.E. Farm, Obedullaganj.   **Type :- 'M'.**

Object :—Type VI—To study the effect of different sources and levels of P and their method of application.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) October—November, 1958. (iv) (a) 6 bakherings. (b) N.A. (c) 70 lb./ac. (d) 10″. (e) N.A. (v) 5000 lb./ac. of compost. (vi) C—591 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 3″. (x) Last week of March, 1959.

2. TREATMETS to 4. GENERAL :

Same as in expt. no. 57(MAE) type VI on page 202.

5. RESULTS :

(i) 1822 lb./ac. (ii) 119.2 lb./ac. (iii) Main effects of S and M, interaction S×P and 'control vs. others' are highly significant. Main effect of P is significant. (iv) Av. yield of grain in lb./ac.

Control = 1388 ib./ac.

	M_1	M_2	M_3	Mean	P_1	P_2
S_1	1852	1690	1792	1778	1786	1770
S_2	2041	1858	1912	1937	1831	2043
Mean	1947	1774	1852	1853	1809	1906
P_1	1886	1738	1802			
P_2	2008	1809	1901			

S.E. of marginal mean of S or P	= 28.1 lb./ac.
S.E. of marginal mean of M	= 34.4 lb./ac.
S E. of body of S × M or P × M table	= 48.7 lb./ac.
S.E. of body of S × P table	= 39.7 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(MAE).**

Site :- M.A.E. Farm, Obedullaganj.   **Type :- 'M'.**

Object :—Type VI—To study the effect of different sources and levels of P and their method of application.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 3rd week of November, 1959. (iv) (a) 6 *bakherings.* (b) N.A. (c) 70 lb./ac. (d) 10″ between rows. (e) N.A (v) 5000 lb./ac. of compost. (vi) C –591 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 7″. (x) March—April, 1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(MAE) type VI on page 202.

5. RESULTS :

(i) 1299 lb./ac. (ii) 171.5 lb./ac. (iii) Main effect of S and 'control *vs.* others' are highly significant. (iv) v. yield of grain in lb /ac.

Control = 839 lb./ac.

	M_1	M_2	M_3	Mean	P_1	P_2
S_1	1136	1201	1234	1190	1168	1212
S_2	1448	1366	1637	1484	1410	1558
Mean	1292	1284	1435	1337	1289	1385
P_1	1177	1325	1366			
P_2	1407	1243	1504			

S E. of marginal mean of S or P	= 40.4 lb./ac.
S.E. of marginal mean of M	= 49.5 lb./ac.
S.E. of body of S × M or P × M table	= 70.0 lb./ac.
S.E. of body of S × P table	= 57.2 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- M.P. 56(MAE).**

Site :- M.A.E. Farm, Obedullaganj. **Type :- 'M'.**

Object :—Type VI (TCM)—To study the cumulative, direct and residual effect of P on Wheat crop.

1. **BASAL CONDITIONS :**

   (i) (a) Wheat—Gram—Wheat and Wheat—Fallow—Wheat. (b) Gram—Wheat. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) 23 to 29.10.1956. (iv) (a) 4 to 5 harrowings with *bakherings*. (b) N.A. (c) 70 lb./ac. (d) 10″ between rows. (e) N.A. (v) 5000 lb./ac. of compost. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 6.75″. (x) 27 to 31.3.1957.

2. **TREATMENTS :**

Treatment	1	2	3	4	5	6	7	8	9	10	11	12
1st year	O	C	C	p_1	p_2	C	C	C	C	$p\frac{1}{2}$	p_1	p_2
2nd year	O	C	C	C	C	p_1	p_2	C	C	$p\frac{1}{2}$	p_1	p_2
3rd year	O	C	C	C	C	C	C	p_1	p_2	$p\frac{1}{2}$	p_1	p_2

   Treatments are three-course rotation with 11 distinct treatments. Plots under one treatment do not receive any fertilizer. Plots under the other ten treatments receive a basal dose 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 : O = No manure, C = 20 lb./ac. of N, $p\frac{1}{2}$ = 10, p_1 = 20 and p_2 = 40 lb./ac. of P_2O_5.

3. **DESIGN :**

   (i) R.B.D. (3rd year of the expt.). (ii) (a) 12. (b) N.A. (iii) 2 for each rotation. (iv) (a) N.A. (b) 25′×30′. (v) N.A. (vi) Yes.

4. **GENERAL :**

   (i) Crop lodged. (ii) Rust attack in all the plots but grain was not effected. (iii) Grain yield. (iv) (a) 1954—contd. (b) Yes. (c) N A. (v) (a) and (b) Nil. (vi) Hail-storm and heavy rainfall damaged the crop. (vii) Results for Wheat—Gram—Wheat and Wheat – Fallow—Wheat rotations are given separately.

5. **RESULTS :**

   1. For Wheat—Gram—Wheat

   (i) 1482 lb./ac. (ii) 256.1 lb./ac. (iii) None of the effects 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	1162	1477	1142	1783	1743	1257	1931	1433	1527	1362	1487

   S.E./mean except (2, 3) = 181.1 lb./ac. ; S.E./mean for (2, 3) = 128.0 lb./ac.

   2. For Wheat—Fallow—Wheat

   (i) 1262 lb./ac. (ii) 237.8 lb./ac. (iii) None of the effects 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	1042	1278	1344	1258	1201	1282	1031	1093	1362	1478	1496

   S.E./mean except (2, 3) = 168.2 lb./ac. ; S.E./mean for (2, 3) = 118.9 lb./ac.

———

Crop :- Wheat *(Rabi),* **Ref :- M.P. 57(MAE).**

Site :- M.A.E. Farm, Obedullaganj. **Type :- 'M'.**

Object :—Type VI (TCM)—To study the cumulative, direct and residual effect of P on Wheat crop.

1. **BASAL CONDITIONS :**

   (i) (a) Wheat—Fallow—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) 2nd week of October, 1957. (iv) (a) 5 to 6 *bakherings*. (b) N.A. (c) 70 lb./ac. (d) 10″ between rows. (e) N.A. (v) 5000 lb./ac. of compost. (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) Nil. (x) 2nd week of March, 1953.

2. **TREATMENTS and 3. DESIGN :**
   Same as in expt. no. 56(MAE) type VI (TCM) above.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—contd. (b) and (c) Yes. (v) to (vii) Nil.

5. RESULTS :

(i) 834 lb./ac. (ii) 170.6 lb./ac. (iii) None of the effects 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	675	889	833	780	679	1030	940	787	729	816	956

S.E /mean except (2, 3) = 120.6 lb./ac. , S.E./mean for (2, 3) = 85.3 lb./ac.

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Crop :- Wheat *(Rabi)*.   Ref :- M.P. 58(MAE).

Site :- M.A E. Farm, Obedullaganj.   Type :- 'M'.

Object :—Type VI (TCM)—To study the cumulative, direct and residual effect of P on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Gram—Wheat and Wheat—Fallow—Wheat. (b) Gram—Wheat. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) October—November, 1958. (iv) (a) 6 *bakherings*. (b) N.A. (c) 70 lb./ac. (d) 10" between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 3". (x) Last week of March, 1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(MAE) type VI (TCM) on page 205.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—contd. (b) and (c) Yes. (v) and (vi) Nil. (vii) Results for the two rotations are given separately.

5. RESULTS :

1. For Wheat—Gram—Wheat

(i) 1398 lb./ac. (ii) 297.9 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	9	10	11	12
Av. yield	1300	1506	1251	1489	1465	1440	1481	1292	1267	1374	1407

S E./mean except (2, 3) = 210.6 lb./ac. ; S.E./mean for (2, 3) = 148.9 lb./ac.

2. For Wheat—Fallow—Wheat

(i) 1305 lb./ac. (ii) 162.9 lb./ac. (iii) "Control *vs*. others" 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	1029	1317	1259	1506	1284	1317	1160	1448	1193	1530	1300

S.E./mean except (2, 3) = 115.2 lb./ac. ; S.E./mean for (2, 3) = 81.4 lb./ac.

———

Crop :- Wheat *(Rabi)*.   Ref :- M.P. 59(MAE).

Site :- M.A.E. Farm, Obedullaganj.   Type :- 'M'.

Object :—Type VI (TCM)—To study the cumulative, direct and residual effect of P on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Fallow—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) 3rd week of November, 1959. (iv) (a) 6 *bakherings*. (b) N.A. (c) 70 lb./ac. (d) 10" between rows. (e) N.A. (v) Nil. (vi) C—591 (late). (vii) Irrigated. (viii) 1 weeding. (ix) 7". (x) March—April, 1960.

2. TREATMENTS :

Same as in expt. no. 56(MAE) type VI (TCM) on page 205.

3. DESIGN :

(i) R B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 30′×20′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—contd. (b) and (c) Yes. (v) to (vii) Nil.

5. RESULTS :

(i) 1227 lb./ac. (ii) 195.4 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	9	10	11	12
Av. yield	1045	1045	1218	1308	1152	1317	1152	1358	1185	1481	1415

S.E./mean except (2, 3) 138.2 lb./ac. ; S.E./mean for (2, 3) = 97.7 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- M.P. 56(MAE).**

Site :- M.A.E. Farm, Powarkheda. **Type :- 'M'.**

Object :— Type II—To study the effect of N, P, K and F.Y.M. on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Fallow—Wheat. (b) Fallow. (c) Nil. (ii) (a) Deep black soil. (b) N.A. (iii) 11 to 16.11.1965. (iv) to (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 2.87″. (x) 6.4.1957.

2. TREATMENTS :

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

(1) 3 levels of N as A/S : $N_0 = 0$, $N_1 = 15$ and $N_2 = 30$ lb./ac.
(2) 3 levels of P_2O_5 as Super : $P_0 = 0$, $P_1 = 15$ and $P_2 = 30$ lb./ac.
(3) 3 levels of K_2O as Pot. Sul. : $K_0 = 0$, $K_1 = 15$ and $K_2 = 30$ lb./ac.
(4) 3 levels of F.Y.M. : $F_0 = 0$, $F_1 = 2500$ and $F_2 = 5000$ lb./ac.

3. DESIGN :

(i) 3^4 confd. NPK (W), NPF (Y), NKF (Z) and PKF (X) components. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 43′×22′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Little infestation of rust. (iii) Grain yield. (iv) (a) No. (b) and (c) —. (v) (a) and (b) Nil. (vi) Hailstorm in the month of March damaged the crop. (vii) Nil.

5. RESULTS :

(i) 650 lb./ac. (ii) 91.3 lb./ac. (iii) Main effects of N and P and interactions N×P, N×K, N×P×F and P×K×F are highly significant. Main effect of F and interactions K×F and N×K×F are significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	451	658	791	564	680	655	608	662	629	633
F_1	518	614	783	567	684	664	650	634	631	638
F_2	504	684	850	612	709	717	725	630	683	679
Mean	491	652	808	581	691	679	661	642	648	650
K_0	481	681	821	587	685	711				
K_1	476	678	773	555	710	661				
K_2	516	597	830	601	678	665				
P_0	473	562	707							
P_1	535	706	832							
P_2	464	688	885							

S.E. of any marginal mean	= 12·4 lb./ac.
S.E. of body of any table	= 21.5 lb./ac.

Crop :- Wheat *(Rabi).*

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

Ref :- M.P. 57(MAE).

Type :- 'M'.

Object —Type II—To study the effect of N, P, K and F.Y.M. on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat – Fallow—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) Deep black soil. (b) N.A. (iii) 3rd week of October, 1957. (iv) (a) 4 *bakherings*. (b) N.A. (c) 80 lb./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) Nil. (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 Pot. Sul. : $K_0=0$, $K_1=20$ and $K_2=40$ lb./ac.
 (4) 2 levels of F.Y.M. : $F_0=0$ and $F_1=5000$ lb./ac.

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) $43' \times 22'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) N.A. (v) (a) Reora. (b) Nil. (vi) Crop suffered badly due to high temperature. (vii) Nil.

5. RESULTS :

(i) 230 lb /ac. (ii) 61.1 lb./ac. (iii) Main effect of N is highly significant and main effect of P is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	175	230	181	178	208	199	191	206	189	195
F_1	254	294	247	230	287	278	277	259	259	265
Mean	214	262	214	204	247	239	234	233	223	230
K_0	242	242	218	229	270	203				
K_1	206	269	224	196	252	251				
K_2	194	275	200	187	219	263				
P_0	213	218	181							
P_1	221	250	271							
P_2	209	318	189							

S.E. of marginal mean of F	= 11.8 lb./ac.
S.E. of marginal mean of N, P or K	= 14.4 lb./ac.
S.E. of body of N×P, N×K or P×K table	= 24.9 lb./ac.
S.E of body of N×F, P×F or K×F table	= 20.4 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 5ᵍ(MAE).**

Site :- M.A.E. Farm, Powarkheda.   **Type :- 'M'**

Object : —Type II :—To study the effect of N, P, K and F.Y.M. on Wheat.

1. **BASAL CONDITIONS :**

(i) (a) Wheat—Fallow—Wheat. (b) Wheat. (c) As per treatments (ii) (a) Deep black soil. (b) N.A. (iii) 4th week of October, ·1958. (iv) (a) 3 *bakherings*. (b) N.A. (c) 80 lb./ac. (d) 12″. (e) N.A. (v) Nil. (vi) Hy—65. (late). (vii) Unirrigated. (viii) N.A. (ix) 2″. (x) 1st and 2nd week of March, 1959.

2. **TREATMENTS and 3. DESIGN :**

Same as in expt no. 57 (MAE) type II on page 208.

4. **GENERAL :**

(i) Below normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) N.A. (v) (a) Reora. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 679 lb./ac. (ii) 216.2 lb./ac. (iii) Main effects of N and P are highly significant. (iv) Av. yield of grain in lb./ac.

	N₀	N₁	N₂	P₀	P₁	P₂	K₀	K₁	K₂	Mean
F_0	527	667	922	551	625	939	675	773	667	705
F_1	427	643	888	431	653	876	570	620	769	653
Mean	477	655	905	491	639	908	623	697	718	679
K_0	395	658	815	560	494	815				
K_1	543	642	905	510	617	964				
K_2	493	665	995	403	806	945				
P_0	346	403	724							
P_1	502	691	724							
P_2	584	872	1267							

S.E. of marginal mean of F   = 41.6 lb./ac.
S.E. of marginal mean of N, P or K ·   = 51.0 lb./ac.
S.E. of body of N×P, N×K or P×K table   = 88.3 lb./ac.
S.E. of body of N×F, P×F or K×F table   = 72.1 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(MAE).**

Site :- M.A.E. Farm, Powarkheda.   **Type :- 'M'.**

Object : —Type II :—To study the effect of N, P, K and F.Y.M. on Wheat.

1. **BASAL CONDITIONS :**

(i) (a) Wheat—Fallow—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) Deep black soil. (b) N.A. (iii) 1st week of November,.1959. (iv) (a) 3 *bakherings*. (b) N.A. (c) 80 lb./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) Hy—65 (late). (vii) Unirrigated. (viii) Nil. (ix) 5″. (x) 1st and 2nd week of March, 1960.

2. **TREATMENTS and 3. DESIGN :**

Same as in expt. no. 57 (MAE) type II on page 208. *

4. GENERAL :

(i) Normal. (ii) Caterpillar attack. Control measures were taken. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) N.A. (v) (a) Reora. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1574 lb./ac. (ii) 316.8 lb./ac. (iii) Main effects of N and P are highly significant. (vi) Av. yield of grain in lb /ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	946	1629	1934	1111	1531	1867	1448	1473	1588	1503
F_1	1238	1585	2114	1165	1749	2024	1678	1681	1579	1646
Mean	1092	1607	2024	1138	1640	1945	1563	1577	1583	1574
K_0	913	176!	2016	1168	1662	1859				
K_1	1152	1456	2123	1152	1498	2081				
K_2	1211	1604	1933	1094	1760	1895				
P_0	889	1045	1481							
P_1	1168	1695	2057							
P_2	1218	2082	2534							

S.E. of marginal mean of F	=	61.0 lb./ac.
S.E. of marginal mean of N, P or K	=	74.7 lb./ac.
S.E. of bobdy of $N \times P$, $N \times K$ or $P \times K$ table	=	129.3 lb./ac.
S.E. of body of $N \times F$, $P \times F$ or $K \times F$ table	=	105.6 lb./ac.

Crop :- Wheat *(Rabi)*.

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

Ref :- M.P. 57(MAE).

Type :- 'M'.

Object :—Type III—To study the effect of N and P on Wheat.

1. BASAL CONDITIONS :

(i) (a) Linseed—Gram—Wheat. (b) Gram. (c) As per treatments. (ii) (a) Deep black soil. (b) N.A. (iii) 3rd week of October, 1957. (iv) (a) 4 *bakherings*. (b) N.A. (c) 80 lb./ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) Nil. (x) N.A.

2. TREATMENTS :

Treatment	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8
1st year	M	M	M	M	O	O	O	O
2nd years	M	M	O	O	M	M	O	O
3rd years	M	O	M	O	M	O	M	O

O=No manure. M=20 lb./ac. of N+20 lb./ac. of P_2O_5.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 31'×14.5'. (v) N.A. (vii) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) Bagwai. (b) Nil. (vi) Crop suffered badly due to high temperature. (vii) Nil.

5. RESULTS :

(i) 430 lb./ac. (ii) 48.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8
Av. yield	551	321	551	230	568	321	502	395

S.E./mean = 34.4 lb./ac.

Crop :- Wheat *(Rabi).*

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

Ref :- M.P.58 (MAE).

Type :- 'M'.

Object :—Type III —To study the effect of N and P on Wheat.

1. **BASAL CONDITIONS :**

(i) (a) Wheat—Linseed—Gram. (b) Gram. (c) As per treatments. (ii) (a) Deep black soil. (b) N.A. (iii) 4th week of October, 1958. (iv) (a) 3 *bakherings.* (b) N.A. (c) 80 lb./ac. (d) 12". (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) Hy—65 (late). (vii) Unirrigated. (viii) N.A. (ix) 2". (x) 1st and 2nd week of March, 1959.

2. **TREATMENTS and 3. DESIGN :**

Same as in expt. no. 57 (MAE) type III on page 210.

4. **GENERAL :**

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) Bagwai. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS:**

(i) 756 lb./ac. (ii) 58.5 lb./ac. (iii) Treatment differences and 'Control vs. others' are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8
Av. yield	946	831	971	831	724	634	667	444

S.E./mean = 41.4 lb./ac.

Crop :- Wheat *(Rabi).*

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

Ref :- M.P. 59(MAE).

Type :- 'M'.

Object :—Type III—To study the effect of N and P on Wheat.

1. **BASAL CONDITIONS :**

(i) (a) Gram—Wheat—Linseed. (b) Gram. (c) As per treatments. (ii) (a) Deep black soil. (b) N.A. (iii) 1st week of November, 1959. (iv) (a) 3 *bakherings.* (b) N.A. (c) 80 lb./ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Hy—65 (late). (vii) Unirrigated. (viii) Nil. (ix) 5". (x) 1st and 2nd week of March, 1960.

2. **TREATMENTS and 3. DESIGN :**

Same as in expt. no. 57 (MAE) type III on page 210.

4. **GENERAL :**

(i) Normal. (ii) Caterpillar attack. Control measures were taken. (iii) Grain yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) Bagwai. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 986 lb./ac. (ii) 77.1 lb./ac. (iii) Treatment differences and 'Control vs. others' are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8
Av. yield	1358	1168	848	782	1317	1020	831	560

S.E./mean = 54.5 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 59(MAE).**

Site :- M.A.E. Farm, Powarkheda.   **Type :- 'M'.**

Object :– Type IV—To study the direct effect of N and residual effect of P on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Legume—Wheat. (b) Legume. (c) As per treatments. (ii) (a) Deep black soil. (b) N.A. (iii) 1st week of November, 1959. (iv) (a) 3 *bakherings*. (b) N.A. (c) 80 lb./ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Hy—65 (late). (vii) Unirrigated. (viii) Nil. (ix) 5". (x) 1st and 2nd week of March, 1960.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)+Control (fallow plot L_0P_0)

(1) 2 previous legume crops : L_1=Gram and L_2=*Teora*.

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

Sub-plot treatments :

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

3. DESIGN :

(i) Split-plot. (ii) (a) 3 sub-plots/main-plot ; 7 main-plots/replication. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 31'×14.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Caterpillar attack. Control measures taken. (iii) Grain yield. (iv) (a) No. (b) and (c) —. (v) (a) Bagwai and Ujjain. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1522 lb./ac. (ii) (a) 410.0 lb./ac. (b) 154.7 lb./ac. (iii) Main effect of N is highly significant and N× 'Control *vs.* others' is 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	1218	1308	1555	1400	1251	1391	1481	1372
N_1	1325	1563	1646	1596	1440	1481	1654	1529
N_2	1218	1498	1884	1810	1572	1802	1860	1663
Mean	1254	1456	1695	1602	1421	1558	1665	1522

S.E. of difference of two

1.	LP marginal means	=	193.7 lb./ac.
2.	N marginal means	=	47.7 lb./ac.
3.	N means at the same level of LP	=	126.3 lb./ac.
4.	LP means at the same level of N	=	219.1 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 57(MAE).**

Site :- M.A.E. Farm, Powarkheda.   **Type :- 'M'.**

Object :—Type V—To study the effect of different sources and time of application of N to Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Deep black soil. (b) N.A. (iii) 3rd week of October, 1957. (iv) (a) 4 *bakherings*. (b) N.A. (c) 80 lb./ac. (d) 12" between rows. (e) N.A. (v) 20 lb./ac. of P_2O_5 and 5000 lb./ac. of F.Y.M. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) Nil. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 56(MAE) type V on page 199.

3. DESIGN :

(i) $3^2 \times 2 + 3$ Fact. confd. (ii) (a) 7 plots/block; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $31' \times 14.5'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) N.A. (c) Nil. (v) (a) Bagwai, Obaidullaganj and Ujjain. (b) Nil. (vi) Nil. (vii) T×S table and the corresponding S.E. are unadjusted.

5. RESULTS :

(i) 1501 lb./ac. (ii) 247.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 1293 lb./ac.

	T_1	T_2	T_3	Mean	S_1	S_2	S_3
N_1	1619	1446	1509	1525	1508	1556	1510
N_2	1613	1524	1507	1548	1537	1671	1436
Mean	1616	1485	1508	1536	1523	1613	1473
S_1	1612	1497	1460				
S_2	1660	1506	1673				
S_3	1576	1453	1390				

S.E. of marginal mean of S or T = 50.4 lb./ac.
S.E. of marginal mean of N = 41.2 lb./ac.
S.E. of body of S×N or T×N table or control mean = 71.3 lb./ac.
S.E. of body of S×T table = 87.4 lb./ac.

Crop :- Wheat *(Rabi)*.

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

Ref :- M.P. 58(MAE).

Type :- 'M':

Object :—Type V—To study the effect of different sources and time of application of N to Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Deep black soil. (b) N.A. (iii) 4th week of October, 1958. (iv) (a) 3 *bakherings*. (b) N.A. (c) 80 lb./ac. (d) 12″ between rows. (e) N.A. (v) 20 lb./ac. of P_2O_5 as Super+5000 lb./ac. of F.Y.M. (vi) Hy—65 (late). (vii) Unirrigated. (viii) N.A. (ix) 2″. (x) 1st and 2nd week of March, 1959.

2. TREATMENTS :

Same as in expt. no. 56(MAE) type V on page 199.

3. DESIGN :

(i) $3^2 \times 2 + 3$ Fact. confd. (ii) (a) 7 plots/block; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $31' \times 14.5'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) N.A. (c) Nil. (v) (a) Bagwai, Obaidullagunj and Ujjain. (b) Nil. (vi) Nil. (vii) S×T table and the corresponding S.E. are adjusted for block effects.

5. RESULTS :

(i) 1525 lb./ac. (ii) 253.7 lb./ac. (iii) "Cotrol *vs.* others" is highly significant. Effects of T and S are significant. (iv) Av. yield of grain in lb /ac.

Control = 1292 lb./ac.

	T₁	T₂	T₃	Mean	S₁	S₂	S₃
N₁	1637	1465	1374	1492	1424	1580	1472
N₂	1715	1579	1616	1637	1638	1624	1648
Mean	1676	1522	1495	1564	1531	1602	1560
S₁	1679	1399	1514				
S₂	1621	1687	1498				
S₃	1728	1480	1473				

S.E. of marginal mean of S or T	= 51.8 lb./ac.
S.E. of marginal mean of N	= 42.3 lb./ac.
S.E. of body of S×N or T×N table or control mean	= 73.2 lb./ac.
S.E. of body of S×T table	= 95.9 lb./ac.

Crop :- Wheat *(Rabi).*　　　　　　　　**Ref :- M.P. 59(MAE).**

Site :- M.A.E. Farm, Powarkheda.　　　　**Type :- 'M'.**

Object :—Type V—To study the effect of different sources and times of application of N to Wheat.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) (a) Deep black soil. (b) N.A. (iii) 1st week of November, 1959. (iv) (a) 3 *bakherings.* (b) N.A. (c) 80 lb./ac. (d) 12″. (e) N.A. (v) Nil. (vi) Hy—65 (late). (vii) Unirrigated. (viii) Nil. (ix) 5″. (x) 1st and 2nd week of March, 1960.

2. **TREATMENTS :**

Same as in expt. no. 56(MAE) type V on page 199.

3. **DESIGN :**

(i) 3²×2+3 Fact. confd. (ii) (a) 7 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 31′×14.5′. (v) N.A. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Catter-piller attack. Control measures taken. (iii) Grain yield. (iv) (a) 1957—contd. (b) N.A. (c) Nil. (v) (a) Bagwai, Obaidullaganj and Ujjain. (b) Nil. (vi) Nil. (vii) S×T table and the corresponding S.E. are adjusted for block effects.

5. **RESULTS :**

(i) 1586 lb./ac. (ii) 164.0 lb./ac. (iii) Main effects of T, S and N and "control vs. others" are highly significant. Interaction T×S is significant. (iv) Av. yield of grain in lb./ac.

Control = 1103 lb./ac.

	T₁	T₂	T₃	Mean	S₁	S₂	S₃
N₁	1547	1498	1572	1539	1588	1481	1548
N₂	1887	1646	1846	1793	1918	1695	1766
Mean	1717	1572	1709	1666	1753	1588	1657
S₁	1942	1531	1786				
S₂	1596	1547	1621				
S₃	1613	1637	1720				

S.E. of marginal mean of S or T	= 33.5 lb./ac.
S.E. of marginal mean of N	= 27.3 lb./ac.
S.E. of body of S×N or T×N table or control mean	= 47.3 lb./ac.
S.E. of body of S×T table	= 62.0 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 56(MAE).**

Site :- M.A.E. Farm, Powarkheda.   **Type :- 'M'.**

Object :—Type VI—To study the effect of different sources and levels of P and their method of application.

1. **BASAL CONDITIONS :**

(i) (a) Wheat—Gram. (b) Gram. (c) As per treatments. (ii) (a) Deep black soil. (b) N.A. (iii) 11 to 16.11.1956. (iv) (a) to (e) N.A. (v) Nil. (vi) Hy—65 (late). (vii) Unirrigated. (viii) N.A. (ix) 2.87". (x) 1st week of April, 1957.

2. **TREATMENTS :**

Same as in expt. no. 58 (MAE) type VI on page 196 conducted at Bagwai.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 31'×14.5'. (v) N.A. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) Little infestation of rust. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) Bagwai, Obaidullaganj, Reora and Ujjain. (b) Nil. (vi) Hail-storm in the month of March damaged the crop. (vii) Nil.

5. **RESULTS :**

(i) 1108 lb./ac. (ii) 160.9 lb./ac. (iii) Main effect of S is highly significant. Others are not significant. (iv) Av. yield of grain in lb./ac.

Control = 973 lb./ac.

	M₁	M₂	M₃	Mean	P₁	P₂
S₁	997	1107	1004	1036	1010	1062
S₂	1103	1293	1210	1202	1184	1220
Mean	1050	1200	1107	1119	1097	1141
P₁	1056	1164	1071			
P₂	1044	1236	1143			

S.E. of marginal mean of S or P	= 37.9 lb./ac.
S.E. of marginal mean of M	= 46.4 lb./ac.
S.E. of body of S×M or P×M table	= 65.7 lb./ac.
S.E. of body of S×P table	= 53.6 lb./ac.
S.E. of control mean	= 92.8 lb./ac

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 57(MAE).**

Site :- M.A.E. Farm, Powarkheda.   **Type :- 'M'.**

Object :—Type VI—To study the effect of different sources and levels of P and their method of application.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) (a) Deep black soil. (b) N.A. (iii) 3rd week of Oct. 1957. (iv) (a) 4 *bakherings.* (b) N.A. (c) 80 lb./ac. (d) 12" between rows. (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) Hy—65 (medium). (vii) Unirrigated. (viii) N.A. (ix) Nil. (x) N.A.

2. TREATMENTS :

Same as in expt. no. 58(MAE) type (VI) on page 196 conducted at Bagwai.

3. DESIGN:

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 31'×14.5'. (v) N.A. (vi) Yes.

5. GENERAL :

(i, Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) Bagwai, Obaidulla-ganj, Reora and Ujjain. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 472 lb./ac. (ii) 30.4 lb./ac. (iii) Main effects of P, M and S, interaction S×M and "control vs. others" are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 304 lb./ac.

	M₁	M₂	M₃	Mean	P₁	P₂
S₁	379	518	444	447	420	474
S₂	403	667	502	524	497	551
Mean	391	593	473	486	458	513
P₁	362	551	461			
P₂	420	634	485			

S.E. of marginal mean of S or P	=	7.2 lb./ac.
S.E. of marginal mean of M	=	8.8 lb./ac.
S.E. of body of S×M or P×M table	=	12.4 lb./ac.
S.E. of body of S×P table	=	10.1 lb./ac.
S.E. of control mean	=	17.6 lb./ac.

Crop :- Wheat (Rabi).   Ref :- M.P. 58(MAE).

Site :- M.A.E. Farm, Powerkheda.   Type :- 'M'.

Object :—Type VI—To study the effect of different sources and levels of P and their method of application.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Deep black soil. (b) N.A. (iii) 4th week of Oct. 1958. (iv) (a) 3 bakherings. (b) N.A. (c) 80 lb./ac. (d) 12" between rows. (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) Hy—65 (long duration). (vii) Unirrigated. (viii) N.A. (ix) 2". (x) 1st and 2nd week of March 1959.

2. TREATMENTS :

Same as in expt. no. 58(MAE) type (VI) on page 196 conducted at Bagwai.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 31'×14.5'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Not satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) Bagwai, Obaidullaganj, Reora and Ujjain. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 784 lb./ac. (ii) 127.9 lb./ac. (iii) Main effect of M and 'control vs. others' are highly significant and S effect is significant. (iv) Av. yield of grain in lb./ac.

Control = 518 lb./ac.

	M₁	M₂	M₃	Mean	P₁	P₂
S₁	642	848	757	749	749	749
S₂	666	1012	913	863	863	863
Mean	654	930	835	806	806	806
P₁	683	897	839			
P₂	625	963	831			

S.E. of marginal mean of S or P	= 30.1 lb./ac.
S.E. of marginal mean of M	= 36.9 lb /ac.
S E. of body of S×M or P×M table	= 52.2 lb./ac.
S.E. of body of S×P table	= 42.6 lb./ac.
S.E. of control mean	= 73.8 lb./ac.

———

Crop :- Wheat *(Rabi).* **Ref :- M.P. 59(MAE).**

Site :- M.A.E. Farm, Powarkheda. **Type :- 'M'.**

Object :—Type VI—To study the effect of different sources and levels of P and their method of applications.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Deep black soil. (b) N.A. (iii) 1st week of Nov. 1959. (iv) (a) 3 bakharings. (b) N.A. (c) 80 lb./ac. (d) 12". (e) N.A. (v) Nil. (vi) Hy—65 (138 days). (vii) Irrigated. (viii) Nil. (ix) 5". (x) 1st and 2nd week of March 1960.

2. TREATMENTS :

Same as in expt no. 58(MAE) type VI on page 196 conducted at Bagwai.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 31'×14.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Catterpillar attack. Control measure taken. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) Bagwai, Obaidullaganj, Reora and Ujjain. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1732 lb./ac. (ii) 158.0 lb./ac. (iii) Main effect of M and "control vs. others" are highly significant. S effect is significant. (iv) Av. yield of grain in lb./ac.

Control = 1399 lb./ac.

	M₁	M₂	M₃	Mean	P₁	P₂
S₁	1629	1876	1563	1689	1670	1708
S₂	1679	1967	1843	1830	1794	1866
Mean	1654	1922	1703	1760	1732	1787
P₁	1654	1843	1699			
P₂	1654	2001	1706			

S.E. of marginal mean of S or P	= 37.2 lb./ac.
S.E. of marginal mean of M	= 45.6 lb /ac.
S.E. of body of S×M or P×M table	= 64.5 lb./ac.
S.E. of body of S×P table	= 52.7 lb./ac.
S.E. of control mean	= 91.2 lb./ac.

1. **BASAL CONDITIONS :**

    (i) (a) Wheat—Fallow—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) Mixed red and black soil. (b) N.A. (iii) Nov.—Dec. 1958. (iv) (a) 4 ploughings. (b) N.A. (c) 70 lb./ac. (d) 10″ between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 3″. (x) 3rd week of April, 1959.

2. **TREATMENTS and 3. DESIGN :**

    Same as in expt. no. 57(MAE) type II on page 218.

4. **GENERAL :**

    (i) Normal. (ii) Brown rust attack. (iii) Grain yield. (iv) 1957—contd. (b) Yes. (c) Nil. (v) (a) Powarkheda. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

    (i) 1120 lb./ac. (ii) (a) 302.4 lb./ac. (b) 174.5 lb./ac. (iii) Main effect of N and P are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	965	1130	1234	781	1212	1336	1076	1135	1118	1110
F_1	958	1185	1246	837	1142	1410	1155	1123	1111	1130
Mean	961	1158	1240	809	1177	1373	1115	1129	1115	1120
K_0	987	1109	1250	826	1190	1330				
K_1	942	1259	1185	780	1214	1393				
K_2	954	1105	1285	8:0	1128	1396				
P_0	737	792	898							
P_1	997	1184	1350							
P_2	1149	1497	1472							

S.E. of different of two
1. F marginal means   = 82.3 lb./ac.
2. N, P or K marginal means   = 58.2 lb./ac.
3. N, P or K means at the same level of F   = 82.3 lb./ac.
4. F means at the same level of N, P or K   = 106.2 lb./ac.
    S.E. of body of N×P, N×K or P×K table   = 71.2 lb./ac.

———

Crop :- Wheat *(Rabi).*

Site :- State Mechanised Farm, Reora.

Ref :- M.P. 59(MAE).

Type :- 'M'.

Object :—Type II—To study the effect of N, P, K and F.Y.M. on Paddy.

1. **BASAL CONDITIONS :**

    (i) Wheat—Fallow—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 1st week of Dec. 1959. (iv) (a) and (b) N.A. (c) 66 lb./ac. (d) 10″ between rows. (e) N.A. (v) N.A. (vi) C—591 (late). (vii) Irrigated. (viii) Nil. (ix) 10″. (x) 3rd week of April 1960.

2. **TREATMENTS and 3. DESIGN :**

    Same as in expt. no. 57(MAE) type II on page 218.

4. **GENERAL :**

    (i) Below normal. (ii) Nil. (iii) Grain yield. (iv) 1957—contd. (b) Yes. (c) Nil. (v) (a) Powarkheda. (b) Nil. (vi) Nil. (vii) Analysed as a factorial confounded design.

5. RESULTS :

(i) 687 lb./ac. (ii) 98.7 lb./ac. (iii) Main effect of P is highly significant and interactions F×N and F×P are significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
F_0	601	560	658	379	658	782	584	650	584	606
F_1	843	766	696	653	812	839	770	754	781	768
Mean	722	663	677	516	735	811	677	702	683	687
K_0	732	683	617	502	765	764				
K_1	765	658	683	568	716	822				
K_2	669	648	731	478	724	847				
P_0	535	477	535							
P_1	766	740	699							
P_2	864	772	798							

S.E. of marginal mean of F	= 19.0 lb /ac.
S.E. of marginal means of N,P or K	= 23.3 lb./ac.
S.E. of body of N×P, N×K or P×K table	= 40.3 lb./ac.
S.E. of body of N×F, P×F or K×F table	= 32.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- M.P. 56(MAE).**

Site :- State Mechanised Farm, Reora. **Type :- 'M'.**

Object : – Type VI—To study the effect of different sources and levels of P and their method of application.

1. BASAL CONDITIONS :

(i) (a) to (c) N A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 30.11.1956. (iv) (a) 2 discings by tractor and 1 ploughing by country plough. (b) N.A. (c) 72 lb./ac. (d) 11″ between rows. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Unirrigated. (viii) Nil. (ix) 2″. (x) 25.4.1957.

2. TREATMENTS :

Same as in expt no. 58 (MAE) type VI on page 196.

3. DESIGN :

(i) R.B.D. (ii) (a) 1). (b) N.A. (iii) 3. (iv) (a) 44 ×22′. (b) 36′×20′. (v) 4′×1′. (vi) Yes.

4. GENERAL :

(i) Not satisfactory. (ii) Brown rust attack common in all the plots but the control plots were badly affected. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) Bagwai, Obedullaganj, Powar-kheda and Ujjain. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 909 lb./ac. (ii) 154.0 lb./ac. (iii) Main effects of P and M and "control *vs* others" are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 416 lb./ac.

	M_1	M_2	M_3	Mean	P_1	P_2
S_1	653	1205	1119	992	917	1067
S_2	747	1014	965	909	821	996
Mean	700	1109	1042	950	869	1031
P_1	588	1051	969			
P_2	812	1167	1115			

		=	
S.E. of marginal mean of S or P		=	36.3 lb./ac.
S.E. of marginal mean of M		=	44.5 lb./ac.
S.E. of body of S×M or P×M table		=	62.9 lb./ac.
S.E of body of S×P table		=	51.3 lb./ac.
S.E. of control mean		=	89.0 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 59(MAE).**

Site :- State Mechanised Farm, Reora.   **Type :- 'M'.**

Object :—Type VI —To study the effect of different sources and levels of P and their method of applications.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 1st week of Dec. 1959. (iv) (a) and (b) N.A. (c) 66 lb./ac. (d) 10″ between rows. (e) N.A. (v) Nil. (vi) C—59 1 (medium). (vii) Irrigated, (viii) Nil. (ix) 10″. (x) 3rd week of April 1960.

2. **TREATMENTS :**

Same as in expt. no. 58(MAE) type VI on page 196.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) N.A. (b) 29′×12.5′. (4) N.A. (vi) Yes.

4. **GENERAL :**

(i Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) Bagwai, Obaidulla-ganj, Powarkheda and Ujjain. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 1030 lb /ac. (ii) 165.7 lb./ac. (iii) "Control *vs* others" alone is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 650 lb./ac.

	M_1	M_2	M_3	Mean	P_1	P_2
S_1	1037	1070	1160	1089	1078	1100
S_2	955	1177	971	1034	936	1133
Mean	996	1124	1065	1062	1007	1117
P_1	938	1045	1037			
P_2	1054	1203	1093			

		=	
S.E. of marginal mean of S or P		=	39.1 lb./ac.
S.E. of marginal mean of M		=	47.8 lb./ac.
S.E. of body of S×M or P×M table		=	67.6 lb./ac.
S.E. of body of S×P table		=	55.2 lb./ac.
S.E. of control mean		=	95.6 lb./ac.

Crop :- Wheat *(Rabi)*   **Ref :- M.P. 56(MAE).**

Site :- M.A.E. Farm, Ujjain.   **Type :- 'M'.**

Object :—Type IV—To study the direct effect of N and residual effect of P on Wheat crop.

1. **BASAL CONDITIONS :**

(i) (a) Wheat – Legume. (b) Legume. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) 6.12.1956. (iv) (a) 2 harrowings with *bakher* and 1 ploughing with *desi* plough followed by planking. (b) N.A. (c) 62 lb./ac. (d) 10″. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 3.27″. (x) 6 to 18.4.1957.

2. TREATMENTS :

Main-plot treatments :

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

(1) 2 previous legume crops : L_1=Gram and L_2=Pea.

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

Sub-plot treatments :

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

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/replication ; 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) Normal. (ii) Mild attack of stem-borer at seedling stage. Control measures taken. (iii) Grain yield. (iv) (a) No. (b) and (c)—. (v) (a) Bagwai and Powarkheda. (b) Nil. (vi) Slight damage due to hail-storm. (vii) Nil.

5. RESULTS :

(i) 443 lb./ac. (ii) (a) 57 6 lb./ac. (b) 37.3 lb./ac. (iii) None of the effects is 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	411	485	435	502	428	444	461	452
N_1	420	395	461	494	428	403	428	433
N_2	395	453	461	485	436	420	461	444
Mean	409	444	453	494	431	422	450	443

S.E. of difference of two

1. LP marginal means	=	27.1 lb./ac.
2. N marginal means	=	11.5 lb./ac.
3. N means at the same level of LP	=	30.5 lb./ac.
4. LP means at the same level of N	=	36.8 lb./ac.

Crop :- Wheat *(Rabi)*.

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

Ref :- M.P. 56 MAE).

Type :- 'M'.

Object :—Type V—To study the effect of different sources and time of application of N to Wheat.

1. BASAL CONDITIONS:

(i) (a) to (c) N A. (ii) (a) Medium black soil. (b) N.A. (iii) 6 to 8.11.1956. (iv) (a) 8 harrowings by bakhering. (b) N A. (c) 50 lb./ac. (d) 12″×3″ to 4″. (e) N.A. (v) Nil. (vi) N A. (vii) Unirrigated. (viii) N.A. (ix) 0.93″. (x) 21 to 28.3.1957.

2. TREATMENTS :

All combinations of (1), (2) and (3)+control (3 plots).

(1) 3 sources of N : S_1=A/S, S_2=A/N and S_3=Urea.

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

(3) 3 times of application of N : T_1=At sowing, T_2=One month after sowing and T_3=½ at sowing+ ½ one month after sowing.

3. DESIGN :

(i) 3^2×2+a control in each block. (ii) (a) 7 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) **Bagwai,** Obaidullaganj and Powarkheda. (b) Nil. (vi) Nil. (vii) Means in S×T table and the corresponding S.E.'s are unadjusted.

5. RESULTS :

(i) 369 lb./ac. (ii) 56.8 lb./ac. (iii) Main effect of **T** is highly significant and interaction T×S×N and "control *vs.* others" are significant. (iv) Av. yield of grain in lb./ac.

Control = 336 lb./ac.

	T_1	T_2	T_3	Mean	S_1	S_2	S_3
N_1	393	337	401	377	361	391	378
N_2	403	339	376	373	373	376	371
Mean	398	338	388	375	367	383	374
S_1	377	343	382				
S_2	410	339	400				
S_3	406	333	383				

S.E. of marginal mean of S or T	= 11.6 lb./ac.
S.E. of marginal mean of N	= 9.5 lb./ac.
S.E. of body of S×N or S×T table or control mean	= 16.4 lb./ac.
S.E. of body of S×T table	= 20.1 lb./ac.

— —

Crop :- Wheat (*Rabi*). 　　　　　　　　**Ref :- M.P. 57(MAE).**

Site :- M.A.E. Farm, Ujjain. 　　　　　　**Type :- 'M'.**

Object :—Type V—To study the effect of different sources and time of application of N to Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 3rd week of October, 1957. (iv) (a) 8 *bakherings*. (b) N.A. (c) 50 lb./ac. (d) 12″ between rows. (e) N.A. (v) 20 lb./ac. of P_2O_5 as triple Super. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 3.94″. (x) 2nd week of March, 1958.

2. TREATMENTS :

Same as in expt. no. 56(MAE) type V on page 222.

3. DESIGN :

(i) $3^2 \times 2$+a control in each block. (ii) (a) 7 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 15′×29′4″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) **Bagwai,** Powarkheda and Obaidullaganj. (b) Nil. (vi) Crop damaged. (vii) Means in S×T table and the corresponding S.E's are unadjusted.

5. RESULTS :

(i) 845 lb./ac. (ii) 73.3 lb./ac. (iii) "Control *vs.* others" alone is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 773 lb./ac.

	T_1	T_2	T_3	Mean	S_1	S_2	S_3
N_1	886	848	839	858	839	848	887
N_2	834	860	875	856	911	842	815
Mean	860	854	857	857	875	845	851
S_1	875	892	858				
S_2	852	840	844				
S_3	853	831	870				

S.E. of marginal mean of S or T	= 15.0 lb./ac.
S.E. of marginal mean of N	= 12.2 lb./ac.
S.E. of body of S × N or T × N table or contol mean	= 21.2 lb./ac.
S.E. of body of S × T table	= 25.9 lb./ac.

Crop :- Wheat *(Rabi)*.

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

Ref :- M.P. 58(MAE).

Type :- 'M'.

Object :- Type V—To study the effect of different sources and time of application of N to Wheat.

1. **BASAL CONDITIONS :**

   - (i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 2nd week of November, 1958. (iv) (a) 6 *bakherings*. (b) N.A. (c) 50 lb./ac. (d) 12". (e) N.A. (v) 20 lb./ac. of P_2O_5 as Super. (vi) Ujjain no. 6 (medium). (vii) Unirrigated. (viii) Nil. (ix) 3". (x) 3rd week of April, 1959.

2. **TREATMENTS :**

   Same as in expt. no. 56(MAE) type V on page 222.

3. **DESIGN :**

   (i) $3^2 × 2 +$ a control in each block. (ii) (a) 7 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 31'×15'. (v) N.A. (vi) Yes.

4. **GENERAL :**

   (i) Poor. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) Bagwai, Obaidullaganj and Powarkheda. (b) Nil. (vi) Hail-storm and rats damaged the crop. (vii) Means in S × T table and the corresponding S.E. have been adjusted for block effects.

5. **RESULTS :**

   (i) 550 lb./ac. (ii) 71.5 lb./ac. (iii) Main effects of T and S are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 514 lb./ac.

	T_1	T_2	T_3	Mean	S_1	S_2	S_3
N_1	527	609	535	557	535	592	544
N_2	521	599	545	555	535	598	532
Mean	524	604	540	556	535	595	538
S_1	477	609	518				
S_2	584	642	560				
S_3	510	560	543				

S.E. of marginal mean of T or S	= 14.6 lb./ac.
S.E. of marginal mean of N	= 11.9 lb./ac.
S.E. of body of S×N or T×N table or control mean	= 20.6 lb./ac.
S.E. of body of S×T table	= 27.0 lb./ac.

Crop :- Wheat *(Rabi)*.

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

Ref :- M.P. 59(MAE).

Type :- 'M'.

Object :—Type V—To study the effect of different sources and time of application af N to Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) Nov., 1959. (iv) (a) 4 *bakherings*. (b) N.A. (c) 50 lb./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) Ujjain no. 6 (late). (vii) Unirrigated. (viii) 1 weeding. (ix) 3″. (x) 2nd and 3rd week of April, 1960.

2. TREATMENTS:

Same as in expt. no. 56(MAE) type V on page 222.

3. DESIGN :

(i) $3^2 \times 2$+control in each block (ii) (a) 7 plots/block, 3 blocks/replications. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 27′×16′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Below normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) Bagwai, Obedullaganj and Powerkheda. (b) Nil. (vi) Slight damage by rats. (vii) Means and S.E. for S×T table have been adjusted for block effect.

5. RESULTS :

(i) 608 lb./ac. (ii) 69.9 lb./ac. (iii) Main effects of T, S, N and interaction T×S and "control *vs.* others" are highly significant. Interaction S×N is significant. (iv) Av. yield of grain in lb./ac.

Control = 535 lb./ac.

	T_1	T_2	T_3	Mean	S_1	S_2	S_3
N_1	617	494	634	582	634	494	617
N_2	733	538	706	659	704	636	636
Mean	675	516	670	620	669	565	626
S_1	773	494	741				
S_2	568	527	601				
S_3	683	527	667				

S.E. of marginal mean of T or S	= 14.3 lb./ac.
S.E. of marginal mean of N	= 11.6 lb./ac.
S.E. of body of S×N or N×T table or control mean	= 20.2 lb./ac.
S.E. of body of S×T table	= 26.4 lb./ac.

Crop :- Wheat *(Rabi)*.

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

Ref :- M.P. 56(MAE).

Type :- 'M'.

Object :—Type VI—To study the effect of different sources and levels of P and their method of applications.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A.   (ii) (a) Medium black soil.   (b) N.A.   (iii) 6 to 8.11.1956.   (iv) (a) 8 harrowings by *bakher*.   (b) N.A.   (c) 50 lb./ac.   (d) 12"×3" to 4".   (e) N.A.   (v) Nil.   (vi) Ujjain no. 6 (medium).   (vii) Unirrigated.   (viii) N.A.   (ix) 0.93".   (x) 21 to 28.3.1957.

2. TREATMENTS :

Same as in expt. no. 58(MAE) type VI on page 196.

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) Normal.   (ii) Nil.   (iii) Grain yield.   (iv) (a) 1956—contd.   (b) N.A.   (c) Nil.   (v) (a) Bagwai, Obedulla-ganj, Powarkheda and Reora.   (b) Nil.   (vi) and (vii) Nil.

5. RESULTS :

(i) 702 lb./ac.   (ii) 167.7 lb./ac.   (iii) None of the effects is significant.   (iv) Av. yield of grain in lb./ac.

Control = 699 lb./ac.

	M_1	M_2	M_3	Mean	P_1	P_2
S_1	724	666	625	672	749	595
S_2	765	667	765	732	733	731
Mean	744	667	695	702	741	663
P_1	782	741	699			
P_2	706	593	691			

S.E. of marginal mean of S or P	= 39.5 lb./ac.
S.E. of marginal mean of M	= 48.4 lb./ac.
S.E. of body of S×M or P×M table	= 68.5 lb./ac.
S.E. of body of S×P table	= 55.9 lb /ac.
S.E. of control mean	= 96.8 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 57(MAE).**

Site :- M.A.E. Farm, Ujjain.   **Type :- 'M'.**

Object :—Type VI—To study the effect of different sources and levels of P and their method of application,

1. BASAL CONDITIONS :

(i) (a) to (c) N.A.   (ii) (a) Medium black soil.   (b) N.A.   (iii) 3rd week of Oct., 1957.   (iv) (a) 8 *bakher-ings*.   (b) N.A.   (c) 50 lb./ac.   (d) 12" between rows.   (e) N.A.   (v) Nitrogen equalised by A/S at 30 lb./ac. of N.   (vi) Ujjain no. 6 (medium).   (vii) Unirrigated.   (viii) N.A.   (ix) 3.94".   (x) 2nd week of March, 1958.

2. TREATMENTS :

Same as in expt. no. 58(MAE) type VI on page 196 conducted at Bagwai.

3. DESIGN :

(i) R.B.D.   (ii) (a) 13.   (b) N.A.   (iii) 3.   (iv) (a) N.A.   (b) 13'×36.5'.   (v) N.A.   (vi) Yes.

4. GENERAL :

(i) Poor.   (ii) Nil.   (iii) Grain yield.   (iv) (a) 1956 –contd.   (b) N.A.   (c) Nil.   (v) (a) Bagwai, Obedulla-ganj, Powarkheda and Reora.   (b) Nil.   (vi) and (vii) Nil.

5. RESULTS :

(i) 580 lb./ac.   (ii) 65.5 lb./ac.   (iii) None of the effects is significant.   (iv) Av. yield of grain in lb./ac.

Control = 576 lb./ac.

	M₁	M₂	M₃	Mean	P₁	P₂
S₁	584	584	569	579	569	589
S₂	584	624	535	581	561	601
Mean	584	604	552	580	565	595
P₁	576	601	518			
P₂	592	607	586			

S.E. of marginal mean of S or P	= 15.4 lb./ac.
S.E. of marginal mean of M	= 18.9 lb./ac.
S.E. of body of S×M or P×M table	= 26.7 lb./ac.
S.E. of body of S×P table	= 21.8 lb./ac.

—

Crop :- Wheat *(Rabi)*.	Ref :- M.P. 58(MAE).
Site :- M.A.E Farm, Ujjain.	Type :- 'M'.

Object :—Type VI—To study the effect of different sources and levels of P and their method of application.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 2nd week of Nov., 1958. (iv) (a) 6 *bakherings*. (b) N.A. (c) 50 lb./ac. (d) 12". (e) N.A. (v) Nil. (vi) Ujjain no. 6 (medium). (vii) Unirrigated. (viii) Nil. (ix) 3". (x) 3rd week of April, 1959.

2. TREATMENTS :

Same as in expt. no. 58(MAE) type VI on page 196 conducted at Bagwai.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 14'×31'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) Bagwai, Obedullaganj, Powarkheda and Reora.' (b) Nil. (vi) Hail-storm and rats damaged the crop. (vii) Nil.

5. RESULTS :

(i) 587 lb./ac. (ii) 56.0 lb./ac. (iii) Main effects of P and S are highly significant. M and "control vs others" effects are significant. (iv) Av. yield of grain in lb./ac.

Control = 518 lb./ac.

	M₁	M₂	M₃	Mean	P₁	P₂
S₁	551	601	527	560	543	576
S₂	617	651	609	626	587	664
Mean	584	626	568	593	565	620
P₁	560	584	551			
P₂	609	667	584			

S.E. of marginal mean of S or P	= 13.2 lb./ac.
S.E. of marginal mean of M	= 16.2 lb./ac.
S.E. of body of S×M or P×M table	= 22.9 lb./ac.
S.E. of body of S×P table	= 18.7 lb./ac.
S.E. of control mean	= 32.4 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 59(MAE).**

Site :- M.A.E. Farm, Ujjain.   **Type :- 'M'.**

Object :—Type VI—To study the effect of different sources and levels of P and their methods of application.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) Nov., 1959. (iv) (a) 4 *bakherings*. (b) N.A. (c) 50 lb./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) Ujjain no. 6 (medium). (vii) Unirrigated. (viii) 1 weeding. (ix) 3″. (x) 2nd and 3rd weeks of April 1960.

2. **TREATMENTS :**

   Same as in expt. no. 58(MAE) type VI on page 196 conducted at Bagwai.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 16′×27′. (v) N.A. (vi) Yes.

4. **GENERAL :**

   (i) Poor. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) Bagwai, Obedullaganj, Powarkheda and Reora. (b) Nil. (vi) Slight damage by rats. (vii) Nil.

5. **RESULTS :**

   (i) 543 lb./ac. (ii) 139.9 lb./ac. (iii) Only M effect is significant. (iv) Av. yield of grain in lb./ac.

   Control = 477 lb./ac.

	M_1	M_2	M_3	Mean	P_1	P_2
S_1	551	683	461	565	555	576
S_2	576	560	461	532	525	540
Mean	564	622	461	549	540	558
P_1	551	592	477			
P_2	577	652	445			

S.E. of marginal mean of S or P	= 33.0 lb./ac.
S.E. of marginal mean of M	= 40.4 lb./ac.
S.E. of body of S×M or P×M table	= 57.1 lb./ac.
S.E. of body of S×P table	= 46.6 lb./ac.
S.E. of control mean	= 80.8 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 54(TCM).**

Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object :—Type I (a)—To study the effect of different sources and levels of N and P on the yield of Wheat.

1 **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 25.11.1954. (iv) and (v) N.A. (vi) Pb—591. (vii) Irrigated. (viii) and (ix) N.A. (x) 2 to 9.4.1955.

2. **TREATMENTS :**

   All combinations of (1), (2) and (3)+3 extra treatments.

   (1) 3 levels of N : N =0, N_1=20 and N_2=40 lb./ac.

   (2) 3 sources of N : S_1=A/⁻, S_2=A/N and S_3=Urea.

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

   3 extra treatments : T_1= 60 lb./ac. of N+40 lb./ac. of P_2O_5, T_2=40 lb./ac. of N+80 lb./ac. of P_2O_5 and T_3=60 lb./ac. of N+80 lb./ac. of P_2O_5.

   N as A/S and P_2O_5 as Triple Super.

3. DESIGN :

(i) 3^3 confd. with 3 extra treatments in each block. (ii) (a) 12 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 60′×18′. (b) 52′×14′. (v) 4′×2′. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) A very mild attack of loose-smut of wheat in almost all plots. (iii) Grain and straw yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Obedullaganj and Reora. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1536 lb./ac. (ii) 150.6 lb./ac. (iii) Main effects of N and P are highly significant. (iv) Av. yield of grain in lb./ac.

T_1 = 1989 lb./ac., T_2 = 1862 lb./ac. and T_3 = 2257 lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2	S_3
P_0	574	664	765	668	625	664	715
P_1	1306	1574	1788	1556	1508	1522	1638
P_2	1456	1994	2208	1886	1950	1788	1920
Mean	1112	1411	1587	1370	1361	1325	1424
S_1	—	1418	1580	1499			
S_2	—	1349	1582	1466			
S_3	—	1465	1599	1532			

S.E. of N or P marginal mean = 50.2 lb./ac.
S.E. of S marginal mean in S×N table = 61.5 lb./ac.
S.E. of body of any table or extra-treatments = 86.9 lb./ac.

Crop :- Wheat *(Rabi)*. Ref :- M.P. 55(TCM).

Site :- M.A.E. Farm, Bagwai. Type :- 'M'.

Object :—Type I (a)—To study the effect of different sources and levels of N and P on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(TCM) type I (a) on page 228.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Obedullaganj and Reora. (vi) and (vii) Nil.

5. RESULTS :

(i) 877 lb /ac. (ii) 110.3 lb./ac. (iii) Main effect of P is highly {significant, while N effect is significant. (iv) Av. yield of grain in lb./ac.

$T_1 = 1096$ lb./ac., $T_2 = 1313$ lb./ac. and $T_s = 1474$ lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2	S_3
P_0	320	348	383	350	369	353	329
P_1	708	895	761	788	800	810	754
P_2	920	1035	1277	1077	1083	1090	1059
Mean	649	759	807	738	751	751	714
S_1	—	703	877	790			
S_2	—	810	781	796			
S_3	—	764	763	763			

S.E. of any marginal mean in N×P or S ×P table	= 36.8 lb./ac.
S.E. of S marginal mean in S×N table	= 45.1 lb./ac.
S.E. of body of any table or extra treatments	= 63.9 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 54(TCM).**

Site :- M.A.E. Farm, Obedullaganj.   **Type :- 'M'.**

Object :—Type I (a)—To study the effect of different sources and levels of N and P on the yield of Wheat.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Obedullaganj. (iii) Oct.—Nov., 1954. (iv) to (vi) N.A. (vii) Unirrigated. (viii) and (ix) N.A. (x) March—April 1955.

2. **TREATMENTS** and 3. **DESIGN :**

Same as in expt. no. 54(TCM) type I (a) on page 228 conducted at Bagwai.

4. **GENERAL :**

(i) No lodging. (ii) No. (iii) Yield of grain and straw. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Bagwai and Reora. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 828 lb./ac. (ii) 148.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

$T_1 = 919$ lb./ac., $T_2 = 1016$ lb./ac. and $T_3 = 1116$ lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2	S_3
P_0	576	596	879	684	749	587	716
P_1	767	804	769	780	721	801	818
P_2	681	878	933	831	819	711	962
Mean	675	759	860	765	763	700	832
S_1	—	783	885	834			
S_2	—	722	737	730			
S_3	—	773	959	866			

S.E. of any marginal mean in N×P or S×P table	= 49.4 lb./ac.
S.E. of S marginal mean in S×N table	= 60.5 lb./ac.
S.E. of body of any table or extra treatments	= 85.5 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 55(TCM).**

Site :- M.A.E. Farm, Obedullaganj.   **Type :- 'M'.**

Object :—Type I (a)—To study the effect of different sources and levels of N and P on non-acid soils for Wheat.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Obedullagunj. (iii) to (vi) N.A. (vii)Unirrigated. (viii) to (x) N.A.

2. **TREATMENTS and 3. DESIGN :**

Same as in expt. no. 54(TCM) type I (a) on page 228.

4. **GENERAL :**

(i) Good. (ii) No. (iii) Yield of grain and straw. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Bagwai and Reora. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 725 lb./ac. (ii) 112.8 lb./ac. (iii) Main effect of N is highly significant and interaction P×S is significant. (iv) Av. yield of grain in lb./ac.

$T_1=963$, $T_2=764$ and $T_3=866$ lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2	S_3
P_0	622	667	769	686	617	601	840
P_1	571	562	749	627	663	613	605
P_2	726	523	924	724	644	794	734
Mean	640	584	814	679	641	669	726
S_1	—	572	713	642			
S_2	—	561	807	684			
S_3	—	618	922	770			

S.E. of any marginal mean in N×P or S×P table = 37 6 lb./ac.

S.E. of S marginal mean in S×N table = 46.1 lb./ac.

S.E. of body of any table or extra treatments = 65.1 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 54(TCM).**

Site :- State Mechanised Farm, Reora.   **Type :- 'M'.**

Object :—Type I (a)—To study the effect of different sources and levels of N and P on the yield of Wheat.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soils. (b) N.A. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. **TREATMENTS and 3 DESIGN :**

Same as in expt. no. 54(TCM) type I (a) on page 228 conducted at Bagwai.

4. **GENERAL :**

(i) Normal (ii) No. (iii) Yield of grain and straw. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Bagwai and Obedullaganj. (b) N.A. (vi) Scanty rains. (vii) Nil.

5. **RESULTS :**

(i) 573 lb./ac. (ii) 158.1 lb./ac. (iii) Main effect of P alone is highly significant. (iv) Av. yield of grain in lb./ac.

$T_1 = 781$ lb./ac., $T_2 = 871$ lb./ac. and $T_3 = 835$ lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2	S_3
P_0	271	329	335	312	345	307	283
P_1	503	561	495	520	461	551	547
P_2	494	666	740	633	656	732	512
Mean	423	519	523	488	487	530	447
S_1	—	483	519	501			
S_2	—	610	588	599			
S_3	—	463	462	462			

S.E. of any marginal mean in N×P or S×P table = 52.7 lb./ac.
S.E. of S marginal mean in S×N table = 64.5 lb./ac.
S.E. of body of any table or extra treatments = 91.3 lb./ac.

Crop :- Wheat *(Rabi).*

Site :- State Mechanised Farm, Reora.

Ref :- M.P. 55(TCM).

Type :- 'M'.

Object :—Type I (a)—To study the effect of different sources and levels of N and P on non-acid soils for Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. **TREATMENTS and 3. DESIGN :**

   Same as in expt. no. 54(TCM) type I (a) on page 228.

4. **GENERAL :**

   (i) Normal. (ii) No. (iii) Yield of grain and straw. (iv) (a) 1953—1956. (b) No. (c) Yes. (v) Bagwai and Obedullaganj. (b) N.A. (vi) Scanty rains. (vii) Nil.

5. **RESULTS :**

   (i) 567 lb./ac. (ii) 130.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

$T_1 = 674$ lb./ac., $T_2 = 781$ lb /ac. and $T_3 = 900$ lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2	S_3
P_0	460	471	577	503	519	543	446
P_1	455	457	463	458	503	410	462
P_2	509	485	569	521	464	572	527
Mean	475	471	536	494	495	508	478
S_1	—	462	574	518			
S_2	—	588	481	535			
S_3	—	363	552	457			

S.E. of any marginal mean in N×P or S×P table = 43.6 lb./ac.
S.E. of S marginal mean in S×N table = 53.4 lb./ac.
S.E. of body of any table or extra treatments = 75.5 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 54(TCM).**

Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object :—Type II—To study the effect of different sources of N and time of application on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil, (b) N.A. (iii) 26.11.1954. (iv) and (v) N.A. (vi) Pb—591 (vii) Irrigated. (viii) and (ix) N.A. (x) 5 and 7.4.1955.

2. TREATMENTS :

All combination of (1) and (2)+control (no nitrogen)
    (1) 3 sources of N : S_1=A/S, S_2=A/N and S_3=Urea.
    (2) 2 times of application : T_1=At sowing and T_2=At first irrigation.
Amount of N applied is 20 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) 7. (b) N.A. (iii) 4. (iv) (a) 60'×18' (b) 52'×14'. (v) 4'×2'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) A mild attack of loose-smut of wheat almost in all plots. (iii) Grain and straw yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Obedullaganj. (b) N.A. (vi) and (vii) N.A.

5. RESULTS :

(i) 777 lb./ac. (ii) 86.4 lb./ac. (iii) "Control *vs.* others" is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 658 lb./ac.

	S_1	S_2	S_3	Mean
T_1	813	768	825	802
T_2	829	842	702	791
Mean	821	805	764	797

S.E. of T marginal mean   = 24.9 lb./ac.
S.E. of S marginal mean   = 30.5 lb./ac.
S.E. of body of table or control mean = 43.2 lb./ac.

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Crop :- Wheat.   **Ref :- M.P. 55(TCM).**

Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object :—Type II—To study the effect of different sources of N and time of application on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(T.C.M.) type II above.

5. RESULTS :

(i) 584 lb./ac. (ii) 49.4 lb./ac. (iii) Interaction S×D is significant and "control *vs.* others" is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 491 lb./ac.

	S_1	S_2	S_3	Mean
T_1	576	578	585	580
T_2	685	626	546	619
Mean	630	602	565	599

S.E. of S marginal mean   = 17.5 lb./ac.
S.E. of T marginal mean   = 14.3 lb./ac.
S.E. of body of table or control   = 24.7 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- 55(TCM).**

Site :- M.A.E. Farm, Obedullaganj.   **Type :- 'M'.**

Object :—Type II—To study the effect of different sources of N and time of application on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Deep black cotton soil. (b) N.A. (iii) to (vi) N.A. (vii) Irrigated, (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(TCM) Type II on page 233.

4. GENERAL :

(i) Normal. (ii) No. (iii) Yield of grain and straw. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Bagwai. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 720 lb./ac. (iii) 112.7 lb./ac. (iii) Main effect of T and "control *vs.* others" are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 488 lb./ac.

	S_1	S_2	S_3	Mean
T_1	834	783	903	840
T_2	734	679	622	678
Mean	784	731	762	759

S.E. of S marginal mean   = 39.8 lb./ac.
S.E. of T marginal mean   = 32.5 lb./ac.
S.E. of body of table or control   = 56.4 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 54(TCM).**

Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object :—Type IV—To study the effect of sources, levels and methods of application of P.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b). N.A. (iii) 29, 30.11.1954. (iv) and (v) N.A. (vi) Pb—591. (vii) Irrigated. (viii) and (ix) N.A. (x) 5 to 7.4.1955.

2. TREATMENTS :

All combination of (1), (2) and (3)+2 controls (no phosphate)
(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=Band placement and M_3= 2½" below seed.
N was equalised at the level of 30 lb./ac. by A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 3. (iv) (a) 52'×21'. (b) 48'×15'. (v) 2'×3'. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) A mild attack of loose—smut of Wheat. (iii) Grain and straw yield. (iv) (a) 1953—1956, (b) No. (c) N.A. (v) (a) Reora. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i)1656 lb./ac. (ii) 117.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 937 lb./ac.

	M_1	M_2	M_3	Mean	S_1	S_2
P_1	1424	1605	1726	1585	1532	1638
P_2	1868	1950	2082	1967	1962	1972
Mean	1646	1778	1904	1776	1747	1805
S_1	1588	1753	1900			
S_2	1704	1803	1908			

S.E. of P or S marginal mean	= 27.7 lb./ac.
S.E. of M marginal mean	= 34.0 lb./ac.
S.E. of body of P×M or S×M table or control mean	= 48.1 lb./ac.
S.E. of body of S×P table	= 39.2 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 54(TCM).**
Site :- State Mechanised Farm, Reora.   **Type :- 'M'.**

Object :—Type IV—To study the effect of sources, levels and methods of application of P.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type IV on page 234 conducted at Bagwai.

5. RESULTS :

(i) 793 lb./ac. (ii) 183.8 lb./ac. (iii) Main effect of P and "control *vs.* others" are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 314 lb./ac.

	M₁	M₂	M₃	Mean	S₁	S₂
P₁	750	877	769	799	798	799
P₂	872	942	1029	948	864	1032
Mean	811	910	899	873	831	915
S₁	822	818	853			
S₂	800	1001	944			

S.E. of P or S marginal mean	= 43.3 lb./ac.
S.E. of M marginal means	= 53.1 lb./ac.
S.E. of body of P×M or S×M table or control mean	= 75.0 lb./ac.
S.E. of body of S×P table	= 61.3 lb./ac.

—

Crop :- Wheat *(Rabi)*.

Site :- State Mechanised Farm, Reora.

Ref :- M.P. 55(TCM).

Type :- 'M'.

Object :—Type IV—To study the effect of sources, levels and methods of application of P.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type IV on page 235.

5. RESULTS :

(i) 546 lb./ac. (ii) 117.5 lb./ac. (iii) Main effect of M and "control vs. others" are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 372 lb./ac.

	M₁	M₂	M₃	Mean	S₁	S₂
P₁	431	576	602	536	513	560
P₂	524	641	674	613	564	662
Mean	477	609	638	575	539	611
S₁	495	564	559			
S₂	460	653	718			

S.E. of P or S marginal mean	= 27.7 lb./ac.
S.E. of M marginal mean	= 34.0 lb /ac.
S.E. of body of P×M or S×M table or control mean	= 48.1 lb /ac.
S.E. of body of S×P table	= 39.2 lb /ac.

Crop :- Wheat.   **Ref :- M.P. 54(TCM).**

Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object :—Type VI—To find out the residual effect of P on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 1, 2.12.1954. (iv) (a) to (e) N.A. (v) As per treatments. (vi) Pb—591. (vii) Irrigated. (viii) and (ix) N.A. (x) 4 to 10.4.1955.

2. TREATMENTS :

Treatment	1	2	3 ·	4	5	6	7	8	9	10	11	12
First year :	o	c	c	p_1	p_2	o	o	o	o	$p\frac{1}{2}$	p_1	p_2
Second year :	o	c	c	o	o	p_1	p_2	o	o	$p\frac{1}{2}$	p_1	p_2
Third year :	o	c	c	o	o	o	o	p_1	p_2	$p\frac{1}{2}$	p_1	p_2

Treatments are 3 course rotations, there being 9 distinct treatment. Plots under treatment 1 do not receive any fertilizer. Plots under other treatments receive a basal application of 20 lb./ac. of N as A/S. One of the treatments consists of the application of basal dose of N only. This treatment, denoted by c, serves as control and is applied to two plots in each block. Various symbols denote—$p\frac{1}{2}=10$, $p_1=20$ and $p_2=40$ lb./ac. of P_2O_5.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 50'×22'. (b) 45'×16'. (v) 2½'×3'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) A mild attack of loose—smut of Wheat in almost all plots. (iii) Grain and straw yield. (iv) (a) 1953—1956. (b) As per treatments. (c) N.A. (v) (a) Obedullaganj and Reora. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1129 lb /ac. (ii) 116.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	o	c	$p\frac{1}{2}$	p_1	p_2
Av. yield	817	831	1257	1427	1819
S.E.	58.4	23.8	58.4	41.3	41.3

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Crop :- Wheat.   **Ref :- M.P· 55(TCM).**

Site :- M.A.E. Farm, Bagwai.   **Type :- 'M'.**

Object :—Type VI—To find out the residual effect of P on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type VI at Bagwai above.

5. RESULTS :

(i) 817 lb./ac. (ii) 97.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	oo	cc	cp_1	cp_2	p_1c	p_2c	$p\frac{1}{2}p\frac{1}{2}$	p_1p_1	p_2p_2
Av. yield	610	607	952	1191	748	802	871	979	1222

S.E./mean (cc)   = 24.3 lb /ac.

S.E./mean (others) = 48.6 lb./ac.

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Crop :- Wheat *(Rabi).*   .   **Ref :- M.P. 54(TCM).**

Site :- M.A.E. Farm, Obedullaganj.   **Type :- 'M'.**

Object :—Type VI—To find out the residual effect of P on the yield of Wheat.

1. BASAL CONDITIONS :

  (i) (a) to (c) N A. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Obeduallaganj. (iii) 30.10.1954. (iv) (a) to (e) N.A. (v) As per treatments. (vi) C—591. (vii) Irrigated. (viii) and (ix) N.A. (x) 20.3.1955.

2. TREATMENTS :

  Same as in expt. no. 54(TCM) type VI at Bagwai on page 237.

3. DESIGN :

  (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 36'×30'. (b) 30'×25'. (v) 3'×2½'. (vi) Yes.

4. GENERAL :

  (i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1953—1956. (b) As per treatments. (c) N.A. (v) (a) Bagwai and Reora. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

  (i) 1124 lb./ac. (ii) 228.8 lb./ac. (iii) N.A. (iv) Av. yield of grain in lb./ac.

Treatments	0	c	$p_{\frac{1}{2}}$	p_1	p_2
Av. yield	852	1143	1156	1091	1219
S.E.	114.4	46.7	114.4	80.9	80.9

— — — —

Crop :- Wheat.   **Ref :- M.P. 55(TCM).**

Site :- M.A.E. Farm, Obedullaganj.   **Type :- 'M'.**

Object :—Type VI—To find out the residual effect of P on the yield of Wheat.

1. BASAL CONDITIONS :

  (i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) Refer soil analysis, Obedullaganj. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

  Same as in expt. no. 54(TCM) type VI at Obedullaganj above.

5. RESULTS :

  (i) 971 lb./ac. (ii) 216.6 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	00	cc	cp_1	cp_2	p_1c	p_2c	$p_{\frac{1}{2}}p_{\frac{1}{2}}$	p_1p_1	p_1p_2
Av. yield	701	922	1182	1179	895	874	937	1047	1147

            S.E./mean (cc.)   =   54.2 lb./ac.

            S.E./mean (other than cc.) = 108.3 lb./ac.

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Crop :- Wheat *(Rabi).*   **Ref :- M.P. 54(TCM).**

Site :- State Mechanised Farm, Reora.   **Type :- 'M'.**

Object :—Type VI—To find out the residual effect of P on the yield of Wheat.

1. BASAL CONDITIONS :

  (i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 25.10.1954. (iv) (a) to (e) N.A. (v) As per treatments. (vi) C—591. (vii) Unirrigated. (viii) and (ix) N.A. (x) 18.4.1955.

2. TREATMENTS :

Same as in expt. no. 54(TCM) at Bagwai on page 237.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 40'×24'. (b) 36'×20'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1953—1956. (b) As per treatments. (c) N.A. (v) (a) Bagwai and Obedullaganj. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 420 lb./ac. (ii) 66.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	0	c	$p\frac{1}{2}$	p_1	p_2
Av. yield	352	344	429	486	609
S.E.	27.2	11.2	27.2	19.3	·19.3

Crop :- Wheat.

Site :- State Mechanised Farm, Reora.

Ref :- M.P. 55(TCM).

Type :- 'M'.

Object :—Type VI—To find out the residual effect of P on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS to 4 GENERAL :

Same as in expt. no. 54(TCM) at Reora on page 238. except that the no. of replications is 4.

5. RESULTS :

(i) 407 lb./ac. (ii) 89.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	00	cc	cp_1	cp_2	p_1c	p_2c	$p\frac{1}{2}p\frac{1}{2}$	p_1p_1	p_2p_2
Av. yield	403	395	374	413	340	346	497	474	459

S.E./mean (c.c.) = 22.3 lb./ac.

S.E./mean (others) = 44.5 lb./ac.

Crop :- Wheat *(Rabi)*.

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

Ref :- M.P. 54(TCM).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Obedullaganj. (iii) October 1954. (iv) to (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

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

    (1) 3 levels of N : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.

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

    (3) 3 levels of F.Y.M. : $F_0=0$, $F_1=10$ and $F_2=20$ C.L./ac.

N fertilizers broadcasted a week before sowing and phosphate drilled in rows along with seed at sowing.

3. DESIGN:

(i) 3^3 confd. (ii) (a) 9 plots/block, ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 30'×25' (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Reora. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 1335 lb./ac. (ii) 182.7 lb./ac. (iii) N.A. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	F_0	F_1	F_2
P_0	1205	1409	1491	1368	946	1426	1732
P_1	1083	1265	1518	1289	1145	1183	1538
P_2	1008	1359	1673	1347	1063	1548	1429
Mean	1099	1344	1561	1335	1052	1386	1566
F_0	717	1168	1270				
F_1	1195	1270	1693				
F_2	1384	1595	1719				

S.E. of any marginal mean = 60.9 lb./ac.

S.E. of body of any table = 105.9 lb./ac.

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Crop :- Wheat *(Rabi)*.   Ref :- M.P. 54(TCM).

Site :- State Mechanised Farm, Reora.   Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 1 md./ac. of mixture of A/S and super. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 6.11.1954. (iv) (a) and (b) N.A. (c) 60 lb./ac. (d) and (e) N.A. (v) N.A. (vi) C—591. (vii) Unirrigated. (viii) and (ix) N.A. (x) 18.4.1955.

2. TREATMENTS :

Same as in expt no. 54(TCM) type IX on page 239 conducted at Obedullaganj.

3. DESIGN :

(i) 3^3 confd. (ii) 9 plots/block, 3 blocks/replications. (b) N.A. (iii) 1. (iv) (a) 40'×27'. (b) 36'×23'. (v) 2'×2'. (vi) Yes

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Obedullaganj. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 568 lb./ac. (ii) 146.5 lb./ac. (iii) Main effect of P alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	F_0	F_1	F_2
P_0	212	327	345	295	302	297	285
P_1	503	662	793	653	660	662	637
P_2	706	756	802	755	786	697	782
Mean	474	582	647	568	583	552	568
F_0	445	614	688				
	462	611	584				
F_2	514	521	669				

S.E. of any marginal mean = 48.8 lb./ac.

S.E. of body of any table = 84.6 lb./ac.

Crop :- Wheat.

Site :- State Mechanised Farm, Reora.

Object :—Type IX—To study the effects of artificial fertilizers in conjunction with organic manures on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) to (vi) N.A. (vii) Unirrigated (viii) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type IX conducted at Reora on page 240.

5. RESULTS :

(i) 611 lb./ac. (ii) 52.7 lb./ac. (iii) Main effect of P alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	F_0	F_1	F_2
P_0	479	545	525	516	490	575	484
P_1	585	648	670	634	606	615	681
P_2	664	671	714	683	610	714	724
Mean	576	621	636	611	569	635	630
F_0	544	591	572				
F_1	613	588	704				
F_2	572	685	633				

S.E. of any marginal mean = 17.6 lb./ac.

S.E. of body of any table = 30.4 lb./ac.

Crop :- Wheat *(Rabi).*

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

Object :—Type XI—To study the effect of N, P and K on the yield of Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Obedullaganj. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. **TREATMENTS :**

   All combinations of (1), (2) and (3)
   - (1) 3 levels of N : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
   - (2) 3 levels of P_2O_5 : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.
   - (3) 3 levels of K_2O : $K_0=0$, $K_1=20$ and $K_2=40$ lb./ac.

3. **DESIGN :**

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

4. **GENERAL :**

   (i) Normal. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Reora. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 981 lb./ac. (ii) 176.1 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	K_0	K_1	K_2
P_0	527	978	1140	882	918	886	842
P_1	583	1051	1436	1023	960	1117	992
P_2	633	1092	1390	1038	1133	976	1005
Mean	581	1040	1322	981	1004	993	946
K_0	648	1160	1204				
K_1	602	991	1386				
K_2	493	969	1376				

S.E. of any marginal mean　　　= 58.7 lb./ac.
S.E. of body of any table　　　= 101.7 lb./ac.

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Crop :- Wheat *(Rabi)*.　　　　　　　　　**Ref :- M.P. 54(TCM).**

Site :- State Mechanised Farm, Reora.　　　**Type :- 'M'.**

Object :—Type XI—To study the effect of N, P and K on the yield of Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Paddy. (c, 1 md./ac. of A/S and Super mixture. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 5.11.1954. (iv) (a) and (b) N.A. (c) 60 lb./ac. (d) N.A. (e) N.A. (v) N A. (vi) C—591. (vii) Unirrigated. (viii) and (ix) N.A. (x) 10.4.1955.

2. **TREATMENTS :**

   All combinations of (1), (2) and (3)
   - (1) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.
   - (2) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
   - (3) 3 levels of K_2O as Pot. Sul. : $K_0=0$, $K_1=20$ and $K_2=40$ lb./ac.
   Fertilisers broadcasted before sowing.

3. **DESIGN :**

   (i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 40'×27'. (b) 36'×23'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Obedullaganj. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 704 lb./ac. (ii) 236.9 lb./ac. (iii) Main effect of P alone is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	K_0	K_1	K_2
P_0	647	341	424	471	515	397	500
P_1	670	770	744	728	706	806	673
P_2	647	938	1150	912	816	959	961
Mean	655	683	773	704	679	721	711
K_0	594	625	817				
K_1	737	601	824				
K_2	633	822	677				

S.E. of any marginal mean = 79.0 lb./ac.
S.E. of body of any table = 136.8 lb./ac.

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Crop :- Wheat.   **Ref :- M.P. 55(TCM).**

Site :- State Mechanised Farm, Reora.   **Tyye :- 'M'.**

Object :—Type XI—To study the effect of N, P and K on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) type XI conducted at Reora on page 242.

5. RESULTS :

(i) 538 lb./ac. (ii) 120.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	K_0	K_1	K_2
P_0	466	447	495	469	513	470	425
P_1	409	558	681	550	516	545	588
P_2	557	574	652	594	584	639	560
Mean	477	527	609	538	538	551	524
K_0	509	485	620				
K_1	461	548	645				
K_2	462	547	563				

S.E. of any marginal mean = 40.3 lb./ac.
S.E. of body of any table = 69.8 lb./ac.

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Crop :- Wheat *(Rabi).*   **Ref :- M.P. 54(TCM).**

Centre :- Hoshangabad (c.f.).   **Type :- 'M'.**

Object :—Type I (i)—To study the effect of different sources and levels of N on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Deep black soil or *regur* soils of valleys. (iii) to (v) N.A. (vi) Nov., 1954. (vii) Unirrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS :

0 =Control.
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1'=20 lb./ac. of N as Urea.
n_2'=40 lb./ac. of N as Urea.

3. DESIGN :

(i) and (ii) Villages were selected at random and a list was prepared of the cultivators growing wheat crop in each selected village. From this list two cultivators were selected at random and one field each belonging to the selected cultivators was taken and in each field an unreplicated trial was laid out. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL:

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

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'
Av. yield	469	609	642	568	601

G.M. = 578 lb./ac. ; S.E./mean = 22.2 lb./ac. and no. of trials = 20.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 55(TCM).**

Centre :- Hoshangabad (c.f.).   **Type :- 'M'.**

Object : —Type I (i)—To study the effect of different sources and levels of N on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Deep black soil or *regur* soils of valleys. (iii) to (v) N.A. (vi) Nov., 1955. (vii) Unirrigated. (viii) and (ix) N.A. (ix) April, 1955.

2. TREATMENTS and 3. DESIGN :

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

4. GENERAL :

(i) Below normal. (ii) No. (iii) Yield of grain. (iv) (a) 1953—1955. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'
Av. yield	362	494	527	477	444

G.M. = 461 lb./ac. ; S.E./mean = 27.2 lb./ac. and number of trials = 15.

Crop :- Wheat *(Rabi).*　　　　　　　　　**Ref :- M.P. 54(TCM).**

Centre :- Hoshangabad (c.f.).　　　　　　　**Type :- 'M'.**

Object :—Type II (i)—To study the effect of different sources and levels of N along with P on Wheat crop.

1. BASAL CONDITIONS :

  (i) (a) to (c) N.A.　(ii) Deep black soil or *regur* soils of valleys.　(iii) to (v) N.A.　(vi) Nov., 1954.　(vii) Unirrigated.　(viii) and (ix) N.A.　(x) April 1955.

2. TREATMENTS :

  0　　=Control.
  p_1　=20 lb /ac. of P_2O_5 as Super.
  n_1p_1 =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
  n_2p_1 =40 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.
  $n_1'p_1$=20 lb./ac. of N as Urea+20 lb./ac. of P_2O_5 as Super.
  $n_2'p_1$=40 lb./ac. of N as Urea+20 lb./ac. of P_2O_5 as Super.

3. DESIGN and 4. GENERAL :

  Same as in expt. no. 54(TCM) type I (i) on page 244 conducted at Hoshangabad.

5. RESULTS :

Treatment	0	p_1	n_1p_1	n_2p_1	$n_1'p_1$	$n_2'p_1$
Av. yield	444	494	636	650	535	584

  G.M. = 557 lb./ac. ; S.E./mean = 28.8 lb./ac. and number of trials = 22.

Crop :- Wheat *(Rabi).*　　　　　　　　　**Ref :- M.P. 55(TCM).**

Centre :- Hoshangabad (c.f.).　　　　　　　**Type :- 'M'.**

Object :—Type II (i)—To study the effect of different sources and levels of N along with P on Wheat crop.

1. BASAL CONDITIONS to 4. GENERAL :

  Same as in expt. no. 54(TCM) type II (i) above conducted at Hoshangabad.

5. RESULTS :

Treatment	0	p_1	n_1p_1	n_2p_1	$n_1'p_1$	$n_2'p_1$
Av. yield	370	477	502	560	543	551

  G.M. = 501 lb./ac. ; S.E./mean = 32.9 lb./ac. and number of trials = 15.

Crop :- Wheat *(Rabi).*　　　　　　　　　**Ref :- M.P. 54(TCM).**

Centre :- Hoshangabad (c.f.).　　　　　　　**Type :- 'M'.**

Object :—Type IV—To study the effect of different sources and levels of P and K along with N on Wheat crop.

1. BASAL CONDITIONS :

  (i) (a) to (c) N.A.　(ii) (a) Deep black soil or *regur* soils of Narbada valley.　(iii) to (v) N.A.　(vi) November, 1955.　(vii) Irrigated.　(viii) and (ix) N.A.　(x) April, 1956.

2. TREATMENTS :

  0　　　=Control.
  n_1　　=20 lb./ac. of N as A/S.
  n_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 ib./ac. of P_2O_5 as Super.
  $n_1p_1k_1$ =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super+20 lb./ac. of K_2O as Pot. Sul.
  $n_1p_1k_2$ =20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super+40 lb./ac. of K_2O as Pot. Sul.

3. **DESIGN :**

(i) and (ii) Villages were selected at random and a list of cultivators growing wheat was prepared in each selected village. From this list two cultivators were selected at random and one field each belonging to them was taken and in each field an unreplicated trial was laid out. (iii) (a) and (b) N.A. (iv) Yes.

4. **GENERAL :**

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

5. **RESULTS :**

Treatment	0	n_1	n_1p_1	n_1p_2	$n_1p_1k_1$	$n_1p_1k_2$
Av. yield	370	453	485	469	485	444

G.M. = 451 lb./ac. ; S.E./mean = 18.9 lb./ac. and number of trails = 18.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 55(TCM).**

Centre :- Hoshangabad (c.f.).   **Type :- 'M'.**

Object :—Type IV—To study the effect of different sources and levels of P and K along with N on Wheat crop.

1. **BASAL CONDITIONS to 4. GENERAL :**

Same as in expt. no. 54(TCM) type IV on page 245 conducted at Hoshangabad.

5. **RESULTS :**

Treatment	0	n_1	n_1p_1	n_1p_2	$n_1p_1k_1$	$n_1p_1k_2$
Av. yield	304	288	469	543	387	403

G.M. = 399 lb./ac. ; S.E./mean = 25.5 lb./ac. and number of trials = 14.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 54(TCM).**

Centre :- Mhow (c.f.).   **Type :- 'M'.**

Object :—Type I (ii)—To study the effect of different sources and levels of N on Wheat crop.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) (a) Medium black soils of trap and gneissic origin. (iii) to (v) N.A. (vi) November, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. **TREATMENTS :**

0   =Control.
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1'' =20 lb /ac. of N as Nitrochalk.
n_2'' =40 lb./ac. of N as Nitrochalk.

3. **DESIGN and 4. GENERAL :**

Same as in expt. no. 54(TCM) type IV on page 245 conducted at Hoshangabad.

5. **RESULTS :**

Treatment	0	n_1	n_2	n_1''	n_2''
Av. yield	996	1349	1555	1407	1621

G.M. = 1386 lb./ac. ; S.E./mean = 63.4 lb./ac. and no. of trials = 9.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 54(TCM).**

Centre :- Mhow (c.f.).   **Type :- 'M.**

Object :—Type II (ii)—To study the effect of different sources and levels of N along with P on Wheat crop.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) Medium black soils of trap and gneissic origin. (iii) to (v) N.A. (vi) November, 1954. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. **TREATMENTS :**

0 = Control.

p_1 = 20 lb./ac. of P_2O_5 as Super.

n_1p_1 = 20 lb./ac. of P_2O_5 as Super + 20 lb./ac. of N as A/S.

n_2p_1 = 20 lb./ac. of P_2O_5 as Super + 40 lb./ac. of N as A/S.

$n_1''p_1$ = 20 lb./ac. of P_2O_5 as Super + 20 lb./ac. of N as Nitrochalk.

$n_2''p_1$ = 20 lb./ac. of P_2O_5 as Super + 40 lb./ac. of N as Nitrochalk.

3. **DESIGN and 4. GENERAL :**

Same as in expt. no. 54(TCM) type IV on page 245 conducted at Hoshangabad.

5. **RESULTS :**

Treatment	0	p_1	n_1p_1	n_2p_1	$n_1''p_1$	$n_2''p_1$
Av. yield	1136	1333	1358	1712	1629	1851

G.M. = 1503 lb./ac.; S.E./mean = 74.1 lb./ac. and no. of trials = 12.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 57(SFT).**

Centre :- Indore (c.f.).   **Type :- 'M'.**

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

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) Medium black soil. (iii) Nil. (iv) and (v) N.A. (vi) October—November, 1957. (vii) to (ix) N.A. (x) April, 1958.

2. **TREATMENTS :**

0 = Control (no manure).

n = 20 lb./ac. of N as A/S.

p = 20 lb./ac. of P_2O_5 as Super.

np = 20 lb./ac. of N as A/S + 20 lb./ac. of P_2O_5 as Super.

k = 20 lb./ac. of K_2O as Mur. Pot.

nk = 20 lb./ac. of N as A/S + 20 lb./ac of K_2O as Mur. Potash.

pk = 20 lb./ac. of P_2O_5 as Super + 20 lb./ac. of K_2O as Mur. 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 Mur. Pot.

3. **DESIGN :**

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

4. **GENERAL :**

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

5. RESULTS:

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	321	239	197	54.3	—107	—8	66	16	49.4

No. of trials = 9.

Crop :- Wheat.   **Ref :- M.P. 57(SFT).**

Centre :- Indore (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) Medium black soil. (iii) Nil. (iv) and (v) N.A. (vi) October—November. (vii) to (ix) N.A. (x) April, 1958.

2. TREATMENTS :

0   =Control.
n_1 =20 lb./ac. of N as A/S.
n_2 =40 lb./ac. of N as A/S.
n_1' =20 lb./ac. of N as Urea.
n_2' =40 lb./ac. of N as Urea.
n_1'''=20 lb./ac. of N as C/A/N.
n_2'''=40 lb./ac. of N as C/A/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 57(SFT) type A on page 247 conducted at Indore.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1'''	n_2'''
Av. yield	592	815	946	823	996	839	1045

G.M. = 865 lb./ac, S.E. = 44.8 lb./ac. and no. of trials = 8.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(19).**

Site :- Govt. Agri. Farm, Baroda.   **Type :- 'MV'.**

Object :—To study the effect of different levels of N and P on the yield of different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Urid* and *moong.* (c) Nil. (ii) (a) M A.R. (b) N A. (iii) 14, 15.11.1959. (iv) (a) 3 *bakherings* before monsoon and 3 after monsoon. (b) Drilled by *nari.* (c) 1 md./ac. (d) Lines 12" apart. (e) N.A. (v) Nil. vi) As per treatments (4 months duration). (vii) Irrigated. (viii) One hand weeding. (ix) N.A. (x) 6 to 8.4.1960.

2. TREATMENTS :

All combinations of (1), (2) and (3)
    (1) 3 varieties : V_1=Local NP 710, V_2=C—281 and V_3=Hy-65.
    (2) 3 levels of N as A/S : N_0=0, N_1=20 and N_2=40 lb./ac.
    (3) 3 levels of P_2O_5 as Super : P_0=0, P_1=20 and P_2=40 lb./ac.

3. DESIGN :

(i) 3^3 Fact. confd. (confounding VN^2P^2 and VN^2P components.) (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 39'×14'. (b) 33'×12'. (v) 3'×1'. (vi) Yes.

4. GENERAL :

(i) Germination good. Crop growth was good in N and P combination ; Poorer in N or P alone, very poor in $N_0 P_0$ plot. (ii) Nil. (iii) Av. height ; Av. no. of tillers/plot. Mean length of earheads in cm. and grain yield. (iv) (a) 1959—N.A. (b) and (c) N.A. (v) (a) Jora (Distt. Morena). (b) N.A. (vi) Nil. (vii) No winter rains. Light rains on 7.3.1960, 9.3.1960 and 10.3.1960.

5. RESULTS :

(i) 1214 lb./ac. (ii) 249.7 lb./ac. (iii) Main effect of N and P are highly significant. Interaction N×P is significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
V_1	899	1261	1433	1198	828	1324	1411
V_2	960	1375	1324	1220	617	1411	1630
V_3	939	1387·	1344	1223	750	1417	1503
Mean	933	1341	1367	1214	732	1384	1525
P_0	679	796	720				
P_1	955	1614	1573				
P_2	1153	1613	1808				

S.E. of any marginal mean = 58.9 lb./ac.
S.E. of body of any table = 101.9 lb./ac.

Crop :- Wheat.

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).

Ref :- M.P. 55(52).

Type :- 'MV'.

Object :—To study the effect of fertilizers on different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) Bakhering one in May and another in June. In June sannhemp was broadcasted in the field and mixed by 2nd bakhering. It was ploughed down by wooden plough once in Sept. and again in Oct. After that 2 bakherings were given in Nov. (b) Drilled. (c) N.A. (d) 12". (e) N.A. (v) Green manuring by sannhemp. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 11.52". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

      (1) 4 varieties of Wheat : V_1 = Desipissi, V_2 = C—591, V_3 = NP—710 and V_4 = NP—718.
      (2) 3 manurial fertilizers : M_0 = Control, M_1 = Fertilizers mixture of the department (74¼ lb./ac. of A/S+149¼ lb.ac of Super) and M_2 = Fertilizer mixture of Parry and Co, Bombay at 224 lb./ac..

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 33'×33'. (b) 27'×27'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 532 lb./ac. (ii) 110.1 lb./ac. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in lb./ac.

	V_1	V_2	V_3	V_4	Mean
M_0	418	326	401	438	396
M_1	533	655	628	643	614
M_2	586	495	608	657	587
Mean	511	492	546	579	522

S.E. of V marginal mean = 31.8 lb./ac.
S.E. of M marginal mean = 27.5 lb /ac.
S.E. of body of V × M table = 55.0 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- M.P. 56(99).**

Site :- Instt. of Plant Industry, Indore. **Type :- 'MV'.**

Object :—To study the effect of different levels and sources of N on different varieties of Wheat.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) N.A. (iv) (a) *Bakhering.* (b) By drilling. (c) 60 lb./ac. (d) 14″ between rows. (c) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 2.12″. (x) N.A.

2. TREATMENTS :

   Main-plot treatments :
   2 varieties : V_1=E.K.—69 and V_2=NP—710.

   Sub-plot treatments :
   All combinations of (1) and (2)
   (1) 4 sources of N : S_1=A/S, S_2=A/S/N, S_3=A/C and S_4=Urea.
   (2) 4 levels of N : N_0=0, N_1=15, N_2=30 and N_3=45 lb./ac.

3. DESIGN :

   (i) Split-plot. (ii) (a) 2 main-plots/replication ; 16 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 35′×16½′. (b) 30′×11½′. (v) 2½′×2½ . (vi) Yes.

4. GENERAL :

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

5. RESULTS :

   (i) 836 lb./ac. (ii) (a) 352.3 lb./ac. (b) 132.7 lb./ac. (iii) "Control *vs.* others" effect and interaction V×S are highly significant. Interaction V×N is significant. Other effects are not significant. (iv) Av. yield of grain in lb /ac.

V_1 No = 752 lb./ac., V_2 No = 723 lb./ac.

	N_1	N_2	N_3	Mean	S_1	S_2	S_3	S_4
V_1	871	950	937	919	863	882	1061	873
V_2	877	765	817	820	894	839	777	768
Mean	874	858	877	869	878	860	919	820
S_1	894	817	924					
S_2	899	851	831					
S_3	847	915	995					
S_4	856	848	757					

S.E. of the difference of two

1. V marginal means	= 71.9 lb./ac.	5. V means at the same level of S	= 85.9 lb./ac.
2. S marginal means	= 38.3 lb./ac.	6. N means at the same level of V	= 46.9 lb./ac.
3. N marginal means	= 33.2 lb./ac.	7. V means at the same level of N	= 81.5 lb./ac.
4. S means at the same level of V	= 54.2 lb./ac.	S.E. of body of NS table	= 46.9 lb./ac.

———

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 56(97).**

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

Object :—To study the response of N on different varieties of Wheat.

1. BASAL CONDITIONS :

   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) N.A. (iv) (a) *Bakhering.* (b) By drilling. (c) 60 lb./ac. (d) 14″ from row to row. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 2.12″. (x) N.A.

2. TREATMENTS :

   Main-plot treatment :
      2 verieties : V_1=EK—69 and V_2=NP—710.
   Sub-plot treatments :
   All combinations of (1) and (2)
         (1) 4 sources of N : S_1=A/S, S_2=A/S/N, S_3=Urea and S_4=A/C.
         (2) 4 levels of N : N_0=0, N_1=20, N_2=40 and N_3=60 lb./ac.

3. DESIGN :

   (i) Split-plot. (ii) 2 main-plots/replication ; 16 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 35′×14′. (b) 30′×9⅓′. (v) 2½′×2⅔′. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

   (i) 1749 lb./ac. (ii) (a) 389.1 lb./ac. (b) 330.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

$$V_1N_0 = 1529 \text{ lb./ac. and } V_2N_0 = 1638 \text{ lb./ac.}$$

	N_1	N_2	N_3	Mean	S_1	S_2	S_3	S_4
V_1	1469	1687	1686	1593	1536	1673	1554	1692
V_2	2040	2019	1922	1965	1913	2233	1750	2079
Mean	1755	1853	1804	1749	1725	1953	1652	1886
S_1	1745	1794	1635					
S_2	1849	1947	2062					
S_3	1880	1628	1448					
S_4	1545	2043	2069					

S.E. of difference of two

1. V marginal means	= 112.3 lb./ac.	5. V means at the same level of S =	199.7 lb./ac.
2. S marginal means	= 134.8 lb./ac.	6. N means at the same level of V =	165.2 lb./ac.
3. L marginal means	= 116.8 lb./ac.	7. V means at the same level of N =	175.5 lb./ac.
4. S means at the same level of V	= 190.7 lb./ac.	S.E. body of N×S table =	165.2 lb./ac.

———

Crop :- Wheat *(Rabi)*. Ref :- M.P. 54(4)

Site :- State Mechanised Farm, Reora. Type :- 'MV'.

Object :—To study the effect of application of N and P on different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) F.Y.M. at 5 C.L./ac. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 7.11.1954 (iv) (a) 3 discings by tractor and two ploughings by *desi* plough. (b) Broadcasting. (c) 32 srs./ac. (d) and (e) Nil. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 3.00". (x) 18, 19.4.1955.

2. TREATMENTS :

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

     (1) 3 levels of N : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.

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

     (3) 3 varieties : $V_1=$C—591, $V_2=$NP—715 and $V_3=$Kathia.'

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 40'×27'. (b) 36'×23'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Not satisfactory. (ii) Mild attack of brown rust and no control measures were taken. (iii) Height, tillering, no. of earheads per plant, grain per earhead and weight of 100 grains. (iv) (a) 1954—1955. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 457 lb./ac. (ii) 36.3 lb./ac. (iii) All effects except N 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	330	385	446	387	319	520	322
P_1	494	350	544	- 463	535	427	425
P_2	519	636	408	521	608	671	284
Mean	448	457	466	457	487	539	344
V_1	491	503	468				
V_2	470	560	587				
V_3	383	307	342				

S.E. of any marginal mean = 12.1 lb./ac.

S.E. of body of any table = 21.0 lb./ac.

Crop :- Wheat *(Rabi)*. Ref :- M.P. 55(2).

Site :- State Mechanised Farm, Reora. Type :- 'MV'.

Object :—To study the effect of application of N and P on different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) F.Y.M. at 5 C.L./ac. (ii) (a) Mixed red and black soil. (b) N A. (iii) 21.11.1955. (iv) Two discings by tractor and two ploughings by *Nari* plough. (b) Sown by *Nari* plough. (c) 32 srs./ac. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 3.50". (x) 4.4.1956.

2. TREATMENTS and 3. DESIGN :

Same as in expt no. 54 (4) above.

4. GENERAL :

(i) Good. (ii) Slight attack of brown ruts after maturity. (iii) Yield data, height, tillering, no. of grains per earhead and weight of grain. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) N.A.

5. RESULTS :

(i) 459 lb./ac. (ii) 84.2 lb./ac. (iii) Main effect of P alone is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean		V_1	V_2	V_3
P_0	369	357	408	378		332	397	406
P_1	419	485	441	448		393	466	487
P_2	543	533	579	552		578	564	513
Mean	444	458	476	459		434	476	469
V_1	439	430	434					
V_2	438	484	503					
V_3	454	461	490					

S.E. of any marginal mean	= 28.1 lb./ac.
S.E. of body of any table	= 48.6 lb./ac.

———

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 54(TCM).**

Site :- M.A.E. Farm, Bagwai.   **Type :- 'MV'.**

Object :—Type VIII—To find the best variety and manurial schedule for maximum yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 28.11.1954. (iv) and (v) N.A. (vi) As per treatments. (vii) Itrigated. (viii) and (ix) N.A. (x) 1 and 2.4.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)
    (1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
    (2) 3 levels of P_2O_5 as triple Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.
    (3) 3 varieties : $V_1=$*Pissi* (local), $V_2=$Pb. 591 and $V_3=$NP—710.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/ block, 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 50'×22'. (b) 45'×16'
(v) 2½'×3'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Mild attack of loose-smut of Wheat. (iii) Grain and straw yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Obedullaganj and Reora. (b) N.A. (vi) and (vii) N.A.

5. RESULTS :

(i) 1201 lb./ac. (ii) 67.9 lb./ac. (iii) Main effects of N and P and interaction N×P are highly significant. Main effect of V is significant. (iv) Av. yield of grain in lb./ac.

	N0	N1	N2	Mean	V1	V2	V3
P0	494	587	587	556	516	576	576
P1	1284	1368	1492	1381	1347	1355	1441
P2	1358	1701	1942	1667	1613	1613	1775
Mean	1045	1219	1340	1201	1159	1181	1264
V1	979	1185	1313				
V2	1051	1191	1301				
V3	1105	1281	1406				

S.E. of any marginal mean = 22.6 lb./ac.
S.E. of body of any table = 39.2 lb./ac.

Crop :- Wheat *(Rabi)*.   Ref :- M.P. 55(TCM).

Site :- M.A.E. Farm, Bagwai.   Type :- 'MV'.

Object ·—Type VIII—To find the best variety and manurial schedule for maximum yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) to (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS to 4. GENERAL.

Same as in expt. no. 54(TCM) at Bagwai on page 253.

5. RESULTS :

(i) 926 lb /ac. (ii) 31 3 lb. ac. (iii) Main effects of P, N and V are highly significant. Interaction N×P is significant. (iv) Av. yield of grain in lb./ac.

	N0	N1	N2	Mean	V1	V2	V3
P0	721	759	823	768	625	824	854
P1	882	1043	993	973	782	1055	1081
P2	943	1043	1123	1036	912	1084	1113
Mean	849	948	980	926	773	988	1016
V1	694	793	832				
V2	911	1020	1032				
V3	941	1032	1075				

S.E. of any marginal mean = 10.4 lb./ac.
S.E. of body of any table = 18.1 lb./ac.

Crop :- Wheat. *(Rabi)*.   Ref :- M.P. 54(TCM).

Site :- M.A.E. Farm, Obedullaganj.   Type :- 'MV'.

Object :—Type VIII—To find the best variety and manurial schedule for maximum yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Obedullaganj. (iii) to (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)
   (1) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.
   (2) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
   (3) 3 varieties : $V_1=$ Local *pissi*, $V_2=$ C -591 and $V_3=$ NP-718.
A/S broadcasted just before sowing and super. applied with the seed.

3. DESIGN :

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

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Bagwai, and Reora. (b) N.A. (vi) and (vii) N.A.

5. RESULTS :

(i) 1377 lb./ac. (ii) 111.1 lb./ac. (iii) Main effect of N is highly significant. Main effects of P and V are significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	V_1	V_2	V_3
P_0	871	1359	1543	1258	1391	1167	1216
P_1	951	1473	1775	1400	1543	1414	1243
P_2	1039	1500	1884	1474	1507	1554	1362
Mean	954	1444	1734	1377	1480	1378	1274
V_1	981	1489	1970				
V_2	964	1452	1718				
V_3	917	1391	1513				

S.E. of any marginal mean $=$ 37.0 lb./ac.

S.E. of body of any table $=$ 64.1 lb./ac.

————

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 55(TCM).**

Site :- M.A.E. Farm, Obedullaganj.   **Type :- 'MV'.**

Object :—Type VIII—To find the best variety and manurial schedule for maximum yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Obedullaganj. (iii) to (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) at Obedullaganj on page 254.

5. RESULTS :

(i) 920 lb./ac. (ii) 120.2 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	V_1	V_2	V_3
P_0	559	1074	999	877	973	945	713
P_1	536	1014	1178	909	967	864	896
P_2	596	1057	1265	973	994	1023	902
Mean	564	1048	1147	920	978	944	837
V_1	625	1107	1202				
V_2	556	1060	1216				
V_3	511	977	1023				

S.E. of any marginal mean   =   40.1 lb./ac.
S.E. of body of any table   =   69.4 lb./ac.

————

Crop :- Wheat *(Rabi).*

Site :- State Mechanised Farm, Reora (Satna).

Ref :- M.P. 54(TCM).

Type :- 'MV'.

Object :—Type VIII—To find the best variety and manurial schedule for maximum yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 1 md./ac. of A/S and Super mixture. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 6.11.1954. (iv) and (v) N.A. (vi) As per treatment. (vii) to (ix) N.A. (x) 14.4.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)
     (1) 3 levels of N as A/S : $N_0 = 0$, $N_1 = 20$ and $N_2 = 40$ lb./ac.
     (2) 3 levels of P_2O_5 : $P_0 = 0$, $P_1 = 20$ and $P_2 = 40$ lb./ac.
     (3) 3 varieties : V_1 = C—591, V_2 = NP—715 and V_3 = Local.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 40'×27'. (b) 36'×23'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Bagwai and Obedullaganj. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 587 lb./ac. (ii) 157.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	V_1	V_2	V_3
P_0	330	384	446	387	318	519	323
P_1	495	350	543	463	535	427	425
P_2	519	636	407	521	608	671	284
Mean	448	457	465	457	487	539	344
V_1	490	503	468				
V_2	471	560	586				
V_3	383	307	342				

S.E. of any marginal mean   =   52.5 lb./ac.
S.E. of body of any table   =   91.0 lb./ac.

Crop :- Wheat *(Rabi)*.　　　　　　　　　　Ref :- M.P. 55(TCM).

Site :- State Mechanised Farm, Reora (Satna).　　Type :- 'MV'.

Object :—Type VIII—To find the best variety and manurial schedule for maximum yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A.　(ii) (a) Mixed red and black soil.　(b) N.A.　(iii) to (v) N.A.　(vi) As per treatments. (vii) Irrigated.　(viii) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) conducted at Reora on page 256.

5. RESULTS :

(i) 456 lb./ac.　(ii) 74.1 lb./ac.　(iii) Main effect of P is significant.　(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	V_1	V_2	V_3
P_0	373	357	407	379	332	397	409
P_1	418	485	440	448	392	466	486
P_2	542	532	543	539	577	528	512
Mean	444	458	433	456	434	464	469
V_1	438	430	433				
V_2	439	485	468				
V_3	457	460	490				

S.E. of any marginal mean　　= 24.7 lb./ac.
S.E. of body of any table　　= 42.8 lb./ac.

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Crop :- Wheat *(Rabi)*.　　　　　　　　　　Ref :- M.P. 57(83).

Site :- Govt. Seed and Demons. Farm, Betul.　　Type :- 'C'.

Object :—To find out the optimum seed rate for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil.　(b) and (c) N.A.　(ii) (a) *Morand—2.*　(b) Refer soil analysis, Betul.　(iii) 17.10.1957. (iv) (a) 2 ploughings, 2 harrowings and 2 *bakherings.*　(b) Drillied with *Nari,*　(c) As per treatments (d) 9"×4".　(e) N.A.　(v) 60 lb./ac. of N as A/S+60 lb./ac. of P_2O_5 as Super drilled with seed.　(vi) Hy—65. (vii) Irrigated.　(viii) Nil.　(ix) N.A.　(x) 17.3.1958.

2. TREATMENTS :

3 seed rates :　R_1=60, R_2=80 and R_3=100 lb./ac.

3. DESIGN :

(i) R.B.D.　(ii) (a) 3.　(b) N.A.　(iii) 4.　(iv) (a) and (b) 33'×16½'.　(v) Nil.　(vi) Yes.

4. GENERAL :

(i) Good.　(ii) Nil.　(iii) Grain yield.　(iv) (a) 1956—1958.　(b) No.　(c) Nil.　(v) to (vii) N.A.

5. RESULTS :

(i) 1323 lb./ac.　(ii) 354.2 lb./ac.　(iii) Treatment differences are not significant.　(iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3
Av. yield	1440	1400	1130

S.E./mean　= 177.1 lb./ac.

— — —

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 58(98).**

Site :- Govt. Seed and Demons. Farm, Betul.   **Type :- 'C'.**

Object :—To find out the optimum seed rate for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) *Morand*—2. (b) Refer soil analysis, Betul. (iii) 12.11.1958. (iv) (a) 2 ploughings, 2 harrowings and 2 *bakherings*. (b) Drilled with *Nari*. (c) As per treatments. (d) 9″×4″. (e) N.A. (v) Nil. (vi) Hy—65. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 29.3.1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(83) on page 257.

5. RESULTS :

(i) 1381 lb./ac. (ii) 261.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3
Av. yield	1088	1525	1530

S.E./mean = 130.7 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(94).**

Site :- Govt. Seed and Demons. Farm, Betul.   **Type :- 'C'.**

Object :—To find out the most suitable spacing and number of seeds/hole for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) *Marand*—2. (b) Refer soil analysis, Betul. (iii) 5.12.1959. (iv) (a) 2 ploughings, 2 harrowings and 2 *bakherings*. (b) Drilled by *Nari*. (c) to (e) As per treatments. (v) Nil. (vi) Hy—65. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 19, 20.4.1960.

2. TREATMENTS :

All combinations of (1) and (2)
(1) No. of seeds/hole : R_1=1, R_2=2 and R_3=3.
(2) 4 spacings : S_1=6″×4″, S_2=9″×4″, S_3=12″×4″ and S_4=18″×4″.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a 36′×12′. (b) 32′×9′. (v) 2′×1½′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—contd. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii, Expt. failed in 1961—1962.

5. RESULTS :

(i) 1423 lb./ac. (ii) 242.6 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
R_1	1478	1419	1400	1283	1395
R_2	1672	1536	1478	1225	1478
R_3	1361	1381	1419	1419	1395
Mean	1504	1445	1432	1309	1423

S.E. of marginal means of S   = 70.0 lb./ac.
S.E. of marginal means of R   = 60.7 lb./ae.
S.E. of body of table   = 121.3 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- M.P. 59(1).**

Site :- Govt. Agri. Farm, Bhind. **Type :- 'C'.**

Object :—To find out a suitable spacing, seedrate and time of sowing for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) G.M. of *sannhemp.* (ii) (a) Sandy loam. (b) Refer soil analysis, Bhind. (iii) As per treatments. (iv) (a) 2 harrowings and 2 ploughings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) G.M. with *sannhemp.* (vi) N.A. (vii) Irrigated. (viii) 1 hand weeding. (ix) 1.53". (x) 24 to 28.3.1960.

2. TREATMENTS :

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

    (1) 3 dates of sowing : D_1=25.10.1959, D_2=1.11.1959 and D_3=8.11.1959.

    (2) 3 spacings : S_1=6", S_2=9" and S_3=12".

    (3) 3 seed rates : R_1=40, R_2=60 and R_3=80 lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 39'×22½'. (b) 33'×16½'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) Fair, partial lodging on 5th and 6th March. (ii) Attack of white ants. B.H.C. 50% was given twice with water. (iii) Av. height of plants, av. length of earhead and grain yield. (iv) (a) 1959—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2702 lb./ac. (ii) 491.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	Mean	R_1	R_2	R_3
S_1	2498	2798	2834	2710	2690	2611	2829
S_2	2644	2839	2746	2743	2645	3044	2539
S_3	2589	2587	2784	2653	2176	2774	3010
Mean	2577	2741	2788	2702	2504	2809	2793
R_1	2367	2339	2805				
R_2	2804	2904	2720				
R_3	2558	2981	2839				

        S.E. of any marginal mean   =   115.2 lb./ac.

        S.E. of body of any table   =   200.8 lb./ac.

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Crop :- Wheat *(Rabi).* **Ref :- M.P. 59(32).**

Site :- Govt. Seed and Demons. Farm, Biora. **Type :- 'C'.**

Object :—To find out suitable spacing and seed rate for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Urid.* (c) G.M. (ii) (a) Clay (b) N.A. (iii) 5.12.1959. (iv) (a) 2 ploughings and 2 *bakherings.* (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) 45.64". (x) 23.4.1960.

2. TREATMENTS :

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

    (1) 3 spacings between rows : S_1=9", S_2=12" and S_3=15".

    (2) 3 seed rates : R_1=30, R_2=35 and R_3=40 srs./ac.

Extra treatment : 12" between rows and local seedrate (N.A.).

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) $39' \times 22\frac{1}{2}'$. (b) $33' \times 16\frac{1}{2}'$. (v) $3' \times 3'$. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1959—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 877 lb./ac. (ii) 232.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 675 lb./ac.

	R_1	R_2	R_3	Mean
S_1	820	890	873	861
S_2	778	955	923	885
S_3	843	1058	955	952
Mean	814	968	917	899

S.E. of any marginal mean == 67.2 lb./ac.
S.E. of body of table or control mean = 116.4 lb./ac.

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Crop :- **Wheat** *(Rabi)*.   Ref :- **M.P. 58(60).**

Site :- **Govt. Exptl. Stn., Chhindwara .**   Type :- **'C'.**

Object :—To find out most suitable spacing and number of seeds/hole for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sannhemp* for green manuring. (c) 20 lb./ac. of P_2O_5. (ii) (a) Heavy black soil. ᵬb) Refer soil analysis, Chhindwara. (iii) 21.11.1958 to 25.11.1958. (iv) (a) *Bakhering* and ploughing. (b) By dibbling. (c) N A. (d) and (e) As per treatments. (v) 20 lb./ac. of P_2O_5 applied to *Sannhemp* crop ; *Sannhemp* crop green manured. 20 lb./ac. of N+50 lb./ac. of P_2O_5 at sowing time of wheat. (vi) Hy—65. (vii. Irrigated. (viii) 1 weeding. (ix) 2.29″. (x) 1.4.1959.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 spacings : $S_1=6″$, $S_2=9″$ and $S_3=12″$.
(2) No. of seeds/hole : $R_1=1$, $R_2=2$ and $R_3=3$.

3. DESIGN·

(i) Fact. in R B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) $35' \times 16'8″$. (b) $33' \times 14'8″$. (v) $3' \times 1'$. (vi) Yes.

4. GENERAL·

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1958—1961. (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 2154 lb./ac. (ii) 385.8 lb./ac. (iii) Only S effect is highly significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	Mean
R_1	2243	1869	1705	1939
R_2	2469	2277	1937	2228
R_3	2487	2623	1776	2295
Mean	2400	2256	1806	2154

S.E. of any marginal mean = 114.3 lb./ac.
S.E. of body of table = 197.9 lb./ac.

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Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(102).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'C'.**

Object :—To find out the most suitable spacing and numbers of seeds/hole for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) Green manuring. (ii) (a) *morand*—1. (b) Refer soil analysis, Chhindwara. (iii) 13.11.1959. (iv) (a) 1 ploughing and 2 *bakherings.* (b) Dibbling. (c) N.A. (d) and (e) As per treatments. (v) 121 lb./ac. of N as A/S+121 lb./ac. of P_2O_5 as Super. (vi) Hy—65. (vii) Irrigated. (viii) Nil. (ix) 5.28″. (x) 15.5.1960.

2. TREATMENTS :

All combinations of (1) and (2)
   (1) 4 spacings : S_1=6″, S_2=9″, S_3=12″ and S_4=18″.
   (2) No. of seeds/hole : R_1=1, R_2=2 and R_3=3.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) and (b) 12′×30′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) N.A.

5. RESULTS :

(i) 1297 lb./ac. (ii) 257.4 lb./ac. (iii) R effect is highly significant and S effect is significant. Interaction is not significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	S_4	Mean
R_1	1369	1123	1051	1047	1147
R_2	1410	1274	1425	1043	1288
R_3	1630	1497	1350	1342	1455
Mean	1470	1298	1275	1144	1297

S.E. of marginal mean of S = 74.3 lb./ac.
S.E. of marginal mean of R = 64.3 lb./ac.
S.E. of body of table = 128.7 lb./ac.

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Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(115).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'C'.**

Object :—To study the effect of leguminous crops on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) As per treatments. (c) N.A. (ii) (a) *morand*—2. (b) Refer soil analysis, Chhindwara. (iii) 8.11.1959. (iv) (a) 1 ploughing and 3 *bakherings.* (b) Drilling by *nari.* (c) 80 lb./ac. (d) 9″×3″. (e) N.A. (v) Nil. (vi) Hy—11. (vii) Unirrigated. (viii) Nil. (ix) 4.86″. (x) 27.4.1960.

2. TREATMENTS :

4 previous crops : L_0=Fallow, L_1=*Jowar*, L_2=Groundnut and L_3= *Mung.*

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) and (b) 40'×12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 1745 lb./ac. (ii) 224.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain • in lb./ac.

Treatment	L_0	L_1	L_2	L_3
Av. yield	1764	1697	1716	1802

S.E./mean = 79.3 lb./ac.

Crop :- Wheat.

Site :- Agri. College Farm, Gwalior.

Ref :- M.P. 54(30).

Type :- 'C'.

Object :—To find out optimum spacing and seed rate for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 27.11.1954. (iv) (a) and (b) N.A. (c) and (d) As, per treatments. (e) N.A. (v) N.A. (vi) NP—710. (vii) Irrigated. (viii) N.A. (ix) 3.57". (x) 12.4.1955

2. TREATMENTS :

Main-plot treatments :
   3 spacings : $S_1=9''$, $S_2=12''$ and $S_3=15''$.
Sub-plot treatments :
   5 seed rates : $R_1=30$, $R_2=35$, $R_3=40$, $R_4=45$ and $R_5=50$ srs/ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) Main-plot : 165'×16½' for S_1, 165'×17' for S_2, 165'×17½' for S_3 and sub-plot : 33'×16½' for S_1, 33'×17' for S_2 and 33'×17½' for S_3. (b) 30'×15'. (v) Two rows on both sides and 1½' of each row at both ends. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Weight of grain and fodder. (iv) (a) 1953—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 1061 lb./ac. (ii) (a) 141.6 lb./ac. (b) 146.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean
S_1	1151	1294	964	1185	1089	1137
S_2	989	1117	1011	1024	1086	1045
S_3	912	1027	1036	1042	989	1001
Mean	1017	1146	1004	1084	1055	1061

S.E. of difference of two

1. S marginal means	=	44.8 lb./ac.
2. R marginal means	=	59.7 lb./ac.
3. R means at the same level of S	=	103.5 lb./ac.
4. S means at the same level of R	=	102.8 lb./ac.

Crop :- Wheat *(Rabi)*.   Ref :- M.P. 59(128).

Site :- Instt. of Plant, Industry, Indore.   Type :- 'C'.

Object :—To study the effect of leguminous crops on the succeeding crop of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) As per treatments. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore.
(iii) 6.11.1959. (iv) (a) 1 ploughing and 1 harrowing. (b) Drilling. (c) 80 lb./ac. (d) 12"×5". (e) N.A.
(v) 5 C.L./ac. of Farm compost. (vi) Hy—65. (vii) Unirrigated. (viii) 2 weedings and 3 interculturings.
(ix) 2.6". (x) 18.3.1960.

2. TREATMENTS :

3 leguminous crops preceding Wheat : L_1=Cowpea, L_2=Groundnut, and L_3=*Moong.*

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 40'×10'. (b) 35'×9.66'. (v) 2.5'×1.16'. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 232 lb./ac. (ii) 84.0 lb./ac. (iii) Treatments differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	L_1	L_2	L_3
Av. yield	85	522	88

S.E./mean = 29.7 lb./ac.

Crop :- Wheat *(Rabi)*   Ref :- M.P. 59(130).

Site :- Instt. of Plant Industry, Indore.   Type :- 'C'.

Object :—To study the effect of leguminous crops on the succeeding crop of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) As per treatments. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore.
(iii) 15.10.1959. (iv) (a) 1 ploughing and 1 harrowing. (b) Drilling. (c) 65 lb./ac. (d) 14"×5". (e) N.A.
(v) 30 lb /ac. of P_2O_5. (vi) Hy—65. (vii) Irrigated. (viii) 2 weedings. (ix) 7.9". (x) 27.3.1960.

2. TREATMENTS :

4 previous crops : L_0=Fallow, L_1=Cowpea, L_2=Groundnut and L_3=*Moong.*

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) 40'×12'. (b) 30'×9.66'. (v) 5'×1.16'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 1603 lb./ac. (ii) 174.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	L_0	L_1	L_2	T_3
Av. yield	1467	1649	1675	1622

S.E./mean = 61.7 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 58(103).**

Site :- Govt. Exptl. Farm, Kuthulia (Rewa).   **Type :- 'C'.**

Object :—To find out suitable numbers of seeds/hole and spacings for better yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Follow—Wheat. (b) Fallow. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 29.11.1958 to 1.12.1958. (iv) (a) 4 ploughings. (b) Line sowings. (c) 80 lb./ac. (d) and (e) As per treatments. (v) Nil. (vi) Hy— 65. (vii) Unirrigated. (viii) Nil. (ix) 1.80". (x) 28.3.1959.

2. TREATMENTS :

All combinations of (1) and (2)

  (1) 3 different spacings between rows : $S_1=6''$, $S_2=9''$ and $S_3=12''$.

  (2) No. of seeds/hole : $R_1=1$, $R_2=2$ and $R_3=3$.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) $30'\times14\frac{2}{3}'$. (v) Nil. [(vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 2052 lb./ac. (ii) 308.2 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	2302	1956	2004	2087
R_2	1779	1763	2125	1889
R_3	2229	2286	2026	2180
Mean	2103	2002	2052	2052

S.E. of any marginal mean   = 89.0 lb./ac.
S.E. of body of table   = 154.1 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(143).**

Site :- Govt. Exptl. Farm, Kuthulia (Rewa).   **Type :- 'C'.**

Object :—To find out suitable spacings and suitable nos. of seeds/hole for better yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Paddy—Wheat. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 21.11.1959. (iv) 4 ploughings. (b) Line sowing. (c) 80 lb./ac. (d) and (e) As per treatments. (v) Nil. (vi) Hy—65. (vii) Unirriged. (viii) Nil. (ix) 2.18". (x) 3.4.1960.

2. TREATMENTS :

All combinations of (1) and (2)

  (1) 4 spacings : $S_1=6''\times4''$, $S_2=9''\times4''$, $S_3=12''\times4''$ and $S_4=18''\times4''$.

  (2) No. of seeds/hole : $R_1=1$, $R_2=2$ and $R_3=3$.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) $72'\times72'$. (iii) 4. (iv) (a) $36'\times12'$. (b) $32'\times9'$. (v) $2.0'\times1.5'$. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1859 lb./ac. (ii) 340.6 lb./ac. (iii) Only main effects of R and S are highly significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	S_4	Mean
R_1	2070	1818	1481	1127	1624
R_2	2333	1886	1852	1059	1782
R_3	2488	2269	2017	1906	2170
Mean	2297	1991	1783	1364	1859

S.E. of marginal mean of R   == 85.1 lb./ac.
S.E. of marginal mean of S   = 98.3 lb./ac.
S.E. of of body of table   = 170.3 lb./ac.

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Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 57(41).**

Site :- Govt. Seed and Demons. Farm, Mahagarh.   **Type :- 'C'.**

Object :—To find out optimum seed rate and spacing for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Mahagarh. (iii) N.A. (iv) (a) 3 *bakherings*. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Ujjain. No. 22. (vii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :
  3 spacings : $S_1=9''$, $S_2=12''$ and $S_3=18''$.
Sub-plot treatments :
  4 seed rates : $R_1=20$, $R_2=25$, $R_3=30$ and $R_4=40$ srs./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) $39\frac{1}{2}' \times 22'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 429 lb./ac. (ii) (a) 104.4 lb./ac. (b) 75.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_1	390	463	411	401	416
S_2	418	506	516	416	465
S_3	395	392	401	433	405
Mean	401	454	443	417	429

S.E. of difference of two
  1. S marginal means   = 42.6 lb./ac.
  2. R marginal means   = 35.3 lb./ac.
  3. R means at the same level of S   = 61.2 lb./ac.
  4. S means at the same level of R   = 78.6 lb./ac.

———

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 58(17).**

Site :- Govt. Seed and Demons. Farm, Mahagarh.   **Type :- 'C'.**

Object :—To find out the most suitable seed rate and spacing for Wheat crop.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Mahagarh. (iii) 16.11.1958. (iv) (a) 3 *bakherings.* (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) Ujjain No 6. (vii) to (ix) N.A. (x) 12.4.1959.

2. **TREATMENTS :**

   All combinations of (1) and (2)
   (1) 3 spacings between lines : $S_1=12''$ $S_2=15''$ and $S_3=18''$.
   (2) 4 seed rates : $R_1=20$, $R_2=25$, $R_3=30$ and $R_4=40$ srs./ac.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $40'\times18'$. (v) N.A. (vi) Yes.

4. **GENERAL :**

   (i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1958—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 531 lb./ac. (ii) 128.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_1	495	500	528	450	493
S_2	590	588	513	584	569
S_3	492	564	563	509	532
Mean	526	551	535	51 4	531

S.E. of marginal means of S = 32.1 lb./ac.
S.E. of marginal means of R = 37.0 lb./ac.
S.E. of body of table   = 64.1 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 54(67).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).   **Type :- 'C'.**

Object :—To find out optimum seed rate for Wheat crop.

1. **BASAL CONDITIONS :**

   (i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 5.11.1954. (iv) (a) 2 harrowings by disc and 3 *bakherings.* (b) Drilling. (c) As per treatments. (d) Rows 12' apart. (e) N.A. (v) Nil. (vi) C—591 (late). (vii) Unirrigated. (viii) to (x) N.A.

2. **TREATMENTS :**

   4 seed rates : $R_1=30$, $R_2=35$, $R_3=40$ and $R_4=45$ srs./ac.

3. **DESIGN :**

   (i) R B.D. (ii) (a) 4. (b) N.A. (iii) 3. (iv) (a) $33'\times33'$. (b) $27'\times27'$. (v) $3'\times3'$. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) N.A. (iii) Av. height of plant and weight of grain. (iv) (a) 1954—contd. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

. (i) 429 lb./ac. (ii) 22.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3	R_4
Av. yield	397	427	454	439

S.E./mean = 13.2 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 55(50).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).   **Type :- 'C'.**

Object :—To find out suitable seed rate for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sealon* and *Sannhemp*. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 21.11.1955. (iv) (a) 4 *bakherings*, 2 wooden ploughings to bury *Sannhemp*. (b)Drilling. (c) As per treatments. (d) Between lines 12". (e) N.A. (v) Green manuring with *sannhemp*. (vi) C—591 (medium). (vii) Unirrigated. (viii) N.A. (ix) 11.52". (x) N.A.

2. TREATMENTS :

7 seed rates : R_1=20, R_2=25, R_3=30, R_4=35, R_5=40, R_6=45 and R_7=50 srs./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3. (iv) (a) 33'×33'. (b) 27'×27'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Weight of grain. (iv) 1954—1956. (b) Yes. (c) N.A. (v) (a) and (b): N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 496 lb./ac. (ii) 51.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3	R_4	R_5	R_6	R_7
Av. yield	435	448	450	532	542	555	512

S.E./mean = 29.4 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 56(57).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).   **Type :- 'C'.**

Object :—To find out suitable seed rate for Wheat crop.

1. BASAL CONDITIONS :

. (i) (a) N.A. (b) Gram. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 19.11.1956. (iv) (a) 6 *bakherings*. (b) Drilling. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) C—591 (medium). (vii) Unirrigated. (viii) N.A. (ix) 74.8". (x) 11.4.1957.

2. TREATMENTS

6 seed rates : R_1=25, R_2=30, R_3=35, R_4=40, R_5=45 and R_6=50 srs./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) 30'×36'. (b) 24'×30'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Weight of grain. (iv) (a) 1954—1956. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 884 lb /ac. (ii) 51.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3	R_4	R_5	R_6
Av. yield	804	840	863	863	838	858

S.E./mean = 29.6 lb./ac.

Crop :- Wheat.

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).

Ref :- M.P. 54(68).

Type :- 'C'.

Object :—To find out suitable seed rate for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 5.11.1954. (iv) (a) 1 harrowing by disc and 4 bakherings. (b) Drilling. (c) As per treatments. (d) Between rows 12". (e) N.A. (v) Fertilizer mixture was added at 1 bag/ac. and was mixed with soil at the time of last bakhering. (vi) C—591 (late). (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

4 seed rates : R_1=25, R_2=30, R_3=35 and R_4=40 lb./ac.

3. DESIGN :

(i) L. sq. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 33'×33'. (b) 27'×27'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Height of plants and weight of grain. (iv) (a) 1954—contd. (b) N.A. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 768 lb./ac. (ii) 38.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb. ac.

Treatment	R_1	R_2	R_3	R_4
Av. yield	722	781	791	778

S.E./mean = 19.4 lb./ac.

Crop :- Wheat.

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).

Ref :- M.P. 55(46).

Type :- 'C'.

Object :—To find out suitable seed rate for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat—Fallow. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 10.11.1955. (iv) (a) 6 bakherings. (b) Drilling. (c) As per treatments. (d) Rows 12" apart. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) N.A. (ix) 11.52". (x) N.A.

2. TREATMENTS :

7 seed rates : R_1=20, R_2=25, R_3=30, R_4=35, R_5=40, R_6=45 and R_7=50 srs./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3. (iv) (a) 33'×33'. (b) 27'×27'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Weight of grain. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1582 lb./ac. (ii) 193.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac

Treatment	R_1	R_2	R_3	R_4	R_5	R_6	R_7
Av. yield	1565	1479	1690	1667	1516	1536	1621

S.E./mean = 111.6 lb./ac.

————

Crop :- Wheat.   **Ref :- M.P. 59(64).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).   **Type :- 'C'.**

Object :—To find out the residual effect of leguminous crops on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) Nil. (ii) (a) Medium black soil. (b) N.A. (iii) 14.11.1959. (iv) (a) 2 bakherings. (b) By drilling. (c) 80 lb./ac. (d) Row to row 9". (e) N.A. (v) Nil. (vi) C—281. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 20.4.1960.

2. TREATMENTS :

4 leguminous crops preceding wheat : L_0=Fallow, L_1=Cowpea, L_2=Groundnut and L_3= Moong.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) 12'×40'. (b) 11'×38'. (v) ½'×1'. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Grain yield. (iv) (a) 1959. (b) and (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 706 lb./ac. (ii) 207.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	L_0	L_1	L_2	L_3
Av. yield	591	713	752	768

S.E./mean = 73.3 lb./ac.

————

Crop :- Wheat.   **Ref :- M.P. 58(8).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).   **Type :- 'C'.**

Object :—To find out the most suitable spacing and seed rate for Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cowpea. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 14 to 20.11.1958. (iv) (a) N.A. (b) Dibbling. (c) N.A. (d) and (e) As per treatments. (v) Green manuring with cowpea. 30 lb./ac. of N as A/S + 30 lb./ac. of P_2O_5 as Super. (vi) C—591 (medium). (vii) Irrigated. (viii) N.A. (ix) 2.03". (x) 6.4.1959.

2. TREATMENTS :

All combinations of (1) and (2)
    (1) 3 spacings between rows : S_1=6", S_2=9" and S_3=12".
    (2) Seeds/hole : R_1=1, R_2=2, and R_3=3.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 20'×18'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Weight of grain. (iv) (a) 1958. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1558 lb./ac. (ii) 124.0 lb./ac. (iii) Only S and R effects are significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	Mean
R_1	1419	1328	1293	1347
R_2	1676	1544	1549	1590
R_3	1852	1750	1607	1736
Mean	1649	1541	1483	1558

S.E. of any marginal mean   =   35.8 lb./ac.

S.E. of body of table   =   62.0 lb./ac.

————

Crop :- Wheat.   **Ref :- M.P. 59(66).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal). Type :- 'C'.

Object :—To find out most suitable spacing and no. of seeds/hole for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 7,8.12.1959. (iv) (a) 2 bakherings. (b) By dibbling. (c) N.A. (d) and (e) As per treatments. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 23.4.1960.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 spacings between lines : $S_1=6''$, $S_2=9''$, $S_3=12''$ and $S_4=15''$.

(2) No of seeds/hole : $R_1=1$, $R_2=2$ and $R_3=3$.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) $36'\times12'$. (b) $32'\times9'$. (v) $2'\times1\frac{1}{2}'$. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—1960. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1188 lb /ac. (ii) 244.5 lb./ac. (iii) Only R effect is significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	S_4	Mean
R_1	1132	1040	1064	938	1044
R_2	1356	1400	1273	1210	1310
R_3	1409	1089	1206	1138	1210
Mean	1299	1176	1181	1095	1188

S.E. of marginal means of S   =   70.6 lb./ac.

S.E. of marginal means of R   =   61.1 lb./ac.

S.E. of body of table   =   122.2 lb./ac.

————

Crop :- Wheat.   Ref :- M.P. 56(54).

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).   Type :- 'C'.

Object :—To study the economy of growing wheat alone and in combination with linseed and gram in mixture.

1. BASAL CONDITIONS :

   (i) (a) N.A. (b) Linseed—Fallow (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 20.11.1956. (iv) (a) 6 harrowing. (b) Drilling. (c) 37.5 srs./ac. (d) 12" between rows. (e) N A. (v) Nil. (vi) *Desi pissi* (medium). (vii) Unirrigated. (viii) Nil. (ix) 7.18". (x) Nil.

2. TREATMENTS :

   4 treatments : T_1=Wheat alone, T_2=Wheat sown with gram in 4 : 1 ratio, T_2=Wheat sown with linseed in 8 : 1 ratio and T_4=Wheat sown with gram and linseed in 8 : 1 : 1 ratio.

3. DESIGN :

   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 24'×30'. (b) 20'×24'. (v) 2'×3'. (vi) Yes.

4. GENERAL :

   (i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956—not contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

   (i) 618 lb./ac. (ii) 83.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3	T_4
Av. yield	671	615	627	557

   S.E./mean = 41.8 lb./ac.

Crop :- Wheat *(Rabi).*   Ref :- M.P. 54(78).

Site :- Govt. Soil Cons. Res. Stn., Phanda.   Type :- 'C'

Object :—To find out optimum seed rate for Wheat.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) *Jowar, sannhemp* as G.M. for Wheat. (c) Nil. (ii) (a) Black cotton soil. (b) N A. (iii) 2.11.1954. (iv) (a) 7 *bakherings.* (b) Drilled. (c) As per treatments. (d) and (e) N.A. (v) G.M. with *sannhemp.* Fertilizers mixture at 20 srs./ac. added at the time of burying *sannhemp.* (vi) C—591. (vii) Unirrigated. (viii) and (ix) N.A. (x) 22.3.1955.

2. TREATMENTS :

   4 seed rates : R_1=25, R_2=30, R_3=35 and R_4=40 srs./ac.

3. DESIGN :

   (i) R.B.D. (ii) (a) 4. (b) 41'×164'. (iii) 4. (iv) (a) 41'×41'. (b) 33'×33'. (v) 4'×4'. (vi) Yes.

4. GENERAL :

   (i) N.A. (ii) A few plants affected with smut were burnt. (iii) Av. height, no. of tillers, weight of grain and *bhusa.* (iv) (a) 1954—1955. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

   (i) 652 lb./ac. (ii) 38.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of wheat in lb./ac.

Treatment	R_1	R_2	R_3	R_4
Av. yield	581	766	633	627

   S.E./mean = 19.2 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 55(82).**

Site :- Govt. Soil Cons. Res. Stn., Phanda.   **Type :- 'C'.**

Object :—To study the effect of harrowing on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) As per treatment. (b) Drilled by *Nari.* (c) 80 lb./ac. (d) Between rows 12". (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 0.70". (x) 23.3.1956.

2. TREATMENTS :

3 cultural practices of harrowing : H_1=Once every month, H_2=Once in alternate month and H_3=Only once in rainy season before sowing.

3. DESIGN :

(i) R.B.D (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 125'×40'. (b) 121'×36'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 390 lb./ac. (ii) 78.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb /ac

Treatment	H_1	H_2	H_3
Av. yield	507	430	232

S.E./mean = 39.4 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 56(88).**

Site :- Govt. Soil Cons. Res. Stn., Phanda.   **Type :- 'C'.**

Object :—To study the effect of harrowing on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 4.11.1956. (iv) (a) As per treatment. (b) Drilled by *Nari.* (c) 80 lb./ac. (d) Between rows 12". (e) N.A. (v) N.A. (vi) C—591. (vii) Unirrigated. viii) N.A. (ix) 4.09". (x) 29 and 30 3.1957.

2. TREATMENTS to 4. GENERAL

Same as in expt. no. 55(82) above.

5. RESULTS :

(i) 637 lb./ac. (ii) 121.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	H_1	H_2	H_3
Av yield	914	572	425

S.E./mean = 60.7 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 55(83).**

Site :- Govt. Soil Cons. Res. Stn., Phanda.   **Type :- 'C'.**

Object :—To study the effect of cultural treatment on the yield of Wheat and moisture conservation.

1. **BASAL CONDITIONS:**

   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 10.11.1955 and 11.11.1955. (iv) (a) As per treatments. (b) Drilling by *Nari*. (c) 80 lb./ac. (d) Row to row 12″. (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 0 70″. (x) 21 to 23.3.1956.

2. **TREATMENTS:**

   3 cultural treatments : T_1=Harvesting of wheat leaving 6″ stubbles, T_2=Ploughing of field after harvest and T_3=Ploughing of field and spreading 3 tons/ac. of straw before rains. Straw was spreaded on 15.6.1955.

3. **DESIGN:**

   (i) R.B D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 64½′×40′. (b) 60½′×36′. (v) 2′×2′. (vi) Yes.

4. **GENERAL:**

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

5. **RESULTS:**

   (i) 323 lb./ac. (ii) 61.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3
Av. yield	251	338	380

   S.E./mean = 30.8 lb./ac.

   ————

   Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(118).**

   Site :- Govt. Soil Cons. Res. Stn., Phanda.   **Type :- 'C'.**

   Object :—To find out the optimum seed rate for Wheat crop.

1. **BASAL CONDITIONS:**

   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 28.10.1959. (iv) (a) 1 ploughing and 4 *bakherings*. (b) Drilling. (c) As per treatments. (d) N.A. (e) N.A. (v) 15 lb./ac. of N+15 lb./ac. of P_2O_5. (vi) H.Y.—65. (vii) Unirrigated. (viii) Nil. (ix) 6.82″. (x) 20.3.1960.

2. **TREATMENTS:**

   4 seed rates : R_1=60, R_2=70, R_3=80 and R_4=90 lb./ac.

3. **DESIGN:**

   (i) R.B D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 37′×26′. (b) 33′×22′. (v) 2′×2′. (vi) Yes.

4. **GENERAL:**

   (i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) N A.

3. **RESULTS:**

   (i) 900 lb./ac. (ii) 123.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3	R_4
Av. yield	882	924	936	856

   S E./mean = 55.0 lb./ac.

   ————

   Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(120).**

   Site :- Govt. Soil Cons. Res. Stn., Phanda.   **Type :- 'C'.**

   Object :—To study the effect of cultural operations on the yield of Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 2.11.1959. (iv) (a' 1 ploughing and 4 *bakherings*. (b) Drilling. (c) 80 lb./ac. (d) 12"×3". (e) N.A- (v) Nil. (vi) H.Y.−65. (vii) Unirrigated. (viii) As per treatments. (ix) 1.09". (x) 19.3.1960.

2. **TREATMENTS :**

   2 cultural treatments : T_0=Control and T_1=1 weeding and hoeing.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 37'×20½'. (b) 33'×16½'. (v) 2'×2'. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) N.A.

5. **RESULTS :**

   (i) 1100 lb./ac. (ii) 63.7 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1
Av. yield	1069	1131

   S.E./mean = 26.0 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 58(46).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'C'.**

Object :—To study the effect of sowing of Wheat in different directions.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) *Morand.* (b) Refer soil analysis, Powarkheda.· (iii) 7.11.1958. (iv) (a) Crossed *bakherings*. (b) Line sowing by *Nari*. (c) 80 lb./ac. (d) Line to line 12". (e) N.A. (v) N.A. (v·) H.Y.−11 (mid-late). (vii) Unirrigated. (viii) to (x) N.A.

2. **TREATMENTS :**

   Sowing in two d.rections : D_1=East-West and D_2=North-South.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 24'×45'. (b) 19'×39'. (v) 2.5'×3'. (vi) Yes.

4. **GENERAL :**

   (i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1958−1960. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) N.A. (vii) Nil.

5. **RESULTS :**

   (i) 1559 lb./ac. (ii) 62.7 lb./ac. (iii) Treatment difference is significant. (iv) Av. yield of grain in lb./ac.

Treatment	D_1	D_2
Av. yield	1615	1503

   S.E./mean = 25.6 lb./ac.

Crop :- Wheat *(Rabi)*.   **[Ref :- M.P. 59(50).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'C'.**

Object :—To study the effect of sowing of Wheat in different directions.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) (a) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 2.11.1959. (iv) (a) Crossed *bakhering.* (b) Line sowing by *Nari.* (c) 80 lb./ac. (d) Between rows 12". (e) N.A. (v) Nil. (vi) H.Y.— 11 (mid-late). (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 25.3.1960.

2. **TREATMENTS :**

Sowing in two directions : D_1=East-West and D_2=North-South.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 33'×16½'. (b) 31'×14'. (v) 1'×1.25'. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1958—1960. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

(i) 1133 lb./ac. (ii) 46.0 lb./ac. (iii) Treatment difference is significant. (iv) Av. yield of grain in lb./ac.

Treatment	D_1	D_2
Av. yield	1133	1134

S.E./mean = 17.8 lb./ac.

————

Crop :- Wheat *(Rabi).* **Ref :- M.P. 58(45).**

Site :- Govt. Wheat Res. Farm, Powarkheda. **Type :- 'C'.**

Object :—To find out suitable spacing and seeds/hole for Wheat crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) (a) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 15.11.1958. (iv) (a) Crossed *bakherings.* (b) Dibbling. (c) N.A. (d) and (e) As per treatments. (v) N.A. (vi) H.Y.—65 (medium). (vii) Irrigated. (viii) Nil. (ix) and (x) N.A.

2. **TREATMENTS :**

All combinations of (1) and (2)
(1) 3 spacings between rows : S_1=6", S_2=9" and S_3=12".
(2) 3 seeds/hole : R_1=1, R_2=2 and R_3=3.
Spacing between hill to hill is 4".

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 36'×16½'. (b) 26.4'×16½'. (v) A guard row of 4'8" along the breadth of plot. (vi) Yes.

4. **GENERAL :**

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1958—1960. (b) No. (c) Nil. (v) to (vii) N.A.

5. **RESULTS :**

(i) 2336 lb./ac. (ii) 271.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean
S_1	2377	2427	1997	2268
S_2	2359	2567	2411	2446
S_3	1938	2492	2455	2295
Mean	2225	2495	2288	2336

S.E. of any marginal mean = 78.3 lb./ac.
S.E. of body of table = 135.7 lb./ac.

————

Crop :- Wheat *(Rabi).*   Ref :- M.P. 59(49).

Site :- Govt. Wheat Res. Farm, Powarkheda.   Type :- 'C'.

Object :—To find out suitable spacing and seeds/hole for Wheat crop.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 17 to 19.11.1959.
   (iv) (a) Preparatory tillage. (b) Dibbling. (c) N.A. (d) and (e) As per treatments. (v) Nil. (vi) H.Y.—65
   (medium). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 26.3.1960.

2. TREATMENTS to 4. GENERAL :

   Same as in expt. no. 58(45) on page 275.

5. RESULTS :

   (i) 3321 lb./ac. (ii) 325.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean
S_1	3310	3174	3302	3262
S_2	3066	3302	3559	3309
S_3	3356	3213	3605	3391
Mean	3244	3230	3489	3321

   S.E. of any marginal mean   =   94.0 lb./ac.
   S.E. of body of table   =   162.8 lb./ac.

Crop :- Wheat *(Rabi).*   Ref :- M.P. 58(44).

Site :- Govt. Wheat Res. Farm, Powarkheda.   Type :- 'C'.

Object :—To study the effect of different methods of sowing with different seed rates.

1. BASAL CONDITIONS :

   (i) (a) to (c) N.A. (ii) (a) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 3.11.1958. (iv) (a) Cross
   bakherings. (b) and (c) As per treatments. (d) 12″ between rows. (e) N.A. (v) 30 lb./ac. of N as A/S+
   30 lb./ac. of P_2O_5 as Super. (vi) H.Y.—65 (medium). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 11.4.1959.

2. TREATMENTS :

   All combinations of (1) and (2)
       (1) 2 methods of sowing : M_1=Broadcast and M_2=Line sowing.
       (2) 2 seed rates : R_1=60 and R_2=80 lb./ac.

3. DESIGN :

   (i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 16½′×33′. (b) 14′×31′. (v) 1.25′×1′. (vi) Yes.

4. GENERAL :

   (i) Satisfactory. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1958—1960. (b) No. (c) Nil. (v) to
   (vii) N.A.

5. RESULTS :

   (i) 1875 lb./ac. (ii) 136.6 lb./ac. (iii) M effect and M×R interaction are highly significant. R effect is not
   significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	Mean
M_1	1696	1625	1660
M_2	1960	2219	2090
Mean	1828	1922	1875

S.E. of any marginal mean* = 39.5 lb./ac.

S.E. of body of table   = 55.8 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(48).**

Site :- Govt. Wheat Res. Farm, Powarkheda. **Type :- 'C'.**

Object :—To study the effect of different methods of sowing with different seed rates.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 30 lb./ac. of N as A/S+30 lb./ac. of P_2O_5. (ii) (a) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 7.11.1959. (iv) (a) Crossed *bakhering.* (b) and (c) As per treatments. (d) 12″ between rows. (e) N.A. (v) 30 lb./ac. of N and 30 lb./ac. of P_2O_5. (vi) H.Y.—65 (medium). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 29.3.1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(44) on page 276.

5. RESULTS :

(i) 1892 lb./ac. (ii) 192.0 lb./ac. (iii) Only M effect is highly significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	Mean
M_1	2159	2157	2158
M_2	1565	1688	1626
Mean	1862	1922	1892

S.E. of any marginal mean = 55.5 lb./ac.

S.E. of body of table   = 78.4 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 58(67).**

Site :- State Mechanised Farm, Reora (Satna). **Type :- 'C'.**

Object :—To find out the optimum spacing and seeds/hole for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 2.12.1958 and 3.12.1958. (iv) (a) Ploughing by *desi* plough. (b) Dibbling. (c) N.A. (d) and (e) As per treatments. (v) 5000 lb./ac. of F.Y.M.+30 lb./ac. of N as A/S+30 lb./ac. of P_2O_5 as Super. (vi) H.Y.—65. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
  (1) 3 spacings : $S_1=6$, $S_2=9″$ and $S_2=12″$.
  (2) No. of seeds/hole : $R_1=1$, $R_2=2$ and $R_3=3$.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) 16⅔×36′. (b) 14⅔′×30′. (v) 1′×3′. (v) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1958. (b) No. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 21 21 lb./ac. (ii) 269.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean
S_1	1899	2178	2144	2074
S_2	2215	2031	2141	2129
S_3	2085	2255	2144	2161
Mean	2066	2155	2143	2121

S.E. of any marginal mean   = 77.8 lb./ac.
S.E. of body of table   = 134.8 lb./ac.

———

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(45).**

Site :- Govt. Seed and Demons. Farm, Sagar.   **Type :- 'C'.**

Object :—To find out the suitable no. of seeds/hole and spacing for Wheat crop.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A.   (ii) (a) *Mund* I and II.   (b) N.A.   (iii) 16.11.1959.   (iv) 3 *bakherings* and 1   ploughing. (b) Dibbling.   (c) N.A   (d) and (e) As per treatments.   (v) 10 C.L./ac. of F.Y.M.   (vi) H.Y.—65.   (vii) Irrigated.   (viii) Nil.   (ix) N.A.   (x) 4.4.1960.

2. **TREATMENTS :**

   All combinations of (1) and (2)
      (1) 4 spacings between rows : $S_1 = 6''$, $S_2 = 9''$, $S_3 = 12''$ and $S_4 = 18''$.
      (2) No. of seeds/hole : $R_1 = 1$, $R_2 = 2$ and $R_3 = 3$.

3. **DESIGN :**

   (i) Fact. in R.B.D.   (ii) (a) 12.   (b) N.A.   (iii) 4.   (iv) (a) 12'×36'.   (b) 9'×33'.   (v) 1½'×1½'.   (vi) Yes.

4. **GENERAL :**

   (i) Satisfactory.   (ii) Nil.   (iii) Weight of grain.   (iv) (a) 1959—N.A.   (b) and (c) —.   (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 851 lb./ac.   (ii) 163.0 lb./ac.   (iii) None of the effects is significant.   (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean
S_1	811	953	1047	937
S_2	802	821	849	824
S_3	783	954	878	873
S_4	736	746	831	771
Mean	783	868	901	851

S.E. of marginal mean of S   = 47.1 lb./ac.
S.E. of marginal mean of R   = 40.8 lb./ac.
S.E. of body of table   = 81.5 lb./ac.

———

Crop :- Wheat.   **Ref :- M.P. 56(16).**

Site :- R.A.K. Agri. Res. Instt., Sehore.   **Type :- 'C'.**

Object :—To study the optimum seed rate for Wheat crop.

1. **BASAL CONDITIONS :**

   (i) (a) *Sannhemp*—Wheat—Fallow—Gram—*Jowar*—Fallow. 3 years rotation followed. (b) G.M. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 7.11.1956. (iv) (a) 1 ploughing. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 23.3.1957.

2. **TREATMENTS :**

   5 seed rates : $R_1=25$, $R_2=30$, $R_3=35$, $R_4=40$ and $R_5=45$ lb./ac.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 20′×49′. (b) 16′×45′. (v) 2′×2′. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) Attack of rust in a few plants. (iii) Germination, height of the plant, average no. of tillers and weight of grain. (iv) (a) 1956. (b) and (c)—. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 718 lb./ac. (ii) 76.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3	R_4	R_5
Av. yield	666	670	766	741	745

   S.E./mean = 38.1 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 57(1).**

Site :- R.A.K. Agri. Res. Instt., Sehore.   **Type :- 'C'.**

Object :—To find out the optimum seed rate and time of sowing for Wheat crop.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Fallow. (c) Nil (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments. (iv) (a) Ploughing by country plough, *bakherings*. (b) Drilling. (c)As per treatments. (d) Between rows 12″. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Unirrigated. (viii) and (ix) Nil. (x) 9.3.1958. for D_1, 12.3.1958. for D_2, 31.3.1958 for D_3, and 1.4.1958. for D_4.

2. **TREATMENTS :**

   Main-plot treatments
   4 dates of sowing .D_1=15th Oct., D_2=25th Oct. D_3=5th Nov. and D_4=15th Nov., 1957.
   Sub-plot treatments
   3 seed rates : R_1=32, R_2=40 and R_3=48 srs./ac.

3. **DESIGN :**

   (i) Split-plot. (ii) (a) 4 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 37′×26′. (b) 33′×22′. (v) 2′×2′. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) Nil. (iii) Height and tillers of 5 plants per plot, yield of grain and *bhusa*. (iv) (a) 1957—contd. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 432 lb./ac. (ii) (a) 258.6 lb./ac. (b) 104.4 lb./ac. (iii) Only R effect is highly significant. (iv)Av. yield of grain lb./ac.

	D_1	D_2	D_3	D_4	Mean
R_1	105	514	420	412	363
R_2	330	521	431	454	434
R_3	371	611	529	488	500
Mean	269	549	460	451	432

S.E. of difference of two

1	D marginal means	=	105.6 lb./ac.
2	R marginal means	=	36.9 lb./ac.
3	R means at the same level of D	=	73.8 lb./ac.
4	D means at the same level of R	=	121.6 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 57(2).**

Site :- R.A.K. Agri. Res. Instt., Sehore.   **Type :- 'C'.**

Object :—To study the effect of different number of bakherings, different spacings and the seed rates for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 28.10.1957. (iv) (a) Ploughing with country plough and *bakhering*. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Unirrigated. (viii) Nil. (ix) Nil. (x) 13 to 18.3.1958.

2. TREATMENTS :

Main-plot treatments :
3 frequincies of *bakherings* : $T_1=2$, $T_2=4$ and $T_3=6$.

Sub-plot treatments :
3 spacings between lines : $S_1=9''$, $S_2=12''$ and $S_3=15''$.

Sub-Sub-plot treatments :
4 seed rates : $R_1=30$, $R_2=35$, $R_3=40$ and $R_4=45$ srs./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot and 4 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) 37'×26'. (b) 33'×22'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Very good. (ii) Nil. (iii) Height of plants and no. of tillers of 5 plants/plot, yield of grain and *bhusa*. (iv) (a) 1957—contd. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 701 lb./ac. (ii) (a) 180.0 lb./ac. (b) 103.8 lb./ac. (c) 117.6 lb./ac. (iii) Only R effect is highly significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	Mean	R_1	R_2	R_3	R_4
T_1	744	690	697	710	801	828	731	482
T_2	633	669	681	661	646	752	775	471
T_3	709	729	757	732	806	802	841	478
Mean	695	696	711	700	751	794	782	477

	S_1	S_2	S_3
R_1	776	722	754
R_2	757	808	818
R_3	785	777	785
R_4	464	478	489

S.E. of difference of two

1. T marginal means	= 36.7 lb./ac.	5. T means at the same level of S	= 47.4 lb./ac.
2. S marginal means	= 21.2 lb./ac.	6. R means at the same level of T or S	= 48.0 lb./ac.
3. R marginal means	= 27.7 lb./ac.	7. T means at the same level of R	= 55.2 lb./ac.
4. S means at the same level of T	= 36.7 lb./ac.	8. S means at the same level of R	= 46.8 lb./ac.

Crop :- Wheat.

Site :- R.A.K. Agri. Res. Instt., Sehore.

Object :—To study the effect of mixed sowing of different legumes with Wheat on its growth and yield.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 30.10.1957. (iv) (a) Ploughing and *bakhering*. (b) Drilling. (c) 65 lb./ac. for wheat and 20 lb./ac. for legumes. (d) and (e) N.A. (v) Nil. (vi) Wheat : C—591, Pea : NP—29, Gram : T—87 and *Teura* : desi. (vii) Unirrigated. (viii) and (ix) N.A. (x) *Teura* 18.2.1958, Pea 18.2.1958, wheat and gram 26.3.1958.

2. **TREATMENTS :**

   T_1 = Wheat alone, T_2 = Wheat+Gram, T_3 = Wheat+Peas and T_4 = Wheat+*Teura*.

3. **DESIGN :**

   (i) R B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 37′×20.5′. (b) 33′×16.5′. (v) 2′×2′. (vi) Yes.

4. **GENERAL :**

   (i) Fair. (ii) Nil. (iii) Height and yield of grain and straw. (iv) (a) 1957—N.A. (b) and (c) N.A. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 160 lb./ac. (ii) 137.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_1	T_2	T_3	T_4
Av. yield	264	116	156	105

   S.E./mean = 61.6 lb./ac.

Crop :- Wheat.

Site :- Govt. Exptl. Farm, Vidisha.

Object :—To find out optimum spacing and seed rate for Wheat crop.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Gram. (c) N.A. (ii) (a) Heavy clay. (b) N.A. (iii) 5 to 7.11.1956. (iv) (a) *Bakhering*. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Ujjain no. 22 (late). (vii) Unirrigated. (viii) Hand weeding. (ix) 4.89″. (x) 29.4.1957.

2. **TREATMENTS :**

   All combinations of (1) and (2)
   (1) 3 spacings between rows : S_1 = 6″, S_2 = 9″ and S_3 = 12″.
   (2) 3 seed rates : R_1 = 40, R_2 = 48 and R_3 = 60 lb./ac.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) and (b) 94′×35′. (v) Nil. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) Affected by rust. Suffered due to termides and wire work. (iii) Height of plant, no of tillers, weight of *bhusa* and grain. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 1018 lb./ac. (ii) 112.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean
S_1	1016	1129	989	1045
S_2	1072	1048	934	1018
S_3	1034	1011	925	990
Mean	1041	1063	949	1018

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

Crop :- Wheat.   **Ref :- M.P. 57(9).**

Site :- Govt. Exptl. Farm, Vidisha.   **Type :- 'C'.**

Object :—To find out optimum spacing and seed rate for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Heavy clay. (b) N.A. (iii) 17.10.1957. (iv) (a) 6 *bakherings.* (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Ujjain no. 22 (*valgare*). (vii) Un-irrigated. (viii) Weeding. (ix) 0.72". (x) 16.3.1958.

2. TREATMENTS :

Main-plot treatments :
   3 spacings between rows : $S_1=9''$, $S_2=12''$ and $S_3=18''$.
Sub-plot treatments :
   4 seed rates : $R_1=20$, $R_2=25$, $R_3=30$ and $R_4=40$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 48'×15'. (v) 2 feet all round the plot was left fallow. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Weight of grain. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 580 lb./ac. (ii) (a) 183.3 lb./ac. (b) 125.2 lb./ac. (iii) Only R effect is highly significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_1	403	376	601	663	511
S_2	486	571	708	744	627
S_3	495	565	648	695	601
Mean	461	504	652	701	580

S.E. of difference of two
   1. S marginal means = 64.8 lb /ac.
   2. R marginal means = 51.1 lb./ac.
   3. R means at the same level of S = 88.3 lb./ac.
   4. S means at the same level of R = 100.4 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 58(39).**

Site :- Govt. Exptl. Farm, Vidisha.   **Type :- 'C'.**

Object :— To find out the most suitable seed rate and spacing for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Peas. (c) N.A. (ii) (a) Heavy clay. (b) N.A. (iii) 9.11.1958. (iv) 2 *bakherings.* (b) Line sowing. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) N.P.—718. (vii) Unirrigated. (viii) N.A. (ix) 3.66″. (x) 30 and 31.3.1959.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 spacings between rows : $S_1 = 9''$, $S_2 = 12''$, and $S_3 = 18''$.
(2) 4 seed rates : $R_1 = 20$. $R_2 = 25$, $R_3 = 30$ and $R_4 = 40$ srs./ac.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 40′×18′ (b) 36′×14′. (v) 2′×2′. (vi) Yes.

4. GENERAL :

(i) Germination and growth satisfactory. (ii) Nil. (iii) Height of 5 random plants/plot, germination stand count per sq. yard. Weight of grain and straw. (iv) (a) 1956—1959. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1485 lb./ac. (ii) 155.3 lb./ac. (iii) Only R effect is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_1	1391	1474	1651	1541	1514
S_2	1567	1350	1415	1454	1447
S_3	1495	1277	1579	1627	1495
Mean	1484	1367	1549	1541	1585

S.E. of marginal mean of S = 38.8 lb./ac.
S.E. of marginal mean of R = 44.8 lb./ac.
S.E. of body of table = 77.7 lb./ac.

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Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(36).**

Site :- Govt. Exptl. Farm, Vidisha.   **Type :- 'C'.**

Object :—To find out the most suitable seed rate and spacing for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 10 C.L/ac. of F.Y.M. (ii) (a) Heavy clay. (b) N.A. (iii) 13.11.1959. (iv) (a) 3 *bakherings.* (b) In line by *Dooffan.* (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) NP—718 (mid-early). (vii) Unirrigated. (viii) N.A. (ix) 4.48″. (x) 31.3.1960.

2. TREATMENTS :

Same as in expt. no. 58(39) on page 282.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 36.3′×15′. (b) 33.3′×13′. (v) 1½′×1′. (vi) Yes.

4. GENERAL :

(i) Germination and crop growth satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1956—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 562 lb./ac. (ii) 173.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_1	440	534	591	572	534
S_2	647	484	707	534	593
S_3	390	653	636	559	559
Mean	492	557	645	555	562

S.E. of marginal mean of S	= 43.3 lb./ac.
S.E. of marginal mean of R	= 50.3 lb./ac.
S.E. of body of table	= 86.5 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 56(19).**

Site :- Govt. Exptl. Farm, Vidisha.   **Type :- 'C'.**

Object :—To find out the suitable seed rate for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (iii) (a) Heavy clay. (b) N.A. (iii) 13.11.1956. (iv) (a) 6 *bakherings*. (b) Drilling. (c) As per treatments. (d) 9″ between lines. (e) N.A. (v) Nil. (vi) Ujjain no. 22 (late). (vii) Unirrigated. (viii) Weeding. (ix) 4.89″. (x) 24.4.1957.

2. TREATMENTS :

4 seed rates : R_1=40, R_2=50, R_3=60 and R_4=70 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 39′×161′. (v) 2′ all round the plot was kept fallow. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Rust affected by termich and wire worms. (iii) Height, no. of earheads, tillering, weight of grain and *bhusa*. (iv) (a) 1956. (b) N.A. (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1136 lb./ac. (ii) 132.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3	R_4
Av. yield	1064	1130	1182	1169

S.E./mean = 66.1 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 59(39).**

Site :- Govt. Exptl. Farm, Vidisha.   **Type :- 'C'.**

Object :—To study the effect of different cultural operations on the conservation of moisture and on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy clay. (b) N.A. (iii) 30.10.1959. (iv) (a) As per treatments. (b) In lines by *Dooffan*. (c) 80 lb /ac. (d) Between lines 12″. (e) N.A. (v) Nil. (vi) C—281 (mid-early). (vii) Unirrigated. (viii) N.A. (ix) 4.48″. (x) 23.3.1960.

2. TREATMENTS :

All combinations of (1) and (2)+two extra treatments E_1 and E_2
- (1) 2 ploughings : T_1=Deep and T_2=Shallow.
- (2) 3 harrowings : H_0=0, H_1=2 and H_2=3.

E_1=Local practices, E_2=1 deep ploughing+1 harrowing+1 shallow ploughing.
Operations were given on 3.6.1959.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 36′×24′. (b) 30′×18′. (v) 3′×3′. (vi) Yes.

4. GENERAL :

(i) Germination good and growth satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1959—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 967 lb./ac. (ii) 100.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

E_1 = 923 lb./ac. and E_2 = 903 lb./ac.

	H_0	H_1	H_2	Mean
T_1	971	976	995	981
T_2	946	989	1034	990
Mean	958	982	1014	985

S.E. of marginal mean of T = 28.9 lb./ac.
S.E. of marginal mean of H = 35.4 lb./ac.
S.E. of body of table = 50.0 lb./ac.

— — = —

Crop :- Wheat *(Rabi)*.

Site :- State Mechanised Farm, Reora (Satna).

Ref :- M.P. 58(65).
Type :- 'CV'.

Object :—To find out suitable rate for different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 1.12.1958. (iv) (a) Ploughing by *desi* plough. (b) and (c) As per treatments. (d) Line to line 10″. (e) N.A. (v) 100 md/ac. of F.Y.M.+30 lb./ac. of P_2O_5 as Super+15 lb./ac. of N as A/S at the time of sowing+15 lb./ac. of N at the time of tillering. (vi) As per treatments. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

Treatments in one direction :
2 varieties : V_1=C—591 and V_2=H.Y.—65.
Treatments in perpendicular direction :
3 seed rates : R_1=6, R_2=12 and R_3=15 srs/ac.

3. DESIGN :

(i) Strip-plot. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 50′×15′. (b) 43½′×10′. (v) 3¾′×2½′. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1958—N.A. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 1371 lb./ac. (ii) (V) 500.4 lb./ac. (R) 339.6 lb./ac. (VR) 243.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean
V_1	1377	1548	1429	1451
V_2	1162	1414	1298	1291
Mean	1269	1481	1363	1371

S.E. of difference of two

1. V marginal means   = 166.8 lb./ac.
2. R marginal means   = 138.7 lb./ac.
3. R means at the same level of V   = 170.7 lb./ac.
4. V means at the same level of R   = 202.5 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 55(43).**

Site :- Govt. Agri. Res. Stn., Adhartal (Jabalpur).   **Type :- 'CM'.**

Object : — To see the residual effect of application of P applied to pulses on Wheat.

1. BASAL CONDITIONS :

(i) (a) Pulses—Wheat. (b) and (c) As per treatments. (ii) (a) *Kabar* II. (b) N.A. (iii) 7 and 8.11.1955. (iv) (a) N A. (b) Drilling (c) 100 lb./ac. (d) and (e) N.A. (v) Nil. (vi) AO—90 (local). (vii) Unirrigated. (viii) and (ix) N.A. (x) 12 and 13.4.1956.

2. TREATMENTS :

All combinations of (1) and (2) :
    (1) 4 previous crops : C_1=Gram, C_2=Teora, C_3=Masoor and C_4=Peas.
    (2) 3 levels of P_2O_5 : P_0=0, P_1=20 and P_2=40 lb./ac.
P_2O_5 applied at the time of sowing the pulses.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 5. (iv) (a) 45'×24'. (b) 39'×18'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—contd. (b) N.A. (c) Nil. (v) (a) Damoh. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 278 lb./ac. (ii) 62.0 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	C_1	C_2	C_3	C_4	Mean
P_0	302	239	278	271	272
P_1	253	336	254	281	281
P_2	276	326	244	281	282
Mean	277	300	259	278	278

S.E. of P marginal mean   = 13.9 lb./ac.
S.E. of C marginal mean   = 16.0 lb./ac.
S.E. of body of table   = 27.7 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 56(48).**

Site :- Govt. Agri. Res. Stn., Adhartal (Jabalpur).   **Type :- 'CM'.**

Object :—To see the residual effect of application of P to pulses on the succeeding crop of Wheat.

1. BASAL CONDITIONS :

   (i) (a) Pulses—Wheat. (b) and (c) As per treatments. (ii) (a) *Kabar* II. (b) N.A. (iii) 16.10.1956. (iv) (a) Harrowing. (b) Drilling. (c) 100 lb./ac. (d) and (e) N.A. (v) Nil. (vi) AO—90 (local). (vii) Unirrigated. (viii) 1 weeding. (ix) N.A. (x) 11.4.1957.

2. TREATMENTS and 3. DESIGN :

   Same as in expt no. 55(43) on page 286.

4. GENERAL :

   (i) Good. (ii) Nil. (iii) Av. no. of tillers, av. height and yield of grain. (iv) 1954—contd. (b) Yes. (c) Nil. (v) (a) Damoh, Sugar and Betul. (b) N.A. (vi) Nil (vii) Continuous rains at sowing, Ripening and harves damaged the crop.

5. RESULTS :

   (i) 418 lb./ac. (ii) 97.9 lb./ac. (iii) No effect is significant. (iv) Av. yield of grain in lb./ac.

	C_1	C_2	C_3	C_4	Mean
P_0	443	479	423	379	431
P_1	362	437	402	443	411
P_2	392	412	452	391	412
Mean	399	443	426	404	418

S.E. of P marginal mean = 21 9 lb./ac.
S.E. of C marginal mean = 25.3 lb./ac.
S.E. of body of table = 43.8 lb./ac.

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Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(4).**

Site :- Govt. Agri. Res. Stn., Adhartal (Jabalpur).   **Type :- 'CM'.**

Object :—To study the effect of different manurial doses and different seed rates on Wheat.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Paddy. (c) 1 truck load of town compost/ac. (ii) (a) *Sehra.* (b) Refer soil analysis, Jabalpur. (iii) 28.11.1959. (iv) (a) Ploughing by *Malwa,* ploughing by *Meston,* working *desi* harrow and levelling. (b) Drilled with *desi Nari.* (d) Between lines 1'. (e) As per .treatments. (e) N.A. (v) 5000 lb./ac. of F.Y.M. broadcasted and mixed on 28.11.1959. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 15.4.1960.

2. TREATMENTS :

   All combinations of (1) and (2)

       (1) 3 seed rates : $R_1 = 60$, $R_2 = 80$ and $R_3 = 100$ lb./ac.

       (2) 3 manurial doses : $M_0 = 0$, $M_1 = 20$ lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super and $M_2 = 40$ lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as Super.

   Manures drilled with seed.

3. DESIGN :

   (i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 36'-3"×15'. (b) 34'-3"×13'. (v) 1×1'. (vi) Yes.

4. GENERAL :

   (i) Very low germination and growth much below normal. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1959—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 468 lb./ac. (ii) 146.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	Mean
R_1	493	349	416	419
R_2	432	453	520	468
R_3	563	519	471	518
Mean	496	440	469	468

S.E. of any marginal mean = 42.4 lb./ac.
S.E. of body of table = 73.4 lb./ac.

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Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 59(5).**

Site :- Govt. Agri. Res. Stn., Adhartal (Jabalpur).   **Type :- 'CM'.**

Object :—To study the effect of different manurial doses and different seed rates for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 20 lb./ac. of N as A/S and 20 lb./ac. of N as A/C were applied with and without 20 lb./ac. of P_2O_5 as Super. (ii) (a) *Kabar* II. (b) Refer soil analysis, Jabalpur. (iii) 27.10.1959. (iv) (a) *Bakhering* and *Raja* cutting. (b) Drilled by country *Nari*. (c) As per treatments. (d) Between lines 1'. (e) N.A. (v) 7 C L./ac. of T C. broadcastedin June, 1959. (iv) N.A. (vii)Unirrigated. (viii) N.I. (ix) N.A. (x) 31.3.1960.

2. TREATMENTS :

Main-plot treatments :
    3 seed rates : $R_1 = 6^{\,}$, $R_2 = 80$ and $R_3 = 100$ lb./ac.
Sub-plot treatments :
All combinations of (1) and (2)+2 controls.
    (1) 2 levels of N as A/S $N_1 = 10$ and $N_2 = 20$ lb./ac.
    (2) 2 levels of P_2O_5 as Super $P_1 = 10$ and $P_2 = 20$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 6 Sub-plots/main-plot. (b) 108'×90'. (iii) 4. (iv) (a) 12'×45'. (b) 8'×40'. (v) 2'×2½'. (vi) Yes.

4. GENERAL :

(i) Fair germination and normal crop growth. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1959—N.A. (b) and (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 716 lb./ac. (ii) (a) 127.7 lb./ac. (b) 138.1 lb./ac. (iii) Main effects of R and N and interactions R×N and R×P are significant. 'Control vs. others' effect is highly significant while other effects are not significant. (iv) Av. yield of grain in lb /ac.

$N_0P_0R_1$ = 534 lb /ac. ; $N_0P_0R_2$ = 601 lb./ac. and $N_0P_0R_3$ = 626 lb./ac.

	R_1	R_2	R_3	Mean	N_1	N_2
P_1	729	813	740	761	745	777
P_2	596	943	857	799	721	876
Mean	662	878	798	780	733	826
N_1	651	756	791			
N_2	673	1000	806			

S.E. of difference of two

1.	R marginal means	=	45.1 lb./ac.
2.	N or P marginal means	=	40.0 lb./ac.
3.	N or P means at the same level of R	=	69.1 lb./ac.
4.	R means at the same level of N or P	=	66.5 lb./ac.
5.	R means under N_0P_0	=	66.5 lb./ac.
	S.E. of body of N×P table	=	40.0 lb./ac.

——————

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 58(11).**

Site :- Govt. Seed and Demons. Farm, Amlaha.   **Type :- 'CM'.**

Object :—To study the effect of different manurial doses and different seed rates for Wheat crop.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) (a) *Kabar.* (b) Refer soil analysis, Amlaha. (iii) 17.11.1958. (iv) (a) *Bakhering.* (b) Drilled. (c) As per treatments. (d) Between rows 12″. (e) N.A. (v) Nil. (vi) C—591. (vii) Unirrigated. (viii) and (ix) N.A. (x) 30.3.1959.

2. **TREATMENTS :**

All combinations of (1) and (2)
     (1) 3 seed rates : $R_1=60$, $R_2=80$ and $R_3=100$ lb./ac.
     (2) 3 manurial doses : $M_0=0$, $M_1=10$ lb./ac. of N as A/S+10 lb./ac. of P_2O_5 · as Super and $M_2=20$
                 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 1/80 ac. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. **GENERAL :**

(i) and (ii) N.A. (iii) Av. height, no. of tillers and grain yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Plot wise yield not recorded. Only av. yield treatment wise was recorded.

5. **RESULTS :**

(i) 505 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	Mean
R_1	355	487	621	488
R_2	355	355	658	456
R_3	366	636	710	571
Mean	359	493	663	505

S.E.—N.A.

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Crop :- Wheat.   **Ref :- M.P. 56(34).**

Site :- Govt. Seed and Demons. Farm, Betul.   **Type :- 'CM'.**

Object :—To study the effect of different seed rate and manurial doses on different varieties of Wheat.

1. **BASAL CONDITIONS :**

(i) (a) N.A. (b) Wheat. (c) 40 C.L./ac. of F.Y.M. (ii) (a) *Morand* II. (b) Refer soil analysis, Betul. (iii) 14.11.1956. (iv) (a) 4 *bakherings.* (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) 40 C.L./ac. of F.Y.M. (vi) As per treatments. (vii) Irrigated. (viii) to (x) N.A.

2. **TREATMENTS :**

All combinations of (1), (2) and (3)
     (1) 3 seed rates : $R_1=60$, $R_2=80$ and $R_3=100$ lb./ac.
     (2) 3 manurial doses : $M_1=20$ lb./ac. of N+20 lb./ac. of P_2O_5, $M_2=2$ M_1 and $M_3=3$ M_1.
     (3) 3 varieties : $V_1=Hy-65$ (early), $V_2=Local$ *banri* and $V_3=Local$ *pissi.*

3. DESIGN :

(i) 3^3 Fact. confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) $24' \times 45'$. (b) $18' \times 39'$. (v) $3' \times 3'$. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Severe attack of black rust on local varieties. (iii) Grain yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Expt. was laid out as 3^3 confounded but has been analysed as an R.B.D. because two local varieties were totally damaged by rust, and were left out. Experiments conducted during the years 1954 and 1955 may be seen under 'CMV'.

5. RESULTS :

(i) 2397 lb./ac. (ii) 202.1 lb./ac. (iii) Only M effect is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean
M_1	1984	2573	2077	2211
M_2	2387	2294	2387	2356
M_3	2635	2790	2449	2625
Mean	2335	2552	2304	2397

S.E. of any marginal mean	=	82.5 lb./ac.
S.E. of body of table	=	142.9 lb./ac.

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Crop :- Wheat *(Rabi).*   **Ref :- M.P. 56(87).**

Site :- Govt. Exptl. Stn., Chindwara.   **Type :- 'CM'.**

Object :—To find out the residual effect of pulses on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Wheat after Pulses. (b) and (c) As per treatments. (ii) (a) *Morand* II. (b) N.A. (iii) 7.11.1956. (iv) (a) *Bakhering* and ploughing. (b) Sown by *Nari.* (c) 80 lb./ac. (d) Row to row 10". (e) NA. (v) Nil. (vi) N A. (vii) Irrigated. (viii) N.A. (ix) 2.50". (x) 9.4.1957.

2. TREATMENTS :

Main-plot treatments :
All combinations of (1) and (2)

     (1) 4 previous pulse crops : C_1=Gram, C_2=*Masoor*, C_3=Peas and C_4=Lakh.

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

Sub-plot treatments :
     2 levels of N as A/S : N_0=0 and N_1=20 lb./ac.
N applied at sowing of Wheat.

3. DESIGN :

(i) Split-plot. (ii) (a) 12 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/124 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Rust infestation on leaves was noticed. (iii) Grain yield. (iv) (a) No. (b) and (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1499 lb./ac. (ii) (a) 292.6 lb./ac. (b) 140.7 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in lb./ac.

	C_1	C_2	C_3	C_4	Mean	N_0	N_1
P_0	1566	1496	1618	1480	1540	1206	1874
P_1	1323	1527	1494	1570	1479	1166	1792
P_2	1385	1517	1527	1481	1478	1177	1778
Mean	1425	1513	1546	1510	1499	1183	1815
N_0	1100	1201	1237	1193			
N_1	1750	1825	1856	1828			

S.E. of difference of two

1. C marginal means = 75.5 lb./ac.
2. P marginal means = 65.4 lb./ac.
3. N marginal means = 25.7 lb./ac.
4. C means at the same level of N = 83.8 lb./ac.
5. N means at the same level of C = 51.4 lb./ac.
6. P means at the aame level of N = 72.6 lb./ac.
7. N means at the same level of P = 44.5 lb./ac.
S.E. of body of P×C table = 92.5 lb./ac.

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Crop :- Wheat *(Rabi)*.

Site :- Instt. of Plant Industry, Indore.

Ref :- M.P. 54(119).

Type :- 'CM'.

Object :—To compare the effect of A/S and C/N for increasing the yield of wheat with and without mulching.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) *Moong*-type 1. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.11.1954. (iv) (a) One *bakhering*. (b) Drilling. (c) 60 lb./ac. (d) 14″ between rows. (e) N.A. (v) Nil. (vi) E—69. (vii) Unirrigated. (viii) Three intercultures at the interval of one month. (ix) 1.23″. (x) 29.3.1955.

2. **TREATMENTS :**

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

    (1) 2 sources of N : S_1=A/S and S_2=Sodium nitrate.

    (2) 3 levels of N : N_0=0, N_1=20 and N_2=40 lb./ac.

    (3) 2 mulchings : M_0=No mulching and M_1=Mulching.

Fertilizers applied at the time of sowing.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 40′×14′. (b) 35′×11⅔′. (v) 2½′×1¼′. (vi) Yes.

4. **GENERAL :**

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

5. **RESULTS :**

(i) 602 lb./ac. (ii) 98.6 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 517 lb./ac.

	S_1	S_2	Mean	M_0	M_1
N_1	577	636	606	573	639
N_2	681	681	681	672	690
Mean	629	658	644	623	665
M_0	619	627			
M_1	639	690			

S.E. of any marginal mean or control mean			=	24.7 lb./ac.
S.E. of body of any table			=	34.9 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 54(121).**

Site :- Instt. of Plant Industry, Indore.   **Type :- 'CM'.**

Object :—To compare the effect on the yield of Wheat of Fallow V/S Moong-Type-I grown as catch crop and for G.M. with and without the application of P_2O_5.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) As per treatments. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.11.1954. (iv) (a) One *bakhering.* (b) Seed sown by drilling. (c) 60 lb./ac. (d) 14″ between rows. (e) N.A. (v) Nil. (vi) E—69. (vii) Unirrigated. (viii) Nil. (ix) 1.23″. (x) 4 to 6.4.1955.

2. TREATMENTS :

All combinations of (1) and (2)

    (1) 3 G.M. crops : C_0=Fallow, C_1=*Moong* Type-I as catch crop, C_2=*Moong* Type-I for G.M.

    (2) 2 levels of P_2O_5 As super : P_0=0 and P_1=30 lb./ac.

P_2O_5 applied 3 weeks before sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 60′×11¾′. (b) 55′×7′. (v) 2¼′×2¼′. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 565 lb./ac. (ii) 50.6 lb./ac. (iii) Main effect of C alone is highly significant. (iv) Av. yield of grain in lb./ac.

	C_0	C_1	C_2	Mean
P_0	579	450	667	565
P_1	583	469	642	565
Mean	581	460	655	565

S.E. of C marginal mean	=	14.7 lb./ac.
S.E. of P marginal mean	=	11.9 lb./ac.
S.E. of body of table	=	20.6 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 55(96).**

Site :- Instt. of Plant Industry, Indore.   **Type :- 'CM'.**

Object :—To study the effect of different crops grown as catch crop and for G.M. with and without P_2O_5 on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) As per treatments. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 31 10.1955. (iv) (a) *Bakhering.* (b) Drilling. (c) 60 lb /ac. (d) 14″ between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 5.22″. (x) 23.3.1956.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 8 G.M. crops : G_0=Fallow, G_1=*Moong* grown as catch crop, G_2=*Moong* grown as G.M., G_3=*Urid* grown as catch crop, G_4=*Urid* grown as G.M., G_5=Cowpea grown as catch crop, G_6=Cowpea grown as G.M. and G_7=*Sannhemp* grown as G.M.

(2) 2 levels of P_2O_5 as Super P_0=0 and P_1=40 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 40'×11⅔'. (b) 35'×7'. (v) 2½'×2½'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 547 lb./ac. (ii) 87.3 lb./ac. (iii) Only main effect of G is highly significant. (iv) Av. yield of grain in lb./ac.

	G_0	G_1	G_2	G_3	G_4	G_5	G_6	G_7	Mean
P_0	481	461	547	511	608	481	558	639	536
P_1	503	464	575	611	583	456	614	658	558
Mean	492	462	561	561	596	468	586	649	547

S.E. of G marginal mean = 30.9 lb./ac.
S.E. of P marginal mean = 15.4 lb./ac.
S.E. of body of table = 43.6 lb./ac.

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Crop :- **Wheat** *(Rabi).*

Ref :- **M.P. 59(129).**

Site :- **Instt of Plant Industry, Indore.**

Type :- **'CM'.**

Object :—To find out the best leguminous crop with suitable doses of manures for getting higher yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Urid*—Cowpea—Wheat. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 16.11.1959. (iv) (a) One ploughing and one harrowing. (b) Drilling. (c) 65 lb./ac. (d) 14"×5". (e) N.A. (v) 30 lb./ac. of P_2O_5 as Super. (vi) Hy—65. (vii) Irrigated. (viii) 2 weedings. (ix) 2.6". (x) 27.3.1960.

2. TREATMENTS :

1. *Urid* followed by wheat (unmanured).
2. *Urid* (manured with 15 lb./ac. of N as A/S).
3. *Urid* (manured with 15 lb./ac. of P_2O_5) followed by wheat (unmanured).
4. *Urid* (unmanured) followed by wheat (manured with 15 lb./ac. of N as A/S).
5. Cowpeas followed by wheat (unmanured).
6. Cowpeas (manured with 15 lb./ac. of P_2O_5).
7. Cowpeas manured with 15 lb./ac. of P_2O_5 followed by wheat (unmanured).
8. Cowpeas (unmanured) followed by wheat (manured with 15 lb./ac. of N).
9. Wheat followed by wheat (unmanured).
10. Wheat (manured by 15 lb./ac. of P_2O_5 as Super).
11. Wheat (manured with 15 lb./ac. of N followed by wheat (unmanured).
12. Wheat (unmanured) followed by wheat (manured with 15 lb./ac. of N+15 lb./ac. of P_2O_5 as Super).

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) 45'×15'. (b) 40'×12⅔'. (v) 2.5'×1⅛'. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 538 lb./ac. (ii) 86.8 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	9	10	11	12
Av. yield	601	530	524	563	522	544	578	583	517	458	503	529

S.E./mean = 49.8 lb./ac.

Ref :- M.P. 56(91).

Type :- 'CM'.

Crop :- Wheat *(Rabi)*.

Site :- Instt. of Plant Industry, Indore.

Object :—To study the residual effect of green manuring versus catch crop trial on Wheat.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 17.10.1956 (iv) Bakherings. (b) Drilling. (c) 60 lb./ac. (d) 14″ between rows. (e) N.A. (v) and (vi) N.A. (vii) Unirrigated.
(viii) N.A. (ix) 2.12″. (x) 23.3.1957.

2. TREATMENTS :
All combinations of (1) and (2)
(1) 9 leguminous crops preceding Wheat crop : C_0=Fallow, C_1= *Moong* grown as catch crop, C_2= *Moong* grown for G.M., C_3= *Urid* grown as catch crop, C_4= *Urid* grown for G.M., C_5=Cowpeas grown as catch crop, C_6=Cowpeas grown for G.M., C_7= *Sannhemp* grown for G.M. and C_8= Glyricidia for G.M.

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

3. DESIGN :
(i) Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) 40′×11⅔′. (b) 35′×7′. (v) 2½′×2⅓′. (vi) Yes.

4. GENERAL :
(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1956—N.A. (b) and (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 1075 lb./ac. (ii) 183.7 lb./ac. (iii) Main effect of C alone is significant. (iv) Av yield of grain in lb./ac.

	C_0	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	Mean
P_0	1152	788	1328	762	1067	838	1124	1154	1177	1043
P_1	1240	844	1293	874	1344	808	1028	1160	1373	1107
Mean	1196	816	1310	818	1206	823	1076	1157	1275	1075

S.E. of C marginal mean = 64.9 lb./ac.
S.E. of P marginal mean = 30.6 lb./ac.
S.E. of body of table = 91.8 lb /ac.

Ref :- M.P. 59(131).

Type :- 'CM'.

Crop :- Wheat *(Rabi)*.

Site :- Instt. of Plant Industry, Indore.

Object :—To study the effect of leguminous crops on the succeeding crop of Wheat.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) *Urid* and cowpeas. (c) As per treatments (ii) (a) Black cotton soil. (b) N.A.
(iii) 6.11.1959. (iv) (a) 2 ploughings and 2 *bakherings*. (b) Drilling. (c) 80 lb /ac. (d) 12″×3″. (e) N.A.
(v) 5 C.L./ac. of compost. (vi) NP—7 0. (vii) Unirrigated. (viii) 2 weedings and 3 interculturings. (ix) 2.6″.
(x) 18 3.1960.

2. TREATMENTS :

All combinations of (1) and (2)

    (1) 2 leguminous crops : $L_1 = Urid$ and $L_2 =$ Cowpeas.

    (2) 4 manurial treatments : $T_1 =$ Legume crop followed by Wheat without manure, $T_2 =$ Legume crop manured with 15 lb./ac. of N as A/S followed by Wheat without manure, $T_3 =$ Legume crop manured with 15 lb./ac. of P_2O_5 followed by Wheat without manure and $T_4 =$ Legume crop followed by Wheat which is manured with 15 lb./ac. of N as A/S.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 45'×15'. (b) 40'×12⅜'. (v) 2'6"×1'2". (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1528 lb./ac. (ii) 367.4 lb./ac. (iii) L effect is highly significant. (iv) T effect is significant while interaction is not significant... (iv) Av. yield of wheat in lb./ac.

	T_1	T_2	T_3	T_4	Mean
L_1	2437	2294	3699	3240	2918
L_2	95	152	215	95	139
Mean	1266	1223	1957	1668	1528

S.E. of marginal mean of T   = 150.0 lb./ac.
S.E. of marginal mean of L   = 106.1 lb./ac.
S.E. of body of table   = 212.1 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 58(104).**

Site :- Govt. Exptl. Farm, Kuthulia (Rewa).   **Type :- 'CM'.**

Object :— To find out suitable seed rates and doses of N and P for better yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Paddy—Wheat. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 5.11.1958. (iv) (a) 4 ploughings. (b) Line sowings. (c) As per treatments. (d) 9" between rows. (e) N.A. (v) Nil. (vi) Hy—65. (vii) Unirrigated. (viii) Nil. (ix) 1.8". (x) 30.3.1959.

2. TREATMENTS :

All combinations of (1) and (2)

    (1) 3 seed rates : $R_1 = 60$, $R_2 = 80$ and $R_3 = 100$ lb./ac.

    (2) 3 levels of N and P_2O_5 : $M_0 =$ No manure (control), $M_1 = 10$ lb./ac. of N + 10 lb./ac. of P_2O_5 and $M_2 =$ Twice M_1 dose.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 33.5'×13.0'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1026 lb./ac. (ii) 128.0 lb./ac. (iii) Only M effect is highly significant. (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	Mean
R_1	849	1108	1278	1078
R_2	766	1000	1217	994
R_3	788	1076	1153	1006
Mean	801	1061	1216	1026

S.E. of any marginal mean = 36.9 lb./ac.
S.E. of body of table = 64.0 lb./ac.

Crop :- Wheat *(Rabi).*　　　　　　　　　　**Ref :- M.P. 59(142).**

Site :- Govt. Exptl. Farm, Kuthulia (Rewa).　　**Type :- 'CM'.**

Object :—To find out suitable seed rate and doses of N and P for better yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Fallow—Wheat. (b) Fallow. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 7.11.1959. (iv) (a) 4 ploughings. (b) Line sowing. (c) As per treatments. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Hy—65. (vii) Unirrigated. (viii) Nil. (ix) 1.90". (x) 30.3.1960.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 59(5) on page 288.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 581 lb./ac. (ii) (a) 119.5 lb./ac. (b) 105.1 lb./ac. (iii) Control *vs.* others alone is highly significant. (iv) Av. yield of grain in lb./ac.

$N_0P_0R_1$ = 527 lb./ac., $N_0P_0R_2$ = 508 lb./ac. and $N_0P_0R_3$ = 458 lb./ac.

	R_1	R_2	R_3	Mean	N_1	N_2
P_1	612	572	620	602	581	622
P_2	621	624	688	644	624	664
Mean	616	598	654	623	603	643
N_1	596	596	615			
N_2	636	600	693			

S.E. of difference of two
1. R marginal means = 42.3 lb./ac.
2. N or P marginal means = 30.3 lb./ac.
3. N or P means at the same level of R = 52.6 lb./ac.
4. R means at the same level of N or P = 56.3 lb./ac.
5. R means at the same level of N_0P_0 = 56.3 lb./ac.
S.E. of body of N × P table = 30.3 lb./ac

Crop :- Wheat *(Rabi).*　　　　　　　　　　**Ref :- M.P. 59(67).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).　　**Type :- 'CM'.**

Object :—To find out suitable seed rate and dose of fertiliser for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 15.11.1959. (iv) (a) 2 *bakherings* by *bakher*. (b) Drilled by plough. (c) As per treatments. (d) Row to row 12″. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 22.4.1960.

2. TREATMENTS :

Main-plot treatments :

3 seed rates : $R_1=60$, $R_2=80$ and $R_3=100$ lb./ac.

Sub-plot treatments :

All combinations of (1) and (2)+2 controls. (N_0P_0)

(1) 2 levels of N as A/S : $N_1=20$ and $N_2=40$ lb./ac.

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

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 45′×12′. (b) 45′×8′. (v) 2′ at the ends. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) No. (v) N.A. (vi) Nil. (vii) The expt. was conducted as R.B.D. with different fertiliser doses during 1960—1961.

5. RESULTS :

(i) 1538 lb /ac. (ii) (a) 370.4 lb./ac. (b) 249.3 lb./ac. (iii) Control *vs.* other fertilisers effect is significant. (iv) Av. yield of grain in lb /ac.

$$N_0P_0R_1 = 1423 \text{ lb./ac.}, \quad N_0P_0R_2 = 1417 \text{ lb./ac. and } N_0P_0R_3 = 1374 \text{ lb./ac.}$$

	R_1	R_2	R_3	Mean	N_1	N_2
P_1	1565	1569	1652	1595	1607	1584
P_2	1589	1790	1460	1613	1597	1629
Mean	1577	1680	1556	1604	1602	1606
N_1	1526	1729	1552			
N_2	1627	1631	1561			

S.E. of difference of two

1. R marginal means   = 131.0 lb./ac.
2. N or P marginal means   = 72.0 lb./ac.
3. N or P means at the same level of R   = 124.7 lb./ac.
4. R means at the same level of N or P   = 157.9 lb./ac.
5. R means at the same level of N_0P_0 = 116.1 lb./ac.

S.E. of body of table N×P   = 72.0 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(148).**

Site :- Govt. Seed and Demons. Farm, Nowgong.   **Type :- 'CM'.**

Object :—To find out suitable seed rate and doses of N and P for better yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat. (b) G.M. (c) N.A. (ii) (a) Heavy black soil. (b) N.A. (iii) 30.10.1959. (iv) (a) Two ploughings and one *bakhering*. (b) Line sowing. (c) As per treatments. (d) 12″ between rows. (e) Nil. (v) Nil. (vi) C—591. (vii) Unirrigated. (viii) One weeding. (ix) 5.2″. (x) 27.3.1960.

2. TREATMENTS :

Same as in expt. no. 59 (5) on page 288.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 6 sub-plots/main-plot. (b) Nil. (iii) 4. (iv) 45'×12'. (b) 45'×8'. (v) 2' on breadth side both ways. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 826 lb./ac. (ii) (a) 161.9 lb./ac. (b) 161.3 lb./ac. (iii) "Control vs. other treatments" is highly significant. P effect is significant while all others effects are not significant. (iv) Av. yield of grain in lb./ac.

$N_0P_0R_1$ = 644 lb./ac. ; $N_0P_0R_2$ = 800 lb./ac. and $N_0P_0R_3$ = 760 lb./ac.

	R_1	R_2	R_3	Mean	N_1	N_2
P_1	745	830	895	823	859	788
P_2	909	975	873	919	891	947
Mean	847	902	884	871	875	867
N_1	814	961	849			
N_2	880	843	919			

S.E. of difference of two
1. R marginal means   = 57.2 lb./ac.
2. N or P marginal means   = 46.6 lb./ac.
3. N or P means at the same level of R   = 80.7 lb./ac.
4. R means at the same level of N or P   = 80.8 lb./ac.
5. R means at the same level of N_0P_0 = 80.8 lb./ac.
    S.E. of body of table N×P   = 46.6 lb./ae.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 56(4).**

Site :- Govt. Wheat Res. Farm, Pawarkheda.   **Type :- 'CM'.**

Object :—To study the effect of N with different seed rates on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam, *Maryar.* (b) Refer soil analysis, Powarkheda. (iii) 14.11.1956. (iv) (a) *Bakherings.* (b) Drilling with *Nari.* (c) As per treatments. (d) Between lines 1'. (e) N.A. (v) Nil. (vi) Hy—65 (improved early). (vii) Unirrigated. (viii) Nil. (ix) 5.92". (x) 23.4.1957.

2. TREATMENTS :

Main-plot treatments :
    3 seed rates : R_1=60, R_2=80 and R_3=100 lb./ac.
Sub-plot treatments :
    3 levels of N as A/S : N_0=0, N_1=10 and N_2=15 lb./ac.
Mannures drilled with seed.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 16½'×33'. (b) 12½'×30'. (v) 2'×1½'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Severe hail storm just before harvest.

5. RESULTS :

(i) 415 lb /ac. (ii) (a) 62.6 lb./ac. (b) 78.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N₀	N₁	N₂	Mean
R₁	367	394	363	375
R₂	445	452	476	458
R₃	445	387	402	411
Mean	419	411	414	415

S.E. of difference of two

1. R marginal means   = 29.5 lb./ac.
2. N marginal means   = 37.2 lb./ac.
3. N means at the same level of R   = 64.4 lb./ac.
4. R means at the same level of N   =. 60.3 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 58(42).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'CM'.**

Object :—To study the effect of N with different seed rates on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 8.11.1958. (iv) (a) Cross *bakhering.* (b) Drilling by *Nari.* (c) As per treatment. (d) Between rows 12″. (e) N.A. (v) Nil. (vi) Hy—11 (mid late). (vii) Unirrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 56 (4) on page 298.

3. DESIGN :

(i) Split-plot. (ii) 3 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 16½′×33′. (b) 14′×31′. (v) 1¼′×1′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1952—1959. (b) Yes. (c) N.A. (v) and (vi) N.A. (vii) Experiment conducted during 1957 not analysed and as such not included in the compendium. The yield was too poor and to many plots had no yield for which no specific reason is available.

5. RESULTS :

(i) 1050 lb./ac. (ii) (a) 168.2 lb./ac. (b) 99.4 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of grain in lb./ac.

	N₀	N₁	N₂	Mean
R₁	822	1058	1185	1022
R₂	860	1058	1228	1049
R₃	870	1192	1179	1080
Mean	851	1103	1197	1050

S.E. of difference of two

1. R marginal means   = 79.3 lb./ac.
2. N marginal means   = 46.8 lb./ac.
3. N means at the same level of R   = 81.1 lb /ac.
4. R means at the same level of N   = 103.3 lb./ac.

Crop :- Wheat *(Rabi).*

Site :- Govt. Wheat Res. Farm, Powarkheda.

Object :—To study the effect of N with different seed rates on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) Morand. (b) Refer soil analysis, Powarkheda. (iii) 2.11.1959. (iv) (a) Cross *bakhering*. (b) Drilling by *Nari*. (c) As per treatments. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) Hy—11 (medium). (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 25.3.1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(42) on page 299.

5. RESULTS :

(i) 1094 lb./ac. (ii) (a) 75.8 lb./ac. (b) 107.4 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
R_1	993	1156	1140	
R_2	979	1112	1119	1096
R_3	891	1221	1234	1070
				1115
Mean	954	1163	1163	
				1094

S.E. of difference of two

1. R marginal means	= 64.3 lb./ac.
2. N marginal means	= 50.6 lb./ac.
3. N means at the same level of R	= 87.7 lb./ac.
4. R means at the same level of N	= 80.0 lb./ac.

Crop - Wheat.

Site :- Govt. Wheat Res. Farm, Powarkheda.

Object :—To study the residual effect of phosphatic manures applied to leguminous crops on the succeeding crop of Wheat.

1. BASAL CONDITIONS :

(i) (a) Legumes—Wheat. (b) and (c) As per treatments. (ii) (a) Clay loam *maryar*. (b) Refer soil analysis, Powarkheda. (iii) 6.11.1955. (iv) (a) Timely *bakherings*. (b) Seed sown with *Nari*. (c) 80 lb./ac. (d) 1′ between two lines. (e) N.A. (v) Nil. (vi) Hy—11 (improved medium). (vii) Unirrigated. (viii) Nil. (ix) 0.93″. (x) 29.4.1956.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 leguminous crops : C_1=Gram, C_2=*Teora*, C_3=*Masoor* and C_4=K.K. Pea.

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

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 5. (iv) (a) 24′×45′. (b) 18′×39′. (v) 3′×3′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—1955. (b) Yes. (c) Nil. (v) (a) Betul. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 281 lb./ac. (ii) 62.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	C_1	C_2	C_3	C_4	Mean
P_0	267	266	293	232	265
P_1	285	293	329	264	293
P_2	300	257	321	265	286
Mean	284	272	314	254	281

S.E. of C marginal mean   = 16.2 lb./ac.
S.E. of P marginal mean   = 14.0 lb./ac.
S.E. of body of C×P table   = 28.0 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 56(6).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'CM'.**

Object :—To study the effect of phosphatic manures applied to leguminous crops and their residual effect on the succeeding crop of Wheat.

1. BASAL CONDITIONS :

(i) (a) Legumes—Wheat. (b) and (c) As per treatments. (ii) (a) Clay loam—*morand*. (b) Refer soil analysis, Powarkheda. (iii) 7.11.1956. (iv) (a) Timely *bakherings*. (b) Sowing with *Nari* plough. (c) 10 lb./ac. (d) Between rows 1'. (e) Nil. (v) Nil. (vi) Hy—11 (improved medium). (vii) Unirrigated. (viii) Nil. (ix) 5.92". (x) 24.4.1957.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 55(8) on page 300.

4. GENERAL :

(i) Good. (ii) Severe hail storm occurred just before harvest. (iii) Grain yield. (iv) (a) 1954—1955. (b) N.A. (c) Yes. (v) (a) Betul. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 277 lb./ac. (ii) 76.9 lb./ac. (iii) Main effect of C and interaction P×C are significant. (iv) Av. yield of grain in lb./ac.

	C_1	C_2	C_3	C_4	Mean
P_0	244	224	296	324	272
P_1	330	225	411	273	310
P_2	248	274	288	188	250
Mean	274	241	332	262	277

S.E. of C marginal mean   = 19.8 lb./ac.
S.E. of P marginal mean   = 17.2 lb./ac.
S.E. of body of table   = 34.4 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 57(34).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'CM'.**

Object :—To study the residual effect of phosphatic manure applied to leguminous crop on the succeeding crop of Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Wheat—Legumes—Wheat. (b) and (c) As per treatments. (ii) (a) Clay loam—*morand*. (b) Refer soil analysis, Powarkheda. (iii) 17.10.1957. (iv) (a) Timely *bakhering*. (b) Sown with *Nari*. (c) 80 lb./ac. (d) Between rows 12". (e) N.A. (v) Nil. (vi) Hy—11 (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.9". (x) 29.3.1958.

2. **TREATMENTS and** 3. **DESIGN :**

   Same as in expt. no. 55(8) on page 300.

4. **GENERAL :**

   (i) Good. (ii) Nil. (iii) Weight of grain. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (v) (a) Damoh and Betul. (b) N A. (vi) Nil. (vii) Yield is very poor.

5. **RESULTS :**

   (i) 163 lb /ac. (ii) 55.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac

	C_1	C_2	C_3	C_4	Mean
P_0	160	134	152	151	149
P_1	152	175	192	144	166
P_2	167	151	229	145	173
Mean	160	153	191	147	163

   S.E. of C marginal mean = 14.2 lb./ac.
   S E. of P marginal mean = 12.3 lb./ac.
   S.E. of body of C×P table = 24.6 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- M.P. 58(50).**

Site :- Govt. Wheat Res. Farm, Powarkheda. **Type :- 'CM'.**

Object :—To see the residual effect of phosphatic manures applied to leguminous crops on the following crop of Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) As per treatments. (ii) (a) Morand. (b) Refer soil analysis, Powarkheda. (iii) 5.11.1958. (iv) (a) Cross *bakhering*. (b) Line sowing by *Nari*. (c) 80 lb./ac. (d) Row to row 12". (e) N.A. (v) Nil. (vi) Hy—65 (medium). (vii) Unirrigated. (viii) Nil. (ix) and (x) N.A.

2. **TREATMENTS and** 3. **DESIGN :**

   Same as in expt. no. 55(8) on page 300.

4. **GENERAL :**

   (i) Satisfactory. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1954—1959. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 249 lb./ac. (ii) 42.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	C_1	C_2	C_3	C_4	Mean
P_0	224	229	251	224	232
P_1	284	244	267	233	257
P_2	241	268	262	255	257
Mean	250	247	260	237	249

S.E. of C marginal means	=	10.9 lb./ac.
S.E. of P marginal mean	=	9.5 lb./ac.
S.E. of body of C×P table	=	18.9 lb./ac.

Crop :- Wheat *(Rabi)*.

Ref :- M.P. 59(53).

Site :- Govt. Wheat Res. Farm, Powarkheda.

Type :- 'CM'.

Object :—To see the residual effect of phosphatic manures applied to leguminous crops on the following crop of Wheat.

1. **BASAL CONDITIONS :**

(i) (a) to (c) As per treatment. (ii) (a) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 10.11.1959. (iv) (a) Cross *bakhering.* (b) Line sowing by *Nari.* (c) 80 lb./ac. (d) Row to row 12". (e) N.A. (v) Nil. (vi) Hy—65. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 27.3.1960.

2. **TREATMENTS to 4. GENERAL :**

Same as in expt. no. 55(8) on page 300.

5. **RESULTS :**

(i) 467 lb./ac. (ii) 85.2 lb./ac. (iii) Main effect of C alone is significant. (iv) Av. yield of grain in lb./ac.

	C_1	C_2	C_3	C_4	Mean
P_0	424	454	489	447	454
P_1	451	526	544	353	468
P_2	459	458	535	468	480
Mean	445	479	523	423	467

S.E. of C marginal mean	=	22.0 lb./ac.
S.E. of P marginal mean	=	19 1 lb./ac.
S.E. of body of table	=	38.1 lb./ac.

Crop :- Wheat.

Ref :- M.P. 54(81).

Site :- Govt. Wheat Res. Farm, Powarkheda.

Type :- 'CM'.

Object :—To study the effect of cultural practices in the presence and absence of manures.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) 15 lb./ac. of N+15 lb./ac. of P_2O_5. (ii) (a) Clay loam, *maryar.* (b) Refer soil analysis, Powarkheda. (iii) 4.11.1954. (iv) (a As per treatments. (b) Drilling with *Nari* plough. (c) 80 lb./ac. (d) Between lines 12". (e) N.A. (v) Nil. (vi) Hy—11 (improved-medium). (vii) Unirrigated. (viii) Nil. (ix) 1.83". (x) 14.3.1955.

2. **TREATMENTS :**

All combinations of (1) and (2)+2 extra treatments.
(1) 2 cultural practices applied in summer : C_1=*Bakhering* and C_2=Deep ploughing.
(2) 2 levels of N as F.Y.M. : N_0=0 and N_1=40 lb./ac.
Extra treatments : E_1=*Bakhering* in summer with 20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super and
E_2=Ploughing in summer with 20 lb./ac. of N as A/S.
A/S and P_2O_5 drilled with seed.

3. **DESIGN :**

(i) R.B D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) 24'×45'. (b) 18'×39'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—1959. (b) No. (c) Nil. (v) (a) and (b) N.A.
(vi) and (vii) Nil.

5. RESULTS:

(i) 469 lb./ac. (ii) 98.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

$$E_1 = 524 \text{ and } E_2 = 517 \text{ lb./ac.}$$

	C_1	C_2	Mean
N_0	433	407	420
N_1	466	470	468
Mean	449	438	444

S.E. of any marginal mean	= 31.0 lb./ac.
S.E. of body of table or E mean	= 43.8 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 55(12).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'CM'.**

Object :—To study the effect of cultural practices in the presence and absence of manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 15 lb./ac. of N+15 lb./ac. of P_2O_5. (ii) (a) Clay loam, *maryar*. (b) Refer
soil analysis, Powarkheda. (iii) 7.11.1955. (iv) (a) As per treatments. (b) Drilling with *Nari* plough. (c)
80 lb./ac. (d) Between lines 1'. (v) Nil. (vi) Hy—11 (improved-medium). (vii) Unirrigated. (viii) Nil.
(ix) 0.93". (x) 28.4.1956.

2. TREATMENTS :

Same as in expt. no. 54(81) on page 303.
F.Y.M. applied before rains and A/S and P_2O_5 drilled with seed.

3. DESIGN :

(i) R.B D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) 24'×45'. (b) 18'×39'. (v) 3'×3'. (vi) Yes:

4. GENERAL :

(i) Good. (ii) and (iii) Nil. (iv) (a) 1954—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 498 lb./ac. (ii) 102.9 lb./ac. (iii) "Extra treatments *vs.* other treatments" is highly significant. (iv) Av.
yield of grain in lb./ac.

$$E_1 = 684 \text{ lb./ac. and } E_2 = 707 \text{ lb./ac.}$$

	C_1	C_2	Mean
N_0	388	410	399
N_1	391	409	400
Mean	389	409	399

S.E. of any marginal mean	= 32.5 lb./ac
S.E. of body of table	= 46.0 lb./ac

Crop :- Wheat.   **Ref :- M.P. 56(5).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'CM'.**

Object :—To study the effect of cultural practices in the presence and absence of manure.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam *maryar*. (b) Refer soil analysis, Powarkheda. (iii) 5.11.1955. (iv) (a) As per treatments. (b) Drilled with *Nari* plough. (c) 80 lb./ac. (d) Between lines 12". (e) N.A. (v) Nil. (vi) Hy—11 (improved, medium). (vii) Unirrigated. (viii) Nil. (ix) 5.92". (x) 23.4.1957.

2. **TREATMENTS to 4. GENERAL :**

Same as in expt. no. 54(81) on page 303.

5. **RESULTS :**

(i) 419 lb./ac. (ii) 92.4 lb./ac. (iii) "Extra treatments vs. others" effect alone is highly significant. (iv) Av. yield of grain in lb./ac.

$$E_1 = 566 \text{ lb /ac. and } E_2 = 524 \text{ lb./ac.}$$

	C_1	C_2	Mean
N_0	340	327	333
N_1	347	408	377
Mean	343	367	355

S.E. of any marginal mean   = 29.2 lb./ac.
S.E. of body of table or E mean   = 41.3 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 57(33).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'CM'.**

Object :—To study the effect of cultural practices in the presence and absence of manure.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam *maryar*. (b) Refer soil analysis, Powarkheda. (iii) 16.10.1957. (iv) (a) As per treatments. (b) Drilled with *nari*. (c) 80 lb./ac. (d) Row to row 12". (e) N.A. (v) Nil. (vi) Hy—11 (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.9". (x) 30.3.1958.

2. **TREATMENTS to 4. GENERAL :**

Same as in expt. no. 54(81) on page 303.

5. **RESULTS :**

(i) 296 lb./ac. (ii) 75.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

$$E_1 = 283 \text{ lb./ac. and } E_2 = 338 \text{ lb./ac.}$$

	C_1	C_2	Mean
N_0	287	357	322
N_1	236	276	256
Mean	261	316	289

S.E. of any marginal mean   = 24.0 lb./ac.
S.E. of body of table or E mean   = 33.9 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- M.P. 58(43).**

Site :- Govt. Wheat Res. Farm, Powarkheda. **Type :- 'CM'.**

Object :—To study the effect of cultural practices in the presence and absence of manure.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) N.A. (ii) (a) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 7.11.1958, (iv) (a) As per treatments. (b) Drilled by *nari.* (c) 80 lb./ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Hy—11 (mid late). (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 18.3.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(81) on page 303.
F.Y.M. broadcasted before rains.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1954—1959. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 792 lb./ac. (ii) 126.9 lb./ac. (iii) Main effect of C and 'extra treatments *vs.* others' are highly significant. N effect is significant. (iv) Av. yield of grain in lb./ac.

$$E_1 = 944 \text{ lb./ac. and } E_2 = 996 \text{ lb./ac.}$$

	C_1	C_1	Mean
N_0	717	835	776
N_1	490	768	629
Mean	603	801	702

S.E. of any marginal mean = 40.4 lb./ac.
S.E. of body of table or E mean = 56.8 lb./ac.

———

Crop :- Wheat *(Rabi)*. **Ref :- M.P. 59(47).**

Site :- Govt. Wheat Res. Farm, Powarkheda. **Type :- 'CM'.**

Object :—To study the effect of cultural practices in the presence and absence of manure.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Morand.* (b) Refer soil analysis. Powarkheda. (iii) 30.10.1959. (iv) (a) As per treatments. (b) Line sowing by *nari.* (c) 80 lb./ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Hy—11 (mid late). (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 21.3.1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(81) on page 303.
F.Y.M. broadcasted before rains.

5. RESULTS :

(i) 931 lb./ac. (ii) 110.2 lb./ac. (iii) "Extra treatments *vs.* others" effect alone is highly significant. (iv) Av. yield af grain in lb./ac.

$$E_1 = 1260 \text{ lb./ac. and } E_2 = 1246 \text{ lb./ac.}$$

	C_1	C_2	Mean
N_0	748	821	784
N_1	738	775	756
Mean	743	798	770

S.E. of any marginal mean = 34.9 lb./ac.
S.E. of body of table or E mean = 49.3 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- M.P. 59(55).**

Site :- Govt. Wheat Res. Farm, Powarkheda. **Type :- 'CM'.**

Object :—To find out suitable manurial dose and seed rate for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 3.11.1959. (iv) (a) Cross *bakherings.* (b) Line sowing by *nari.* (c) As per treatments. (d) Row to row 12″. (e) N.A. (v) Nil. (vi) Hy—11. (vii) Unirrigated. (viii) Nil. (ix) 5.16″. (x) 21.3.1960.

2. TREATMENTS :

Main-plot treatments :

3 seed rates : R_1=60, R_2=80 and R_3=100 lb./ac.

Sub-plot treatments :

All combinations of (1) and (2)+2 controls (N_0P_0)

(1) 2 level of N as A/S : N_1=10 and N_2=20 lb./ac.
(2) 2 levels of P_2O_5 as Super : P_1=10 and P_2=20 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12′×45′. (b) 8′×40′. (v) 2′×2½′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1038 lb./ac. (ii) (a) 195.5 lb./ac. (b) 39.0 lb./ac. (iii) Main effect of N and "control *vs.* others" and interactions R×N and R×P are highly significant. Interaction R×N×P and P effect are significant while all other effects are not significant. (iv) Av. yield of grain in lb./ac.

$$N_0P_0R_1 = 792, N_0P_0R_2 = 758 \text{ and } N_0P_0R_3 = 871 \text{ lb./ac.}$$

	R_1	R_2	R_3	Mean	P_1	P_2
N_1	1151	1025	1041	1072	1054	1091
N_2	1254	1167	1287	1236	1230	1242
Mean	1202	1096	1164	1154	1142	1166
P_1	1183	1109	1135			
P_2	1222	1083	1194			

S.E. of difference of two

1. R marginal means = 69.1 lb./ac.
2. N or P marginal means = 11.3 lb./ac.
3. N or P means at the same level of R = 19.5 lb./ac.
4. R means at the same level of N or P = 70.5 lb./ac.
5. R means at the same level of N_0P_0 = 70.5 lb./ac.
S.E. of body of N×P table = 11.3 lb./ac.

Crop :- Wheat. Ref :- M.P. 59(N.A.).

Site :- State Mechanised Farm, Reora. Type :- 'CM'.

Object :—To find out the effect of different seed rates along with different levels of N and P on Wheat.

1. **BASAL CONDITIONS :**

    (i) ʹa) Fallow—Wheat. (b) Fallow. (c) Nil. (ii) (a) Medium black. (b) N.A. (iii) 5.12.1959. (iv) (a) 6 ploughings. (b) Drilling. (c) As per treatments. (d) Rows 1½' apart. (e) N.A. (v) Nil. (vi) C—591. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 22.4.1960.

2. **TREATMEᴺTS :**

    Same as in expt. no. 59 (55) on page 307.

3. **DESIGN :**

    (i) Split-plot. (ii) (a) 3 main-plots/block ; 6 sub-plots/replication. (b) N.A. (iii) 4. (iv) (a) 12 ×45'. (b) 8'×45'. (v) 2' along length side. (vi) Yes.

4. **GENERAL :**

    (i) and (ii) No. (iii) Grain yield. (iv) (a) 1959—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

    (i) 901 lb./ac. (ii) (a) 207.4 lb./ac. (b) 186.8 lb./ac. (iii) Only "control vs. others" is highly significant. (iv) Av. yield of grain in lb./ac.

    $N_0P_0R_1$ = 576 lb./ac., $N_0P_0R_2$ = 540 lb./ac. and $N_0P_0R_3$ = 806 lb./ac.

	R_1	R_2	R_3	Mean	P_1	P_2
N_1	1119	983	1017	1040	1023	1056
N_2	1089	931	1052	1024	1044	1003
Mean	1104	957	1034	1032	1034	1030
P_1	1104	987	1010			
P_2	1104	927	1058			

S.E. of difference of two
1. R marginal means   = 73.3 lb./ac.
2. N or P marginal means   = 53.9 lb./ac.
3. N or P means at the same level of R   = 93.4 lb./ac.
4. R means at the same level of N or P   = 98.7 lb./ac.
5. R means at the same level of N_0P_0 = 98.7 lb./ac.
   S.E. of body of N × P table   = 53.9 lb./ac.

Crop :- Wheat *(Rabi).* Ref :- M.P. 59(43).

Site :- Govt. Seed and Demons. Farm, Sagar. Type :- 'CM'.

Object :—To study the effect of different manurial doses with different seed rates on Wheat.

1. **BASAL CONDITIONS :**

    (i) (a) Nil. (b) and (c) N.A. (ii) (a) *Mund* I and II. (b) N.A. (iii) 12.11.1959. (iv) 3 *bakherings* and one ploughing. (b) Drilled by *nari*. (c) As per treatments. (d) Between lines 12". (e) N.A. (v) 10 C L./ac. of F.Y.M. (vi) Hy—65. (vii) Unirrigated. (viii) and (ix) N.A. (x) 27.3.1960.

2. **TREATMENTS :**

    All combinations of (1) and (2)

    (1) 3 manurial doses : M_3=0, M_1=10 lb./ac. of N as A/S+10 lb./ac. of P_2O_5 as Super and M_2=20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.

    (2) 3 seed rates : R_1=60, R_2=80 and R_3=100 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 15'×36.3'. (b) 13'×33.5'. (v) 1'×1.4'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Straw and grain yield. (iv) (a) 1959—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 736 lb./ac. (ii) 108.5 lb./ac. (iii) Only M effect is significant. (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	Mean
R_1	572	850	880	767
R_2	605	798	817	741
R_3	547	720	835	701
Mean	574	790	843	736

S.E. of any marginal mean   = 34.2 lb./ac.
S.E. of body of table   = 59.3 lb./ac.

Crop :- Wheat *(Rabi)*.

Site :- Govt. Seed and Demons. Farm, Sagar.

Ref :- M.P. 59(44).

Type :- 'CM'.

Object :—To study the the effect of different manurial doses with different seed rates on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) *Mund* I and II. (b) N.A. (ii') 14.11.1959. (iv) (a) 3 *bakherings* and 1 ploughing. (b) Drilling. (c) As per treatments. (d) Between lines 12". (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) Hy—65. (vii) Irrigated. (viii) and (ix) N.A. (x) 4.4.1960.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 59(43) on page 308.

4. GENERAL :

(i) Satisfactory. (ii) and (iii) Nil. (iv) (a) 1959—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) Rainfall on 10th March has stimulated the crop growth. (vii) Nil.

5. RESULTS .

(i) 844 lb./ac. (ii) 160.5 lb./ac. (iii) Only M effect is highly significant. (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	Mean
R_1	598	919	862	793
R_2	688	887	1106	894
R_3	643	874	1016	844
Mean	643	893	995	844

S.E. of any marginal mean   = 46.3 lb./ac.
S.E. of body of table   = 80.2 lb./ac.

Crop :- Wheat *(Rabi)*.

Site :- Govt. Res. Farm, Seoni.

Ref :- M.P. 59(97).

Type :- 'CM'.

Object :—To study the effect of different manurial doses with different seed rates on the yield of Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) 8 mds./ac. of G.N.C.. (ii) (a) *Morand*—1. (b) N.A. (iii) 11.11.1959. (iv) (a) 5 *bakherings*. (b) Drilling. (c) 80 lb./ac. (d) 9″×9″. (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) Hy—65. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 5.4.1960.

2. TREATMENTS and 3. DESIGN:

Same as in expt. no. 59(55) on page 307.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 1742 lb./ac. (ii) (a) 377.2 lb./ac. (b) 156.4 lb./ac. (iii) N effect and interactions $R \times N$ and $R \times N \times P$ are significant. "Control vs. others" is highly significant. No other effect is significant. (iv) Av. yield of grain in lb./ac.

$$N_0P_0R_1 = 1489 \text{ lb./ac., } N_0P_0R_2 = 1454 \text{ lb./ac. and } N_0P_0R_3 = 1614 \text{ lb./ac.}$$

	R_1	R_2	R_3	Mean	P_1	P_2
N_1	1750	1710	1954	1805	1825	1784
N_2	1950	1878	1878	1902	1902	1901
Mean	1850	1794	1916	1853	1863	1843
P_1	1836	1778	1976			
P_2	1861	1810	1856			

S.E. of difference of two

1. R marginal means — 133.6 lb./ac.
2. N or P marginal means — 45.1 lb./ac.
3. N or P means at the same level of R — 78.2 lb./ac.
4. R means at the same level of N or P — 144.4 lb./ac.
5. R means at the same level of N_0P_0 — 144.4 lb./ac.

S.E. of body of $N \times P$ table — 45.1 lb./ac.

—————

Crop :- Wheat *(Rabi)*.　　　　　　　　**Ref :- M.P. 59(59).**

Site :- Central Res. Farm, Ujjain.　　　**Type :- 'CM'.**

Object :—To find out suitable manurial schedule and seed rate for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Moong.* (c) 50 lb./ac. of Super. (ii) (a) Black cotton soil. (b) N.A. (iii) 29.10 1959. (iv) (a) 4 *bakherings* and 1 *patela.* (b) Drilling by *duffan.* (c) As per treatments. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) *Kopergaon.* (vii) Unirrigated. (viii) N.A. (ix) 0.25″. (x) 16.3.1960.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 manurial treatments : M_0=Control (no manure), M_1=10 lb./ac. of N as A/S+10 lb./ac. of P_2O_5 as Super and M_3=2 times M_1.

(2) 3 seed rates : R_1=60, R_2=80 and R_3=100 lb./ac.

Manures applied at the time of sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (ii) 4. (iv) (a) 36.3′×15′. (b) 33.3′×13′. (v) 1½′×1′. (vi) Yes.

4. GENERAL:

(i) Fair. (ii) Damaged by white ants and grass-hoppers. (iii) Grain yield. (iv) (a) 1959—1960. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Season was particularly dry. Winter showers received were in very small quantity. Frost on 23.1.1960.

5. RESULTS:

(i) 733 lb./ac. (ii) 65.4 lb./ac. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean
M_0	609	592	642	614
M_1	733	722	803	753
M_2	892	819	787	833
Mean	745	711	744	733

S.E. of any marginal mean = 18.9 lb./ac.
S.E. of body of table = 32.7 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- M.P. 59(38).**

Site :- Govt. Exptl. Farm, Vidisha. **Type :- 'CM'.**

Object :—To study the effect of different manurial doses with different seed rates on the yield of Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat (c) Nil. (ii) (a) Heavy clay. (b) N.A. (iii) 13.11.1959. (iv) (a) *Bakhering.* (b) Line sowing. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) NP—718 (mid-early). (vii) Unirrigated. (viii) Nil. (ix) 4.48". (x) 4.4.1960.

2. TREATMENTS:

All combinations of (1) and (2)
(1) 3 seed rates : $R_1=60$, $R_2=80$ and $R_3=100$ lb./ac.
(2) 3 manurial treatments : $M_0=0$, $M_1=10$ lb./ac. of N as A/S+10 lb./ac. of P_2O_5 as Super and $M_2=20$ lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 36.5'×15'. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Height per plant, earbearing, tillers/plant, length of each ear and grain yield. (iv) (a) 1959—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 897 lb./ac. (ii) 104.4 lb./ac. (iii) Only M effect is highly significant. (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	Mean
R_0	603	944	1063	870
R_1	603	879	1182	888
R_2	681	1038	1080	933
Mean	629	954	1108	897

S.E. of any marginal means = 30.1 lb./ac.
S.E. of body of M×R table = 52.2 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 57(MAE).**

Site :- M.A.E. Farm, Bagwai.   **Type :- 'CM'.**

Object :—Type VIII—To find the best seed rate, date of sowing and manurial schedule for Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) As per treatments. (iv) (a) 2 ploughings and 1 *bakhering.* (b) Line sowing. (c) As per treatments. (d) Row to row 1'. (e) N.A. (v) 5000 lb./ac. of F.Y.M (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 2nd week of April, 1958.

2. **TREATMENTS :**

   Main-plot treatments
   All combinations of (1) and (2)
       (1) 3 seed rates : $S_1=50$, $S_2=70$ and $S_3=90$ lb./ac.
       (2) 3 dates of sowing : $D_1=6.9.1957.$, $D_2=21.9.1957$ and $D_3=6.12.1957$.
   Sub-plot treatments
   All combinations of (3) and (4)
       (3) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
       (4) 3 levels of P_2O_5 as Triple Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.

3. **DESIGN :**

   (i) Split-plot. (ii) (a) 9 main-plots/replications ; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 34'×13'. (v) N.A. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1957—1959. (b) No. (c) N.A. (v) (a) Obedullaganj, Ujjain, and Powarkheda. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 1007 lb./ac. (ii) (a) 492.9 lb./ac. (b) 201.4 lb./ac. (iii) Main effects of N and P are highly significant. Interaction $D \times N \times P$ is significant. (iv) Av. yield of grain in lb /ac.

	S_1	S_2	S_3	P_0	P_1	P_2	N_0	N_1	N_2	Mean
D_1	1010	953	1014	809	1062	1107	695	1042	1241	993
D_2	1002	1088	1179	979	1099	1190	785	1129	1355	1090
D_3	915	943	955	759	1020	1033	691	928	1193	938
Mean	976	995	1049	849	1060	1110	724	1033	1263	1007
N_0	702	700	769	643	733	794				
N_1	1005	1019	1075	877	1097	1125				
N_2	1220	1266	1303	1028	1351	1411				
P_0	838	817	893							
P_1	1036	1049	1096							
P_2	1053	1119	1158							

S.E. of difference of two

    1. S or D marginal means   = 94.9 lb./ac.
    2. N or P marginal means   = 38.8 lb./ac.
    3. N or P means at the same level of S or D   = 67.1 lb./ac.
    4. S or D means at the same level of N or P   = 109.6 lb./ac.
    S.E. of body of S×D table   = 116.4 lb./ac.
    S.E. of body of N×P table   = 47.5 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 58(MAE).**

Site :- M.A.E. Farm, Bagwai.   **Type :- 'CM'.**

Object :—Type VIII—To find the best seed rate, date of sowing and manurial schedule for Wheat.

1. BASAL CONDITIONS :

  (i) (a) to (c) N.A. (ii) (a) Madium black soil. (b) N.A. (iii) As per treatments. (iv) (a) 2 ploughings and 1 *bakhering.* (b) Drilling. (c) As per treatments. (d) Row to row 1'. (e) N.A. (v) Nil. (vi) NP—710 (medium). (vii) Irrigated. (viii) Nil. (ix) 6". (x) 1, 2.4.1959.

2. TREATMENTS to 4. GENERAL :

  Same as in expt. no. 57(MAE) type VIII conducted at Bagwai on page 312.
  Dates of sowing are : D_1=9.11.1958. D_2=24.11.1958, and D_3=9.12.1958.

5. RESULTS :

  (i) 1330 lb./ac. (ii) (a) 383.5 lb./ac. (b) 157.6 lb./ac. (iii) Main effects of N, P and interactions N×P, D×N are highly significant. D effect and interaction S×D are significant. (iv) Av. yield is of grain in lb./ac.

	S_1	S_2	S_3	P_0	P_1	P_2	N_0	N_1	N_2	Mean
D_1	1307	1582	1313	1104	1459	1639	1131	1408	1663	1401
D_2	1563	1307	1418	1237	1429	1622	1180	1452	1656	1429
D_3	1038	1078	1363	873	1239	1367	1020	1212	1247	1160
Mean	1303	1322	1365	1071	1376	1543	1110	1357	1522	1330
N_0	1141	1105	1085	985	1130	1216				
N_1	1303	1354	1415	1082	1420	1570				
N_2	1464	1508	1594	1147	1577	1842				
P_0	1032	1071	1112							
P_1	1364	1370	1393							
P_2	1512	1526	1589							

S.E. of difference of two

1.	S or D marginal means	=	73.8 lb./ac.
2.	N or P marginal means	=	30.3 lb./ac.
3.	N or P means at the same level of S or D	=	52.5 lb./ac.
4.	S or D means at tne same level of N or P	=	85.4 lb./ac.
	S.E. of body of S×D table	=	90.4 lb./ac.
	S.E. of body of N×P table	=	37.1 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(MAE).**

Site :- M.A.E. Farm, Bagwai.   **Type :- 'CM'.**

Object :—Type VIII—To find the best seed rate, date of sowing and manurial schedule for Wheat.

1. BASAL CONDITIONS :

  (i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) As per treatments. (iv) (a) 3 ploughings. (b) Line sowing. (c) As per treatments. (d) Row to row 1'. (e) N.A. (v) Nil. (vi) NP—710. (vii) Irrigated. (viii) Nil. (ix) 2". (x) 1.4.1960.

2. TREATMENTS to 4. GENERAL :

  Same as in expt. no. 57(MAE) type VIII conducted at Bagwai on page 312.
  Dates of sowing are : D_1=5.11.1959, D_2=20.11.1959 and D_3=5.12.1959.

5. RESULTS :

(i) 1207 lb./ac. (ii) (a) 40.0 lb./ac. (b) 82.5 lb./ac. (iii) Main effects of N, P, S and D, interactions S×D, N×P and D×P are highly significant and interaction S×N is significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	P_0	P_1	P_2	N_0	N_1	N_2	Mean
D_1	1126	1203	1188	793	1267	1457	1049	1185	1283	1172
D_2	1142	1195	1176	846	1269	1398	1001	1194	1318	1171
D_3	1233	1250	1350	808	1427	1598	1104	1286	1443	1278
Mean	1167	1216	1238	816	1321	1484	1051	1222	1348	1207
N_0	1042	1071	1041	727	1159	1268				
N_1	1170	1220	1275	815	1260	1490				
N_2	1289	1357	1398	905	1444	1695				
P_0	755	839	853							
P_1	1280	1309	1374							
P_2	1466	1500	1487							

S.E. of difference of two

1. S or D marginal means	=	7.7 lb./ac.
2. N or P marginal means	=	15.9 lb./ac.
3. N or P means at the same level of S or D	=	27.5 lb./ac.
4. S or D means at the same level of N or P	=	23.7 lb./ac.
S.E. of body of S×D table	=	9.4 lb./ac.
S.E. of body of N×P table	=	19.4 lb./ac.

Crop :- Wheat *(Rabi).*

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

Ref :- M.P. 56(MAE).

Type :- 'CM'.

Object :—Type VIII—To find the best seed rate, date of sowing and manurial schedule for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Obedullaganj. (iii) As per treatm nts. (iv) (a) 4 to 5 *bakherings.* (b) Drilling. (c) As per treatments. (d) Row to row 10". (e) N.A. (v) 5000 lb./ac. of compost. (vi) to (viii) N.A. (ix) 6.75". (x) 27 to 31.3.1957.

2. TREATMENTS :

Same as in expt. no. 57(MAE) type VIII conducted at Bagwai on page 312.
Dates of sowing are : D_1=14.10.1956, D_2=29.10.1956 and D_3=13.11.1956.

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) 1/175.27 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Rust attack. (iii) Grain and straw yield. (iv) (a) 1956—1959. (b) No. (c) N.A. (v) (a) Bagwai, Powarkheda and Ujjain. (b) N.A. (vi) Hail-storm and heavy rains in last week of March. (vii) Nil.

5. RESULTS :

(i) 1727 lb./ac. (ii) (a) 351.4 lb./ac. (b) 418.0 lb./ac. (iii) Main effect of D and N are highly significant. S×D interaction is significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3		P_0	P_1	P_2		N_0	N_1	N_2	Mean
D_1	1972	1792	1691		1724	1757	1974		1497	1934	2024	1818
D_2	1603	1996	1816		1901	1690	1824		1571	1798	2046	1805
D_3	1508	1502	1666		1414	1629	1633		1389	1565	1722	1559
Mean	1694	1763	1724		1680	1692	1810		1486	1766	1930	1727
N_0	1497	1510	1450		1538	1425	1494					
N_1	1767	1753	1777		1723	1768	1805					
N_2	1819	2027	1946		1778	1883	2131					
P_0	1671	1683	1685									
P_1	1708	1714	1654									
P_2	1704	1893	1834									

S.E. of difference of two

1. S or D marginal means	=	67.6 lb./ac.
2. N or P marginal means	=	80.4 lb./ac.
2. N or P means at the same level of S or D	=	139 3 lb./ac.
4. S or D means at the same level of N or P	=	132.3 lb./ac.
S.E. of body of S × D table	=	82.8 lb./ac.
S.E. of body of N × P table	=	98.5 lb./ac.

Crop :- Wheat *(Rabi)*.   Ref :- M.P. 57(MAE).

Site :- M.A.E. Farm, Obedullaganj.   Type :- 'CM'.

Object :—Type VIII—To find the best seed rate, date of sowing and manurial schedule for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Obedullaganj. (iii) As per treatments. (iv) (a) 5 to 6 *bakherings*. (b) Line sowing. (c) As per treatments. (d) Row to row 1'. (e) N.A. (v) 5000 lb./ac. of compost. (vi) to (viii) N.A. (ix) Nil. (x) 2nd week of March, 1958.

2. TREATMENTS:

Same as in expt. no. 57(MAE) type VIII conducted at Bagwai on page 312.
Dates of sowing are : $D_1 = 6.10.1957$, $D_2 = 21.10.1957$ and $D_3 = 5.11.1957$.

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. (c) 1/120.08 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1956—1959. (b) No. (c) N.A. (v) (a) Bagwai, Powarkheda and Ujjain. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 622 lb./ac. (ii) (a) 481.7 lb./ac. (b) 134.1 lb./ac. (iii) Main effects of D and P are highly significant. N effect and interaction D × N × P are significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	P_0	P_1	P_2	N_0	N_1	N_2	Mean
D_1	465	512	553	498	540	492	501	527	502	510
D_2	959	744	837	856	893	791	831	802	907	847
D_3	314	622	590	600	515	411	473	480	573	509
Mean	579	626	660	651	649	565	602	603	661	622
N_0	564	597	644	607	656	542				
N_1	515	648	646	623	606	580				
N_2	659	633	690	724	686	572				
P_0	624	670	660							
P_1	597	688	653							
P_2	517	520	657							

S.E. of difference of two

1. S or D marginal means   = 92.7 lb./ac.
2. N or P marginal means   = 25.8 lb./ac.
3. N or P means at the same level of S or D   = 44.7 lb./ac.
4. S or D means at the same level of N or P   = 99.6 lb./ac.

S.E. of body of S × D table   = 113.5 lb./ac.

S.E. of body of N × P table   = 31.6 lb./ac.

—— ——

Crop :- Wheat *(Rabi).*

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

Ref :- M.P. 58(MAE).

Type :- 'CM'.

Object :—Type VIII—To find the best seed rate, date of sowing and manurial schedule for Wheat.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N A. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Obedullaganj. (iii) As per treatments. (iv) (a) 6 *bakherings*. (b) Drilling. (c) As per treatments. (d) Row to row 10". (e) N.A. (v) 5000 lb./ac. of compost. (vi) C—591. (vii) Irrigated. (viii) 1 weeding. (ix) 3". (x) 4.3.1959.

2. **TREATMENTS :**

Same as in expt. no. 57(MAE) type VIII conducted at Bagwai on page 312.
Dates of sowing are : D_1=21.10.1958, D_2=6.11.1958 and D_3=17.11.1958.

3. **DESIGN :**

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 14'×31'. (b) 12'4"×29'5". (v) 10"×9½". (vi) Yes.

4. **GENERAL :**

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1956.—1959. (b) No. (c) N.A. (v) (a) Bagwai, Ujjain and Powarkheda. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 1298 lb./ac. (ii) (a) 299.5 lb./ac. (b) 237.9 lb./ac. (iii) Main effect of N is highly significant and P effect is significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3		P_0	P_1	P_2		N_0	N_1	N_2	Mean
D_1	1300	1309	1440		1317	1366	1366		1012	1424	1613	1350
D_2	1291	1210	1325		1168	1374	1284		938	1349	1539	1275
D_3	1201	1333	1275		1193	1242	1374		988	1284	1538	1270
Mean	1264	1284	1347		1226	1327	1341		979	1352	1563	1298

	S_1	S_2	S_3		P_0	P_1	P_2
N_0	955	963	1020		979	971	988
N_1	1291	1350	1415		1300	1349	1407
N_2	1546	1539	1605		1399	1662	1629

	S_1	S_2	S_3
P_0	1201	1226	1251
P_1	1316	1366	1300
P_2	1275	1260	1489

S.E. of difference of two

1. S or D marginal means = 57.6 lb./ac.
2. N or P marginal means = 45.8 lb./ac.
3. N or P means at the same level of S or D = 79.3 lb./ac.
4. S or D means at the same level of N or P = 86.7 lb./ac.
   S.E. of body of S×D table = 70.6 lb./ac.
   S.E. of body of N×P table = 56.1 lb./ac.

Crop :- **Wheat** *(Rabi)*. Ref :- M.P. 59(MAE).

Site :- M.A.E. Farm, Obedullaganj. Type :- 'CM'.

Object :—Type VIII—To find the best seed rate, date of sowing and manurial schedule for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Obedullaganj. (iii) As per treatments. (iv) (a) 6 *bakherings*. (b) Drilling. (c) As per treatments. (d) Row to row 10". (e) N.A. (v) Compost. (vi) C—591. (vii) Irrigated. (viii) 1 weeding. (ix) 7". (x) 4.3.1960 to 1.4.1960.

2. TREATMENTS :

Same as in expt. no. 57(MAE) type VIII conducted at Bagwai on page 312.

Dates of sowing are : $D_1=27.10.1959$, $D_2=7.11.1959$ and $D_3=17.11.1959$.

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) 13′4″×29′5″. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1956—1959. (b) No. (c) N.A. (v) (a) Bagwai, Powarkheda and Ujjain. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 935 lb./ac. (ii) (a) 434.5 lb./ac. (b) 197.5 lb./ac. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	S₁	S₂	S₃	P₀	P₁	P₂	N₀	N₁	N₂	Mean
D₁	736	867	916	822	816	881	635	856	1028	840
D₂	1063	960	873	988	919	989	658	1047	1191	965
D₃	946	977	1076	992	981	1026	766	1021	1212	1000
Mean	915	935	955	934	905	965	686	975	1144	935
N₀	634	680	745	707	615	737				
N₁	954	1011	959	925	974	1025				
N₂	1157	1113	1161	1170	1127	1134				
P₀	923	929	950							
P₁	878	900	938							
P₂	944	975	977							

S.E. of difference of two

1. S or D marginal means = 83.6 lb./ac.
2. N or P marginal means = 38.0 lb./ac.
3. N or P means at the same level of S or D = 65.8 lb./ac.
4. S or D means at the same level of N or P = 99.4 lb./ac.

S.E. of body of S×D table = 102.41 lb./ac.

S.E. of body of N×P table = 46.6 lb./ac.

Crop :- Wheat *(Rabi).*

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

Ref :- M.P. 56(MAE).

Type :- 'CM'.

Object :—Type VIII—To find the best seed rate, date of sowing and manurial schedule for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) Refer soil analysis, Powarkheda. (iii) As per treatments. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) to (viii) N.A. (ix) 2.87″. (x) 1st week of April, 1957.

2. TREATMENTS :

Same as in expt. no. 57(MAE) type VIII conducted at Bagwai on page 312.
Dates of sowing are : D₁=31.10.1956, D₂=10.11.1956 and D₃=20.11.1956.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plot/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/96.93 ac. (v) N.A. (vi) Yes.

4 GENERAL :

(i) Good. (ii) Slight infection of rust (i i) Grain and straw yield. (iv) (a) 1956—1958. (b) No. (c) N.A. (v) (a) Bagwai, Obedullaganj and Ujjain. (b) N.A. (vi) Severe hail-storm in March, 1957. (vii) Nil.

5. RESULTS :

(i) 1349 lb./ac. (ii) (a) 746.3 lb./ac. (b) 200.8 lb./ac. (iii) Main effects of N, P and interactions N×P and D×N are highly significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	P_0	P_1	P_2	N_0	N_1	N_2	Mean
D_1	1412	1537	1508	1009	1581	1867	1084	1495	1877	1485
D_2	1443	1340	1562	1049	1599	1697	1128	1514	1704	1449
D_3	983	1110	1244	752	1171	1414	875	1129	1332	1112
Mean	1279	1329	1438	937	1450	1659	1029	1379	1638	1349
N_0	977	932	1178	737	1008	1342				
N_1	1288	1377	1474	1017	1559	1563				
N_2	1573	1678	1662	1056	1784	2073				
P_0	896	856	1058							
P_1	1386	1427	1538							
P_2	1556	1704	1718							

S.E. of difference of two

1. S or D marginal means   = 143.6 lb./ac.
2. N or P marginal means   = 38.6 lb./ac.
3. N or P means at the same level of S or D   = 66.9 lb./ac.
4. S or D means at the same level of N or P   = 153.7 lb./ac.
S.E. of body of S×D table   = 175.9 lb./ac.
S.E. of body of N×P table   = 47.3 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 57(MAE).**

Site :- M.A.E Farm, Powarkheda.   **Type :- 'CM'.**

Object :—Type VIII —To find the best seed rate, date of sowing and manurial schedule for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) Refer soil analysis, Powarkheda. (iii) As per treatments. (iv) 4 *bakherings.* (b) Drilling. (c) As per treatments. (d) Row to row 1'. (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) to (viii) N.A. (ix) Nil. (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(MAE) type VIII conducted at Powarkheda on page 318.
Dates of sowing are : D_1=14.10.1957., D_2=29.10.1957. and D_3=13.11.1957.

5. RESULTS :

(i) 682 lb./ac. (ii) (a) 864.0 lb./ac. (b) 240.3 lb./ac. (iii) Main effects of D, P and interaction D×P are highly significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	P_0	P_1	P_2	N_0	N_1	N_2	Mean
D_1	379	593	657	507	586	536	501	586	542	543
D_2	1017	1159	1102	889	1111	1278	1035	1158	1085	1093
D_3	201	392	639	361	499	372	420	479	333	411
Mean	532	715	799	586	732	729	652	741	653	682
N_0	547	676	733	612	714	630				
N_1	596	796	831	649	756	818				
N_2	454	672	824	496	726	738				
P_0	458	644	655							
P_1	558	742	896							
P_2	581	758	847							

S.E. of difference of two

1. S or D marginal means   = 166.3 lb./ac.
2. N or P marginal means   = 46.2 lb./ac.
3. N or P means at the same level of S or D   = 80.1 lb./ac.
4. S or D means at the same level of N or P   = 178.7 lb./ac.
   S.E. of body of S × D table   = 203.6 lb./ac.
   S.E. of body of N × P table   = 56.5 lb /ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 58(MAE).**

Site :- M.A.E. Farm, Powarkheda.   **Type :- 'CM'.**

Object :—Type VIII—To find the best seed rate, date of sowing and manurial schedule for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) Refer soil analysis, Powarkheda. (iii) As per treatments. (iv) (a) 3 *bakherings*. (b) Line sowing. (c) As per treatments. (d) Row to row 1'. (e) N.A. (v) 500 lb./ac. of F.Y.M. (vi) Hy−65. (vii) Irrigated. (viii) Nil. (ix) 2". (ix) 1, 2.3.1959.

2 TREATMENTS to 4. GENERAL :

Same as in expt. no 56(MAE) type VIII conducted at Powarkheda on page 318.
Date of sowing are : D_1=13.10.1958, D_2=7.11.1958 and D_3=21.11.1958.

5. RESULTS :

(i) 1364 lb./ac. (ii) (a) 339.8 lb./ac. (b) 237.0 lb./ac. (iii) Main effects of S, D, N, P and interaction D × N are highly significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	P_0	P_1	P_2	N_0	N_1	N_2	Mean
D_1	1395	1380	1366	1151	1476	1514	1043	1451	1647	1380
D_2	1254	1488	1760	1402	1526	1574	1285	1577	1640	1501
D_3	1044	1165	1428	1078	1254	1305	1115	1308	1214	1212
Mean	1231	1344	1518	1210	1419	1464	1148	1445	1500	1364
N_0	1065	1119	1259	1023	1192	1228				
N_1	1270	1488	1578	1297	1495	1544				
N_2	1358	1426	1717	1311	1569	1621				
P_0	1087	1201	1343							
P_1	1317	1390	1549							
P_2	1289	1442	1662							

S.E. of difference of two

1. S or D marginal means   = 65.4 lb./ac.
2. N or P marginal means   = 45 6 lb /ac.
3. N or P means at the same level of S or D   = 79.0 lb./ac.
4. S or D means at the same level of N or P   = 91.9 lb./ac.
   S.E. of body of S × D table   = 80.1 lb./ac.
   S.E. of body of N × P table   = 55.9 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 57(MAE).**

Site :- M.A.E. Farm, Ujjain.   **Type :- 'CM'.**

Object :—Type VIII—To find the best seed rate, date of sowing and manurial schedule for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A.   (ii) (a) Medium black soil.   (b) N.A. (iii) As per treatments.   (iv) (a) 8 *bakherings*.   (b) Line sowing.   (c) As per treatments.   (d) Row to row 1".   (e) N.A.   (v) Nil.   (vi) N.A.   (vii) Unirrigated. (viii) N.A.   (ix) 0.37".   (x) 2nd week of March, 1958.

2. TREATMENTS :

Same as in expt. no. 57(MAE) type VIII conducted at Bagwai on page 312.
Date of sowings are : D_1=13.10.1957, D_2=29.10.1957 and D_3=13.11.1957.

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) 14'×31'.   (v) N.A.   (vi) Yes.

4. GENERAL :

(i) N.A.   (ii) Nil.   (iii) Grain and straw yield.   (iv) (a) 1957-1959.   (b) No.   (c) N.A.   (v) (a) Bagwai, Obeduallaganj and Powarkheda.   (b) N.A.   (vi) and (vii) Nil.

5. RESULTS :

(i) 679 lb./ac.   (ii) (a) 255.1 lb./ac.   (b) 128.4 lb./ac.   (iii) Main effect of P is highly significant. N effect is significant.   (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	P_0	P_1	P_2	N_0	N_1	N_2	Mean
D_1	646	680	625	622	664	665	596	677	678	650
D_2	805	622	764	652	762	777	710	771	710	730
D_3	629	670	674	631	628	714	637	689	647	658
Mean	693	657	688	635	685	719	648	712	678	679
N_0	684	604	655	641	624	678				
N_1	720	691	726	623	740	774				
N_2	676	677	682	641	693	704				
P_0	650	636	619							
P_1	695	653	706							
P_2	735	683	738							

S.E. of difference of two

1. S or D marginal means   = 49.1 lb./ac.
2. N or P marginal means   = 24.7 lb./ac.
3. N or P means at the same level of S or D = 42.8 lb./ac.
4. S or D means at the same level of N or P = 34.9 lb./ac.
   S.E. of body of S×D table   = 60.1 lb./ac.
   S.E. of body of N×P table   = 30.3 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 58(MAE).**

Site :- M.A.E. Farm, Ujjain.   **Type :- 'CM'.**

Object :—Type VIII—To find the best seed rate, date of sowing and manurial schedule for Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) As per treatments. (iv) (a) 6 *bakherings.* (b) Drilling. (c) As per treatments. (d) Row to row 1'. (e) N.A. (v) Nil. (vi) Ujjain no. 6. (vii) Unirrigated. (viii) Nil. (ix) 3". (x) 3.4.1959.

2. **TREATMENTS :**

   Same as in expt. no. 57(MAE) type VIII conducted at Bagwai on page 312.
   Dates of sowing are : $D_1=25.10.1958$, $D_2=9.11.1958$ and $D_3=24.11.1958$.

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) 13'×33.5'. (v) N.A. (vi) Yes.

4. **GENERAL :**

   (i) N.A. (ii) Nil. (iii) Grain and straw yield (iv) (a) 1957—1959. (b) No. (c) N A. (v) (a) Bagwai, Obedullaganj and Powarkheda. (b) N.A. (vi) Hail-storm. (vii) Rat menace.

5. **RESULTS :**

   (i) 517 lb./ac. (ii) (a) 172.8 lb./ac. (b) 68.3 lb./ac. (iii) Main effect of D, N, P and interactions D×N, D×P are highly significant and interaction N×P is significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	P_0	P_1	P_2	N_0	N_1	N_2	Mean
D_1	462	375	376	385	412	416	4C0	399	414	404
D_2	572	538	516	493	566	567	525	564	537	542
D_3	663	546	605	507	620	687	526	641	647	605
Mean	566	486	499	462	533	557	484	535	533	517
N_0	524	446	481	460	477	514				
N_1	584	512	508	473	555	576				
N_2	5E9	501	508	452	566	580				
P_0	514	425	446							
P_1	582	509	505							
P_2	601	525	546							

S.E. of difference of two

1. S or D marginal means	=	33.3 lb./ac.
2. N or P marginal means	=	13.1 lb./ac.
3. N or P means at the same level of S or D	=	22.8 lb./ac.
4. S or D means at the same level of N or P	=	38.1 lb./ac.
S.E. of body of S×D table	=	40.7 lb./ac.
S.E. of body of N×P table	=	16.1 lb./ac.

Crop :- **Wheat** *(Rabi).*   Ref :- **M.P. 59(MAE).**

Site :- **M.A.E. Farm, Ujjain.**   Type :- **'CM'.**

Object :—Type VIII—To find the best seed rate, date of sowing and manurial schedule for Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N A. (ii) (a) Medium black soil. (b) N.A. (iii) As per treatments. (iv) (a) 4 *bakherings.* (b) Line sowing. (c) As per treatments. (d) Row to row 1'. (e) N.A. (v) Nil. (vi) Ujjain no. 6. (vii) Unirrigated. (viii) 1 weeding. (ix) 3". (x) 2, 3.4.1960.

2. TREATMENTS:

Same as in expt. no. 57(MAE) type VIII conducted at Bagwai on page 312.
Dates of sowing are : $D_1 = 28.10.1959$, $D_2 = 13.11.1959$ and $D_3 = 29.11.1959$.

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) $16' \times 27'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Slight damage by rats. (iii) Grain and straw yield. (iv) (a) 1957—1959. (b) No. (c) N.A. (v) (a) Bagwai, Obedullaganj and Powarkheda. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 563 lb./ac. (ii) (a) 191.7 lb./ac. (b) 116.8 lb./ac. (iii) Main effects of S, N, P and interaction $N \times P$ are highly significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	P_0	P_1	P_2	N_0	N_1	N_2	Mean
D_1	405	625	559	458	570	561	354	617	618	530
D_2	431	584	642	497	578	582	394	640	623	552
D_3	557	569	697	556	620	647	446	671	706	608
Mean	464	593	633	504	589	597	398	643	649	563
N_0	290	421	483	398	431	365				
N_1	549	682	697	542	683	703				
N_2	554	675	718	571	654	722				
P_0	423	490	598							
P_1	477	666	625							
P_2	493	622	675							

S.E. of difference of two
1. S or D marginal means = 36.9 lb./ac.
2. N or P marginal means = 22.5 lb./ac.
3. N or P means at the same level of S or D = 38.9 lb./ac.
4. S or D means at the same level of N or P = 48.7 lb./ac.
S.E. of body of $S \times D$ table = 45.2 lb./ac.
S.E. of body of $N \times P$ table = 27.5 lb./ac.

Crop :- Wheat.

Site :- Govt. Agri. Res. Stn., Adhartal (Jabalpur).

Ref :- M.P. 54(52).

Type :- CMV'.

Object :—To study the effect of different manurial doses and seed rates on the yield of different varieties of Wheat.

1. BASAL CONDITIONS .

(i) (a) Nil. (b) Gram. (c) N.A. (ii) (a) Kabar—2. (b) Refer soil analys's, Jabalpur. (iii) 22 and 23.10.1954. (iv) (a) Bakhering. (b) Drilled by nari plough. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) Nil. (vii) Unirrigated. (viii) Border cleaning. (ix) 4.59". (x) 29, 30.3.1955, 2, 4 and 5.4.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 3 varieties: $V_1 = A—115$, $V_2 = AO—90$ and $V_3 = Local$.
(2) 3 seed rates : $R_1 = 60$, $R_2 = 80$ and $R_3 = 100$ lb./ac.
(3) 3 manurial doses : $M_1 = 10$ lb./ac. of N as A/S + 10 lb./ac. of P_2O_5 as Super, $M_2 = 2$ times M_1 and $M_3 = 3$ times M_1.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) 45′×24′. (b) 39′×18′. (v) 3′×3′. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Height, no. of tillers and yield of grain. (iv) (a) 1954—1956. (b) N A. (c) Nil. (v) (a) Betul. (b) N.A. (vi) Nil. (vii) Expt. was laid out as 3^3 confd. but has been analysed as R.B.D. because of defective randomisation.

5. RESULTS:

(i) 497 lb./ac. (ii) 119.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean	M_1	M_2	M_3
V_1	489	461	549	500	479	465	555
V_2	538	521	499	519	496	514	548
V_3	443	458	515	472	456	464	496
Mean	490	480	521	497	477	481	533
M_1	452	471	508				
M_2	507	474	462				
M_3	511	495	593				

S.E. of any marginal mean = 28.2 lb./ac.
S.E. of body of any table = 48.9 lb./ac.

Crop :- Wheat.

Site :- Govt. Agri. Res. Stn., Adhartal (Jabalpur).

Ref :- M.P. 55(38).

Type :- 'CMV'.

Object :—To test the different manurial doses with different seed rates on the yield of different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Kabar*—2. (b) Refer soil analysis, Jabalpur. (iii) 16,17.11.1955. (iv) (a) N.A. (b) Dr.lled by *nari*. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) N.A. (ix) 64.66″. (x) 16, 17.4.1956.

2. TREATMENTS :

All combinations of (1), (2) and (3)
   (1) 3 varieties : V_1=A—115, V_2=Local—1 and V_2=Local—2.
   (2) 3 seed rates : R_1=60, R_2=80 and R_3=100 lb./ac.
   (3) 3 manurial doses : M_1= 10 lb./ac. of N as A/S+10 lb./ac. of P_2O_5 as Super, M_2=2 times M_1 and M_3=3 times M_1.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 45′×24′. (b) 39′×18′. (v 3′×3′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) Powarkheda. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 424 lb./ac. (ii) 101.2 lb./ac. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in lb /ac.

	R_1	R_2	R_3	Mean	M_1	M_2	M_3
V_1	480	434	391	435	387	393	525
V_2	397	466	511	458	391	428	554
V_3	388	391	355	378	332	437	365
Mean*	422	430	419	424	370	419	481
M_1	393	352	365				
M_2	393	497	369				
M_3	479	442	523				

S.E. of any marginal mean = 23.8 lb./ac.

S.E. of body of any table = 41.4 lb./ac.

— — —

Crop :- Wheat.

Site :- Govt. Agri. Res. Stn.,,Adhartal (Jabalpur).

Ref :- M.P. 56(44).

Type :- 'CMV'.

Object :—To study the effect of different manurial doses with seed rates on the yield of different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments (ii) (a) *Sehra.* (b) Refer soil analysis, Jabalpur. (iii) 30, 31.10.1956 and resown on 21.11.1956. (iv) (a) Harrowing. (b) Drilled. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 68.67". (x) 22.4.1957.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(52) on page 323.

4. GENERAL :

(i) Good. (ii) Attack of rust —sulphur dusted. (iii) Av. no. of tillers, av. height and yield of grain. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) Powarkheda and Betul. (b) Nil. (vi) Nil. (vii) Expt. was laid out in 3^3 confd. but has been analysed as R.B.D. because of defective randomisation.

5. RESULTS :

(i) 372 lb./ac. (ii) 92.7 lb./ac. (iii) Only M effect is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean	M_1	M_2	M_3
V_1	358	315	400	358	367	323	383
V_2	378	389	410	392	400	340	437
V_3	365	349	381	365	312	351	432
Mean	367	351	397	372	360	338	417
M_1	372	309	398				
M_2	332	319	363				
M_3	397	425	430				

S.E. of any marginal mean = 21.8 lb./ac.

S.E. of body of any table = 37.8 lb./ac.

— — —

Crop :- Wheat.   **Ref :- M.P. 54(38).**

Site :- Govt. Seed and Demons. Farm, Betul.   **Type :- 'CMV'.**

Object:—To study the effect of different seed rates and manurial doses on the yield of different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 40 C.L./ac. of F.Y.M. (ii) (a) *Morand*—2. (b) Refer soil analysis, Betul. (iii) 2.11.1954. (iv) (a) 4 *bakherings*. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) 40 C.L./ac. of F.Y.M. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 42.69". (x) 23.3.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)
- (1) 3 varieties : V_1=Hy—65 (early), V_2=*Bansi* (local) and V_3=*Pissi* (local).
- (2) 3 seed rates : R_1=60, R_2=80 and R_3=100 lb./ac.
- (3) 3 manurial doses : M_1=20 lb./ac. of N+20 lb./ac. of P_2O_5, M_2=2 times M_1 and M_3=3 times M_1.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) 24'×45'. (b) 18'×39'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) Adhartal. (b) Nil. (vi) Nil (vii) Expt. was laid out as 3^3 confd. but has been analysed as R.B.D. because of defective randomisation.

5. RESULTS :

(i) 2679 lb./ac. (ii) 288.3 lb./ac. (iii) Main effect of M is highly significant and that of V and R are significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean	M_1	M_2	M_3
V_1	2314	2665	2748	2576	2314	2686	2727
V_2	2521	2665	2706	2631	2376	2665	2851
V_3	2789	2707	2996	2831	2665	2810	3016
Mean	2541	2679	2817	2679	2452	2720	2865
M_1	2335	2459	2562				
M_2	2583	2727	2851				
M_3	2706	2851	3037				

S.E of any marginal mean   = 68 0 lb./ac.
S.E. of body of any table   = 117.2 lb /ac.

Crop :- Wheat.   **Ref :- M.P. 55(20).**

Site :- Govt. Seed and Demons. Farm, Betul.   **Type :- 'CMV'.**

Object '—To study the effect of different seed rates and different manurial doses on the yield of different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 40 C.L./ac. of F.Y.M. (ii) (a) *Morand*—2. (b) Refer soil analysis, Betul. (iii) 17.11.1955. (iv) (a) 4 *bakherings*. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) 40 C.L./ac. of F.Y.M. (vi) As per treatments. (vii) Irrigeted. (viii) and (ix) N.A. (x) 20.4.1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(38) above.

5. RESULTS :

(i) 2450 lb./ac. (ii) 310 lb./ac. (iii) Only the main effect of R is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean	M_1	M_2	M_3
V_1	2190	2397	2582	2390	2231	2459	2479
V_2	2376	2675	2521	2524	2459	2459	2655
V_3	2242	2448	2624	2438	2397	2293	2624
Mean	2269	2507	2576	2450	2362	2403	2586
M_1	2128	2541	2417				
M_2	2262	2407	2541				
M_3	2417	2572	2768				

S.E. of any marginal mean   =   73.2 lb./ac.
S.E. of body of any table   =   126.5 lb./ac.

Crop :- Wheat.

Site :- Govt. Wheat Res. Farm, Powarkheda.

Ref :- M.P. 54(13).

Type :- 'CMV'.

Object :—To study the effect of different manurial doses with different seed rates on the yield of different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 30 lb./ac. of N as A/S+30 lb./ac. of P_2O_5 as Super. (ii) (a) Clay loam *maryar*. (b) Refer soil analysis, Powarkheda. (iii) 4.11.1954. (iv) (a) *Bakherings*. (b) Drilling with *nari*. (c) As per treatments. (d) Between lines 12″. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 1.83″. (x) 17.3.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)
  (1) 3 varieties : V_1=Hy—11 (improved medium), V_2=Hy—65 (improved early) and V_3=A—115.
  (2) 3 seed rates : R_1=60, R=80 and R_3=100 lb./ac.
  (3) 3 manurial doses : M_1=20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super, M_2=2 times M_1 and M_3=3 times M_1.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) 45′×24′. (b) 39′×18′. (v) 3′×3′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) and (iii) Nil. (iv) (a) 1954—1957. (b) No. (c) Nil. (v) (a) Betul and Adhartal. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1399 lb./ac. (ii) 254.3 lb./ac. (iii) V effect is highly significant. R and M effects are significant. Interactions are not significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean	M_1	M_2	M_3
V_1	1008	1393	1232	1211	1096	1167	1370
V_2	1708	1764	1391	1621	1456	1809	1598
V_3	1326	1432	1339	1366	1303	1217	1577
Mean	1347	1530	1321	1399	1285	1398	1515
M_1	1221	1394	1240				
M_2	1299	1518	1376				
M_3	1522	1677	1346				

S.E. of any marginal mean   =   60.0 lb./ac.

S.E. of body of any table   =   103.8 lb./ac.

———

Crop :- Wheat.   **Ref :- M.P. 56(7).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'CMV'.**

Object :—To study the effect of different manurial doses and seed rates on the yield of different varieties of Wheat.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam *maryar*. (b) Refer soil analysis. Powarkheda. (iii) 14.11.1956. (iv) (a) *Bakherings*. (b) Drilled with *nari*. (c) As per treatments. (d) Between lines 1'. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 5.92". (x) 21.4.1957.

2. **TREATMENTS and 3. DESIGN :**

Same as in expt. no. 54(13) on page 327.

4. **GENERAL :**

(i) Good. (ii) Rust appeared on variety A—115. (iii) Grain yield. (iv) (a) 1954—1957. (b) No. (c) Nil (v) (a) Adhartal and Betual. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 907 lb./ac. (ii) 253.0 lb./ac. (iii) Only V effect is highly significant and M effect is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean	M_1	M_2	M_3
V_1	916	1107	1139	1054	907	1142	1113
V_2	921	1041	991	984	839	908	1206
V_3	725	652	674	684	586	680	785
Mean	854	933	935	907	777	910	1035

	R_1	R_2	R_3
M_1	723	664	940
M_2	811	1044	875
M_3	1023	1092	989

S.E. of any marginal mean   =   59.6 lb./ac.

S.E. of body of any table   =   103.2 lb./ac.

———

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 57(79).**

Site :- Govt. Seed and Demons. Farm, Betul.   **Type :- 'I'.**

Object :—To study the effect of irrigations at different stages of crop growth.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Morand*—2. (b) Refer soil analysis, Betul. (iii) 17.10.1957. (iv) (a) 2 ploughings, 2 harrowings and 2 *bakherings*. (b) Drilled by *nari*. (c) 80 lb./ac. (d) 9"×4". (e) N.A. (v) 30 lb./ac. of N as A/S+30 lb./ac. of P_2O_5 as Super. (vi) Hy—65. (vii) As per treatments. (viii) and (ix) N.A. (x) 15.3.1958.

2. **TREATMENTS :**

15 irrigational treatments : I_0=No irrigation, I_1=At T_1, I_2=At T_2, I_3=At T_3, I_4=At T_4, I_5=At T_1 and T_2, I_6=At T_2 and T_3, I_7=At T_3 and T_4, I_8=At T_1 and T_4, I_9=At T_1 and T_3, I_{10}= At T_2, T_3 and T_4, I_{11}=T_1, T_3 and T_4, I_{12}=At T_1, T_2 and T_4, I_{13}=At T_1, T_2 and T_3 and I_{14}=At T_1, T_2, T_3 and T_4.

T_1=Early growth stage, T_2=Boot stage, T_3=Full bloom stage and T_4=Dough stage.
Each irrigation is of 3ac. inches intensity.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 1/80 ac. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1025 lb./ac. (ii) 294.3 lb./ac (iii) Treatments difference are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	I_0	I_1	I_2	I_3	I_4	I_5	I_6	I_7
Av. yield	550	962	912	737	662	1200	1150	887

Treatment	I_8	I_9	I_{10}	I_{11}	I_{12}	I_{13}	I_{14}
Av. yield	987	912	1250	1225	1375	1337	1225

S.E./mean = 147.1 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 58(94).**

Site :- Govt. Seed and Demons. Farm, Betul.   **Type :- 'I'.**

Object :—To study the effect of irrigations at different stages of crop growth.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Morand*—2. (b) Refer soil analysis, Betul. (iii) 10.11.1958. (iv) (a) 2 ploughings 2 harrowings and 2 *bakherings*. (b) Drilled by *nari*. (c) 80 lb./ac. (d) 9″×4″. (e) N.A. (v) Nil. (vi) Hy—65. (vii) As per treatments. (viii) Nil. (ix) N.A. (x) 30.3.1959.

2. TREATMENTS :

Same as in expt. no. 57(79) on page 328.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) and (b) 33′×16½′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1205 lb./ac. (ii) 162.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	I_0	I_1	I_2	I_3	I_4	I_5	I_6	I_7
Av. yield	.1135	1068	1157	1095	1157	1158	1195	1275

Treatment	I_8	I_9	I_{10}	I_{11}	I_{12}	I_{13}	I_{14}
Av. yield	1148	1418	1328	1308	1090	1258	1292

S.E./mean = 81.3 lb./ac

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(96).**

Site :- Govt. Seed and Demons. Farm, Betul.   **Type :- 'I'.**

Object :— To study the effect of different irrigations at different times on the yield of Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Morand—2.* (b) Refer soil analysis, Betul. (iii) 23.11.1959. (iv) (a) 2 ploughings, 2 harrowings and 2 *bakherings.* (b) Drilled by *nari.* (c) 80 lb./ac. (d) $9'' \times 4''$. (e) N A. (v) Nil. (vi) Hy—65. (vii) As per treatments. (viii) Nil. (ix) N.A. (x) 21.22.4.1960.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 5 levels of Irrigations: $I_0 =$ No irrigation, $I_1 = 1$ irrigation at tillering, $I_2 = 1$ irrigation at heading stage, $I_3 = 2$ Irrigations, 1 at tillering and 1 at flowering stage. and $I_4 = 3$ irrigations, 1 at tillering, 1 at heading and 1 at milk stage.

(2) 2 levels of manures: $M_1 = 15$ lb./ac. of N as A/S$+15$ lb./ac. of P_2O_5 as Super and $M_2 = 80$ lb./ac. of N as A/S $+$ 80 lb./ac. of P_2O_5 as Super.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) $16' \times 40'$. (b) $12' \times 35'$. (v) $2' \times 2\frac{1}{2}'$. (vi) Yes.

4. GENERAL:

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

5. RESULTS:

(i) 811 lb./ac. (ii) 142.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	I_0	I_1	I_2	I_3	I_4	Mean
M_1	837	804	758	843	745	797
M_2	914	758	726	849	875	824
Mean	876	781	742	846	810	811

S.E. of I marginal mean = 50.4 lb./ac.
S.E. of M marginal mean = 31.9 lb./ac.
S.E. of body of table = 71 2 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- M.P. 57(81).**

Site :- Govt. Seed and Demons. Farm, Betul. **Type :- 'I'.**

Object :—To find out the suitable frequency and intensity of irrigation for Wheat crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) and (c) N.A. (ii) (a) *Morand—2.* (b) Refer soil analysis, Betul. (iii) 3.11.1957. (iv) (a) 2 ploughings, 2 harrowings and 2 *bakherings.* (b) Drilled by *nari.* (c) 80 lb./ac. (d) $9''$ between lines. (e) N.A. (v) 30 lb./ac. of N$+30$ lb./ac. of P_5O_5. (vi) Hy—65. (vii) As per treatments. (viii) and (ix) N.A. (x) 29.3.1958.

2. TREATMENTS:

All combinations of (1) and (2)$+$control (no irrigation).

(1) 2 intensities of irrigation: $I_1 = 3$ and $I_2 = 4$ acre inches.

(2) 3 frequencies of irrigation: $F_1 = 1$ irrigation at leaves development, $F_2 = F_1 + 1$ irrigation at heading stage and $F_3 = F_2 +$ one irrigation at blooming stage.

3. DESIGN:

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 2. (iv) (a) and (b) $12\frac{1}{2}' \times 344'$. (v) N A. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 2399 lb./ac. (ii) 61.5 lb.·ac. (iii) Effect F, interaction I$\times$F and "control *vs.* others" are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1454 lb./ac.

	F$_1$	F$_2$	F$_3$	
I$_1$	2188	2456	2730	2458
I$_2$	2168	2862	2938	2656
Mean	2178	2659	2834	2557

S.E. of I marginal mean = 25.1 lb./ac.
S.E. of F marginal mean = 30.7 lb./ac.
S.E. of body of table or control mean = 43.5 lb./ac.

Crop :- Wheat (*Rabi*).　　　　　　　　　**Ref :- M.P. 58(96).**

Site :- Govt. Seed and Demons. Farm, Betul.　　　**Type :- 'I'.**

Object :—To find out the suitable frequency and intensity of irrigation for Wheat crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Morand*—2. (b) Refer soil analysis, Betul. (iii) 4.11.1958. (iv) (a) 2 ploughings, 2 harrowings and 2 *bakherings*. (b) Drilled by *nari*. (c) 80 lb./ac. (d) 9″×4″. (e) N.A. (v) 30 lb./ac. of N as A/S+30 lb./ac. of P$_2$O$_5$ as Super. (vi) Hy—65. (vii) As per treatment. (viii) Nil. (ix) N.A. (x) 2.4.1959.

2. **TREATMENTS to 4. GENERAL :**

Same as in expt. no. 57(81) on page 330.

5. **RESULTS :**

(i) 1804 lb./ac. (ii) 69.6 lb./ac. (iii) Only F effect and "control vs. others" are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1195 lb./ac.

	F$_1$	F$_2$	F$_3$	Mean
I$_1$	1793	1980	2077	1950
I$_2$	1702	1859	2021	1861
Mean	1747	1920	2049	1905

S.E. of marginal mean of F = 34.8 lb./ac.
S.E. of marginal mean of I = 28.4 lb./ac.
S.E. of body of table or control mean = 49.2 lb./ac.

Crop :- Wheat (*Rabi*).　　　　　　　　**Ref :- M.P. 57(55).**

Site :- Govt. Exptl. Stn.. Chhindwara.　　　**Type :- 'I'.**

Object :—To find out suitable time and number of irrigations for Wheat.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) *Sannhemp*. (c) N.A. (ii) (a) Heavy black soil (b) Refer soil analysis, Chhindwara. (iii) 1 and 2.11.1957. (iv) (a) *Bakhering* and ploughing. (b) Line sowing by *nari*. (c) 80 lb./ac. (d) 12″×9″. (e) N.A. (v) G.M. with *sannhemp* and 20 lb./ac of N as A/S+20 lb./ac. of P$_2$O$_5$ as Super at sowing of wheat. (vi) Hy—65. (vii) As per treatments. (viii) N.A. (ix) 2.70″. (x) 3.4.1958.

2. TREATMENTS:

5 irrigational treatments : I_1=Initial pre-soaking dose, I_2=1 irrigation at late vegetative growth, I_3= 1 irrigation at heading, I_4=2 irrigations, 1 at tillering and the other at flowering stage and I_5=3 irrigations, 1 at tillering stage, 2nd at heading stage and 3rd at dough stage.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 36'×18½'. (b) 34'×16½'. (v) 1'×1'. (vi) Yes.

4. GENERAL:

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

5. RESULTS:

(i) 1046 lb./ac. (ii) 24.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	I_1	I_2	I_3	I_4	I_5
Av. yield	605	655	1126	1403	1441

S.E./mean = 12.2 lb./ac.

Crop :- Wheat *(Rabi)*.   Ref :- M.P. 58(57).

Site :- Govt. Exptl. Stn., Chhindwara.   Type :- 'I'.

Object :—To find out suitable time and number of irrigations for Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Sannhemp. (c) N.A. (ii) (a) Heavy black soil. (b) Refer soil analysis, Chinndwara. (iii) 5.11 1958. (iv) (a) Bakhering and ploughing. (b) Line sowing by nari. (c) 80 lb./ac. (d) 12"×9". (e) N.A. (v) G M. with sannhemp. (vi) Hy—65. (vii) As per treatments. (viii) 3 hand weedings. (ix) 2.29". (x) 30.3 1959.

2. TREATMENTS

5 irrigational treatments : I_0 = No irrigation, I_1=1 irrigation at tillering stage, I_2=1 irrigation at heading stage, I_3=2 irrigations, 1 at tillering and other at flowering stage and I_4=3 irrigations 1 at tillering, 2nd at heading and 3rd at milk stage.

M=15 lb./ac. of N+15 lb /ac. of P_2O_5 was drilled along with seed in plots of I_0 treatment and 2 times M in all other plots.

3. DESIGN :

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

4. GENERAL:

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1958—1961. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 1954 lb./ac. (ii) 107.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	I_0	I_1	I_2	I_3	I_4
Av. yield	1408	1936	2116	2208	2100

S.E./mean = 47.9 lb./ac.

Crop :- Wheat *(Rabi)*.   Ref :- M.P. 59(99).

Site :- Govt. Exptl. Stn., Chhindwara.   Type :- 'I'.

Object :—To find out suitable time and number of irrigations for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b)*Moong* (c) N.A. (ii) (a) Heavy. (b) Refer soil analysis, Chhindwara. (iii) 28.10.1959. (iv) (a) 1 ploughing and 3 *bakherings*. (b) Drilled by *nari*. (c) 80 lb./ac. (d) 9"×3". (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) Hy—65. (vii) As per treatments. (viii) Nil. (ix) 7.97". (x) 18.4.1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt no. 58(57) on page 332.

5. RESULTS :

(i) 1920 lb./ac. (ii) 185.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	I_0	I_1	I_2	I_3	I_4
Av. yield	1652	1948	1806	1964	2232

S.E./mean = 83.1 lb./ac.

———

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 58(102).**

Site :- Govt. Agri. Res. Farm, Kuthulia (Rewa).   **Type :- 'I'.**

Object :—To find suitable time and number of irrigations for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (e) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 4.11.1958. (iv) (a) 4 ploughings. (b) Line sowing. (c) 80 lb./ac. (d) 9" between rows. (e) N.A. (v) Nil. (vi) Hy—65. (viii) As per treatments. (viii) Nil. (ix) 1.9". (x) 25.3.1959.

2. TREATMENTS :

Same as in expt. no. 58(57) on page 332.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 13'×33½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1996 lb./ac. (ii) 186.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatments	I_0	I_1	I_2	I_3	I_4
Av. yield	1596	1994	1973	2211	2204

S.E /mean = 76.1 lb./ac.

———

Crop :- Wheat.   **Ref :- M.P. 58(9).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal)   **Type :- 'I'.**

Object :—To find the most suitable time and number of irrigations for Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Dhaincha*. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 8.11.1958. (iv) (a) to (e) N.A. (v) G.M. with *Dhaincha* and 30 lb./ac. of N as A/S+30 lb./ac. of P_2O_5 as Super. (vi) C—591 (medium). (vii) Irrigated. (viii) N.A. (ix) 2.03". (x) N.A.

2. TREATMENTS :

Same as in expt. no. 57(55) on page 331.

3. DESIGN :

(i) R.B D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 1/80 ac. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1471 lb./ac. (ii) 207.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	I_1	I_2	I_3	I_4	I_5
Av. yield	776	1623	1336	1728	1892

S.E./mean = 84.8 lb./ac.

— — — —

Crop :- Wheat *(Rabi)*. **Ref :- M.P. 58(48).**

Site :- Govt. Wheat Res. Farm, Powarkheda. **Type :- 'I'.**

Object :—To study the effect of irrigations at different stages of crop growth.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) 'a) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 20.11.1958. (iv) (a) Crossed *bakhering.* (b) Line sowing by *Nari.* (c) 80 lb./ac. (d) Row to row 12". (e) N.A. (v) 30 lb./ac. of N as A/S+30 lb./ac. of P_2O_5 as Super drilled with seed. (vi) Hy—65 (medium). (vii) Irrigated. (viii) Nil. (ix) 2.29" (x) N.A.

2. TREATMENTS :

All the treatments in expt. no. 57(79) on page 328+I_{15}=at T_2+T_4

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 16½'×33'. (b) 14'×31'. (v) 1¼'×1'. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1958—1960. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1813 lb./ac. (ii) 243.0 lb /ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	I_0	I_1	I_2	I_3	I_4	I_5	I_6	I_7
Av. yield	1088	1840	1667	1339	1139	2186	1521	1280

Treatment	I_8	I_9	I_{10}	I_{11}	I_{12}	I_{13}	I_{14}	I_{15}
Av. yield	1792	2150	2067	2243	2137	2104	2321	1774

S.E./mean = 121.5 lb./ac.

————

Crop :- Wheat. *(Rabi)*. **Ref :- M.P. 59(56).**

Site :- Govt. Wheat Res. Farm, Powarkheda. **Type :- 'M'.**

Object :—To study the effect of irrigations at different stages of crop growth.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) *Morand.* (b) Refer soil analysis, Powarkheda. (iii) 25.11.1959. (iv) (a) Crossed *bakhering.* (b) Line sowing by *nari.* (c) 80 lb./ac. (d) Row to row 12". (e) N.A. (v) 30 lb./ac. of N as A/S+30 lb./ac. of P_2O_5 as Super. (vi) Hy—65 (medium). (vii) Irrigated. (viii) Nil. (ix) 5.16". (x) 30.3.1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 58(48) on page 334.

5. RESULTS :

(i) 2261 lb./ac.   (ii) 274.4 lb./ac.   (iii) Treatment differences are not significant.   (iv) Av. yield of grain in lb./ac.

Treatment	I_0	I_1	I_2	I_3	I_4	I_5	I_6	I_7
Av. yield	2120	2283	2297	2010	1962	2126	2343	2161

Treatment	I_8	I_9	I_{10}	I_{11}	I_{12}	I_{13}	I_{14}	I_{15}
Av. yield	2192	2163	2344	2323	2410	2652	2501	2296

S.E./mean   137.2 lb./ac.

———

Crop :- Wheat.   **Ref :- M.P. 54(49).**

Site :- Govt. Agri. Res. Stn., Adhartal (Jabalpur).   **Type :- 'IM'.**

Object :—To study the effect of different irrigations and fertilizers on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) *Sehra*. (b) Refer soil analysis, Adhartal. (iii) 16 and 17.11.1954. (iv) (a) 1 ploughing and *bakhering*. (b) Drilling. (c) to (e) N.A. (v) N.A. (vi) Hy—38 (early). (vii) Irrigated. (viii) Cleaning. (ix) 4.59". (x) 8 and 9.4.1955.

2. TREATMENTS :

Main-plot treatments :

4 irrigational treatments : I_0=No irrigation, I_1=Irrigation after 1 month of sowing, I_2=2 irrigations at one month interval from sowing and I_3=3 irrigations at one month interval from sowing.

Sub-plot treatments :

2 manures : M_0=No manure and M_1=20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super. Manures drilled with seed.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) 66'×20'. (b) 60'×14'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—1956. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 544 lb./ac. (ii) (a) 158.1 lb./ac. (b) 100.6 lb./ac. (iii) Only M effect is highly significant. (iv) Av. yield of grain in lb./ac.

	I_0	I_1	I_2	I_3	Mean
M_0	417	405	434	479	434
M_1	584	624	649	760	654
Mean	500	515	542	620	544

S.E. of difference of two

1.	I marginal means	= 70.7 lb./ac.
2.	M marginal means	= 31.8 lb./ac.
3.	M means at the same level of I	= 63.5 lb./ac.
4.	I means at the same level of M	= 83.9 lb./ac.

———

Crop :- Wheat *(Rabi).*　　　　　　　　　　　**Ref :- M.P. 56(80).**

Site :- Govt. Agri. Res. Stn., Adhartal.　　　　**Type :- 'IM'.**

Object :—To study the effect of different irrigations and fertilizers on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Sehra.* (b) Refer soil analysis, Adhartal. (iii) 26.11.1956.
(iv) (a) 3 ploughings with *Malwa* plough. (b) Drilling. (c) 80 lb./ac. (d) Between lines 1'. (e) N.A. (v)
Nil. (vi) Hy—65. (vii) Irrigated. (viii) and (ix) N.A. (x) 12 and 13.11.57.

2. TREATMENTS :

Same as in expt no. 54(49) on page 335.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) and (b)
15'×40'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Growth much below normal. Not satisfactory. (ii) Black brown rust attack. (iii) Grain and straw yield.
(iv) (a) 1954—1956. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 326 lb./ac. (ii) (a) 180.2 lb./ac. (b) 161.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield
of grain in lb./ac.

	I_0	I_1	I_2	I_3	Mean
M_0	254	464	240	290	312
M_1	321	326	349	365	340
Mean	288	395	295	328	326

S.E. of difference of two

1.	I marginal means	= 80.6 lb./ac.
2.	M marginal means	= 51.0 lb./ac.
4.	M means at the same level of I	= 102.0 lb./ac.
3.	I means at the same level of M	= 108.1 lb./ac.

———

Crop :- Wheat *(Rabi).*　　　　　　　　　　**Ref :- M.P. 57(80).**

Site :- Govt. Seed and Demons. Farm, Betul.　　**Type :- 'IM'.**

Object :—To study the effect of N, P and irrigation on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) *Morand*—II. (b) Refer soil analysis, Betul. (iii) 18.10.1957. (iv)
(a) 2 ploughings, 2 harrowings and 2 *bakherings*. (b) Drilled with *nari.* (c) 80 lb./ac. (d) 9"×4". (e)
N A. (v) Nil. (vi) Hy—65. (vii) Irrigated. (viii) Nil. (ix) 18.3.1958

2. TREATMENTS :

Main-plot treatments :

8 irrigations treatments : I_0=No irrigation, I_1=1, I_2=2, I_3=3, I_4=4 Irrigations of 2 ac. inches intensity,
　　　　　I_5=2, I_6=3 and I_7=4 irrigations of 4 ac. inches.

Sub-plot treatments :

8 manures : M_0=No manure, M_1=30 lb./ac. of P_2O_5 as Super, M_2=2 times M_1, M_3=30 lb./ac. of N as
　　　　A/S, M_4=M_1+M_3, M_5=2 times M_3, M_6=M_1+M_5 and M_7=M_2+M_5.

3. DESIGN :

(i) Split-plot. (ii) (a) 8 main-plots/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 33'×16½'.
(b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

' (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 1280 lb./ac. (ii) (a) 509.7 lb./ac. (b) 265.0 lb./ac. (iii) M effect is highly significant and I effect is significant. Interaction M × I is not significant. (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	Mean
I_0	425	450	550	650	700	575	550	550	556
I_1	900	950	675	1100	1375	1400	1450	1750	1200
I_2	1100	1350	1300	1625	1475	1500	1725	1400	1434
I_3	1050	1150	1300	1325	1850	1650	1675	1700	1462
I_4	1250	1375	1300	1400	1400	1675	1950	2000	1544
I_5	900	975	1000	1150	1600	1350	1550	1575	1262
I_6	850	1025	1025	1250	1500	1550	1900	1975	1384
I_7	1100	1225	1100	1150	1500	1550	1550	2000	1397
Mean	947	1062	1031	1206	1425	1406	1544	1619	1280

S.E. of difference of two

1. I marginal means = 180.2 lb./ac.
2. M marginal means = 93.7 lb./ac.
3. M means at the same level of I = 265.0 lb./ac.
4. I means at the same level of M = 306.4 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 58(95).**

Site :- Govt. Seed and Demons. Farm, Betul.   **Type :- 'IM'.**

Object :—To study the effect of N, P and irrigation on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Morand* II. (b) Refer soil analysis, Betul. (iii) 10.11.1958. (iv) (a) 2 plouphings, 2 harrowings and 2 *bakherings*. (b) Drilled by *nari*. (c) 80 lb./ac. (d) 9″×4″. (e) N.A. (v) 30 lb./ac. of N as A/S+30 lb./ac. of P_2O_5 as Super. (vi) Hy—65. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 27, 28.3.1959.

2. TREATMENTS :

Same as in expt. no. 57(80) on page 336.

3. DESIGN :

(i) Split-plot. (ii) (a) 8 main-plots/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 33′×16½′. (b) 26½′×16½′. (v) 3¼′ length-wise on both sides. (vi) Yes.

4. GENERAL : .

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1367 lb./ac. (ii) (a) 142.8 lb./ac. (b) 174.4 lb./ac. (iii) Main effects of I and M are highly significant. (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	Mean
I_0	706	1025	837	1094	1412	1262	1412	1725	1184
I_1	887	918	1062	1412	1387	1518	1525	1969	1335
I_2	1050	1100	1268	1362	1444	1588	1587	1950	1419
I_3	868	1000	912	1125	1450	1569	1713	1924	1320
I_4	1053	950	837	1075	1381	1618	1881	1975	1346
I_5	862	1294	1137	1406	1281	2069	1712	1844	1451
I_6	875	931	906	1356	1650	1481	2037	1881	1390
I_7	987	912	1212	1712	1568	1813	1918	1794	1489
Mean	911	1016	1021	1318	1447	1615	1723	1883	1367

S.E. of difference of two

1. I marginal means   = 50.5 lb./ac.
2. M marginal means   = 61.7 lb./ac.
3. M means at the same level of I = 174.4 lb./ac.
4. I means at the same level of M = 170.7 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 59(105).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'IM'.**

Object :—To study the effect of different levels of irrigation with and without fertilizers on the yield of Wheat.

BASAL CONDITIONS :

(i) (a) Nil. (b) *Kali* flower. (c) N.A. (ii) (a) Medium. (b) Refer soil analysis, Chhindwara. (iii) 7.11.1959. (iv) (a) 1 ploughing and 3 *bakherings*. (b) Drilled by *nari*. (c) 80 lb./ac. (d) $9'' \times 3''$. (e) N.A. (v) Nil. (vi) Hy—11. (vii) Irrigated. (viii) Nil. (iv) 4.86″. (x) 22.4.1960.

2. TREATMENTS :

All combinations of (1) and (2)

    (1) 5 irrigation treatments : I_0=No irrigation, I_1=1 irrigation at tillering, I_2=1 irrigation at weeding, I_3=2 irrigations, 1 at tillering and other at heading and I_4=3 irrigations, 1st at tillering 2nd at heading and 3rd at milky stage.

    (2) 2 levels of fertilizers : F_0=0, F_1=50 lb./ac. of N+50 lb./ac. of P_2O_5.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) $40' \times 12'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 2216 lb./ac. (ii) 180.0 lb./ac. (iii) Main effects of I and F are highly significant. (iv) Av. yield of grain in lb./ac.

	I_0	I_1	I_2	I_3	I_4	Mean
F_0	1588	2172	1991	1900	2192	1969
F_1	2121	2555	2501	2459	2677	2463
Mean	1855	2364	2246	2180	2435	2216

S.E. of F marginal mean   = 40.2 lb./ac.
S.E. of I marginal mean   = 63.6 lb./ac.
S.E. of body of table   = 90.0 lb./ac.

Crop :- Wheat *(Rabi).* **Ref :- M.P. 57(20).**

Site :- Agri. College Farm, Gwalior. **Type :- 'IM'.**

Object :—To find out suitable levels of manure and irrigation for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sanai* for G.M. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 1.12.1957. (iv) (a) Ploughing and planking. (b) Drilled. (c) 40 srs./ac. (d) Between lines 18″. (e) N.A. (v) G.M. with *sanai.* (vi) NP—710 (medium). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 20, 21.4.1958.

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 irrigation : $I_1=1$, $I_2=2$ and $I_3=3$ irrigations.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) 17′×40′. (b) 11′×34′. (v) 3′×3′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Attack of termite. (iii) Yield of grain. (iv) (a) 1957—1958. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1337 lb./ac. (ii) 370.1 lb./ac. (iii) Main effects of I and N are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
I_1	618.4	1026.0	1052.8	899.1	892.7	841.8	962.7
I_2	1154.7	1681.1	1652.0	1495.9	1384.9	1542.9	1560.0
I_3	1377.9	1642.3	1826.7	1615.6	1397.3	1882.6	1567.0
Mean	1050.3	1449.8	1510.5	1336.9	1225.0	1422.4	1363.2
P_0	909.6	1322.0	1643.3				
P_1	1082.1	1542.9	1642.3				
P_2	1159.4	1484.5	1445.9				

S.E. of any marginal mean = 87.2 lb./ac.
S.E. of body of any table = 151.1 lb./ac.

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Crop :- Wheat *(Rabi).* **Ref :- M.P. 59(139).**

Site :- Govt. Agri. Res. Farm, Kuthulia (Rewa). **Type :- 'IM'.**

Object :—To find out the suitable levels of N, P and irrigation, for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 7.11.1959. (iv) (a) 4 ploughings. (b) Line sowing. (c) 80 lb./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) Hy—65. (vii) As per treatments. (viii) Nil. (ix) 1.9″. (x) 25.3.1960.

2. TREATMENTS :

Same as in expt. no. 59(105) on page 338.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) 80′×80′. (iii) 4. (iv) (a) 40′×16′. (b) 35′×12′. (v) 2½′×2′. (vi) Yes.

4. GENERAL :

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

5. **RESULTS :**

(i) 1410 lb./ac. (ii) 190.4 lb./ac. (iii) Only the main effect of F is significant. (iv) Av. yield of grain in lb./ac.

	I_0	I_1	I_2	I_3	I_4	Mean
F_0	1060	1030	977	979	1063	1022
F_1	1867	1726	1736	1763	1896	1798
Mean	1464	1378	1357	1371	1480	1410

S.E. of I marginal mean = 67.3 lb./ac.
S.E. of F marginal mean = 42.7 lb./ac.
S.E. of body of table = 95.2 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 59(63).**

Site :- Govt. Seed and Demons. Farm, Nabibagh (Bhopal). Type :- 'IM'.

Object :—To study the effect of different levels of irrigation with and without fertilizers on the yield of Wheat.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 15.11.1959. (iv) (a) 2 *bakherings* by *bakhar*. (b) Drilled behind *desi* plough. (c) 80 lb./ac. (d) Row to row 12". (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 21.4.1960.

2. **TREATMENTS :**

Same as in expt. no. 59 (105) on page 338.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 40'×16'. (b) 35'×12'. (v) 2½'×2'. (vi) Yes.

4. **GENERAL :**

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

5. **RESULTS :**

(i) 1899 lb./ac. (ii) 184.2 lb./ac. (iii) Main effect of F and interaction F×I are highly significant. (iv) Av. yield of grain in lb./ac.

	I_0	I_1	I_2	I_3	I_4	Mean
F_0	1290	1916	1923	2073	1926	1826
F_1	1706	2023	2047	2087	1996	1972
Mean	1498	1970	1985	2080	1961	1899

S.E. of I marginal mean = 65.1 lb./ac.
S.E. of F marginal mean = 41.2 lb./ac.
S.E. of body of table = 92.1 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 54(3).**

Site :- State Mechanised Farm, Reora.   **Type :- 'IM'.**

Object :—To find out suitable levels of manure and irrigation for Wheat.

1. **BASAL CONDITIONS :**

    (i) (a) Nil. (b) Paddy. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 13.12.1954. (iv) (a) 2 discings after paddy and 2 ploughings by *Nari* plough. (b) N.A. (c) 32 srs./ac. (d) Between rows 10″. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) Nil. (ix) 3.00″. (x) 13.4.1954.

2. **TREATMENTS :**

    Same as in expt. no. 57 (20) on page 339.

3. **DESIGN :**

    (i) 3^3 confd. (ii) (a) 9 plots/block, 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 40′×27′. (b) 36′×23′. (v) 2′×2′. (vi) Yes.

4. **GENERAL :**

    (i) Good. (ii) Brown rust appeared at maturity stage. No control measures taken. (iii) Height, tillering, population count, yield of grain, length and no. of earheads. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) (a) Gwalior. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

    (i) 566 lb./ac. (ii) 127.3 lb./ac. (iii) Only P effect is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	I_1	I_2	I_3
P_0	361	333	497	397	343	326	522
P_1	514	644	617	592	461	649	665
P_2	668	715	750	711	642	759	731
Mean	514	564	621	566	482	578	639
I_1	412	490	545				
I_2	507	592	634				
I_3	623	611	685				

    S.E. of any marginal mean   = 42.4 lb./ac.

    S.E. of body of any table   = 73.5 lb./ac.

Crop :- Wheat *(Rabi).*

Site :- State Mechanised Farm, Reora.

Ref :- M.P. 55(1).

Type :- 'IM'.

Object :—To find suitable levels of manure and irrigation for Wheat.

1. **BASAL CONDITIONS :**

    (i) (a) Nil. (b) Paddy. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 20.12.1955. (iv) (a) 2 discings by tractor. (b) By *Nari* plough. (c) N.A. (d) Between rows 10″. (e) N.A. (v) Nil. (vi) C—591. (vii) Irrigated. (viii) Nil. (ix) 3.50″. (x) 17.4.1956.

2. **TREATMENTS to 4. GENERAL .**

    Same as in expt. no. 54 (3) on page 340.

5. **RESULTS :**

    (i) 728 lb./ac. (ii) 156.8 lb./ac. (iii) Only N effect is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	I_1	I_2	I_3
P_0	561	710	703	658	471	699	803
P_1	587	804	916	769	654	787	866
P_2	620	766	888	758	694	775	805
Mean	590	760	836	728	607	754	825
I_1	526	654	639				
I_2	642	782	838				
I_3	600	844	1030				

S.E. of any marginal mean = 52.3 lb./ac.

S.E. of body of any table = 90.5 lb./ac.

Crop :- **Wheat** *(Rabi)*.   Ref :- **M.P. 56(MAE)**.

Site :- **M.A.E. Farm, Bagwai**.   Type :- **'IM'**.

Object :—Type I—To find the best levels of manure and irrigation for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A.   (ii) (a) Medium black soil.   (b) N.A.   (iii) 6.12.1956.   (iv) (a) 2 harrowings with *bakhar*, 1 ploughing with *desi* plough followed by planking.   (b) Line sowing.   (c) 62 lb./ac.   (d) Row to row 10".   (e) Nil.   (v) Nil.   (vi) N.A.   (vii) As per treatments.   (viii) N.A.   (ix) 3.27".   (x) 6 to 18.4.1957.

2. TREATMENTS :

Main-plot treatments :
   3 levels of irrigation : $I_1=1$, $I_2=2$ and $I_3=3$ irrigations.

Sub-plot treatments :
All combinations of (1) and (2)
   (1) 3 levels of N as A/S : $N_0=0$, $N_1=30$ and $N_2=60$ lb./ac.
   (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=30$ and $P_2=60$ lb./ac.
Intensity of each irrigation is 2".

3. DESIGN :

(i) Split-plot.   (ii) (a) 3 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) Nil.   (ii) Wheat stem-borer at seedling stage.   No control measures taken.   (iii) Grain and straw yield.
(iv) (a) No.   (b) and (c) Nil.   (v) (a) Obedullaganj and Powarkheda.   (b) N.A.   (vi) Slight damage by hail-storm.   (vii) Nil.

5. RESULTS :

(i) 1265 lb./ac.   (ii) (a) 67.2 lb /ac.   (b) 224.7 lb./ac.   (iii) Main effects of N and P are highly significant and effect of I is significant.   (iv) Av. yield of grain in lb./ac.

	I_1	I_2	I_3	Mean	N_0	N_1	N_2
P_0	1061	1167	1218	1149	932	1150	1364
P_1	1088	1303	1350	1247	1017	1275	1450
P_2	1348	1432	1414	1398	1096	1521	1577
Mean	1166	1301	1327	1265	1015	1315	1464
N_0	1011	1024	1011				
N_1	1103	1407	1436				
N_2	1384	1472	1535				

S.E. of difference of two

1. I marginal means = 22.4 lb./ac.
2. N or P margnal means = 74.9 lb./ac.
3. N or P means at the same level of I = 129.7 lb./ac.
4. I means at the same level of N or P = 108.3 lb./ac.
   S.E. of body of N × P table = 91.7 lb./ac.

Crop :- Wheat *(Rabi)*.

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

Ref :- M.P. 56(MAE)

Type :- 'IM'.

Object : —Type I—To find the best levels of manure and irrigation for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Deep black cotton soil. (b) Rerer soil analysis, Obedullaganj. (iii) 23 to 29.10.1956. (iv) (a) 4 to 5 harrowings with *bakhar*. (b) Line sowing. (c) 70 lb./ac. (d) Row to row 10". (e) Nil. (v) 5000 lb./ac. of compost. (vi) N.A. (vii) As per treatments. (viii) N.A. (ix) 6.75" (x) 27 to 31.3.1957.

2.- TREATMENTS :

Main-plot treatments :
All combinations of (1) and (2)
    (1) 3 levels of irrigation : $F_1=1$, $F_2=2$ and $F_3=3$ irrigations.
    (2) 3 intensities of irrigation : $I_1=1"$, $I_2=2"$ and $I_3=3"$.

Sub-plot treatments :
All combinations of (3) and (4)
    (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.

A/S broadcasted before final cultivation and Super drilled with seed.

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) 1/120 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Rust attack. (iii) Grain and straw yield. (iv) (a) 1956—1959. (b) No. (c) Nil. (v) (a) Bagwai, Powarkheda and Reora. (b) N.A. (vi) 10% damage due to hail storm and heavy rain in the end of March, 1957. (vii) Nil.

5. RESULTS :

(i) 2520 lb./ac. (ii) (a) 360.2 lb./ac. (b) 384.0 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in lb./ac.

	I_1	I_2	I_3	F_1	F_2	F_3	N_0	N_1	N_2	Mean
P_0	2472	2343	2560	2366	2553	2455	1706	2697	2971	2458
P_1	2576	2535	2481	2538	2439	2616	1730	2669	3194	2531
P_2	2502	2594	2617	2521	2565	2627	1990	2756	2967	2571
Mean	2517	2491	2553	2475	2519	2566	1809	2707	3044	2520
N_0	1823	1814	1790	1795	1809	1823				
N_1	2609	2775	2738	2584	2731	2806				
N_2	3119	2884	3130	3046	3017	3069				
F_1	2353	2486	2586							
F_2	2524	2446	2588							
F_3	2674	2541	2484							

S.E. of difference of two

1. I or F marginal means = 69.3 lb./ac.
2. N or P marginal means = 73.9 lb./ac.
3. N or P means at the same level of I or F = 128.0 lb./ac.
4. I or F means at the same level of N or P = 125.4 lb./ac.
S.E. of body of I×F table = 84.9 lb /ac.
S.E. of body of N×P table = 90.5 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 57(MAE).**

Site :- M.A.E. Farm, Obedullaganj.   **Type :- 'IM'.**

Object :—Type I—To find the best levels of manure and irrigation for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Obedullagarj. (iii) 2nd week of October, 1957. (iv) (a) 5 to 6 *bakherings.* (b) Line sowing. (c) 70 lb./ac. (d) Row to row 10". (e) Nil. (v) 5000 lb./ac. of compost. (vi) N.A. (vii) As per treatments. (viii) 1 weeding. (ix) N.A. (x) 2nd week of March, 1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56 (M.A.E.) Conducted at Obedullaganj on page 343.

5. RESULTS :

(i) 1075 lb./ac. (ii) (a) 460.3 lb./ac. (b) 201.5 lb./ac. (iii) Main effect of N is highly significant and interaction I×N×P is significant. (iv) Av. yield of grain in lb./ac.

	I_1	I_2	I_3	F_1	F_2	F_3	N_0	N_1	N_2	Mean
P_0	1113	910	1079	1018	1015	1069	892	1050	1160	1034
P_1	1185	954	1146	1080	1043	1162	880	1180	1225	1095
P_2	1141	1082	1066	1024	1014	1250	857	1132	1299	1096
Mean	1146	982	1097	1041	1024	1160	876	1121	1228	1075
N_0	964	759	905	873	863	892				
N_1	1127	1071	1165	1073	1043	1247				
N_2	1347	1116	1221	1177	1166	1341				
F_1	1133	913	1077							
F_2	1098	893	1076							
F_3	1207	1135	1138							

S.E. of difference of two

1. I or F marginal means = 88.6 lb./ac.
2. N or P marginal means = 38.8 lb./ac.
3. N or P means at the same level of I or F = 67.2 lb./ac,
4. I or F means at the same level of N or P = 104.2 lb./ac.
S.E. of body of I×F table = 108.5 lb./ac.
S.E. of body of N×P table = 47.5 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 58(MAE).**

Site :- M.A.E. Farm, Obedullaganj.   **Type :- 'IM'.**

Object :—Type I—To find the best levels of manure and irrigation for Wheat crop.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Obedullaganj (iii) October, 1958. (iv) (a) 6 *bakherings*. (b) Line sowing. (b) 70 lb./ac. (d) Row to row 10″. (e) Nil. (v) 5000 lb./ac. of compost. (vi) C—591. (vii) As per treatments. (viii) 1 weeding. (ix) 3″. (x) 4.3.1959.

2. **TREATMENTS :**

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

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

   (2) 3 levels of P_2O_5 as Super : $P_0 = 0$, $P_1 = 30$ and $P_2 = 60$ lb./ac.

   (3) 3 frequencies of irrigation : $F_1 = 1$, $F_2 = 2$ and $F_3 = 3$ irrigations.

   (4) 3 intensities of irrigation : $I_1 = 1″$, $I_2 = 2″$ and $I_3 = 3″$.

3. **DESIGN :**

   (i) 3^4 confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) 14′×31′. (b) 12′4″×29′5″. (v) N.A. (vi) Yes.

4. **GENERAL :**

   (i) N.A. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1956—1959. (b) No. (c) N.A. (v) (a) Bagwai, Powarkheda and Reora. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 1955 lb./ac. (ii) 427.8 lb./ac. (iii) Main effect of N alone is highly significant. (iv) (a) Av. yield of grain in lb./ac.

	I_1	I_2	I_3	F_1	F_2	F_3	N_0	N_1	N_2	Mean
P_0	1928	2024	1922	1901	2049	1924	1522	2074	2271	1958
P_1	1854	1906	1925	1936	1912	1837	1539	1876	2271	1895
P_2	1969	2004	2066	1914	1851	2274	1596	2172	2271	2013
Mean	1917	1978	1971	1917	1937	2012	1552	2041	2271	1955
N_0	1450	1646	1561	1456	1496	1705				
N_1	2041	2064	2019	2186	1978	1961				
N_2	2259	2223	2332	2108	2336	2370				
F_1	2016	1868	1867							
F_2	1884	2090	1837							
F_3	1851	1975	2210							

S.E. of any marginal mean	= 82.3 lb./ac.
S.E. of body of any table	= 142.6 lb./ac.

———

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 59(MAE).**

Site :- M.A.E. Farm, Obedullaganj.   **Type :- 'IM'.**

Object :—Type I—To find the best levels of manure and irrigation for Wheat crop.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Obedullaganj. (iii) 3.11.1959. (iv) (a) 6 *bakherings*. (b) Drilling. (c) 70 lb./ac. (d) Row to row 10″. (e) N.A. (v) Compost applied—amount N.A. (vi) C—591. (vii) As per treatments. (viii) 1 weeding. (ix) 7″. (x) 4.3.1960.

2. **TREATMENTS to 4. GENERAL :**

   Same as in expt. no· 58(MAE) conducted at Obedullaganj on page 344.

5. RESULTS :

(i) 1033 lb./ac.   (ii) 186.8 lb./ac.   (iii) Main effect of N alone is highly significant.   (iv) Av. yield of grain in lb./ac.

	I_1	I_2	I_3	F_1	F_2	F_3	N_0	N_1	N_2	Mean
P_0	941	859	1104	922	1001	981	699	1045	1160	968
P_1	1067	985	1083	1114	1029	992	708	1103	1325	1045
P_2	1112	12.6	930	1114	1042	1102	741	1078	1440	1086
Mean	1040	1020	1039	1050	1024	1025	716	1075	1308	1033
N_0	724	763	661	727	754	667				
N_1	1045	1136	1044	1100	1051	1074				
N_2	1351	1161	1412	1323	1267	1334				
F_1	1029	1012	1109							
F_2	987	1086	999							
F_3	1103	963	1009							

S E. of any marginal mean   =   36.0 lb./ac.
S.E. of body of any table   =   62.3 lb./ac.

———

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 56(MAE).**

Site :- M.A.E. Farm, Powarkheda.   **Type :- 'IM'.**

Object :—Type I—To find the best levels of manure and irrigation for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A.   (ii) (a) Deep black soil.   (b) Refer soil analysis, Powarkheda.   (iii) 10.11.1956.   (iv) to (vi) N.A.   (vii) As per treatments.   (viii) N.A.   (ix) 2.87".   (x) 1st week of April, 1957.

2. TREATMENTS

Main-plot treatments :
All combinations of (1) and (2)
   (1) 3 frequencies of irrigation : $F_1=2$, $F_2=3$ and $F_3=4$ irrigations.
   (2) 3 intensities of irrigation : $I_1=2"$, $I_2=3"$ and $I_3=4"$.

Sub-plot treatments :
All combinations of (3) and (4)
   (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) Split-plot.   (ii) (a) 9 main-plots/replication ; 9 sub-plots/main-plot.   (b) N.A.   (iii) 2.   (iv) (a) N.A.   (b) 1/96.9 ac.   (v) N.A.   (vi) Yes.

4. GENERAL :

(i) Nil.   (ii) Slight infection of rust.   (iii) Grain and straw yield.   (iv) (a) 1956—1959.   (b) No.   (c) N.A.   (v) (a) Bagwai, Obedullaganj, and Reora.   (b) N.A.   (vi) Damage by hail storn.   (vii) Nil.

5. RESULTS :

(i) 1463 lb./ac.   (ii) (a) 270.1 lb./ac.   (b) 166.2 lb./ac.   (iii) Main effects of N and P and interactions N×P and F×P are highly significant.   Main effect of F and interactions F×N and F×N×P are significant.   (iv) Av. yield of grain in lb./ac.

	I_1	I_2	I_3	F_1	F_2	F_3	N_0	N_1	N_2	Mean
P_0	989	965	1049	1038	1012	953	755	1089	1160	1001
P_1	1639	1629	1667	1605	1763	1567	1070	1818	2046	1645
P_2	1707	1697	1829	1458	1650	2124	1300	1690	2243	1744
Mean	1445	1430	1515	1367	1475	1548	1042	1532	1816	1463
N_0	991	1011	1124	1029	1020	1077				
N_1	1571	1497	1529	1409	1572	1615				
N_2	1773	1783	1893	1663	1834	1952				
F_1	1393	1327	1381							
F_2	1385	1464	1577							
F_3	1557	1499	1587							

S.E. of difference of two
1. I or F marginal means = 52.0 lb./ac.
2. N or P marginal means = 32.0 lb./ac.
3. N or P means at the same level of I or F = 55.4 lb./ac.
4. I or F means at the same level of N or P = 68.9 lb./ac.
   S.E. of body of I × F table = 63.7 lb./ac.
   S.E. of body of N × P table = 39.2 lb./ac.

Crop :- Wheat *(Rabi)*. **Ref :- M.P. 57(MAE).**

Site :- M.A.E. Farm, Powarkheda. **Type :- 'IM'.**

Object :—Type I—To find out the best levels of manure and irrigation for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Deep black soil. (b) Refer soil analysis, Powarkheda. (iii) 3rd week of October, 1957. (iv) (a) 4 *bakherings*. (b) Line sowing. (c) 80 lb./ac. (d) Row to row 1'. (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) N.A. (vii) As per treatments. (viii) N.A. (ix) Nil. (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(MAE) conducted at Powarkheda on page 346.

5. RESULTS :

(i) 1459 lb./ac. (ii) (a) 632.7 lb./ac. (b) 198.7 lb./ac. (iii) Main effects of N, P and interaction N × P are highly significant. Main effect of F and interactions I × F × N are significant. (iv) Av. yield of grain in lb./ac.

	I_1	I_2	I_3	F_1	F_2	F_3	N_0	N_1	N_2	Mean
P_0	1076	1087	1085	961	1110	1177	936	1099	1213	1083
P_1	1509	1605	1733	1388	1664	1796	1294	1682	1872	1616
P_2	1590	1703	1740	1427	1707	1899	1386	1668	1979	1678
Mean	1392	1465	1519	1259	1494	1624	1205	1483	1688	1459
N_0	1187	1199	1229	1010	1256	1350				
N_1	1441	1498	1510	1290	1513	1646				
N_2	1548	1697	1819	1476	1712	1875				
F_1	1183	1298	1295							
F_2	1511	1343	1627							
F_3	1481	1754	1636							

S.E. of difference of two

1. I or F marginal means	=	121.8 lb./ac.
2. N or P marginal means	=	38.2 lb./ac.
3. N or P means at the same level of I or F	=	66.2 lb./ac.
4. I or F means at the same level of N or P	=	133.2 lb./ac.
S.E. of body of I×F table	=	149.1 lb./ac.
S.E. of body of N×P table	=	46.8 lb./ac.

Crop :- Wheat *(Rabi)*.　　　　　　　　　　　**Ref :- M.P. 58(MAE),**

Site :- M.A.E. Farm, Powarkheda.　　　　　**Type :- 'M'.**

Object :—To find the best levels of manure and irrigation for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Deep black soil. (b) Refer soil analysis, Powarkheda. (iii) 4.10.1958. (iv) (a) 2 *bakherings*. (b) Drilling. (c) 80 lb./ac. (d) Row to row 10". (e) N.A. (v) 5000 lb./ac. of F.Y.M. (vi) Hy−65. (vii) As per treatments. (viii) N.A. (ix) 2". (x) 4.3.1959.

2. TREATMENTS :

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

　　(1) 3 levels of N as A/S : $N_0=0$, $N_1=30$ and $N_2=60$ lb./ac.
　　(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=30$ and $P_2=60$ lb./ac.
　　(3) 3 frequencies of irrigation : $F_1=2$, $F_2=3$ and $F_3=4$ irrigations.
　　(4) 3 intensities of irrigation : $I_1=2"$, $I_2=3"$ and $I_3=4"$.

3. DESIGN :

(i) 3^4 confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 1/96.9 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1956—1959. (b) No. (c) N.A. (v) Bagwai and Obedullaganj. (vi) and (vii) Nil

5. RESULTS :

(i) 1738 lb./ac. (ii) 175.8 lb./ac. (iii) Main effects of F, N, P and interactions F×N and F×P are highly significant. Main effect of I and interaction F×I are significant. (iv) Av. yield of grain in lb./ac.

	I_1	I_2	I_3	F_1	F_2	F_3	N_0	N_1	N_2	Mean
P_0	1270	1281	1317	1177	1398	1292	952	1425	1490	1289
P_1	1837	1847	1978	1826	1885	1950	1202	2166	2294	1887
P_2	1867	2126	2123	1893	2052	2171	1512	2083	2522	2039
Mean	1658	1751	1806	1632	1778	1804	1222	1891	2102	1738
N_0	1151	1225	1289	1287	1107	1272				
N_1	1826	1895	1951	1738	2050	1885				
N_2	1996	2134	2177	1871	2178	2256				
F_1	1619	1686	1591							
F_2	1693	1809	1832							
F_3	1661	1758	1994							

S.E. of any-marginal mean	= 33.8 lb./ac.
S.E. of body of any table	= 58.6 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 59(MAE).**

Site :- M.A.E. Farm, Powarkheda.   **Type :- 'IM'.**

Object :—Type I—To find the best levels of manure and irrigation for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Deep black soil. (b) Refer soil analysis, Powarkheda. (iii) October, 1959. (iv) (a) 4 *bakherings*. (b) Drilling. (c) 80 lb./ac. (d) Row to row 1'. (e) N.A. (v) F.Y.M. applied—amount N.A. (vi) Hy—65. (vii) As per treatments. (viii) 1 weeding. (ix) 5". (x) 2.3.1960.

2. TREATMENTS to 4. GENERAL:

Same as in expt no. 58(MAE) conducted at Powarkheda on page 348.

5. RESULTS :

(i) 1835 lb./ac. (ii) 202.3 lb./ac. (iii) Main effects of F, N and P and interaction $N \times P$ are highly significant. (iv) Av. yield of grain in lb./ac.

	I_1	I_2	I_3	F_1	F_2	F_3	N_0	N_1	N_2	Mean
P_0	1522	1517	1488	1462	1467	1598	1127	1605	1794	1509
P_1	2019	1917	2022	1991	1871	2096	1465	2049	2444	1986
P_2	1893	2038	2099	1876	1945	2209	1267	2161	2600	2010
Mean	1811	1824	1870	1776	1761	1968	1286	1939	2279	1835
N_0	1327	1188	1343	1201	1210	1448				
N_1	1942	1961	1915	1904	1857	2056				
N_2	2164	2323	2351	2223	2216	2399				
F_1	1728	1810	1790							
F_2	1728	1761	1794							
F_3	1977	1901	2026							

S.E. of any marginal mean = 38.9 lb./ac.
S.E. of body of any table   = 67.4 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 57(MAE).**

Site :- State Mechanised Farm, Reora.   **Type :- 'IM'.**

Object :—Type I—To find the best levels of manure and irrigation for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 12.12.1957. (iv) (a) 2 ploughings by *desi* plough. (b) Line sowing. (c) 72 lb./ac. (d) Row to row 10". (e) N.A. (v) Nil. (vi) N.A. (vii) As per treatments. (viii) N.A. (ix) 2". (x) 13.4.1958.

2. TREATMENTS :

Same as in expt. no. 58(MAE) conducted at Powarkheda on page 348.

3. DESIGN :

(i) 3^4 confd. (ii) (a) 9 blocks/replication ; 9 plots/block. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 1/120 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Brown rust. (iii) Grain and straw yield. (iv) (a) 1957—1958. (b) No. (c) N.A. (v) (a) Bagwai, Obedullaganj and Powarkheda. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1173 lb./ac. (ii) 465.5 lb./ac. (iii) Effect of P is highly significant. and effect of N is significant. (iv) Av. yield of grain in lb./ac.

	I_1	I_2	I_3	F_1	F_2	F_3	N_0	N_1	N_2	Mean
P_0	647	669	592	752	568	588	543	625	741	636
P_1	1171	1481	1338	1391	1284	1315	1012	1547	1432	1330
P_2	1464	1414	1778	1349	1616	1691	1333	1522	1802	1552
Mean	1094	1188	1236	1164	1156	1198	963	1231	1325	1173
N_0	872	965	1051	987	1007	892				
N_1	1116	1061	1516	1100	1286	1307				
N_2	1294	1538	1141	1404	1174	1396				
F_1	1127	1144	1221							
F_2	996	1292	1180							
F_3	1160	1127	1307							

S.E. of any marginal mean   = 89.6 lb./ac.
S.E. of body of any table   = 155.2 lb./ac

—

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 58(MAE).**

Site :- M.A.E. Farm, Reora.   **Type :- 'IM'.**

Object :—Type I—To find the test levels of manure and irrigation for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) November, 1958. (iv) (a) 4 ploughings. (b) Line sowing. (c) 70 lb./ac. (d) Row to row 10″. (e) N.A. (v) Nil. (vi) C—591. (vii) As per treatments. (viii) N.A. (ix) 3″. (x) 3.4.1959.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(MAE) conducted at Reora on page 349.

5. RESULTS :

(i) 1432 lb./ac. (ii) 343.8 lb./ac. (iii) Main effect of P is highly significant. Effect of N and interactions $I \times F$ and $I \times N$ are significant. (iv) Av. yield of grain in lb./ac.

	I_1	I_2	I_3	F_1	F_2	F_3	N_0	N_1	N_2	Mean
P_0	772	788	940	754	943	802	760	734	1006	833
P_1	1542	1491	1782	1552	1610	1682	1456	1647	1711	1605
P_2	1971	1801	1806	1640	2064	1874	1676	1836	2066	1859
Mean	1428	1360	1509	1305	1539	1453	1297	1406	1594	1432
N_0	1369	1299	1223	1234	1321	1336				
N_1	1368	1441	1409	1338	1492	1388				
N_2	1547	1341	1895	1344	1804	1634				
F_1	1428	1350	1137							
F_2	1510	1376	1731							
F_3	1346	1354	1659							

S.E. of any marginal mean   = 66.2 lb./ac.
S.E. of body of any table   = 114.6 lb /ac.

Crop :- Wheat *(Rabi).*

Ref :- M.P. 54(TCM).

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

Type :- 'IM'.

Object :—Type VII—To find the best levels of manure and irrigation for Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 27.11.1954. (iv) and (v) N.A. (vi) Pb —591. (vii) As per treatments. (viii) and (ix) N.A. (x) 3 to 9.4.1955.

2. **TREATMENTS :**

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

   (1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
   (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.
   (3) 3 levels of irrigation : $I_1=1$, $I_2=2$ and $I_3=3$ irrigations.

3. **DESIGN :**

   (i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 60′×18′. (b) 52′×14′. (v) 4′×2′. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) Mild attack of loose—smut. (iii) Grain and straw yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Obedullagunj and Reora. (b) N.A. (vi) and (vii) N.A.

5. **RESULTS :**

   (i) 1224 lb./ac. (ii) 40.3 lb./ac. (iii) Main effects of N, P, I and interactions N×P and P×I are highly significant. Interaction N×I is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	I_1	I_2	I_3
P_0	516	675	590	594	495	634	652
P_1	1039	1512	1665	1405	1061	1580	1574
P_2	1174	1806	2035	1672	1419	1805	1792
Mean	910	1331	1430	1224	992	1340	1339
I_1	691	1037	1248				
I_2	1053	1440	1527				
I_3	986	1516	1515				

S.E. of any marginal mean   = 13.4 lb./ac.
S.E. of body of any table   = 23.3 lb./ac.

Crop :- Wheat.

Ref :- M.P. 55(TCM).

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

Type :- 'IM'.

Object :- Type VII—To find the best levels of manure and irrigation for Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) to (vi) N.A. (vii) As per treatments. (viii) to (x) N.A.

2. **TREATMENTS to 4. GENERAL :**

   Same as in expt. no. 54(TCM) conducted at Bagwai above.

5. **RESULTS :**

   (i) 962 lb./ac. (ii) 111.9 lb./ac. (iii) Main effect of P is highly significant and N effect is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	I_1	I_2	I_3
P_0	685	835	795	772	735	828	752
P_1	920	1066	1038	1008	981	1053	990
P_2	975	1154	1188	1106	1078	1164	1075
Mean	860	1018	1007	962	931	1015	939
I_1	906	977	911				
I_2	823	1124	1098				
I_3	851	954	1012				

S.E. of any marginal mean = 37.3 lb./ac.
S.E. of body of any table = 64.6 lb./ac.

———

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 54(TCM).**

Site :- M.A.E. Farm, Obedullaganj.   **Type :- 'IM'.**

Object : —Type VII—To find the best levels of manure and irrigation for Wheat.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Obedullaganj. (iii) 31.10.1954· (iv) and (v) N.A. (vi) C—591. (vii) As per treatments. (viii) and (ix) N.A. (x) 10.3.1955.

2. **TREATMENTS:**

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

    (1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
    (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.
    (3) 3 levels of irrigation : $I_0=0$, $I_1=1$ and $I_2=2$ irrigations.

A/S broadcasted just before sowing and Super applied alongwith the seed.

3. **DESIGN :**

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 36'×30'. (b) 30'×25'. (v) 3'×2½'. (vi) Yes.

4. **GENERAL :**

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) (a) Bagwai and Reora. (b) N.A. (vi) and (vii) N.A.

5. **RESULTS :**

(i) 1051 lb./ac. (ii) 49.4 lb./ac. (iii) Main effects of N and I and interactions N×P, N×I and P×I are highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	I_1	I_2	I_3
P_0	871	1219	1044	1045	904	828	961
P_1	697	1011	1400	1036	1009	1175	1122
P_2	876	1113	1221	1070	1221	1108	127
Mean	815	1115	1222	1051	1045	1037	1070
I_1	769	968	955				
I_2	869	1216	1219				
I_3	806	1158	1493				

S.E. of any marginal mean   =   16.5 lb./ac.

S.E of body of any table   =   28.5 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 55(TCM).**

Site :- M.A.E. Farm, Obedullaganj.   **Type :- 'IM'.**

Object :—Type VII—To find the best levels of manure and irrigation for Wheat.

1. BASAL CONDITIONS :

   (i) (a) to (c) N.A.   (ii) (a) Deep black cotton soil.   (b) Refer soil analysis, Obedullaganj.   (iii) to (vi) N.A.
   (vii) As per treatments.   (viii) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

   Same as in expt. no. 54(TCM) conducted at Obedullaganj on page 352.

5. RESULTS :

   (i) 1057 lb./ac.   (ii) 276.8 lb./ac.   (iii) None of the effects is significant.   (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	I_0	I_1	I_2
P_0	910	842	1398	1050	832	1043	1275
P_1	914	1074	769	919	791	1032	934
P_2	743	1385	1480	1203	1140	1006	1463
Mean	856	1100	1216	1057	921	1027	1224
I_0	703	908	1152				
I_1	890	939	1252				
I_2	975	1453	1244				

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

S.E. of body of any table   =   159.8 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 54(TCM).**

Site :- State Mechanised Farm, Reora (Satna).   **Type :- 'IM'.**

Object :—Type VII—To find the best levels of manure and irrigation for Wheat.

1. BASAL CONDITIONS:

   (i) (a) to (c) N.A.   (ii) (a) Mixed red and black soil.   (b) N.A.   (iii) to (v) N.A.   (vi) C—591.   (vii) As
   per treatments.   (viii) and (ix) N.A.   (x) 21.4.1955.

2. TREATMENTS :

   Same as in expt. no. 54(TCM) conducted at Obedullaganj on page 352.

3. DESIGN :

   (i) 3^3 confd.   (ii) (a) 9 plots/block; 3 blocks/repliaction.   (b) N.A.   (iii) 1.   (iv) (a) 40'×24'. (b) 36'×20'.
   (v) 2'×2'.   (vi) Yes.

4. GENERAL :

   (i) Good.   (ii) N.A.   (iii) Grain and straw yield.   (iv) (a) 1953—1956.   (b) No.   (c) N.A.   (v) (a) Bagwai
   and Obedullaganj.   (b) N.A.   (vi) and (vii) N.A. -

5. RESULTS :

(i) 650 lb./ac. (ii) 143.9 lb./ac. (iii) Main effect of P alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
I_0	474	564	626	555	394	531	740
I_1	583	681	728	664	374	746	872
I_2	716	702	779	732	600	763	833
Mean	591	649	711	650	456	680	815
P_0	415	383	571				
P_1	591	741	709				
P_2	768	822	854				

S.E. of any marginal mean = 48.0 lb./ac.
S.E. of body of any table = 83.1 lb./ac.

Crop :- Wheat *(Rabi).*   **Ref :- M.P. 55(TCM).**

Site :- State Mechanised Farm, Reora.   **Type :- 'IM'.**

Object :—Type VII—To find the best levels of manure and irrigation for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Mixed red and black soil. (b) N.A. (iii) to (vi) N.A. (vii) As per treatments. (viii) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(TCM) conducted at Reora on page 353.

5. RESULTS :

(i) 833 lb./ac. (ii) 167.8 lb./ac. (iii) Main effects of N and I are significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	I_0	I_1	I_2
P_0	645	816	808	756	541	804	923
P_1	676	924	1014	871	753	865	996
P_2	713	881	1021	872	797	891	927
Mean	678	874	948	833	697	853	949
I_0	605	752	735				
I_1	739	899	922				
I_2	690	970	1185				

S.E. of any marginal mean = 55.9 lb./ac.
S.E. of body of any table = 96.9 lb./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 56(79).**

Site :- Agri. Res. Stn., Adhartal (Jabalpur).   **Type :- 'D'.**

Object :—To find the effective dose of best synthetic insecticide to control the white ant attack.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) and (c) N.A. (ii) (a) *Kabar* 2. (b) Refer soil analysis, Adhartal. (iii) N.A. (iv) (a) *Bakhering* Raja cutting. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

   T_0=Control, T_1=B.H.C. 5% at 50 lb./ac. T_2=D.D.T. 5% at 50 lb./ac. T_3=Aldrin 20% at 50 lb./ac. and T_4=Dieldrin 1½% at 66 lb./ac.

3. DESIGN :

   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 33'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

   (i) Poor growth. (ii) No serious damage by white ants. (iii) Grain yield. (iv) (a) No. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS :

   (i) 257 lb./ac. (ii) 110.4 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	287	248	221	297	234

   S.E./mean = 55.2 lb./ac.

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Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 56(78).**

Site :- Govt. Agri. Res. Stn., Adhartal (Jabalpur).   **Type :- 'D'.**

Object :—To find the effective dose of best synthetic insecticides to control the white ant attack.

1. BASAL CONDITIONS :

   i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Kabar* 2. (b) Refer soil analysis, Adhartal. (iii) 23.10.1956. (iv) (a) 3 ploughings. (b) By *nari*. (c) to (e) N.A. (v) Nil. (vi) Wheat AO—90. (vii) Unirrigated. (viii) 1 weeding. (ix) N.A. (x) 2.4.1957.

2. TREATMENTS :

   All combinations of (1) and (2) + control.
   (1) Insecticides : I_1=B.H.C. 5% at 50 lb./ac. I_2=D.D.T. 5% at 50 lb./ac. I_3=Aldrin at 50 lb./ac. I_4=Dieldrin at 66 lb./ac. and I_5=Endrine at 100 lb /ac.
   (2) 2 methods of application : M_1=By mixing in soil prior to sowing and M_2=By drilling with seed.

3. DESIGN :

   (i) R.B.D. (ii) (a) 11 (b) N.A. (iii) 4. (iv) (a) and (b) 33'×16½'. (v) Nil. (vi) Yes.

4. GENERAL :

   (i) Growth is poor. (ii) No white ant damage was observed. (iii) Grain yield. (iv) (a) No. (b) and (c) Nil. (v) (a) Powarkheda. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

   (i) 223 lb./ac. (ii) 75.2 lb./ac. (iii) Only I×M interaction in significant. (iv) Av. yield of grain in lb./ac.

Control = 259 lb./ac.

	I_1	I_2	I_3	I_4	I_5	Mean
M_1	216	269	198	319	190	238
M_2	149	174	206	200	276	201
Mean	182	222	202	260	233	219

S.E. of marginal mean of I   = 16.8 lb./ac.
S.E. of marginal mean of M   = 26.6 lb./ac.
S.E. of body of table   = 37.6 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 55(10).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'D'.**

Object :—To find the effective dose of best synthetic insecticide to control the white ant attack.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Wheat (c) 15 lb./ac. of P_2O_5+15 lb./ac. of N. (ii) (a) Clay loam. *Maryar.* (b) Refer soil analysis, Powarkheda. (iii) 12.11.1955. (iv) (a) *Bakhering.* (b) By *nari* plough. (c) 80 lb./ac. (d) 1' between lines. (e) N.A. (v) Nil. (vi) Hy—65 (improved-medium). (vii) Unirrigated. (viii) Nil. (ix) 0.93". (x) 26.4.1956.

2. **TREATMENTS :**

   9 insecticides : T_0=Control, T_1=B.H.C. 5% mixed in soil at 80 lb./ac., T_2=D.D.T. 5% mixed in soil at 50 lb./ac., T_3=Aldrin mixed in soil at 66 lb./ac., T_4=Dieldrin mixed in soil at 100 lb./ac. T_5=B.H C. 5% drilled with seed at 25 lb./ac., T_6=D.D.T. 5% drilled with seed at 25 lb./ac. T_7=Dieldrin drilled with seed at 25 lb./ac. and T_8=Aldrin drilled with seed at 25 lb./ac.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) $16\frac{1}{2}' \times 8\frac{1}{4}'$. (v) Nil. (vi) Yes.

4. **GENERAL:**

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

5. **RESULTS :**

   (i) 230 lb./ac. (ii) 59.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8
Av. yield	257.2	224.4	232.4	202.4	229.6	162.0	260.0	219.6	257.2

   S.E./mean = 29.6 lb./ac.

Crop :- Wheat.   **Ref :- M.P. 57(37).**

Site :- Govt. Wheat Res. Farm, Powarkheda.   **Type :- 'D'.**

Object :—To find the effective dose of best synthetic insecticide to control the white ant attack.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Wheat. (c) 15 lb./ac. of N+15 lb./ac. of P_2O_5. (ii) (a) Clay loam. *Maryar.* (b) Refer soil analysis, Powarkheda. (iii) 28.10.1957. (iv) (a) *Bakhering.* (b) By *nari.* (c) 80 lb./ac. (d) Between rows 12". (e) N.A (v) Nil. (vi) Hy—11 (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.9". (x) 3.4.1958.

2. TREATMENTS:

Same as in expt. no. 56(78) on page 355.

3. DESIGN:

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) and (b) $16\frac{1}{2}'\times 8\frac{1}{4}'$. (v) Nil. (vi) Yes.

4. GENERAL:

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

5. RESULTS:

(i) 1027 lb./ac. (ii) 339.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb /ac.

Control = 1145 lb./ac.

	I_1	I_2	I_3	I_4	I_5	Mean
M_1	1110	830	625	1015	955	907
M_2	1171	1041	1080	1186	1136	1123
Mean	1141	936	853	1101	1046	1015

S.E. of M marginal mean = 75.9 lb./ac.
S.E. of I marginal mean = 120.0 lb./ac.
S.E. of body of table or control mean = 169.8 lb./ac.

Crop :- Jowar *(Kharif)*.   Ref :- M.P. 55(59).

Site :- Govt. Seed and Demons. Farm, Amlaha.   Type :- 'M'.

Object :—To find the optimum levels of N and P for Jowar under unirrigated conditions.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Light clay. (b) Refer soil analysis, Amlaha. (iii) 22.6.1955. (iv) (a) 4 *bakherings*. (b) Drilling. (c) 5 lb./ac. (d) $2'\times 9''$. (e) N.A. (v) N.A. (vi) *Chichawada*. (vii) Unirrigated. (viii) Thining, hoeing and weeding. (ix) and (x) N.A.

2. TREATMENTS:

11 manurial treatments : M_0=Control, M_1=100 lb./ac. of A/S, M_2=M_1+S_1, M_3=M_1+2 times S_1, M_4 =M_1+3 times S_1, M_5=M_1+4 times S_1, M_6=150 lb./ac. of A/S, M_7=M_6+S_2, M_8=M_6+2 times S_2, M_9=M_6+3 times S_2 and M_{10}=M_6+4 times S_2.

S_1=$62\frac{1}{2}$ lb./ac. of Super and S_2=94 lb./ac. of Super.
Fertilizers drilled into soil to 3" depth.

3. DESIGN:

(i) R.B.D. (ii) (a) 11. (b) $363'\times 33'$. (iii) 4. (iv) (a) $33'\times 33'$. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Stem-borer attack from 23.7.1955 to 14.8.1955 but due to heavy rains it disappeared. Seeds were treated with Agroson. (iii) Yield of grain. (iv) (a) No. (b) and (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 594 lb./ac. (ii) 160.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
Av. yield	798	612	560	529	540	551	535	516	605	635	648

S.E./mean = 80.4 lb./ac.

Crop :- Jowar *(Kharif).*   **Ref :- M.P. 58(33).**

Site :- Govt. Seed and Demons. Farm, Biora.   **Type :- 'M'.**

Object :—To find out suitable manurial schedule for Jowar crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Clay. (b) N.A. (iii) 6.7.1958. (iv) (a) 2 *bakherings.* (b) Drilled. (c) 8 lb./ac. (d) 18″ between rows. (e) N.A. (v) Nil. (vi) U—6. (vii) Unirrigated. (viii) 2 *kulpas* and 1 hand weeding. (ix) 41.2″. (x) N.A.

2. **TREATMENTS :**

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

     (1) 3 levels of N as A/S : $N_0=0$, $N_1=15$ and $N_2=30$ lb./ac.
     (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=15$, $P_2=30$ lb./ac.
     (3) 3 levels of K_2O : $K_0=0$, $K_1=15$ and $K_2=30$ lb./ac.

3. **DESIGN :**

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2.] (iv) (a) 33′×22′. (b) 30′× 20′. (v) 1½′×1′. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1958—N.A. (b)] N.A. (c) Nil. (v) (a) Jhabua. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 313 lb./ac. (ii) 45.1 lb./ac. (iii) Only effect of P and interaction N×P are significant. (iv) (a) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	313	294	248	285	294	300	262
N_1	251	322	360	311	330	301	303
N_2	250	434	345	343	380	313	336
Mean	271	350	318	313	334	305	300
K_0	281	381	340	334			
K_1	266	365	283	305			
K_2	266	304	330	300			

S.E. of any marginal mean   = 18.4 lb./ac.
S.E. of body of any table   = 31.9 lb./ac.

Crop :- Jowar *(Kharif).*   **Ref :- M.P. 59(27).**

Site :- Govt. Seed and Demons. Farm, Biora.   **Type :- 'M'.**

Object :—To find out suitable manurial schedule for Jowar crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) 15 lb./ac. of N+15 lb./ac. of P_2O_5 (ii) (a) Clay. (b) N.A. (iii) 8.7.1959. (iv) (a) 2 *bakherings.* (b) Drilling. (c) 8 lb /ac. (d) 18″ between rows. (e) N.A. (v) Nil. (vi) U—6. (vii) Unirrigated. (viii) 2 *kulpas* and 1 hand weeding. (ix) 45.6″. (x) 26.12.1959.

2. **TREATMENTS :**

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

     (1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
     (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.
     (3) 3 levels of K_2O : $K_0=0$, $K_1=20$ and $K_2=40$ lb./ac.

3. DESIGN :

   (i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 30'×18'.
   (v) N.A. (vi) Yes.

4. GENERAL :

   (i) Normal. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1958– N.A. (b) N.A. (c) Nil. (v) (a) Jhabua.
   (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

   (i) 490 lb./ac. (ii) 68.4 lb./ac. (iii) Main effect of N is significant and main effect of P is highly significant.
   (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	400	498	504	467	483	472	447
N_1	363	451	541	452	531	385	439
N_2	392	632	627	550	540	610	501
Mean	385	527	557	490	518	489	462
K_0	427	538	588				
K_1	414	518	536				
K_2	314	524	548				

   S.E. of any marginal mean = 27.9 lb./ac.
   S.E. of body of any table = 48.4 lb./ac.

- - - -

Crop :- Jowar *(Kharif).*   Ref :- M.P. 59(30).

Site :- Govt. Seed and Demons. Farm, Biora.   Type :- 'M'.

Object :– To find out the most suitable manurial schedule for Jowar crop.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Wheat. (c) 15 lb./ac. of N+15 lb./ac. of P. (ii) (a) Clay loam. (b) N.A. (iii) 8.7.1959.
   (iv) (a) 2 *bakherings.* (b) Drilling. (c) 8 lb./ac. (d) 18" between rows. (e) N.A. (v) Nil. (vi) Ujjain—6.
   (vii) Unirrigated. (viii) 2 *kulpas* and 1 hand weeding. (ix) 45.6". (x) 26.12.1959.

2. TREATMENTS :

   All combinations of (1) and (2)
   (1) 4 levels of N as A/S : $N_0=0$, $N_1=7\frac{1}{2}$, $N_2= 15$ and $N_3=22\frac{1}{2}$ lb./ac.
   (2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=15$ lb./ac.

3. DESIGN :

   (i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 15'×30'. (b) 12'×26'. (v) 1½'×2'. (vi) Yes.

4. GENERAL :

   (i) Normal. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1959—N.A. (b) N.A. (c) Nil. (v) (a) N.A.
   (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

   (i) 613 lb./ac. (ii) 100.8 lb./ac. (iii) Only main effects of N and P are highly significant. (iv) Av. yield
   of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	428	524	489	720	540
P_1	668	594	746	733	685
Mean	548	559	618	726	613

S.E. of marginal mean of N $=$ 35.6 lb./ac.
S.E. of marginal mean of P $=$ 25.2 lb./ac.
S.E. of body of table $=$ 50.4 lb./ac.

———

Crop :- Jowar.   **Ref :- M.P. 57(14).**

Site :- Agri. College Farm, Gwalior.   **Type :- 'M'.**

Object :—To find out suitable manurial schedule for Jowar crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 28.7.1957. (iv) (a) 3 ploughings. (b) N.A. (c) 5 srs./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) G—12—2. (vii) Unirrigated. (viii) 1 weeding. (ix) N.A. (x) 13.11.1957.

2. TREATMENTS :

Same as in expt. no. 58(33) on page 358.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 50′×30′. (b) 46′×26′. (v) 2′×2′. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1883 lb./ac. (ii) 277.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	1779	1861	1921	1854	1806	1873	1882
N_1	1800	2040	1921	1920	1843	1994	1925
N_2	1851	1839	1938	1876	1730	1877	2022
Mean	1810	1913	1927	1883	1793	1915	1943
K_0	1786	1827	1765				
K_1	1789	1958	1997				
K_2	1855	1955	2019				

S.E. of any marginal mean $=$ 65.4 lb./ac
S.E. of body of table $=$ 113.3 lb./ac.

———

Crop :- Jowar *(Kharif)*.   **Ref :- M.P. 54(26).**

Site :- Central Res. Farm, Gwalior.   **Type :- 'M'.**

Object :—To find out suitable dose of N and P for Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 26.7.1954. (iv) (a) N.A. (b) Drilling. (c) N.A. (d) 18″ between rows. (e) N.A. (v) Nil. (vi) Gwalior 12—2. (vii) Unirrigated. (viii) N.A. (ix) 28.4″. (x) N.A.

2. TREATMENTS :

Strips in one direction :

5 levels of N as A/S : $N_0=0$, $N_1=10$, $N_2=20$, $N_3=30$ and $N_4=40$ lb./ac.

Strips in orthogonal direction :

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

A/S applied 3 weeks after sowing and Super applied before sowing.

3. DESIGN :

(i) Strip-plot. (ii) (a) 15. (b) N.A. (iii) 4? (iv) (a) 34"×15'. (b) 30'×12'. (v) 2'×1½'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 707 lb./ac. (ii) S.E. (N) = 176.4 lb./ac., S.E. (P) = 259.3 lb./ac. and S.E. (NP) = 137.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
P_0	688	821	782	762	836	778
P_1	661	692	677	704	739	694
P_2	556	537	642	755	751	648
Mean	635	683	700	740	775	707

S.E. of difference of two

1.	Marginal means of N	= 72.0 lb./ac.
2.	Marginal means of P	= 82.0 lb./ac.
3.	P means at the same level of N	= 132.1 lb./ac.
4.	N means at the same level of P	= 103.0 lb./ac.

Crop :- Jowar *(Kharif).*   **Ref :- M.P. 54(31).**

Site :- Agri. College Farm, Gwalior.   **Type :- 'M'.**

Object :—To determine the optimum dose of micronutrients on Jowar.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 16.7.1954. (iv) (a) Ploughing, discing and *patela.* (b) N.A. (c) 4 srs./ac. (d) 9" between rows. (e) N.A. (v) N.A. (vi) Gwalior 12—2. (vii) N.A. (viii) Weeding and interculturing. (ix) 28.4". (x) 28.11.1954.

2. TREATMENTS :

7 micronutrients : M_0=Control, M_1=8, M_2=16, M_3=32 oz./ac. of Borax, M_4=6, M_5=12 and M_6=24 oz./ac. of C/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 50'×12'. (b) 44'×9'. (v) 3'×1½. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 422 lb./ac. (ii) 65.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	402	374	464	370	444	490	413

S.E./mean = 32.5 lb./ac.

Crop :- Jowar *(Kharif).*   **Ref :- M.P. 59(N.A.).**

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

Object:—To find suitable doses of N, P and K for Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 12.6.1959. (iv) (a) 2 *bakherings.* (b) Drilling. (c) 10 lb./ac. (d) 14″×12″. (e) N.A. (v) 20 lb./ac. of P_2O_5. (vi) American. (vii) Unirrigated. (viii) 2 weedings and 3 interculturings. (ix) N.A. (x) 26.12.1960.

2. TREATMENTS :

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

    (1) 4 levels of N : $N_0=0$, $N_1=30$, $N_2=60$ and $N_3=90$ lb./ac.
    (2) 4 levels of P_2O_5 : $P_0=0$, $P_1=30$, $P_2=60$ and $P_3=90$ lb./ac.
    (3) 4 levels of K_2O : $K_0=0$ lb./ac., $K_1=30$ lb./ac. $K_2=60$ lb./ac., and $K_3=90$ lb./ac.

3. DESIGN :

(i) 4^3 confd. (ii) (a) 16 plots/block ; 4 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 40′×12′. (b) 35′×9′. (v) 2½′×1½′. (vi) Yes.

4. GENERAL :

(i) and (ii) Nil. (ii) Grain yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 452 lb./ac. (ii) 180 3 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	K_0	K_1	K_2	K_3
N_0	367	528	505	652	513	391	408	728	525
N_1	484	514	470	380	462	535	518	389	406
N_2	442	447	512	395	449	527	451	475	343
N_3	391	463	328	347	382	423	387	376	342
Mean	421	488	454	444	452	469	441	492	404
K_0	447	510	528	391					
K_1	395	546	393	430					
K_2	432	510	501	525					
K_3	410	384	393	429					

      S.E. of any marginal mean   = 45.1 lb./ac.
      S E. of body of any table   = 90.1 lb./ac.

Crop :- Jowar.   **Ref :- M.P. 59(N.A.).**

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

Object :—To find suitable doses of N, P and K for Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 12.6.1959. (iv) 2 *bakherings.* (b) Drilling. (c) 10 lb./ac. (d) 14″×12″. (e) N.A. (v) 20 lb./ac. of P_2O_5. (vi) *Deshi Jowar.* (vii) Unirrigated. (viii) 2 weedings and 3 interculturings. (ix) N.A. (x) 27.12.1960.

2. TREATMENTS :

Same as in expt. no. 59(N.A.) above.

3. DESIGN :

(i) R.B D. (ii) (a) and (b) N.A. (iii) 1. (iv) (a) 40'×11⅝'. (b) 35'×7'. (v) 2½'×2½'. (vi) N.A.

4. GENERAL :

(i) and (ii) Nil. (iii) Grain yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 332 lb./ac. (ii) 96.8 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of *Jowar* in lb./ac.

	P_0	P_1	P_2	P_3	Mean	K_0	K_1	K_2	K_3
N_0	372	408	428	336	386	420	433	344	347
N_1	259	308	267	294	282	278	267	233	350
N_2	296	301	394	361	338	355	350	323	324
N_3	381	447	267	193	322	316	348	265	359
Mean	327	366	339	296	332	342	350	291	345
K_0	333	475	322	239					
K_1	444	336	309	309					
K_2	256	281	319	309					
K_3	275	372	406	327					

S.E. of any marginal mean = 24.2 lb./ac.
S.E. of body of any table = 48.4 lb./ac.

Crop :- Jowar *(Kharif).*

Site :- Instt. of Plant Industry, Indore.

Ref :- M.P. 54(114).

Type :- 'M'.

Object :—To study the residual effect on Jowar of the organic and inorganic manures applied to preceeding Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*—Cotton. (b) Cotton. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 1.7.1954. (iv) 1 *bakhering*. (b) Drilling (c) 10 lb./ac. (d) 14" between rows. (e) N.A. (v) Nil. (vi) I P.I —3. (vii) Unirrigated. (viii) 2 intercultures. (ix) 52.2". (x) 5.1.1955. to 8.1.1955.

2. TREATMENTS :

All combinations of (1), (2) and (3)
   (1) 4 sources of N : S_1='K' manure, S_2=F.Y.M., S_3=F.W.C. and S_4=G.N.C.
   (2) 3 levels of N : N_0=0, N_1=20 and N_2=40 lb./ac.
   (3) 2 levels of P_2O_5 as Super : P_0=0, and P_1=30 lb./ac,
Treatments applied to preceeding cotton crop.

3. DESIGN :

(i) Fact in R.B.D. (ii) (a) 24. (b) N.A. (iii) 3. (iv) (a) 45'×14'. (b) 40'×9½'. (v) 2½'×2½'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) 1952—1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Heavy rains during September. (vii) Nil.

5. RESULTS :

(i) 657 lb./ac. (ii) 86.6 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

$N_0P_0 = 584$ lb./ac. and $N_0P_1 = 637$ lb./ac.

	S_1	S_2	S_3	S_4	Mean	P_0	P_1
N_1	687	638	684	641	663	661	664
N_2	682	655	723	728	697	682	712
Mean	684	647	704	684	680	672	688
P_0	654	654	722	656			
P_1	715	640	686	712			

S.E. of S marginal mean   = 25.0 lb./ac,
S.E. of N or P marginal mean   = 17.7 lb./ac.
S.E. of body of $S \times N$ or $S \times P$ table   = 35.4 lb./ac.
S.E. of body of $N \times P$ table   = 25.0 lb./ac.

Crop :- Jowar *(Kharif)*.

Site :- Instt. of Plant Industry, Indore.

Ref .- M.P. 55(87).

Type :- 'M'.

Object:—To study the residual effect on Jowar of the organic and inorganic manures applied to the preceeding Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*—Cotton. (b) Cotton. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 18.6.1955. (iv) *Bakherings*. (b) Drilling. (c) 10 lb./ac. (d) 14″ between rows. (e) N.A. (v) Nil. (vi) Type—3. (vii) Unirrigated. (viii) N.A. (ix) 42.1″. (x) 9.12.1955.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(114) on page 363.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 432 lb /ac. (ii) 78.5 lb./ac. (iii) Only main effect of P is highly significant. (iv) Av. yield of grain in lb./ac.

$N_0P_0 = 387$ lb./ac. and $N_0P_1 = 431$ lb./ac.

	S_1	S_2	S_3	S_4	Mean	P_0	P_1
N_1	455	399	479	421	438	395	481
N_2	441	451	474	429	449	432	466
Mean	448	425	476	425	444	414	473
P_0	404	404	441	406			
P_1	492	446	512	444			

S.E. of S marginal mean   = 22.7 lb./ac.
S.E. of N or P marginal mean   = 16.0 lb./ac.
S.E. of body of $S \times N$ or $S \times P$ table   = 32.0 lb /ac.
S.E. of body of $N \times P$ table   = 22.7 lb./ac.

Crop :- Jowar *(Kharif).*　　　　　　　　　**Ref :- M.P. 56(89).**

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

Object :—To study the residual effect on Jowar of the organic and inorganic manures applied to preceeding Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*—Cotton. (b) Cotton. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 24.6.1956. (iv) (a) *Bakhering.* (b) Drilling. (c) 10 lb./ac. (d) 14" between rows. (e) N.A. (v) Nil. (vi) I.P.I.—3. (vii) Unirrigated. (viii) N.A. (ix) 25.0". (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(114) on page 363.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1956. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 681 lb./ac. (ii) 132.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb/ac.

$$N_0P_0 = 631 \text{ lb./ac. and } N_0P_1 = 675 \text{ lb./ac.}$$

	S_1	S_2	S_3	S_4	Mean	P_0	P_1
N_1	586	706	621	729	661	672	650
N_2	728	705	680	800	728	655	802
Mean	657	706	650	765	694	663	726
P_0	627	688	659	678			
P_1	687	723	642	851			

S.E. of S marginal mean = 38.1 lb./ac.
S.E. of N or P marginal mean = 27.0 lb./ac.
S.E. of body of S×N or S×P table = 53.9 lb./ac.
S.E. of body of N×P table = 38.1 lb./ac.

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Crop :- Jowar *(Kharif).*　　　　　　　**Ref :- M.P. 54(123).**

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

Object :—To study the residual effect of G.M. applied to Wheat on the yield of Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 19.6.1954. (iv) 2 *bakherings.* (b) Drilling. (c) 10 lb./ac. (c) 14" between rows. (e) N.A. (v) Nil. (vi) I.P.I.—3. (vii) Unirrigated. (viii) 1 weeding and 1 interculture. (ix) 52.2". (x) 14 to 18.12.1954.

2. TREATMENTS :

Main-plot treatments :
　2 ages of G.M. crop : $D_1=5$ and $D_2=7$ weeks old.
Sub-plot treatments :
All combinations of (1) and (2)
　(1) 2 levels of P_2O_5 : $P_0=0$ and $P_1=30$ lb./ac.
　(2) 10 G.M. crops : $C_0=$No. G.M. crop $C_1=Dhaincha$, $C_2=Moong$ type I, $C_3=Moong$ *sindh khera*, $C_4=Sannhemp$, $C_5=Urid$, $C_6=$Cowpeas, $C_7=Soyabeen$, $C_8=Guar$ and $C_9=Moong$ local.

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3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 20 sub-plots/main-plot. (b) 170′×233½′. (iii) 4. (iv) (a) 85′×11¾′. (b) 80′×7′. (v) 2½′×2½′. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Heavy rains in September. (vii) Nil.

5. RESULTS :

(i) 622 lb./ac. (ii) (a) 301.0 lb./ac. (b) 110.0 lb./ac. (iii) None of the effect is significant. (iv) Av. yield of grain in lb./ac.

	C_0	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	Mean	D_1	D_2
P_0	586	616	664	626	674	638	578	623	613	529	615	600	629
P_1	594	661	633	702	683	614	573	635	566	637	630	600	660
Mean	590	639	648	664	679	626	575	629	589	583	622	600	644
D_1	599	634	624	630	619	606	538	618	575	557			
D_2	581	643	672	698	738	647	613	640	604	609			

S.E. of difference of two

1. D marginal means = 47.6 lb./ac.
2. C marginal means = 38.9 lb./ac.
3. P marginal means = 17.4 lb./ac.
4. C means at the same level of D = 55.0 lb./ac.
5. D means at the same level of C = 70.6 lb./ac.
6. P means at the same level of D = 24.6 lb./ac.
7. D means at the same level of P = 50.7 lb./ac.
S.E. of body of C×P table = 38.9 lb./ac.

— — — —

Crop :- Jowar *(Kharif)*.　　　　　　　　　**Ref :- M.P. 54(115).**

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

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Linseed. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 1.7.1954. (iv) (a) 1 bakhering. (b) Drilled. (c) 10 lb./ac. (d) 14″ between rows. (e) N.A. (v) Nil. (vi) I.P.I.—9. (vii) Unirrigated. (viii) 1 interculture and 3 hand weedings. (ix) 52.2″. (x) 10 to 12.10.1954.

ATMENTS :

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 as Super : P_0=0 and P_1=20 lb./ac.
(3) 2 levels of F.W C. : F_0=No F.W.C. and F_1=F.W.C. applied.
Amount of F.W.C. in F_1—N.A.

DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 35′×14′, (b) 30′×9¾′. (v) 2½′×2½′. (vi) Yes.

GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (iv) Heavy rains in September. (vii) Nil.

5. RESULTS :

(i) 618 lb /ac. (ii) 154.0 lb./ac. (iii) Only main effect of N is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	Mean	F_9	F_1
N_0	579	544	561	551	572
N_1	690	661	675	639	712
Mean	634	602	618	595	642
F_0	575	614			
F_1	694	591			

S.E. of any marginal mean   = 38.5 lb./ac.

S.E. of body of any table   = 54.4 lb./ac.

Crop :- Jowar *(Kharif)*.   **Ref :- M.P. 55(89).**

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

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) N.A. (iv) (a) *Bakherings*. (b) Drilling. (c) 10 lb./ac. (d) 14" between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) Un-irrigated. (viii) N.A. (ix) 42.1". (x) N.A.

2. TREATMENTS :

Same as in expt. no. 54(115) on page 366.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 45'×14'. (b) 40'×9¼'. (v) 2½'×2¼'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1951—1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 268 lb /ac. (ii) 70.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	Mean	F_0	F_1
N_0	281	210	245	237	254
N_1	282	299	290	280	301
Mean	281	255	268	258	278
F_0	258	259			
F_1	305	250			

S.E. of any marginal mean   = 17.7 lb./ac.

S.E. of body of any table   = 25.0 lb./ac.

Crop :- Jowar *(Kharif).*   **Ref :- M.P. 55(62).**

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

Object :—To see the residual effect of manurers, fertilizers and green manures on Jowar crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) As per treatments. (ii) *Morand.* (b) Refer soil analysis, Khandwa. (iii) 25 6 1955. (iv) (a) 4 *bakherings.* (b) to (e) N.A. (v) Nil. (vi) N.J.—171. (vii) Unirrigated. (viii) 3 hoeings and 1 weeding. (ix) N.A. (x) 22.12.1955.

2 TREATMENTS :

M_0=Control, M_1=A/S, M_2=*Urid*+Super, M_3=*Sannhemp*+Super, M_4=F.Y.M., M_5=*Sannhemp* and M_6=*Urid.*

Doses of manures and fertilizers N.A. These treatments were applied to the previous cotton crop.

3 DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 48'×24'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 628 lb./ac. (ii) 109.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	747	685	573	627	555	591	617

S.E./mean = 54.8 lb./ac.

Crop :- Jowar *(Kharif).*   **Ref :- M.P. 58(93).**

Site :- Reg. Res. Stn., Khargone.   **Type :- 'M'.**

Object :—To find out the most suitable doses of N, P and K for Jowar.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 5.7.1958. (iv) (a) 1 summer ploughing and 2 harrowings. (b) Seed drilled. (c) 10 lb./ac. (d) 16"×10" to 12". (e) N.A. (v) Nil. (vi) Ujjain—8. (vii) Unirrigated. (viii) N A. (ix) 27.8". (x) 5 to 14.12.1958.

2. TREATMENTS :

Same as in expt. no. 59(27) on page 358.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 32'×26½'. (b) 30'×24'. (v) 1'×1½' (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1400 lb./ac. (ii) 265.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in b./ac.

	P₀	P₁	P₂	Mean	K₀	K₁	K₂
N₀	1328	1137	1369	1278	1089	1413	1331
N₁	1413	1527	1451	1464	1525	1399	1467
N₂	1518	1532	1326	1459	1501	1357	1518
Mean	1420	1399	1382	1400	1372	1390	1439
K₀	1523	1258	1334				
K₁	1351	1467	1351				
K₂	1386	1470	1461				

S.E. of any marginal mean = 62.6 lb./ac.
S.E. of body of any table = 108.5 lb./ac.

Crop :- Jowar *(Kharif).*   **Ref :- M.P. 59(93).**

Site :- Reg. Res. Stn., Khargone.   **Type :- 'M'.**

Object :—To find out the most suitable dose of N, P and K for Jowar.

1. **BASAL CONDITIONS :**

(i) (a) N.A. (b) *Urid* and *moong.* (c) Nil. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 6.7.1959. (iv) (a) 1 summer ploughing and 2 harrowings. (b) Drilling. (c) 10 lb./ac. (d) 16"×10 to 12". (e) N.A. (v) Nil. (vi) Ujjain—8. (vii) Unirrigated. (viii) 2 hand weedings and 1 hoeing. (ix) 29.9". (x) 25.11.1959 to 2.12.1959.

2. **TREATMENTS :**

Same as in expt. no. 59(27) on page 358.

3. **DESIGN :**

(i) 3³ confd. (complete confounding). (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 36'×24'. (b) 30'×18'. (v) 3'×3'. (vi) Yes.

4. **GENERAL :**

(i) Fair. (ii) Mild attack of stem-borer and smut. (iii) Yield of grain. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) to (vii).

5. **RESULTS :**

(i) 1254 lb./ac. (ii) 136.4 lb./ac. (iii) Only the main effect of N is significant. (iv) Av. yield of grain in lb./ac.

	P₀	P₁	P₂	Mean	K₀	K₁	K₂
N₀	1150	1138	1216	1168	1080	1260	1163
N₁	1260	1203	1361	1274	1320	1276	1228
N₂	1282	1318	1360	1320	1331	1331	1298
Mean	1231	1220	1312	1254	1244	1289	1230
K₀	1241	1160	1329				
K₁	1276	1267	1324				
K₂	1175	1231	1283				

S.E. of any marginal mean = 32.2 lb./ac.
S.E. of body of any table = 55.7 lb./ac.

Crop :- Jowar *(Kharif)*. **Ref :- M.P. 58(15).**

Site :- Govt. Seed and Demons. Farm, Mahagarh. **Type :- 'M'.**

Object :—To find out the most suitable manurial schedule for Jowar crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Mahagarh. (iii) 17.7.1958. (iv) (a) N.A. (b) *Desi* seed drill. (c) and (d) N.A. (e) —. (v) N.A. (vi) Ujjain—no. 6. (vii) Unirrigated. (viii) and (ix) N.A. (x) 23.12.1958.

2. **TREATMENTS :**

Same as in expt. no. 59(27) on page 358.

3. **DESIGN :**

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 36'×25'. (b) 33'×22'. (v) $1\frac{1}{2}'×1\frac{1}{2}'$. (vi) Yes.

4. **GENERAL :**

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—N.A. (b) N.A. (c) Nil. (v) (a) Biora and Khargone. (b) Nil. (vi) and (vii)

5. **RESULTS :**

(i) 320 lb./ac. (ii) 92.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	137	407	288	277	310	221	301
N_1	314	252	501	356	399	312	356
N_2	248	318	411	326	308	349	320
Mean	233	325	400	320	339	294	326
K_0	324	362	330				
K_1	210	217	455				
K_2	164	398	414				

S.E. of any marginal mean = 37.8 lb./ac.
S.E. of body of any table = 65.4 lb./ac.

———

Crop :- Jowar *(Kharif)*. **Ref :- M.P. 59(8).**

Site :- Govt. Seed and Demons. Farm, Mahagarh. **Type :- 'M'.**

Object :—To find out a suitable manurial schedule for Jowar crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Groundnut. (c) N.A. (ii) (a) Medium black soil. (b) Refer soil analysis, Mahagarh. (iii) 9.7.1959. (iv) (a) N.A. (b) *Desi* seed drill. (c) and (d) N.A. (e) N.A. (v) Nil. (vi) Ujjain—no. 6. (vii) Unirrigated. (viii) and (ix) N.A. (x) 13.12.1959.

2. **TREATMENTS :**

Same as in expt. no. 59(27) on page 358.

3. **DESIGN :**

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 36'×24'. (b) 30'×18'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) Biora and Khargone. (b) Nil. (vi) and (vii) Nil.

5. RESULTS .

(i) 348 lb./ac. (ii) 89.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	239	279	482	330	338	285	367
N_1	331	293	341	322	287	326	352
N_2	402	377	403	394	361	422	398
Mean	320	316	409	348	329	344	372
K_0	361	312	313				
K_1	326	309	398				
K_2	274	326	516				

S.E. of any marginal mean = 36.3 lb./ac.
S.E. of body of any table = 62.9 lb./ac.

Crop :- Jowar *(Kharif)*. **Ref :- M.P. 54(70).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal). **Type :- 'M'.**

Object :—To see the effect of different manures on Jowar.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 2.7.1954. (iv) (a) 2 *bakherings*. (b) Drilling. (c) 4 srs./ac. (d) N.A. (e) N.A. (v) Nil. (vi) 501 (medium). (vii) N.A. (viii) 1 weeding, 1 thinning and 1 interculturing. (ix) N.A. (x) 29.11.1954.

2. TREATMENTS :

All combinations of (1) and (2)+one control.
(1) 4 sources of N : S_1=A/S, S_2=A/N, S_3=Urea and S_4=Sod. Nitrate.
(2) 2 levels of N : N_1=15 lb./ac. and N_2=30 lb./ac.
Fertilisers broadcasted on 26.6 1954 and mixed with soil.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) 36'×30'. (b) 33'×22'. (v) 1½'×4'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 318 lb./ac. (ii) 65.4 lb./ac. (iii) Main effect of N and "control vs. others" are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 205 lb./ac.

	S_1	S_2	S_3	S_4	Mean
N_0	230	322	300	290	286
N_1	345	312	384	477	380
Mean	288	317	342	384	333

S.E. of S marginal mean	= 26.7 lb./ac.
S.E. of N marginal mean	= 18.9 lb./ac.
S.E. of body of table or control mean	= 37.8 lb./ac.

Crop :- Jowar *(Kharif).* **Ref :- M.P. 55(74).**

Site :- Govt. Seed and Demons. Farm, Nowgong. **Type :- 'M'.**

Object :—To study the effect of different forms of fertilizers on Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) *Kabar* and *dumat.* (b) N.A. (iii) 7.7.1955. (iv) (a) Ploughing by local plough. (b) Line sowing. (c) 8 lb./ac. (d) $18'' \times 6''$. (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) 1 hoeing and 1 ploughing. (ix) N.A. (x) 3.12.1955.

2. TREATMENTS :

$M_1 = 91$ lb./ac. of A/S, $M_2 = 83$ lb./ac. of Urea, $M_3 = 42$ lb./ac. of Ammo. Phos. and $M_4 = 200$ lb./ac. of fertilizer mixture.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) $72' \times 18'$. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 301 lb./ac. (ii) 79.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M_1	M_2	M_3	M_4
Av. yield	324	209	330	339

S.E./mean = 39.6 lb./ac.

Crop :- Jowar *(Kharif).* **Ref :- M.P. 57(4).**

Site :- R.A.K. Agri. Res. Instt., Sehore. **Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.7.1957. (iv) (a) Ploughed by country plough and then harrowed. (b) Seed drilled. (c) 6 srs./ac. (d) $12''$ between rows. (e) N.A. (v) Nil (vi) Local. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) N.A. (x) 30.11.1957.

2. TREATMENTS :

All combinations of (1) and (2)+one control.
    (1) 3 levels of N as A/S : $N_1 = 20$, $N_2 = 40$ and $N_3 = 60$ lb./ac.
    (2) 2 levels of P_2O_5 as Super : $P_0 = 0$ and $P_1 = 20$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) $37' \times 26'$. (b) $33' \times 22'$. (v) $2' \times 2'$. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 739 lb ac. (ii) 189.7 lb./ac. (iii) Main effect of P is significant and "control *vs.* others" is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 900 lb./ac.

	N_1	N_2	N_3	Mean
P_0	832	945	630	802
P_1	652	544	668	621
Mean	742	744	649	712

S.E. of N marginal mean	= 67.1 lb./ac.
S.E. of P marginal mean	= 54.8 lb./ac.
S.E. of body of table	= 94.9 lb./ac.

Crop :- Jowar *(Kharif).*

Site :- Central Exptl. Farm, Ujjain.

Ref :- M.P. 59(60).

Type :- 'M'.

Object :—To find out suitable manurial schedule for Jowar.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Wheat. (c) 50 lb./ac. of Urea. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) 2 *bakherings*. (b) Drilling. (c) 5 lb./ac. (d) 18" between rows. (e) N.A. (v) Nil. (vi) Ujjain no. 6. (vii) Unirrigated. (viii) 2 *dorsa* and 1 hand weeding. (ix) 53.5". (x) 29.12.1959.

2. **TREATMENTS :**

   Same as in expt. no. 59(30) on page 359.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 30'×15'. (b) 24'×12'. (v) 3'×1.5'. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—1961. (b) No. (c) Nil. (v) (a) Biora. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 1285 lb./ac. (ii) 127.2 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	1080	1349	1321	1394	1286
P_1	1191	1302	1248	1396	1284
Mean	1135	1326	1284	1395	1285

S.E. of N marginal mean	= 45.0 lb./ac.
S.E. of P marginal mean	= 31.8 lb./ac.
S.E. of body of table	= 63.6 lb./ac.

Crop :- Jowar *(Kharif).*

Site :- Govt. Exptl. Farm, Vidisha.

Ref :- M.P. 54(15).

Type :- 'M'.

Object :—To find out suitable dose of N and P for Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar.* (c) N.A. (ii) (a) Heavy clay. (b) N.A. (iii) 2, 5.6.1954. (iv) (a) 2 harrowings. (b) N.A. (c) 4 srs./ac. (d) 18″ between rows. (e) N.A. (v) Compost at 5 C.L./ac. (vi) Saoner. (vii) Unirrigated. (viii) 1 hand weeding and 2 hoeings. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

    (1) 3 levels of N as A/S : $N_0=0$, $N_1=10$ and $N_2=20$ lb./ac.

    (2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=10$ lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 36′×24′. (b) 32′×21′. (v) 2′×1½′. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1337 lb./ac. (ii) 197.0 lb./ac. (iii) Only N×P interaction is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	1397	1226	1453	1359
P_1	1168	1425	1348	1314
Mean	1283	1326	1402	1337

S.E. of N marginal mean   = 46.4 lb./ac.
S.E. of P marginal mean   = 56.9 lb./ac.
S.E. of body of table   = 80.4 lb./ac.

————

Crop :- Jowar *(Kharif).*   Ref :- M.P. 57(7).

Site :- Govt. Exptl. Farm, Vidisha.   Type :- 'M'.

Object :—To find out suitable dose of N, P and K for Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar.* (c) Nil. (ii) (a) Heavy clay. (b) N.A. (iii) 12.7.1957. (iv) (a) *Bakhering.* (b) to (d) N.A. (e) N.A. (v) Nil. (vi) Ujjain no. -6. (vii) Unirrigated. (viii) N.A. (ix) 23.6″. (x) 21.11.1957.

2. TREATMENTS :

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

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

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

    (3) 3 levels of K_2O as Pot. Sul. : $K_0=0$, $K_1=15$ and $K_2=30$ lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replications. (b) N.A. (iii) 2. (iv) (a) and (b) 33′×33′. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) First year of expt. (c) —. (v) to (vii) Nil.

5. RESULTS :

(i) 1343 lb./ac. (ii) 154.0 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	1154	1044	1107	1102	1014	1141	1150
N_1	1359	1485	1331	1392	1451	1311	1413
N_2	1544	1612	1452	1536	1591	1466	1551
Mean	1352	1380	1297	1343	1352	1306	1371
K_0	1354	1397	1305				
K_1	1254	1392	1271				
K_2	1449	1351	1314				

S.E. of any marginal mean   = 36.3 lb./ac.
S.E. of body of any table   = 62.9 lb./ac.

————

Crop :- Jowar *(Kharif)*.   **Ref :- M.P. 56(MAE).**

Site :- M.A.E. Farm, Ujjain.   **Type :- 'M'.**

Object :—Type V—To study the effect of sources and time of application of different doses of N on Jowar.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*—Fallow—Wheat. (b) and (c) N.A. (ii) (a) Medium black soil, clay loam in texture. (b) N.A. (iii) Third week of July, 1956. (iv) (a) and (b) N.A. (c) 5 lb./ac. (d) 18″. (e) N.A. (v) Nil. (vi) Ujjain no. 6 (late). (vii) Unirrigated. (viii) and (ix) N.A. (x) First week of December. 1956.

2. TREATMENTS :

All combinations of (1), (2 and (3)
   (1) 3 sources of N : S_1=A/S, S_2=A/N and S_3=Urea.
   (2) 2 levels of N : N_1=20 and N_2=40 lb./ac.
   (3) 3 times of application of N : T_1=At sowing, T_2=At first interculture and $T_3=\frac{1}{2}$ at sowing+$\frac{1}{2}$ at first interculture.

3. DESIGN :

(i) $3^2 \times 2$ fact. confd. (ii) (a) 3 blocks/replication ; 6 plots/block. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 29′×15′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Stem-borer attack. (iii) Grain yield. (iv) (a) 1956—contd. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) S×T table means and the corresponding S.E. are unadjusted.

5. RESULTS :

(i) 1572 lb./ac. (ii) 228.5 lb./ac. (iii) Main effects of T and N are highly significant. (iv) Av. yield of grain in lb./ac.

	T_1	T_2	T_3	Mean	S_1	S_2	S_3
N_1	1659	1345	1447	1484	1506	1445	1500
N_2	1768	1580	1636	1661	1641	1681	1661
Mean	1714	1462	1541	1572	1574	1563	1580
S_1	1643	1547	1532				
S_2	1685	1340	1663				
S_3	1813	1500	1428				

S.E. of S or T marginal mean	= 46.6 lb./ac.
S.E. of N marginal mean	= 38.1 lb./ac.
S.E. of body of S×N or T×N table	= 66.0 lb./ac.
S.E. of body of S×T table	= 93.3 lb./ac.

Crop :- Jowar *(Kharif)*.
Site :- M.A.E. Farm, Ujjain.

Ref :- M.P. 57(MAE).
Type :- 'M'.

Object :—Type V—To study the effect of sources and time of application of different doses of N on Jowar.

1. **BASAL CONDITIONS :**

(i) (a) Cotton—*Jowar*—Fallow—Wheat. (b) Cotton. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) 1st week of July, 1957. (iv) (a) 4 *bakherings* and 1 interculture. (b) Sown by two coultured seed drill. (c) 5 lb./ac. (d) 18". (e) N.A. (v) Nil. (vi) Ujjain No. 6 (late). (vii) Unirrigated. (viii) One hand weeding. (ix) 26". (x) 2nd—3rd week of December, 1957.

2. **TREATMENTS :**

All combinations of (1), (2) and (3)+3 controls
   (1) 3 sources of N : S_1=A/S, S_2=A/N and S_3=Urea.
   (2) 2 levels of N : N_1=20 and N_2=40 lb./ac.
   (3) 3 times of application of N : T_1=At sowing, T_2=At first interculture and T_3=½ at sowing+½ at first interculture.

3. **DESIGN :**

(i) $3^2 \times 2 + 3$ confd. (ii) (a) 3 blocks'replication ; 7 plots/block with on control in each block. (b) N.A. (iii) 4. (iv) (a) N A. (b) 29'×15'. (v) N.A. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) and (c) Yes. (v) and (vi) Nil. (vii) Means in S×T table and the corresponding S.E. are unadjusted.

5. **RESULTS :**

(i) 831 lb./ac. (ii) 167.8 lb./ac. (iii) "Control vs. others" alone is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 555 lb./ac.

	T_1	T_2	T_3	Mean	S_1	S_2	S_3
N_1	812	872	829	838	773	902	839
N_2	897	946	907	917	977	897	876
Mean	855	909	868	877	875	900	857
S_1	977	797	851				
S_2	838	947	914				
S_3	749	983	839				

S.E. of S or T marginal mean	= 34.3 lb./ac.
S.E. of N marginal mean	= 28.0 lb./ac.
S.E. of body of S×N or T×N table	= 48.4 lb./ac.
S.E. of body of S×T table	= 59.3 lb./ac.
S.E. of control mean	= 48.4 lb./ac.

Crop :- Jowar *(Kharif)*.
Site :- M.A.E. Farm, Ujjain.

Ref :- M.P. 58(MAE).
Type :- 'M'.

Object :—Type V—To study the effect of sources and time of application of different doses of N on Jowar.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*—Fallow—Wheat. (b) Cotton. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) 4th week of June to 1st week of July 1958. (iv) (a) 4 *bakherings*. (b) N.A. (c) 5 lb./ac. (d) 18". (e) N.A. (v) Nil. (vi) Ujjain no. 6. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 3rd and 4th week of Dec. 1958.

2. TREATMENTS :

Same as in expt. no. 57(MAE) type V on page 376.

3. DESIGN :

(i) $3^2 \times 2+3$ confd. (ii) (a) 3 blocks/replication ; 7 plots/block with one control in each block. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/110 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Stemborer attack controlled. (iii) Grain yield. (iv) (a) 1956—contd. (b) and (c) Yes. (v) (a) Nil. (b) N.A. (vi) Crop suffered due to prolonged wet conditions. (vii) Means in S×T table and the corresponding S.E. are adjusted for block effects.

5. RESULTS :

(i) 429 lb./ac. (ii) 129.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 387 lb./ac.

	T_1	T_2	T_3	Mean	S_1	S_2	S_3
N_1	485	403	387	425	477	420	378
N_2	427	441	471	446	479	438	422
Mean	456	422	429	436	478	429	400
S_1	504	411	519				
S_2	437	447	402				
S_3	428	407	365				

S.E. of S or T marginal mean	= 26.4 lb./ac.
S.E. of N marginal mean	= 21.6 lb./ac.
S.E. of body of S×N or T×N table	= 37.3 lb./ac.
S.E. of body of S×T table	= 48.9 lb./ac.
S.E. of control mean	= 37.3 lb./ac.

Crop :- Jowar *(Kharif).*   **Ref :- M.P. 59(MAE).**

Site :- M.A.E. Farm, Ujjain.   **Type :- 'M'.**

Object :—Type V—To study the effect of sources and time of application of different doses of N on Jowar.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*—Fallow—Wheat. (b) Cotton. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) N.A. (iv) (a) 4 *bakherings*. (b) N.A. (c) 5 lb./ac. (d) 18". (e) N.A. (v) 20 lb /ac. of P_2O_5 as Super. (vi) Ujjain no. 6. (vii) Unirrigated. (viii) 1 weeding. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 57(MAE) type V on page 376.

3. DESIGN :

(i) $3^2 \times 2+3$ confd. (ii) (a) 3 blocks/replication and 7 plots/block with one control plot in each block. (b) N.A. (iii) 4. (iv) (a) 1/69 ac. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) and (c) Yes. (v) (a) Nil. (b) N.A. (vi) Nil. (vii) Means in S×T table and corresponding S.E. are adjusted for block effects.

5. RESULTS :

(i) 578 lb /ac. · (ii) 261.5 lb./ac. (iii) Main effect of T is highly significant. Interaction T×N and "control *vs.* others" are significant. (iv) Av. yield of grain in lb./ac.

Control = 411 lb./ac.

	T₁	T₂	T₃	Mean	S₁	S₂	S₃
N₁	650	354	782	595	510	551	724
N₂	766	518	568	617	692	585	575
Mean	708	436	675	606	601	568	650
S₁	724	403	675				
S₂	790	395	518				
S₃	609	510	831				

S.E. of S or T marginal mean	= 53.4 lb./ac.
S.E. of N marginal mean	= 43.6 lb./ac.
S.E. of body of S×N or T×N table	= 75.5 lb /ac.
S.E. of body of S×T table	= 98.8 lb./ac.
S.E. of control mean	= 75.5 lb /ac.

Crop :- Jowar *(Kharif)*.

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

Ref :- M.P. 57(MAE).

Type :- 'M'.

Object : ·Type VI—To study the effect of sources and method of application of different doses of P on Jowar.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*—Fallow—Wheat. (b) Cotton. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) 1st week of July, 1957. (iv) (a) 4 *bakherings* and 1 interculture. (b) Sown by two coultered seed drill. (c) 5 lb /ac. (d) 18″. (e) N.A. (v) Nil. (vi) Ujjain no. 6 (late). (vii) Unirrigated. (viii) One) hand weeding. (ix) 26″. (x) 2nd and 3rd week of December, 1957.

2. TREATMENTS :

All combinations of (1), (2) and (3)+control.
    (1) 2 sources of P_2O_5 : S_1=Super and S_2=Ammo. Phos.
    (2) 2 levels of P_2O_5 : P_1=20 and P_2=40 lb./ac.
    (3) 3 methods of placement : M_1=Broadcast, M_2=2½″ below seed and M_3=Band placement.

3. DESIGN :

(i) R.B D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) and (c) Yes. (v) to (vii) Nil.

5. RESULTS :

(i) 583 lb./ac. (ii) 87.2 lb./ac. (iii) Main effects of M and P are significant. (iv) Av. yield of grain in lb./ac.

Control = 633 lb./ac.

	M₁	M₂	M₃	Mean	S₁	S₂
P₁	587	482	565	545	569	521
P₂	648	557	634	613	612	614
Mean	618	519	600	579	591	567
S₁	659	509	603			
S₂	576	530	596			

S.E. of marginal mean of M	= 25.2 lb./ac.
S.E. of marginal mean of S or P	= 20.6 lb./ac.
S.E. of body of S×M or P×M table	= 35.6 lb./ac.
S.E. of body of S×P table	= 29.1 lb./ac.
S.E. of control mean	= 50.4 lb./ac.

Crop :- Jowar *(Kharif)*.

Ref :- M.P. 58(MAE).

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

Type :- 'M'.

Object : -Type VI—To study the effect of sources and method of application of different doses of P on Jowar.

1   BASAL CONDITIONS :

(i) (a) Cotton—Jowar—Fallow—Wheat. (b) Cotton. (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) 4th week of June to 1st week of July, 1958. (iv) (a) 4 bakherings. (b) N.A. (c) 5 lb./ac. (d) 18″. (e) N.A. (v) Nil. (vi) Ujjain no. 6. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 3rd and 4th week of December, 1958.

2.   TREATMENTS :

Same as in expt. no. 57(MAE) type VI on page 378.

3.   DESIGN :

(i) 2²×3+1. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/110 ac. (v) N.A. (vi) Yes.

4.   GENERAL :

(i) Normal. (ii) Stem-borer attack controlled. (iii) Grain yield. (iv) (a) 1956—contd. (b) and (c) Yes. (v) (a) Nil. (b) N.A. (vi) Crop suffered due to prolonged wet conditions. (vii) Nil.

5.   RESULTS :

(i) 662 lb./ac. (ii) 103.7 lb./ac. (iii) Main effect of M, interaction S×M and "control vs. others" are significant. (iv) Av. yield of grain in lb./ac.

Control = 437 lb /ac.

	M₁	M₂	M₃	Mean	S₁	S₂
P₁	736	596	700	677	694	660
P₂	757	575	723	685	638	732
Mean	747	585	712	681	666	696
S₁	740	524	735			
S₂	753	647	688			

S.E. of marginal mean of M	= 29.9 lb./ac.
S.E. of marginal mean of S or P	= 24.4 lb./ac.
S.E. of body of S×M or P×M table	= 42.3 lb./ac.
S.E. of body of S×P table	= 34.6 lb./ac.
S.E. of control mean	= 59.8 lb./ac.

—————

Crop :- Jowar *(Kharif)*.

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

Ref :- M.P. 59(MAE).

Type :- 'M'.

Object :—Type VI—To study the effect of sources and method of application of different doses of P on Jowar.

1. **BASAL CONDITIONS :**

   (i) (a) Cotton—*Jowar*—Fallow—Wheat. (b) Cotton. (c) As per treatments. (ii) (a) Medium black soil. (b) N A. (iii) N.A. (iv) (a) 4 *bakherings*. (b) N.A. (c) 5 lb./ac. (d) 18". (e, N.A. (vj Nil. (vi) Ujjain no. 6. (vii) Unirrigated. (viii) 1 weeding. (ix) and (x) N.A.

2. **TREATMENTS :**

   Same as in expt. no. 57(MAE) type VI on page 378.

3. **DESIGN :**

   (i) $2^2 \times 3 + 1$. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) 1/69 ac. (b) 1/100 ac. (v) N.A. vi) Yes.

4. **GENERAL :**

   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) and (c) Yes. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 431 lb./ac. (ii) 263.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb /ac.

   Control = 508 lb./ac.

	M_1	M_2	M_3	Mean	S_1	S_2
P_1	262	330	521	371	404	338
P_2	426	386	625	479	440	518
Mean	344	358	573	425	422	428
S_1	324	359	583			
S_2	364	357	563			

S.E. of marginal mean of M	= 76.0 lb./ac.
S.E. of marginal mean of S or P	= 53.7 lb./ac.
S.E. of body of S×M or P×M table	= 107.5 lb./ac.
S.E. of body of S×P table	= 87.8 lb./ac.
S.E. of control mean	= 152.0 lb./ac.

—————

Crop :- Jowar.

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

Ref :- 57(MAE).

Type :- 'M'.

Object :—Type VI (T.C.M.)—To study the effect of P on Jowar crop.

1. **BASAL CONDITIONS :**

   (i) (a) Jowar—Cotton—Groundnut. (b) and (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 1st week of July 1957. (iv) (a) 4 *bakherings* and 1 interculture. (b) Sown by two coultered seed drill. (c) 5 lb /ac. (d) 18". (e) N.A. (v) Nil. (vi) Ujjain no. 6 (late). (vii) Unirrigated. (viii) 1 weeding. (ix) 26" lb./ac. (x) 2nd and 3rd week of December 1957.

2. TREATMENTS :

Treatment	1	2	3	4	5	6	7	8	9	10	11	12
1st year	O	C	C	p_1	p_2	C	C	C	C	$p_{\frac{1}{2}}$	p_1	p_2
2nd year	O	C	C	C	C	p_1	p_2	C	C	$p_{\frac{1}{2}}$	p_1	p_2
3rd year	O	C	C	C	C	C	C	p_1	p_2	$p_{\frac{1}{2}}$	p_1	p_2

Treatments are three-year course rotation with 11 distinct treatments. Plots under one treatment do not receive any fertilizer. 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 rotations are : O=Control, C=20 lb./ac. of N ; $p_{\frac{1}{2}}$=10 lb./ac. of P_2O_5 ; p_1=20 lb./ac. of P_2O_5 ; p_2=40 lb./ac. of P_2O_5.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal (b) Nil. (c) Grain yield. (v) (a) and (b) No. (c) Yes. (v) to (vii) Nil.

5. RESULTS :

(i) 878 lb./ac. (ii) 162.5 lb./ac. (iii) "Control vs. others" alone is significant. (iv) Av. yield of grain in lb./ac.

Treatment	O	C	$p_{\frac{1}{2}}$	p_1	p_2
Av. yield	625	831	880	1004	1020

S.E./mean for O, $p_{\frac{1}{2}}$ =114.9 lb./ac. S.E./mean for p_1, p_2=81.2 lb./ac. S.E./mean for C=46.9 lb./ac.

Crop :- Jowar.

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

Ref :- 58 (MAE).

Type :- 'M'.

Object : —Type VI (T.C.M.)—To study the effect of P on Jowar crop.

1. BASAL CONDITIONS :

(i) (a) Jowar—Cotton—Groundnut. (b) and (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 4th week of June to 1st week of July 1958. (iv) (a) 4 bakherings. (b) N.A. (c) 5 lb./ac. (d) 18" (e) N.A. (v) Nil. (vi) Ujjain no. 6 (late). (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 3rd and 4th week of December 1958.

2. TREATMENTS :

Same as in expt. no. 57(MAE) type VI (TCM) on page 380.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/110 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal (ii) Stem borer attack controlled. (iii) Grain yield. (iv) (a) and (b) No. (c) Yes. (v) (a) Nil. (b) —. (vi) Crop suffered due to prolonged wet conditions. (vii) Nil.

5. RESULTS :

(i) 354 lb./ac. (ii) 55.0 lb./ac. (iii) "Control vs. others" alone is significant. (iv) Av. yield of grain in lb./ac.

Treatment	O	C	$p_{\frac{1}{2}}$	p_1	p_2
Av. yield	245	378	344	348	352

S.E./mean for O, $p_{\frac{1}{2}}$=38.9 lb./ac. ; S.E./mean for p_1, p_2=26.5 lb./ac. S.E./mean for C=15.9 lb./ac.

Crop :- Jowar *(Kharif)*.   **Ref :- M.P. 59(110).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'MV'.**

Object :—To find out the suitable variety and optimum dose of N for Jowar crop.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) *Kutki* and *sannhemp*. (c) N.A. (ii) (a) *Sehra*. (b) Refer soil analysis, Chhindwara. (iii) 21.6.1959. (iv) (a) 1 deep ploughing and 4 *bakherings*. (b) Drilling. (c) 12 lb./ac. (d) $18'' \times 12''$. (e) N.A. (v) 10 to 15 C.L./ac. of F.Y.M. (vi) As per treatments. (vii) Unirrigated. (viii) 3 hand weedings. (ix) 27.0″. (x) 11.12.1959.

2. **TREATMENTS :**

   All combinations of (1) and (2)
   - (1) 3 varieties : $V_1 = Saoner$, $V_2 = N.J.—(7)$ and $V_3 = Ramkel$.
   - (2) 4 levels of N : $N_0 = 0$, $N_1 = 5$, $N_2 = 10$ and $N_3 = 20$ lb./ac.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 12 (b) N.A. (iii) 4. (iv) (a) and (b) $27' \times 16'$. (v) Nil. (vi) Yes.

4. **GENERAL :**

   (i) Poor. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—confd. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 311 lb./ac. (ii) 125.5 lb./ac. (iii) Only main effect of V is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
V_1	224	400	457	416	374
V_2	318	321	354	252	311
V_3	224	277	185	302	247
Mean	255	333	332	323	311

S.E. of N marginal mean	=	36.2 lb./ac.
S.E. of V marginal mean	=	31.4 lb./ac.
S.E. of body of table	=	62.8 lb./ac.

Crop :- Jowar *(Kharif)*.   **Ref :- M.P. 57(50).**

Site :- Govt. Seed and Demons. Farm, Biora.   **Type :- 'C'.**

Object :—To find out suitable spacing and seed rate for Jowar crop.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Clay. (b) N.A. (iii) 11.7.1957. (iv) (a) Ploughing and *bakhering*. (b) Drilling. (c) and (d) As per treatment. (e) N.A. (v) Nil. (vi) U—6. (vii) Unirrigated. (viii) 2 weedings with *khurpi*. (ix) N.A. (x) 23.12.1957.

2. **TREATMENTS :**

   Main-plot treatments :
   4 row spacings : $S_1 = 12''$, $S_2 = 18''$, $S_3 = 24''$ and $S_4 = 30''$.
   Sub-plot treatments :
   5 seed rates : $R_1 = 2$, $R_2 = 3$, $R_3 = 5$, $R_4 = 6$ and $R_5 = 8$ lb./ac.

3. **DESIGN :**

   (i) Split-plot. (ii) (a) 4 main-plots/replication; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $33' \times 33'$. (b) $30' \times 30'$. (v) $1\frac{1}{2}' \times 1\frac{1}{2}'$. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) Khargone. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 545 lb./ac. (ii) (a) 265.6 lb /ac. (b) 101.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean
S_1	590	614	687	617	614	624
S_2	505	549	566	634	526	556
S_3	485	557	543	454	532	514
S_4	520	440	545	411	523	488
Mean	525	540	585	529	549	545

S.E. of difference of two .

1. Marginal means of S   =   84.0 lb./ac.
2. Marginal means of R   =   35.8 lb./ac.
3. R means at the same level of S   =   71.5 lb./ac.
4. S means at the same level of R   =   105.6 lb./ac.

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Crop :- Jowar *(Kharif).*   **Ref :- M.P. 58(32).**

Site :- Govt. Seed and Demons. Farm, Biora.   **Type :- 'C'.**

Object :—To find out the suitable spacing and seed rate for Jowar crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Clay. (b) N.A. (iii) N.A. (iv) (a) 2 *bakherings.* (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) U—6. (vii) Unirrigated. (viii) 2 *kulpas* and 1 hand weeding. (ix) 41.2". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

    3 row spacings : $S_1=12''$, $S_2=18''$ and $S_3=24''$.

Sub-plot treatments :

    4 seed rates : $R_1=4$, $R_2=6$, $R_3=8$ and $R_4=10$ srs./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 33'×33'. (b) 30'×30'. (v) 1½'×1½'. (vi) Yes.

4. GENERAL :

(i) Not satisfactory due to heavy rains. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) Khargone. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 203 lb./ac. (ii) (a) 196.0 lb./ac. (b) 64.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_1	254	157	186	88	171
S_2	257	218	203	109	197
S_3	260	215	242	242	240
Mean	257	197	210	146	203

S.E. of difference of two

1. S marginal means   =   99.3 lb./ac.
2. R marginal means   =   42.9 lb./ac.
3. R means at the same level of S   =   74.4 lb./ac.
4. S means at the same level of R   =   129.9 lb./ac.

Crop :- Jowar *(Kharif).*   **Ref :- M.P. 59(29).**

Site :- Govt. Seed and Demons. Farm, Biora.   **Type :- 'C'.**

Object :—To find out suitable spacing and seed rate for Jowar crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil (b) Wheat. (c) 15 lb./ac. of N+15 lb./ac. of P_2O_5. (ii) (a) Clay soil. (b) N.A. (iii) N.A. (iv) (a) 2 *bakherings.* (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Ujjain—6. (vii) Un-irrigated. (viii) 2 *kulpas* and 1 hand weeding. (ix) 45'.6". (x) N.A.

2. **TREATMENTS :**

All combinations of (1) and (2)

  (1) 3 row spacings : $S_1=12''$, $S_2=18''$ and $S_3=24''$.
  (2) 3 seed rates : $R_1=8$, $R_2=10$ and $R_3=12$ lb./ac.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 24'×36'. (b) 18'×30'. (v) 3'×3'. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) N.A. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 603 lb./ac. (ii) 160.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean
S_1	605	569	683	619
S_2	638	602	537	592
S_3	622	612	557	597
Mean	622	594	592	603

S.E. of any marginal mean   =   46.3 lb./ac.
S.E. of body of table   =   80.3 lb./ac.

Crop :- Jowar *(Kharif).*   **Ref :- M.P. 57(78).**

Site :- Reg. Res. Stn., Khargone.   **Type :- 'C'.**

Object :—To find out most suitable seed rate and row spacing for Jowar crop.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 9.7.1957. (iv) (a) 1 summer ploughing and 2 harrowings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Ujjain—8. (vii) Unirrigated. (viii) 1 interculture and 1 weeding. (ix) 17.8". (x) 28.10.1957 to 4.11.1957.

2. **TREATMENTS:**

Main-plot treatments:
  4 row spacings : $S_1=12''$, $S_2=15''$, $S_3=18''$ and $S_4=24''$.
Sub-plot treatments :
  5 seed rates : $R_1=2$, $R_2=3$, $R_3=5$, $R_4=6$ and $R_5=8$ srs/ac.

3. DESIGN :

   (i) Split-plot. (ii) (a) 4 main-plots/replication ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 36'×20'. (v) Nil. (vi) Yes.

4. GENERAL :

   (i) Satisfactory. (ii) Nil. (iii) Yield of grain and *karbi*. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) Biora. (b) Nil. (vi) N.A. (vii) Nil.

5. RESULTS :

   (i) 935 lb./ac. (ii) (a) 385.0 lb./ac. (b) 139.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean
S_1	928	961	972	819	875	911
S_2	908	844	771	950	788	852
S_3	949	1106	992	788	955	958
S_4	1045	1067	947	1038	997	1019
Mean	958	995	921	899	904	935

S.E. of difference of two

1. S marginal means = 121.7 lb./ae.
2. R marginal means = 49.3 lb./ac.
3. R means at the same level of S = 98.6 lb./ac.
4. S means at the same level of R = 150.3 lb./ac.

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Crop :- Jowar *(Kharif)*.   Ref :- M.P. 58(92).

Site :- Reg. Res. Stn. Khargone.   Type :- 'C'.

Object :—To find out the most suitable seed rate and spacing for Jowar.

1. BASAL CONDITIONS :

   (i) (a) to (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 1, 2.7.1958. (iv) (a) 1 summer ploughing and 2 harrowings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Ujjain— 8. (vii) Unirrigated. (viii) N.A. (ix) 27.8". (x) 28.11.1958 to 5.12.1958.

2. TREATMENTS :

   Main-plot-treatments :
       3 row spacings : $S_1=16''$, $S_2=24''$ and $S_3=30''$.
   Sub-plot treatments :
       4 seed rates : $R_1=4$, $R_2=6$, $R_3=8$ and $R_4=10$ sr./ac.

3. DESIGN :

   (i) Split-plot. (ii) (a) 3 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 38'×22½' (b) 36'×20'. (v) 1'×1¼'. (vi) Yes.

4. GENERAL :

   (i) Fair. (ii) N.A. (iii) Yield of grain and *Karbi*. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) Biora. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

   (i) 1385 lb./ac. (ii) (a) 239.4 lb./ac. (b) 203.8 lb./ac. (iii) Main effect of S and interaction S×R are significant. (iv) Av. yield of grain in lb./ac.

	R₁	R₂	R₃	R₄	Mean
S₁	1426	1625	1184	1603	1460
S₂	1495	1486	1493	1400	1469
S₃	1430	1232	1242	1004	1227
Mean	1450	1448	1306	1336	1385

S.E. of difference of two

1. S marginal means   = 84.6 lb./ac.
2. R marginal means   = 83.2 lb./ac.
3. R means at the same level of S   = 144.1 lb./ac.
4. S means at the same level of R   = 150.8 lb./ac.

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Crop :- Jowar *(Kharif)*.   **Ref :- M.P. 54(109).**

Site :- Govt. Seed and Demons. Farm, Nowgong.   **Type :- 'C'.**

Object :—To study the effect of different intercultural operations on Jowar.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) *Kabar* and *Dumet.* (b) N.A. (iii) 13.7.1954. (iv) (a) Ploughing by local plough. (b) Line sowing. (c) 8 lb./ac. (d) 18″×6″. (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) As per treatments. (ix) N.A. (x) 15.12.1954.

2. **TREATMENTS :**

   Interculture by : A=Country, B=*Akola* hoe and C=*Dundia.*

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 2. (iv) (a) 72′×18′. (b) 66′×12′. (v) 3′×3′. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) and (iii) Nil. (iv) (a) 1954—1955. (b) No. (c) Nil, (v) to (vii) Nil.

5. **RESULTS :**

   (i) 1746 lb./ac. (ii) 270.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	A	B	C
Av. yield	1746	1541	1952

   S.E./mean = 191.3 lb./ac.

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Crop :- Jowar *(Kharif)*.   **Ref :- M.P. 55(75).**

Site :- Govt. Seed and Demons. Farm, Nowgong.   **Type :- 'C'.**

Object :—To study the effect of different intercultural operations on Jowar.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) *Kabar* and *Dumet.* (b) N.A (iii) 7.7.1955. (iv) (a) Ploughing. (b) Line sowing (c) 8 lb./ac. (d) 18″×6″. (e) N.A. (v) 100 lb./ac. of A/S+40 lb./ac. of Super+100 md./ac. of F.Y.M. (vi) Local. (vii) Unirrigated. (viii) As per treatments. (ix) N.A. (x) 6.12.1955.

2. **TREATMENTS :**

   Sowing by : A=Country plough, B=*Akola* hoe and C=*Dundia.*

. **DESIGN:**

   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 50′×18′. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) and (iii) Nil. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 270 lb./ac. (ii) 53.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	A	B	C
Av. yield	262	282	267

S.E./mean = 22.0 lb./ac.

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Crop :- Jowar *(Kharif)*.   Ref :- M.P. 57(60).

Site :- Govt. Soil Cons. Res. Stn., Phanda.   Type :- 'C'.

Object :—To find out optimum spacing for Jowar.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 8.7.1957. (iv) (a) *Bakhering.* (b) and (c) N.A. (d) As per treatments (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 34.6″. (x) 28.11.1957.

2. TREATMENTS :

3 spacings : $S_1 = 12'' \times 9''$, $S_2 = 18'' \times 13\frac{1}{2}''$ and $S_3 = 24'' \times 18''$.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 49′×37′. (iii) 4. (iv) (a) 37′×15′. (b) 33′×11′. (v) 2′×2′. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 644 lb./ac. (ii) 145.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_1	S_2	S_3
Av. yield	725	675	532

S.E./mean = 72.6 lb./ac.

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Crop :- Jowar *(Kharif)*.   Ref :- M.P. 57(61).

Site :- Govt. Soil Cons. Res. Stn., Phanda.   Type :- 'C'.

Object : – To find out optimum seedrate for Jowar.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 28.6.1957. (iv) (a) *Bakhering.* (b) Drilling. (c) As per treatments. (d) and (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 34.6″. (x) 28 and 29.11.1957.

2. TREATMENTS :

3 seed rates : $R_1 = 5$, $R_2 = 2\frac{1}{2}$ and $R_3 = 1\frac{1}{4}$ srs./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 82′×37′. (iii) 4. (iv) (a) 37′×26′. (b) 33′×22′. (v) 2′×2′. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Height of plants and yield of grain. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 462 lb./ac. (ii) 94.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3
Av. yield	320	440	625

S.E./mean = 47.3 lb./ac.

Crop :- Jowar *(Kharif).*   **Ref :- M.P. 58(69).**

Site :- Govt. Soil Cons. Res. Stn., Phanda.   **Type :- 'C'.**

Object :—To find out optimum seedrate for Jowar.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 29.6.1958. (iv) (a) *Bakhering.* (b) Drilling. (c) As per treatments. (d) and (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) 2 weedings. (ix) 48.4". (x) 5.12.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(61) on page 387.

5. RESULTS :

(i) 1310 lb./ac. (ii) 131.3 lb./ac. (iii) Treatment differences are not significant (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3
Av. yield	1176	1404	1350

S E./mean = 65.7 lb./ac.

Crop :- Jowar *(Kharif).*   **Ref :- M.P. 59(121).**

Site :- Govt. Soil Cons. Res. Stn., Phanda.   **Type :- 'C'.**

Object :—To study the effect of mulching and interculturing on Jowar crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 4.7.1959. (iv) (a) 2 harrowings and 2 *bakherings.* (b) Drilling. (c) 5 lb./ac. (d) 18"×9". (e) N.A. (v) Nil. (vi) NJ—171. (vii) Unirrigated. (viii) As per treatments. (ix) 48.4". (x) 9.12.1959.

2. TREATMENTS :

A=Control, B=Same soil undisturbed except for hand picking of weeds, C=Hoeing 2" deep, D=Weeds pulled out and straw spread at 3 tons/ac. and E=Hoing 2" deep and straw spread at 3 tons/ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 37'×26'. (b) 33'×22'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 1591 lb./ac. (ii) 418.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	A	B	C	D	E
Av. yield	1330	1624	1849	1523	1629

S.E./mean = 209.4 lb./ac.

Crop :- Jowar *(Kharif)*. **Ref :- M.P. 58(36).**

Site :- Govt. Exptl. Farm, Vidisha. **Type :- 'C'.**

Object :—To find out most suitable seedrate and spacing for Jowar crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy and late *moong.* (c) 10 lb./ac. of N as A/S. (ii) (a) Heavy clay. (b) N.A. (iii) 17.7.1958. (iv) (a) 3 *bakherings.* (b) Line sowing. (c) and (d) As per treatments. (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) *Shankarpur—*1. (vii) Unirrigated. (viii) 2 weedings and 2 intercultures. (ix) 50.0". (x) 1.1.1959.

2. **TREATMENTS :**

Main-plot treatments :
 4 row spacings : $S_1=12"$, $S_2=18"$, $S_3=24"$ and $S_4=30"$.
Sub-plot treatments :
 4 seed rates : $R_1=4$, $R_2=6$, $R_3=8$ and $R_4=10$ srs./ac.

3. **DESIGN :**

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) $37' \times 26'$. (b) $33' \times 22'$. (v) $2' \times 2'$. (vi) Yes.

4. **GENERAL :**

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1958—1959. (b) No. (c) N.A. (v) (a) Biora and Khargone. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 1562 lb./ac. (ii) (a) 488.7 lb./ac. (b) 308.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_1	1170	1560	1830	1410	1493
S_2	1680	1440	1890	1950	1740
S_3	1710	1980	1950	1830	1868
S_4	1140	870	1110	1470	1148
Mean	1425	1463	1695	1665	1562

S.E. of difference of two

1.	Marginal means of S	=	244.3 lb./ac.
2.	Marginal means of R	=	154.4 lb./ac.
3.	R means at the same level of S	=	308.9 lb./ac.
4.	S means at the same level of R	=	362.3 lb./ac.

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Crop :- Jowar *(Kharif)*. **Ref :- M.P. 59(34).**

Site :- Govt. Exptl. Farm, Vidisha. **Type :- 'C'.**

Object :—To find out optimum seed rate and spacing for Jowar crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar.* (c) 10 C.L./ac. of F.Y.M. (ii) (a) Heavy clay. (b) N.A. (iii) 2.7.1959. (iv) (a) 2 *bakherings.* (b) Line sowing. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) *Shankarpur—*I. (vii) Unirrigated. (viii) 2 weedings. (ix) 51.3". (x) 29.12.1959.

2. **TREATMENTS and 3. DESIGN :**

Same as in expt. no. 59(29) on page 384.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of grain and straw. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) (a) Biora. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 995 lb./ac. (ii) 370.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean
S_1	575	1021	1177	924
S_2	1173	1087	1394	1218
S_3	950	809	774	844
Mean	899	972	1115	995

S.E. of any marginal mean = 107.0 lb./ac.
S.E. of body of table = 185.3 lb./ac.

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Crop :- Jowar *(Kharif)*.

Site :- Instt. of Plant Industry, Indore.

Ref :- M.P. 54(124).

Type :- 'CM'.

Object :—To study the effect of different times of sowing and different plant spacings with different sources of N on the yield of Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 18.6.1954 and 4.7.1954. (iv) (a) 1 *bakhering*. (b) Drilling. (c) 10 lb./ac. (d) 14" between rows (e) N.A. (v) Nil. (vi) I.P.I.—3. (vii) Unirrigated. (viii) 1 weeding and 1 interculture. (ix) 52.2" (x) 20.12.1954 to 3.11.1955.

2. TREATMENTS :

Main-plot treatments :

2 sowing times : D_1=Pre-monsoon and D_2=At monsoon break.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 plant spacings : S_1=9" and S_2=18".
(2) 4 sources of N : N_0=0, N_1=10 lb./ac. of N as A/S, N_2=20 lb./ac. of N as A/S and G.N.C. in 3 : 1 ratio, N_3=20 lb./ac. of N as A/S and G.N.C. in 1 : 1 ratio.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 45'×11". (b) 40'×9½'. (v) 2½'×10". (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1955. (b) No. (c) Nil. (v) N.A. (vi) Heavy rains in September. (vii) Nil.

5. RESULTS :

(i) 373 lb /ac. (ii) (a) 192.7 lb./ac. (b) 104.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean	S_1	S_2
D_1	361	430	398	381	392	411	374
D_2	313	388	318	392	353	337	368
Mean	337	409	358	387	373	374	371
S_1	340	428	357	372			
S_2	334	390	358	401			

S.E. of difference of two

1. D marginal means	= 48.2 lb./ac.	5. D means at the same level of S	= 54.8 lb./ac.
2. S marginal means	= 26.2 lb./ac.	6. N means at the same level of D	= 52.4 lb./ac.
3. N marginal means	= 37.0 lb./ac.	7. D means at the same level of N	= 66.2 lb./ac.
4. S means at the same level of D	= 37.0 lb./ac.	S.E. of body of S×N table	= 37.0 lb./ac

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Crop :- Jowar *(Kharif).*   **Ref :- M.P. 55(98).**

Site :- Instt. of Plant Industry, Indore.   **Type :- 'CM'.**

Object :—To study the effect of different times of sowing and different plant spacing with different sources of N on the yield of Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 16.6.1955. and 20.6.1955. (vi) (a) *Bakherings*. (b) Drilling. (c) 10 lb./ac. (d) 14" between rows. (e) N.A. (v) Nil. (vi) I.P.I.—3. (vii) Unirrigated. (viii) N.A. (ix) 42.1". (x) 6.12.1955.

2. TREATMENTS :

Same as in expt. no. 54(124) on page 390.

3. DESIGN :

(i) Split plot. (ii) (a) 2 main-plots/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 40'×14'. (b) 35'×9⅜'. (v) 2½'×2⅛'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 513 lb./ac. (ii) (a) 109.0 lb./ac. (b) 102.1 lb./ac. (iii) Only main effect of M is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean	S_1	S_2
D_1	358	517	563	476	479	479	478
D_2	363	635	619	575	548	551	545
Mean	360	576	591	526	513.	515	511
S_1	378	602	561	519			
S_2	343	549	621	532			

S.E. of difference of two

1. D marginal means	= 27.3 lb./ac.	5. D means at the same level of S	= 37.3 lb./ac.
2. S marginal means	= 25.5 lb./ac.	6. N means at the same level of D	= 51.1 lb /ac.
3. N marginal means	= 36.1 lb./ac.	7. D means at the same level of N	= 51.9 lb./ac.
4. S means at the same level of D	= 36.1 lb./ac.	S.E. of body of S×N table	= 36.1 lb./ac.

Crop :- Jowar *(Kharif).*   **Ref :- M.P. 56(92).**

Site :- Instt. of Plant Industry, Indore.   **Type :- 'CM'.**

Object :—To study the residual effect on Jowar of green manuring trial on Wheat.

1. BASAL CONDITIONS :

(i) Nil. (ii) Wheat. (b) As per treatments. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 22.6.1959. (iv) (a) *Bakhering*. (b) Drilling. (c) 10 lb./ac. (d) 14" between rows. (e) N.A. (v) N.A. (vi) I.P.I.—3. (vii) Unirrigated. (viii) N.A. (ix) 25.0". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

    (1) G.M. and catch crops : C_0=Fallow, C_1=*Moong* as catch crop, C_2=*Moong* for G.M., C_3=*Urid* as catch crop, C_4=*Urid* for G.M., C_5=Cowpea as catch crop, C_6=Cowpea for G.M., and C_7=*Sannhemp* for G.M.

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

3. DESIGN :

(i) R.B.D. (ii) (a) 16 (b) N.A. (iii) 4. (iv) (a) $40' \times 11\frac{3}{4}'$. (b) $35' \times 7'$. (v) $2\frac{1}{4}' \times 2\frac{1}{4}'$. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 806 lb./ac. (ii) 153.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	C_0	C_1	C_2	C_3	C_4	C_5	C_6	C_7	Mean
P_0	825	761	778	939	789	744	786	811	804
P_1	856	900	753	858	681	819	783	814	808
Mean	840	830	765	858	735	782	785	812	806

S.E. of C marginal mean   = 54.2 lb./ac.
S.E. of P marginal mean   = 27.1 lb./ac.
S.E. of body of table   = 76.6 lb./ac.

Crop :- Jowar *(Kharif)*.   **Ref :- M.P. 59(92).**

Site :- Reg. Res. Stn., Khargone.   **Type :- 'CM'.**

Object :—To find out most suitable seed rate, spacing and levels of N for Jowar crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Urid—Moong*. (c) Nil. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 7.7.1959. (iv) (a) 1 summer ploughing and 2 harrowings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Ujjain—8. (vii) Unirrigated. (viii) 2 weedings and 1 hoeing. (ix) 29.9". (x) 3.12.1959 to 12.12.1959.

2. TREATMENTS :

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

    (1) 3 row spacings : S_1=12", S_2=18" and S_3=24".

    (2) 3 seed rates : R_1=8, R_2=10 and R_3=12 lb./ac.

    (3) 3 levels of N as A/S : N_0=0, N_1=20 and N_2=40 lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) $36' \times 24'$. (b) $30' \times 20'$. (v) $3' \times 2'$. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Mild attack of stem-borer. (iii) Germination stand, height of plants and yield of grain. (iv) (a) No. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1042 lb./ac. (ii) 235.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean	N_0	N_1	N_2
S_1	1172	1029	908	1037	905	1098	1107
S_2	890	1111	1123	1041	941	1089	1093
S_3	1020	1051	1078	1050	944	1039	1166
Mean	1027	1064	1036	1042	930	1075	1122
N_0	854	1079	857				
N_1	1022	1036	1169				
N_2	1207	1076	1083				

S.E. of any marginal mean = 55.6 lb./ac.

S.E. of body of any table = 96.2 lb./ac.

Crop :- Jowar *(Kharif)*.   Ref :- M.P. 57(40).

Site :- Govt. Seed and Demons. Farm, Mahagarh.   Type :- 'CM'.

Object :—To find out optimum spacing and manurial dose for Jowar crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Mahagarh. (iii) N.A. (iv) (a) N.A. (b) Drilling. (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) Ujjain—8. (vii) Unirrigated. (viii) to (ix) N.A.

2. TREATMENTS :

Main-plot treatments :

4 row spacings : $S_1 = 12''$, $S_2 = 15''$, $S_3 = 18''$ and $S_4 = 24''$.

Sub-plot treatments :

6 manures : $M_0 =$ No manure, $M_1 = 20$ lb./ac. of N, $M_2 = 2$ M_1, $M_3 = M_1 + 20$ lb./ac. of P_2O_5, $M_4 = 2$ M_3 and $M_5 = M_1 + 20$ lb./ac. of K_2O.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 21'×42'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Plot yields. (iv) (a) No. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 495 lb./ac. (ii) (a) 189.1 lb./ac. (b) 122.0 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_1	568	475	557	615	605	560	564
S_2	424	512	533	535	450	533	502
S_3	490	389	453	346	576	352	434
S_4	525	564	360	424	531	488	481
Mean	502	485	475	479	541	488	495

S.E. of difference of two

1.	S marginal means	= 54.6 lb./ac.
2.	M marginal means	= 43.1 lb./ac.
3.	M means at the same level of S	= 86.3 lb./ac.
4.	S means at the same level of M	= 95.8 lb./ac.

Crop :- Jowar *(Kharif).*

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

Ref :- M.P. 56(MAE).

Type :- 'CM'.

Object :—Type VIII—To study the effect of spacing and manures on Jowar yield.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil clay loam in texture. (b) N.A. (iii) 3rd week of July, 1956. (iv) (a) and (b) N.A. (c) 5 lb./ac. (d) As per treatment. (e) N.A. (v) Nil. (vi) Ujjain no. 6. (vii) Un-irrigated. (viii) N.A. (ix) 26". (x) 1st week of December, 1956.

2. TREATMENTS :

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

(1) 3 levels of N : $N_0 = 0$, $N_1 = 20$ and $N_2 = 40$ lb./ac.

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

(3) 3 row to row spacings : $S_1 = 12"$, $S_2 = 18"$ and $S_3 = 24"$.

3. DESIGN :

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

4. GENERAL :

(i) Normal. (ii) Stem-borer attack. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Yes. (v) (a) Nil. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1385 lb./ac. (ii) 249.6 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
S_1	1150	1461	1798	1470	1336	1572	1503
S_2	1115	1351	1498	1331	1363	1254	1376
S_3	1182	1187	1690	1353	1264	1443	1353
Mean	1159	1333	1662	1385	1321	1423	1411
P_0	1031	1351	1580				
P_1	1099	1369	1800				
P_2	1348	1280	1605				

S.E. of any marginal mean	= 58.8 lb./ac.
S.E. of body of any table	= 101.9 lb./ac.

Crop :- Jowar *(Kharif).*

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

Ref :- M.P. 57(MAE).

Type :- 'CM'.

Object :—Type VIII—To study the effect of spacing and manures on Jowar yield.

1. BASAL CONDITIONS

(i) (a) to (c) N.A.   (ii) (a) Medium black soil.   (b) N.A.   (iii) 1st week of July, 1957.   (iv) (a) 4 *bakherings* and 1 interculture.   (b) Sown by two coultered seed drill.   (c) 5 lb./ac.   (d) As per treatments.   (e) N.A.   (v) Nil.   (vi) Ujjain no. 6 (late).   (vii) Unirrigated.   (viii) 1 weeding.   (ix) 26".   (x) 2nd to 3rd week of December, 1957.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(MAE) type VIII on page 394.

4. GENERAL :

(i) Normal.   (ii) Nil.   (iii) Grain yield.   (iv) (a) 1955—contd.   (b) No.   (c) Yes.   (v) to (vii) Nil.

5. RESULTS :

(i) 673 lb./ac.   (ii) 174.0 lb./ac.   (iii) Main effect of N alone is highly significant.   (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
S_1	609	815	815	746	716	732	791
S_2	485	691	790	655	609	732	624
S_3	543	699	609	617	667	633	552
Mean	546	735	738	673	664	699	656
P_0	560	667	765				
P_1	568	773	757				
P_2	510	765	692				

S.E. of any marginal mean   =   41.0 lb./ac.
S.E. of body of any table   =   71.0 lb./ac.

Crop :- Jowar *(Kharif)*.

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

Ref :- M.P. 58(MAE).

Type :- 'CM'.

Object :—Type VIII—To study the effect of spacing and manures on Jowar yield.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A.   (ii) (a) Medium black soil.   (b) N.A.   (iii) 1st week of July, 1958.   (iv) (a) 4 *bakherings*.   (b) N.A.   (c) 5 lb./ac.   (d) As per treatments.   (e) N.A.   (v) Nil.   (vi) Ujjain no. 6 (late).   (vii) Unirrigated.   (viii) and (ix) N.A.   (x) 3rd and 4th week of December, 1958.

2. TREATMENTS :

Same as in expt. no. 56(MAE) type VIII on page 394.

3. DESIGN :

(i) 3^3 confd.   (ii) (a) 3 blocks/replication ; 9 plots/block.   (b) N.A.   (iii) 2.   (iv) (a) N.A.   (b) $S_1 = 1/106.8$ ac., $S_2 = 1/110$ ac. and $S_3 = 1/114.5$ ac.   (v) N.A.   (vi) Yes.

4. GENERAL :

(i) Normal.   (ii) Stem-borer attack controlled.   (iii) Grain yield.   (iv) (a) 1956—contd.   (b) No.   (c) Yes.   (v) (a) Nil.   (b) N.A.   (vi) Crop suffered due to prolonged wet condition.   (vii) Nil.

5. RESULTS :

(i) 429 lb./ac.   (ii) 110.1 lb./ac.   (iii) None of the effects is significant.   (iv) Av. yield of grain in lb./ac.

I

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
S_1	543	428	453	475	510	453	461
S_2	395	453	354	401	395	379	429
S_3	428	428	379	412	454	410	371
Mean	455	436	395	429	453	414	420
P_0	494	453	411				
P_1	420	379	444				
P_2	452	476	331				

S.E. of any marginal mean   =   25.9 lb./ac.
S.E. of body of any table   =   44.9 lb./ac.

Crop :- Jowar *(Kharif).*   **Ref :- M.P. 59(MAE).**

Site :- M.A.E. Farm, Ujjain.   **Type :- 'CM'.**

Object :—Type VIII—To study the effect of spacing and manures on Jowar yield.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A.   (ii) (a) Medium black soil.   (b) N.A.   (iii) 1st and 2nd week of July, 1959.   (iv) (a) and (b) N.A.   (c) 5 lb./ac.   (d) As per treatments.   (e) N.A.   (v) Nil.   (vi) Ujjain no. 6.   (vii) Unirrigated. (viii) N.A.   (ix) 54".   (x) 1st to 3rd week of Jan. 1960.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(MAE) type VIII on page 394.

4. GENERAL :

(i) Normal.   (ii) Nil.   (iii) Grain yield.   (iv) (a) 1956—contd.   (b) No.   (c) Yes.   (v) to (vii) Nil.

5. RESULTS :

(i) 906 lb./ac.   (ii) 223.5 lb./ac.   (iii) Main effect of N is highly significant and main effect of P is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
S_1	650	1070	1185	968	922	987	995
S_2	683	1004	1004	897	741	955	995
S_3	625	1029	905	853	689	890	980
Mean	653	1034	1031	906	784	944	990
P_0	543	938	872				
P_1	667	1012	1152				
P_2	749	1152	1069				

S.E. of any marginal mean   =   52.7 lb./ac.
S.E. of body of any table   =   91.2 lb./ac.

Crop :- Jowar *(Kharif).*　　　　　　　　　**Ref :- M.P. 56(94).**

Site :- Instt. of Plant Industry, Indore.　　　**Type :- 'D'.**

Object :—To find out the effect of weedicides on the yield of Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Tur* and Wheat. (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 23.6.1956. (iv) (a) *Bakhering.* (b) Drilling. (c) 10 lb./ac. (d) 14″ between rows. (e) N.A. (v) N A. (vi) I.P.I.—3. (vii) Unirrigated. (viii) N.A. (ix) 25.0″. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+2 Extra treatments.

(1) 6 weedicides : $W_1 = 1\frac{1}{2}$ and $W_2 = 3$ lb./ac. of M. 7, $W_3 = \frac{1}{2}$ and $W_4 = 1$ lb./ac. of K.W., $W_5 = 2$ and $W_6 = 4$ lb./ac. of P.C.P.

(2) 3 times of applying weedicides : $T_1 = $At pre-emergence, $T_2 = $After 4 weeks and $T_3 = $Repeated after 4 weeks.

$C_0 = $Control without weeding and $C_1 = $Control with weeding.

3. DESIGN :

(i) R.B D. (ii) (a) 20. (b) N.A (iii) 4. (iv) (a) 42′×9½′. (b) 37′×7′. (v) 2½′×1¼′. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 637 lb./ac. (ii) 219.2 lb./ac. (iii) Main effect of W is significant and "C_0 *vs.* C_1" effect is highly significant. (iv) Av. yield of grain in lb./ac.

$$C_0 = 462, \text{ and } C_1 = 921 \text{ lb./ac.}$$

	W_1	W_2	W_3	W_4	W_5	W_6	Mean
T_1	690	688	682	696	617	517	648
T_2	588	493	643	722	696	349	582
T_3	567	688	764	698	840	402	660
Mean	615	623	696	705	718	433	630

S.E. of marginal mean of T　　=　44.8 lb./ac.
S.E. of marginal mean of W　　=　63.3 lb./ac.
S.E. of body of table or C mean　=　109.6 lb./ac.

Crop :- Maize *(Kharif).*　　　　　　　　**Ref :- M.P. 57(48).**

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

Object :—To find out most suitable manurial schedule for Maize.

1. BASAL CONDITIONS :

(i) to (v) N.A. (vi) *Suneri.* (vii) 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 as Super : $P_0 = 0$, $P_1 = 20$ and $P_2 = 40$ lb./ac.
(3) 3 levels of K_2O : $K_0 = 0$, $K_1 = 20$ and $K_2 = 40$ lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 32′×17′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) to (iii) N.A.   (iv) (a) 1957—1959.   (b) and (c) N.A.   (v) to (vii) Nil.

5. RESULTS :

(i) 918 lb./ac.   (ii) 280.0 lb./ac.   (iii) Main effect of N alone is significant.   (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	729	622	756	702	549	874	684
N_1	831	894	961	895	964	756	966
N_2	1138	1338	996	1157	1125	1149	1198
Mean	899	951	904	918	879	926	949
K_0	812	974	851				
K_1	844	724	1211				
K_2	1041	1156	651				

S.E. of any marginal mean   = 93.3 lb./ac.
S.E. of body of any table   = 161.7 lb./ac.

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Crop :- Maize *(Kharif)*.

Site :- Govt. Agri. Res. Stn., Jhabua.

Ref :- M.P. 58(27).

Type :- 'M'.

Object :—To find out suitable manurial schedule for Maize.

1. BASAL CONDITIONS and 2. TREATMENTS :

Same as in expt. no. 57(48) on page 397.

3. DESIGN :

(i) 3^3 confd.   (ii) (a) 9.   (b) N.A.   (iii) 2.   (iv) (a) N.A.   (b) 15'×30'.   (v) and (vi) N.A.

4. GENERAL :

(i) to (iii) N.A.   (iv) (a) 1957–1959.   (b) No.   (c) N.A.   (v) to (vii) Nil.

5. RESULTS :

(i) 1335 lb./ac.   (ii) 391.2 lb./ac.   (iii) N effect is highly significant. P×K interaction is significant. N other effect is significant.   (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	859	1137	1234	1077	992	1186	1053
N_1	1234	1041	1500	1258	1186	1210	1379
N_2	1634	1730	1646	1670	1343	1706	1960
Mean	1242	1303	1460	1335	1174	1367	1464
K_0	980	1113	1428				
K_1	1597	1367	1137				
K_2	1149	1428	1815				

S.E. of any marginal mean   = 92.2 lb./ac.
S.E. of body of any table   = 159.7 lb./ac.

— — —

Crop :- Maize *(Kharif).*   **Ref :- M.P. 59(21).**

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

Object :—To find out suitable manurial schedule for Maize crop.

1. **BASAL CONDITIONS and 2. TREATMENTS :**

   Same as in expt. no. 57(48) on page 397.

3. **DESIGN :**

   (i) 3^3 confd. (ii) (a) 9. (b) N.A. (iii) 2. (iv) (a) N.A. (b) $24' \times 12'$. (v) Nil. (vi) Yes.

4. **GENERAL :**

   (i) to (iii) N.A. (iv) (a) 1957—1959. (b) No. (c) N.A. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 952 lb./ac. (ii) 237.4 lb./ac. (iii) Main effects of N, P and K are highly significant. Interaction $N \times P$ is significant. No other effect or interaction is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	781	781	920	827	781	781	920
N_1	706	807	1034	849	756	870	920
N_2	908	996	1638	1181	945	1122	1475
Mean	798	861	1197	952	827	924	1105
K_0	681	819	983				
K_1	718	908	1147				
K_2	996	857	1462				

S.E. of any marginal mean   = 56.0 lb./ac.
S.E. of body of any table   = 96.9 lb./ac.

———

Crop :- Kodo *(Kharif)*   **Ref :- M.P. 58(63).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'CM'.**

Object :—To find out most suitable variety, spacing and level of N for Kodo crop.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) *Morand.* (b) N.A. (iii) 8 and 9.7.1957. (iv) (a) *Bakhering.* (b) Sowing by hand. (c) 113 lb./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) N.A. (ix) 44.53". (x) 14 and 15.12.1958.

2. **TREATMENTS :**

   All combinations of (1), (2) and (3)
   - (1) 3 varieties : V_1=No. 13. V_2=No. 110 and V_3=No. 96.
   - (2) 3 row spacings : S_1=9", S_2=12" and S_3=15".
   - (3) 3 levels of N as A/S : N_1=5, N_2=10 and N_3=20 lb./ac.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) and (b) $20' \times 12'$. (v) Nil. (vi) Yes.

4. **GENERAL :**

   (i) Lodging. (ii) and (iii) N.A. (iv) (a) No. (b) and (c) —. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 207 lb./ac. (ii) 120.5 lb./ac. (iii) Interaction $V \times S \times N$ alone is significant. (iv) Av. yield of grain in lb./ac.

	V_1	V_2	V_3	Mean	S_1	S_2	S_3
N_1	229	206	123	186	197	225	136
N_2	201	273	208	227	226	217	238
N_3	221	230	176	209	257	201	170
Mean	217	236	169	207	227	214	181
S_1	250	248	182				
S_2	204	253	186				
S_3	197	207	140				

S.E. of any marginal mean   = 28.4 lb./ac.

S.E. of body of any table   = 49.2 ib./ac.

Crop :- Potato *(Rabi).*   **Ref :- M.P. 56 (84).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'M'.**

Object :—To see the effect of various Nitrogenous fertilizers on the yield and quality of Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sannhemp.* (c) 20 lb./ac. of P_2O_5 as Super. (ii) (a) Light soil. (b) Refer soil analysis, Chhindwara. (iii) 14.11.1956. (iv) (a) *Bakhering* and ploughing. b) Tuber sowing. (c) 7½ mds/ac. (d) 18"×9". (e) N.A. (v) G.M. with *sannhemp.* (vi) Local. (vii) Irrigated. (viii) Hand weeding. (ix) 3.54". (x) 18.3.1957.

2. TREATMENTS :

4 sources of 100 lb./ac. of N : S_0 = Control (no N), S_1 = A/S, S_2 = A/S/N and S_3 = Urea.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. 'b) N.A. (iii) 4. (iv) (a) and (b) 10'×27½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Potato yield. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 7248 lb./ac. (ii) 878.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3
Av. yield	6780	7668	6560	7983

S.E./mean = 439.2 lb./ac.

Crop :- Potato *(Rabi).*   **Ref :- M.P. 57(53).**

Site :- Govt. Exptl. Stn., Chhindwara.   *   **Type :- 'M'.**

Object :—To see the effect of various nitrogenous fertilizers on the yield and quality of Potato.

1. BASAL CONDITIONS :

(i) Nil. (b) *Sannhemp.* (c) 20 lb./ac. of P_2O_5 as Super. (ii) (a) Black soil. (b) Refer soil analysis, Chhindwara. (iii) 27.11.1957. (iv) (a) *Bakhering* and ploughing. (b) Tuber sowing. (c) 7½ mds/ac. (d) 18"×9". (e) N.A. (v) G.M. with *sannhemp.* (vi) D.R.R. (vii) Irrigated. (viii) Hand weeding and earthing. (ix) N.A. (x) 4.4.1958.

2. TREATMENTS :

· 5 sources of 100 lb./ac. of N : S_0=Control (no N), S_1=A/S, S_2=Urea, S_3=A/S/N and S_4=A/C.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 36'×10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Potato yield. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 5476 lb./ac. (ii) 317.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4
Av. yield	4402	5507	5025	6235	6192

S.E./mean = 158.6 lb./ac.

———

Crop :- Potato *(Rabi)*.

Site :- Govt. Exptl. Stn., Chhindwara.

Ref :- M.P. 58(55).

Type :- 'M'.

Object :—To see the effect of various nitrogenous fertilizers on the yield and quality of Potato.

1. BASAL CONDITIONS :

(i) (a) Nil (b) *Sannhemp*. (c) 20 lb./ac. of P_2O_5 as Super. (ii) (a) Medium black. (b) Refer soil analysis, Chhindwara. (iii) 8.12.1958. (iv) (a) *Bakhering* and ploughing. (b) Tuber sowing. (c) 7½ mds./ac. (d) 18"×9". (e) N.A. (v) G.M. with *Sannhemp*. (vi) Local. (vii) Irrigated. (vii) 4 weedings. (ix) 0.27". (x) 15.3.1959.

2. TREATMENTS :

5 sources of 40 lb./ac. of N : S_0=Control (no manure), S_1=A/S, S_2=Urea, S_3=A/S/N and S_4=A/C.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 15'×24'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Heavy attack of late-blight—Spraying of insecticides. (iii) Tuber yield. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Spraying of insecticides to control late-blight was ineffective.

5. RESULTS :

(i) 2685 lb./ac. (ii) 235.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tuber in lb./ac.

Treatment	S_0	S_1	S_2	S_3	S_4
Av. yield	2055	2715	2456	3170	3033

S.E./mean = 117.8 lb./ac.

———

Crop : Potato.

Centre :- Indore (c.f.).

Ref :- M.P. 57(SFT).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Medium black soil. (iii) Nil. (iv) to (x) N.A.

2. TREATMENTS :

0   =Control (no manure).

n   =50 lb./ac. of N as A/S.

p   =50 lb./ac. of P_2O_5 as Super.

np   =50 lb./ac. of N as A/S+50 lb./ac. of P_2O_5 as Super.

k   =50 lb./ac. of K_2O as Mur. Pot.

nk   =50 lb./ac. of N as A/S+50 lb./ac. of K_2O as Mur. Pot.

pk   = ⁙0 lb./ac. of P_2O_5 as Super+50 lb./ac. of K_2O as Mur. Pot.

npk   =50 lb./ac. of N as A/S+50 lb./ac. of P_2O_5 as Super+50 lb./ac. of K_2O as Mur. Pot.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogenous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crops, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects cf phosphate application are studied in 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) N.A. (b) and (c) —. (v) As per design (vi) and (vii) Nil.

5. RESULTS :

Effect	n	p	k	S.E.	np	nk	pk	npk	S.E.
Av. response in lb./ac.	1391	280	1061	391.7	—1119	—173	— 82	543	391.7

No. of trials = 8.

Crop :- Potato.

Centre :- Indore (c.f.).

Ref :- M.P. 57(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) Medium black. (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. af N as A/S/N.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 57 (SFT) type A on page 401 conducted at Indore.

5. RESULTS :

Treatment	0	n_1	n_2	n_1'	n_2'	n_1''	n_2''
Av. yield	10483	11372	12894	11734	12820	12038	13092

G.M. = 12062 lb./ac., S.E. = 298.5 lb./ac. and no. of trials = 8

Grop :- Potato *(Rabi)*.　　　　　　　　　　　　Ref :- M.P. 56(85).

Site :- Govt. Exptl. Stn., Chhindwara.　　　　　Type :- 'D'.

Object :—To find out the effect of insecticides on the yield of Potato.

1. BASAL CONDITIONS :

　(i) (a) Nil. (b) Cabbage. (c) N.A. (ii) Sandy. (b) Refer soil analysis, Chhindwara. (iii) 19.12.1950. (iv) (a) *Bakhering* and ploughing. (b) Furrows. (c) 7½ mds./ac. (d) 18″×9″. (e) N.A. (v) 70 lb./ac. of P_2O_5 a Super+5 mds/ac. of oil cakes. (vi) Local. (vii) Irrigated. (viii) Hand weeding and earthing. (ix) 3.54″. (x) N.A.

2. TREATMENTS :

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

　　(1) 2 insecticides : T_1=Aldrin 2% dust at 1 lb./ac. and T_2=B.H.C. 5% at 15 lb./ac.
　　(2) 3 methods of application : M_1=Mixed with manure and applied before sowing M_2=Dusted before earthing so that it may mix with soil and M_3= Dusted on crop when 6″ high and dusting repeated after a month.

3. DESIGN:

　(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3. (iv) (a) and (b) 10′×51′. (v) Nil. (vi) Yes.

4. GENERAL :

　(i) and (ii) N.A. (iii) Tuber yield. (iv) (a) 1956—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

　(i) 4719 lb./ac. (ii) 458.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of tuber in lb./ac.

<div align="center">Control　=　4703 lb./ac.</div>

	M_1	M_2	M_3	Mean
T_1	4561	4900	4764	4742
T_2	4642	4555	4908	4702
Mean	4601	4728	4836	4722

S.E. of T marginal mean　　　　= 152.9 lb./ac.
S.E. of M marginal mean　　　　= 187.2 lb./ac.
S.E. of body of table　　　　　= 264.8 lb./ac.

Crop :- Potato *(Rabi)*.　　　　　　　　　　　　Ref :- M.P. 57(54).

Site :- Govt. Exptl. Stn., Chhindwara.　　　　　Type :- 'D'.

Object :—To find out the effect of insecticides on the yield of Potato.

1. BASAL CONDITIONS :

　(i) (a) Nil. (b) *Urid* crop. (c) N.A. (ii) Sandy loam. (b) Refer soil analysis, Chhindwara. (iii) 9.11.1957. (iv) (a) *Bakhering* and ploughing. (b) Tuber sowing in furrows. (c) 7½ mds./ac. (d) 18″×9″. (e) N.A. (v) 20 lb./ac. of P_2O_5 as Super+5 md./ac. of oil cakes at sowing. (vi) Local. (vii) Irrigated. (viii) Hand weeding and earthing. (ix) N.A. (x) 26 and 27.2.1958.

2. TREATMENTS :

　Same as in expt. no. 56(85) above.

3. DESIGN :

　(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 15′×24′. (v) Nil. (vi) Yes.

4. GENERAL :

　(i) N.A. (ii) Attack seems to be sporadic. The cut worm appeared late resulting into cutting of small sized soft tubers. (iii) Tuber yield. (iv) 1956—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 4629 lb./ac. (ii) 1312 0 lb./ac. (iii) No effect is significant. (iv) ¦Av. yield of tuber in lb./ac.

Control = 4595 lb./ac.

	M_1	M_2	M_3	Mean
T_1	4441	5044	4664	4715
T_2	3931	5326	4358	4555
Mean	4211	5183	4511	4635

S.E. of T marginal mean	= 378.7 lb./ac.
S.E. of M marginal mean	= 463.8 lb./ac.
S.E. of body of table	= 656.0 lb./ac.

Crop :- Potato *(Rabi)*.

Site :- Govt. Exptl. Stn., Chhindwara.

Ref :- M.P. 58(56).

Type :- 'D'.

Object :—To find out the effect of insecticides on the yield of Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sannhemp*. (c) 25 lb./ac. of P_2O_5 as Super. (ii) (a) Medium black. (b) Refer soil analysis, Chhindwara. (iii) 9.12.1958. (iv) (a) *Bakhering* and ploughing. (b) Tuber sowing in furrows. (c) 5 mds./ac. (d) 18"×9". (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Hand weeding and earthing. (ix) 0.27". (x) 15.3.1959.

2. TREATMENTS :

T_0=Control, T_1=Soil treated with Aldrin 2% at 50 lb./ac. before sowing, T_2=T_1+Soil treated with 50 lb./ac. of 2% Aldrin at first earthing and T_3=Soil treated with 50 lb./ac. of 2% Aldrin at first earthing and at 2nd earthing.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 15'×24'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of late blight. (iii) Tuber yield. (iv) 1951—contd. (b) Nil. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 5540 lb./ac. (ii) 1207.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of tuber in lb./ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	5385	5952	5673	5150

S.E./mean = 603.5 lb./ac.

Crop :- Potato *(Rabi)*.

Site :- Govt. Exptl. Stn., Chhindwara.

Ref :- M.P. 59(109).

Type :- 'D'.

Object :—To find out the effect of insecticides on the yield of Potato.

1. **BASAL CONDITIONS:**

   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Medium sandy. (b) Refer soil analysis, Chhindwara. (iii) 23.11.1959. (iv) (a) 1 ploughing. and 2 *bakherings* (b) Planting. (c) 21 mds./ac. (d) 12″×6″. (e) 1. (v) 48 lb./ac. of N+48 lb./ac. of P_2O_5. (vi) *Kufri*. (vii) Irrigated. (viii) 3 weedings. (ix) 4.7″. (x) 29.4 1960.

2. **TREATMENTS and** 3. **DESIGN :**

   Same as in expt. no. 58(56) on page 404.

4. **GENERAL :**

   (i) Good. (ii) Nil. (iii) Potato yield. (iv) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 2380 lb./ac. (ii) 717.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of tuber in lb./ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	2147	2178	2396	2800

   S.E./mean = 358.8 lb./ac.

Crop :- Potato *(Rabi).*　　　　　　　　　**Ref :- M.P. 59(108).**

Site :- Govt. Exptl. Stn., Chhindwara.　　　**Type :- 'D'.**

Object :—To find out the effect of insecticides on the yield of Potato.

1. **BASAL CONDITIONS :**

   (i) Nil. (b) *Sannhemp*. (c) N.A. (ii) (a) *Sehra*. (b) Refer soil analysis, Chhindwara. (iii) 29.10.1959. (iv) (a) 1 ploughing and 2 *bakherings*. (c) 10 mds./ac. (d) 12″×6″. (e) 1. (v) 52 lb./ac. of N+52 lb./ac. of P_2O_5. (vi) *Kufri*. (vii) Irrigated. (viil) 3 weedings and earthing. (ix) Nil. (x) 11.4.1960.

2. **TREATMENTS :**

   All combinations of (1) and (2)

   (1) 4 different fungicides : T_0=Control, T_1=Spray with cupravait 3 lbs. in 100 gallons, T_2=Spray with Bord. mixture 2 : 2 : 50, T_3=Diathane 2078 at 3 lbs. in 100 gallons.
   (2) Two intervals of application of Fungicides : D_1=15 days and D_2=30 days after spray.

3. **DESIGN:**

   (i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 28′×12′. (v) Nil. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) Nil. (iii) Potato yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 6758 lb./ac. (ii) 1475 lb./ac. (iii) None of the effects is significant (iv) Av. yield of tuber in lb./ac.

	T_0	T_1	T_2	T_3	Mean
D_1	6133	6400	6400	7200	6533
D_2	5733	6733	7867	7600	6983
Mean	5933	6567	7134	7400	6758

   S.E. of marginal mean of T = 521 lb./ac.
   S.E. of marginal mean of D = 369 lb./ac.
   S.E. of body of table = 738 lb./ac.

Crop :- Tomato *(Kharif).*   **Ref :- M.P 55(53).**

Site :- Govt. Veg. Res. Stn., Silary.   **Type :- 'M'.**

Object :—To find out optimum doses of N, P and K for Tomato.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Tomato. (c) 15 C.L./ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Silary. (iii) 11.10.1955/11.11.1955. (iv) (a) Ploughing and *bakhering*. (b) Transplanted. (c) N.A. (d) 2'×2'. (e) 1. (v) 20 C.L./ac. of compost broadcasted. (vi) EC—1151 (*Sioux*-late). (vii) Irrigated. (viii) 4 weedings and mulchings. (ix) and (x) N.A.

2. **TREATMENTS :**

All combinations of (1), (2) and (3),
(1) 3 levels of N as A/S : $N_0=0$, $N_1=25$ and $N_2=50$ lb./ac.
(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.
(3) 3 levels of K_2O as Mur. Pot. : $K_0=0$, $K_1=25$ and $K_2=50$ lb./ac.

3. **DESIGN :**

(i) 3^3 partially confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) 36'×144'. (iii) 3. (iv) (a) 36'×16'. (b) 32'×12'. (v) 2'×2'. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) Spotted wilt due to virus—Prenox was sprayed thrice. (iii) Yield of Tomato. (iv) (a) 1955—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

(i) 14585 lb./ac. (ii) 3562 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of tomato in lb./ac.

	K_0	K_1	K_2	Mean	P_0	P_1	P_2
N_0	8960	9632	12544	10379	10528	9632	10976
N_1	16128	17472	15456	16352	16352	16128	16576
N_2	15680	18368	17024	17024	15904	17696	17472
Mean	13589	15157	15008	14585	14261	14485	15008
P_0	13664	15008	14112				
P_1	13440	14784	15232				
P_2	13664	15680	15680				

S.E. of any marginal mean = 685.4 lb./ac.
S.E. of body of any table = 1187.0 lb./ac.

Crop :- Tomato *(Kharif).*   **Ref :- M.P. 56(59).**

Site :- Govt. Veg. Res. Stn., Silary.   **Type :- 'M',**

Object :—To find out optimum doses of N, P and K for Tomato.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Tomato. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analyssis, Silary. (iii) 19.7.1956/29.8.1956. (iv) (a) Ploughing and *bakhering*. (b) Transplanted. (c) N.A. (d) 2'×2'. (e) 1. (v) 20 C.L./ac. of compost broadcasted in May. (vi) EC—1151 (*Sious*-late). (vii) Irrigated. (viii) 2 interculturings and 4 weedings. (ix) N.A. (x) 4 pickings : 15.12.1956 to 6.2.1957.

2. **TREATMENTS and 3. DESIGN :**

Same as in expt. no. 55(53) above.

4. GENERAL :

(i) Good. (ii) Purple veins of leaves disease observed—Prenox sprayed. (iii) Tomato yield. (iv) (a) 1955–1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 16927 lb./ac. (ii) 5197.0 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of tuber in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	10214	8938	9610	9587	7638	9856	11267
N_1	16419	18838	19174	18144	15680	18682	20070
N_2	20227	23677	25245	23050	23542	22490	23118
Mean	15620	17151	18010	16927	15620	17009	18152
K_0	13821	15635	17404				
K_1	16374	16598	18055				
K_2	16665	19220	18571				

S.E. of any marginal mean = 1000 lb./ac.
S.E. of body of any table = 1732 lb./ac.

Crop :- Tomato *(Kharif)*.   Ref :- M.P. 57(28).

Site :- Govt. Veg. Res. Stn., Silary.   Type :- 'M'.

Object :—To find out optimum doses of N, P and K on Tomato.

1. BASAL CONDITIONS :

(i) (a) No. (b) Tomato. (c) As per treatments+20 C.L./ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Silary. (iii) 25.7.1957/19.9.1957. (iv) (a) Ploughing and *bakhering*. (b) Transplanted. (c) N.A. (d) 2'×2'. (e) 1. (v) 20 C.L./ac. of compost broadcasted in May. (vi) EC—1151 *(Sioux*-late). (vii) Irrigated. (viii) 2 interculturings by *kulfi* and 4 weedings. (ix) N.A. (x) 16.12.1953 to 10.2.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(59) on page 406.

5. RESULTS :

(i) 16377 lb./ac. (ii) 3741 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of tuber in lb./ac.

	P_6	P_1	P_2	Mean	K_0	K_1	K_2
N_0	10954	10528	11491	10991	9990	11581	11402
N_1	17562	19286	17965	18271	16061	19107	19645
N_2	17786	20205	21616	19869	20922	20362	18323
Mean	15434	16673	17024	16377	15658	17017	16457
K_0	16038	14605	16330				
K_1	14112	18435	18504				
K_2	16152	16979	16240				

S.E. of any marginal mean = 720 lb./ac.
S.E. of body of any table = 1247 lb./ac.

Crop :- Tomato *(Kharif)*.   **Ref :- M.P. 58(8).**

Site :- Govt. Veg. Res. Stn., Silary.   **Type :- 'M'.**

Object :—To find out optimum doses of N, P and K for Tomato.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Tomato. (c) As per treatments+20 C.L./ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Silary. (iii) 19.7.1958/15, 16.9.1958. (iv) (a) *Bakhering* and ploughing. (b) Transplanted. (c) N.A. (d) 2'×2'. (e) 1. (v) 20 C.L./ac. of compost. (vi) EC—1151 *(Sioux*-late). (vii) Irrigated. (viii) 5 weedings and mulchings. (ix) N.A. (x) 19.12.1958 to 10.2.1959.

2. **TREATMENTS and 3. DESIGN :**

   Same as in expt. no. 55(53) on page 406.

4. **GENERAL:**

   (i) Satisfactory. (ii) Mild attack of leaf curlvirns. (iii) Yield of ripe tomato. (iv) (a) 1955—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 25262 lb./ac. (ii) 1523 lb./ac. (iii) Main effect of N and interactions N×P, K×P and N×P×K are highly significant. Main effect of K is significant. (iv) Av. yield of tomato in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	21997	22602	21773	22124	23251	22154	20967
N_1	26992	27395	26813	27067	27978	28338	24685
N_2	27709	26813	25267	26596	25424	25850	28514
Mean	25566	25603	24618	25262	25551	25514	24722
K_0	25043	24058	27552				
K_1	26544	26320	23678				
K_2	25111	26431	22624				

S.E. of any marginal mean   = 293.1 lb./ac.
S.E. of body of any table   = 507.7 lb./ac.

Crop :- Tomato *(Kharif)*.   **Ref :- M.P. 59(133).**

Site :- Govt. Veg. Res. Stn., Silary.   **Type :- 'M'.**

Object :—To find out optimum doses of N, P and K for Tomato.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Peas and *chillies.* (c) 25 C.L./ac. of T.C. (ii) (a) Sandy loam. (b) Refer soil analysis, Silary. (iii) 31.7.1959/29.9.1959. (iv) (a) 3 *bakherings* and 1 ploughing. (b) Transplanting. (c) 1 lb./ac. (d) 24"×24". (e) 2. (v) 20 C.L./ac. of T.C. (vi) EC—1151. (vii) Irrigated. (viii) 3 weedings. (ix) 59.78". (x) 16.11.1959 to 12.2.1960.

2. **TREATMENTS and 3. DESIGN :**

   Same as in expt. no. 55(53) on page 406.

4. **GENERAL :**

   (i) Good. (ii) Nil. (iii) Tomato yield. (iv) (a) 1955—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 11230 lb./ac. (ii) 2313 lb./ac. (iii) Only main effect of N is significant. (iv) Av. yield of tomato in lb./ac

	P₀	P₁	P₂	Mean	K₀	K₁	K₂
N_0	9174	9064	9103	9114	8109	9819	9414
N_1	12770	13539	11660	12656	12452	13668	11849
N_2	11781	10969	12013	11921	11998	11366	12399
Mean	11242	11191	11259	11230	10853	11618	11221

	P₀	P₁	P₂
K_0	12008	10151	10401
K_1	11296	12336	11222
K_2	10422	11086	12154

S.E. of any marginal mean = 445.1 lb./ac.
S.E. of body of any table = 771.0 lb./ac.

Crop :- Cluster beans *(Kharif).*

Site :- Govt. Veg. Res. Stn., Silary.

Ref :- M.P. 56(49).

Type :- 'M'.

Object :—To find out optimum doses of N, P and K for Cluster beans.

1. **BASAL CONDITIONS :**

(i) (a) No. (b) *Bhindi.* (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Silary. (iii) 30.7.1956. (iv) (a) Ploughing and *bakherings.* (b) Dibbling. (c) N.A. (d) Row to row 24″. (e) 1. (v) 20 C.L /ac. of compost before sowing. (vi) *Nadiad* (medium). (vii) Unirrigated. (viii) Weeding and mulching 3 times. (ix) N.A. (x) 2 pickings on 14.11.1956 and 3.12.1956.

2. **TREATMENTS :**

All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S : $N_0=0$; $N_1=25$ and $N_2=50$ lb./ac.
(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.
(3) 3 levels of K_2O as Mur. Pot. : $K_0=0$, $K_1=25$ and $K_2=50$ lb./ac.

3. **DESIGN :**

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replications. (b) 144′×36′. (iii) 3. (iv) (a) 36′×16′. (b) 32′×12′. (v) 2′×2′. (vi) Yes.

4. **GENERAL :**

(i) Ordinary. (ii) Attack of white ants—gammexane D. 025 dusted. (iii) Yield of dry seeds. (iv) (a) 1956—1959. (b) No (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) The field was brought into cultivation of cluster beans for the first time. Field was uneven and therefore the heterogenous condition of the field in regard to its fertility has its effect on the crop. White ants greatly affected the crop.

5. **RESULTS :**

(i) 149 lb./ac. (ii) 78.6 lb./ac. (iii) N effect is highly significant. P effect and N×P interaction are significant. Other effects are not significant. (iv) Av. yield of dry seed in lb./ac.

	P₀	P₁	P₂	Mean	K₀	K₁	K₂
N_0	170	129	139	146	133	172	132
N_1	132	120	127	126	120	126	133
N_2	179	160	184	174	131	184	209
Mean	160	136	150	149	128	161	158

	P₀	P₁	P₂
K_0	138	118	128
K_1	169	148	165
K_2	173	149	156

S.E. of any marginal mean   ·   =   15.1 lb./ac.
S.E. of body of any table   =   26.2 lb./ac.

Crop :- Cluster beans *(Kharif)*.   **Ref :- M.P. 57(27).**

Site :- Govt. Veg. Res. Stn., Silary.   **Type :- 'M'.**

Object :—To find out suitable doses of N, P and K for Cluster beans.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cluster beans. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Silary. (iii) 27.7. 957. (iv) (a) Ploughing and *bakherings*. (b) Dibbled. (c) N.A. (d) $2' \times 2'$. (e) 1. (v) 20 C.L./ac. of compost broadcasted in May. (vi) *Nadiad* (medium). (vii) Unirrigated. (viii) 2 interculturing and 3 weedings. (ix) N.A. (x) 2 pickings on 15.11.1957 and 13.12.1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(40) on page 409.

5. RESULTS :

(i) 190 lb./ac. (ii) 78.3 lb./ac. (iii) N effect, $P \times K$ interaction and Z component of $N \times P \times K$ are significant. (iv) Av. yield of dry seeds in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	177	165	169	170	203	152	156
N_1	159	177	174	170	132	202	176
N_2	249	229	213	230	259	244	188
Mean	195	190	185	190	198	199	173
K_0	198	184	212				
K_1	160	216	221				
K_2	226	171	123				

S.E. of any marginal mean   =   45.2 lb./ac.
S.E. of body of ary table   =   26.1 lb./ac.

Crop :- Cluster beans *(Kharif)*.   **Ref :- M.P. 59(134).**

Site :- Govt. Veg. Res. Stn., Silary.   **Type :- 'M'.**

Object :—To find out the best doses of N, P and K for higher yield of cluster beans.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cluster beans. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Silary. (iii) 5.7.1959. (iv) (a) 5 *bakherings*. (b) Dibbling. (c) 7 lb./ac. (d) $24'' \times 24''$. (e) 2. (v) 20 C.L./ac. of T.C. (vi) *Nadiad*. (vii) Unirrigated. (viii) 3 weedings and 1 hoeing. (ix) 59.78″. (x) 27.11.1959 to 11.12.1959.

2. TREATMENTS and 3. DESIGN

Same as in expt. no. 56(40) on page 409.

4. GENERAL :

(i) Crop was unsatisfactory due to hetrogenity of soil. (ii) Attack of root rot disease. (iii) Vegetable yield. (iv) (a) 1956—1959. (b) No. (c) Nil. v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 184 lb./ac. (ii) 63.8 lb./ac. (iii) Interaction $N \times K$ alone is highly significant. (iv) Av. yield of dry seed in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	161	188	151	167	207	145	143
N_1	174	172	198	181	179	147	218
N_1	215	211	190	205	227	237	151
Mean	183	190	179	184	204	176	172
K_0	189	219	205				
K_1	180	169	180				
K_2	181	183	153				

S.E. of any marginal mean = 12.3 lb./ac.
S.E. of body of any table = 21.3 lb./ac.

Crop :- Cabbage *(Rabi)*.   **Ref :- M.P. 59(111).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'MV'.**

Object :—To study the effect of N on different varieties of Cabbage.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) *Morand*—II. (b) Refer soil analysis, Chhindwara. (iii) 15.8.1959. (iv) (a) One ploughing and three *bakherings*. (b) Planting. (c) 75 lb./ac. (d) $18'' \times 9''$. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 3 weedings and earthing. (ix) 18.7". (x) 15.2.1960, 6 and 28.3.1960.

2. TREATMENTS:

All combinations of (1) and (2)
    (1) 4 levels of N as A/S : $N_1 = 10$, $N_2 = 20$, $N_3 = 30$ and $N_4 = 40$ lb./ac.
    (2) 5 varieties : $V_1 =$ *Canarian*, $V_2 =$ *Elizabein*, $V_3 =$ *Cake solid*, $V_4 =$ *Golden acre* and $V_5 =$ Pride of India.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 2. (iv) (a) and (b) $24' \times 12'$. (vi) Nil. (vii) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Cabbage yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 19707 lb./ac. (ii) 6174 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of Cabbage in lb./ac.

	V_1	V_2	V_3	V_4	V_5	Mean
N_1	18185	27401	23781	22299	14647	21263
N_2	16210	22711	16457	14811	22793	18596
N_3	30775	11767	17362	18926	20489	12864
N_4	20160	14976	24027	20983	15387	19107
Mean	21332	19214	20407	19255	18329	19707

S.E. of V marginal mean	=	2183 lb./ac.
S.E. of N marginal mean	=	1381 lb./ac.
S.E. of body of table	=	4366 lb./ac.

————

Crop :- Gram.   **Ref :- M.P. 54(45).**

Site :- Govt. Agri. Res. Stn., Adhartal (Jabalpur).   **Type :- 'M'.**

Object : - To see the effect of different doses of Super on Gram and to study its residual effect on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Gram—Wheat—Gram. (b) Wheat. (c) Nill (ii) (a) *Kabar*—2. (b) N A. (iii) 5.11.1954. (iv) (a) *Bakhering*. (b) Drilling. (c) 60 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Ad—5. (vii) Unirrigated. (viii) Kans cutting and weeding. (ix) 4.59″. (x) 23, 24.3.1955.

2. TREATMENTS :

5 doses of P_2O_5 as Super : $P_0=0$, $P_1=15$, $P_2=20$, $P_3=25$ and $P_4=30$ lb./ac.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 4. (b) $66'×16\frac{1}{2}'$. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Fair. (ii) N.A. (iii) Yield of grain. (iv) (a) 1950—1955. (b) No. (c) N.A. (v) to (vii) N.A.

5. RESULTS:

(i) 476 lb./ac. (ii) 44.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2	P_3	P_4
Av. yield	442	431	486	495	525

S.E./mean = 22.1 lb./ac.

————

Crop :- Gram.   **Ref :- M.P. 55(42).**

Site :- Govt. Agri. Res. Stn., Adhartal (Jabalpur).   **Type :- 'M'.**

Object :—To ascertain the effect of different doses of Super on Gram and to see its residual effect on Wheat.

1. BASAL CONDITIONS :

(i) (a) Gram—Wheat—Gram. (b) and (c) N.A. (ii) (a) *Kabar* II. (b) N.A. (iii) 9.11.1955. (iv) (a) N.A. (b) Seeds drilled. (c) 60 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Ad—5. (vii) Unirrigated. (viii) N.A. (ix) 64.66″. (x) 24.3.1956.

2. TREATMENTS:

5 doses of P_2O_5 as Super : $P_0=0$, $P_1=15$, $P_2=30$, $P_3=45$ and $P_4=60$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) $66'×16\frac{1}{2}'$. (v) Nil. (vi) Yes.

4 GENERAL :

(i) Not satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1950—1955. (b) No. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 244 lb./ac. (ii) 69.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2	P_3	P_4
Av. yield	248	221	236	275	241

S.E /mean = 34.8 lb./ac.

Crop :- Gram *(Rabi).*   **Ref :- M.P. 59(3).**

Site :- Govt. Agri. Res. Stn., Adhartal (Jabalpur).   **Type :- 'M'.**

Object:—To study the effect of different manurial doses on Gram crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) 10 lb./ac. of N as A/S+10 lb./ac. of P_2O_5 as Super. (ii) (a) *Kabar* II. (b) N.A. (iii) 6.11.1959. (iv) (a) *Bakhering* and Raja cutting. (b) Drilled with country *nari.* (c) 60 lb./ac. (d) Rows 12″ apart. (e) N.A. (v) T.C. at 9½ C.L./ac. broadcasted. (vi) N.A. (vii) Unirrigated. (viii) Nil. (ix) 60″. (x) 13.4.1960.

2. **TREATMENTS :**

All combinations of (1) and (2)
    (1) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=7.5$ and $P_2=15$ lb./ac.
    (2) 2 levels of N as A/S : $N_0=0$ and $N_1=10$ lb./ac.
Manures drilled with seed on 6.11.1959.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 36′ 3″×15′. (b) 33′5″×13′. (v) 15″×1″. (vi) Yes.

4. **GENERAL :**

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

5. **RESULTS :**

(i) 554 lb /ac. (ii) 124.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	519	495	546	520
N_1	509	654	601	588
Mean	514	574	574	554

S.E. of N marginal mean   = 29.4 lb./ac.
S.E. of P marginal mean   = 36.1 lb./ac.
S.E. of body of table   = 51.0 lb./ac.

————

Crop :- Gram.   **Ref :- M.P. 56(24).**

Site :- Govt. Seed and Demons. Farm, Betul.   **Type :- 'M'.**

Object : —To study the effect of P on different legumes and its residual effect on Wheat.

1. **BASAL CONDITIONS :**

(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) *Morand*—II. (b) Refer soil analysis, Betul. (iii) N.A. (iv) (a) 4 *bakherings.* (b) to (e) N.A. (v) Nil. (vi) Local varieties of *rabi* legumes. (vii) Unirrigated. (viii) N.A. (ix) 47.79″. (x) N.A.

2. **TREATMENTS :**

All combinations of (1) and (2)
    (1) 4 legumes : L_1=Gram, L_2=*Teoda*, L_3=*Masoor* and L_4=*Peas.*
    (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 5. (iv) (a) 1/40 ac. (b) 1/62 ac. (v) 3 rows. (vi) Yes.

4. **GENERAL :**

(i) Poor. (ii) N.A. (iii) Yield of grain. (iv) (a) N.A. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) Due to heavy rains the crop *teoda, masoor* and *peas* were completely damaged. So, analysis was done only for gram. (vii) Nil.

5. RESULTS :

(i) 702 lb./ac. (ii) 65.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2
Av. yield	471	818	818

S.E./mean = 29.1 lb./ac.

Crop :- Gram *(Rabi).* **Ref :- M.P. 59(100).**

Site :- Govt. Exptl. Stn., Chhindwara. **Type :- 'M'.**

Object :—To find out the optimum doses of N and P for Gram.

1. BASAL CONDITIONS :

(i) 'a) Nil. (b) Wheat. (c) G.M with *sannhemp.* (ii) (a) *Morand*—I. (b) Refer soil analysis, Chhindwara. (iii) 9 11.1959. (iv) (a) 1 ploughing and 2 *bakhering.* (b) Drilled by *nari.* (c) 64 lb./ac. (d) 9″×6″. (e) N.A. (v) Nil. (vi) No. 28. (vii) Unirrigated. (viii) Nil. (ix) 4.86″. (x) 30.3.1960.

2. TREATMENTS :

All combinations of (1) and (2)+a control (no marure).
 (1) 2 levels of N as A/S : $N_1=7\frac{1}{2}$ and $N_2=15$ lb./ac.
 (2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=10$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 21′×12′. (v) Nil. (vi) Yes.,

4. GENERAL :

(i) Good. (ii) N.i. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) N.A.

5. RESULTS :

(i) 748 lb./ac. (ii) 178.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 698 lb./ac.

	P_0	P_1	Mean
N_1	749	799	774
N_2	734	760	747
Mean	742	780	761

S.E. of any marginal mean = 51.6 lb./ac.
S.E. of body of table or control mean = 72.9 lb./ac.

Crop :- Gram *(Rabi).* **Ref :- M.P. 59(98).**

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

Object :—To find out the manurial requirement of Gram and its effect on succeeding Wheat crop.

. BASAL CONDITIONS :

(i) (a) Wheat—Gram. (b) Wheat. (c) G.M. with *sannhemp.* (ii) (a) Medium. (b) Refer soil analysis, Chhindwara. (iii) 10.11.1959. (iv) (a) 1 ploughing and 2 *bakherings.* (b) Drilled by *nari.* (c) 52 lb./ac. (d) 9″×6″. (e) N.A. (v) Nil. (vi) No. 28. (vii) Unirrigated. (viii) Nil. (ix) 4.85″. (x) 29.3.1960.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=7\frac{1}{2}$ and $N_2=15$ lb./ac.
(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=10$ lb./ac.

Fertilizers mixed with seed and sown.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 30'×14'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) N.A.

5. RESULTS :

(i) 845 lb./ac. (ii) 218.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	808	761	805	791
P_1	873	950	877	900
Mean	840	855	841	845

S.E. of marginal mean of N   = 63.0 lb./ac.
S.E. of marginal mean of P   = 51.4 lb./ac.
S.E. of body of table   = 89.0 lb./ac.

Crop :- Gram (Kharif).   **Ref :- M.P. 59(72).**

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

Object :—To study the effect of different manurial schedule on the yield of Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) Nil (ii) (a) Kanhar—II. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings by desi plough. (b) Drilling. (c) 75 lb./ac. (d) Row to row 12". (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Nil. (ix) 0.29". (x) 4.3.1960.

2. TREATMENTS :

Same as in expt. no. 59(100) on page 414.

3. DESIGN :

(i) R.B D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 12'×45'. (v) N.A. (vi) Yes.

4. GENERAL :

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

RESULTS :

(i) 257 lb./ac. (ii) 29.1 lb./ac. (iii) Only N effect and 'control vs. others' effects are significant. (iv) Av. yield of grain in lb./ac.

Control = 175 lb./ac.

	P_0	P_1	Mean
N_1	181	202	192
N_2	350	376	363
Mean	266	289	277

S.E. of any marginal mean   =   8.4 lb./ac.

S.E. of body of table or control mean   =   11.0 lb./ac.

Crop :- Gram *(Rabi)*.   **Ref :- M.P. 58(30).**

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

Object :—To find out proper manurial schedule for Gram crop.

1. **BASAL CONDITIONS :**

(i) to (v) N.A.   (vi) Ujjain—21.   (vii) to (x) N.A.

2. **TREATMENTS :**

All combinations of (1) and (2)

(1) 3levels of N as A/S : $N_0=0$, $N_1=10$ and $N_2=20$ lb./ac.

(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=10$ and $P_2=20$ lb./ae.

3. **DESIGN :**

(i) Fact. in R.B.D.   (ii) (a) 9.   (b) N.A.   (iii) 4.   (iv) (a) N.A.   (b) 40'×18'.   (v) N.A.   (vi) Yes·

4. **GENERAL :**

(i) and (ii) N.A.   (iii) Grain yield.   (iv) (a) 1958—1959.   (b) and (c) No.   (v) to (vii) N.A.

5. **RESULTS :**

(i) 335 lb./ac.   (ii) 88.3 lb./ac.   (iii) None of the effects is significant.   (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	340	393	376	370
N_1	340	348	295	328
N_2	308	325	284	306
Mean	329	355	318	335

S.E. of any marginal mean   =   25.5 lb./ac.

S.E. of body of table   =   44.2 lb./ac.

Crop :- Gram *(Rabi)*.   **Ref :- M.P. 59(26).**

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

Object :—To find out proper manurial schedule for Gram crop.

1. **BASAL CONDITIONS to 4. GENERAL :**

Same as in expt. no. 58 (30) above except that the no. of replications is 2.

5. **RESULTS :**

(i) 207 lb./ac.   (ii) 13.7 lb./ac.   (iii) All the effects are highly significant.   (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	136	178	165	160
N_1	216	144	212	191
N_2	286	240	284	270
Mean	213	187	220	207

S.E. of any marginal mean   =.   5.6 lb./ac.

S.E. of body of table   =   9.7 lb./ac.

Crop :- Gram *(Rabi).*　　　　　　　　　　**Ref :- M.P. 58(86).**

Site :- Reg. Res. Stn., Khargone.　　　　　　**Type :- 'M'.**

Object :—To find out optimum doses of N and P for Gram.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 6, 7.10.1958. (iv) (a) *Bakherings.*
   (b) Drilling. (c) 60 lb./ac. (d) Row to row 16". (e) N.A. (v) Nil. (vi) Gram—T_1. (vii) Unirrigated.
   (viii) N.A. (ix) 3.41". (v) 9 to 23.1.1959.

2. **TREATMENTS :**

   All combinations of (1) and (2)
   　　(1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
   　　(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 44'×20'. (b) 40'×18'. (v) 2'×1'. (vi) Yes.

4. **GENERAL :**

   (i) Poor. (ii) N.A. (iii) Plant height, no. of plants and grain yield. (iv) (a) 1958—1959. (b) No. (c) Nil.
   (v) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 290 lb./ac. (ii) 56.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	253	278	321	284
P_1	241	304	277	274
P_2	278	364	294	312
Mean	257	315	297	290

S.E. of any marginal mean　　　=　16.4 lb./ac.
S.E. of body of table　　　　　=　28.4 lb./ac.

Crop :- Gram *(Rabi).*　　　　　　　　　　**Ref :- M.P. 59(87).**

Site :- Reg. Res. Stn., Khargone.　　　　　　**Type :- 'M'.**

Object :—To find out optimum doses of N and P for Gram.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Linseed. (c) Nil. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 16.10.1959. (iv) (a)
   4 harrowings. (b) Drilling. (c) 60 lb./ac. (d) Row to row 16". (e) N.A. (v) Nil. (vi) Gram—T_1. (vii)
   Unirrigated. (viii) 1 hand weeding. (ix) 0.83". (x) 6.2.1960.

2. **TREATMENTS :**

   Same as in expt. no. 58(86) above.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 46'×20'. (b) 40'×16'. (v) 3'×2'. (vi) Yes.

4. **GENERAL :**

   (i) Poor. (ii) Slight attack of pod-borer. (iii) Germination stand, height, branches and weight of 1000
   grains and grain yield. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) N.A. (vi) Late October rains. (vii) Nil.

5. **RESULTS :**

   (i) 383 lb./ac. (ii) 93.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	416	336	411	388
N_1	307	463	386	385
N_2	361	365	400	375
Mean	361	388	399	383

S.E. of any marginal mean   = 27.1 lb./ac.
S.E. of body of table   = 47.0 lb./ac.

Crop :- Gram *(Rabi).*   **Ref :- M.P. 59(88).**

Site :- Reg. Res. Stn., Khargone.   **Type :- 'M'.**

Object :—To find out the most suitable combination of N and P for Gram.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Linseed. (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 17.10.1959. (iv) (a) 4 harrowings. (b) Drilling. (c) 60 lb./ac. (d) Row to row 16". (e) N.A. (v) Nil. (vi) Ujjain—21. (vii) Unirrigated. (viii) 1 hand weeding. (ix) 0.83". (x) 7.2.1960.

2. **TREATMENTS:**

   Same as in expt. no. 59(100) on page 414.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 45'×12'. (b) 40'×8'. (v) 2½'×2'. (vi) Yes.

4. **GENERAL :**

   (i) Poor. (ii) Attack of pod borer. (iii) Grain and straw yield. (iv) (a) 1959—1961. (b) No. (c) Nil. (v) N.A. (vi) Late October rains. (vii) Nil.

5. **RESULTS :**

   (i) 246 lb./ac. (ii) 53.4 lb./ac. (iii) None of the effects is signiffcant. (iv) Av. yield of grain in lb./ac.

<div align="center">

Control = 246 lb./ac.

</div>

	N_1	N_2	Mean
P_0	232	249	240
P_1	230	275	252
Mean	231	262	246

S.E. of any marginal mean   = 15.4 lb./ac.
S.E. of body of table or control mean   = 21.8 lb./ac.

Crop :- Gram *(Rabi).*   **Ref :- M.P. 59(140).**

Site :- Govt. Agri. Res. Farm, Kuthulia (Rewa).   **Type :- 'M'.**

Object :—To find out the suitable doses of N and P for Gram.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 4.11.1959. (a) 3 ploughings. (b) Line sowing. (c) 60 lb./ac. (d) Row to row 9". (e) N.A. (v) 20 lb./ac. of P_2O_5. (vi) T—81. (vii) Unirrigated. (viii) Nil. (ix) 1.9". (x) 18.3.1960.

2. **TREATMENTS :**

   Same as in expt. no. 59(98) on page 414.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 36.3'×15'. (b) 33.5'×13'. (v) 1.4'×1'. (vi) Yes.

4. **GENERAL :**

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

5. **RESULTS :**

   (i) 778 lb./ac. (ii) 156.8 lb./ac. (iii) Only the main effect of P is highly significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	619	785	662	689
P_1	814	933	858	868
Mean	716	859	760	778

   S.E. of N marginal mean   = 45.3 lb./ac.
   S.E. of P marginal mean   = 37.0 lb./ac.
   S.E. of body of table   = 64.0 lb./ac.

Crop :- Gram *(Rabi).*   **Ref :- M.P. 59(68).**

Site :- Govt. Seed and Demons. Farm, Nabibagh (Bhopal).   **Type :- 'M'.**

Object :—To find out the optimum levels of N and P for Gram.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 25.11.1959. (iv) (a) 2 *bakherings*. (b) Drilled by *desi* plough. (c) 60 lb./ac. (d) Row to row 12". (e) N.A. (v) Nil. (vi) NP—58 (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 4.4.1960.

2. **TREATMENTS :**

   All combinations of (1) and (2)
   > (1) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=7\frac{1}{2}$ and $P_2=15$ lb./ac.
   > (2) 2 levels of N as A/S : $N_0=0$ and $N_1=10$ lb./ac.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 15'×36¼'. (b) 13'×33½'. (v) 1'×1⅜'. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—contd. (b) Yes. (c) Nil. (v) (a) Vidish. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 647 lb /ac. (ii) 112.4 lb./ac. (iii) Interaction N×P alone is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	566	690	655	637
N_1	716	583	673	657
Mean	641	636	664	647

S.E. of N marginal mean   = 26.5 lb./ac
S.E. of P marginal mean   = 32.4 lb./ac.
S.E. of body of table   = 45.9. lb./ac.

Crop :- Gram *(Rabi).*   **Ref :- M.P. 59(147).**

Site :- State Mechanised Farm, Reora (Satna).   **Type :- 'M'.**

Object :—To find out suitable doses of N and P for Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 25.10.1959. (iv) (a) 3 harrowings. (b) Drilling. (c) 70 lb./ac. (d) Row to row 12". (e) N.A. (v) Nil. (vi) T—87., (vii) Unirrigated. (ix) 13.4": (x) 18.3.1960.

2. TREATMENTS :

Same as in expt. no. 59 (100) on page 414.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 45'×12'. (b) 40'×8'. (v) 2.5'×2.0'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 964 lb./ac. (ii) 252.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 834 lb./ac.

	P_0	P_1	Mean
N_1	1015	1163	1089
N_2	788	1021	904
Mean	902	1092	997

S.E. of N or P marginal mean   = 72.9 lb./ac.
S.E. of body of table   = 103.1 lb./ac.

Crop :- Gram *(Rabi).*   **Ref :- M.P. 59(42).**

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

Object :—To study the effect of different manurial doses on Gram.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Gram. (c) Nil. (iii) (a) Heavy clay. (b) N.A. (iii) 26.11.1959. (iv) (a) *Iclicí'ig.* l) Line sowing. (c) 60 lb./ac. (d) N.A. (e) Nil. (v) Nil. (vi) U—24. (vii) Unirrigated. (viii) Nil. (ix) 4.48". (x) 21.3.1960.

2. **TREATMENTS:**

Same as in expt. no. 59 (68) on page 419.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 36'×15'. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. **GENERAL :**

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

5. **RESULTS :**

(i) 1272 lb./ac. (ii) 215.6. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	1264	1213	1322	1266
N_1	1301	1242	1292	1278
Mean	1282	1227	1307	1272

S.E. of N marginal mean	= 50.8 lb./ac.
S.E. of P marginal mean	= 62.2 lb./ac.
S.E. of body of table	= 88.0 lb./ac.

————

Crop :- Gram.

Centre :- Indore (c.f.).

Ref :- M.P. 57(SFT).

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) Medium black soil. (iii) Nil. (iv) and (v) N.A. (vi) October 1957. (vii) to (ix) Nil. (x) March 1958.

2. **TREATMENTS :**

0 = Control (no manure).

p_1 = 30 lb./ac. of P_2O_5 as Super.

p_2 = 60 lb./ac. of P_2O_5 as Super.

p_1' = 30 lb./ac. of P_2O_5 as Dicalcium phosphate.

p_2' = 60 lb./ac. of P_2O_5 as Dicalcium phosphate.

3. **DESIGN :**

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

4. **GENERAL :**

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

5. RESULTS :

Treatment	0	p₁	p₂	p₁′	p₂′
Av. yield	247	354	403	428	403

G.M. = 367 lb./ac. S.E. = 46.0 lb./ac. and no. of trials = 7.

Crop :- Gram.   **Ref :- M.P. 56(14).**

Site :- Agri. College Farm, Gwalior.   **Type :- 'MV'.**

Object :—To study the effect of different levels of P on different varieties of Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar+Guar*. (c) Nil. (ii) (a) Light sandy loam. (b) N.A. (iii) 30.10.1956. (iv) (a) Deep ploughing and followed by discing. (b) Drilling. (c) 30 srs./ac. (d) Rows 18″ apart. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 8.38″. (x) 3.4.1957.

2. TREATMENTS :

All combinations of (1) and (2)
  (1) 3 varieties : V₁=Type 87 (late), V₂=Type I (medium) and T₃=U—21 (early).
  (2) 3 levels of P₂O₅ : P₀=0, P₁=20 and P₂=30 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 41′×18′. (b) 37′×14′. (v) 2′×2′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Plant height, population, no. of pods/plant and grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1648 lb./ac. (ii) 178.4 lb./ac. (iii) P effect is significant. Interaction P×V is highly significant while V effect is not significant. (iv) Av. yield of grain in lb./ac.

	V₁	V₂	V₃	Mean
P₀	1610	1654	1380	1548
P₁	1648	1978	1664	1763
P₂	1603	1598	1700	1634
Mean	1620	1743	1581	1648

S.E. of any marginal mean = 51.5 lb./ac.
S.E. of body of table = 89.2 lb./ac.

Crop :- Gram.   **Ref :- M.P. 57(15).**

Site :- Agri. College Farm, Gwalior.   **Type :- 'C'.**

Object :—To find out suitable spacing and seed rate for Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) No. (ii) (a) Sandy loam. (b) N.A. (iii) 2 to 4.10.1957. (iv) (a) 2 ploughings and 2 discings. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) T—87 (late). (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 9.3.1958.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 row spacings : $S_1=12''$, $S_2=18''$ and $S_3=24''$.
(2) 4 seed rates : $R_1=25$, $R_2=30$, $R_3=40$ and $R_4=45$ lb./ac.

3. DESIGN :

(i) Fact. in R.B.D.   (ii) (a) 12.   (b) N.A.   (iii) 4.   (iv) (a) 41'×18'.   (b) 37'×14'.   (v) 2'×2'.   (vi) Yes.

4. GENERAL :

(i) Poor.   (ii) Nil.   (iii) Total dry produce and grain yield.   (iv) (a) 1956—1958.   (b) Yes.   (c) Nil.   (v) (a) and (b) N.A.   (vi) Crop suffered due to lack of rains.   (vii) Nil.

5. RESULTS :

(i) 479 lb./ad.   (ii) 63.1 lb./ac.   (iii) S effect is highly significant, R effect is significant while interaction is not significant.   (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_1	407	482	473	464	457
S_2	476	582	526	561	536
S_3	405	417	539	412	443
Mean	429	494	513	479	479

S.E. of R marginal mean   = 18.2 lb./ac.
S.E. of S marginal mean   = 15.8 lb./ac.
S.E. of body of table   = 31.5 lb./ac.

———

Crop :- Gram *(Rabi).*

Site :- Govt. Agri. Res. Stn., Jhabua.

Ref :- M.P. 58(28).

Type :- 'C'.

Object :—To find out suitable seed rate and spacing for Gram.

1. BASAL CONDITIONS :

(i) to (v) N.A.   (vi) Ujjain—21.   (vii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 row spacings : $S_1=12''$, $S_2=15''$ and $S_3=18''$.
(2) 4 seed rates : $R_1=20$, $R_2=25$, $R_3=30$ and $R_4=35$ srs/ac.

3. DESIGN :

(i) Fact. in R.B.D.   (ii) (a) 12.   (b) N.A.   (iii) 2.   (iv) (a) N.A.   (b) 40'×18'.   (v) N.A.   (vi) Yes.

4. GENERAL :

(i) and (ii) N.A.   (iii) Grain yield.   (iv) (a) 1958—1959.   (b) No.   (c) Nil.   (v) to (vii) N.A.

5. RESULTS :

(i) 861 lb./ac.   (ii) 231.0 lb./ac.   (iii) None of the effects is significant.   (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_1	847	628	908	1119	875
S_2	817	666	696	968	787
S_3	877	817	1028	968	923
Mean	847	704	877	1018	861

		=	81.7 lb./ac.
S.E. of S marginal mean		=	81.7 lb./ac.
S.E. of R marginal mean		=	94.3 lb./ac.
S.E. of body of table		=	163.3 lb./ac.

———

Crop :- Gram *(Rabi).*   **Ref :- M.P. 59(24).**

Site :- Govt. Agri. Res. Stn., Jhabua.   **Type :- 'C'.**

Object :—To find out suitable seed rate and spacing for Gram.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 58(28) on page 423.

5. RESULTS :

(i) 603 lb./ac.   (ii) 117.2 lb./ac.   (iii) None of the effects is significant.   (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_1	556	756	609	757	669
S_2	526	586	635	480	557
S_3	614	643	677	393	582
Mean	565	662	640	543	603

S.E. of S marginal mean	=	41.4 lb./ac.
S.E. of R marginal mean	=	47.8 lb./ac.
S.E. of body of table	=	82.9 lb./ac.

— — —

Crop :- Gram *(Rabi).*   **Ref :- M.P. 59(22).**

Site :- Govt. Agri. Res. Stn., Jhabua.   **Type :- 'C'.**

Object :—To find out suitable ploughings and harrowings for Gram crop.

1. BASAL CONDITIONS :

(i) (a) to (iii) N A.   (iv) (a) As per treatments.   (b) to (e) N.A.   (v) N.A.   (vi) Ujjain—21.   (vii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

     (1) 4 ploughings : P_0=Control (no ploughing), P_1=One shallow ploughing P_2=One medium ploughing and P_3=One deep ploughing.

     (2) 2 harrow treatments : H_0=No harrowing and H_1=2 harrowings.

3. DESIGN :

(i) Fact. in R.B.D.   (ii) (a) 8.   (b) N.A.   (iii) 2.   (iv) (a) N.A.   (b) 30'×18'   (v) N.A.   (vi) Yes.

4. GENERAL :

(i) and (ii) N A.   (iii) Grain yield.   (iv) (a) 1959—N.A.   (b) No.   (c) Nil.   (v) to (vii) N.A.

5. RESULTS :

(i) 398 lb /ac.   (ii) 109.2 lb./ac.   (iii) None of the effects is significant.   (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	Mean
H_0	323	413	368	620	431
H_1	363	363	413	323	365
Mean	343	388	390	472	398

S.E. of H marginal mean = 54.6 lb./ac.
S.E. of P marginal mean = 38.6 lb./ac.
S.E. of body of table = 77.2 lb./ac.

———

Crop :- Gram *(Rabi).* **Ref :- M.P. 58(85).**

Site :- Reg. Res. Stn., Khargone. **Type :- 'C'.**

Object :—To find out the most suitable seed rate and spacing for Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Linseed. (c) Nil. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 5, 6.10.1958. (iv) (a) *Bakhering*. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Gram—T_1. (vii) Unirrigated. (viii) N.A. (ix) 3.41". (x) 19 to 24.1.1959.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 4 seed rates : R_1=25, R_2=30, R_3=35 and R_4=40 srs./ac.
(2) 3 row spacings : S_1=12", S_2=15" and S_3=18".

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 44'×15'. (b) 40'×15'. (v) 2' lenght wise. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Grain yield. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) (a) Gwalior and Jhabua. (b) N.A. (vi) N.A. (vii) Nil.

5. RESULTS :

(i) 264 lb./ac. (ii) 85.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac

	R_1	R_2	R_3	R_4	Mean
S_1	277	249	281	281	272
S_2	194	238	293	315	260
S_3	244	214	317	267	260
Mean	238	234	297	288	264

S.E. of R marginal mean = 24.7 lb./ac.
S.E. of S marginal mean = 21.4 lb./ac.
S.E. of body of table = 42.8 lb./ac.

———

Crop :- Gram *(Rabi).* **Ref :- M.P. 59(86).**

Site :- Reg. Res. Stn., Khargone. **Type :- 'C'.**

Object :—To find out the most suitable seedrate and spacing for Gram.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Linseed. (c) Nil. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 16.10.1959. (iv) (a) 4 harrowings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Gram—T_1. (vii) Unirrigated. (viii) 1 hand weeding. (ix) 0.83″. (v) 5.2.1960.

2. **TREATMENTS :**

   Same as in expt. no. 58(85) on page 425.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 46′×15′. (b) 40′×15′. (v) 3′ length wise. (vi) Yes.

4. **GENERAL :**

   (i) Poor. (ii) Light attack of pod borer. (iii) Germination stand, height, no. of branches, weight of 1000 grains and grain yield. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) (a) Gwalior and Jhabua. (b) N.A. (vi) N.A. (vii) Nil.

5. **RESULTS :**

   (i) 436 lb./ac. (ii) 74.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_1	455	478	389	476	450
S_2	413	430	393	426	416
S_3	426	475	446	431	444
Mean	431	461	409	444	436

   S.E. of R marginal mean   = 21.4 lb./ac.
   S.E. of S marginal mean   = 18.5 lb./ac.
   S.E. of body of table   = 37.0 lb./ac.

Crop :- Gram *(Rabi).*   **Ref :- M.P. 54(62).**

Site :- Govt. Seed and Demons. Farm, Nabibagh (Bhopal).   **Type :- 'C'.**

Object :—To determine the optimum seed rate for gram under unirrigated conditions.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 10.11.1954. (iv) (a) Harrowing by disc in May followed by 3 *bakherings* in the rainy season and more disc harrow in October. (b) Drilled. (c) N.A. (d) Row to row 12″. (e) Nil. (v) Nil. (vi) *Desi.* (vii) Unirrigated. (viii) and (ix) N.A. (x) 23.3.1955.

2. **TREATMENTS :**

   4 seed rates : R_1=20, R_2=25, R_3=30 and R_4=35 srs./ac.

3. **DESIGN :**

   (i) L.Sq. (ii) (a) 4. (b) N.A. (iii) 4. (vi) (a) 33′×33′. (b) 27′×27′. (v) 3′×3′. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) N.A. (iii) Av. height and yield of grain. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) (a) Phanda and Vidisha (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 474 lb./ac. (ii) 51.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3	R_4
Av. yield	460	513	470	453

   S.E./mean   = 25.8 lb./ac.

Crop :- Gram.

Site :- Govt. Seed and Demons. Farm, Nabibagh (Bhopal).

Ref :- M.P. 55(49).

Type :- 'C'.

Object :—To find out suitable seed rate for Gram under unirrigated conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sannhemp.* (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 22.11.1955. (iv) (a One bakhering in May and June ; 2 *bakherings* in October and November. (b) Drilled. (c) As per treatments. (d) 12″ between rows. (e) Nil. (v) G.M. by *Sannhemp* burried in October. (vi) NP—58 (medium). (vii) Unirrigated. (viii) N.A. (ix) 11.52″. (x) March, 1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54 (62) on page 426 except that in 1955 the no. of replications is 3.

5. RESULTS :

(i) 754 lb./ac. (ii) 78.3 lb./ac. (iii) Treatments are not significantly different. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3	R_4
Av. yield	750	737	772	755

S.E./mean = 45.2 lb./ac.

———

Crop :- Gram *(Rabi).*

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal).

Ref :- M.P. 56(52).

Type :- 'C'.

Object :—To find out economical seed rate for Gram under unirrigated conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 17.11.1956. (iv) (a) 6 harrowings. (b) Drilling. (c) As per treatments. (d) Rows 12″ apart. (e) Nil. (v) Nil. (vi) N.P.—58″ (medium.) (vii) Unirrigated. (viii) N.A. (ix) 7.18″. (x) 29.3.1957.

2. TREATMENTS :

All combinations of (1) and (2)
   (1) 4 seed rates : $R_1=15$, $R_2=20$, $R_3=25$ and $R_4=30$ srs/ac.
   (2) 2 types of seeds : S_0=Unsoaked (dry) seed and S_1=Soaked in water before sowing for 3 hours.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 24′×30′. (b) 20′×24′. (v) 2′×3′. (vi) Yes.

4. GENERAL :

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

5. RESULTS : .

(i) 542 lb./ac. (ii) 65.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_0	537	525	580	478	530
S_1	572	496	610	543	555
Mean	554	510	595	511	542

S.E. of R marginal mean = 23.3 lb./ac.
S.E. of S marginal mean = 16.4 lb./ac.
S.E. of body of table = 32.9 lb./ac.

Crop :- Gram *(Rabi).* **Ref :- M.P. 56(53).**

Site :- Govt. Seed and Demons. Farm, Nabi-bagh (Bhopal). **Type :- 'C'.**

Object :—To find out suitable seed rate for Gram under irrigated conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Two tractor loads/ac. of city compost. (ii) (a) Black cotton soil. (b) N.A. (iii) 14.11.1956. (iv) (a) Harrowings in Oct. and Nov. 1956. (b) Drilling. (c) As per treatments. (d) Row to row 12". (e) N.A. (v) N.A. (vi) NP—58 (medium). (vii) Irrigated. (viii) N.A. (ix) 7.18". (x) 28.3.1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56(52) on page 427.

5. RESULTS : '

(i) 1626 lb./ac. (ii) 130.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_0	1593	1639	1747	1651	1657
S_1	1461	1619	1607	1695	1595
Mean	1527	1629	1677	1673	1626

S.E. of R marginal mean = 46.1 lb /ac.
S.E. of S marginal mean = 32.6 lb./ae.
S.E. of body of the table = 65.2 lb./ac.

Crop :- Gram *(Rabi).* **Ref :- M.P. 54(74).**

Site :- Govt. Soil Cons. Res. Stn., Phanda. **Type :- 'C'.**

Object:—To find out suitable seed rate for Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sannhemp.* (c) Nil. (ii) (a) Black cotton soil *(morand—2).* (b) N.A. (iii) 31.10.1954. (iv) (a) One *bakhering* in May, July, Sept. and Oct. (b) *Pora* system. (c) As per treatments. (d) and (e) N.A. (v) G.M. by *sannhemp.* (vi) *Desi* (vii) Unirrigated. (viii) and (ix) N.A. (x) 6.3.1955.

2. TREATMENTS :

3 seed rates : R_1=16, R_2=32 and R_3=64 srs./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 78'×37'. (iii) 4. (iv) (a) 37'×26'. (b) 33'×22'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Wilt disease—dusting with 5% B.H.C. (iii) Plant height and yield of grain. (iv) (a) 1954—1955. (b) N.A. (c) Nil. (v) (a) Nabibagh and Vidisha. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 597 lb./ac. (ii) 33.1 lb./ac. (iii) Treatments are not significantly different. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3
Av. yield	609	601	582

S.E./mean = 16.5 lb./ac.

Crop :- Gram *(Rabi).*   **Ref :- M.P. 55(81).**

Site :- Govt. Soil Cons. Res. Stn., Phanda.   **Type :- 'C'.**

Object : —To find out optimum seed rate for Gram.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 11.11.1955. (iv) (a) N A. (b) Dibbling. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) T. 87. (vii) Unirrigated. (viii) Nil. (ix) 0.70″. (x) 17.3.1956.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(74) on page 428.

4. GENERAL :

(i) Germination satisfactory. Growth normal. (ii) N.A. (iii) Plant height and grain yield. (iv) (a) 1954—1958. (b) N.A. (c) Nil. (v) (a) Nabi-bagh and Vidisha. (vi) and (vii) Nil.

5. RESULTS :

(i) 598 lb./ac. (ii) 48.4 lb./ac. (iii) Treatments are not significantly different. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3
Av. yield	563	633	598

S.E./mean = 24.2 lb./ac.

Crop :- Gram *(Rabi).*   **Ref :- M.P. 54(77).**

Site :- Govt. Soil Cons. Res. Stn., Phanda.   **Type :- 'C'.**

Object : — To find out optimum spacing for Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sannhemp.* (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 8, 9.11.1954. (iv) (a) 5 bakherings. (b) Dibbled. (c) N.A. (d) As per treatments. (e) N.A. (v) G.M. by *sannhemp.* (vi) *Desi.* (vii) Unirrigated. (viii) and (ix) N A. (x) 19.3.1955.

2. TREATMENTS :

3 spacings : $S_1 = 3″ \times 9″$, $S_2 = 4\frac{1}{2}″ \times 1\frac{1}{2}′$. and $S_3 = 6″ \times 1\frac{1}{2}′$.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) $24' \times 45'$. (iii) 4. (iv) (a) $24' \times 15'$. (b) $20' \times 11'$. (v) $2' \times 2'$. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Mild attack of wilt—dusting of 5% B.H.C. (iii) Plant height, no. of branches and yield of grain. (iv) (a) 1954—1955. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 614 lb./ac. (ii) 49.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_1	S_2	S_3
Av. yield	659	665	519

S.E./mean = 24.7 lb./ac.

Crop :- Gram *(Rabi).*   **Ref :- M.P. 55(80).**

Site :- Govt. Soil Cons. Res. Stn., Phanda.   **Type :- 'C'.**

Object :—To find out optimum spacing for Gram.

1. **BASAL CONDITION$_{\mathcal{S}}$:**

   (i) (a) to (c) N.A.   (ii) (a) Black cotton soil.   (b) N.A.   (iii) 22.11.1955.   (iv) (a) 4 *bakherings.*   (b) Dibbling.   (c) 32 srs./ac.   (d) As per treatments.   (e) N.A.   (v) N.A.   (vi) Local.   (vii) Unirrigated. (viii) N.A.   (ix) 0.70".   (x) 24.3.1956.

2. **TREATMENTS :**

   3 spacings : $S_1=3''\times9''$, $S_2=4\frac{1}{2}''\times18''$ and $S_3=6''\times18''$.

3. **DESIGN :**

   (i) R.B.D.   (ii) (a) 3.   (b) 49'×19'.   (iii) 4.   (iv) (a) 19'×15',   (b) 15'×11'.   (v) 2'×2'.   (vi) Yes.

4. **GENERAL :**

   (i) and (ii) N.A.   (iii) Plant height and grain yield.   (iv) (a) 1954—1955.   (b) N.A.   (c) Nil.   (v) to (vii) Nil.

5. **RESULTS :**

   (i) 367 lb./ac.   (ii) 115.1 lb./ac.   (iii) Treatments are not significantly different.   (iv) Av. yield of grain in lb./ac.

Treatment	S_1	S_2	S_3
Av. yield	407	407	288

   S.E./mean = 57.6 lb./ac.

Crop :- Gram *(Rabi).*   **Ref :- M.P. 56(20).**

Site :- Govt. Exptl. Farm, Vidisha.   **Type :- 'C'.**

Object :—To find out suitable seed rate for Gram.

1. **BASAL CONDITIONS :**

   (i) (a) Nil.   (b) Wheat.   (c) N.A.   (ii) (a) Heavy clay.   (b) N.A.   (iii) 13.11.1956.   (iv) (a) N.A.   (b) Drilling.   (c) As per treatments.   (d) Row to row 9".   (e) N.A.   (v) Nil.   (vi) Gram No. 24.   (vii) Unirrigated.   (viii) Hand weeding.   (ix) 4.89".   (x) 24.4.1957.

2. **TREATMENTS :**

   4 seed rates : $R_1=20$, $R_2=22$, $R_3=24$ and $R_4=26$ srs./ac.

3. **DESIGN :**

   (i) R.B.D.   (ii) (a) 4.   (b) N.A.   (iii) 4.   (iv) (a) and (b) 39'×16'.   (v) Nil.   (vi) Yes.

4. **GENERAL :**

   (i) Average.   (ii) Wilt and frost.   (iii) Plant height, no. of plants and yield of grain.   (iv) (a) No.   (b) and (c) —.   (v) to (vii) Nil.

5. **RESULTS**

   (i) 914 lb./ac.   (ii) 80.3 lb./ac.   (iii) Treatments are not significantly different.   (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3	R_4
Av. yield	851	912	947	947

   S.E./mean = 40.1 lb./ac.

Crop :- Gram *(Rabi).*   **Ref :- M.P. 57(3).**

Site :- R.A.K. Agri. Res. Instt., Sehore.   **Type :- 'CV'.**

Object :—To find suitable seed rate for different varieties of Gram.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 26.10.1957. (iv) (a) Ploughing by country plough and *bakhering*. (b) Drilling. (c) As per treatments. (d) Row to row 12″. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) and (ix) Nil. (x) 2.3.1958.

2. TREATMENTS:

All combinations of (1) and (2)
    (1) 4 seed rates: $R_1=15$, $R_2=20$, $R_3=25$ and $R_4=30$ srs./ac.
    (2) 3 varieties: $V_1=$T-87 (medium), $V_2=Guleti$ (early) and $V_3=Desi$ (medium).

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 37′×20.5′. (b) 33′×16.5′. (v) 2′×2′. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Height and no. of branches of 5 plants per plot. Yield of grain and *bhusa* per plot. (iv) (a) No. (b) and (c) —. (v) to (vii) Nil.

5. RESULTS:

(i) 262 lb./ac. (ii) 64.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
V_1	195	300	255	250	250
V_2	255	260	250	295	265
V_3	270	280	295	235	270
Mean	240	280	267	260	262

S.E. of R marginal mean   = 18.6 lb./ac.
S.E. of V marginal mean   = 16.2 lb./ac.
S.E. of body of table   = 32.3 lb./ac.

Crop :- Urid *(Kharif).*

Site :- Govt. Soil Cons. Res. Stn. Phanda.

Ref :- M.P. 57(62).

Type :- 'C'.

Object :—To find out optimum seed rate for Urid.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 1.7.1957. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 34.4″. (x) 5.10.1957.

2. TREATMENTS:

3 seed rates: $R_1=5, R_2=10$ and $R_3=20$ srs./ac.

3. DESIGN:

(i) R.B.D. (ii) 3. (b) 82′×37′. (iii) 4. (iv) 37′×26′. (b) 33′×22′. (v) 2′×2′. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Height, no. of shoots, no. of pods and yield of grain. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 80 lb./ac. (ii) 35.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3
Av. yield	80	62	99

S.E./mean = 18.0 lb./ac.

Crop :- Tur *(Kharif).*   **Ref :- M.P. 54(117).**

Site :- 'Instt. of plant Industry, Indore.   **Type :- 'M'.**

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

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Linseed. (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 1.7.1954. (iv) (a) *Bakhering.* (b) Drilling. (c) N.A. (d) 14" between rows. (e) N.A. (v) Nil. (vi) Type—5. (vii) Unirrigated. (viii) 1 interculturing and 3 hand weedings. (ix) 52.23". (x) 10 to 12.10.1954.

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 Farm compost : $F_0=$ Without compost and $F_1=$ With Farm compost.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 35'×14'. (b) 30'×9⅜'. (v) 2½'×2¼'. (vi) Yes.

4. **GENERAL :**

   (i) Satisfactory. (ii) Nil. (iii) Grain weight. (iv) (a) 1951—1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Heavy rains in September. (vii) Nil.

5. **RESULTS :**

   (i) 800 lb./ac. (ii) 182.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	Mean	F_0	F_1
N_0	778	893	835	825	846
N_1	716	812	764	703	825
Mean	747	852	800	764	835
F_0	697	831			
F_1	797	874			

S.E. of any marginal mean   = 45.5 lb./ac.
S,E. of body of any table   = 64.4 lb./ac.

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Crop :- Tur *(Kharif).*   **Ref :- M.P. 55(91).**

Site :- Instt. of plant Industry, Indore.   **Type :- 'M'.**

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

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) N.A. (iv) (a) *Bakhering.* (b) Drilling. (c) N.A. (d) 14" between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 42.05". (x) N.A.

2. **TREATMENTS :**

   Same as in expt. no. 54(117) above.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 45'×14'. (b) 40'×9¼'. (v) 2½'×2¼'. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1236 lb./ac. (ii) 231.8 lb./ac. (iii) Main effect of P is highly significant while interactions N×P and N×F are significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	Mean	F_0	F_1
N_0	1165	1328	1246	1127	1365
N_1	968	1483	1225	1309	1142
Mean	1066	1405	1236	1218	1253
F_0	969	1467			
F_1	1163	1343			

S.E. of any marginal mean = 82.0 lb./ac.
S.E. of body of any table = 58.0 lb./ac.

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Crop :- Teora *(Rabi).*   **Ref :- M.P. 54(76).**

Site :- Govt. Soil Cons. Res. Stn., Phanda.   **Type :- 'C'.**

Object :—To find the optimum seed rate for Teora.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Jowar.* (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.11.1954/N.A. (iv) (a) 5 *bakherings.* (b) Drilling. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) *Desi* (vii) Unirrigated. (viii) and (ix) N.A. (x) 25.2.1955.

2. TREATMENTS :

3 seed rates : $R_1 = 16$, $R_2 = 32$ and $R_3 = 64$ srs./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 78'×37'. (iii) 4. (iv) (a) 37'×26'. (b) 33'×22'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of aphids. Spraying of 1% D.D.T. (iii) Height and yield of grain. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 567 lb./ac. (ii) 28.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3
Av. yield	596	567	538

S.E /mean = 14.0 lb./ac.

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Crop :- Teora *(Rabi).*   **Ref :- M.P. 55(78).**

Site :- Govt. Soil Cons. Res. Stn., Phanda.   **Type :- 'C'.**

Object :—To find optimum seed rate for Teora.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 11.11.1955. (iv) (a) *Bakhering.* (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 0.70". (x) 1.3.1956.

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2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(76) on page 433.

4. GENERAL :

(i) and (ii) N.A. (iii) Av. height and yield of grain. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 590 lb./ac. (ii) 114.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3
Av. yield	609	571	591

S.E./mean = 57.1 lb./ac.

Crop :- Teora *(Rabi).* **Ref :- M.P. 54(72).**

Site :- Govt. Soil Cons. Res. Stn., Phanda. **Type :- 'C'.**

Object:—To find out optimum spacing for Teora.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sannhemp.* (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 10.11.1954/N.A. (iv) (a) *Bakhering* in May and June. G.M. with *Sannhemp* and again 3 *bakherings* in September and October. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 2 to 3. (v) G.M. *Sannhemp.* (vi) *Desi.* (vii) Unirrigated. (viii) Roguing. (ix) N.A. (x) 19.3.1955.

2. TREATMENTS :

3 spacings : $S_1 = 1\frac{1}{2}'' \times 4\frac{1}{2}''$, $S_2 = 3'' \times 9''$ and $S_3 = 6'' \times 18''$.

3. DESIGN :

(i) R B.D.. (ii) (a) 3. (b) 45'×24'. (iii) (4) (iv) (a) 15'×24'. (b) 11'×20'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of aphids—Spraying 1.5% D.D.T. and dusting with 5% B.H.C. (iii) Average height, average number of branches and yield of Gram. (iv) (a) 1954—1955. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RFSULTS :

(i) 538 lb./ac. (ii) 65.1 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_1	S_2	S_3
Av. yield	616	547	451

S.E./mean = 32.5 lb./ac.

Crop :- Teora *(Rabi).* **Ref :- M.P. 55(76).**

Site :- Govt. Soil Cons. Res. Stn., Phanda. **Type :- 'C'.**

Object :—To find out optimum spacing for Teora.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 23.11.1955/N.A. (v) (a) *Bakhering.* (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) and (vi) N.A. (viii) Unirrigated. (viii) N.A. (ix) 0.70″. (x) 8.3.1956.

2. TREATMENTS :

Same as in expt. no. 54(72) above.

3. DESIGN:

(i) R.B.D. (ii) (a) 3. (b) 49'×19'. (iii) 4. (iv) (a) 19'×15'. (b) 15'×11'. (v) 2'×2'. (vi) Yes.

4. GENERAL:

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

5. RESULTS:

(i) 170 lb./ac. (ii) 82.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_1	S_2	S_3
Av. yield	153	171	187

S.E./mean = 41.3 lb./ac.

Crop :- Lobia *(Kharif)*.　　　　　　　　　　　Ref :- M.P. 58(25).

Site :- Govt. Agri. Res. Stn., Jhabua.　　　　Type :- 'C'.

Object :—To find out optimum seed rate for Lobia to increase production under local condition.

1. BASAL CONDITIONS :

(i) to (x) N.A.

2. TREATMENTS :

4 seed rates : $R_1=6$, $R_2=8$, $R_3=10$ and $R_4=12$ srs./ac.

3. DESIGN :

(i) R.B D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 27'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 600 lb./ac. (ii) 132.7 lb./ac. (iii) Treatments are not significantly different. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3	R_4
Av. yield	639	717	571	471

S.E./mean = 66.3 lb./ac.

Crop :- Moong.　　　　　　　　　　　　　　Ref :- M.P. 57(12).

Site :- Central Res. Farm, Gwalior.　　　　　Type :- 'M'.

Object :—To find out suitable manurial schedule for Moong.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 28.7.1957. (iv) (a) 2 ploughings. (b) Drilling. (c) 4 srs./ac. (d) Row to row 18″. (e) N.A. (v) Nil. (vi) K—11. (vii) Unirrigated. (viii) 2 weedings. (ix) 57.7″. (x) 21.10.1957.

2. TREATMENTS :

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

(1) 3 levels of N : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
(2) 3 levels of P_2O_5 : $P_0=0$, $P_1=30$ and $P_2=60$ lb./ac.
(3) 3 levels of K_2O : $K_0=0$, $K_1=20$ and $K_2=40$ lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 17'×44'. (b) 14'×40'. (v) 1½'×2'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) and (c) —. (v) to (vii) Ni'.

5. RESULTS :

(i) 586 lb./ac. (ii) 119.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	560	613	568	580	605	584	552
N_1	528	622	649	600	682	534	583
N_2	557	536	641	578	538	570	626
Mean	548	590	619	586	608	563	587
K_0	583	604	638				
K_1	495	549	644				
K_2	567	617	576				

$$\text{S.E. of any marginal mean} = 28.2 \text{ lb./ac.}$$
$$\text{S.E. of body of any table} = 48.9 \text{ lb./ac.}$$

Crop :- **Moong** *(Kharif).*   Ref :- **M.P. 58(24).**

Site :- **Govt. Agri. Res. Stn., Jhabua.**   Type :- **'C'.**

Object :—To find out the optimum seed rate for Moong under local conditions.

1. BASAL CONDITIONS :

(i) to (v) N.A. (vi) Krishan—II. (vii) to (x) N.A.

2. TREATMENTS :

4 seed rates : $R_1=3$, $R_2=5$, $R_3=7$ and $R_4=9$ srs./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 27'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 487 lb./ac. (ii) 91.4 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3	R_4
Av. yield	336	493	549	571

$$\text{S.E./mean} = 45.7 \text{ lb./ac.}$$

Crop :- **Masoor** *(Rabi).*   Ref :- **M.P. 54(75).**

Site :- **Govt. Soil Cons. Res. Stn., Phanda.**   Type :- **'C'.**

Object :—To find out suitable seed rate for Masoor.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar.* (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.11.1954 . (iv) (a) 5 *bakherings.* (b) Drilling. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) *Desi.* (vii) Unirrigated. (viii) Roguing. (ix) N.A. (x) 17, 18.2.1955.

2. TREATMENTS :

   3 seed rates : R_1=20, R_2=40 and R_3=80 srs/ac.

3. DESIGN :

   (i) R.B.D. (ii) (a) 3. (b) 37'×78'. (iii) 4. (iv) (a) 37'×26'. (b) 33'×22'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

   (i) N.A. (ii) Mild attack of wilt disease. (iii) Plant height, no. of branches, yield of grain and straw. (iv) (a) 1954—1955. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

   (i) 605 lb./ac. (ii) 23.1 lb./ac. (iii) R effect is highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3
Av. yield	698	569	547

   S.E./mean = 11.5 lb./ac.

Crop :- Masoor *(Rabi).*   **Ref :- M.P. 55(79).**

Site :- Govt. Soil Cons. Res. Stn., Phanda.   **Type :- 'C'.**

Object :—To find out optimum seed rate for Masoor.

1. BASAL CONDITIONS :

   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 11.11.1955. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 0.70". (x) 27.2.1956.

2. TREATMENTS and 3. DESIGN :

   Same as in expt. no. 54(75) on page 436.

4. GENERAL :

   (i) and (ii) N.A. (iii) Plant height and grain yield. (iv) (a) 1954—1955. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

   (i) 549 lb./ac. (ii) 98.0 lb./ac. (iii) Treatments are not significantly different. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3
Av. yield	500	581	567

   S.E./mean = 49.0 lb./ac.

Crop :- Masoor *(Rabi).*   **Ref :- M.P. 54(73).**

Site :- Govt. Soil Cons. Res. Stn., Phanda.   **Type :- 'C'.**

Object :—To find out optimum spacing for Masoor.

1. BASAL CONDITIONS :

   (i) (a) N.A. (b) *Sannhemp.* (c) N.A. (ii) (a) Malwa black cotton soil. (b) N.A. (iii) 11, 12.11.1954. (iv) (a) *Bakhering* in May and July. G.M. with *Sannhemp* in Sept. 3 *bakherings* in Sept. and Oct. (b) Dibbling. (c) N.A. (d) As per treatments. (e) N.A. (v) G.M. with *sannhemp.* (vi) *Desi.* (vii) Unirrigated. (viii) Roging. (ix) N.A. (x) 19.3.1955.

2. TREATMENTS :

   3 spacings: S_1=4"×8", S_2=2"×4" and S_3=8"×16".

3. DESIGN :

   (i) R.B.D. (ii) (a) 3. (b) 24'×45'. (iii) 4. (iv) (a) 24'×15'. (b) 20'×11'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Mild attack of wilt disease. (iii) Plant height, no. of {branches and grain yield. (iv) (a) 1954—1955. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 290 lb./ac. (ii) 30.1 lb./ac. (iii) Treatments are highly significantly different. (iv) Av. yield of grain in lb./ac.

Treatment	S_1	S_2	S_3
Av. yield	318	342	210

S.E./mean = 15.1 lb./ac.

————

Crop :- Masoor *(Rabi)*.

Site :- Govt. Soil Cons. Res. Stn., Phanda.

Ref :- M.P. 55(77).

Type :- 'C'.

Object :—To find out optimum spacing for Masoor.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 22.11.1955. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 0.70". (x) 25.3.1956.

2. TREATMENTS :

3 spacings : $S_1=4''\times8''$, $S_2=2''\times4''$ and $S_3=8''\times16''$.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) $49'\times19'$. (iii) 4. (iv) (a) $19'\times15'$. (b) $15'\times11'$. (v) $2'\times2'$. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Plant height and grain yield. (iv) (a) 1954—1955. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 345 lb./ac. (ii) 63.5 lb./ac. (iii) Treatments are highly significantly different. (iv) Av. yield of grain in lb./ac.

Treatment	S_1	S_2	S_3
Av. yield	390	441	204

S.E./mean = 31.8 lb./ac.

————

Crop :- Arhar.

Site :- Centre Res. Farm, Gwalior.

Ref :- M.P. 54(27).

Type :- 'C'.

Object :—To find out suitable seed rate and spacing for Arhar.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 29.7.1954. (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) Gwalior—3. (vii) and (viii) N.A. (ix) 28.44". (x) N.A.

2. TREATMENTS :

Main-plot treatments :
   3 rows spacings : $S_1=18''$, $S_2=24''$ and $S_3=30''$.
Sub-plot treatments :
   3 seeds rates : $R_1=10$, $R_2=15$ and $R_3=20$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) $S_1=33'\times33'$, $S_2=33'\times34'$ and $S_3=33'\times35'$. (b) $30'\times30'$. (v) One row on both sides and $1\frac{1}{2}'$ at both ends. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain and straw. (iv) (a) 1952—1954. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 430 lb./ac. (ii) (a) 120.2 lb./ac. (b) 119.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean
S_1	354	458	418	410
S_2	384	492	511	462
S_3	477	448	326	417
Mean	405	466	418	430

S.E. of difference of two

1. S marginal means = 40.1 lb./ac.
2. R marginal means = 39.9 lb./ac.
3. R means at the same level of S = 69.1 lb./ac.
4. S means at the same level of R = 69.2 lb./ac.

Crop :- Gram, Teoda, Masoor and Peas (Rabi).   **Ref :- M.P. 54(36).**

Site :- Govt. Seed and Demons. Farm, Betul.   **Type :- 'X'.**

Object :—To study the effect of P on different legumes and its residual effect on the succeeding Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Morand II. (b) Refer soil analysis, Betul. (iii) 26.10.1954. (iv) (a) 4 bakherings. (b) to (e) N.A. (v) As per treatments. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 42.69". (x) 12.2.1955.

2. TREATMENTS :

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

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) 24'×45'. (b) 18'×39'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) to (ii) N.A. (iii) Yield of grain. (iv) (a) 1955—N.A. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Separate analysis was done for each crop and results presented accordingly. Residual, effects on wheat not studied.

5. RESULTS :

	Av. yield in lb./ac.			Mean	Significance	S.E./plot in lb./ac.	S.E./mean in lb./ac.
	P_0	P_1	P_2				
Gram	1637	1463	1339	1480	Not significant	212.7	94.9
Teoda	818	930	868	872	Not significant	221.3	99.2
Masoor	1600	1699	1736	1678	Not significant	158.7	68.2
Peas	1265	1004	1302	1190	Highly significant	121.5	51.5

Crop :- Masoor, Gram, Peas and Lakh.　　　　　　**Ref :- M.P. 54(37).**

Site :- Govt. Seed and Demons. Farm, Damoh.　　　**Type :- 'X'.**

Object :—To study the effect of P on different legumes and its residual effect on the succeeding Wheat crop.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) *Kabar*. (b) N.A. (iii) 17 and 18.11.1954. (iv) (a) 3 *bakherings*. (b) to (e) N.A. (v) Nil. (vi) Masoor and *lakh* local ; peas NP—29 and gram N.A. (vii) Unirrigated. (viii) Nil. (ix) 3.68". (x) 7 and 25.3.1960.

2. **TREATMENTS and 3. DESIGN :**

   Same as in expt. no. 54(36) on page 439.

4. **GENERAL :**

   (i) Nil. (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—contd. (b) 1954—1956.. (c) N.A. (v) (a) Betul. (b) N.A. (vi) Nil. (vii) Residual effect on wheat was not studied.

5. **RESULTS :**

	Av. yield in lb./ac.					S.E./plot in lb./ac.	S E./mean in lb./ac.
	P₀	P₁	P₂	Mean	Significance		
Gram	475	625	580	560	Not significant	127.0	56.8
Masoor	264	211	230	235	Not significant	72.1	32.3
Peas	237	192	192	207	Not significant	152.2	68.1
Lakh	198	174	264	212	Not significant	116.9	52.3

Crop :- Masoor, Peas, Gram and Lakh,　　　　**Ref :- M.P. 55(18),**

Site :- Govt. Seed and Demons. Farm, Damoh.　　**Type : 'M'.**

Object :—To study the effect of P on different legumes and its residual effect on the succeeding Wheat crop.

1. **BASAL CONDITIONS :**

   (i) Nil. (b) Wheat. (c) Nil. (i) *Kabar* I. (b) N.A. (iii) 30.11.1955. (iv) (a) 3 *bakhering*. (b) to (e) N.A. (v) Nil. (vi) *Masoor* and *Lakh* : local, Gram : V and Peas : NP—29. (vii) Unirrigated. (ix) 0.95". (x) 5 and 6.4.1956.

2. **TREATMENTS to 4. GENERAL :**

   Same as in expt. no. 54(37) above.

5. **RESULTS :**

	Av. yield in lb./ac.					S.E./plot in lb./ac.	S.E./mean in lb./ac.
	P₀	P₁	P₂	Mean	Significance		
Gram	374	426	472	424	Significant	49.4	22.1
Masoor	180	174	214	189	Not significant	49.9	22.3
Lakh	143	146	138	142	Not significant	29.4	13.2
Peas	143	172	166	160	Not significant	61.4	27.5

Crop :- Gram, Lakh, Masoor and Peas.   **Ref :- M.P. 56(30).**

Site :- Govt. Seed and Demons. Farm, Damoh.   **Type :- 'M'.**

Object :—To study the effect of P on different legumes and its residual effect on the succeeding Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) *Kabar* I. (b) N.A. (iii) 19 and 20.11.1956. (iv) (a) 3 *bakherings*. (b) N.A. (c) 60 lb./ac. (d) 12″ between rows. (e) N.A. (v) Nil. (vi) Gram – Ad 5 peas – NP 29, *masoor* and *lakh* local. (vii) Unirrigated. (viii) Nil. (ix) 2.65″. (x) 22.3.1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(37) on page 440.

5. RESULTS :

	Av. yield in lb./ac.			Mean	Significance	S.E./plot in lb./ac.	S.E./mean in lb./ac.
	P_0	P_1	P_2				
Gram	845	1260	1306	1137	Highly significant	146 0	65.3
Masoor	255	256	285	265	Not significant	71.2	31.8
Peas	358	576	796	577	Highly significant	114.4	51.2
Lakh	405	363	431	400	Not significant	50.7	22.7

———

Crop :- Pulses.   **Ref :- M.P. 54(44).**

Site :- Govt. Agri. Res. Stn. Adhartal (Jabalpur).   **Type :- 'M'.**

Object :—To study the effect of P on different pulse crops and to see its residual effect on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) *Kabar* 2. (b) N.A. (iii) 19, 20.10.1954. (iv) (a) *Bakhering*. (b) Drilling. (c) 50 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Peas—K, Gram—Ad 5, *teora* and *masoor* local (vii) Unirrigated. (viii) Weeding. (ix) 4.59″. (x) Peas 18.2.1955. and other crops 15, 16, 17.3.1955.

2. TREATMENTS :

3 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac. applied to each of the following crops (a) Gram. (b) Teora. (c) *Masoor*. and (d) Peas.

3. DESIGN :

(i) R.B.D. (ii) (a) 12(3 for each crop). (b) N.A. (iii) 5. (iv) (a) 45′×24′. (b) 39′×18′. (v) 3′×3′. (vi) Yes

4. GENERAL :

(i) Fair. (ii) *Teora* attacked by mites and therefore dusted with Guesol 550. (iii) Yield of grains. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) Damoh. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

Crop : Gram

(i) 483 lb./ac. (ii) 65.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2
Av. yield	508	430	510

S.E./mean = 29.3 lb./ac.

Crop : Teora

(i) 739 lb./ac.   (ii) 169.4 lb./ac.   (iii) Treatment differences are not significant.   (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2
Av. yield	755	712	751

S.E./mean = 75.7 lb./ac.

Crop : Masoor

(i) 441 lb./ac.   (ii) 96.2 lb./ac.   (iii) Treatment differences are not significant.   (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2
Av. yield	407	448	467

S.E./mean = 43.1 lb./ac.

Crop : Peas

(i) 584 lb./ac.   (ii) 65.2 lb./ac.   (iii) Treatment differences are not significant.   (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2
Av. yield	540	592	620

S.E./mean = 29.3 lb./ac.

Crop :- Pulses.   **Ref :- MP 55(41).**

Site :- Govt. Agri. Res. Stn. Adhartal (Jabalpur).   **Type :- 'M'.**

Object :—To study the effect of P on different pulse crops and to see its residual effect on Wheat.

1. BASAL CONDITONS :

(i) (a) to (c) N.A.   (ii) (a) *Kabar* II.   (b) N.A.   (iii) 1.11.1955.   (iv) (a) N.A.   (b) Drilling.   (c) 50 lb./ac. (d) and (e) N.A.   (v) Nil.   (vi) N.A.   (vii) Unirrigated.   (viii) and (ix) N.A.   (x) Peas 21.2.1956, *masoor* and Gram : 31.3.1956, *Teora* : N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(44) on page 441.

4. GENERAL :

(i) Good.   (ii) Nil.   (iii) Yield of grains.   (iv) (a) 1954—1956.   (b) No.   (c) Nil.   (v) (a) Damoh.   (b) (b) Nil.   (vi) and (vii) Nil.

5. RESULTS :

Crop : Gram

(i) 241 lb./ac.   (ii) 46.9 lb./ac.   (iii) Treatment differences are not significant.   (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2
Av. yield	250	209	263

S.E./mean = 21.0 lb./ac.

Crop : Teora

(i) 888 lb./ac.   (ii) 230.1 lb./ac.   (iii) Treatment differences are not sigianificant.   (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2
Av. yield	887	735	1041

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

Crop : Masoor

(i) 325 lb./ac.   (ii) 93.5 lb./ac.   (iii) Treatment differences are not significant.   (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2
Av. yield	333	296	345

S.E./mean = 41.8 lb./ac.

Crop : Peas

(i) 446 lb./ac.   (ii) 51.8 lb./ac.   (iii) Treatment differences are not significant.   (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2
Av. yield	373	463	502

S.E./mean = 23.2 lb./ac.

Crop :- Pulses.   **Ref :- M.P. 56(45).**

Site :- Govt. Agri. Res. Stn., Adhartal (Jabalpur).   **Type :- 'M'.**

Object :—To study the effect of P on different pulse crops and to see its residual effect on Wheat.

1. **BASAL CONDITIONS :**

(i) (a) Wheat—Pulses. (b) Wheat. (c) N.A. (ii) (a) Kabar—2. (b) N.A. (iii) 26.10.1956. (iv) (a) Harrowing. (b) Drilling. (c) 60 lb./ac. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 22.2.1957 to 9.4.1957.

2. **TREATMENTS :**

3 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac. applied to each of the following crop (a) Gram, (b) Teora, (c) Masoor and (d) Peas.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 12 (3 for each crop). (b) N.A. (iii) 5. (iv) (a) 45'×24'. (b) 39'×18'. (v) 3'×3'. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—1956. (b) Yes. (c) Nil. (v) (a) Damoh. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS :**

Crop : Gram

(i) 699 lb./ac.   (ii) 145.2 lb./ac.   (iii) Treatment differences are not significant.   (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2
Av. yield	697	775	625

S.E./mean = 64.9 lb./ac.

Crop : Teora

(i) 889 lb./ac.   (ii) 163.1 lb./ac.   (iii) Treatment differences are significant.   (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2
Av. yield	1054	883	730

S.E./mean = 72.9 lb./ac.

Crop : Masoor

(i) 331 lb./ac.   (ii) 119.3 lb./ac.   (iii) Treatment differences are not significant.   (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2
Av. yield	305	334	355

S.E./mean = 53.3 lb./ac.

Crop : Peas

(i) 346 lb./ac. (ii) 165.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2
Av. yield	301	409	329

S.E./mean = 74.2 lb./ac.

Crop :- Pulses *(Rabi).*   **Ref :- M.P. 56(86).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'M'.**

Object :—To study the effect of P on different pulse crops and to see its residual effect on Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) *Morand.* (b) Refer soil analysis, Chhindwara. (iii) 16.11.1956. (iv) (a) *Bakhering* and ploughing. (b) N.A. (c) Gram, *masoor* and *lakh* : 60 lb./ac ; *peas* : 80 lb./ac. (d) 10" between rows. (e) N A. (v) Nil. (vi) Local. (vii) and (viii) N.A. (ix) 2.50". (x) 8.3.1957.

2. **TREATMENTS :**

   3 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac. applied to each of the following crops :
   (a) Gram, (b) *Masoor*, (c) *Peas* and (d) *Lakh.*

3. **DESIGN :**

   (i) R.B D. (ii) (a) 12 (3 for each crop). (b) N.A. (iii) 4. (iv) (a) 21'×52'. (b) 15'×46'. (v) 3'×3'. (vi) Yes.

4. **GENERAL :**

   (i *Masoor, lakh* and *peas* dried up prematured due to cold wave. (ii) Aphids were noticed on peas and *lakh* plots. (iii) Yield of grain. (iv) (a) 1956 only. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) *Masoor* and *lakh* crops failed completely.

5. **RESULTS :**

Crop : Gram

(i) 2020 lb./ac. (ii) 195.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2
Av. yield	1844	2006	2211

S.E./mean = 97.7 lb./ac.

Crop : Peas

(i) 789 lb./ac. (ii) 109.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	P_0	P_1	P_2
Av. yield	677	873	817

S.E./mean = 54.8 lb./ac.

Crop :- Sugarcane.

Site :- R.A.K. Agri. Res. Instt., Sehore.

Object :—To study the effect of different doses and times of application of K on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 1.2.1956. (iv) (a) 1 tractor ploughing, 2 harrowings and ridging by bullock drawn ridger. (b) Planted between ridges rows. (c) 40,000 eye buds/ac. (d) 3' between rows. (e) N.A. (v) 1000 lb./ac. of compost+75 lb./ac. of P_2O_5. (vi) CO—421 (medium-late). (vii) Irrigated. (viii) 2 weedings, 1 interculturing and 2 earthings. (ix) 70". (x) February, 1957.

2. TREATMENTS :

All combinations of (1) and (2)
    (1) 3 levels of K_2O : $K_0=0$, $K_1=50$ and $K_2=100$ lb /ac.
    (2) 2 times of application : T_1=At sowing and T_2=3 months after sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 18'×29'. (b) 12'×26' (v) 3'×1½'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Pyrilla and borers—spraying of Endrine and manual removal of borers. (iii) Height, number of internodes, girth and yield of cane. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 37.18 tons/ac. (ii) 5.67 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of suagrcane in tons/ac.

	K_0	K_1	K_2	Mean
T_1	—	34.85	32.47	33.66
T_2	—	38.84	40.22	39.53
Mean	38.34	36.85	36 35	37.18

S.E. of K marginal mean   = 2.00 tons/ac.
S.E. of T marginal mean   = 1.64 tons/ac.
S.E. of body of table   = 2.84 tons/ac.

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Crop :- Sugarcane.

Site :- R.A.K. Agri. Res. Instt., Sehore.

Object :—To study the effect of different sources and levels of N on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 7,9.2.1956. (iv) (a) Ploughing and harrowing by tractor. (b) Planted between ridges. (c) 40,000 eye buds/ac. (d) 3' between rows. (e) N.A. (v) 75 lb./ac. of P_2O_5 as Super. (vi) CO—421 (medium-late). (vii) Irrigated. (viii) 2 weedings and 1 interculturing. (ix) 70". (x) 10/12.3.1957.

2. TREATMENTS :

Strips in one direction : 7 sources of N : S_1=Compost, S_2=G.N.C., S_3=Compost+A/S in 1 : 1 ratio,
        S_4=G.N.C.+A/S in 1 : 1 ratio, S_5=A/S, S_6=A/N and S_7=Urea.
Strips in orthogonal direction : 4 levels of N : N_1=100, N_2=200, N_3=300 and N_4=400 lb./ac.

3. DESIGN :

(i) Strip-plot. (ii) (a) 28. (b) N A. (iii) 3. (iv) (a) 24'×21'. (b) 18'×19'. (v) 3'×1'. (vi) Yes.

4. GENERAL :

(i' Good. (ii) Attack by pyrilla spray of Endrine with 12 oz./100 gallons. (iii) Height, no. of G.L , no. of internodes and yield of sugarcane. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 33 88 tons/ac. (ii) S.E. (S) = 10.62 tons/ac. ; S.E. (N) = 6.06 tons/ac and S.E. (SN) = 4.72 tons/ac. (iii) Only the interaction S × N is significant. (iv) Av. yield of sugarcane in tons/ac.

	S_1	S_2	S_3	S_4	S_5	S_6	S_7	Mean
N_1	31.74	39.81	34.51	33.94	39.08	34.40	31.72	35.03
N_2	30.50	31.72	32.29	26.93	39.81	38.21	34 00	33.35
N_3	29.35	33.35	34.26	33.05	33.31	37.67	36.36	33.91
N_4	31.67	37.38	33.67	38.08	24.99	34.59	32.12	33.21
Mean	30.81	35.57	33.68	33.00	34.30	36.22	33.55	33.88

S.E. of difference of two

1. S marginal means = 4.34 tons/ac.
2. N marginal means = 1.87 tons/ac.
3. N means at the same level of S = 4.03 tons/ac.
4. S means at the same level of N = 5.47 tons/ac.

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Crop :- Sugarcane.   Ref :- M.P. 56(31).

Site :- R.A.K. Agri. Res. Instt., Sehore.   Type :- 'M'.

Object :—To study the effect of different doses of P obtained from different sources.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 3 and 4.2.1956. (iv) (a) Ploughing, harrowing by tractor. (b) Planted between ridges. (c) 40,000 eye buds/ac. (d) 3' between rows. (e) N.A. (v) 10,000 lb./ac. of compost. (vi) CO—421 (medium-late). (vii) Irrigated. (viii) 2 interculturings and 3 weedings. (ix) 70". (x) March, 1957.

2. TREATMENTS :

Strips in one direction : 2 sources of P_2O_5 : S_1=B.M. and S_2=Super.
Strips in orthogonal direction : 4 levels of P_2O_5 : P_0=0, P_1=50, P_2=100 and P_3=150 lb./ac.

3. DESIGN :

(i) Strip-plot. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 24'×45'. (b) 18'×42'. (v) 3'×1½'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Pyrilla, stemborer and black smut — spraying of Endrine and rouging of diseased plants. (iii) No. of tillers, height of cane, no. of internodes and yield of cane. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 32.62 ton/ac. (ii) S.E. (S) = 7.82 tons/ac., S.E. (P) = 3.28 tons/ac. and S.E. (SP) = 5.45 tons/ac. (iii) None of the effects is significant (iv) Av. yield of sugarcane in tons/ac.

	P_0	P_1	P_2	P_3	Mean
S_1	—	29.16	29.19	33.38	30.58
S_2	—	33.99	36.21	33.76	34.65
Mean	32.62	31.58	32.70	33.57	32.62

S.E. of difference of two

1. S marginal means   = 2.76 tons/ac.
2. P marginal means   = 1.64 tons/ac.
3. P means at the same level of S   = 3.18 tons/ac.
4. S means at the same level of P   = 4.34 tons/ac.

Crop :- Sugarcane.   **Ref :- M.P. 56(28).**

Site :- R.A.K. Agri. Res. Instt., Sehore.   **Type :- 'M'.**

Object :—To compare the effect of different ratios of organic to inorganic N on Sugarcane.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 2.2.1956. (iv) (a) 1 tractor ploughing and harrowing. (b) Planted between ridges. (c) 40,000 eyebuds/ac. (d) 3' between rows. (e) N.A. (v) 75 lb./ac. of P_2O_5 as Super applied in furrows a day before planting. (vi) CO—421 (medium to late). (vii) Irrigated. (viii) 2 interculturings, 3 weedings and 2 earthings. (ix) 70". (x) Feb. 1957.

2. **TREATMENTS :**

5 ratios of N as compost and A/S : $N_1=3 : 1$, $N_2=2: 1$, $N_3=1 : 1$, $N_4=1 : 2$ and $N_5=1 : 3$.
Dose of N in each case is 300 ib./ac.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 30'×37'. (b) 24'×31'. (v) 3'×3'. (vi) Yes.

4. **GENERAL :**

(i) Good. (ii) Borers and pyrilla—roguing done and Endrine sprayed. (iii) Height and yield of cane. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. **RESULTS :**

(i 33.68 tons/ac. (ii) 3.41 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	N_1	N_2	N_3	N_4	N_5
Av. yield	34.52	32.93	32.29	33.00	35.68

S.E./mean = 1.72 tons/ac.

Crop :- Sugarcane.   **Ref :- M.P. 56(29).**

Site :- R.A.K. Agri. Res. Instt., Sehore.   **Type :- 'M'.**

Object :—To find out suitable time of application of N on Sugarcane.

1. **BASAL CONDITIONS :**

(i) (a) to (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.2.1956. (iv) (a) 1 tractor ploughing and 1 harrowing. (b) Planted between ridges. (c) 40,000 eye buds/ac. (d) 3' between rows. (e) N.A. (v) 75 lb./ac. of P_2O_5 as Super applied in furrows one day after sowing. (vi) CO—421 (medium—late). (vii) Irrigated. (viii) 2 weedings and 2 interculturings. (ix) 70". (x) Feb. 1957.

2. TREATMENTS :

7 split-applications of N : T_1 =Full at sowing, T_2 =$\frac{1}{2}$ at sowing and $\frac{1}{2}$ after 1$\frac{1}{2}$ months of sowing, T_3 =$\frac{1}{2}$ at sowing and $\frac{1}{2}$ after 3 months of sowing, T_4 =$\frac{1}{2}$ at sowing and $\frac{1}{2}$ after 4$\frac{1}{2}$ months of sowing, T_5 =$\frac{1}{2}$ after 1$\frac{1}{2}$ months and $\frac{1}{2}$ after 3 months of sowing, T_6 =$\frac{1}{2}$ after 1$\frac{1}{2}$ months and $\frac{1}{2}$ after 4$\frac{1}{2}$ months of sowing and T_7 =$\frac{1}{2}$ after 3 months and $\frac{1}{2}$ after 4$\frac{1}{2}$ months of sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 30'×36'. (b) 24'×30'. (v) 3'×3'. (vi) Yes.

4. GENERAL ·

(i) Good. (ii) Borers and pyrilla—roguing and Endrine spraying. (iii) Yield and height of cane, no. of internodes per cane. (iv) (a) 1956·-N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 34.63 tons/ac. (ii) 5.44 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	T_7
Av. yield	35.02	34.83	38.23	37.15	34.81	29.62	32.74

S.E./mean = 2 72 tons/ac.

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Crop :- Sugarcane. **Ref :- M.P. 56(27).**

Site :- R.A.K. Agri. Res. Instt., Sehore. **Type :- 'C'.**

Object :—To see the effect of monthly plantings on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments. (iv) (a) Ploughing by tractor ; 2 *bakherings*. (b) Planted between ridges. (c) 40,000 eye buds/ac. (d) 3' between rows. (e) N A. (v) 10,000 lb./ac. of compost (1% N) one day before planting+75 lb./ac. of P_2O_5 as Super in furrows. (vi) CO—421 (medium—late). (vii) Irrigated. (viii) 2 interculturings and 3 weedings. (ix) 70″. (x) As per treatments.

2. TREATMENTS :

5 times of planting : T_1 =Middle of January 1956, T_2 =Middle of February 1956, T_3 =Middle of March 1956, T_4 =Middle of April 1956 and T_5 =Middle of May 1956.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 30'×51'. (b) 24'×45'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) Very good. (ii) Pyrilla and stemborer—Endrine spraying. (iii) Height and no. of green leaves/plant, number of tillers, no. of ear heads and cane yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 30.99 tons/ac. (ii) 2.68 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in lb./ac.

Treatment	T_1	T_2	T_3	T_4	T_5
Av. yield	38.47	37.08	29.03	28.06	22.31

S.E./mean = 1.34 tons/ac.

— — —

Crop :- Sugarcane.   **Ref :- M.P. 56(26).**

Site :- R.A.K. Agri. Res. Instt., Sehore.   **Type :- 'C'.**

Object :—To see the effect of different spacings on Sugarcane.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 5.2.1956. (iv) (a) 1 tractor ploughing and 1 harrowing. (b) Planted between ridges. (c) 30,000, 40,000 and 60,000 eyebuds/ac. for 4', 3' and 2' spacings between rows. (d) As per treatments. (e) N.A. (v) 10,000 lb./ac. of compost (1%N)+ 75 lb./ac. of P as Super and 250 lb./ac. of N as A/S and G.N.C. in 1 : 1 ratio top dressed. (vi) CO—421. (medium-late). (vii) Irrigated. (viii) 1 interculturing, 3 weedings and 2 earthings. (ix) 70″. (x) 9/10.3.1957.

2. TREATMENTS :

   3 row spacings : $S_1=2'$, $S_2=3'$ and $S_3=4'$.

3. DESIGN :

   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 24′×45′. (b) 24′×42′. (v) 1½′×1½′. (vi) Yes.

4. GENERAL :

   (i) Good. (ii) Pyrilla attack—one sprayig of Endrine in Oct. (iii) Yield and height of cane, no. of internodes per cane. (v) (a) 1956—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

   (i) 34.72 tons/ac. (ii 5.55 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	S_1	S_2	S_3
Av. yield	36.26	35.76	32.14

   S.E./mean = 2.27 tons/ac.

Crop :- Sugarcane.   **Ref :- M.P. 54(126).**

Site :- Instt. of Plant Industry, Indore.   **Type :- 'D'.**

Object :—To study the effect of weedicides on the yield of Sugarcane.

1. BASAL CONDITIONS :

   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

   4 weedicides : T_0=Control, T_1=2 lb./ac. of 2—4—D (3% solution of Fernoson powder), T_2=4 lb./ac. of 2—4—D (6% solution of Fernoson powder) and T_3=6 lb./ac. of 2—4—D. (1% solution of Fernoson powder).

3. DESGIN :

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

4. GENERAL :

   (i) and (ii) N.A. (iii) Cane yield. (iv) (a) No. (b) and (c) —. (v) N.A. (vi) Heavy rains in September. (vii) Nil.

5. RESULTS :

   (i) 5.53 tons/ac. (ii) 1.79 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	5.67	6.21	4.86	5.40

   S.E./mean = 0.89 tons/ac.

Crop : Sugarcane.   Ref :- M.P. 59(124).

Site :- Instt. of Plant Industry, Indore.   Type :- 'D'.

Object :—To study the effect of weedicides on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Potato. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 9.5.1959. (iv) (a) 1 harrowing and 1 *bakhering*. (b) Planting. (c) 40 mds./ac. (d) 3' between rows. (e) N.A. (v) Nil. (vi) CO—419. (vii) Irrigated. (viiii 2 weedings. (ix) 69.1". (x) 6 to 21.1.1960.

2. TREATMENTS :

All combinations of (1) and (2)+one control
     (1) 3 levels of P_2O_5 : $P_1=1$, $P_2=2$ and $P_3=3$ lb./ac.
     (2) 4 times of spraying of P_2O_5 : $T_1=$At pre-emergence, $T_2=2$ weeks after sowing, $T_3=4$ weeks after sowing and $T_4=8$ weeks after sowing.

3. DESIGN .

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) and (b) 15'×9'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Cane yield. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 37.65 tons/ac. (c) 8.68 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac

Control = 39.06 tons/ac.

	T_1	T_2	T_3	T_4	Mean
P_1	45.04	40.32	37.62	44.15	41.78
P_2	30.98	34.90	32.24	40.54	34.67
P_3	35.03	36.59	39.15	33.88	36.16
Mean	37.02	37.27	36.34	39.52	37.54

S.E. of P marginal mean   = 2.17 tons/ac.
S.E. of T marginal menn   = 2.51 tons/ac.
S.E. of body of table   = 4.34 tons/ac.

Crop :- Cotton *(Kharif)*.   Ref :- M.P. 55(59).

Site :- Govt. Seed and Demons. Farm, Amlaha.   Type :- 'M'.

Object :—To find out optimum levels of N and P for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and) (b) Refer soil analysis, Amlaha. (iii) 25.6. 1955. (iv) (a) N.A. (b)Drilling. (c) 10 srs./ac. (d) N.A. (e) N.A. (v) N.A. (iv) Malvia. (vii) Unirrigated. (viii) N A. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+Control
     (1) 2 levels of A/S : $N_1=100$ and $N_2=150$ lb./ac.
     (2) 5 levels of Super : $P_0=0$, $P_1=62\frac{1}{2}$, $P_2=125$ $P_3=187\frac{1}{2}$ and $P_4=250$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) 363'×33'. (iii) 4. (iv) (a) 33'×33'. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Weight of *kapas*. (iv) (a) and (b)|N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 83.9 lb./ac.   (ii) 29.86 lb./ac.   (iii) No effect is significant.   (iv) Av. yield of *kapas* in lb./ac.

Control = 75.3 lb./ac.

	P_0	P_1	P_2	P_3	P_4	Mean
N_1	109.8	79.0	67.9	94.4	73.1	84.8
N_2	88.9	96.3	75.3	88.8	75.0	84.9
Mean	99.4	87.6	71.6	91.6	74.0	84.8

S.E. of N marginal mean   = 6.68 lb./ac.
S.E. of P marginal mean   = 10.56 lb./ac.
S.E. of body of table   = 14.93 lb./ac.

Crop :- Cotton *(Kharif)*   **Ref :- M.P. 55(56).**

Site :- Govt. Seed and Demons. Farm, Amlaha.   **Type :- 'M'.**

Object :—To find out the effect of organic and inorganic N with and without P on Cotton.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A.   (ii) (a) and (b) Refer soil analysis, Amlaha.   (iii) 27.6.1955.   (iv) (a) N.A.   (b) Drilling. (c) 5 lb./ac.   (d) 2'×9".   (e) N.A.   (v) N.A.   (vi) Malvia.   (vii) Unirrigated.   (viii) to (x) N.A.

2. TREATMENTS:

All combinations of (1) and (2)+Control.
     (1) 3 N treatments: N_1=150 lb./ac. of A/S, N_2=400 lb./ac. of G.N.C. and N_3=200 lb./ac. of G.N.C. +75 lb./ac. of A/S.
     (2) 3 levels of Super: P_0=0, P_1=188 and P_2=376 lb./ac.

3. DESIGN:

(i) R.B.D.   (ii) (a) 10.   (b) 330'×33'.   (iii) 4.   (iv) (a) 33'×33'.   (b) 1/60 ac.   (v) N.A.   (vi) Yes.

4. GENERAL:

(i) N.A.   (b) Nil.   (iii) Weight of *kapas*.   (iv) (a) to (c) N.A.   (v) (a) and (b) Nil.   (vi) Rains were heavy, but the crop was not affected adversely.   (viii) Nil.

5. RESULTS:

(i) 147.0 lb./ac.   (ii) 30.6 lb./ac.   (iii) No effect is significant.   (iv) Av. yield of *kapas* in lb./ac.

Control = 111.7 lb./ac.

	P_0	P_1	P_2	Mean
N_1	132.7	142.6	144.7	140.0
N_2	168.2	159.8	164.5	164.2
N_3	162.0	135.1	148.1	148.4
Mean	154.3	145.8	152.4	150.9

S.E. of any marginal mean   = 8.8 lb./ac.
S.E. of body of table or *control* mean   = 15.3 lb./ac.

Crop :- Cotton *(Kharif)*   Ref :- M.P. 55(94).

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

Object :—To compare the effect of different levels and sources of N on Cotton yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, .Indore. (iii) 25.6.1955. (iv) (a) *Bakherings*. (b) Seed sown by drilling. (c) 20 lb./ac. (d) 14″ between rows. (e) N.A. (v) Nil. (vi) Dhar—43. (vii) Unirrigated. (viii) N.A. (ix) 42.05″. (x) 19.11.1955. and 11.12.1955.

2. TREATMENTS :

All combinations of (1) and (2)
  (1) 2 sources of N : $S_1 = C/N$ and $S_2 = A/S$.
  (2) 4 levels of N : $N_0 = 0$, $N_1 = 20$, $N_2 = 40$ and $N_3 = 60$ lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 30′×14′. (b) 25′×9¼′. (v) 2¼′×2¼′. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 96 lb./ac. (ii) 19.1 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	Mean
S_1	—	76	105	138	106
S_2	—	86	103	119	103
Mean	71	81	104	128	96

S.E. of N marginal mean   = 5.5 lb./ac.
S.E. of S marginal mean   = 4.5 lb./ac.
S.E. of body of table   = 7.8 lb./ac.

————

Crop :- Cotton *(Kharif)*.   Ref :- M.P. 59(127).

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

Object :— To find out the effect of different levels of N, P and K on the yield of Cotton.

1. BASAL CONDITIONS :

(i) Cotton—G.M. crop—Wheat. (b) Wheat. (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 3.7.1959. (iv) 2 *bakherings*. (b) Drilling. (c) 10 lb./ac. (d) 14″×12″. (e) N.A. (v) Nil. (vi) American. (vii) Unirrigated. (viii) 6 weedings and 3 interculturings. (ix) 65.5″. (x) 1.12.1960 to 31.3.1960.

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 : $P_0 = 0$, $P_1 = 30$ and $P_2 = 60$ lb./ac.
  (3) 3 levels of K_2O as Mur. Pot : $K_0 = 0$, $K_1 = 30$ and $K_2 = 60$ lb./ac.

3. DESIGN :

(i) 3^3 confd (NPK confd.). (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) 40′×15′. (b) 35′×12′ (v) 2.5′×1.5′ (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 417 lb./ac. (ii) 151.2 lb./ac. (iii) Main effect af N alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	292	345	283	307	285	352	284
N_1	366	450	477	431	437	433	422
N_2	451	549	536	512	563	468	505
Mean	370	448	432	417	428	418	404
K_0	381	428	476				
K_1	403	441	409				
K_2	325	475	411				

S.E. of any marginal mean = 35.6 lb./ac.
S.E. of body of any table = 61.7 lb./ac.

Crop :- Cotton *(Kharif).*   **Ref :- M.P. 59(125).**

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

Object :—To find out the effect of different levels of N, P and K on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—G.M. crop—Wheat. (b) Wheat? (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 6.7.1959. (iv) (a) 2 *bakherings.* (b) Drilling. (c) 10 lb./ac. (d) 14"×12". (e) N.A. (v) Nil. (vi) *Desi* bhoj. (vii) Unirrigated. (viii) 8 weedings and 4 interculturings. (ix) 65.5". (x) 27.1.1960 to 12.3.1960.

2. TREATMENTS :

Same as in expt. no. 59(127) on page 452.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 40'×14'. (b) 35'×9.33'. (v) 2.5'×2.33'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 176 lb./ac. (ii) 42.0 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	138	124	161	141	136	146	141
N_1	185	186	174	182	170	203	172
N_2	201	216	198	205	204	193	218
Mean	175	175	178	176	170	181	177
K_0	178	156	176				
K_1	176	186	180				
K_2	170	184	177				

S.E. of any marginal mean = 9.9 lb./ac.
S.E. of body of any table = 17.1 lb./ac.

Crop :- Cotton *(Kharif).*　　　　　**Ref :- M.P. 55(88).**

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

Object :—To study the residual effect on Cotton of organic and inorganic manures applied to preceeding Jowar.

1. **BASAL CONDITIONS :**

(i) (a) *Jowar*—Cotton. (b) *Jowar.* (ç) As per reatments. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 17.6.1955. (iv) 'a) *Bakhering.* (b) Seeds sown by drilling. (c) 20 lb./ac. (d) 14" between rows. (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 42.05". (x) 17 and 18.11.1955, 3 to 5.1.1956 and 30 31.1.1956.

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 Farm compost : $F_0 =$ No farm compost and $F_1 =$ Farm compost (quantity applied N.A.).

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 35'×14'. (b) 30'×9½'. (v) 2½'×2½'. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) N.A. (iii) Yield of *kapas.* (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 233 lb./ac. (ii) 49.3 lb./ac. (iii) No effect is significant. (iv) Av. yield of *kapas* in lb./ac.

	P_0	P_1	Mean	F_0	F_1
N_0	220	227	224	213	235
N_1	241	244	242	236	249
Mean	230	236	233	224	242
F_0	220	229			
F_1	241	243			

S.E. of any marginal mean = 12.3 lb./ac.
S.E. of body of any table = 17.4 lb./ac.

Crop :- Cotton *(Kharif).*　　　　　**Ref :- M.P. 54(113).**

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

Object :— To study the effect of different sources and levels of N at different levels of P.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 29.6.1954. (iv) (a) 1 *bakhering.* (b) Seed sown by drilling. (c) 20 lb./ac. (d) 14" between rows. (e) N.A. (v) Nil. (vi) Dhar—43. (vii) Unirrigated. (viii) 2 weedings and 1 interculture. (ix) 52.23". (x) 18.12.1954, 1.2.1955 and 12.3.1955.

2. TREATMENTS :

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

    (1) 4 sources of N : S_1=K manure, S_2=F.Y.M., S_3=Farm compost and S_4=G.N.C.
    (2) 3 levels of N : N_0=0, N_1=20 and N_2=40 lb./ac.
    (3) 2 levels of P_2O_5 : P_0=0 and P_1=30 lb./ac. as Super.

3. DESIGN :

    (i) Fact. in R.B.D.   (ii) (a) 24.   (b) N.A.   (iii) 3,   (iv) (a) 45'×14'.   (b) 40'×9¼'.   (v) 2¼'×2¼'.   (vi) Yes.

4. GENERAL :

    (i) Poor.   (ii) Nil.   (iii) Yield of *kapas.*   (iv) (a) 1951—1955.   (b) No.   (c) Nil.   (v) (a) and (b) N.A.   (vi) Heavy rains in September.   (vii) Nil.

5. RESULTS :

    (i) 144 lb./ac.   (ii) 44.6 lb./ac.   (iii) Main effects of N and P are highly significant. Other effects are not significant.   (iv) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	S_4	P_0	P_1	Mean
N_0	—	—	—	—	96	131	113
N_1	135	128	148	159	133	152	142
N_2	152	169	186	204	158	198	178
Mean	143	148	167	194	145	175	164
P_0	130	129	154	189			
P_1	157	168	180	194			

S.E. of S marginal mean   = 12.9 lb./ac.
S.E. of P marginal mean (of N×P table)   = 7.4 lb./ac.
S.E. of N marginal mean (of N×P table)   = 9.1 lb./ac.
S.E. of body of (N×S) table   = 18.2 lb./ac.
S.E. of body of N×P table   = 12.9 lb./ac.

Crop :- Cotton *(Kharif).*   **Ref :- M.P. 55(86).**

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

Object : —To study the effect of different sources and levels of N with and without P on the yield of Cotton.

1. BASAL CONDITIONS :

    (i) (a) Nil.   (b) Groundnut.   (c) N.A.   (ii) (a) Black cotton soil.   (b) Refer soil analysis, Indore.   (iii) 18.6.1955.   (iv) (a) *Bakhering.*   (b) Seed sown by drilling.   (c) 20 lb./ac.   (d) 14" between rows.   (e) N.A.   (v) N.A.   (vi) Bhoj.   (vii) Unirrigated.   (viii) N.A.   (ix) 42.05".   (x) Picking from 29.10.1955 to 25.1.1956.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 54(113) on page 454.

4. GENERAL :

    (i) Satisfactory.   (ii) Nil.   (iii) Yield of *kapas.*   (iv) (a) 1951—1955.   (b) No.   (c) Nil.   (v) (a) and (b) N.A.   (vi) and (vii) Nil

5. RESULTS :

    (i) 219 lb./ac.   (ii) 46.4 lb./ac.   (iii) Main effects of N and P are highly significant. Other effects are not significant.   (iv) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	S_4	P_0	P_1	Mean
N_0	—	—	—	—	176	215	196
N_1	205	194	188	230	184	225	204
N_2	241	287	238	265	230	285	258
Mean	223	241	213	247	197	242	219
P_0	211	218	202	198			
P_1	235	264	225	297			

S.E. of S marginal mean	= 13.4 lb./ac.
S.E. of N marginal mean	= 9.5 lb./ac.
S.E. of P marginal mean (of $N \times P$ table)	= 7.7 lb./ac.
S.E. of body of $S \times N$ or $S \times P$ table	= 18.9 lb./ac.
S.E. of $N \times P$ table	= 13.4 lb./ac.

———

Crop :- Cotton.   **Ref :- M.P. 54(25).**

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

Object:—To study the effect of different levels of N and P with and without farm compost on the yield of Cotton.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 1.7.1954. (iv) (a) N.A. (b) Drilled. (c) 20 lb./ac. (d) 14" between rows. (e) N.A. (v) Nil. (vi) Desi dhar—43 (medium). (vii) Unirrigated. (viii) 2 hand weedings followed by culture with daura. (ix) 52.22". (x) Pickings on 27.11.1954. 22.12.1954 and 24.1.1955.

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 B.D. : B_0=0 and B_1=Farm compost.
   - (3) 2 levels of P_2O_5 as Super : P_0=0 and P_1=20 lb./ac.

3. **DESIGN :**

   (i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 35'×14'. (b) 30'×9'4". (v) 2 rows on either side and 2½' at the end of each row. (vi) Yes.

4. **GENERAL :**

   (i) Satisfactory. (ii) Nil. (iii) Yield of kapas. (iv) (a) 1952—1956. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Heavy rains resulted in low yield. (vii) Nil.

5. **RESULTS :**

   (i) 186 lb./ac. (ii) 49.6 lb./ac. (iii) Main effects of P alone is highly significant. (iv) Av. yield of kapas in lb./ac.

	B_0	B_1	Mean	P_0	P_1
N_0	164	200	182	165	199
N_1	184	196	190	165	215
Mean	174	198	186	165	207
P_0	145	185			
P_1	203	211			

S.E. of any marginal mean = 12.4 lb./ac.

S.E. of body of any table = 17.5 lb./ac.

Crop :- Cotton.   **Ref :- M.P. 54(24).**

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

Object :—To study the effect of different levels and sources of N on the yield of Cotton.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) *Tur.* (c) Nil. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Khandwa. (iii) 7.7.1954. (iv) (a) *Bakhering.* (b) Sown by *tiphan.* (c) to (e) N.A. (v) N.A. (vi) H—420 (medium). (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 43.44". (x) 30.11.1954 to 23.12.1954.

2. **TREATMENTS :**

   All combinations of (1) and (2)+control (3 plots).
   - (1) 2 levels of N : $N_1=20$ and $N_2=40$ lb./ac.
   - (2) 3 sources of N : $S_1=A/S$, $S_2=A/N$ and $S_3=$Urea.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 45'×24'. (b) 33'×12'. (v) 6'×6'. (vi) Yes

4. **GENERAL :**

   (i) Satisfactory. (ii) Nil. (iii) Weight of *kapas.* (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 317 lb./ac. (ii) 99.9 lb./ac. (iii) All effects are highly significant. (iv) Av. yield of *kapas* in lb./ac.

   Control = 225 lb./ac.

	S_1	S_2	S_3	Mean
N_1	399	275	234	303
N_2	743	289	241	424
Mean	571	282	237	363

   S.E. of N marginal mean or control mean   = 28.8 lb./ac.

   S.E. of S marginal mean   = 35.3 lb./ac.

   S.E. of body of table   = 50.0 lb./ac.

Crop :- Cotton.   **Ref :- M.P. 54(23).**

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

Object :—To study the effect of C/N on Cotton crop.

1. **BASAL CONDITIONS :**

   (i) (a) N.A. (b) Cotton—0394. (c) N.A. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Khandwa. (iii) 2.7.1954. (iv) (a) *Bakhering* and hoeing etc. (b) to (e) N.A. (v) N.A. (vi) H—420 (medium). (vii) Unirrigated. (viii) Weeding. (ix) 43.44". (x) 2.12.1954 and 8.1.1955.

2 **TREATMENTS :**

   All combinations of (1) and (2)
   - (1) 2 levels of lime : $L_0=0$ and $L_1=300$ lb./ac.
   - (2) 5 manurial treatments : $N_0=$Control (no manure), $N_1=40$ lb./ac. of N as A/S, $N_2=60$ lb./ac. of N as A/S, $N_3=40$ lb./ac. of N as C/N and $N_4=60$ lb./ac. of N as C/N.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 1/30 ac. (b) 33'×33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Weight of *kapas*. (iv) (a) 1953—1954. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 345 lb./ac (ii) 106.5 lb /ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
L_0	273	420	386	380	313	354
L_1	230	360	436	333	320	336
Mean	251	390	411	355	317	345

S.E. of L marginal mean = 19.4 lb./ac.
S.E. of N marginal mean = 30.7 lb./ac.
S.E of body of table = 43.5 lb./ac.

Crop :- Cotton *(Kharif)*.   Ref :- M.P. 57(75).

Site :- Reg. Res. Stn., Khargone.   Type :- 'M'.

Object :—To find out the most suitable manurial combination of N, P and K for Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 7.7.1957. (iv) (a) Summer ploughing and harrowing twice. (b) to (e) N.A. (v) N.A. (vi) A. 51—9. (vii) Unirrigated. (viii) 3 hand weedings and interculture. (ix) 17.79". (x) Middle of November and first week of December.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S : $N_0=0$, $N_1=25$ and $N_2=50$ lb./ac.
(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=12\frac{1}{2}$ and $P_2=25$ lb./ac.
(3) 3 levels of K_2O as Mur. Pot. : $K_0=0$, $K_1=20$ and $K_2=40$ lb./ac.

3. DESIGN :

(i) 3^3 Fact. confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) and (b) 45'×24'. (v) Nil. (vi) Yes.

4. GENERAL :

(i Satisfactory. (ii) Nil. (iii) Height, branching, boll count and yield of *kapas*. (iv) (a) 1957 to 1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 271 lb./ac. (ii) 60.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	238	260	254	267	244	300	256
N_1	257	258	290	268	262	264	278
N_2	275	265	290	277	292	268	271
Mean	273	261	278	271	267	277	268
K_0	252	274	275				
K_1	293	270	268				
K_2	275	239	290				

S.E. of any marginal mean   = 14.1 lb./ac.

S.E. of body of any table   = 24.5 lb./ac.

Crop :- Cotton *(Kharif)*.   **Ref :- M.P. 58(89).**

Site :- Reg. Res. Stn., Khargone.   **Type :- 'M'.**

Object :—To find out the most suitable manurial combination of N, P and K for Cotton.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A.   (ii) (a) Medium black cotton soil.   (b) N.A.   (iii) 11.7.1958.   (iv) (a) Summer ploughing and harrowing twice.   (b) *Duffan* with *sarata*.   (c) to (e) N.A.   (v) Nil.   (vi) A. 51—9.   (vii) Irrigated. (viii) N.A.   (ix) 27.83″.   (x) Pickings on 15.12.1958, 19.12.1958 and 5.1.1959.

2. **TREATMENTS :**

Same as in expt. no. 57(75) on page 458.

3. **DESIGN :**

(i) 3^3 confd.   (ii) (a) 9 plots/block ; 3 blocks/replication.   (b) N.A.   (iii) 2.   (iv) (a) 36′×26⅝″.   (b) 34′×24′ (v) 1′×1⅓′   (vi) Yes.

4. **GENERAL :**

(i) Poor.   (ii) N.A.   (iii) Yield of *kapas*.   (iv) (a) 1957- to 1959.   (b) No.   (c) Nil.   (v) and (vi) N.A.   (vii) Nil.

5. **RESULTS :**

(i) 160 lb./ac.   (ii) 45.8 lb./ac.   (iii) Main effect of N alone is highly significant.   (iv) Av. yield of *kapas* in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	145	121	103	123	121	104	144
N_1	161	172	221	185	199	169	187
N_2	137	179	198	171	179	171	163
Mean	148	157	174	160	166	148	165
K_0	163	167	168				
K_1	149	145	150				
K_2	132	159	204				

S.E. of any marginal mean   = 10.8 lb./ac.

S.E. of body of any table   = 18.7 lb./ac.

Crop :- Cotton *(Kharif)*.   **Ref :- M.P. 59(89).**

Site :- Reg. Res. Stn., Khargone.   **Type :- 'M'.**

Object :—To find out the most suitable manurial combination of N, P and K for Cotton.

1. **BASAL CONDITIONS :**

(i) (a) Nil.   (b) *Urid* and *Moong*.   (c) Nil.   (ii) (a) Medium black cotton soil.   (b) N.A.   (iii) 7.7.1959/N.A. (iv) (a) Summer ploughing and harrowing twice.   (b) Duffan with Sarata.   (c) to (e) N.A.   (v) Nil.   (vi) A. 51—9.   (vii) Unirrigated.   (viii) One hand weeding and 3 hoeings.   (ix) 30.40″.   (x) 13, 29.12.1959 and 8.1.1960.

2. TREATMENTS :

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

    (1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.

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

    (3) 3 levels of K_2O as Mur. Pot. : $K_0=0$, $K_1=20$ and $K_2=40$ lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots, block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 36'×24'. (b) 30'×18'. (v) 3'×3'. (vi) Yes.

4. GENERALS :

(i) Poor. (ii) Attack of aphide and Jassids—No control measures taken. (iii) Yield of *kapas*. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Due to heavy rains, the fields were heavily infested with weeds, adversely effecting the yield. (vii) Nil.

5. RESULTS :

(i) 453 lb /ac. (ii) 134.4 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	342	377	350	357	346	346	378
N_1	515	444	436	465	476	460	460
N_2	442	589	580	537	444	586	580
Mean	433	470	455	453	422	464	473
K_0	376	498	392				
K_1	416	472	503				
K_2	507	440	471				

S.E. of any marginal mean   = 31.7 lb./ac.
S.E. of body of any table   = 54.9 lb./ac.

Crop :- Cotton *(Kharif)*.

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

Ref :- M.P. 57(MAE).

Type :- 'M'.

Object :—Type V—To study the effect of time of application of N on kapas yield.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) June—July, 1958. (iv) 4 *bakherings* and 1 interculture. (b) Sowing by two coultered seed drill. (c) 10 lb./ac. (d) 24"×12" to 18". (e) N A. (v) Nil. (vi) Maljari. (vii) Unirrigated. (viii) 1 hand weeding. (ix) 30". (x) November, 1957 to January 1958.

2. TREATMENTS:

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

    (1) 2 sources of 50 lb./ac. of N : $S_1=$ A/S and $S_2=$ Urea.

    (2) 6 times of application of N : $T_1=$ At sowing, $T_2=$ At 1st interculture, $T_3=$ At flowering, $T_4=\frac{1}{2}$ at sowing+$\frac{1}{2}$ at flowering, $T_5=\frac{1}{3}$ at sowing+$\frac{1}{3}$ at 1st interculture+$\frac{1}{3}$ at flowering and $T_6=\frac{1}{2}$ at flowering+$\frac{1}{2}$ one month after flowering.

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) Normal. (ii) Nil. (iii) *kapas* yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 549 lb./ac.   (ii) 64.1 lb./ac. (iii) Interaction $S \times T$ and "control *vs.* others" are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 432 lb./ac.

	T_1	T_2	T_3	T_4	T_5	T_6	Mean
S_1	642	543	543	592	568	535	570
S_2	346	601	617	560	576	584	547
Mean	494	572	580	576	572	559	559

S.E. of marginal mean of S   = 15.1 lb./ac.
S.E. of marginal mean of T   = 26.2 lb./ac.
S.E. of body of table or control mean   = 37.0 lb./ac.

———

Crop :- Cotton *(Kharif)*.   **Ref :- M.P. 58(MAE).**

Site :- M.A.E. Farm, Ujjain.   **Type :- 'M'.**

Object : —Type V—To study the effect of times of application of N on Kapas yield.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A.   (ii) (a) Medium black soil.   (b) N.A.   (iii) June—July, 1958.   (iv) (a) 4 *bakherings*.   (b) N.A.   (c) 10 lb./ac.   (d) 18".   (e) N.A.   (v) Nil.   (vi) *Maljari*.   (vii) Unirrigated.   (viii) Nil.   (ix) 46".   (x) November—December, 1958.

2. TREATMENTS :

Same as in expt. no. 57 (MAE) type V on page 460.

3. DESIGN :

(i) R.B.D.   (ii) (a) 13.   (b) N.A.   (iii) 3.   (iv) (a) N.A.   (b) 1/109.5 ac.   (v) N.A.   (vi) Yes.

4. GENERAL :

Normal.   (ii) Nil.   (iii) *Kapas* yield.   (iv) (a) 1957—contd.   (b) No.   (c) Nil.   (v) to (vii) Nil.

5. RESULTS :

(i) 254 lb./ac. (ii) 53.6 lb./ac.   (iii) Main effect of T and "control *vs.* others" are highly significant.   (iv) Av. yield of *kapas* in lb./ac.

Control = 109 lb./ac.

	T_1	T_2	T_3	T_4	T_5	T_6	Mean
S_1	222	420	216	244	339	252	282
S_2	183	380	219	252	230	238	250
Mean	202	400	218	248	284	245	266

S.E. of marginal mean of S   = 12.6 lb./ac.
S.E. of marginal mean of T   = 21.9 lb./ac.
S.E. of body of table or control mean   = 30.9 lb./ac.

———

Crop :- Cotton *(Kharif)*.   **Ref :- M.P. 57(MAE).**

Site :- M.A.E. Farm, Ujjain.   **Type :- 'M'.**

Object :—Type VI (T.C.M.) —To study the effect of N and P on Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Jowar*—Cotton. (b) *Jowar.* (c) As per treatments. (ii) (a) Medium black soil. (b) N.A. (iii) June—July, 1957. (iv) (a) 4 *bakherings* and 1 interculture. (b) Sowing by two coultered seed drill. (c) 10 lb./ac. (d) 24″×12″ to 18″. (e) N.A. (v) Nil. (vi) *Maljari.* (vii) Unirrigated. (viii) 1 hand weeding. (ix) 30″. (x) November, 1957 to January, 1958.

2. TREATMENTS :

Treatment	1	2	3	4	5	6	7	8	9	10	11	12
1st year	0	c	c	p_1	p_2	c	c	c	c	$p_{\frac{1}{2}}$	p_1	p_2
2nd year	0	c	c	c	c	p_1	p_2	c	c	$p_{\frac{1}{2}}$	p_1	p_2
3rd year	0	c	c	c	c	c	c	p_1	p_2	$p_{\frac{1}{2}}$	p_1	p_2

Three-course rotation with eleven treatments. Plots under one of the treatments do not receive any fertilizers. Plots under the other ten treatments receive a basal dose of N. One of the treatments consists of a basal dose of N only. This treatment which serves as a control is applied to two plots in each block. Notations : 0=No manure, c=50 lb./ac. of N, $p_{\frac{1}{2}}$ =10, p_1=20 and p_2=40 lb./ac. of P_2O_5.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) *Kapas* yield. (iv) 1957—contd. (b) and (c) Yes. (v) to (vii) Nil.

5. RESULTS :

(i) 400 lb./ac. (ii) 72.9 lb./ac. (iii) None of the effects is significant. (iv) Av, yield of *kapas* in lb./ac.

Treatment	0	c	$p_{\frac{1}{2}}$	p_1	p_2
Av. yield	304	403	436	379	444

S E./mean 0, $p_{\frac{1}{2}}$ = 51.5 lb./ac. S.E./mean p_1, p_2 = 36.4 lb./ac. S.E./mean for c = 21.0 lb./ac.

———

Crop :- Cotton.   **Ref :- M.P. 57(SFT).**

Centre :- Indore (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) Medium black soil. (iii) Nil. (iv) and (v) N.A. (vi) June—July 1957. (vii) Unirrigated. (viii) and (ix) N.A. (x) November 1957.

2. TREATMENTS :

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

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogenous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue cricle or thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crops, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half

of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The above experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village (iii) (a) N.A. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Cotton yield. (iv) (a) No. (b) and (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	255	395	444	370	444	370	428

G.M. = 387 lb./ac. S.E. = 21.5 lb./ac. and no. of trials. = 6

Crop :- Cotton *(Kharif).*

Site :- Instt. of Plant Industry, Indore.

Ref :- M.P. 56(95).

Type :- 'MV'.

Object :—To find out the varietal response to different levels of N as A/S and Farm compost.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 20.6.1956. (iv) (a) *Bakhering.* (b) Seed sown by dibbling. (c) 20 lb./ac. (d) 14″ between rows. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) N.A. (ix) 24.98″. (x) N.A.

2. TREATMENTS :

All combinations of (1),(2) and (3)
    (1) 3 varieties : V_1=Indore—1, V_2=Indore—2 and V_3=B.48—72.
    (2) 4 levels of N as A/S : N_0=0, N_1=30, N_2=60 and N_3=90 lb./ac.
    (3) 2 levels of Farm compost : F_0=Without Farm compost and F_1=With Farm compost (quantity N.A.)

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 4. (iv) (a) 39′×12′. (b) 34′×9′. (v) 2½′×1½′. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of *kapas.* (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 512 lb./ac. (ii) 131.9 lb./ac. (iii) Main effects of V and N are highly significant while effect of F is significant. Other effects are not significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	Mean	F_0	F_1
V_1	347	558	643	751	575	557	592
V_2	358	499	513	610	495	442	548
V_3	291	461	535	583	467	445	490
Mean	332	506	564	648	512	481	543
F_0	307	472	503	644			
F_1	357	540	624	651			

S.E. of N marginal mean	= 26.7 lb./ac.
S.E. of V marginal mean	= 23.3 lb./ac.
S.E. of F marginal mean	= 19.0 lb./ac.
S.E. of body of V×N table	= 46.6 lb./ac.
S.E. of body of F×N table	= 38.0 lb./ac.
S.E. of body of V×F table	= 33.0 lb./ac.

Crop :- Cotton *(Kharif)*.   Ref :- M.P. 56(98).

Site :- Instt., of Plant Industry, Indore.   Type :- 'MV'.

Object :—To find out the varietal response to different levels of N as A/S and farm compost. -

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Groundnut. (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 16 to 19.6.1956. (iv) (a) *Bakhering*. (b) Seed sown by drilling. (c) 20 lb./ac. (d) 14" between rows. (e) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) N.A. (ix) 24.98". (x) N.A.

2. TREATMENTS :

Main-plot treatments :
   3 varieties : V_1=Bhoj, V_2=197—3 and V_3=Malziri.

Sub-plot treatments :
All combinations of (1) and (2)
   (1) 4 levels of N as A/S : N_0=0, N_1=30, N_2=60 and N_3=90 lb./ac.
   (2) 2 levels of farm compost : F_0=No farm compost and F_1=With farm compost.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 39'×11¾'. (b 34'×7'. (v, 2½'×2¼'. (vi) Yes.

4. GENERAL·

(i) Good. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 715 lb./ac. (ii) (a) 222.9 lb./ac. (b) 119.6 lb./ac. (iii) Main effects of N and F are highly significant. O.her effects are not significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	Mean	F_0	F_1
V_1	488	771	739	849	712	666	758
V_2	518	685	671	678	638	592	684
V_3	595	734	874	931	796	733	859
Mean	534	747	761	897	715	664	767
F_0	496	714	703	741			
F_1	571	780	820	897			

.S.E. of difference of two

1. V marginal means = 55.7 lb./ac.   5. V means at the same level of N = 76.0 lb./ac.
2. N marginal means = 34.5 lb./ac.   6. F means at the same level of V = 42.3 lb./ac.
3. F marginal means = 24.4 lb./ac.   7. V means at the same level of F = 63.2 lb./ac.
4. N means at the same level of V = 59.8 lb./ac.   S.E. of body of F×N table = 34.5 lb./ac.

___

Crop :- Cotton *(Kharif)*.   Ref :- M.P. 54(118).

Site :- Instt. of Plant Industry ; Indore.   Type :- 'C'.

Object :—To find out the optimum seed rate and spacing for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (ii) 30.6.1954. (iv) (a) 1 *bakhering*. (b) Seed sown by drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Dhar—43. (vii) Unirrigated. (viii) 2 weedings and one interculture. (ix) 52.23". (x) Pickings on 3.1.1955, 3.2.1955 and 10.3.1955.

2. TREATMENTS :

    All combinations of (1) and (2)

        (1) 3 seed rates : $R_1=10$, $R_2=20$ and $R_3=30$ lb./ac.

        (2) 4 spacings between rows : $S_1=7''$, $S_2=14''$, $S_3=21''$ and $S_4=28''$.

3. DESIGN :

    (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) $40'\times14'$. (b) $35'\times7'$. (v) $2\frac{1}{2}'\times3\frac{1}{2}'$. (vi) Yes.

4. GENERAL :

    (i) Not satisfactory. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Crop suffered due to heavy rains in the month of September. (vii) Nil.

5. RESULTS :

    (i) 108 lb./ac. (ii) 43.3 lb./ac. (iii) Main effect of R alone is significant. (iv) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	S_4	Mean
R_1	78	92	111	89	92
R_2	106	108	100	86	100
R_3	169	103	111	139	131
Mean	118	101	107	105	108

        S.E. of R marginal mean   =   10.8 lb./ac.

        S.E. of S marginal mean   =   12.5 lb./ac.

        S.E. of body of table   =   21.6 lb./ac.

———

Crop :- Cotton *(Kharif)*.   **Ref :- M.P. 55(93).**

Site :- Instt. of Plant Industry, Indore.   **Type :- 'C'.**

Object :—To find out the optimum seed rate and spacing for Cotton.

1. BASAL CONDITIONS :

    (i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 20.6.1955. (iv) (a) *Bakhering*. (b) Seed sown by drilling. (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) Dhar—43. (vii) Unirrigated. (viii) N.A. (ix) 42.05". (x) Pickings on 28.12.1955, 13.1.1956 and 8.2.1956.

2. TREATMENTS and 3. DESIGN :

    Same as in expt. no. 54(118) on page 464.

4. GENERAL :

    (i) Satisfactory. (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

    (i) 485 lb./ac. (ii) 329 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	S_4	Mean
R_1	311	346	404	456	379
R_2	869	815	376	396	614
R_3	550	525	319	459	463
Mean	577	562	366	437	485

        S.E. of R marginal mean   =   109.7 lb./ac.

        S.E. of S marginal mean   =   95.0 lb./ac.

        S.E. of body of table   =   190.0 lb./ac.

———

Crop :- Cotton.   **Ref :- M.P. 54(1).**

Site :- Instt. of Plant Industry, Indore.   **Type :- 'C'.**

Object :—To study the residual effect of various crops on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 1.7.1954. (iv) (a) N.A. (b) By drilling. (c) 20 lb./ac. (d) 14" between rows. (e) N.A. (v) Nil. (vi) Dhar-43 (medium). (vii) Unirrigated. (viii) 2 hand weedings. (ix) 52.22". (x) Pickings on 27.11.1954, 21.12.1954 and 21.1.1955.

2. TREATMENTS :

8 crops preceding cotton crop : C_1=Groundnut A.K. 1224, C_2=Moong V.P. no., C_3=Guar, C_4=Til, C_5= Jowar, C_6=Tuer, C_7=Eelbow gram and C_8=Linseed.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) $45' \times 14'$. (b) $40' \times 9'4"$. (v) $2\frac{1}{2}' \times 2\frac{1}{2}'$. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of kapas. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Heavy rains resulted in poor yields. (vii) Nil.

5. RESULTS :

(i) 176 lb./ac. (ii) 45.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

Treatment	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8
Av. yield	160	215	162	136	217	160	213	147

S.E./mean = 22.7 lb./ac.

Crop :- Cotton *(Kharif)*.   **Ref :- M.P. 55(92).**

Site :- Instt. of Plant Industry, Indore.   **Type :- 'C'.**

Object :—To study the residual effect of different rotations of crops on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 17.6.1955. (iv) (a) Bakhering. (b) Seed sown by drilling. (c) 20 lb./ac. (d) 14" between rows. (e) N.A. (v) N.A. (vi) Dhar—43. (vii) Unirrigated. (viii) N.A. (ix) 42.05". (x) Pickings on 21.11.1955 and 10.1.1956.

2. TREATMENTS :

8 rotations of crops preceding cotton crop : R_1=Groundnut—Fallow, R_2=Moong, type 1—Fallow, R_3= Moong type 1—Gram, R_4=Moong type 1—Linseed, R_5= Jowar—Fallow, R_6=Tur—Fallow, R_7=Fallow—Gram and R_8=Fallow—Linseed.

In all the rotations first crops relates to the previous kharif crop and second the robi crop.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) $50' \times 23\frac{1}{4}'$. (b) $45' \times 18\frac{3}{4}'$. (v) $2\frac{1}{2}' \times 2\frac{1}{2}'$. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of kapas. (iv) (a) 1955 to 1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 185 lb./ac. (ii) 16.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

Treatment	R_1	R_2	R_3	R_4	R_5	R_6	R_7	R_8
Av. yield	175	220	155	201	181	165	230	155

S.E./mean = 8.1 lb./ac.

Crop :- Cotton *(Kharif)*.　　　　　　　　　**Ref :- M.P. 56(90).**

Site :- Instt. of Plant Industry, Indore.　　　　**Type :- 'C'.**

Object :—To study the residual effect of different rotations of crops on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 4.6.1956. (iv) (a) *Bakhering*. (b) Seed sown by drilling. (c) 20 lb./ac. (d) 14″ between rows. (e) N.A. (v) N.A. (vi) Cotton—Bhoj. (vii) Unirrigated. (viii) N.A. (ix) 24.98″. (x) N.A.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 55(92) on page 466.

5. RESULTS :

(i) 285 lb./ac. (ii) 52.7 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	R_1	R_2	R_3	R_4	R_5	R_6	R_7	R_8
Av. yield	326	370	255	248	283	275	292	234

S.E./mean = 26.3 lb./ac.

Crop :- Cotton.　　　　　　　　　　　**Ref :- M.P. 54(22).**

Site :- Govt. Res. Farm, Khandwa.　　　　**Type :- 'C'.**

Object :—To study the effect of different methods of sowing with different spacings and number of seeds per hole on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Groundnut. (c) N.A. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Khandwa. (iii) 26.6.1954. (iv) (a) *Bakhering*. (b) As per treatments. (c) N.A. (d) and (e) As per treatments. (v) 20 lb./ac. of N as F.Y.M.+20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super. (vi) O—394 (medium). (vii) Unirrigated. (viii) Weeding. (ix) 43.44″. (x) N.A.

2. TREATMENTS :

5 cultural treatments : C_1=Sowing by *Argad* with 24″×12″ spacing, C_2=Dibbling single seed with 24″×24″ spacing, C_3=Dibbling single seed with 30″×30″ spacing. C_4=Dibbling two seeds with 24″×24″ spacing and C_5=Dibbling two seeds with 30″×30″ spacing.

3. DESIGN :

(i) R B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 30′×50′. (b) 10′×30′. (v) 10′×10′. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Weight of *kapas*. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 468 lb./ac. (ii) 80.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	C_1	C_2	C_3	C_4	C_5
Av. yield	421	544	334	603	436

S.E./mean = 35.9 lb./ac.

Crop :- Cotton.   **Ref :- M.P. 55(15).**

Site :- Govt. Res. Farm, Khandwa.   **Type :- 'C'.**

Object :—To study the effect of different methods of sowing with different spacings and number of seeds per hole.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Groundnut. (c) N.A. (ii) (a) Medium black cotton soil. (b) ·Refer soil analysis, Khandwa. (iii) 27.6.1955. (iv) (a, Bakhering. (b) As per treatments. (c) 16 lb./ac. (d) and (e) As per treatments. (v) 20 lb./ac. of N as F.Y.M. before sowing+20 lb./ac. of N as F.Y.M.+20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super mixed and applied by hand at sowing. (vi) O−394 (medium). (vii) Unirrigated. (viii) Hoeing and weeding. (ix) 37.20". (x) Pickings on 9.11.1955, 5.12.1955 and 3.1.1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(22) on page 467.

5. RESULTS :

(l) 2023 lb./ac. (ii) 37.3 lb./ac. (iii) Treatment differences are highly significant.· (iv) Av. yield of *kapas* in lb./ac.

Treatment	C_1	C_2	C_3	C_4	C_5
Av. yield	2388	1988	1532	2309	1897

S.E./mean = 16.7 lb./ac.

Crop :- Cotton.   **Ref :- M.P. 56(23).**

Site :- Govt. Res. Farm, Khandwa.   **Type :- 'C'.**

Object .—To study the different methods of sowing with different spacings and number of seeds per hole.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Cotton. (b) Groundnut. (c) N.A. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Khandwa. (iii) 30.6.1956. (iv) (a) Bakhering. (b) to (e) As per treatments. (v) F.Y.M. at 20 lb./ac. of N as basal dose before sowing+F.Y.M. at 20 lb./ac. of N+20 lb./ac. of N as A/S+20 lb./ac. P_2O_5 as Super mixed and applied by hand at sowing. (vi) O−394 (medium). (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 26.74". (x) Pickings on 20.11.1956, 7.12.1956, 23.12.1956 and 16.1.1957.

2. TREATMENTS to 4. GENERAL:

Same as in expt. no. 54 (22) on page 467.

5. RESULTS :

(i) 714 lb./ac. (ii) 128.0 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	C_1	C_2	C_3	C_4	C_5
Av. yield	773	778	831	551	636

S.E./mean = 57.2 lb./ac.

Crop :- Cotton.   **Ref :- M.P. 54(21).**

Site :- Govt. Res. Farm, Khandwa.   **Type :- 'C'.**

Object :—To study the effect of different methods of sowing with different spacings and number of seeds per hole.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Groundnut. (c) N.A. (ii) (a) Medium black cotton soil.. (b) Refer soil analysis, Khandwa. (iii) 1.7.1954. (iv) (a) *Bakhering.* (b) As per treatments. (c) N.A. (d) and (e) As per treatments. (v) 20 lb./ac. of N as F.Y.M. as basal dressing+20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super drilled with the seed. (vi) H—420. (medium). (vii) Unirrigated. (viii) Weeding, thinning and hoeing. (ix) 43.44". (x) Pickings on 1.12.1954. and 22.12.1954.

2. TREATMENTS:

5 cultural treatments : C_1 = Argada sowing with 18"×9" spacing, C_2 = Dibbling single seed with 18"×18" spacing, C_3 = Dibbling single seed with 18"×24" spacing, C_4 = Dibbling two seeds with 18"×18" spacing and C_5 = Dibbling two seeds with 18"×24" spacing.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 42'×24'. (b) 30'×18'. (v) 6'×3'. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Weight of *kapas.* (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 290 lb /ac. (ii) 111.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	C_1	C_2	C_3	C_4	C_5
Av. yield	250	355	210	403	234

S.E./mean = 49.8 lb./ac,

Crop :- Cotton.　　　　　　　　　　　　　　　**Ref :- M.P. 55(16).**

Site :- Govt. Res. Farm, Khandwa.　　　　　　**Type :- 'C'.**

Object :—To study the effect of different methods of sowing with different spacings and number of seeds per hole.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Khandwa. (iii) 28.6.1955. (iv) (a) *Bakhering.* (b) to (e) As per treatments. (v) 20 lb./ac. of N as F.Y.M. as basal dressing+20 lb./ac. of N as F.Y.M.+ 20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super mixed together and applied by hand at sowing. (vi) H—420 (medium). (vii) Unirrigated. (viii) Weeding, thinning and hoeing. (ix) 37.20". (x) Pickings on 9.11.1955, 19.12.1955, 13 1.1956 and 16.2.1956.

2. TREATMENTS to 4. GENERAL:

Same as in expt. no. 54(21) on page 468.

5. RESULTS:

(i) 743 lb./ac. (ii) 159.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	C_1	C_2	C_3	C_4	C_5
Av. yield	821	705	705	829	654

S.E./mean = 71 4 lb /ac.

Crop :- Cotton.　　　　　　　　　　　　　　　**Ref :- M.P. 56(22).**

Site :- Govt. Res. Farm, Khandwa.　　　　　　**Type :- 'C'.**

Object :—To study the effect of different methods of sowing with different spacings and number of seeds per hole.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Khandwa. (iii) 30.6.1956. (iv) (a) *Bakhering.* (b) to (e) As per treatments. (v) 20 lb./ac. of N as F.Y.M. as basal dressing+20 l ./ac. of N as F.Y.M.+20 lb./ac. of N as A/S+20 lb /ac. of P_2O_5 as Super mixed together and applied by hand at sowing. (vi) H—420 (medium). (vii) Unirrigated. (viii) Thinning, weeding and hoeing. (ix) 26.74". (x) Pickings on 21.11.1956, 7.12.1956, 24.12.1956 and 15.1.1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54(21) on page 468.

5. RESULTS :

(i) 603 lb./ac. (ii) 92.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	C_1	C_2	C_3	C_4	C_5
Av. yield	669	536	673	560	575

S.E./mean = 41.5 lb./ac.

Crop :- Cotton *(Kharif).*   **Ref :- M.P. 57(74).**

Site :- Reg. Res. Stn., Khargone.   **Type :- 'C'.**

Object :—To find out the most suitable seed rate and spacing for Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 8.7.1957. (iv) (a) Summer ploughing. and harrowing twice. (b) *Duffan* with *sarata.* (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) A. 51—9. (vii) Unirrigated. (viii) 3 hand weedings and intercultures. (ix) 17.79". (x) Pickings during first and the last week of November.

2. TREATMENTS :

Main-plot treatments :
     4 spacings between rows : $S_1=12"$, $S_2=18"$, $S_3=24"$ and $S_4=30"$.

Sub-plot treatments :
     4 seed rates : $R_1=4\frac{1}{2}$, $R_2=6$, $R_3=7\frac{1}{2}$ and $R_4=9$ srs./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 20'×36'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *kapas.* (iv) (a) 1957—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 553 lb./ac. (ii) (a) 153.1 lb./ac. (b) 94.9 lb./ac. (iii) Main effects of S and R are highly significant. (iv) Av. yield of *kapas* in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_1	737	696	743	840	754
S_2	558	583	587	731	615
S_3	552	348	473	548	480
S_4	327	366	329	428	363
Mean	544	498	533	637	553

S.E. of difference of two

1. S marginal means = 54.1 lb./ac.
2. R marginal means = 33.6 lb./ac.
3. R means at the same level of S = 67.1 lb./ac.
4. S means at the same level R = 79.4 lb./ac.

Crop :- Cotton *(Kharif).*   **Ref :- M.P. 58(88).**

Site :- Reg. Res. Stn., Khargone.   **Type :- 'C'.**

Object :—To find out the most suitable seedrate and spacing for Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 1.7.1958. (iv) (a) Summer ploughing and harrowing twice. (b) *Duffan* with *sarata.* (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) A. 51—9. (vii) Unirrigated. (viii) N.A. (ix) 27.83". (x) Pickings on 3.12.1958, 11.12.1958 and 24.12.1958.

2. TREATMENTS :

Main-plot treatments :
   3 spacings between rows : $S_1=16"$, $S_2=24"$ and $S_3=30"$.
Sub-plot treatments :
   4 seed rates : $R_1=4\frac{1}{2}$, $R_2=6$, $R_3=7\frac{1}{2}$ and $R_4=9$ srs./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 40'×22½'. (b) 38'×20'. (v) 1'×1¼'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *kapas.* (iv) (a) 1957 to 1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 571 lb./ac. (ii) (a) 135.3 lb./ac. (b) 93.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_1	501	639	581	560	570
S_2	484	517	558	598	539
S_3	586	535	626	663	603
Mean	524	564	588	607	571

S.E. of difference of two

1. S marginal means = 47.8 lb./ac.
2. R marginal means , = 38.1 lb./ac.
3. R means at the same level of S = 66.0 lb./ac.
4. S means at the same level of R = 74.5 lb./ac.

Crop :- Cotton *(Kharif).*   **Ref :- M.P. 57(39).**

Site :- Govt. Seed and Demons. Farm, Mahagarh.   **Type :- 'C'.**

Object :—To find out the most suitable seed rate and spacing for Cotton crop.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Mahagarh. (iii) N.A. (iv) (a) Ploughing. (b) By *desi* seed drill. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Cotton 197—3. (vii) to (x) N.A.

2. **TREATMENTS :**

   Main-plot treatments :
   3 spacings between rows : $S_1 = 18''$, $S_2 = 24''$ and $S_3 = 30''$.
   Sub-plot treatments :
   3 seed rates : $R_1 = 4\frac{1}{2}$, $R_2 = 6$ and $R_3 = 7\frac{1}{2}$ srs./ac.

3. **DESIGN :**

   (i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) $21' \times 42'$. (v) Nil. (vi) Yes.

4. **GENERAL :**

   (i) Satisfactory. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 388 lb./ac. (ii) (a) 144.3 lb./ac. (b) 83.0 lb./ac (iii) No effect is significant. (iv) Av. yield of *kapas* in lb /ac.

	R_1	R_2	R_3	Mean
S_1	356	380	338	358
S_2	419	351	434	401
S_3	392	488	331	404
Mean	389	406	368	388

   S.E. of difference of two
   1. S marginal means   = 58.9 lb./ac.
   2. R marginal means   = 35.9 lb./ac.
   3. R means at the same level of S   = 62.2 lb./ac.
   4. S means at the same level of R   = 77.8 lb./ac.

Crop :- Cotton *(Kharif).*   **Ref :- M.P. 58(14).**

Site :- Govt. Seed and Demons. Farm, Mahagarh.   **Type :- 'C'.**

Object :—To find out the most suitable seed rate and spacing for Cotton crop.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Mahagarh. (iii) 12.7.1958. (iv) (a) Ploughings. (b) By *desi* seed drill. (c) to (e) As per treatments. (v) Nil. (vi) Cotton 197—3. (vii) to (ix) N.A. (x) Pickings on 6.1.1959, 28.1.1959 and 21.2.1959.

2. **TREATMENTS :**

   Same as in expt. no. 57(39) on page 471.

3. **DESIGN :**

   (i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) $33 \times 33'$. (v) Nil. (vi) Yes.

4. **GENERAL :**

   Same as in expt. no. 57(39) on page 471.

5. **RESULTS :**

   (i) 143 lb./ac. (ii) (a) 78.8 lb./ac. (b) 48.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	R_1	R_2	R_3	Mean
S_1	156	120	96	124
S_2	113	174	120	136
S_3	210	136	159	168
Mean	160	143	125	143

S.E. of difference of two

1. S marginal means — = 32.2 lb./ac.
2. R marginal means — = 19.8 lb./ac.
3. R means at the same level of S — = 34.3 lb./ac.
4. S means at the same level of R — = 42.6 lb./ac.

Crop :- Cotton *(Kharif)*.

Site :- Instt. of Plant Industry, Indore.

Ref :- M.P. 55(97).

Type :- 'CM'.

Object :—To study the residual effect on cotton of mixed cropping experiment with Wheat and Gram, with different levels of N and P.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 17.6.1955. (iv) (a) *Bakherings*. (b) Seed sown by drilling. (c) 20 lb./ac. (d) 14″ between rows. (e) N.A. (v) Nil. (vi) Dhar—43. (vii) Unirrigated. (viii) N.A. (ix) 42.05″. (x) 12, 28.11.1955 and 12.1.1956.

2. TREATMENTS:

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

5 types of crop mixtures of wheat and gram : M_1=Wheat alone with 60 lb./ac. of seed, M_2=Gram alone with 60 lb./ac. of seed, $M_3=\frac{3}{4}$th wheat+$\frac{1}{4}$th gram, $M_4=\frac{1}{2}$ wheat+$\frac{1}{2}$ gram and $M_5=\frac{2}{3}$rd wheat+$\frac{1}{3}$rd gram.

(2) 2 levels of N applied to wheat and gram : N_0=No N and N_1=40 lb./ac. of N as farm compost.

(3) 2 levels of P_2O_5 applied to wheat and gram : P_0=No P_2O_5, P_1=40 lb./ac. P_2O_5 as Super.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 3. (iv) (a) $45'×11\frac{3}{8}'$. (b) $40'×7'$. (v) $2\frac{1}{2}'×2\frac{1}{2}'$. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1955—1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 52.2 lb./ac. (ii) 21.2 lb./ac. (iii) Main effects of N and P are highly significant. Other effects are not significant. (iv) Av. yield of cotton *kapas* in lb./ac.

-	M_1	M_2	M_3	M_4	M_5	Mean	P_0	P_1
N_0	38.9	56.7	37.3	37.3	37.3	41.5	34.7	48.3
N_1	46.2	71.3	72.1	56.7	68.1	62.9	54.8	71.0
Mean	42.5	64.0	54.7	47.0	52.7	52.2	44.7	59.6
P_0	41.3	55.9	44.6	39.7	42.1			
P_1	43.7	72.1	64.8	54.3	63.2			

S.E. of M marginal mean	= 6.12 lb./ac.
S.E. of N or P marginal mean	= 3.87 lb./ac.
S.E. of body of N×M or P×M table	= 8.66 lb./ac.
S.E. of body of N×P table	= 5.48 lb./ac.

Crop :- Cotton *(Kharif)*.   **Ref :- M.P. 56(93).**

Site :- Instt. of Plant Industry, Indore.   **Type :- 'CM'.**

Object :—To study the residual effect on cotton of mixed cropping experiment with wheat and gram with different levels of N and P.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 5.6.1956. (iv) (a) *Bakhering*. (b) Seed sown by drilling. (c) 20 lb./ac. (d) 14″ between rows. (e) N.A. (v) N.A. (vi) Bhoj. (vii) Unirrigated. (viii) N.A. (ix) 24.98″. (x) N.A.

2. **TREATMENTS and 3. DESIGN :**

Same as in expt, no. 55(97) on page 473.

4. **GENERAL :**

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

5. **RESULTS :**

(i) 307 lb./ac. (ii) 91.3 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of *kapas* in lb./ac.

	M_1	M_2	M_3	M_4	M_5	Mean	P_0	P_1
N_0	219	345	288	287	248	277	275	280
N_1	290	368	394	301	327	336	343	329
Mean	254	356	341	294	288	307	309	305
P_0	254	337	394	280	280			
P_1	256	376	288	308	295			

S.E. of M marginal mean	= 26.4 lb./ac.
S.E. of N or P marginal mean	= 16.7 lb./ac.
S.E. of body of N×M or P×M table	= 37.3 lb./ac.
S.E. of body of N×P table	= 23.6 lb./ac.

Crop :- Cotton.   **Ref :- M.P. 54(20).**

Site :- Govt. Res. Farm, Khandwa.   **Type :- 'CM'.**

Object :—To study the effect of different spacings along with some manurial treatments on the yield of Cotton.

1. **BASAL CONDITIONS:** .

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Medium black cotton soil. (b) Refer soil analysis. Khandwa. (iii) 29.6.1954. (iv) (a) *Bakhering*. (b) Sown with *Tiffan*. (c) 16 lb./ac. (d) As per treatments. (e) —. (v) Nil. (vi) H—420 (medium). (vii) Unirrigated. (viii) Weeding, thinning and hoeing. (ix) 43.44″. (x) Pickings on 30.11.1954 and 23.12.1954.

1. TREATMENTS :

7 treatments : T_1=No manure with 18″ row spacing, T_2=10 C L./ac. of F.Y.M. with 18″ row spacing, T_3=20 lb./ac. of N as A/S with 18″ row spacing, T_4=*Sannhemp* G.M.+30 lb./ac. of P_2O_5 as Super with 24″ row spacing, T_5=*Urid* G.M.+30 lb./ac. of P_2O_5 with 24″ row spacing, T_6=*Sannhemp* G.M. with 24″ row spacing and T_7=*Urid* G.M. with 24″ row spacing.

3, DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 45′×24′. (b) 33′×12′. (v) 6′ alround the plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Weight of *kapas*. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 427 lb./ac. (ii) 191.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. yield	261	399	564	495	419	454	399

S.E /mean = 95.7 lb./ac.

———

Crop :- Cotton.　　　　　　　　　　　　　　**Ref :- M.P. 55(14).**

Site :- Govt. Res. Farm, Khandwa.　　　　　**Type :- 'CM'.**

Object :—To study the effect of different spacings along with some manurial treatments.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Khandwa. (iii) 4.7.1955. (iv) (a) *Bakhering*. (b) Sowing with *Tijfan*. (c) N.A. (d) As per treatments. (e) —. (v) Nil. (vi) H—420 (medium). (viii) Unirrigated. (viii) Thinning, weeding and hoeing. (ix) 37.20″. (x) Pickings on 9.11.1955, 19.12.1955, 13-1.1956 and 16.2.1956.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54 (20) on page 474.

5. RESULTS ;

(i) 560 lb./ac. (ii) 97.9 lb./ac. (iii) The treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. yield	541	519	645	600	420	581	615

S.E./mean = 48.9 lb./ac.

———

Crop :- Cotton.　　　　　　　　　　　　　　**Ref :- M.P. 56(21).**

Site :- Govt. Res. Farm, Khandwa.　　　　　**Type :- 'CM'.**

Object :—To study the effect of different spacings along with some manurial treatments.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) N.A. (ii) (a) Medium black cotton soil. (b) Reffer soil analysis, Khandwa. (iii) 30.6.1956. (iv) (a) *Bakhering*. (b) Sown by *Tiffan*. (c) 16 lb./ac. (d) As per treatments. (e) —. (v) Nil. (vi) H—420 (medium). (vii) Unirrigated. (viii) Weeding, hoeing and thinning. (ix) 26.74″. (x) Pickings on 20.11.1956, 8.12.1956, 24.12.1956 and 12.1.1957.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 54 (20) on page 474.

5. RESULTS :

(i) 1632 lb./ac. (ii) 378.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	R_7
Av. yield	1375	1891	2544	1409	1279	1389	1540

S.E./mean = 189.2 lb./ac.

———

Crop :- Cotton *(Kharif)*. **Ref :- M.P. 58(87).**

Site :- Reg. Res. Stn. Khargone, **Type :- 'CM'.**

Object :—To find out proper green manure for Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Method of sowing : *Duffan* with *Sarata.* (c) and (d) N.A. (e) —. (v) N.A. (vi) A—51—9. (vii) Unirrigated. (viii) N.A. (ix) 27.83". (x) N.A.

2. TREATMENTS :

7 manurial and spacing treatments : M_0=No manure with 18" row spacing (2 plots), M_1=20 lb./ac. of N as A/S with 18" row spacing, M_2=40 lb./ac. of N as A/S with 18" row spacing, M_3=*Sannhemp* G.M. with 24" row spacing. M_4=M_3+20 lb./ac. of P_2O_5 as Super to G.M. crop. M_5=*Urid* G.M. with 24" row spacing and M_6=M_5+20 lb./ac. of P_2O_5 as Super to G.M. crop.

Seed rates of *Sannhemp* and *Urid* are 40 and 12 lb./ac. respectively.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 40'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) Nil. (v) and (vi) N.A. (vii) Nil.

5. RESULTS :

(i) 371 lb./ac. (ii) 99.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	396	492	431	225	288	369	374

S.E./mean = 40.5 lb./ac.

———

Crop :- Cotton *(Kharif)*. **Ref :- M.P. 59(61).**

Site :- Central Res. Farm, Ujjain. **Type :- 'CM'.**

Object : —To find out suitable spacing, no. of seeds/hole and manurial schedule for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Groundnut – Cotton. (b) Groundnut. (c) 50 lb./ac. of Super. (ii) (a) Black cotton soil. (b) N.A. (iii) 11 to 17.7.1959. (iv) (a) 4 *bakherings.* (b) Seed sown by dibbling. (c) to (e) As per treatments. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Two hand weedings. (ix) 53.49". (x) 16 to 18.1.1960.

2. TREATMENTS :

All combinations of (1) and (2)

Main-plot treatments

(1) 4 spacings : S_1=18"×6", S_2=18"×9", S_3=24"×6" and S_4=24"×9".

(2) seeds/hole : R_1=1 and R_2=2.

Sub-plot treatments

4 levels of N as A/S : N_0=0, N_1=20, N_2=40 and N_3=60 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 8 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) .3 (iv) (a) $48' \times 24'$. (b) $44' \times 21'$. (v) $2' \times 1.5'$. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Kapas yield. (iv) (a) 1959—1960. (b) No. (c)Nil. (v) (a) and (b) N.A. (vi) Heavy and continuous showers during August and September, hindering weeding and interculturing. (vii) Nil.

5. RESULTS :

(i) 212 lb./ac. (ii) (a) 80.9 lb./ac. (b) 46.4 lb./ac. (iii) Main effects of S and N are highly significant while that of R is significant. No other effect is significant. (iv) Av. yield of kapas in lb./ac.

	S_1	S_2	S_3	S_4	Mean	R_1	R_2
N_0	209	172	129	142	163	133	194
N_1	247	265	172	165	212	196	229
N_2	259	223	225	173	220	195	244
N_3	287	302	242	173	251	234	268
Mean	251	241	192	163	212	190	234
R_1	218	228	200	112			
R_2	283	253	184	215			

S.E. of difference of two
1. S marginal means = 23.4 lb./ac.
2. R marginal means = 16.5 lb./ac.
3. N marginal means = 13.4 lb./ac.
4. N means at the same level of R = 18.9 lb./ac.
5. R means at the same level of N = 23.3 lb./ac.
6. N means at the same level of S = 26.8 lb./ac.
7. S means at the same level of N = 32.9 lb. ac.
S.E. of body of the $S \times R$ table = 33.0 lb./ac.

Crop :- Cotton (Kharif).   Ref :- M.P. 57(MAE).

Site :- M.A.E. Farm, Ujjain.   Type :- 'CM'.

Object :—Type VIII—To study the effect of spacing and different sources and levels of manures on Kapas yield.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) June—July, 1957. (iv) (a) 4 bakherings and 1 interculture. (b) Sowing by two coultered seed drill. (c) 10 lb./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) Maljari. (vii) Unirrigated. (viii) 1 hand weeding. (ix) 30". (x) November, 1957 to January, 1958.

2. TREATMENTS :

All combinations of (1), (2) and (3)
     (1) 3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.
     (2) 3 levels of P_2O_5 : $P_0=0$, $P_1=50$ and $P_2=100$ lb./ac.
     (3) 3 row to row spacings : $S_1=12"$, $S_2=18"$ and $S_3=24"$.

3. DESIGN :

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

4. GENERAL :

(i) Good. (ii) Nil. (iii) Kapas yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 708 lb./ac. (ii) 113.9 lb./ac. (iii) Main effect of S and N are highly significant. Interaction $N \times P$ is significant. (iv) Av. yield of kapas in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
S_1	595	905	868	789	780	809	778
S_2	487	706	674	622	572	607	688
S_3	545	739	853	712	606	770	761
Mean	542	783	798	708	653	729	742
P_0	533	662	763				
P_1	603	847	736				
P_2	490	840	896				

S.E. of any marginal mean	= 26.8 lb./ac.
S.E. of body of any table	= 46.5 lb./ac.

Crop :- Cotton *(Kharif).*   **Ref :- M.P. 58(MAE).**

Site :- M.A.E. Farm, Ujjain.   **Type :- 'CM'.'**

Object :—Type VIII—To study the effect of spacing and different sources and levels of manures on Kapas yield.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) June—July, 1958. (iv) (a) 4 *bakherings.* (b) N.A. (c) 10 lb./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) *Maljari.* (vii) Unirrigated. (viii) Nil. (ix) 46". (x) November—December, 1958.

2. TREATMENTS :

Same as in expt. no. 57(MAE) type VIII on page 477.

3. DESIGN :

(i) 3^3 Fact. confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) N.A. (b) S_1= 1/106.8 ac., S_2=1/110 ac. and S_3=1/114.5 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 288 lb./ac. (ii) 80.2 lb./ac. (iii) Main effect of S and N are highly significant. Main effect of P is significant. (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1	P_2
S_1	159	348	387	298	293	296	304
S_2	169	359	466	331	244	355	395
S_3	160	270	276	235	195	289	222
Mean	163	326	376	288	244	313	307
P_0	162	258	313				
P_1	163	359	418				
P_2	163	361	398				

S.E. of any marginal mean	= 18.9 lb./ac.
S.E. of body of any table	= 32.7 lb./ac.

Crop :- Cotton *(Kharif).*

Site :- Govt. Res. Farm, Khandwa.

Ref :- M.P. 54(106).

Type :- 'IC'.

Object :—To study the effect of different dates of sowing and spacings at different levels of irrigation on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Khandwa. (iii) As per treatments (iv) (a) and (b) N.A. (c) 6 to 8 lb./ac. (d) As per treatments. (e) N.A. (v) 40 lb./ac. of N as F.Y.M.+20 lb./ac. of N as A/S. (vi) Bhaj 0394. (vii) As per treatments. (viii) 8 hoeings and 5 weedings. (ix) 43.44". (x) Pickings on 2.11.1954, 20.11.1954 and 16.12.1954.

2. TREATMENTS :

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

(1) 3 spacings : $S_1=2\frac{1}{2}'\times2'$, $S_2=2\frac{1}{2}'\times2\frac{1}{2}'$ and $S_3=2\frac{1}{2}'\times3'$.

(2) 3 dates of sowing : $D_1=15.5.1954$, $D_2=31.5.1954$ and $D_3=23.6.1954$.

(3) 3 levels of irrigation : $I_0=$No irrigation, $I_1=1$ irrigation in the middle of October 1954 and $I_2=I_1+$ one irrigation in the middle of November 1954.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 1/19.4 ac. (b) 1/96.4 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of cotton. (iv) (a) 1954—1956. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) The expt. was supposed to be laid out in 3^3 confd. design. But due to incorrect allotment of treatments to different blocks, it is analysed as fact. in R.B.D.

5. RESULTS :

(i) 880 lb./ac. (ii) 79.8 lb./ac. (iii) Main effect of D and I×S interaction are highly significant while main effect of S and D×I interaction are significant. (iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	Mean		I_0	I_1	I_2
S_1	1244	1174	267	895		679	951	1055
S_2	1396	1139	291	942		999	890	937
S_3	1228	1007	176	804		910	879	622
Mean	1289	1107	245	880		863	907	871
I_0	1140	1170	279					
I_1	1364	1135	221					
I_2	1364	1015	235					

S.E. of any marginal mean   = 26.6 lb./ac.

S.E. of body of any table   = 46 1 lb./ac.

Crop :- Cotton.

Site :- Govt. Res. Farm, Khandwa.

Ref :- M.P. 55(36).

Type :- 'IC'.

Object :—To study the effect of different dates of sowing and spacings at different levels of irrigation on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sugarcane ratoon. (c) N.A. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Khandwa. (iii) As per treatments. (iv) (a) 1 ploughing and 4 *bakherings*. (b) Dibbling. (c) N.A. (d) As per treatments. (e) N.A. (v) 40 lb./ac. of N as F.Y.M.+20 lb./ac. of N as A/S. (vi) Bhaj 0394 (medium). (vii) As per treatments. (viii) N.A. (ix) 37.20". (x) 3 pickings on 28.10.1955 and 25.1.1955.

2. TREATMENTS :

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

(1) 3 spacings : $S_1 = 2\frac{1}{2}' \times 2'$, $S_2 = 2\frac{1}{2}' \times 2\frac{1}{2}'$ and $S_3 = 2\frac{1}{2}' \times 3'$.

(2) 3 dates of sowing : $D_1 = 15.5.1955$, $D_2 = 31.5.1955$ and $D_3 = 4.7.1955$.

(3) 3 levels of irrigation : $I_0 =$ No irrigation, $I_1 = 1$ and $I_2 = 2$ irrigations.

3. DESIGN :

(i) 3^3 fact. confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) $25' \times 45'$. (b) $15' \times 33'$. (v) 5' alround the plot. (vi) Yes.

4. GENERAL :

Same as in expt. no 54(106) on page 479.

5. RESULTS :

(i) 670 lb./ac. (ii) 65.8 lb./ac. (iii) Main effect of D is highly significant. $S \times D$ interaction is significant. (iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	Mean	I_0	I_1	I_2
S_1	649	757	810	739	687	804	726
S_2	573	812	484	623	597	615	657
S_3	716	760	470	649	660	657	630
Mean	646	776	588	670	648	692	671
I_0	612	768	564				
I_1	631	795	650				
I_2	695	765	552				

S.E. of any marginal mean = 21.9 lb./ac.
S.E. of body of any table = 38.0 lb./ac.

Crop :- Cotton.

Site :- Govt. Res. Farm, Khandwa.

Ref :- M.P. 56(39).

Type :- 'IC'.

Object :—To study the effect of different dates of sowing and spacings at different levels of irrigation on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sugarcane. (c) F.Y.M. at 30 C.L./ac.+448 lb./ac. of A/S. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Khandwa. (iii) As per treatments. (iv) (a) 1 ploughing and 5 *bakherings*. (b) Seeds dibbled. (c) N.A. (d) As per treatments. (e) N.A. (v) 40 lb./ac. of N as F.Y.M.+20 lb./ac. of N as A/S. (vi) *Busi* - 0394 (medium). (vii) As per treatments. (viii) N.A. (ix) 26.74". (x) N.A.

2. TREATMENTS :

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

(1) 3 spacings : $S_1 = 2\frac{1}{2}' \times 2'$, $S_2 = 2\frac{1}{2}' \times 2\frac{1}{2}'$ and $S_3 = 2\frac{1}{2}' \times 3'$.

(2) 3 dates of sowing : $D_1 = 15.5.1956$. $D_2 = 31.5.1956$ and $D_3 = 19.6.1956$.

(3) 3 levels of irrigation : $I_0 =$ No irrigation, $I_1 = 1$ and $I_2 = 2$ irrigations.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 55(36) on page 479.

5. RESULTS:

(i) 1332 lb./ac. (ii) 122.5 lb./ac. (iii) Main effect of D alone is highly significant. (iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	Mean	I_0	I_1	I_2
S_1	1968	1315	984	1422	1283	1388	1595
S_2	1614	1323	920	1286	1275	1412	1171
S_3	1815	1178	871	1288	1218	1363	1283
Mean	1799	1272	925	1332	1259	1388	1350
I_1	1638	1250	889				
I_2	1880	1226	1058				
I_3	1879	1340	830				

S.E. of any marginal mean = 40.8 lb./ac.
S.E. of body of any table = 70.7 lb./ac.

Crop :- Cotton *(Kharif).*   **Ref :- M.P. 55(61).**

Site :- Govt. Res. Farm, Khandwa.   **Type :- CMVI.**

Object :—To study the effect of varieties manurial doses sowing period and irrigation and spacing on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) *Morand.* (b) Refer soil analysis, Khandwa. (iii) As per treatments. (iv) (a) 3 *bakherings* one ploughing. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) and (vii) As per treatments. (viii) 5 hoeings and 2 weedings. (ix) N.A. (x) 4 pickings on 24.10.1955, 11.11.1955, 15.12. 955 and 24.1.1956.

2. TREATMENTS :

Main-plot treatments :
All combinations of (1), (2) and (3)
    (1) 2 irrigations : I_0=No irrigation and I_1=Post monsoon irrigation.
    (2) 2 sowing dates : D_1=Pre monsoon sowing on 4, 5.6.1955 and D_2=Normal sowing on 4, 5.7.1955.
    (3) 3 levels of N as A/S : N_0=0, N_1=40 and N_2=80 lb./ac.
Sub-plot treatments :
    2 varieties : V_1=H 420 *(desi)* and V_2=0394 American.
Sub-Sub-plot treatments :
    3 spacings for H 420 : S_1=18″×9″, S_2=18″×18″, S_3=27″×18″ and Spacing for 0394 : S_1=2′×1′, S_2=2′×2′ and S_3=2′×3′.

3. DESIGN :

(i) Split-ptot. (ii) (a) 12 main-plots/replication ; 3 sub-plots/main-plot ; 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) 36′×18′. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) to (iv) Av. yield of cotton in lb./ac.

Treatment	I_0	I_1	D_1	D_2	N_0	N_1	N_2
Av. yield	274	294	339	228	278	291	285

    S.E./mean = 15.10 lb./ac.   12.33 lb./ac.

Treatment	V_1	V_2	S_1	S_2	S_3
Av. yield	270	298	281	271	301

    S.E./mean = 13.57 lb./ac.   5.2 lb./ac.

Crop :- Groundnut *(Kharif)*.　　　　　　　**Ref :- M.P. 54(116).**

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

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

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Linseed. (c) A/S and Super. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 1.7.1954/N.A. (iv) (a) One *bakhering*. (b) Drilling. (c) N.A. (d) Row to row 14". (e) N.A. (v) Nil. (vi) A/S—12—24. (vii) Unirrigated. (viii) 1 interculture and 3 hand weedings. (ix) 52.23". (x) 29.10.1954.

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 Farm-compost : F_0=Without farm compost and F_1=With farm compost.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 35'×14'. (b) 30'×9½'. (v) 2½'×2½'. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of groundnut-pods. (iv) (a) 1951—1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Heavy rains in September. (vii) Nil.

5. **RESULTS :**

(i) 803 lb./ac. (ii) 112.1 lb./ac. (iii) Only P effect is significant. (iv) Av yield of grain in lb./ac.

	P_0	P_1	Mean	F_0	F_1
N_0	717	820	769	730	807
N_1	786	887	837	824	850
Mean	752	854	803	777	828
F_0	719	834			
F_1	784	873			

S.E. of any marginal mean　　= 28.0 lb./ac.
S.E. of body of any table　　= 39.6 lb./ac.

————

Crop :- Groundnut *(Kharif)*.　　　　　　　**Ref :- M.P. 55(90).**

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

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

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) N.A. (iv) (a) *bakherings*. (b) Drilling. (c) N.A. (d) Row to row 14". (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 42.05". (x) N.A.

2. **TREATMENTS :**

Same as in expt. no. 54(116) above.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 45'×14'. (b) 40'×9½'. (v) 2½'×2½'. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Yield of pods. (iv) (a) 1951—1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vi) Nil.

5. RESULTS :

(i) 327 lb./ac. (ii) 88.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of pods in lb./ac.

	P_0	P_1	Mean	F_0	F_1
N_0	302	348	350	305	395
N_1	332	274	303.	311	295
Mean	342	311	327	308	345
F_0	326	290			
F_1	358	332			

S.E. of any marginal mean   = 25.5 lb./ac.
S.E. of the body of any table   = 36.1 lb./ac.

Crop :- Groundnut *(Kharif)*.   Ref :- M.P. 57(47).

Site :- Govt. Agri. Res. Stn., Jhabua.   Type :- 'M'.

Object :—To find out the most suitable combination of N, P and K for Groundnut.

1. BASAL CONDITIONS :

(i) 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 as Super : P_0=0, P_1=20 and P_2=40 lb./ac.
     (3) 3 levels of K_2O : K_0=0, K_1=20 and K_2=40 lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 32'×17'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of pods. (iv) (a) 1957—1959. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 797 lb./ac. (ii) 260.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of pods in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	697	931	752	793	916	706	759
N_1	939	812	824	858	789	878	909
N_2	550	765	901	739	669	871	677
Mean	729	836	826	797	791	818	782
K_0	756	657	961				
K_1	814	862	777				
K_2	617	989	739				

S.E. of any marginal mean = 86.9 lb./ac.
S.E. of body of any table = 150.6 lb./ac.

———

Crop :- Groundnut *(Kharif).*   **Ref :- M.P. 58(26).**

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

Object :—To find out the most suitable combination of N, P and K for Groundnut.

1. **BASAL CONDITIONS :**

   (i) to (x) N.A.

2. **TREATMENTS :**

   Same as in expt. no. 57(47) on page 483.

3. **DESIGN :**

   (i) 3^3 confd. (ii) (a) 9. (b) N.A. (iii) 2. (iv) (a) N.A. (b) $24' \times 12'$. (v) and (vi) N.A.

4. **GENERAL :**

   (i) and (ii) N.A. (iii) Yield of pods. (iv) (a) 1957—1959. (b) and (c) N.A. (v) to (vii) N.A.

5. **RESULTS :**

   (i) 508 lb./ac. (ii) 160.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of pods in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	453	504	567	508	529	504	492
N_1	453	618	466	512	429	668	441
N_2	416	580	517	504	517	441	555
Mean	441	567	517	508	492	538	495
K_0	416	555	504				
K_1	453	580	580				
K_2	453	567	466				

S.E. of any marginal mean = 37.8 lb./ac.
S.E. of body of any table = 65.5 lb./ac.

———

Crop :- Groundnut *(Kharif).*   **Ref :- M.P. 59(20).**

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

Object :—To find out the most suitable combination of N, P and K for Groundnut.

1. **BASAL CONDITIONS :**

   (i) to (x) N.A.

2. **TREATMENTS to 4. GENERAL :**

   Same as in expt. no. 58(26) above.

5. **RESULTS :**

   (i) 556 lb./ac. (ii) 74.2 lb./ac. (iii) Effect due to N, P and K, interaction $N \times P$, $P \times K$ and $N \times P \times K$ are highly significant. Interaction $N \times K$ is significant. (iv) Av. yield of pods in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	504	479	542	508	479	517	529
N_1	479	504	542	508	479	466	580
N_2	479	567	907	651	580	567	807
Mean	487	517	664	556	513	517	639
K_0	492	492	555				
K_1	479	492	580				
K_2	492	567	857				

S.E. of any marginal mean   = 17.5 lb./ac.
S.E. of body of any table   = 30.3 lb./ac.

———

Crop :- Groundnut *(Kharif)*.   **Ref :- M.P. 57(77).**

Site :- Reg. Res. Stn., Khargone.   **Type :- 'M'.**

Object :—To find the most suitable combination of N, P and K for Groundnut.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 5.7.1957. (iv) (a) Summer ploughing and 2 harrowings. (b) Drilling. (c) 60 lb./ac. (d) 16"×6" to 8". (e) N.A. (v) Nil. (vi) AK. 12—24. (vii) Unirrigated. (viii) 2 hand weedings and 2 earthings. (ix) 17.79". (x) 20 to 24.10.1957.

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 : $P_0=0$, $P_1=30$ and $P_2=60$ lb./ac.
   (3) 3 levels of K_2O as Mur. Pot. : $K_0=0$, $K_1=20$ and $K_2=40$ lb./ac.

3. **DESIGN :**

   (i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) and (b) 24'×45'. (v) Nil. (vi) Yes.

4. **GENERAL :**

   (i) Satisfactory. (ii) Nil. (iii) N.A. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) Jhabua. (b) N.A. (vi) N.A. (vii) Nil.

5. **RESULTS :**

   (i) 1124 lb./ac. (ii) 126.5 lb./ac. (iii) Main effect of K and interactions N×K, N×P and N×P×K are highly significant. (iv) Av. yield of groundnut in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	1113	1123	1035	1090	1008	1211	1052
N_1	1124	1132	1186	1147	1100	1235	1107
N_2	1075	1207	1125	1136	1169	1099	1139
Mean	1104	1154	1115	1124	1092	1182	1099
K_0	1066	1054	1157				
K_1	1239	1259	1046				
K_2	1007	1148	1143				

| | | | S.E. of any marginal mean | = 29.8 lb./ac. |
| | | | S.E. of body of any table | = 51.6 lb./ac. |

Crop :- Groundnut *(Kharif)*.

Site :- Reg. Res. Stn., Khargone.

Ref :- M.P. 58(91).

Type :- 'M'.

Object :—To find the most suitable combination of N, P and K for Groundnut.

1. **BASAL CONDITIONS :**

   (i) (a) to (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 7.7.1958/N.A. (iv) (a) Summer ploughing and 2 harrowings. (b) Drilling. (c) 60 lb./ac. (d) 16"×6" to 8". (e) N.A. (v) Nil. (vi) AK. 12—24 (vii) Unirrigated. (viii) N.A. (ix) 27.83". (x) 27.10.1958 to 14.11.1958.

2. **TREATMENTS :**

   Same as in expt. no. 57(77) on page 485.

3. **DESIGN :**

   (i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 32'×26.6'. (b) 30'×24'. (v) 1'×1.3'. (vi) Yes.

4. **GENERAL :**

   (i) Fair. (ii) Nil. (iii) N.A. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) Jhabua. (b) N.A. (vi) N.A. (vii) Nil.

5. **RESULTS :**

   (i) 877 lb./ac. (ii) 140.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of pods in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	775	838	833	815	815	886	745
N_1	915	873	893	894	875	878	928
N_2	908	835	1025	923	909	945	914
Mean	866	849	917	877	866	903	862
K_0	865	853	880				
K_1	851	911	946				
K_2	882	782	924				

| | | S.E. of any marginal mean | = 33.2 lb./ac. |
| | | S.E. of body of any table | = 57.5 lb./ac. |

Crop :- Groundnut *(Kharif)*.

Site :- Reg. Res. Stn., Khargone.

Ref :- M.P. 59(91).

Type :- 'M'.

Object :—To find the most suitable combination of N, P and K for Groundnut.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Cotton. (c) 20 lb./ac. of N as A/S. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 8.7.1959. (iv) (a) Summer ploughing and 2 harrowings. (b) Drilling. (c) 60 lb./ac. (d) 16"×6" to 8". (e) N.A. (v) Nil. (vi) AK 12—24. (vii) Unirrigated. (viii) 2 hand weedings and 1 hoeing. (ix) 27.0". (x) 3 to 10.11.1959.

2. **TREATMENTS :**

   Same as in expt. no. 57(77) on page 485.

3. **DESIGN :**

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) $36' \times 24'$. (b) $30' \times 18'$. (v) $3' \times 3'$. (vi) Yes.

4. **GENERAL :**

(i) Poor. (ii) Aphids and *tikka* disease—No control measures taken. (iii) Germination stand, wt. of 100 pods and yield of pods. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) Jhabua. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 767 lb./ac. (ii) 175.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of pods in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	715	718	749	727	764	677	741
N_1	886	679	877	813	874	788	778
N_2	802	820	662	761	752	712	820
Mean	801	738	762	767	796	726	780
K_0	877	781	731				
K_1	687	691	800				
K_2	839	743	757				

S.E. of any marginal mean = 41.4 lb./ac.

S.E. of body of any table = 71.8 lb./ac.

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Crop :- Groundnut *(Khairf)*.   **Ref :- M.P. 58(13).**

Site :- Govt. Seed and Demons. Farm, Mahagarh.   **Type :- 'M'.**

Object :—To find out most suitable combination of N, P and K for Groundnut.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black cotton soil. (b) Refer soil analysis Mahagarh. (iii) 17.7.1958. (iv) (a) 3 ploughings. (b) By *desi* seed drill. (c) to (e) N.A. (v) Nil. (vi) AK.—12—24. (vii) N.A. (viii) 1 Interculturing. (ix) N.A. (x) 28.10.1958.

2. **TREATMENTS :**

Same as in expt. no. 57 (77) on page 485.

3. **DESIGN :**

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 bloks/replication. (b) N.A. (iii) 2. (iv) (a) $36' \times 25\frac{1}{2}'$. (b) $33' \times 22\frac{1}{2}'$. (v) $1\frac{1}{2}' \times 1\frac{1}{2}'$. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of pods. (iv) (a) 1958—N.A. (b) N.A. (c) Nil. (v) (a) Jhabua and Khargone. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 1039 lb./ac. (ii) 181.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of pods in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	963	997	1085	1015	1002	1027	1017
N_1	958	1027	1105	1030	939	1144	1007
N_2	1017	1079	1120	1072	1051	1154	1010
Mean	979	1034	1103	1039	997	1108	1011
K_0	978	948	1066				
K_1	1080	1080	1164				
K_2	880	1074	1080				

S.E. of any marginal mean = 42.8 lb./ac.
S.E. of body of any table = 73.9 lb./ac.

Crop :- Groundnut *(Kharif)*.   **Ref :- M.P. 59(7).**

Site :- Govt. Seed and Demons. Farm, Mahagarh.   **Type :- 'M'.**

Object :—To find out the most suitable combination of N, P and K for Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) N.A. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Mahagarh. (iii) 7.7.1959/N.A. (iv) (a) N.A. (b) By *desi* seed drill. (c) to (e) N.A. (v) Nil. (vi) AK.—12—24. (vii) to (ix) N.A. (x) 17.10.1959.

2. TREATMENTS :

Same as in expt. no. 57 (47) on page 483.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/black ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 36'×24'. (b) 30'×18'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) and (iii) N.A. (ii) Plant population and yield of pods. (iv) (a) 1958—N.A. (b) N.A. (c) Nil. (v) (a) Jhabua and Khargone. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 685 lb./ac. (ii) 180.3 lb./ac. (iii) Only P effect is significant. (iv) Av. yield of pods in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	610	740	806	719	713	756	687
N_1	541	755	834	710	760	644	726
N_2	628	630	619	626	761	580	535
Mean	593	708	753	685	745	660	649
K_0	656	704	874				
K_1	623	619	739				
K_2	501	802	649				

S.E. of any marginal mean = 42.5 lb./ac.
S.E. of body of any table = 72.5 lb./ac.

Crop :- Groundnut.   **Ref :- M.P. 57(SFT).**

Centre :- Indore (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) Medium black soil.   (iii) Nil.   (iv) and (v) N.A.   (vi) July, 1957.   (vii) to (ix) N.A.
(x) November, 1957.

2. TREATMENTS :

0 = Control (no manuure).
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) The district has been divided into four agriculturally homogeneous zones and one field assistant
has been posted in each zone. The field assistant conducts the trials in one revenue circle or thana in the
zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required
to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crops, 4 on an oilseed crop
and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of
type B on crops other the legumes. The three trials on legumes are of type C. Residual effects of phos
phate 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 villagers in each of the
4 zones at the rate of one experiment per village.   (iii) (a) N.A.   (b) 1/80 ac.   (iv) Yes.

4. GENERAL :

(i) Normal.   (ii) Nil.   (iii) Pod yield.   (iv) (a) No.   (b) and (c) —.   (v) As per design.   (vi) and (vii) Nil.

5. RESULTS .

Treatment	0	n_1	n_2	n_1'	n_2'
Av. yield	1300	1967	2345	1670	2205

G.M. = 1897 lb./ac.   S.E. = 108.8 lb./ac. and no. of trials = 10.

Crop :- Groundnut. *(Kharif).*   **Ref :- M.P. 57(76).**

Site :- Reg. Res. Stn. Khargone.   **Type :- 'C'.**

Object :—To find out most suitable seed rate and row spacing for Groundnut.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A.   (ii) Medium black cotton soil.   (b) N.A.   (iii) 6.7.1957./—   (iv) (a) Summer ploughing
and harrowing twice.   (b) Drilling.   (c) and (d) As per treatments.   (e) N.A.   (v) N.A.   (vi) A.K.—12—24.
(vii) Unirrigated.   (viii) 2 earthings and weedings.   (ix) 17.79".   (x) 24 to 30.10.1957.

2. TREATMENTS :

Main-plot treatments :
       4 row spacings : $S_1 = 15"$, $S_2 = 18"$. $S_3 = 24"$ and $S_4 = 30"$.

Sub-plot treatments :
       5 seed rates : $R_1 = 15$, $R_2 = 20$, $R_3 = 25$, $R_4 = 30$ and $R_5 = 35$ srs./ac.

3. DESIGN :

(i) Split-plot.   (ii) (a) 4 main-plots/replication ; 5 sub-plots/main-plot.   (b) N.A.   (iii) 3.   (iv) (a) and (b)
36'×20'.   (v) Nil.   (vi) Yes.

4. GENERAL :

(4) Satisfactory.   (ii) N.A.   (iii) Yield of pods.   (iv) (a) 1957—1959.   (b) No.   (c) Nil.   (v) (a) and (b)
N.A.   (vi) Nil.   (vii) Treatments changed year to year.

5. RESULTS :

(i) 918 lb./ac. (ii) (a) 178.6 lb./ac. (b) 222.3 lb./ac.. (iii) Main effects of S and R alone are significant. (vi) Av. yield of pods in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean
S_1	909	846	1265	1132	931	1017
S_2	990	954	1102	1020	923	998
S_3	490	783	876	828	972	790
S_4	738	622	1001	985	986	866
Mean	782	801	1061	991	953	918

S.E. of difference of two

1. S marginal means   = 65.2 lb./ac.
2. R marginal means   = 90.8 lb./ac.
3. R means at the same level of S   = 181.5 lb./ac.
4. S means at the same level of R   = 175.0 lb./ac.

Crop :- Groundnut *(Kharif)*.   **Ref :- M.P. 58(90).**

Site :- Reg. Res. Stn., Khargone.   **Type :- 'C'.**

Object :—To find out most suitable seed rate and row spacing for Groundnut.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 2, 3.7.1958. (iv) (a) Summer ploughing and harrowing twice. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) A.K.—12—24. (vii) Unirrigated. (viii) N.A. (ix) 27.83". (x) 17 to 27.10.1958.

2. TREATMENTS :

Main-plot treatments
     3 row spacings : $S_1=16"$, $S_2=24"$ and $S_3=30"$.
Sub-plot treatments
     5 seed rates : $R_1=15$, $R_2=20$, $R_3=25$, $R_4=30$ and $R_5=35$ srs./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $38'\times22\frac{1}{2}'$. (b) $36'\times17\frac{1}{2}'$. (v) $1'\times2\frac{1}{2}'$. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Yield of pods. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Treatments modified from year to year.

5. RESULTS :

(i) 699 lb./ac. (ii) (a) 176.3 lb./ac. (b) 122.2 lb./ac. (iii) Main effect. of R and interaction S x R are highly significant, while main effect of S is significant. (iv) Av. yield of pods in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean
S_1	547	774	903	1122	761	822
S_2	607	574	563	711	608	613
S_3	426	614	610	778	894	664
Mean	527	654	693	871	754	699

S.E. of difference of two

1. S marginal means   = 55.8 lb./ac.
2. R marginal means   = 49.9 lb./ac.
3. R means at the same level of S   = 86.4 lb./ac.
4. S means at same level of R   = 95.3 lb./ac.

Crop :- Groundnut *(Kharif)*.   **Ref :- M.P. 59(90).**

Site :- Reg. Res. Stn., Khargone.   **Type :- 'C'.**

Object :—To find out most suitable seed rate and row spacing for Groundnut.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) *Urid* and *Moong*. (c) Nil. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 7.7.1959. (iv) (a) 2 summer ploughings and harrowings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) AK.—12—24. (vii) Unirrigated. (vii) 2 hand weedings. (ix) 27.00". (x) 24 to 30.10.1959.

2. **TREATMENTS :**

All combinations of (1) and (2)
  (1) 3 row spacings : $S_1=12"$, $S_2=18"$ and $S_3=24"$.
  (2) 5 seed rates : $R_1=20$, $R_2=25$, $R_3=30$, $R_4=35$ and $R_5=40$ srs./ac.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 36'×24'. (b) 30'×18'. (v) 3'×3'. (vi) Yes.

4. **GENERAL :**

(i) Poor. (ii) *Tikka* disease and Aphid attack—No control measures taken. (iii) Germination Stand, weight of 100 pods and yield of pods (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 1041 lb./ac. (ii) 253.3 lb./ac. (iii) Main effect *of R alone is highly significant.* (iv) Av. yield of pods in lb./ac.

	R₁	R₂	R₃	R₄	R₅	Mean
S_1	686	882	989	1253	1022	966
S_2	869	1065	1059	1189	1196	1076
S_3	896	954	1011	1083	1457	1080
Mean	817	967	1020	1175	1225	1041

S.E. of R marginal mean   = 73.4 lb /ac.
S.E. of S marginal mean   = 56.5 lb./ac.
S.E. of body of table   = 126.6 lb./ac.

Crop :- Groundnut *(Kharif)*.   **Ref :- M.P. 57(38).**

Site :- Govt. Seed. Demons. Farm, Mahagarh.   **Type :- 'C'.**

Object :—To find out suitable spacing and seed rate for Groundnut.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Mahagarh. (iii) N.A. (iv) (a) 3 ploughings. (b) Drilling (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) AK.—12—24. (vii) Unirrigated. (viii) 1 interculture by *khurpi*. (ix) and (x) N A.

2. TREATMENTS :

Main-plot treatments

4 row spacings : $S_1=12''$, $S_2=18''$, $S_3=24''$ and $S_4=30''$.

Sub-plot treatments

5 seed rates : $R_1=15$, $R_2=20$, $R_3=25$, $R_4=30$ and $R_5=35$ srs./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication, 5 sub-plots/main-plot. (b) N.A (iii) 4. (iv) (a) and (b) $21'\times42'$. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Yield of pods. (iv) (a) 1957—1958. (b) No. (b) Nil. (v) (a) Khargone. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 463 lb./ac. (ii) (a) 109.9 lb./ac. (b) 68.9 lb./ac. (iii) Main effect of R alone is highly significant. (iv) Av. yield of pods in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean
S_1	455	481	459	485	498	476
S_2	399	436	516	457	494	460
S_3	490	469	483	562	541	509
S_4	333	399	418	440	440	406
Mean	419	446	469	486	493	463

S.E. of difference of two

1,	S marginal means	=	34.8 lb./ac.
2.	R marginal means	=	24.4 lb./ac.
3.	R means at the same level of S	=	48.8 lb./ac.
4.	S means at the same level of R	=	55.7 lb./ac.

Crop :-Groundnut *(Kharif)*.

Ref :- M.P. 58(12).

Site :- Govt. Seed and Demons. Farm, Mahagarh.

Type :- 'C'.

Object :—To find out suitable seed rate and spacing for Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Mahagarh. (iii) 13.7.1958. (iv) (a) 3 ploughings. (b) By *desi* seed drill. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) AK.—12—24. (vii) Unirrigated. (viii) Interculture by *desi khurpi*. (ix) N.A. (x) 30.10.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 57(38) on page 491.

5. RESULTS :

(i) 637 lb./ac. (ii) (a) 180.0 lb./ac. (b) 161.7 lb./ac. (iii) Main effect of R alone is highly significant. (iv) Av. yield of pods in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean
S_1	579	770	594	579	718	648
S_2	528	696	718	667	858	693
S_3	498	521	718	814	748	660
S_4	557	476	586	491	616	545
Mean	541	616	654	638	735	637

S.E. difference of two

1. S marginal means   = 56.9 lb./ac.
2. R marginal means   = 57.2 lb./ac.
3. R means at the same level of S   = 114.4 lb./ac.
4. S means at the same level of R   = 117.0 lb./ac.

Crop :- Groundnut *(Kharif).*   **Ref :- M.P. 57(58)**

Site :- Govt. Soil. Cons. Res. Stn., Phanda.   **Type :- 'C'.**

Object :—To find out suitable spacing for Groundnut.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Dibbling. (c) N.A. (d) As per treatments. (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 34.6". (x) 26.11.1957.

2. TREATMENTS :

3 spacings : $S_1 = 9'' \times 6''$, $S_2 = 12'' \times 9''$ and $S_3 = 15'' \times 12''$.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) $49' \times 37'$. (iii) 2. (iv) (a) $37' \times 15'$. (b) $33' \times 11'$. (v) $2' \times 2'$. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Height, no. of shoots and yield of pods. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 856 lb./ac. (ii) 186.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	S_1	S_2	S_3
Av. yield	887	957	725

S.E./mean = 131.6 lb./ac.

Crop :- Groundnut *(Kharif).*   **Ref :- M.P. 57(59).**

Site :- Govt. Soil Cons. Res. Stn., Phanda.   **Type :- 'C'.**

Object :—To find out optimum seed rate for unirrigated Groundnut crop.

1. BASAL CONDITIONS :

(i) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 28.6.1957. (iv) (a) *Bakhering.* (b Dibbling. (c) As per treatments. (d) and (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) 2 weedings. (ix) 34.6". (x) 29.11.1957.

2. TREATMENTS :

3 seed rates : $R_1 = 15$, $R_2 = 25$ and $R_3 = 35$ srs./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) $82' \times 37'$. (iii) 4. (iv) (a) $37' \times 26'$. (b) $33' \times 22'$. (v) $2' \times 2'$. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Height, no. of shoots and yield of pods. (iv) (a) 1957—1958. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Crop was damaged by wild animals to some extent.

5. RESULTS :

(i) 184 lb./ac. (ii) 186.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	R_1	R_2	R_3
Av. yield	320	131	100

S.E./mean $=$ 93.4 lb./ac.

Crop :- Groundnut *(Kharif)*. **Ref :- M.P. 58(68).**

Site :- Govt. Soil Cons. Res. Stn., Phanda. **Type :- 'C'.**

Object :—To find out optimum seed rate for unirrigated Groundnut crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 30.7.1958—N.A. (iv) (a) *Bakhering.* (b) Dibbling. (c) As per treatments. (d) and (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) 3 weedings and 1 earthing. (ix) 48.36". (x) 1.12.1958.

2. TREATMENTS :

3 seed rates : $R_1=20$, $R_2=30$ and $R_3=40$ srs./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 82'×37'. (iii) 4. (iv) (a) 37'×26'. (b) 33'×22'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Height, no. of shoots and yield of pods. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 756 lb./ac. (ii) 113.1 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of pods in lb./ac.

Treatment	R_1	R_2	R_3
Av. yield	615	779	875

S.E./mean $=$ 56.5 lb./ac.

Crop :- Groundnut. **Ref :- M.P. 57(10).**

Site :- Agri. Exptl. Farm, Vidisha. **Type :- 'C'.**

Object :—To find out suitable spacing and seed rate for Groundnut crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar.* (c) Nil. (ii) (a) Heavy clay soil. (b) N.A. (iii) 17.7.1957. (iv) (a) Tractorised. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) A.K.—12×24. (vii) Unirrigated. (viii) Weeding. (ix) 23 61". (x) 6.11.1957.

2. TREATMENTS :

Same as in expt. no. 57(38) on page 491.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 33'×33'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Medium (ii) *Tikka* disease. (iii) Yield of pods. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) (a) Mahagarh. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 589 lb./ac. (ii) (a) 92.8 lb./ac. (b) 53.2 lb./ac. (iii) All the effects are highly significant. (iv) Av. yield of pods in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean
S_1	444	492	558	522	528	509
S_2	450	444	582	666	720	572
S_3	408	528	744	702	690	614
S_4	432	684	696	756	738	661
Mean	433	537	645	662	669	589

S.E. of difference of two
1. S marginal means = 29.3 lb./ac.
2. R marginal means = 18.8 lb./ac.
3. R means at the same level of S = 37.6 lb./ae.
4. S means at the same level of R = 44.7 lb./ac.

Crop :- Groundnut *(Kharif).*　　　　　**Ref :- M.P. 58(35).**

Site :- Govt. Exptl. Farm, Vidisha.　　　　**Type :- 'C'.**

Object :—To find out most suitable spacing and seed rate for Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar.* (c) N.A. (ii) (a) Heavy clay. (b) N.A. (iii) 20.7.1958. (iv) (a) 2 *bakherings.* (b) Line sowing. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) A. K. 12—24. (vii) Unirrigated. (viii) Weeding and earthing. (ix) 49.98". (x) 2.11.1958.

2. TREATMENTS :

Main-plot treatments :
　3 row spacings : S_1=18", S_2=24" and S_3=30".
Sub-plot treatments :
　4 seed rates : R_1=25, R_2=30, R_3=35 and R_4=40 srs./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 33'×33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of pods. (iv) (a) 1957—1958. (b) No. (c) N.A. (v) (a) Mahagarh. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 638 lb./ac. (ii) (a) 126.4 lb./ac. (b) 134.4 lb./ac. (iii) No effect is significant. (iv) Av. yield of pods in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_1	640	665	615	735	664
S_2	570	490	715	710	621
S_3	695	615	620	585	629
Mean	635	590	650	677	638

S.E. of difference of two
1. S marginal means = 44.7 lb./ac.
2. R marginal means = 54.9 lb./ac.
3. R means at the same level of S = 95.1 lb./ac.
4. S means at the same level of R = 93.7 lb./ac.

Crop :- Groundnut *(Kharif).* **Ref :- M.P. 59(6).**

Site :- Govt. Seed and Demons. Farm, Mahagarh. **Type :- 'CM'.**

Object :—To find out suitable seed rate and spacing under different levels of N on the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Jowar. (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 6.7.1959. (iv) (a) 3 ploughings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) AK.—12—24. (vii) Unirrigated. (viii) and (ix) N.A. (x) 17.11.1959.

2. TREATMENTS :

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

(1) 3 row spacings : $S_1 = 12''$, $S_2 = 18''$ and $S_3 = 24''$.
(2) 3 seed rates : $R_1 = 30$, $R_2 = 35$ and $R_3 = 40$ srs/ac.
(3) 3 levels of N as A/S : $N_0 = 0$, $N_1 = 20$ and $N_2 = 40$ lb./ac.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) $36' \times 24'$. (b) $30' \times 18'$. (v) $3' \times 3'$. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Plant population and pod yield. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 389 lb./ac. (ii) 118.5 lb./ac (iii) No effect is significant. (iv) Av. yield of pods in lb./ac.

	R_1	R_2	R_3	Mean	N_0	N_1	N_2
S_1	425	407	479	437	373	415	523
S_2	349	377	405	377	352	419	360
S_3	320	375	368	354	397	376	291
Mean	365	386	417	389	374	403	391
N_0	325	370	427				
N_1	398	385	427				
N_2	371	403	398				

S.E. of any marginal mean = 27.9 lb./ac.
S.E. of body of any table = 48.4 lb./ac.

———

Crop :- Linseed *(Rabi).* **Ref :- M.P. 59(2).**

Site :- Govt. Agri. Res. Farm, Adhertal (Jabalpur). **Type :- 'M'.**

Object :—To find out suitable manurial schedule for Linseed.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 10 lb./ac. of N as A/S+10 lb./ac. of P_2O_5 as Super. (ii) (a) *Kahar* II. (b) N.A. (iii) 11.11.1959. (iv) (a) *Bakhering* and Reja cutting. (b) Drilled by *nari*. (c) 20 ib./ac. (d) Between lines 12". (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Nil. (ix) 62.1". (x) 24.3.1960.

2. TREATMENTS .

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0 = 0$, $N_1 = 7\frac{1}{2}$ and $N_2 = 15$ lb./ac.
(2) 2 levels of P_2O_5 as Super : $P_0 = 0$ and $P_1 = 10$ lb./ac.

Manures were drilled along with the seed.

3. DESIGN :

    (i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 36'3"×15'. (b) 33'5"×13'. (v) 17"×1'. (vi) Yes.

4. GENERAL :

    (i) Good. (ii) Nil. (iii) Yield of linseed. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) Kuthulia, Mahagarh, Ujjain, Nabibagh and Vidisha. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

    (i) 469 lb./ac. (ii) 105.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of linseed in lb./ac.

	N_0	N_1	N_2	Mean
P_0	464	360	518	447
P_1	463	498	509	490
Mean	464	429	514	469

S.E. of N marginal mean = 30.4 lb./ac.
S.E. of P marginal mean = 24.8 lb./ac.
S.E. of body of table = 43.0 lb./ac.

Crop :- Linseed *(Rabi).*　　　　　　**Ref :- M.P. 59(71).**

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

Object :—To find suitable manurial schedule for Linseed.

1. BASAL CONDITIONS :

    (i) (a) Nil. (b) Gram. (c) Nil. (iii) *Kanhar*—II. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings by *deshi* plough. (b) Seed drilled by plough. (c) 20 lb./ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) R. 55. (vii) Unirrigated. (viii) Nil. (ix) 8.29". (x) 20.2.1960.

2. TREATMENTS :

    All combinations of (1) and (2)
        (1) 2 levels of N as A/S : $N_0=0$ and $N_1=12$ lb./ac.
        (2) 2 levels of P_2O_5 as Super . $P_0=0$ and $P_1=10$ lb./ac.

3. DESIGN :

    (i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 14'×40'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

    (i) 136 lb./ac. (ii) 18.1 lb./ac. (iii) Main effects of N and P alone are highly significant. (iv) Av. yield of inseed in lb./ac.

	P_0	P_1	Mean
N_0	88	97	92
N_1	165	194	180
Mean	126	146	136

S.E. of any marginal mean = 4.52 lb./ac.
S.E. of body of table = 6.39 lb./ac.

Crop :- Linseed. **Ref :- M.P. 56(15).**

Site :- Agri. College Farm, Gwailor. **Type :- 'M'.**

Object :—To study the effect of different levels of N, P and borax on the yield of Linseed.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) *Jowar+Guar.* (c) Nil. (ii) (a) Light sandy lonm. (b) N.A. (iii) 1.11.1956. (iv) (a) Prepartion of the seed bed. (b) Drilling. (c) 10 srs./ac. (d) Rows 18″ apart. (e) N.A. (v) Nil. (vi) Type—1. (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 8.38″. (x) 13.4.1957.

2. **TREATMENTS :**

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

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

      (2) 2 levels of P_2O_5 as Super : $P_0=0$, and $P_1=60$ lb./ac.

      (3) 3 levels of borax : $B_0=0$, $B_1=5$ lb./ac. given as spray and $B_2=10$ lb./ac. applied to the soil before sowing.

3. **DESIGN :**

   (i) Fact. in R.B D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) 18′×23′. (b) 15′×19′. (v) 1½′×2′. (vi) Yes.

4. **GENERAL :**

   (i) Fair. (ii) Nil. (iii) Height, branching, and linseed yield. (iv) (a) 1956 –1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 1405 lb./ac. (ii) 213.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of linsed in lb./ac.

	B_0	B_1	B_2	Mean	P_0	P_1
N_0	1337	1359	1388	1361	1388	1334
N_1	1449	1515	1384	1449	1544	1354
Mean	1393	1437	1386	1405	1466	1344
P_0	1420	1553	1426			
P_1	1366	1321	1346			

S.E. of N or P marginal mean	= 50.3 lb./ac.
S.E. of B marginal mean	= 61.6 lb./ac.
S.E. of body of N×B or P×B table	= 87.2 lb./ac.
S.E. of body of N×P table	= 71.2 lb./ac.

Crop :- Linseed. **Ref :- M.P. 57(16).**

Site :- Agri. College Farm, Gwalior. **Type :- 'M'.**

Object :—To study the effect of N, P and borax on the yield of Linseed.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) *Jowar+cowpea* (c) Nil. (ii) (a) Sandy loam (b) N.A. (iii) 17 11.1957. (iv) (a) Ploughing by soil turning plough twice, discing 4 times, followed by planking. (b) Drilling. (c) 10 srs./ac. (d) Row to row 18″. (e) N.A. (v) Nil. (vi) H—397 (medium). (vii) Irrigated. (viii) Weeding once. (ix) N.A. (x) 3.4.1958.

2. **TREATMENTS :**

   Same as in expt. no. 56(15) above.

3. **DESIGN :**

   (i) Fact. in R.B.D (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) and (b) 24′×16.5′. (v) Nil. (vii) Nil.

4. **GENERAL :**

   Same as in expt. no. 56(15) above.

5. RESULTS :

(i) 227 lb./ac. (ii) 67.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of linsed in lb./ac.

	B_0	B_1	B_2	Mean	P_0	P_1
N_0	226	225	194	215	212	218
N_1	230	249	240	240	252·	227
Mean	228	237	217	227	232	223
P_0	233	237	226·			
P_1	223	237	208			

S.E. of N or P marginal mean   = 13.8 lb./ac.
S.E. of B marginal mean   = 16.9 lb./ac.
S.E. of body of N×B or P×B table   = 24.0 lb./ac.
S.E. of body of N×P table   = 19.6 lb./ac.

———

Crop :- Linseed *(Rabi)*.

Site :- Reg. Res. Stn., Khargone.

Ref :- M.P. 58(83).

Type :- 'M'.

Object :—To find out suitable manurial schedule for Linseed.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 15 and 16.10.1958. (iv) (a) 3 harrowings. (b) Drilling. (c) 30 lb./ac. (d) 15" between rows. (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 3.41". (x) 24 to 31.1.1959.

2. TREATMENTS :

All combinations of (1), (2) and (3)
    (1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
    (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$ and $P_2=40$ lb./ac.
    (3) 3 levels of K_2O as Mur. Pot. : $K_0=0$, $K_1=10$ and $K_2=20$ lb./ac.
Fertilizers were applied on 3.10.1958.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 block/replication. (b) N.A. (iii) 2. (iv) (a) 40'×18'. (b) 36'×16'. (v) 2'×1'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of Linseed. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 516 lb./ac. (ii) 68.5 lb./ac. (iii) Main effect of K alone is highly significant. (iv) Av. yield of grain in lb./ac.

	K_0	K_1	K_2	Mean	P_0	P_1	P_2
N_0	540	431	507	493	506	470	501
N_1	544	510	537	530	564	529	497
N_2	533	503	542	526	543	511	524
Mean	539	481	529	516	538	503	524
P_0	581	489	544				
P_1	497	479	534				
P_2	540	475	507				

S.E. of any marginal mean   = 16.1 lb./ac.

S.B. of body of any table   = 28.0 lb./ac.

———

Crop :- Linseed *(Rabi).*   **Ref :- M.P. 59(84).**

Site :- Reg. Res. Stn., Khargone.   **Type :- 'M'.**

Object :—To find out suitable manurial schedule for Linseed.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 17.10.1959. (iv) (a 4 harrowings. (b) Drilling. (c) 30 lb./ac. (d) Row to row 15". (e) N.A. (v) Nil. (vi) Local. (vii, Unirrigated. (viii) 1 hand weeding. (ix) N.A. (x) 13.2.1960.

2. **TREATMENTS :**

Same as in expt. no. 58(83) on page 499.

3. **DESIGN :**

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 46'×20'. (b) 40'×16'. (v) 3'×2'. (vi) Yes.

4. **GENERAL :**

(i) Poor. (ii) Nil. (iii) Germination count, height and yield of linseed. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Unexpected October rains affected the yield of the crop. (vii) Nil.

5. **RESULTS :**

(i) 219 lb./ac. (ii) 63.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of linseed in lb./ac.

	K_0	K_1	K_2	Mean	P_0	P_1	P_2
N_0	248	168	215	211	228	202	203
N_1	270	209	219	232	204	248	244
N_2	194	232	217	214	194	212	237
Mean	238	203	217	219	209	221	228
P_0	231	192	203				
P_1	212	210	241				
P_2	267	208	207				

S E. of any marginal mean   = 14.9 lb./ac.

S.E. of any body of table   = 25.9 lb./ac.

———

Crop :- Linseed *(Rabi).*   **Ref :- M.P. 59(141).**

Site :- Govt. Agri. Res. Farm, Kuthulia (Rewa).   **Type :- 'M'.**

Object :—To find out suitable manurial schedule for Linseed.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 4.11.1959. (iv) (a) 4 ploughings. (b) Line sowing. (c) 15 lb./ac. (d) Row to row 9". (e) N.A. (v) 20 lb./ac. of N+20 lb./ac. of P_2O_5. (vi) Local. (vii) Unirrigated. (viii) Nil. (ix) 1.9". (x) 29.3.1960.

2. **TREATMENTS to 4. GENERAL :**

Same as in expt. no. 59(2) on page 496.

5. RESULTS :

(i) 327 lb./ac.   (ii) 91.1 lb./ac.   (iii) None of the effects is significant.   (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	337	281	350	323
P_1	377	337	283	332
Mean	357	309	316	327

S.E. of N marginal mean	= 26.3 lb./ac.
S.E. of P marginal mean	= 21.5 lb./ac.
S.E. of body of table	= 37.2 lb /ac.

———

Crop :- Linseed *(Rabi).*   .Ref :- M.P. 59(10).

Site :- Govt. Seed and Demons. Farm, Mahagarh.   **Type :- 'M'.**

Object :—To find out suitable manurial schedule for Linseed.

1. BASAL CONDITIONS :

(i) (a) Nil.   (b) Fallow.   (c) N.A.   (ii) (a) Medium black cotton soil.   (b) N.A.   (iii) 10.11.1959/-.   (iv) (a) 3 *bakherings.*   (b) Sown by *nari.*   (c) 6 srs./ac.   (d) and (e) N.A.   (v) Nil.   (vi) EB—3.   (vii) Unirrigated.   (viii) Nil.   (ix) 1.97".   (x) 14.4.1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no 59(2) on page 496.

5. RESULTS :

(i) 241 lb./ac.   (ii) 66.1 lb /ac.   (iii) None of the effects is significant.   (iv) Av. yield of linseed in lb./ac.

	N_0	N_1	N_2	
P_0	215	233	298	249
P_1	230	238	231	233
Mean	223	236	265	241

S.E. of N marginal mean	= 19.1 lb./ac.
S.E. of P marginal mean	= 15.6 lb./ac.
S.E. of body of table	= 27.0 lb./ac.

———

Crop :- Linseed *(Rabi).*   Ref :- M.P. 59(70).

Site :- Govt. Seed and Demons. Farm, Nabibagh (Bhopal).   **Type :- 'M'.**

Object :—To find out the optimum combination of N and P for Linseed.

1 BASAL CONDITIONS :

(i) (a) Nil.   (b) and (c) N.A.   (ii) (a) Medium black.   (b) N.A.   (iii) 24.11.1959.   (iv) (a) 2 *bakherings.*   (b) Drilled by *desi* plough   (c) 20 lb./ac.   (d) Row to row 12".   (e) N.A.   (v) Nil.   (vi) Local.   (vii) Unirrigated.   (viii) Nil.   (ix) N.A.   (x) 3.4.1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(2) on page 496.

5. RESULTS :

(i) 434 lb./ac. (ii) 57.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of linseed in lb./ac.

	N_0	N_1	N_2	Mean
P_0	413	484	420	439
P_1	424	431	433	429
Mean	418	457	426	434

S.E. of N marginal mean = 16.6 lb./ac.
S.E. of P marginal mean = 13.6 lb /ac.
S.E. of body of table = 23.5 lb./ac.

Crop :- Linseed *(Rabi).*   Ref :- M.P. 59(N.A.).

Site :- State Mechanised Farm, Reora (Satna).   Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) N.A. (ii) (a) Black soil. (b) N.A. (iii) 25.10.1959. (iv) (a) 4 harrowings. (b) Broadcasting. (c) 18 lb./ac. (d) 9″ between plants. (e) N.A. (v) Nil. (vi) T—1193. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 21.3.1960.

2. TREATMENTS :

4 manures : M_0=Control (no manure), M_1=15 lb./ac. of N, M_2=10 lb./ac. of P_2O_5 and M_3=M_1+M_2.

3, DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) and (b) 40′×14′. (v) 35′×10′. (vi) 2½′×2′.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 405 lb./ac. (ii) 61.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of linseed in lb./ac.

Treatment	M_0	M_1	M_2	M_3
Av. yield	401	385	398	436

S.E./mean = 21.8 lb./ac.

Crop :- Linseed *(Rabi).*   Ref :- M.P. 59(57).

Site :- Central Res. Farm, Ujjain.   Type :- 'M'.

Object :—To find out suitable manurial schedule for Linseed.

1. BASAL CONDITIONS :

(i) Nil. (b) *Mung.* (c) 50 lb./ac. of Super. (ii) (a) Black cotton soil. (b) N.A. (iii) 7.11.1959/—. (iv) (a) 3 *bakherings.* (b) Drilled by *Duffan.* (c) 12 lb./ac. (d) 12″ between lines. (e) N.A. (v) Nil. (vi) EB—3. (vii) Unirrigated. (viii) N.A. (ix) 0.25″. (x) 18.3.1960.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 59(2) on page 496.

4. GENERAL :

(i) Fair. (ii) Damaged by white ants and grass hoppers. (iii) Grain and straw yield. (iv) (a) 1959—1962. (b) No. (c) Nil. (v) (a) Adhartal, Kuthulia, Mahagarh, Nabi-bagh and Vidisha. (b) N.A. (vi) Scanty rains. Light frost on 23.1.1960. (vii) Nil.

5. RESULTS :

(i) 379 lb./ac. (ii) 30.5 lb./ac, (iii) Main effects of N and P are highly significant while the interaction N×P is significant. (iv) Av. yield of linseed in lb./ac.

	N_0	N_1	N_2	Mean
P_0	351	375	365	364
P_1	337	420	424	394
Mean	344	397	395	379

S.E. of N marginal mean	=	8.8 lb./ac.
S.E. of P marginal mean	=	7.2 lb./ac.
S.E. of body of table	=	12.5 lb./ac.

Crop :- Linseed *(Rabi)*.

Site :- Govt. Exptl. Farm, Vidisha.

Ref :- M.P. 59(41).

Type :- 'M'.

Object :—To find out proper manurial schedule for Linseed crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 10 C.L./ac. of F.Y.M. (ii) (a) Heavy clay. (b) N.A. (iii) 9.11.1959/—. (iv) (a) 2 *bakherings*. (b) Line sowing by *duffan*. (c) to (e) As per local practices. (v) Nil. (vi) R.R. 204. (vii) Unirrigated. (viii) N.A. (ix) 4.48". (x) 23.3.1960.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 59(2) on page 496.

5. RESULTS :

(i) 633 lb./ac. (ii) 64.0 lb./ac. (iii) Interaction N×P alone is highly significant. (iv) Av. yield of linseed in lb./ac.

	N_0	N_1	N_2	Mean
P_0	615	692	596	634
P_1	631	578	684	631
Mean	623	635	640	633

S.E. of N marginal mean	=	15.1 lb./ac.
S.E. of P marginal mean	=	18.5 lb./ac.
S.E. of body of the table	=	26.1 lb./ac.

Crop :- Linseed *(Rabi)*.

Site :- Reg. Res. Stn., Khargone.

Ref :- M.P. 58(84).

Type :- 'C'.

Object :—To find out the most suitable seed rate and row spacing for Linseed.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 7.10.1958/—. (iv) (a) 3 harrowings. (b)Drilling. (c) and (d) As per treatment. (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) N.A. (ix) 3.41". (x) 27.1.1959 to 17.2.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 row spacings : $S_1=12''$, $S_2=15''$ and $S_3=18''$.
(2) 4 seed rates : $R_1=15$, $R_2=20$, $R_3=25$ and $R_4=30$ srs./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 44'×15'. (b) 40'×15'. (v) 2' breadthwise on either side. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Plant population, height, no. of branches, no. of pods and yield of linseed. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) N.A. (vii) Nil.

5. RESULTS :

(i) 199 lb./ac. (ii) 62.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of linseed in lb./ac.

	R_1	R_2	R_3	R_4	Mean
S_1	182	167	226	1ſ6	193
S_2	170	195	190	208	191
S_3	180	202	245	229	214
Mean	177	188	220	211	199

S.E. of S marginal mean	=	15.6 lb./ac.
S.E. of R marginal mean	=	17.4 lb./ac.
S.E. of body of table	=	31.2 lb./ac.

Crop :- Linseed *(Rabi)*.   **Ref :- M.P. 59(85).**

Site :- Reg. Res. Stn., Khargone.   **Type :- 'C'.**

Object :—To find out the most suitable seed rate and row spacing for Linseed.

1. BASAL CONDITIONS :

(i) a) Nil. (b) Gram. (c) Nil. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 16.10.1959. (iv) (a) 4 harrowings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) 1 hand weeding. (ix) 0.83". (x) 14.2.1960.

2. TREATMENTS :

Same as in expt. no. 58(84) on page 503.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 46'×15'. (b) 40'×15'. (v) 3' breadth wise o$_n$ either side. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Stand, height, branch and yield of linseed. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Late rains in October, effected the yields. (vii) Nil.

5. RESULTS :

(i) 302 lb./ac (ii) 69.7 lb./ac. (iii) No effect is significant (iv) Av. yield of linseed in lb./ac.

	R₁	R₂	R₃	R₄	Mean
S₁	290	290	332	305	304
S₂	333	311	290	278	303
S₃	349	303	275	263	298
Mean	324	301	299	282	302

S.E. of R marginal mean = 20.1 lb./ac.
S.E. of S marginal mean = 17.4 lb./ac.
S.E. of body of table = 34.8 lb./ac.

Crop :- Linseed *(Rabi)*. **Ref :- M.P. 59(69).**

Site :- Govt. Seed and Demons. Farm, Nabibagh (Bhopal). **Type :- 'C'.**

Object :—To find out the optimum time of sowing for Linseed.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) As per treatments. (iv) (a) 2 *bakherings*. (b) Sown with seed pencil. (c) 15 lb /ac. (d) Row two row 12". (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 25, 28.3.1960 and 3, 6.4.1960.

2. TREATMENTS :

4 dates of sowing : D₁=5.11.1959, D₂=5.11.1959, D₃=25.11.1959 and D₄=5.12.1959.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) and (b) 40'×11¾'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of linseed. (iv) (a) 1959—1960. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 422 lb./ac. (ii) 64.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of linseed in lb./ac.

Treatment	D₁	D₂	D₃	D₄
Av. yield	576	387	336	390

S.E./mean = 22.7 lb./ac.

Crop :- Linseed. **Ref M.P. 56(17).**

Site :- Govt. Exptl. Farm, Vidisha. **Type :- 'C'.**

Object :—To find out suitable seed rate for linseed.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Heavy clay. (b) N.A. (iii) 13.11.1956/—. (iv) (a) N.A. (b) Drilled. (c) As per treatments. (d) 12" between rows. (e) N.A. (v) Nil. (vi) R.R.—204. (vii) Unirrigated. (viii) N.A. (ix) 4.89". (x) 22.4.1957.

2. TREATMENTS :

4 seed rates : S₁=6, S₂=8, S₃=10, and S₄=12 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 39'×16'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Affected of wilt. (iii) Height, population count and yield of linseed. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 336 lb./ac. (ii) 45.4. lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of linseed in lb./ac.

Treatment	S_1	S_2	S_3	S_4
Av. yield	276	325	369	369

S.E./mean = 22.7 lb./ac.

Crop :- Castor *(Rabi)*.

Site :- Govt. Agri. Res. Stn., Jhabua.

Ref :- M.P. 59(23).

Type :- 'M'.

Object :—To find out proper manurial schedule for Castor.

1. BASAL CONDITIONS :

(i) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

    (1) 4 levels of N as A/S : $N_0=0$, $N_1=7\frac{1}{2}$, $N_2=15$ and $N_3=22\frac{1}{2}$ lb./ac.

    (2) 2 levels of P_2O_5 : $P_0=0$ and $P_1=15$ lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 15'×30'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of castor. (iv) (a) 1959—1960. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 88 lb./ac. (ii) 17.7 lb./ac. (iii) Only the effect of P is highly significant. (iv) Av. yield of castor in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	58	88	79	88	78
P_1	109	84	80	220	98
Mean	84	86	80	104	88

S.E. of N marginal mean = 6.3 lb./ac.
S.E. of P marginal mean = 4 4 lb./ac.
S.E. of body of table = 8.9 lb./ac.

Crop :- Chillies *(Kharif)*.

Site :- Govt. Veg. Res. Stn., Silary.

Ref :- M.P. 56(58).

Type :- 'M'.

Object :—To find out suitable manurial schedule for Chillies.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Chillies. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Silary. (iii) 29.5.1956 and 30.6.1056. (iv) (a) Ploughing and *bakhering.* (b) Transplanted. (c) N.A. (d) Plant to plant 2″. (e) 1. (v) 2 C.L./ac. of compost in May, 1956. (vi) *Pandhurna* (medium). (vii) Irrigated. (viii) 3 weedings and hoeings. (ix) N.A. (x) 5 pickings on 16.10.1956, 12.11.1956, 17.12.1956, 8.1.1957 and 3.2.1257.

2. TREATMENTS :

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

(1) 3 doses of N as A/S : $N_0=0$, $N_1=25$ and $N_2=50$ lb./ac.
(2) 3 doses of P_2O_5 as Super : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.
(3) 3 doses of K_2O as Mur Pot. : $K_0=0$, $K_1=25$, $K_2=50$ lb./ac

Fertilizers applied in 3 equal doses. First doss applied in 31.7.1956, second on 21.9.1956 and third on 29.9.1956.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) 144′×36′. (iii) 3. (iv) (a) 16′×36′. (b) 12′×32′. (iv) 2′×2′. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Mild effect of '*Churda Murda* disease. Hexidole 950 (40 oz. in 5 gallons of water) was sprayed. (iii) Yield of red Chillies. (iv) (a) 1956—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS .

(i) 3584 lb./ac. (ii) 1051.6 lb./ac. (iii) Only N×K interaction is significant. (iv) Av. yield of Chillies in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	1770	1995	2157	1974	2017	2084	1821
N_1	3912	3927	4047	3962	3088	3727	5072
	4729	4766	4954	4816	4922	4830	4697
Mean	3470	3563	3719	3584	3342	3547	3863
K_0	3138	3319	3570				
K_1	3850	3188	3602				
K_2	3423	4181	3986				

S.E. of any marginal mean   = 202.4 lb./ac.
S.E. of body of any table   = 350.5 lb./ac.

Crop :- Chillies *(Kharif).*   **Ref :- M.P. 57(26).**

Site :- Govt. Veg. Res. Stn., Silary.   **Type :- 'M'.**

Object :—To find out suitable manurial schedule for Chilles.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Chillies. (c) 2 C.L./ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Silary. (iii) 30.5.1957 and 31.7.1957. (iv) (a) Ploughing and *bakhering.* (b) Transplanted. (c) —. (d) Plant to plant 2″. (e) 1. (v) 20 C.L./ac. of cpmpost in May. (vi) *Pandhurna* Chillies (medium). (vii) Irrigated. (viii) 8 weedings and hoeings. (ix) N.A. (x) 5 picking on : 29.12.1957, 12.1.1958, 22.1.1958, 2.2.1958 and 14.1.1958.

2. TREATMENTS to 4. GENERAL :

Same as in expt. no. 56 (58) on page 506. Time of application is not available for this experiment.

5. RESULTS :

(i) 1937 lb./ac. (ii) 467.4 lb./ac. (iii) N effect and interaction N×K are highly significant. W and Z component of N×P×K are significant. Often effects are not significant. (iv) Av. yield of Chillies in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	1152	1174	1166	1164	1148	1335	1008
N_1	1749	2018	2054	1940	1448	1973	2400
N_2	2505	2775	2842	2707	2945	2669	25u8
Mean	1802	1989	2021	1937	1847	1992	1972
K_0	1690	1750	2101				
K_1	1715	2105	2157				
K_2	2001	2111	1805				

S.E. of any marginal mean = 90.0 lb./ac.
S.E. of body of any table = 155.8 lb./ac.

Crop :- Chillies *(Kharif)*.　　　　　**Ref :- M.P. 58(9).**

Site :- Govt. Veg. Res. Stn., Silary.　　　　**Type :- 'M'.**

Object :—To find out suitable manurial schedule for Chillies.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Chillies. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Silary. (iii) 20.5.1958/ 1.7.1958. (iv) (a) Ploughing and *bakhering*. (b) Transplanting. (c) N.A. (d) 2' spacing between plant. (e) 1. (v) 20 C.L./ac. of compost in May. (vi) *Pandhurna* (medium). (vii) Irrigated. (viii) Gap-filling on 9.7.1958, weeding and mulching 5 times. (ix) N.A. (x) 9 pickings on 5.10.1958 to 2.3.1959.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(58) on page 506.
Fertilizers applied in 3 equal doses : first dose applied on 17.7.1958, second dose on 4.8.1958 and third dose on 22.8.1958.

4. GENERAL :

(i) Stunted and poor growth. (ii) Mild infection of *Churda—Murdha* disease—Basudin 20 E and Hexamave were used to control (iii) Yield of ripe chillies. (iv) (a) 1956—1959. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Heavy rains in August. (vii) Nil.

5. RESULTS :

(i) 1268 lb./ac. (ii) 529.8 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of chillies in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	644	853	758	752	733	718	804
N_1	1236	1224	1193	1218	1154	1426	1073
N_2	1760	1772	1972	1835	1935	1922	1647
Mean	1213	1283	1308	1268	1274	1355	1175
K_0	1066	1467	1289				
K_1	1448	1130	1487				
K_2	1125	1252	1146				

S.E. of any marginal mean	= 102.0 lb./ac.
S.E. of body of any table	= 176.6 lb./ac.

Crop :- Chillies *(Kharif).*   **Ref :- M.P. 59(132).**

Site :- Govt. Veg. Res. Stn., Silary.   **Type :- 'M'.**

Object :—To find out suitable manurial schedule for Chillies.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Chillies. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Silary. (iii) 30.5.1959/8.7.1959. (iv) (a) 5 *bakherings*. (b) Transplanting. (c) 1 lb./ac. (d) 24"×24". (e) 2. (v) 20 C.L./ac. of T.C. (vi) *Pandhurna*. (vii) Irrigated. (viii) 6 weedings and hoeing. (ix) 59.87". (x) 31.12.1959 to 19.3.1960.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(58) on page 506.
Time of application of fertilizers is not available

4. GENERAL :

(i) The crop was affected by water lodging. (ii) Attack of leaf callvirus and poundery mildew—Spersul was sprayed. (iii) Chillies yield. (iv) (a) 1956—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1594 lb./ac. (ii) 488.1 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of chillies in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	725	866	717	769	725	777	806
N_1	1693	1512	1601	1602	1704	1597	1507
N_2	2409	2259	2566	2411	2498	2470	2266
Mean	1609	1546	1628	1594	1642	1615	1546
K_0	1419	1702	1806				
K_1	1768	1502	1574				
K_2	1641	1433	1505				

S.E. of any marginal mean	= 94.0 lb./ac.
S.E. of body of any table	= 162.7 lb./ac.

Crop :- Ginger *(Kharif).*   **Ref :- M.P. 56(82).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'D'.**

Object :—To control Ginger rot by treating the rhizomes with different insecticides.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Potato. (c) N.A. (ii) (a) Sandy. (b) Refer soil analysis, Chhindwara. (iii) 23.6.1956. (iv) (a) *Bakhering* and ridging (b) Sown on ridges. (c) 2108 lb./ac. of rhizomes (d) 18"×9". (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) 3 hand weedings. (ix) 44.61". (x) 19.4.1957.

2. TREATMENTS

4 insecticidal treatments : T_0=Control, T_1=3 lb /ac. of peronox in 100 gallons of water, T_2=Bordeaux mixture (4—4—50) and T_3=Peronox+D.D.T. 50%, both 3 lb./ac. in 100 gallons of water.

Rhizomes were dipped in the solutions for half an hour before sowing.

3. DESIGN:

(i) L. Sq. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) $8\frac{1}{2}'\times5'$. (v) Nil. (vi) As per design.

4. GENERAL :

(i) Crop growth : good. (b) Nil. (c) Yield of ginger. (iv) (a) 1956—1957. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 21102 lb./ac. (ii) 5492 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of ginger in lb /ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	18068	22552	23478	20310

S E./mean = 2746 lb./ac.

———

Crop :- Ginger *(Kharif)*.   **Ref :- M.P. 57(51).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'D'.**

Object :—To control Ginger rot disease by treating the rhizomes with different insecticides.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Potato. (c) N.A. (ii) (a) Light soil. (b) Refer soil analysis, Chhindwara. (iii) 20.6.1957. (iv) (a) *Bakhering,* ploughing and ridging. (b) Sown on ridges. (c) 2108 lb./ac. of rhizomes. (d) 18"×9". (e) N.A. (v) N A. (vi) Local. (vii) Irrigated. (viii) 2 hand weedings. (ix) 32.54". (x) 18.4.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(82) on page 509.

4. GENERAL :

(i) N.A. (ii) Softr ot noticed. (iii) Yield of ginger. (iv) (a) 1956—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2639 lb./ac. (ii) 387.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of ginger in lb /ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	2083	2980	2932	2562

S.E./mean = 193.5 lb./ac.

———

Crop :- Ginger *(Kharif)*.   **Ref :- M.P. 56(83).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'D'.**

Object :—To control Giner rot disease by treating seed and soil with different insecticides.,

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Potato. (c) N A. (ii) (a) Sandy. (b) N.A. (iii) 23.6.1956. (iv) (a) *Bakherings* and ridging. (b) Rhizomes sown both sides of ridge. (c) 1025 srs./ac. of Rhizomes. (d) 18"×9". (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated (viii) 3 hand weedings. (ix) 44.61". (x) 19.4.1957.

2. TREATMENTS :

4 insecticidal treatments :T_0=Control, T_1=3 lb./ac. of Peronox in 100 gallons. of water, T_2=Bordeaux mixture 4-4-50 and T_3=T_1+D.D.T. 50% at 3 lb./ac. in 100 gallons of water.
Treatments applied to soil and rhizomes.

3. DESIGN and 4. GENERAL :

Same as in expt. no, 56(82) on page 509.

5. RESULTS :

(i) 15056 lb./ac. (ii) 3306 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of ginger in lb./ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	14463	15283	14142	16338

S.E./mean = 1653 lb /ac.

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

Site :- Govt. Exptl. Stn. Farm, Chhindwara. Type :- 'D'.

Object :—To control Ginger rot disease by treating the seed and soil in different insecticides.

1. BASAL CONDITIONS :

Same as in expt. no. 57(51) on page 510.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 56(83) on page 510.

4. GENERAL :

(i) N.A. (ii) Expt. showed heavy infection of soft rot. (iii) Yield of ginger. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 551 lb./ac. (ii) 173 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of ginger in lb./ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	420	597	579	610

S.E./mean = 86.5 lb./ac.

Crop :- Ginger *(Kharif)*. Ref :- M P. 58(54).

Site :- Govt. Exptl. Stn., Chhindwara. Type :- 'D'.

Object :—To control Ginger rot disease by treating the seed and soil with different incecticides.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Peas.* (c) N.A. (ii) (a) Light soil. (iii) 14.6.1958. (iv) (a) Ploughing : *bakhering* and ridging. (b) Sowing rhizones as both rides of ridges. (c) 1025 seers rhizones/acre. (d) 18"×9". (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) Earthing and weedings. (ix) 44.53". (x) N.A.

2. TREATMENTS :

Same as in expt. no. 56(83) on page 510.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 6'×5¼'. (b) 5'×4¼'. (v) ½'×½'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Only in few of the plots stems of the plants have gone yellow giving symptonas of ginger rot. (iii) Yield of ginger. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) to (viii) Nil.

5. RESULTS:

(i) 22.438 lb./ac. (ii) 4252 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of ginger in lb./ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	21756	22811	21730	23457

S.E./mean = N.A.

Crop :- Ginger *(Kharif)*.   **Ref :- M.P. 58(52).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'D'.**

Object :—To control Ginger rot disease by treating the seed and soil with different insecticides.

1. BASAL CONDITIONS

Same as in expt. no. 58(54) on page 511.

2. TREATMENTS :

4 insecticidal spray treatments : T_0=Control,' T_1=peronox 3 lbs. in 100 gallons of water, T_2=Bordaeux mixture 4-4-50 and T_3=Peronox+D.D.T. 50% (both 3 lbs. in 100 gallons of watar).

Spraying of above solution was done two times.

3. DESIGN :

Same as in expt. no. 58(54) on page 511.

4. GENERAL :

(i) Satisfactory. (ii) Only in few of the plots stems of the plants have gone yellow, giving symptoms of ginger rot. (iii) N.A. (iv) (a) 1958—N.A. (b) N.A. (c) Nil. (v) to (viii) Nil.

5. RESULTS :

(i) 20630 lb./ac. (ii) 3738 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of ginger in lb./ac.

Treatments	T_0	T_1	T_2	T_3
Av. yield	19859	21176	20725	20761

S.E./mean = 1869 lb./ac.

Crop :- Ginger *(Kharif)*.   **Ref :- M.P. 59(107).**

Site :- Govt. Exptl. Stn., Chhindwara.   **Type :- 'D'.**

Object :—To find out the best soil and seed treatment for Gingers soft rot disease.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Garlic. (c) Nil. (ii) (a) *Sehra*. (b) Refer soil analysis, Chhindwara. (iii) 8.6.1959/N.A. (iv) (a) 1 p'oughing and 9 *bakherings*. (b) Transplanting. (c) 10 md./ac. (d) 12"×6". (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) Local. (vii) Irrigated. (viii) 4 weedings and earthing. (ix) 31.78". (x) 15.2.1960.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 soil treatments : T_0=No treatment and T_1=Soil treated with diathane before sowing and monthly, throughout rainy period.

(2) 2 seed treatments : S_0=No treatment and S_1=Seed treated with ceresan wet.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 6'×6'. (b) 6'×3½', (v) 1½' at the end of each row. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Ginger yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 8872 lb./ac. (ii) 2418 lb./ac. (iii) No effect is significant. (iv) Av. yield of ginger in lb./ac.

	S_0	S_1	Mean
T_0	9167	7105	8136
T_1	9864	9351	9608
Mean	9516	8228	8872

S E. of any marginal mean = 854.9 lb./ac.
S.E. of body of table = 120.0 lb./ac.

———

Crop :- Ginger *(Kharif)*. **Ref :- M.P. 59(123).**

Site :- Govt. Exptl. Stn., Chhindwara. **Type :- 'D'.**

Object :—To find out the best seed treatment to control Ginger soft rot disease.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Turmeric (c) Nil. (ii) (a) *Sehra*. (b) Refer soil analysis, Chhindwara. (iii) 9.6.1959/N.A. (iv) (a) 1 ploughing and 2 *bakherings*. (b) Planting. (c) 10 mds/ac. (d) 12″×6″. (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) Local. (vii) Irrigated. (viii) 4 weedings. (ix) 13.48″. (x) 15.12.1959.

2. TREATMENTS :

4 insecticidal treatments : T_0=Control, T_1=Bordeaux mixture 5 : 5 : 50, T_2=Cereson wet. and T_3=Diathane. Seed treated about 10 days prior to sowing.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 59(107) on page 512 excepting that the design is R.B.D.

5. RESULTS :

(i) 8333 lb./ac. (ii) 1601 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of ginger in lb./ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	8462	7457	7706	9707

S.E./mean = 800.5 lb./ac.

———

Crop :- Ginger *(Kharif)*. **Ref :- M.P. 59(122).**

Site :- Govt. Exptl. Stn., Chhindwara. **Type :- 'D'.**

Object :—To find out the best soil treatment for controlling Ginger rot disease.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Garlic. (c) Nil. (ii) (a) *Sehra*. (b) Refer soil analysis, Chhindwara. (iii) 1 6.1959. (iv) (a) 1 ploughing and 2 *Bakherings*. (b) Planting. (c) 10 mds./ac. (d) 12″×6″. (e) N.A. (v) 15 C.L./ac. of F.Y.M. (vi) Local. (vii) Irrigated. (viii) 4 weedings. (ix) 15.89″. (x) 9.2.1960.

2. TREATMENTS :

4 insecticidal treatments : T_0=Control, T_1=Cereson wet., T_2=Diathane and T_3=Bordeaux mixture 5 : 5 : 50. Insecticides applied to the soil before sowing and replanted after 30 days.

3. DESIGN and 4. GENERAL :

Same as in expt. no. 59(107) on page 512 excepting that the design is R.B.D.

5. RESULTS :

(i) 18679 lb./ac. (ii) 2026 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of ginger in lb./ac.

Treatment	T_0	T_1	T_2	T_3
Av. yield	19255	17445	18761	19255

S.E./mean = 1013 lb./ac.

Crop :- Berseem.   **Ref :- M.P. 56(12).**

Site :- Agri. College Farm, Gwalior.   **Type :- 'M'.**

Object :—To study the effect of different doses of N and P on Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar.* (c) Nil. (ii) (a) Light sandy loam. (b) N.A. (iii) 17.11.1956. (iv) (a) Ploughing followed by harrowing, dising and levelling. (b) Broadcast. (c) 10 srs./ac. (d) and (e) N.A. (v) As per treatments. (vi) N.A (vii) Irrigated. (viii) Nil. (ix) 8.38". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
    (1) 4 levels of N as A/S : $N_0=0$, $N_1=20$, $N_2=40$ and $N_3=80$ lb./ac.
    (2) 4 levels of P_2O_5 as Super : $P_0=0$, $P_1=40$, $P_2=80$ and $P_3=120$ lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) 37'×16'. (b) 33'×12'. (v) 2'×2'. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Yield of fodder and seed. (iv) (a) 1956—1957. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 76834 lb./ac. (ii) 9786 lb./ac. (iii) N and P effects are highly significant. (iv) Av. yield of fodder in lb./ac.

	P_0	P_1	P_2	P_3	Mean
N_0	38280	84920	-76230	76450	68970
N_1	55770	77880	84920	86900	76367
N_2	66220	78650	77550	86240	77165
N_3	78540	84480	88880	87450	84837
Mean	58202	81482	81895	84260	76834

S.E. of any marginal mean   = 2825 lb./ac.
S.E. of body of table   = 5650 lb./ac.

Crop :- Berseem *(Rabi).*   **Ref :- M.P. 57(22).**

Site :- Agri. College Farm, Gwalior.   **Type :- 'M'.**

Object :—To study the effect of varying doses of N and P on the fodder yield of Berseem.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) *Jowar*. (c) Nil. (iii) N.A. (ii) (a) Sandy loam. (b) N.A. (iv) (a) Ploughing and planking. (b) Broadcast. (c) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

   All combinations of (1) and (2)
       (1) 4 levels of N as A/S : $N_0=0$, $N_1=20$, $N_2=40$ and $N_3=80$ lb./ac.
       (2) 4 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$, $P_2=40$ and $P_3=80$ lb./ac.

3. DESIGN :

   (i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) $37' \times 16'$. (b) $33' \times 12'$. (v) $2' \times 2'$. (vi) Yes.

4. GENERAL :

   (i) Satisfactory. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1956—1957. (b) Yes. (c) Nil. (v) to (vii) Nil.

5 RESULTS :

   (i) 57966 lb./ac. (ii) 12693 lb./ac. (iii) P effect alone is highly significant. (iv) Av. yield of fodder in lb./ac.

	N_0	N_1	N_2	N_3	Mean
P_0	24679	36963	41327	50898	38467
P_1	65089	62596	59589	62376	62412
P_2	63769	63036	62449	68206	64365
P_3	60872	67986	66299	71323	66620
Mean	53602	57645	57416	63201	57966

S.E. of any marginal mean   = 3664 lb./ac.
S.E. of body of table   = 7328 lb./ac.

———

Crop :- Berseem.   **Ref :- M.P. 56(11).**

Site :- Agri. College Farm, Gwalior.   **Type :- 'C'.**

Object :—To study the effect of time of sowing and mixture on the period of availability of green fodder and seed yield of Berseem.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Light loam. (b) N.A. (iii) As per treatments. (iv) (a) 2 ploughings. (b) Broadcasted. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) 8.38". (x) First cutting after 45 days of sowing and subsequent cuttings at an interval of 10 days.

2. TREATMENTS :

   All combinations of (1) and (2)
       (1) 2 seed rates : $S_1=$ Berseen alone 12½ srs./ac. and $S_2=S_1+$ mustered 5 srs./ac.
       (2) 5 dates of sowing : $D_1=21.9.1956$, $D_2=6.10.1956$, $D_3=21.10.1956$, $D_4=6.11.1956$ and $D_5=21.11.1956$.

3. DESIGN :

   (i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) $28' \times 39'$. (b) $22' \times 33'$. (v) $3' \times 3'$. (vi) Yes.

4. GENERAL :

   (i) Normal. (ii) Nil. (iii) Yield of green fodder and seed. (iv) (a) 1956—N.A. (b) Yes (c) Nil. (v) to (vii) Nil.

5. RESULTS :

   (i) 53074 lb./ac. (ii) 7435 lb./ac. (iii) D effect alone is highly significant. (iv) Av. yield of fodder in lb./ac.

	D₁	D₂	D₃	D₄	D₅	Mean
S₁	57780	60640	68000	46480	36760	53732
S₂	59320	64920	58680	44580	34580	52416
Mean	58050	62780	63340	45530	35670	53074

S.E. of D marginal mean   = 3035 lb./ac.
S.E. of S marginal mean   = 1920 lb./ac.
S.E of body of table   = 4293 lb. ac.

————

Crop :- Berseem.   **Ref :- M.P. 56(10).**

Site :- Agri. College Farm, Gwalior.   **Type :- 'C'.**

Object :—To findout the effect of different seed rates and interval of cutting on the fodder yield of Berseem.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Jawar. (c) Nil. (ii) (a) Light sandy loam. (b) N.A. (iii) 19.10.1956. (iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) 8.38". (x) 1st cutt ng on 19 to 21.12.1956.

2. **TREATMENTS :**

   All combinations of (1) and (2)

   (1) 3 seed rates : S₁=8, S₂=12 and S₃=16 srs./ac.
   (2) 3 intervals of cutting : I₁=20, I₂=30 and I₃=40 days.

3. **DESIGN :**

   (i) Fact. i : R.B.D. (ii (a) 9. (b) 48'×135'. (iii) 3. (iv) (a) 48'×15'. (b) 44'×11'. (v) 2'×2'. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) Nil. (iii) Yield of green fodder in each cutting and seed yield. (iv) (a) 1956—1957. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Analysis has been done of the total yield of fodder.

5. **RESULTS :**

   (i) 50537 lb./ac. (ii) 7542 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of green fodder in lb./ac.

	S₁	S₂	S₃	Mean
I₁	44130	49410	57630·	50390
I₂	35100	51390	53880	46790
I₃	60060	53400	49830	54430
Mean	46430	51400	53780	50537

S.E. of any marginal mean   = 2514 lb./ac.
S.E. cf body of table   = 4354 lb./ac.

————

Crop :- Berseem *(Rabi).*   **Ref :- M.P. 57(25).**

Site :- Agri. College Farm, Gwalior.   **Type :- 'C'.**

Object :—To findout suitable seed rate and interval of cutting on the fodder yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar.* (c) 200 lb./ac. of A/S. (ii) (a) Sandy loam. (b) N.A. (iii) 9.11.1957. (iv) (a) Ploughing and planking. (b) Broadcast. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 1st cutting : 31.12.1957 to 5.1.1958.

2. TREATMENTS :

All combinations of (1) and (2)
   (1) 3 seed rates : $S_1=8$, $S_2=12$ and $S_3=16$ lb./ac.
   (2) 4 intervals of cutting : $I_1=20$, $I_2=25$, $I_3=30$ and $I_4=35$ days.

3. DESIGN :

(i) Fact in R.B.D. (ii) (a) 12. (b) 132'×60'. (iii) 3. (iv) (a) 22'×30' (b) 21'×28'. (v) ½'×1'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1956—1957. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 44019 lb./ac. (ii) 10130 lb./ac. (iii) I effect alone is highly significant. (iv) Av. yield of fodder in lb /ac.

	I_1	I_2	I_3	I_4	Mean
S_1	31740	51125	40338	35840	29765
S_2	25121	44127	49289	60440	44756
S_3	28983	47653	63286	50232	47538
Mean	28615	47652	50971	48837	44019

S.E. of S marginal mean	= 2924 lb./ac.
S.E. of I marginal mean	= 3377 lb./ac.
S.E. of body of table	= 5849 lb./ac.

— — —

Crop :- Berseem.   **Ref :- M.P. 56(9).**

Site :- Agri. College Farm, Gwalior.   **Type :- 'C'.**

Object :—To study the effect of number of cuttings on the yield of green fodder.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar.* (c) Nil. (ii) (a) Light sandy loam. (b) N.A. (iii) 22.10.1956. (iv) (a) N.A. (b) Broadcast. (c) 17 srs./ac. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) 8.38". (x) First cutting 45 days after sowing on 5.12.1956 and subsequent cutting with 30 days interval.

2. TREATMENTS :

5 no. of cuttings : $C_1=1$, $C_2=2$, $C_3=3$, $C_4=4$ and $C_5=5$ cuttings.
Dates of cutting are : 5.12.1956, 4.1.1957, 3.2.1957, 5.3.1957 and 4.4.1957 respectively.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 30'×21'. (b) 27'×18'. (v) 1½'×1½'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of fodder in each cutting and yield of seed. (iv) (a) 1956—1957. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 26837 lb./ac. (ii) 6236 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in lb./ac.

Treatment	C_1	C_2	C_3	C_4	C_5
Av. yield	6811	16311	26124	35893	49044

S.E./mean = 3118 lb./ac.

Crop :- Berseem *(Rabi).*   **Ref :- M.P. 57(24).**

Site :- Agri. College Farm, Gwalior.   **Type :- 'C'.**

Object :—To study the effect of number of cuttings on the yield of green fodder.

1. **BASAL CONDITIONS :**

   (i) (a) *Jowar* Berseem. (b) *Jowar.* (c) A/S at 200 lb./ac. (ii) (a) Sandy loam. (b) N.A. (iii) 25.10.1957. (iv) (a) Ploughing and planking. (b) Broadcast. (e) 6 oz./plot. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) As per treatments.

2. **TREATMENTS :**

   4 no. of cuttings : $C_1 = 1$, $C_2 = 2$, $C_3 = 3$ and $C_4 = 4$
   Dates of cutting are : 29.11.1957, 9.1.1958, 9.2.1958 and 9.3.1958 respectively.

3. **DESIGN :**

   (i) R.B D. (ii) (a) 4. (b) 68'×41'. (iii) 6 (iv) (a) 41'×17'. (b) 38'×14'. (v) 1½'×1½'. (vi) Yes.

4. **GENERAL :**

   (i) Good. (ii) Nil. (iii) Yield of fodder and seed. (iv) (a) 1956—1957. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

   (i) 13190 lb./ac. (ii) 4813 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in lb./ac.

Treatment	C_1	C_2	C_3	C_4
Av. yie d	2054	11162	17743	21801

S.E./mean = 1965 lb./ac.

Crop :- Berseem.   **Ref :- M.P. 56(8).**

Site :- Agri. College Farm, Gwalior.   **Type :- 'I'.**

Object :—To study the effect of interval and intensity of irrigation on the yield of Berseem.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Berseem. (c) No. (ii) (a) Light loam. (b) N.A. (iii) 22.9.1956. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) 2.54". (x) 1st cutting on 8, 9 and 10.11.1956. Another 4 cuttings at equal interval of 1 month.

2. **TREATMENTS :**

   All combinations of (1) and (2)
       (1) 3 intervals of irrigation : $I_1 = 10$, $I_2 = 15$ and $I_3 = 20$ days.
       (2) 2 intensities of irrigation : $A_1 = 1$ and $A_2 = 2$ ac. inches.

3. **DESIGN.**

   (i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) 20½'×34'. (b) 16½'×30'. (v) 2'×2'. (vi) Yes.

4. **GENERAL:**

   (i) Good. (ii) No. (iii) Yield of seed and fodder. (iv) (a) 1956—1957. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Heavy rains on 9 and 17.1.1957. (vii) The field had a slight slope. The distribution of water was not uniform.

5. RESULTS :

(i) 61984 lb./ac. (ii) 6678 lb./ac. (iii) Main effects of A and I are highly significant. (iv) Av. yield of of fodder in lb./ac.

	I_1	I_2	I_3	Mean
A_1	67254	50624	47603	55160
A_2	86113	61300	59012	68808
Mean	76683	55962	53307	61984

S.E. of I marginal mean   = 2726 lb./ac.
S.E. of A marginal mean   = 2226 lb./ac.
S.B. of body of table   = 3856 lb./ac.

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Crop :- Berseem *(Rabi)*.   **Ref :- M.P. 57(21).**

Site :- Agri. College Farm, Gwalior.   **Type :- 'I'.**

Object :—To study the effect of interval and intensity of irrigation on the yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil: b) *Sava.* (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 15.10.1957. (iv) (a) Ploughing and planking. (b) Broadcast. (c) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 1st cutting 22 to 24.11.1957 and subsequent cuttings at one month interval up to 24.3.1958.

2. TREATMENTS:

All combinations of (1) and (2)
       (1) 3 intervals of irrigation : $I_1 = 10$, $I_2 = 15$ and $I_3 = 20$ days.
       (2) 3 intensities of irrigation : $A_1 = 1$, $A_2 = 2$ and $A_3 = 3$ acre inches.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) $102' \times 63'$. (iii) 3. (iv) (a) $34' \times 21'$. (b) $31' \times 18'$. (v) $1\frac{1}{2}' \times 1\frac{1}{2}'$. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1956—1957. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 53540 lb./ac. (ii) 9061 lb./ac. (iii) A effect alone is highly significant. (iv) Av. yield of fodder in lb./ac.

	A_1	A_2	A_3	Mean
I_1	46758	57868	65206	56611
I_2	40955	63853	64712	56507
I_3	39602	52456	50453	47504
Mean	42438	58059	60124	53540

S.E. of any marginal mean   = 3020 lb./ac.
S.E. of body of table   = 5231 lb./ac.

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Crop :- Sannhemp *(Kharif)*.   Ref :- M.P. 57(63).

Site :- Govt. Soil Cons. Res. Stn., Phanda.   Type :- 'C'.

Object :—To find out optimum seed rate for Sannhemp.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 29.6.1957. (iv) (a) and (b) N.A. (c) As per treatment. (d) and (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 34.6". (x) 29 and 30.11.1957.

2. TREATMENTS :

3 seed rates: R_1=20, R_2=40 and R_3=80 srs./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 82'×37'. (iii) 4. (iv) (a) 37'×26'. (b) 33'×22'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Plant height and grain yield. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 237 lb./ac. (ii) 44.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *sannhemp* seed in lb./ac.

Treatment	R_1	R_2	R_3
Av. yield	237	229	245

S.E./mean = 22.0 lb./ac.

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Crop :- Wheat and Gram   Ref :- M.P. 54(47).

Site :- Govt. Agri. Res. Farm, Adhartal (Jabalpur).   Type :- 'X'.

Object :—To study the effect of sowing Wheat and Gram as mixed crops.

1. BASAL CONDITIONS :

(i) (a) Nil. (a) Wheat and Gram. (c) Nil. (ii) (a) *Kabar* 2. (b) N.A. (iii) 21.10.1952. (iv) (a) *Bakhering*. (b) Drilling. (c) As per treatments. (d) and (e) N.A. (v) Nil. vi) Wheat—A. 90. and Gram—AD. V. (vii) Unirrigated. (viii) N.A. (ix) 4.59". (x) 10, 11.4.1955.

2. TREATMENTS :

6 mixed cropping treatments : T_1=Wheat and gram sown together in the same row at the rate of 40 lb./ac. each, T_2=Wheat and gram sown together in the same row each at 80 lb./ac., T_3=Wheat and gram sown separately wheat in east-west direction and gram in north-south direction each at 40 lb./ac. T_5=Wheat and gram sown sepaerately wheat in east-west direction and gram in north-south direction each at 80 lb./ac., T_5=Wheat alone at 80 lb./ac. and T_6= Gram alone at 80 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 40'×15'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of grain. (iv) (a) 1950—contd. (b) Yes. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

. (i) 51.8 Rs./ac. (ii) 11.1 Rs./ac. (iii) Treatment differences are significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6
Av. money value	49.3	60.4	49.1	63.2	48.0	40.8

S.E./mean = 4.5 Rs./ac.

Crop :- Wheat and Gram *(Rabi)*.　　　　　　　　**Ref :- M.P. 54(9).**

Site :- Agri. Res. Farm, Adhartal (Jabalpur).　　**Type :- 'X'.**

Object :—To study the effect of sowing Wheat and Gram as mixed crops.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat and *Teora*. (c) N.A. (ii) (a) *Kabar* 2. (b) N.A. (iii) 20.10.1954. (iv) (a) *Bakhering*. (b) N.A. (c) As per trearments. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Wheat A.O.—90 and Gram—AD. V. (vii) Unirrigated. (viii) and (ix) N.A. (x) 10.4.1955.

2. TREATMENTS :

6 mixed cropping treatmemts : T_1=Wheat and Gram in one row at 40 lb./ac. of seed. T_2=Wheat and Gram in one row at 80 lb./ac. of seed, T_3=Wheat and gram sown separately at 40 lb./ac. of seed, T_4=Wheat and gram sown separately at 80 lb./ac. of seed, T_5=Wheat alone at 80 lb./ac. of seed and T_6=Gram alone at 80 lb./ac. of seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 40'×15'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Rust on wheat after grain formation. Control measure taken N.A. (iii) Yield of grain. (iv) (a) 1950—contd. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 59.0 Rs./ac. (ii) 15.0 Rs./ac. (iii) Treatment differences are significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6
Av. money value	55.2	68.3	59.5	71.7	56.7	42.4

S.E./mean = 6.1 Rs./ac.

Crop :- Wheat and Gram *(Rabi)*.　　　　　　　　**Ref :- M.P. 55(9).**

Site :- Govt. Agri. Res. Farm, Adhartal (Jabalpur).　　**Type :- 'X'.**

Object :—To study the effect of sowing Birra by different methods.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Gram and Wheat. (c) As per treatments (ii) (a) *Kabar* 2. (b) N.A. (iii) 9.11.1955. (iv) (a) *Bakhering*. (b) Line sowing. (c) As per treatments, (d) 12" between rows. (e) N.A. (v) N.A. (vi) Gram—AD. V and Wheat—A.O.90. (vii) Unirrigated. viii) and (ix) N.A. (x) 4.4.1956.

2. TREATMENTS :

Same as in expt. no. 54 (9) on page 522.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 40'×15'. (b) 40'×15'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 59.7 Rs./ac. (ii) 15.1 Rs./ac. (iii) Treatment differences are not significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6
Av. money value	60.2	58.4	57.3	64.6	59.3	58.5

S.E./mean = 6.2 Rs./ac.

Crop :- Jowar, Moong and Tur. *(Kharif)*. Ref :- M.P. 57(49).

Site :- Govt. Seed and Demons. Farm, Biora. Type :- 'X'.

Object :—To find out the most suitable crop mixture of Jowar, Moong and Tur.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Clay. (b) N.A. (iii) 12.7.1957. (iv) (a) *Desi* ploughing and *bakhering*. (b) Line sowing and broadcasting as per treatments. (c) 8 lb./ac. (d) 18" between rows. (e. N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Weeding and thinning. (ix) N.A. (x) 9.1.1958.

2. TREATMENTS :

6 mixed cropping treatments : T_1=6 rows each of *Arhar, Jowar* and *Moong*, T_2=5 rows of *Arhar*, 4 rows of *Jowar* and 9 rows of *Moong*, T_3=4 rows of *Arhar* and 7 rows each of *Jowar* and *Moong*, T_4=4 rows of *Arhar* and 7 rows each of *Jowar* and *Moong*, T_5=18 rows of *Jowar* and T_6=*Jowar* broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 30'×50'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain and *bhusa*. (iv) (a) 1957—contd. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 74 8 Rs./ac. (ii) 20.6 Rs./ac. (iii) Treatment differences are significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6
Av. money table	73 8	78.7	67.1	84.2	101.9	65.0

S.E./mean = 8.4. Rs./ac.

Crop :- Jowar, Moong and Tur. *(Kharif)*. Ref :- M.P. 58(31).

Site :- Govt. Seed and Demons. Farm, Biora. Type :- 'X'.

Object :—To find out the most suitable crop mixture of Jowar, Moong and Tur.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Clay. (b) N.A. (iii) N.A. (iv) (a) 2 *bakherings*. (b) Line sowing and broadcasting. (c) 8 lb./ac. (d) 18" between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) 2 *kulpas* and 1 weeding. (ix) and (x) N.A.

2. TREATMENTS :

Same as in expt. no. 57(49) on page 523.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 33′×33′. (b) 29′×29′. (v) 2′×2′. (vi) Yes.

4. GENERAL :

(i) Crop turned yellowish due to heavy and continuous rains. (ii) Nil. (iii) Yield of grain and *bhusa*. (iv) (a) 1957—N.A. (b) and (c) N.A. (v) (a) and (b) N.A.. (vi) and (vii) Nil.

5. RESULTS :

(i) 32.2 Rs./ac. (ii) 24.1 Rs./ac. (iii) Treatment differences are not significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6
Av. money value	61.9	40.4	7.5	31.8	13.2	38.6

S.E./mean = 9.8 Rs./ac.

————

Crop :- Jowar, Moong and Arhar *(Kharif)*.   Ref :- M.P. 59(28).

Site :- Govt. Seed and Demons. Farm, Biora.   Type :- 'X'.

Object :—To find out the most effective and profitable crop mixture.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 15 lb./ac. of N and 15 lb./ac. of P_2O_5 (ii) (a) Clay soil. (b) N.A. (iii) 8.1.1959. (iv) (a) 2 *bakherings*. (b) Drilling. (c) 18″ between rows. (d) 8 lb./ac. (e) N.A. (v) Nil. (vi) *Jowar* : Ujjain—6, *Moong* : K—11 and *Arhar* : Ujjain—7. (vii) Unirrigated. (viii) 2 *kulpas* and 1 hand weeding. (ix) N.A. (x) 26.12.1959.

2. TREATMENTS :

6 mixed cropping treatments : T_1=8 rows each of *Jowar, Moong* and *Arha*r, T_2=12 rows of *Jowar* and 6 rows each of *Moong* and *Arhar*, T_3=6 rows each of *Jowar* and *Moong* and 12 rows of *Arhar*, T_4=6 rows each of *Jowar* and *Arhar* and 12 rows of *Moong*, T_5=24 rows of *Jowar* and T_6=24 rows of *Jowar, Moong* and *Arhar* (mixed) in rows.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 40′×28′. (b) 36′×24′. (v) 2′×2′. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—N.A. (b) and (c) N.A. (v) (a) Govt. Agri. Farm, Jhabua. (vi) and (vii) Nil.

5. RESULTS :

(i) 78.23 lb./ac. (ii) 15.27 lb./ac. (iii) Treatment differences are significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6
Av. money value	73.86	96.93	75.62	57.47	69.20	96.30

S.E./mean = 7.63 Rs./ac.

————

Crop :- Moong and Arhar.

Site :- Agri. College Farm, Gwalior.

Ref :- M.P. 57(13).

Type :- 'X'.

Object :—To find out the most suitable crop mixture of Jowar, Moong and Tur.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 30.7.1957. (iv) (a) 4 ploughings. (b) to (e) N.A. (v) Nil. (vi) *Jowar* : Gwalior—12—2, *Moong* : K—11, and *Arhar* : U.P.H 4. (vii) Unirrigated. (viii) 1 weeding. (ix) and (x) N.A.

2. **TREATMENTS :**

   Same as in expt. no. 57(49) on page 523.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 34'×54'. (b) 30'×50'. (v) 2'×2'. (vi) Yes.

4. **GENERAL :**

   (i) Fair. (ii) No. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) Yes. (c) Nil. (v) (a) Jhabua. (b Nil. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 202.8 Rs./ac. (ii) 48.4 Rs./ac. (iii) Treatment differences are significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6
Av. money value	223.9	276.2	228.8	215.5	194.9	127.5

S E./mean = 19.8 Rs./ac.

Crop :- Jowar and Arhar.

Site :- Agri. College Farm, Gwalior.

Ref :- M.P. 54(28).

Type :- 'X'.

Object :—To find out suitable proportion of mixture of Jowar and Arhar crops and compare it against a pure crop of Jowar and Arhar.

1. **BASAL CONDITIONS :**

   (i) (a) N.A. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 28.7.1954. (iv) (a) N.A. (b) Drilling. (c) As per treatments. (d) 18" between rows. (e) N.A. (v) N.A. (vi) *Jowar* : Gwalior 12-2 and *Arhar* : Gwalior 3. (v.i) and (viii) Nil. (ix) and (x) N.A.

2. **TREATMENTS :**

   6 treatments : T_1=*Jowar* only at 6 lb./ac. of seed, T_2=*Arhar* only at 16 lb./ac. of seed, T_3=*Jowar* and *Arhar* in 80 : 20 proportion and seed rate as 4 8 : 3.2 lb./ac., T_4=*Jowar* and *Arhar* in 60 : 40 proportion and seed rate as 3.6 : 6.4 lb./ac. T_5=*Jowar* and *Arhar* in 40 : 60 proportion and seed rate at 2.4 : 9 6 lb./ac. and T_6=*Jawar* and *Arhar* in 20 : 80 proportion and seed rate as 1.2 : 12 8 lb./ac.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 96'×15' (b) 90'×12'. (v) 3'×1.5. (vi) Yes.

4. **GENERAL :**

   (i) and (ii) N.A. (iii) Yield of grain and *bhusa*. (iv) and (v) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 67.2 Rs./ac. (ii) 17.10 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. money value of produce in Rs /ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6
Av money value	28.1	65.9	72.9	76.4	91.4	68.2

S.E./mean = 8.6 Rs./ac.

Crop :- Wheat and Gram *(Rabi).* **Ref :- M.P. 54(125).**

Site :- Instt. of Plant. Industry, Indore. **Type :- 'X'.**

Object :—To find out suitable crop mixture and manurial dose for Wheat and Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore (iii) 3.11.1954. (iv) (a) *Bakhering.* (b) Drilling. (c) 60 lb./ac. (d) 14″ between rows. (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 1.23″. (x) N.A.

2. TREATMENTS :

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

(1) 5 mixed cropping treatments : M_1=Wheat alone at 60 lb./ac. of seed, M_2 = Gram alone at 60 lb./ac. of seed, M_3=Wheat and Gram in 3 : 1 ratio, M_4=Wheat and Gram in 1 : 1 ratio and M_5=Wheat and Gram in 2 : 1 ratio.

(2) 2 levels of N as Farm Compost : N_0=0 and N_1=40 lb./ac.

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

3. DESIGN :

(i) R.B.D. (ii) (a) 20. (b) N.A. (iii) 3. (iv) (a) 45′×11⅔′. (b) 40′×7′. (v) 2½′×2⅓′. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 106 2 Rs./ac. (ii) 26.4 Rs./ac. (iii) Only main effect of P is highly significant. (iv) Av. money value of produce in Rs./ac.

	M_1	M_2	M_3	M_4	M_5	Mean	P_0	P_1
N_0	116.7	97.3	106.3	112.3	107.7	108.1	93.9	122.2
N_1	107.9	78.2	112.1	115.5	107.8	104.3	91.6	117.0
Mean	112.3	87.8	109.2	113.9	107.7	106 2	92.8	119.6
P_0	102.1	65.7	94.6	102.1	99.5			
P_1	112.5	109.8	123.8	125.7	116.0			

S..E of N or P marginal mean = 4.8 Rs./ac.
S.E. of M marginal mean = 7.6 Rs./ac.
S.E. of body of M×N or M×P table = 10.8 Rs./ac.
S.E. of body of N×P table = 6.8 Rs./ac.

———

Crop :- Wheat and Gram *(Rabi).* **Ref :- M.P. 55(99).**

Site :- Instt. of Plant Industry, Indore. **Type :- 'X'.**

Object :—To find out suitable crop mixture and manurial dose for Wheat and Gram.

1. BASAL CONDITIONS :-

(i) Nil. (b) and (c) N.A. (ii) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 25.10.1955. (iv) (a) *Bakhering.* (b) Drilling. (c) 60 lb./ac. (d) 14″ between rows. (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 5.22″. (x) Gram : 23, 24.2.1956, and Wheat. 22.3.1956.

2. TREATMENTS :

Same as in expt. no. 54(125) above.

3. DESIGN :

   (i) R.B.D. (ii) (a) 20. (b) N.A. (iii) 3. (iv) (a) 45'×11⅜'. (b) 40'×7'. (v) 2½'×2½'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

   (i) 96.8 Rs./ac. (ii) 12.7 Rs./ac. (iii) Main effect of M is highly significant. Main effect of P is significant. (iv) Av. money value of produce in Rs./ac.

	M_1	M_2	M_3	M_4	M_5	Mean	P_0	P_1
N_0	94.8	77.5	108.6	93.1	111.0	97.0	93.0	101.0
N_1	100.6	79.8	100.4	99.7	102.4	96.6	92.9	100.3
Mean	97.7	78.6	104.5	96.4	106.7	96.8	93.0	100.6
P_0	98.0	73.9	95 7	90.0	107.2			
P_1	97 4	83.4	113.3	102.8	106.3			

S E. of N or P marginal mean	= 2.3 Rs./ac.
S E. of M marginal mean	= 3.7 Rs./ac.
S.E. of body of M×N or M×P table	= 5.2 Rs./ac.
S.E. of body of N×P table	= 3.3 Rs./ac.

Crop :- Groundnut and Cotton *(Kharif)*.   **Ref :- M.P. 54(120).**

Site :- Instt. of Plant Industry, Indore.   **Type :- 'X'.**

Object :—To study the economics of interculturing of Cotton and Groundnut and to find out the combination which will give the highest return.

BASAL CONDITIONS :

(i) (a) Nil (b) Wheat. (c) *Moong* type—1 as G.M. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 3.7.1954. (iv) (a) 1 *bakhering*. (b) Drilling. (c) N.A. (d) 14″ between rows. (e) N.A. (v) Nil. (vi) Groundnut : A.K. 12—24 and Cotton : *Dhar* 43. (vii) Unirrigated. (viii) 2 hand weedings. (ix) 52.23″. (x) Groundnut : 24.10.1954 and Cotton : 20.2.1954.

2. TREATMENTS :

   4 mixed cropping treatments : T_1=One row of cotton+5 rows of Groundnut, T_2=2 rows of cotton+4 rows of Groundnut, T_3=3 rows of cotton+3 rows of Groundnut and T_4=12 rows of Groundnut only.

3. DESIGN :

   (i) R.B.D. (ii) (a) 4. (b) Nil. (iii) 8. (iv) (a) 50'×14'. (b) 1/75 ac., 1/93. ac., 1/124. ac., and 1 62. ac. for treatments T_1, T_2, T_3 and T_4 respectively. (v) N.A. (vi) Yes.

4. GENERAL :

   (i) Satisfactory. (ii) N.A. (iii) *kapas* and Pod yield. (iv) 1952—Contd. (b) No. (c) Nil. (v) N.A. (vi) Heavy rains in September. (vi) Nil.

5. RESULTS :

   (i) 64.1 Rs /ac. (ii) 14.7 Rs /ac. (iii) Treatment differences are highly significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4
Av. money value	54.7	59.7	88.8	53-4

S.E./mean = 5.2 Rs./ac.

Crop :- Groundnut and Cotton *(Kharif).*   **Ref :- M.P. 55(95).**

Site :- Instt. of Plant Industry, Indore.   **Type :- 'X'.**

Object :—To study the economics of interculturing of Groundnut and Cotton and to find out the combination which will give highest return.

1. BASAL CONDITIONS :

(i) (a) Nil (b) *Jowar.* (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) 22.6.1955. (iv) (a) *Bakhering.* (b) Drilling. (c) N A. (d) 14″ between rows. (e) N.A. (v) N.A. (vi) Groundnut :- AK. 12—24 and Cotton : *Dhar* 43. (vii) Unirrigated. (viii) 2 hand weedings. (ix) 42.05″. (x) Groundnut :- 3.11.1955 to 9.11.1955, Cotton : 10.1.1956 and 11.1.1956.

2. TREATMENTS :

4 mixed cropping treatments : T_1=One row of Cotton+5 rows of Groundnut, T_2=2 rows of Cotton+4 rows of Groundnut, T_3=3 rows of Cotton+3 rows of Groundnut and T_4= 12 rows of Groundnut.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) 50′×23½′. (b) 45′×18⅜′. (v) 2½′×2½′. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* and pod yield. (iv) (a) 1952—1955. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 120 Rs./ac. (ii) 14.1 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4
Av. money value	138	110	92	140

S.E./mean = 5.0 Rs./ac.

———

Crop :- Gram, Linseed and Castor *(Rabi).*   **Ref :-M.P. 58 (29).**

Site :- Govt. Agri. Res. Stn., Jhabua.   **Type :- 'X'.**

Object :—To find out suitable crop mixture for the locality.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy. (b) Refer soil analysis, Jhabua. (iii) to (x) N.A.

2. TREATMENTS :

3 mixed cropping treatments : T_1=Gram alone, T_2=3 rows of Gram and one row of Linseed and T_3=3 rows of Gram and one row of Castor.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 32′×19′. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—1959. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 161.2 Rs./ac. (ii) 17.2 Rs./ac. (iii) Treatment differences are not significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3
Av. money value	176.7	156.4	150.6

S.E./mean = 8.6 Rs./ac.

———

Crop :- Gram, Linseed and Castor *(Rabi).*　　　**Ref :- M.P. 59(25).**

Site :- Govt. Agri. Res. Stn., Jhabua.　　　**Type :- 'X'.**

Object : -To find out suitable crop mixture for the locality.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Sandy. (b) Refer soil analysis, Jhabua. (iii) 20.10.1959. (iv) to (ix) N.A. (x) Gram : 26.1.1960, Linseed : 9.2.1960 and Castor : 10.2.1960.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 58(29) on page 528.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—1959. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi, and (vii) Nil.

5. RESULTS :

(i) 26.0 Rs./ac. (ii) 9.3 Rs./ac. (iii) Treatment differences are not significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3
Av. money value	23.5	21.5	27.9

S.E./mean　=　4.7 Rs./ac.

Crop :- Groundnut and Maize *(Kharif).*　　　**Ref :- M.P. 57(45).**

Site :- Govt. Agri. Res. Stn., Jhabua.　　　**Type :- 'X'.**

Object :—To find out the economy of mixed cropping of Groundnut and Maize.

1. BASAL CONDITIONS :

(i, (a) Nil. (b) and (c) N.A. (ii) (a) Sandy. (b) Refer soil analysis, Jhabua. (iii) N.A. (iv) to (x) N.A.

2. TREATMENTS :

5 mixed cropping treatments : T_1=Groundnut and Maize in alternate rows, T_2=Groundnut 2 rows and Maize one row, T_3=Groundnut 3 rows and Maize one row, T_4=Maize alone and T_5=Groundnut alone.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 50.75'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain and pod yield. (iv) (a) 1957–contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 217 Rs./ac. (ii) 67.7 Rs./ac. (iii) Treatment differences are not significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4	T_5
Av. money value	251	187	211	247	183

S.E./mean　=　33.8 Rs./ac.

Crop :- Groundnut and Maize *(Kharif).*　　　**Ref :- M.P. 58(23).**

Site :- Govt. Agri. Res. Stn., Jhabua.　　　**Type :- 'X'.**

Object :— To find out the economy of mixed cropping of Groundnut and Maize.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy. (b) Refer soil analysis, Jhabua. (iii) to (x) N.A.

2. TREATMENTS :

   Same as in expt. no. 57(45) on page 528.

3. DESIGN :

   (i) R B.D. (ii) (a) 5 (b) N.A. (iii) 4. (iv) (a) N.A. (b) $37\frac{1}{2}' \times 35'$. (v) N.A. (vi) Yes.

4. GENERAL :

   (i) and (ii) N.A. (iii) Grain and pod yield. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

   (i) 44.0 Rs./ac. (ii) 13.30 Rs./ac. (iii) Treatment differences are not significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4	T_5
Av. yield	43.0	51.5	41.5	38.8	45.0

       S.E./mean = 6.65 Rs./ac.

Crop :- Jowar, Moong and Tur *(Kharif)*.   **Ref :- M.P. 58(16).**

Site :- Govt. Seed and Demons. Farm, Mahagarh.   **Type :- 'X'.**

Object :—To find out the most objective crop mixture which will give the maximum profit against local method.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black cotton. (b) Refer soil analysis, Mahagarh. (iii) 18.7.1958. (iv) (a) 2 ploughings. (b) Drilling and broadcasting. (c) to (e) N.A. (v) Nil. (vi) *Jowar* : U. no. 6, *Moong* : *Krishna* and *Tur* : T. 5. (vii) to (ix) N.A. (x) *Jowar* : 22.12.1958, *Moong* : 9.10.1958 and *Tur* : 21.12.1958.

2. TREATMENTS :

   7 mixed cropping treatments : T_1=6 rows each of *Jowar*, *Moong* and *Tur*, T_2=6 rows of *Jowar*, 9 rows of *Moong* and 5 rows of *Tur*, T_3=7 rows each of *Jowar* and *Moong* and 4 rows of *Tur*, T_4=7 rows each of *Jowar* and *Moong* 4 rows of *Tur*, T_5=*Jowar* alone T_6=*Jowar* with *Moong* and *Tur* broadcasted and T_7=*Jowar* and *Moong* mixed in rows.

3. DESIGN :

   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) $35' \times 19'$. (v) Nil. (vi) Yes.

4. GENERAL :

   (i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

   (i) 53.3 Rs./ac. (ii) 13.2 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. money value	78.4	77.3	66.5	47.5	14.9	15.1	73.2

      S.E./mean = 6.6 Rs./ac.

Crop :- Jowar, Moong and Tur *(Kharif).* **Ref :- M.P. 59(9).**

Site :- Govt. Seed and Demons. Farm, Mahagarh. **Type :- 'X'.**

Object :—To find out the most objective crop mixture which will give the maximum profit against local method.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Black cotton soil. (b) Refer soil analysis, Mahagarh. (iii) 5.7.1959. (iv) (a) N.A. (b) Drilling. (c) to (e) N.A. (v) N.A. (vi) *Jowar*: U. no. 6, *Moong* : N.A., and *Tur* T. 5. (vii) to (ix) N.A. (x) 18.9.1959 to 13.12.1959.

2. **TREATMENTS :**

6 mixed cropping treatments : $T_1 = 8$ rows each of *Jowar*, *Moong* and *Tur*, $T_2 = 12$ rows of *Jowar* and 6 rows each of *Moong* and *Tur*, $T_3 = 6$ rows each of *Jowar* and *Moong* and 12 rows of *Tur*, $T_4 = 6$ rows each of *Jowar* and *Tur* and 12 rows of *Moong*, $T_5 = Jowar$ alone 24 rows and $T_6 = Jowar$, *Moong* and *Tur* mixed and broadcast in rows.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 40′×28′. (b) 36 ×24′. (v) 2′×2′. (vi) Yes.

4. **GENERAL :**

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 69.2 Rs./ac. (ii) 20.8 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6
Av. money value	79.5	84 4	93.8	75.5	40.0	42.4

S.E./mean = 8.5 Rs./ac.

———

Crop :- Wheat, Gram and Linseed *(Rabi).* **Ref :- M.P. 58(19).**

Site :- Govt. Seed and Demons. Farm, Mahagarh. **Type :- 'X'.**

Object :—To find out most suitable crop mixture of Wheat, Gram and Linseed which will give maximum profit to cultivator against existing local practice.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) *Moong*. (c) N.A. (ii) (a) Medium black cotton soil. (b) Refer soil analysis, Mahagarh. (iii) 13.11.1958. (iv) (a) N.A. (b) Drilling. (c) to (e) N.A. (v) N.A. (vi) Wheat : U. no. 6, Gram : U. no. 21 and Linseed : Brown. (vii) to (ix) N.A. (x) Wheat : 29.3.1959. Gram : 28.3.1959 and Linseed : 27.3.1959.

2. **TREATMENTS :**

9 mixed cropping treatments : $T_1 = 8$ rows of Wheat and 4 rows of Linseed, $T_2 = 4$ rows each of Wheat and Linseed, $T_3 = 8$ rows of Wheat and 4 of Gram, $T_4 = 4$ rows each of Wheat, Gram and Linseed, $T_5 =$ Wheat and Gram mixed in rows, $T_6 = 4$ rows each of Wheat and Gram, $T_7 = 8$ rows of Wheat, 4 rows of Gram and 4 rows of Linseed, $T_8 =$ Wheat and Linseed mixed in rows and $T_9 =$ Wheat alone.

3. **DESIGN :**

(i) R.B D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 1/37.8 ac. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Fair. (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) No, (vii) T_7 was missing in one replication.

5. **RESULTS :**

(i) 74.2 Rs./ac. (ii) 15.8 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9
Av. money value	94.4	91.8	91.0	87.3	72.0	70.8	63.9	52.2	44.7

S.E./mean (other than T_7)   =   7.9 Rs./ac.

S.E. of T_7 mean   =   9.1 Rs./ac.

Crop :- Wheat *(Rabi)*.   **Ref :- M.P. 59(116).**

Site :- Govt. Soil Conservation Res. Stn., Phanda.   **Type :- 'X'.**

Object :—To find out a suitable mixture of legume crops with Wheat.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 11.11.1959. (iv) (a) 1 ploughing and 4 *bakherings*. (b) Drilling. (c) 80 lb./ac. (d) $12'' \times 3''$. [(e) N.A. (v) Nil. (vi) Wheat : Hy- 65, Gram : T—87, Peas : Local and *Teora* : Local. (vii) Unirrigated. (viii) Nil. (ix) $1.09''$. (x) 21.3.1960.

2. **TREATMENTS :**

   6 treatments : T_1=Wheat alone, T_2=Wheat (followed by gram next year), T_3=Gram alone, T_4=Wheat and Gram in 3 : 2 ratio, T_5=Wheat and Peas in 3 : 2 ratio and T_6=Wheat and *Teora* in 3 : 2 ratio.

3. **DESIGN :**

   (i) R.B.D. (ii) 6. (b) N.A. (iii) 4. (iv) (a) $37' \times 20\frac{1}{2}'$. (b) $33' \times 16\frac{1}{2}'$. (v) $2' \times 2'$. (vi) Yes.

4. **GENERAL :**

   (I) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   (i) 115 4 Rs./ac. (ii) 16.5 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6
Av. money value	143.6	133.0	54.8	122.4	114.4	124.0

S.E./mean = 8.2 Rs./ac.

Caop :- Jowar, Moong and Arhar *(Kharif)*.   **Ref :- M.P. 58(37).**

Site :- Govt. Exptl. Farm, Vidisha.   **Type :- 'X'.**

Object :—To find out the most effective crop mixture which will give maximum profit against local practice of mixed broadcast.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) *Jowar*. (c) N.A. (ii) (a) Heavy clay. (b) N.A. (iii) 16.7.1958. (iv) (a) 3 *bakherings*. (b) Line sowing and braodcasting. (c) N.A. (d) $18''$ between rows. (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) *Jowar : Shankarpur I, Moong : Krishna II* and *Arhar* : local. (vii) Unirrigated. (viii) 4 weedings. (ix) $49.98''$. (x) *Jowar* : 3.1.1959, *Moong* : 4.10.1958 and *Arhar* : 24.3.1959

2. **TREATMENTS :**

   6 intercropping treatments : T_1=6 rows each of *Arhar, Jowar* and *Moong*, T_2=5 rows of *Arhar*, 4 rows of *Jowar* and 9 rows of *Moong*, T_3=4 rows of *Arhar* and, 7 rows each of *Jowar* and *Moong*, T_4=4 rows of *Arhar* and 7 rows each of *Jowar* and *Moong*, T_5= 18 rows of *Jowar* and T_6=*Jowar, Moong* and *Arha*- mixed and broadcast.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) N.A. (b) $30' \times 50'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fairly satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 242.6 Rs./ac. (ii) 54.5 Rs./ac. (iii) Treatment differences are not significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6
Av. morey value	235.6	221.7	262.5	263.0	220.4	252.2

S.E./mean = 24.4 Rs./ac.

Crop :- Jowar, Moong and Arhar *(Kharif).*

Site :- Govt. Exptl. Farm, Vidisha.

Ref :- M.P. 59(35).

Type :- 'X'.

Object :—To find out the most effective crop mixture which will give maximum profit against local practice of mixed broadcast.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jawar.* (c) Nil. (ii) (a) Heavy clay. (b) N.A. (iii) 3.7.1959. (iv) (a) 2 *bakherings.* (b) Line sowing. (c) N.A. (d) 12" between rows. (e) N.A. (v) N.A. (vi) *Jowar*—V. 50, Arhar—Ujjain no. 7 and *Moong*—Krishna 11. (vii) Unirrigated. (viii) 2 weedings. (ix) 51.30". (x) N.A.

2. TREATMENTS :

6 intercropping treatments : T_1=8 rows each of *Arhar, Jowar* and *Moong*, T_2=6 rows each of *Arhar* and *Moong* and 12 rows of *Jowar*, T_3=6 rows each of *Jowar* and *Moong* and 12 rows of *Arhar*, T_4=6 rows each of *Jowar* and *Arhar* and 12 rows of *Moong*, T_5=24 rows of *Jowar* alone and T_6=*Jowar, Moong* and *Arhar* mixed in the same row.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 40'×28'. (b) 36'×24'. (v) 2'×2'. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 266.2 Rs./ac. (ii) 23.5 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6
Av. money value	301.2	293.3	309.4	277.6	144.4	271.1

S.E./mean = 9.6 Rs./ac.

Crop :- Wheat, Gram and Linseed *(Rabi).*

Site :- Govt. Exptl. Farm, Vidisha.

Ref :- M.P. 58(38).

Type :- 'X'.

Object :—To find out the most suitable mixture of Wheat, Gram and Linseed, which will give the maximum profit to the cultivator against existing local practice of mixed cropping in the same row.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A.; (ii) (a) Heavy clay. (b) N.A. (iii) 7 and 8.11.1958. (iv) (a) 2 *bakherings.* (b) Line sowing. (c) Wheat : 80 lb./ac. and linseed : 20 lb./ac. (d) 12"; between rows. (e) N.A.. (v) 10 C.L./ac. of F.Y.M. (vi) Wheat :U—22, Gram : U—24 and Linseed : R:R.—204. (vii) Unirrigated. (viii) 2 weedings. (ix) 3.66". (x) Gram : 6.3.1959, Linseed : 11.3.1959 and Wheat : 14.3.1959.

2. TREATMENTS :

9 mixed cropping treatments : T_1=Wheat alone, T_2=4;rows of Wheat and 4 rows of Gram sown alternately, T_3=4 rows of Wheat and 4 rows of Linseed sown alternately, T_4=4 rows of Wheat, 4 rows of Gram and 4 rows of Linseed alternately, T_5=8 rows of Wheat and 4 rows of Gram alternately, T_6=8 rows of Wheat and 4 rows of Linseed alternately, T_7=8 rows of Wheat, 4 rows of Gram and 4 rows of Linseed alternately, T_8=Wheat and Gram mixed in the same row and T_9=Wheat and Linseed mixed in the same row.

3. DESIGN :

(i) R.B D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 48'×24'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—N.A. (b) N.A. (c) Nil; (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 188.4 Rs./ac. (ii) 22.7 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. money value of produce in Rs./ac.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9
Av. money value	227.4	201.9	201.2	195.8	213.4	201.7	183.6	153.5	116.8:

S.E./mean = 11.4 Rs./ac.

Crop :- Groundnut, Cotton, Wheat and Jowar.   **Ref :- M.P. 54(110).**

Site :- Instt. of Plant Industry, Indore.   **Type :- 'R'.**

Object :—To find out the effect of rotation of crops and trace-elements on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Cotton—Wheat—*Jowar.* (b) As per treatments. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) N.A. (iv) and (v) N.A. (vi) American Cotton. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

1. Control.
2. 18 lb /ac. of Cu as C/S.
3. 15 lb./ac. of Zn. as Zinc Sul.
4. 10 lb./ac. of B as Borax.
Treatments applied in 1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 4 (in each crop). (b) N.A. (iii) 2. (iv) (a) N.A. (b) 18'×37' for Cotton, 16½'×36' for Groundnut, Wheat and *Jowar.* (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Pod, *kapas* and grain yield. (iv) (a) 1951—1954. (b) Manurial treatments applied only in the first year. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme.

RESULTS :

(i) to (iv) All figures in lb./ac.

	Groundnut	Cotton (kapas)	Wheat	Jowar
(i)	510	180	816	394
(ii)	93.6	22.7	56.7	77.7
(iii)	N.S.	N.S.	N.S.	N.S.
(iv)	Av. yield	Av. yield	Av. yield	Av. yield
1.	491	205	859	412
2.	586	194	778	414
3.	442	147	885	373
4.	519	174	741	377
S.E./mean	66.2	16.0	40.1	55.0

———

Crop :- Groundnut, Cotton, Wheat and Jowar.   **Ref :- M.P. 54(111).**

Site :- Instt. of Plant Industry, Indore.   **Type :- 'R'.**

Object :—To find out the effect of rotation of crops and trace-elements on the yield of Cotton.

1. BASAL CONDITIONS :

   (i) (a) Groundnut—Cotton—Wheat—Jowar. (b) As per treatments. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Indore. (iii) N.A. (iv) and (v) N.A. (vi) American Cotton. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:

   Same as in expt. no. 54(110) on page 533.

3. DESIGN :

   (i) R.B.D. (ii) (a) 4 (in each crop). (b) N.A. (iii) 4 (for each crop). (iv) (a) N.A. (b) 18'×37' for Cotton, 16¼'×36' for Groundnut, Wheat and Jowar. (v) N.A. (vi) Yes.

4. GENERAL :

   (i) and (ii) N.A. (iii) Pod, kapas and grain yield. (iv) (a) 1951—1954. (b) Manurial treatments applied only in 1951. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Expt. conducted under Plant Physiological Scheme.

5. RESULTS :

   (i) to (iv) All figures in lb./ac.

	Groundnut	Cotton (kapas)	Wheat	Jowar
(i)	642	180	584	692
(ii)	59.6	35.4	88.6	178.5
(iii)	N.S.	N.S.	N.S.	N.S.
(iv)	Av. yield	Av. yield	Av. yield	Av. yield
1.	657	176	582	713
2.	666	196	567	684
3.	591	154	587	666
4.	652	195	600	705
S.E./mean	29.8	17.7	44.3	69.3

———

Crop :- As per treatments.   **Ref :- 54 to 59(1).**

Site :- Instt. of Plant Industry Indore.   **Type :- 'R'.**

Object :—To study the effect of organic and inorganic nitrogenous fertilizers on rotation crops and the influence of (a) rotation and (b) frequency of manuring on changes in soil productivity as measured principally by crop yields.

1. BASAL CONDITIONS :

(i) (a) Three course rotation of *Jowar*—Cotton—Wheat. Four course rotation of *Jowar*—Groundnut—Cotton—Wheat. (b) As per rotation every year. (c) As per scheme. (ii) (a) Black cotton soil of medium fertility. (b) Soil samples are taken after completion of each rotation but analysis not completed as yet.

(iii)

Year	Kharif	Rabi
1954	29.6.54 to 1.7.54	22.10.54
1955	24, 25.6.55	22 and 24.10.55
1956	29, 30.6.56	19 and 20.10.56
1957	1, 2.7.57	10 and 11.10.57
1958	26, 27.6.58	29.10.58
1959	2 to 4.7.59	7.11.59
1960	25.6.60	17.10.60
1961	20, 21.6.61	17 and 18.11.61
1962	9, 10.7.62	20.10.62
1963	11, 12.7.63	10.10.63
1964	5 to 10.7.64	26 and 27.10.64.

(iv) (a) *Bakherings* every year before sowing. (b) Sowing with two coultered *desi* drill, drawn by bullocks with a distance of 14 inches between two adjoining rows, every year for *rabi* and *kharif* crops.

(c)

Crop	Seed Rate	
Jowar	10 lbs. per acre	
Groundnut	50 lbs. per acre	Every year
Cotton	20 lbs. per acre	
Wheat	60 lbs. per acre	

(d) 14 inches between rows and 6 to 9 inches between plants within rows for *kharif* crops. (e) All crops are bullk sown. (v) No. (vi) Bhoj (*Dhar*-43) for cotton, I.P.I.-3 for *jowar*, C-591 for wheat and AK-12-24 for groundnut. (vii) Unirrigated. (viii) Two or three wedings and inter-culturings with *khurpi*, *daura* and Indore ridger for *kharif* crops.

(ix)

	Rainfall for *kharif* crops i.e. total rainfall for five months viz. June July, August, Sept. and October.		Total rainfall for the whole year	
1954	...	51.06 inches	...	51.84 inches
1955	...	41.15 ,,	...	43.41 ,,
1956	...	24.73 .,	...	26 81 ,,
1957	...	25.86 ,,	...	26.34 ,,
1958	...	42.43 ,,	...	43.73 ,,
1959	...	56.13 ,,	...	57.41 ,,
1960	...	33.44 .,,	...	36.88 ,,
1961	...	57.71 ,.	...	60.12 ,,
1962	...	42.40 ,,	...	45.37 ,,
1963	...	37.56 ,,	...	39.85 ,,
1964	...	36.41 ,,		38.06 ,,

(x)

Year	Jowar	Groundnut	Cotton	Wheat
1954	10.1.55 to 16.1.55	8.11.54 to 14.11.54	I picking, II picking and III picking on Dec. 44, Jan. 55 and March 55	22.3.55 to 27.3.56
1955	26.12.55 to 31.12.55	1.11.55 to 8.11.55	Dec. 55, Jan. 56 and March 56	20.3.56 to 28.3.56

Year	Jowar	Groundnut	Cotton	Wheat
1956	18.12.56 to 23.12.56	22.10.56 to 29.10.56	Dec. 56, Jan. 57 and Feb. 57	11.3.57 to 19.3.57
1957	20.12.57 to 26.12.57	16.10.57 to 21.10.57	Dec. 57, Feb. 58	19.3.58 to 25.3.58
1958	22.12.58 to 27.12.58	17.10.58 to 24.10.58	Dec. 58, Jan. 59 Feb. 59	9.3.59 to 14.3.59
1959	25.12.59 to 30.12.59	9.11.59 to 14.11.59	Dec. 59, Feb. 60	23.3.60 to 29.3.60
1960	Last week of Dec. 1960	25.10.60 to 31.10.60	Dec. 60, Jan. 61 and Feb. 61	25 3.61 to 31.3.61
1961	1.1.62 to 7.1.62	23.10.61 to 25.10.61	Jan. 62, Feb. 62	22.3.62 to 28.3.62
1962	25.12.62 to 30.12.62	21.10.62 to 26.10.62	Feb. 63, March 63	Second week of March 1963
1963	22.12.63 to 1.1.64	28.10.63 to 2.11.63	Dec. 63, Jan. 64 and Feb. 64	2nd week of March 1964
1964	Last week of Dec.	28.10.64 to 18.11.64	Dec. 64, Feb. 65	20.3.65 to 26.3.65

2. TREATMENTS :

Details of frequency of manuring during the rotations.

Starting with Jowar in the year 1947.

	Rotation I (Jowar—Cotton—Wheat) Year of manuring				Rotation II (Jowar—Groundnut—Cotton—Wheat) Year of manuring			
	1	2	3		1	2	3	4
1.	O	O	O		O	X	O	O
2.	F	O	O		F	X	O	O
3.	O	F	O		O	X	F	O
4.	O	O	F		O	X	O	F
5.	F	F	O		F	X	F	O
6.	F	O	F		F	X	O	F
7.	O	F	F		O	X	F	F
8.	F	F	F		F	X	F	F
9.	O	O	O		O	X	O	O
10.	S	O	O		S	X	O	O
11.	O	S	O		O	X	S	O
12.	O	O	S		O	X	O	S
13.	S	S	O		S	X	S	O
14.	S	O	S		S	X	O	S
15.	O	S	S		O	X	S	S
16.	S	S	S		S	X	S	S
17.	O	O	O		O	X	O	O
18.	G	O	O		G	X	O	O
19.	O	G	O		O	X	G	O
20.	O	O	G		O	X	O	G
21.	G	G	O		G	X	G	O
22.	G	O	G		G	X	O	G
23.	O	G	G		O	X	G	G
24.	G	G	G		G	X	G	G

Above are 24 main-plot treatments where F=Manuring with F.Y.M., S=Manuring with A/S, G=Manuring with G.N.C. and O=No manure. Frequency of manuring used as per scheme given above. The sequence of manurial treatments, in two way tables of results start from 1947, as for example, the treatment combination OOF indicates that O is applied in 1947, O in 1948 F in 1949 and again O in 1950 and so on.

Each plot is divided in 3 sub-plots and following treatments given : $M_1 = 20$ lb./ac. of N, $M_2 = 20$ lb./ac. of P_2O_5 and $M_3 = 20$ lb./ac. of N+20 lb./ac. of P_2O_5.

Groundnut crop in the four course rotation is left unmanured and the symbol is X.

3. DESIGN :

(i) (a) Split-plot. (ii), (a), 24 main-plots/replication ; 3 sub-plots/main-plot. (b) $116'8'' \times 162'$ for each crop. (iii) 2. (iv) (a) $9'4'' \times 27'$. (b) $4'8'' \times 22'$. (v) Two guard rows on either side of each crop plot. (vi) Randomisation at the starting time of the experiment and are continued as per scheme.

4. GENERAL :

(i) No lodging. (ii) No incidence of pests. (iii) Height of random [plants in *jowar* and wheat crops for statistical study and average yield. (iv) (a) Long term duration. Started in *kharif* season of 1947 and is in progress still. (b) The crop plots are same every year as per crop rotation and manuring as per scheme. (c) Nil. (iv) (a) and (b) No. (vi) Nil. (vii) In expressing S. E.s., main-plots have been denoted by M while sub-plots by S.

5. RESULTS :

JOWAR Rotation I Year 1954

(i) 482 lb./ac. (ii) (a) 391.4 lb./ac. (b) 322.3 lb./ac. (iii) None of the effect is significant. (iv) Av. yield of grain in lb./ac.

Control = 340 lb./ac.

JOWAR Rotation II Year 1954

(i) 494 lb./ac. (ii) (a) 196.2 lb./ac. (b) 335.2 lb./ac. (iii) Manures and 2 np *vs.* (n+p) are significant. (iv) Av. yield of grain in lb./ac.

Control = 327 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
OOF	497	484	428	470	XOOF	504	487	421	471
OFO	491	457	570	506	XOFO	514	408	547	490
OFF	559	650	603	604	XOFF	517	620	577	571
FOO	494	554	414	487	XFOO	441	580	447	489
FOF	540	388	331	420	XFOF	554	517	520	530
FFO	504	620	653	592	XFFO	600	663	374	546
FFF	577	534	470	527	XFFF	663	590	573	609
OOS	391	418	308	372	XOOS	451	431	500	461
OSO	557	321	355	411	XOSO	312	361	534	402
OSS	636	540	544	573	XOSS	570	368	573	504
SOO	451	414	335	400	XSOO	534	491	341	455
SOS	583	374	282	413	XSOS	676	491	451	539
SSO	557	726	437	573	XSSO	315	414	355	361
SSS	636	636	759	677	XSSS	607	331	802	580
OOG	457	404	388	416	XOOG	497	508	583	529
OGO	507	491	451	483	XOGO	381	451	434	422
OGG	646	557	441	548	XOGG	620	666	603	630
GOO	530	471	587	529	XGOO	577	461	404	481
GOG	408	504	500	471	XGOG	424	421	563	469
GGO	670	428	597	565	XGGO	653	646	683	661
GGG	524	573	444	514	XGGG	855	520	683	686
Mean	534	502	471	502	Mean	536	496	522	518

S.E. of difference of two

1. M marginal means = 226.0 lb./ac.
2. S marginal means = 70.3 lb./ac.
3. S means at the same level of M = 322.3 lb./ac.
4. M means at the same level of S = 346.9 lb./ac.

S.E. of difference of two

1. M marginal means = 113.3 lb./ac.
2. S marginal means = 73.1 lb./ac.
3. S means at the same level of M = 335.2 lb./ac.
4. M means at the same level of S = 295.2 lb./ac.

COTTON Rotation I Year 1954

(i) 98 lb./ac. (ii) (a) 24.35 lb /ac. (b) 19.84 lb./ac.

(iii) Control vs. treated, manure effect, 2np vs. (n+p) and manure×effect×2np vs. (n+p) are highly significant. Kind effect is si nificant. (iv) Av. yield of kapas in lb./ac.

Control=64 lb./ac.

	N	P	NP	Mean
FOO	99	90	129	105
OFO	109	80	96	95
OOF	76	99	136	104
FFO	123	123	99	115
FOF	93	90	139	107
OFF	156	143	162	154
FFF	156	149	113	139
SOO	63	80	99	81
OSO	96	123	109	109
OOS	83	83	76	81
SSO	103	99	159	120
SOS	80	73	83	79
OSS	86	90	119	98
SSS	96	76	176	116
GOO	66	96	103	88
OGO	119	86	59	101
OOG	76	83	103	87
GGO	83	129	116	109
GOG	50	63	90	68
OGG	76	70	136	94
GGG	99	86	159	115
Mean	95	96	119	103

S.E. of difference of two
1. M marginal means = 14.12 lb./ac.
2. S marginal means = 4.33 lb./ac.
3. S means at the same level of M = 19.84 lb./ac.
4. M means at the same level of S = 21.49 lb./ac.

COTTON Rotation II Year 1954.

(i) 234 lb./ac. (ii) (a) 47.7 lb./ac. (b) 31.1 lb./ac.

(iii) Control vs. treated, n vs. p and 2np vs. (n+p) are highly significant. Kind effect i: significant. (iv) Av. yield of kapas in lb./ac.

Control=196 lb./ac.

	N	P	NP	Mean
XFOO	229	229	239	232
XOFO	176	212	202	197
XOOF	225	225	245	232
XFFO	235	206	252	231
XFOF	269	252	269	263
XOFF	255	292	272	273
XFFF	282	305	305	297
XSOO	229	278	262	256
XOSO	166	222	212	200
XOOS	229	202	249	227
XSSO	232	242	298	257
XSOS	196	245	199	213
XOSS	196	215	239	217
XSSS	199	282	318	266
XGOO	212	239	202	218
XOGO	235	242	252	243
XOOG	225	209	212	215
XGGO	232	272	249	251
XGOG	209	259	275	248
XOGG	219	222	245	229
XGGG	225	282	295	267
Mean	223	244	252	240

S.E. of difference of two
1. M marginal means = 27.54 lb./ac.
2. S marginal means = 6.79 lb./ac.
3. S means at the same level of M = 31.11 lb./ac.
4. M means at the same level of S = 37.46 lb./ac.

WHEAT Rotation I Year 1954.

(i) 653 lb./ac. (ii) (a) 147.1 lb./ac. (b) 256.2 lb./ac.

(iii) All effects are not significant. (iv) Av. yield of grain in lb./ac.

WHEAT Rotation II Year 1954.

(i) 610 lb./ac. (ii) (a) 79.7 lb./ac. (b) 48.8 lb./ac.

(iii) 2np vs. (n+p) is highly significant. Control vs. treated, manure×effect×2np vs. (n+p)are sign:- ficant. (iv) Av. yield of grain in lb./ac.

	Control=596 lb./ac.					Control=566 lb /ac.			
	N	P	NP	Mean		N	P	NP	Mean
FOO	719	501	630	617	FXOO	560	573	613	582
OFO	646	540	819	668	OXFO	623	590	640	618
OOF	587	653	706	649	OXOF	653	593	713	653
FFO	633	673	617	641	FXFO	627	673	630	643
FOF	743	815	975	844	FXOF	597	577	607	594
OFF	603	706	603	637	OXFF	580	590	494	555
FFF	660	607	593	620	FXFF	610	583	653	615
SOO	600	766	683	683	SXOO	560	607	597	588
OSO	676	623	530	610	OXSO	580	597	613	597
OOS	656	636	527	606	OXOS	550	627	600	592
SSO	670	646	743	686	SXSO	627	633	709	656
SOS	680	557	772	670	SXOS	660	524	693	626
OSS	676	613	656	648	OXSS	537	590	703	610
SSS	666	640	809	705	SXSS	620	680	769	690
GOO	680	544	646	623	GXOO	554	656	636	615
OGO	560	633	633	609	OXGO	587	590	583	586
OOG	477	676	699	617	OXOG	587	573	527	562
GGO	693	680	713	695	GXGO	617	557	670	615
GOG	746	772	686	735	GXOG	597	630	703	643
OGG	597	723	696	672	OXGG	630	623	666	640
GGG	643	567	746	652	GXGG	613	680	690	661
Mean	648	646	690	661	Mean	599	607	643	616

S.E. of difference of two

1. M marginal means	=	84.9 lb./ac.
2. S marginal means	=	55.9 lb./ac.
3. S means at the same level of M	=	256.2 lb./ac.
4. M means at the same level of S	=	225.8 lb./ac.

S.E. of difference of two

1. M marginal means	=	46.0 lb./ac.
2. S marginal means	=	10.6 lb./ac.
3. S means at the same level of M	=	48.8 lb./ac.
4. M means at the same level of S	=	60.9 lb./ac.

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GROUNDNUT Rotation II Year 1954.

(i) 549 lb./ac. (ii) (a) 222.6 lb./ac. (b) 121.1 lb./ac.
(iii) n vs. p and 2 np vs. (n+p) are highly significant.
(iv) Av. yield of dry pod in lb./ac.

GROUNDNUT Rotation II Year 1955

(i) 688 lb./ac. (ii) (a) 265.7 lb./ac. (b) 129.4 lb./ac.
(iii) n vs. p and 2 np vs. (n+p) are highly significant.
(iv) Av. yield of dry pod in lb./ac.

Control = 487 lb./ac.

Control = 604 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOOX	544	530	550	541	XFOO	663	564	762	663
OFOX	524	670	557	584	XOFO	550	560	573	561
OOFX	544	530	550	541	XOOF	719	517	653	630
FFOX	378	365	477	407	XFFO	753	713	825	764
FOFX	484	636	630	583	XFOF	617	869	955	814

Contd.

Contd.

OFFX	610	656	796	687	XOFF	703	411	703	60?
FFFX	438	471	524	478	XFFF	756	703	709	723
SOOX	404	391	385	393	XSOO	607	680	716	66?
OSOX	530	530	517	526	XOSO	560	666	699	64?
OOSX	431	716	650	599	XOOS	600	676	865	71?
SSOX	643	551	776	657	XSSO	421	643	514	525
SOSX	471	557	603	544	XSOS	501	640	607	583
OSSX	451	769	902	707	XOSS	511	1048	1008	85?
SSSX	418	590	709	572	XSSS	762	799	981	847
GOOX	418	544	457	473	XGOO	696	736	869	76?
OGOX	358	471	597	475	XOGO	623	855	607	695
COGX	424	617	683	575	XOOG	623	643	792	686
GGOX	716	835	941	831	XGGO	693	878	1008	860
GOGX	424	617	683	575	XGOG	550	537	530	539
OGGX	451	603	696	583	XOGG	789	1117	739	882
GGGX	371	520	577	493	XGGG	650	723	696	690
Mean	478	580	631	563	Mean	636	713	753	701

S.E. of difference of two

1. M marginal means = 128.5 lb./ac.
2. S marginal means = 26.4 lb./ac.
3. S means at the same level of M = 121.1 lb./ac.
4. M means at the same level of S = 162.2 lb./ac.

S.E. of difference of two

1. M marginal means = 153.4 lb. ac.
2. S marginal means = 28.2 lb.,ac.
3. S means at the same level of M = 129.4 lb./ac.
4. M means at the same level of S = 186.3 lb.,ac.

Jowar Rotation I Year 1955

(i) 355 lb./ac. (ii) (a) 98.6 lb./ac. (b) 70.8 lb./ac.
(iii) n *vs.* p and 2 np *vs.* $\overline{n+p}$ are highly significant. Effects are significant. (iv) Av. yield of grain in lb./ac.

Control = 303 lb./ac.

Jowar Rotation II Year 1955

(i) 272 lb.,ac. (ii) (a) 90.2 lb./ac. (b) 75.8 lb./ac.
(iii) n *vs.* p and 2 np *vs.* n+p are highly significant. Manure×effects×2 np *vs.* $\overline{n+p}$ are significant. (iv) Av. yield of grain in lb./ac.

Control = 241 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOO	346	196	346	296	FXOO	271	237	259	256
OFO	393	241	462	365	OXFO	188	287	245	240
OOF	383	326	300	336	OXOF	298	226	283	269
FFO	477	470	514	466	FXFO	326	272	242	280
FOF	442	268	353	354	FXOF	306	223	225	251
OFF	339	271	426	345	OXFF	275	273	508	352
FFF	337	373	377	362	FXFF	424	235	473	377
SOO	343	358	283	328	SXOO	285	137	138	187
OSO	370	284	375	343	OXSO	189	236	286	237
OOS	309	305	378	331	OXOS	296	224	229	250
SSO	470	362	486	439	SXSO	347	219	477	341

Contd.

Contd.

SOS	385	284	512	394	SXOS	435	262	391	363
OSS	370	299	459	376	OXSS	226	288	250	255
SSS	408	303	567	426	SXSS	238	227	358	274
GOO	304	325	257	295	GXOO	326	225	352	301
OGO	323	296	241	287	OXGO	285	185	274	248
OOG	404	386	353	381	OXOG	341	264	279	295
GGO	418	273	369	353	GXGO	304	262	206	257
GOG	319	303	512	378	GXOG	327	235	270	277
OGG	428	315	481	408	OXGG	332	202	258	264
GGG	298	317	422	346	GXGG	177	223	296	232
Mean	375	309	403	362	Mean	295	235	300	277

S.E. of difference of two

1. M marginal means = 56.9 lb./ac.
2. S marginal means = 15.4 lb./ac.
3. S means at the same level of M = 70.8 lb./ac.
4. M means at the same level of S = 65.8 lb./ac.

S.E. of difference of two

1. M marginal means = 52.1 lb./ac.
2. S marginal means = 16.5 lb./ac.
3. S means at the same level of M = 75.8 lb/ac.
4. M means at the same level of S = 80.9 lb./ac.

COTTON Rotation I Year 1955

(i) 119 lb./ac. (ii) (a) 52.2 lb./ac. (b) 19.8 lb./ac. (iii) n vs. p, 2 np vs. $\overline{n+p}$ and effects × sub-treatment are highly significant. Effect and manure × 2 np vs. $\overline{n+p}$ are significant. (iv) Av. yield of *kapas* in lb./ac.

COTTON Rotation II Year 1955

(i) 136 lb./ac. (ii) (a) 41.2 lb./ac. (b) 26.4 lb./ac. (iii) Control vs. treated and 2 np vs. $\overline{n+p}$ are highly significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 94 lb./ac.

Control = 103 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOO	96	93	116	102	FOOX	123	103	106	111
OFO	116	86	103	102	OFOX	129	126	169	141
OOF	129	116	156	134	OOFX	162	126	152	147
FFO	166	133	169	156	FFOX	139	106	169	138
FOF	143	93	109	115	FOFX	136	176	172	161
OFF	143	126	139	136	OFFX	136	146	186	156
FFF	162	99	159	140	FFFX	179	186	209	191
SOO	70	103	96	90	SOOX	156	136	139	144
OSO	90	70	76	79	OSOX	96	96	93	95
OOS	126	66	146	113	OOSX	106	149	152	136
SSO	86	86	96	89	SSOX	109	179	169	152
SOS	156	116	179	150	SOSX	86	146	152	128
OSS	139	86	189	138	OSSX	83	119	136	113
SSS	159	93	206	153	SSSX	109	106	166	126
GOO	113	90	133	112	GOOX	129	106	156	130
OGO	126	123	133	127	OGOX	86	99	133	106
OOG	126	86	133	115	OOGX	96	116	106	106

Contd.

GGO	106	99	116	107	GGOX	136	196	176	169
GOG	109	90	129	109	GOGX	149	143	172	155
OGG	159	103	152	138	OGGX	152	149	129	143
GGG	196	119	232	182	GGGX	1:6	166	162	155
Mean	129	99	141	123	Mean	125	137	153	138

S.E. of difference of two

1. M marginal means = 30.1 lb./ac.
2. S marginal means = 4.3 lb./ac.
3. S means at the same level of M = 19.8 lb./ac.
4. M means at the same level of S = 34.2 lb./ac.

S.E. of difference of two

1. M marginal means = 23.8 lb./ac.
2. S marginal means = 5.8 lb./ac.
3. S means at the same level of M = 26.4 lb./ac.
4. M means at the same level of S = 32.1 lb./ac.

WHEAT Rotation I Year 1955,

(i) 352 lb./ac. (ii) (a) 109.3 lb./ac. (b) 73.7 lb./ac.
(iii) n *vs.* p and 2 np *vs.* $\overline{n+p}$ are significant. (iv)
Av. yield of grain in lb./ac.

Control = 323 lb./ac.

WHEAT Rotation II Year 1955.

(i) 408 lb./ac. (ii) (a) 117.7 lb./ac. (b) 20.3 lb./ac.
(iii) n *vs.* p, 2 np *vs.* $\overline{n+p}$, manure×2 np *vs.* $\overline{n+p}$,
effect×sub-treatment and manure×effect×2 r p *vs.*
$\overline{n+p}$ are highly significant. (iv) Av. yield of grain
in lb./ac.

Control = 394 lb./ac.

	N	P	NP,	Mean		N	P	NP	Mean
FOO	361	292	378	344	FOXO	381	305	371	352
OFO	418	431	361	403	OFXO	477	471	355	434
OOF	269	292	282	281	OOXF	189	345	318	284
FFO	385	358	394	379	FFXO	431	408	441	427
FOF	335	418	474	409	FOXF	262	302	385	316
OFF	394	278	391	354	OFXF	365	335	467	389
FFF	318	424	507	416	FFXF	381	418	524	441
SOO	298	249	298	282	SOXO	448	444	451	448
OSO	278	391	312	327	OSXO	394	414	325	378
OOS	404	411	434	416	OOXS	394	328	401	374
SSO	341	371	335	349	SSXO	388	394	520	434
SOS	385	454	550	463	SOXS	388	385	494	422
OSS	348	315	411	358	OSXS	345	444	487	425
SSS	348	358	414	373	SSXS	438	474	547	486
GOO	295	378	295	323	GOXO	501	471	388	453
OGO	378	295	388	354	OGXO	365	381	338	361
OOG	225	418	411	351	OOXG	474	428	474	459
GGO	272	418	332	341	GGXO	457	487	501	482
GOG	232	292	269	264	GOXG	361	471	322	385
OGG	269	322	371	321	OGXG	371	454	414	413
GGG	341	477	312	377	GGXG	358	444	501	434
Mean	328	364	377	356	Mean	389	410	430	410

S.E. of difference of two		S.E. of difference of two	
1. M marginal means	= 63.1 lb./ac.	1. M marginal means	= 67.9 lb./ac.
2. S marginal means	= 16.1 lb./ac.	2. S marginal means	= 4.4 lb./ac.
3. S means at the same level of M	= 73.7 lb./ac.	3. S means at the same level of M	= 20.3 lb./ac.
4. M means at the same level of S	= 87.2 lb./ac.	4. M means at the same level of S	= 69.9 lb./ac.

JOWAR Rotation I Year 1956

(i) 804 lb./ac. (ii) (a) 166.8 lb./ac. (b) 134.9 lb./ac.
(iii) Control vs. others, effects, n vs. p, 2 np vs. $\overline{n+p}$ and effects×sub-treatments are highly significant. Manures is significant. (iv)Av. yield of grain in lb./ac.

JOWAR Rotation II Year 1956

(i) 749 lb./ac. (ii) (a) 263.1 lb./ac. (b) 110.8 lb./ac.
(iii) n vs. p and 2 np vs. $\overline{n+p}$ are highly significant.
(iv) Av. yield of grain in lb./ac.

Control = 584 lb./ac.　　　　　　　Control = 640 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOO	845	670	1018	844	XFOO	686	504	769	653
OFO	564	511	663	579	XOFO	888	709	935	844
OOF	743	656	869	756	XOOF	544	603	680	609
FFO	859	822	1004	895	XFFO	762	557	809	709
FOF	885	762	961	869	XFOF	653	570	457	560
OFF	643	743	1001	796	XOFF	570	530	716	605
FFF	928	617	975	840	XFFF	885	729	945	853
SOO	772	772	872	805	XSOO	743	779	872	798
OSO	799	733	680	737	XOSO	796	729	882	802
OOS	845	643	1134	874	XOOS	564	511	550	542
SSO	985	825	1101	970	XSSO	938	699	888	842
SOS	872	772	1167	937	XSOS	862	640	1094	865
OSS	656	716	1054	809	XOSS	825	845	908	859
SSS	1140	809	1478	1142	XSSS	855	749	1217	940
GOO	782	709	749	747	XGOO	935	766	828	843
OGO	636	477	547	553	XOGO	683	646	673	667
OOG	845	626	646	705	XOOG	835	610	610	685
GGO	822	617	988	809	XGGO	1041	752	1074	956
GOG	849	965	1452	1089	XGOG	832	530	753	705
OGG	782	626	1014	807	XOGG	822	733	872	809
GGG	1147	660	1157	988	XGGG	859	819	1140	943
Mean	828	701	978	836	Mean	790	667	842	766

S.E. of difference of two		S.E. of. difference of two	
1. M marginal mean	= 96.3 lb./ac.	1. M marginal mean	= 151.9 lb./ac.
2. S marginal mean	= 29.4 lb./ac.	2. S marginal mean	= 24 2 lb./ac.
3. S means at the same level of M	= 134.9 lb./ac.	3. S means at the same level of M	= 110.8 lb./ac.
4. M means at the same level of S	= 146.3 lb./ac.	4. M means at the same level of S	= 176.8 lb./ac.

COTTON Rotation I Year 1956

(i) 272 lb./ac. (ii) (a) 172.1 lb./ac. (b) 59.7 lb./ac. (iii) 2 np vs. n+p is highly significant. (iv) Av yield of kapas in lb./ac.

Control = 217 lb./ac.

	N	P	NP	Mean
FOO	318	215	321	285
OFO	252	229	338	273
OOF	232	209	215	219
FFO	312	219	322	284
FOF	292	269	335	299
OFF	3 2	225	325	287
FFF	391	269	358	339
SOO	269	262	331	297
OSO	249	186	199	211
OOS	278	252	239	246
SSO	.05	215	335	285
SOS	312	269	391	324
OSS	252	196	308	252
SSS	308	292	401	334
GOO	345	192	308	282
OGO	252	262	318	277
OOG	199	162	225	195
GGO	275	196	322	264
GOG	325	245	368	313
OGG	295	219	272	262
GGG	338	255	431	341
Mean	291	230	317	279

COTTON Rotation II 1956

(i) 424 lb./ac. (ii) (a) 78.8 lb./ac. (b) 14 3 lb./ac. (iii) n vs. p, 2 np vs. n+p, manures×2 np vs. n+p effect×sub-treatments are highly significant. (iv) Av. yield of kapas in lb./ac.

Control = 307 lb./ac.

	N	P	NP	Mean
XFOO	457	504	557	506
XOFO	315	401	394	370
XOOF	378	361	418	386
XFFO	444	401	454	433
XFOF	438	385	474	432
XOFF	481	421	537	480
XFFF	653	487	656	599
XSOO	371	467	570	469
XOSO	325	355	338	339
XOOS	365	428	378	390
XSSO	371	388	544	434
XSOS	355	481	454	430
XOSS	265	302	371	313
XSSS	358	504	501	454
XGOO	461	438	520	473
XOGO	365	318	332	338
XOOG	361	411	457	410
XGGO	583	524	623	577
XGOG	497	471	709	559
XOGG	322	411	501	411
XGGG	351	358	590	431
Mean	406	420	494	440

S.E. of difference of two

1. M marginal means = 99.3 lb./ac.
2. S marginal means = 13.0 lb./ac.
3. S means at the same level of M = 59.7 lb./ac.
4. M means at the same level of S = 110.7 lb./ac.

S.E. of difference of two

1. M marginal means = 45.5 lb., ac.
2. S marginal means = 3.1 lb./ac.
3. S means at the same level of M = 14.3 lb./ac.
4. M means at the same level of S = 47.0 lb./ac.

WHEAT Rotation I Year 1956.

(i) 764 lb./ac. (ii) (a) 177.1 lb./ac. (b) 118.3 lb./ac. (iii) 2 np vs. n+p is highly significant. (iv)Av· yield of grain in lb./ac.

WHEAT Rotation II 1956

(i) 566 lb./ac. (ii) (a) 129.4 lb./ac. (b) 68.4 lb./ac. (iii) Control vs. others, n vs. p and manure×effect ×2np vs. n+p are highly significant 2np vs. n+p and effects×sub-treatments are significant. (iv) Av. yield of grain in lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
	Control=727 lb./ac.					Control=475 lb./ac.			
FOO	815	749	789	784	FOOX	554	421	570	515
OFO	845	839	819	834	OFOX	527	610	666	601
OOF	693	888	716	766	OOFX	610	570	610	597
FFO	955	882	865	901	FFOX	709	524	802	678
FOF	825	912	865	867	FOFX	567	587	706	620
OFF	646	792	839	759	OFFX	507	673	534	571
FFF	630	888	918	812	FFFX	663	723	564	630
SOO	756	583	759	699	SOOX	603	583	520	569
OSO	577	670	650	632	OSOX	408	557	537	501
OOS	603	676	753	677	OOSX	554	597	530	560
SSO	703	709	1081	831	SSOX	477	729	603	603
SOS	617	759	948	775	SOSX	474	520	577	524
OSS	547	627	663	612	OSSX	385	603	593	527
SSS	785	905	905	865	SSSX	607	557	746	637
GOO	779	680	729	729	GOOX	650	547	550	582
OGO	600	709	620	643	OGOX	457	501	534	497
OOG	600	627	603	610	OOGX	534	590	484	536
GGO	839	709	951	833	GGOX	564	785	557	636
GOG	928	815	1104	949	GOGX	683	610	660	651
OGG	709	892	855	819	OGGX	640	570	590	600
GGG	875	603	792	757	GGGX	474	517	693	561
Mean	730	758	820	769	Mean	552	589	601	581

S.E. of difference of two

1. M marginal means = 102.2 lb./ac.
2. S marginal means = 25.8 lb./ac.
3. S means at the same level of M = 118.3 lb./ac.
4. M means at the same level of S = 140.7 lb./ac.

S.E. of difference of two

1. M marginal means = 74.7 lb./ac.
2. S marginal means = 14 9 lb./ac.
3. S means at the same level of M = 68.4 lb./ac.
4. M means at the same level of S = 93.3 lb./ac.

GROUNDNUT Rotation II Year 1956.

(i) 1078 lb./ac. (ii) (a) 180.6 lb./ac. (b) 115.9 lb./ac. (iii) n vs. p and 2 np vs. (n+p) are highly significant. Control vs. other and manure is significant. (iv) Av. yield of dry pods in lb./ac.

GROUNDNUT Rotation II Year 1957.

(i) 1249 lb./ac. (ii) (a) 230.9 lb./ac. (b) 140.8 lb./ac. (iii) Control vs. treated, n vs. p and 2 np vs. (n+p) are highly significant. (iv) Av. yield of dry pods in lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
	Control = 971 lb./ac.					Control = 1056 lb./ac.			
FXOO	1124	1167	1286	1192	FOXO	1192	1133	1226	1184
OXFO	1034	1104	1250	1129	OFXO	1229	1385	1252	1259
OXOF	981	1087	1323	1130	OOXF	1007	1083	1126	1072
FXFO	1167	1435	1174	1259	FFXO	1295	1252	1537	1361
FXOF	1154	1034	1349	1179	FOXF	1153	1166	1411	1243

Contd.

Contd

OXFF	865	1220	1071	1052	OFXF	1332	1398	1524	1418
FXFF	1170	1210	1256	1212	FFXF	1438	1471	1504	1471
SXOO	925	1064	1071	1020	SOXO	1043	1358	1295	1232
OXSO	842	1111	1054	1002	OSXO	1060	1086	1106	1084
OXOS	998	1014	1160	1057	OOXS	1272	1226	1298	1205
SXSO	965	1187	1230	1127	SSXO	1166	1587	1517	1423
SXOS	951	1157	1134	1081	SOXS	1040	1328	1385	1251
OXSS	1164	1236	1130	1177	OSXS	990	1332	1123	1148
SXSS	739	1057	932	909	SSXS	918	1487	1358	1254
GXOO	1014	1071	1144	1076	GOXO	1060	1398	1325	1261
OXGO	1004	935	1101	1013	OGXO	1216	1398	1570	1395
OXOG	1140	1200	1303	1214	OOXG	987	1173	1113	1091
GXGX	845	1044	941	943	GGXO	1159	1504	1342	1335
GXOG	1004	1160	1034	1066	GOXG	1159	1279	1298	1233
OXGG	902	1091	1270	1088	OGXG	1143	1365	1385	1258
GXGG	961	1008	1124	1031	GGXG	1292	1457	1709	1436
Mean	998	1123	1159	1093	Mean	1150	1326	1353	1275

S.E. of difference of two

1. M marginal means = 104.3 lb./ac.
2. S marginal means = 25.3 lb./ac.
3. S means at the same level of M = 115.9 lb./ac.
4. M means at the same level of S = 140.8 lb.ac.

S.E. of difference of two

1. M marginal means = 133.3 lb./ac.
2. S marginal means = 30 7 lb./ac.
3. M means at the same level of S = 176 0 lb./ac.
4. S means at the same level of M = 140 8 lb.,ac.

Jowar Rotation I Year 1957.

(i) 859 lb./ac. (ii) (a) 200.3 lb./ac. (b) 159.0 lb./ac. (iii) Control vs. treated, manures, n vs. p, 2np vs. n+p and manures×2np vs. n+p are highly significant. (iv) Av. yield of grain in lb./ac

Jowar Rotation II Year 1957.

(i) 759 lb./ac. (ii) (a) 204.7 lb./ac. (b) 191.7 lb./ac. (iii) Control vs. treated, n vs. p and 2np vs. n+p are highly significant. Effects are significant. (iv) Av. yield of grain in lb./ac.

Control = 627 lb./ac.

Control = 538 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOO	951	743	842	845	FOOX	733	670	812	738
OFO	786	779	786	784	OFOX	868	733	1028	876
OOF	802	865	902	856	OOFX	888	749	686	774
FFO	1061	743	935	913	FFOX	736	527	961	741
FOF	988	699	1074	920	FOFX	852	593	733	726
OFF	752	726	805	761	OFFX	978	796	766	847
FFF	905	815	1074	931	FFFX	1067	557	1087	904
SOO	859	547	1233	880	SOOX	1077	640	875	864
OSO	922	729	888	846	OSOX	663	544	789	665
OOS	792	607	646	682	OOSX	713	769	958	813
SSO	1167	676	1346	1063	SSOX	759	1021	1167	982

Contd.

Contd.

	N	P	NP	Mean		N	P	NP	Mean
SOS	895	534	1220	.883	SOSX	590	733	663	662
OSS	699	617	935	750	OSSX	603	454	1223	760
SSS	1313	922	1790	1342	SSSX	786	534	1210	843
GOO	981	875	1004	953	GOOX	709	494	636	613
OGO	849	570	948	789	OGOX	540	703	636	626
OOG	779	696	723	733	OOGX	699	517	813	676
GGO	736	703	1283	907	GGOX	948	1087	965	1000
GOG	971	752	1061	928	GOGX	975	613	859	816
OGG	1147	772	1071	997	OGGX	789	623	716	709
GGG	1134	646	1154	978	GGGX	1008	670	1223	967
Mean	928	715	1034	892	Mean	809	669	895	791

S.E. of difference of two

1. M marginal means = 115.6 lb./ac.
2. S marginal means = 34.7 lb./ac.
3. S means at the same level of M = 159.0 lb./ac.
4. M means at the same level of S = 173.9 lb./ac.

S.E. of difference of two

1. M marginal means = 118.2 lb./ac.
2. S marginal means = 41.8 lb./ac.
3. S means at the same level of M = 191.7 lb./ac.
4. M means at the same level of S = 196.1 lb./ac.

COTTON Rotation I Year 1957.

(i) 292 lb./ac. (ii) (a) 230.0 lb./ac. (b) 333.9 lb./ac. (iii) Control *vs.* treated, effects, n *vs.* p and 2 np *vs.* $\overline{n+p}$ are highly significant. Effects × sub-treatments is significant. (iv) Av. yield of *kapas* in lb./ac.

COTTON Rotation II Year 1957.

(i) 455 lb./ac. (ii) (a) 118.5 lb./ac. (b) 79.9 lb./ac. (iii) 2 np *vs.* $\overline{n+p}$ and effects × sub-treatments are highly significant. Control *vs.* treated and manures × effects × 2 np *vs.* $\overline{n+p}$ are significant. (iv) Av. yield of *kapas* in lb./ac.

Control = 243 lb./ac.

Control = 393 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOO	331	272	351	318	FXOO	381	326	482	39
OFO	312	235	328	292	OXFO	386	433	497	439
OOF	242	239	285	255	OXOF	380	428	481	430
FFO	394	282	351	342	FXFO	522	491	570	528
FOF	295	272	348	305	FXOF	545	399	481	475
OFF	414	239	348	334	OXFF	481	545	485	504
FFF	328	275	401	335	FXFF	583	465	651	566
SOO	255	262	288	268	SXOO	387	359	417	388
OSO	331	278	338	316	OXSO	405	383	507	432
OOS	232	292	239	254	OXOS	324	430	466	407
SSO	292	189	285	255	SXSO	386	404	451	414
SOS	229	235	321	262	SXOS	428	414	470	437
OSS	358	258	348	321	OXSS	387	473	748	536
SSS	384	249	378	337	SXSS	456	548	565	523
GOO	245	288	258	264	GXOO	341	462	483	429
OGO	391	249	391	344	OXGO	402	448	500	450
OOG	239	235	292	255	OXOG	419	449	517	462

Contd.

Contd.

GGO	328	282	328	313		GXGO	571	458	561	463
GOG	268	285	305	286		GXOG	478	571	527	525
OGG	312	212	321	282		OXGG	434	327	535	432
GGG	401	262	388	350		GXGG	484	492	544	507
Mean	313	257	328	299		Mean	428	443	521	464

S.E. of difference of two

1. M marginal means = 132.8 lb./ac.
2. S marginal means = 72.9 lb./ac.
3. S means at the same level of M = 333.9 lb./ac.
4. M means at the same level of S = 303.2 lb./ac.

S.E. of difference of two

1. M marginal means = 46.1 lb./ac.
2. S marginal means = 25.9 lb /ac.
3. S means at the same level of M = 79.9 lb./ac.
4. M means at the same level of S = 94.5 lb./ac.

WHEAT Rotation I Year 1957.

(i) 511 lb./ac. (ii) (a) 99.3 lb./ac. (b) 84.2 lb./ac. (iii) Control *vs.* treated is highly significant. Effects and 2np *vs.* n+p are significant. (iv) Av. yield of grain in lb./ac.

WHEAT Rotation II Year 1957.

(i) 502 lb./ac. (ii) (a) 122.3 lb./ac. (b) 87.4 lb./ac. (iii) n *vs.* p and 2np *vs.* n+p are highly significant. Effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 444 lb./ac.

Control = 453 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOO	550	447	504	500	XFOO	510	613	563	562
OFO	537	501	640	559	XOFO	418	438	418	425
OOP	421	510	544	492	XOOF	461	484	378	441
FFO	597	540	603	580	XFFO	444	683	643	590
FOF	640	573	630	614	XFOF	520	524	457	500
OFF	583	524	534	547	XOFF	408	428	610	482
FFF	643	524	550	572	XFFF	554	428	673	552
SOO	520	573	550	548	XSOO	457	504	623	528
OSO	381	517	501	466	XOSO	384	447	524	452
OOS	477	431	438	449	XOOS	378	491	355	408
SSO	550	590	626	589	XSSO	454	610	587	550
SOS	454	464	504	474	XSOS	408	626	547	527
OSS	563	563	597	574	XOSS	421	434	530	462
SSS	424	404	680	503	XSSS	514	636	670	607
GOO	451	411	524	462	XGOO	355	497	560	471
OGO	451	541	481	491	XOGO	451	447	474	457
OOG	375	451	444	423	XCOG	444	534	451	476
GGO	544	550	520	538	XGGO	583	514	607	568
GOG	530	431	504	488	XGOG	394	537	454	462
OGG	540	583	520	548	XOGG	464	504	650	539
GGG	447	587	530	521	XGGG	447	643	663	584
Mean	508	510	544	521	Mean	451	525	545	507

S.E. of difference of two

1 M marginal means	=	57.3 lb./ac.
2. S marginal means	=	18.4 lb./ac.
3. S means at the same level of M	=	84.2 lb./ac.
4. M means at the same level of S	=	89.5 lb./ac.

S.E. of difference of two

1. M marginal means	=	70.6 lb./ac.
2. S marginal means	=	19.1 lb./ac.
3. S means at the same level of M	=	87.4 lb./ac.
4. M means at the same level of S	=	100.4 lb./ac.

JOWAR Rotation I Year 1958.

(i) 560 lb./ac. (ii) (a) 185.1 lb./ac. (b) 170.0 lb./ac. (iii) Control *vs.* others and 2 np *vs.* $\overline{n+p}$ are highly significant. (iv) Av. yield of grain in lb./ac.

JOWAR Rotation II Year 1958.

(i) 557 lb./ac. (ii) (a) 170.6 lb./ac. (b) 114.8 lb./ac. (iii) Control *vs.* others and 2 np *vs.* $\overline{n+p}$ are highly significant. Effects and manures×2 np *vs.* $\overline{n+p}$ are significant. (iv) Av. yield of grain in lb./ac.

Control = 362 lb./ac.

Control = 392 lb./ac.

	N	P	NP	Mean
FOO	590	517	544	550
OFO	630	527	772	643
OOF	477	689	454	540
FFO	477	557	756	597
FOF	663	587	888	713
OFF	653	666	767	695
FFF	438	510	550	499
SOO	451	714	736	634
OSO	557	351	620	509
OOS	497	454	636	529
SSO	640	613	842	698
SOS	610	510	789	636
OSS	659	331	637	542
SSS	474	630	772	625
GOO	438	604	444	495
OGO	438	358	464	420
OOG	613	410	750	591
GGO	617	640	749	669
GOG	597	781	431	603
OGG	663	464	878	668
GGG	530	341	593	488
Mean	558	536	670	588

	N	P	NP	Mean
XFOO	557	481	792	610
XOFO	464	500	590	518
XOOF	557	387	494	479
XFFO	736	650	656	681
XFOF	487	670	570	576
XOFF	716	569	663	649
XFFF	633	597	776	669
XSOO	421	534	650	535
XOSO	278	603	630	504
XOOS	365	441	587	464
XSSO	341	544	424	436
XSOS	447	544	809	600
XOSS	510	636	699	615
XSSS	517	716	822	685
XGOO	603	550	623	592
XOGO	411	593	313	439
XOOG	621	501	603	575
XGGO	633	739	829	734
XGOG	510	514	424	483
XOGG	607	563	768	646
XGGG	733	597	756	695
Mean	531	568	642	580

S.E. of difference of two

1. M marginal means	=	106.9 lb./ac.
2. S marginal means	=	37.1 lb./ac.
3. S means at the same level of M	=	170.0 lb./ac.
4. M means at the same level of S	=	175.2 lb./ac.

S.E. of difference of two

1. M marginal mean	=	98.5 lb./ac.
2. S marginal mean	=	25.0 lb./ac.
3. S means at the same level of M	=	114.8 lb./ac
4. M means at the same level of S	=	136.0 lb /ac.

COTTON Rotation I Year 1958.

(i) 111 lb./ac. (ii) (a) 39.5 lb./ac. (b) 22.3 lb./ac. (iii) 2np vs. n+p is highly significant. Control vs. treated, effects, manures×effects and n vs. p are significant. (iv) Av. yield of kapas in lb./ac.

COTTON Rotation II Year 1958.

(i) 141 lb./ac. (ii) (a) 43.7 lb./ac. (b) 38.2 lb./ac. (iii) Only 2 np vs. n+p is highly significant. (iv) Av. yield of kapas in lb./ac.

Control = 92 lb./ac.

Control = 114 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOO	109	103	142	118	FOXO	106	103	113	107
OFO	103	60	83	82	OFXO	106	86	106	99
OOF	89	96	116	100	OOXF	146	123	126	132
FFO	126	113	129	123	FFXO	146	149	139	145
FOF	89	76	80	82	FOXF	133	162	129	141
OFF	109	103	126	113	OFXF	146	156	205	169
FFF	156	116	189	154	FFXF	192	149	162	168
SOO	76	113	106	98	SOXO	123	106	159	129
OSO	89	99	86	91	OSXO	109	113	149	124
OSS	139	109	192	147	OOXS	149	129	196	158
SSO	70	70	103	81	SSXO	136	169	156	154
SOS	166	113	152	144	SOXS	162	162	126	150
OSS	139	89	189	139	OSXS	123	103	199	142
SSS	176	136	176	163	SSXS	129	142	215	162
GOO	79	93	106	93	GOXO	126	152	139	139
CGO	79	129	133	114	OGXO	159	149	156	155
OOG	133	152	162	149	OOXG	139	129	152	140
GGO	106	89	109	101	GGXO	119	196	156	157
GOG	70	60	76	69	GOXG	152	116	165	145
OGG	123	113	139	125	OGXG	152	136	189	159
GGG	113	70	106	96	GGXG	152	142	189	161
Mean	111	100	129	113	Mean	138	137	158	144

S.E. of difference of two

1. M marginal means = 22.8 lb./ac.
2. S marginal means = 4.9 lb./ac.
3. S means at the same level of M = 22.3 lb./ac.
4. M means at the same level of S = 29.2 lb./ac.

S.E. of difference of two

1. M marginal means = 25.2 lb./ac.
2. S marginal means = 8.3 lb./ac.
3. S means at the same level of M = 38.2 lb./ac.
4. M means at the same level of S = 40.1 lb./ac.

WHEAT Rotation I Year 1958.

(i) 584 lb./ac. (ii) (a) 179.0 lb./ac. (b) 131.5 lb./ac. (iii) Control vs. others and 2 np vs. n+p are significant. (iv) Av. yield of grain in lb./ac.

WHEAT Rotation II Year 1958.

(i) 537 lb./ac. (ii) (a) 101.7 lb./ac. (b) 77.4 lb./ac. (iii) Control vs. others, n vs p and 2 np vs. n+p are highly significant. (iv) Av. yield of grain in lb./ac.

Control=493 lb./ac.   Control=458 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOO	643	663	819	708	FXOO	438	530	560	509
OFO	643	563	590	599	OXFO	510	544	500	518
OOF	497	590	557	548	OXOF	524	573	593	563
FFO	656	610	597	621	FXFO	600	620	650	623
FOF	630	716	646	664	FXOF	530	514	517	520
OFF	603	534	603	580	OXFF	365	583	471	473
FFF	633	772	683	696	FXFF	637	610	563	603
SOO	491	504	510	502	SXOO	477	537	491	502
OSO	550	550	610	570	OXSO	477	504	500	494
OOS	603	683	563	616	OXOS	524	563	491	526
SSO	464	547	583	531	SXSO	547	603	699	616
SOS	583	593	676	617	SXOS	580	540	560	560
OSS	540	646	597	594	OXSS	457	683	686	609
SSS	643	534	762	646	SXSS	524	603	636	588
GOO	484	491	431	469	GXOO	444	477	517	479
OGO	550	570	530	550	OXGO	484	537	491	504
OOG	471	544	656	557	OXOG	494	537	577	536
GGO	437	554	550	514	GXGO	471	517	640	543
GOG	517	587	643	582	GXOG	484	633	550	556
OGG	527	454	673	551	OXGG	491	554	696	580
GGG	563	729	1081	791	GXGG	550	613	703	622
Mean	558	592	636	595	Mean	505	565	576	549

S.E. of difference of two

1. M marginal means = 103.3 lb./ac.
2. S marginal means = 28.7 lb./ac.
3. S means at the same level of M = 131.5 lb./ac.
4. M means at the same level of S = 149.0 lb./ac.

S.E. of difference of two

1. M marginal means = 58.7 lb./ac.
2. S marginal means = 16.9 lb./ac.
3. S means at the same level of M = 77.4 lb./ac.
4. M means at the same level of S = 86.3 lb./ac.

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JOWAR Rotation I Year 1959.

(i) 253 lb./ac. (ii) (a) 118.3 lb./ac. (b) 86.7 lb./ac. (iii) Control *vs.* treated and 2np *vs.* $\overline{n+p}$ are highly significant. Effects and effects × sub-treatments are significant. (iv) Av. yield of grain in lb./ac.

JOWAR Rotation II Year 1959.

(i) 169 lb./ac. (ii) (a) 114.3 lb./ac. (b) 59.4 lb./ac. (iii) n *vs.* p is significant. (iv) Av. yield of grain in lb./ac.

Control=123 lb./ac.   Control=128 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOO	232	245	265	247	FXOO	83	60	93	79
OFO	106	172	232	170	OXFO	50	139	192	127
OOF	232	258	341	277	OXOF	162	162	89	138
FFO	222	252	292	255	FXFO	182	235	235	217
FOF	192	315	371	293	FXOF	142	242	325	236

Contd.

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OFF	331	325	391	349	OXFF	149	86	202	146
FFF	491	315	378	395	FXFF	209	215	156	193
SOO	109	298	464	290	SXOO	215	202	192	203
OSO	169	275	199	214	OXSO	142	235	205	194
OOS	192	258	302	251	OXOS	176	123	222	174
SSO	259	252	494	335	SXSO	103	156	199	153
SOS	126	292	272	230	SXSS	182	159	133	158
OSS	93	265	414	257	OXSS	99	199	139	146
SSS	295	219	457	324	SXSS	106	258	249	204
GOO	126	275	215	206	GXOO	146	176	189	170
OGO	196	79	179	151	OXGO	156	142	149	149
OOG	258	292	216	255	OXOG	113	133	123	123
GGO	318	282	391	330	GXGO	126	173	116	138
GOG	219	286	384	296	GXOG	189	222	262	224
OGG	192	179	418	263	OXGG	195	258	142	198
GGG	265	232	451	316	GXGG	305	308	292	302
Mean	220	255	339	271	Mean	154	185	186	175

S.E. of difference of two

1. M marginal means = 68.3 lb./ac.
2. S marginal means = 18.9 lb./ac.
3. S means at the same level of M = 86.7 lb./ac.
4. M means at the same level of S = 98.4 lb./ac.

S.E. of difference of two

1. M marginal means = 66.0 lb./ac.
2. S marginal means = 13.0 lb./ac.
3. S means at the same level of M = 59.4 lb./ac.
4. M means at the same level of S = 81.9 lb./ac.

COTTON Rotation I Year 1959.

(i) 74 lb./ac. (ii) (a) 33.5 lb./ac. (b) 24.6 lb./ac. (iii) Control vs. treated, effects, manures × effects and 2 np vs. n+p are highly significant. (iv) Av. yield of kapas in lb./ac.

COTTON Rotation II Year 1959.

(i) 89 lb./ac. (ii) (a) 50.9 lb./ac. (b) 22.2 lb./ac. (iii) Treatments are not significant. (iv) Av. yield of kapas in lb./ac.

Control = 48 lb./ac.

Control = 76 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOO	26	56	83	55	FOOX	93	63	103	86
OFO	79	83	113	92	OFOX	109	116	139	121
OOF	63	113	86	87	OOFX	126	79	93	99
FFO	73	93	119	95	FFOX	70	76	103	83
FOF	119	73	126	106	FOFX	93	89	103	95
OFF	86	93	103	94	OFFX	103	93	133	110
FFF	23	50	36	36	FFFX	109	96	133	113
SOO	46	53	73	57	SOOX	116	79	86	94
OSO	99	53	70	74	OSOX	79	89	60	76
OOS	99	66	93	86	OOSX	86	53	66	68
SSO	126	106	116	116	SSOX	56	83	96	78

Contd.

Contd.

SOS	83	73	86	81	SOSX	106	133	99	113
OSS	40	36	40	39	OSSX	83	66	76	75
SSS	79	63	106	83	SSSX	83	63	83	76
GOO	76	86	83	82	GOOX	60	63	86	70
OGO	40	20	46	35	OGOX	50	83	89	74
OOG	63	113	126	101	OOGX	46	73	56	58
GGO	70	83	79	77	GGOX	103	166	149	139
GOG	79	76	96	84	GOGX	99	76	109	95
OGG	70	86	142	99	OGGX	103	116	99	106
GGG	46	40	50	45	GGGX	56	99	50	68
Mean	71	72	89	77	Mean	87	88	96	90

S.E. of difference of two
1. M marginal means = 19.3 lb./ac.
2. S marginal means = 5.4 lb./ac.
3. S means at the same level of M = 24.6 lb./ac.
4. M means at the same level of S = 27.9 lb./ac.

S.E. of difference of two
1. M marginal means = 29.4 lb./ac.
2. S marginal means = 4.8 lb./ac.
3. S means at the same level of M = 22.2 lb./ac.
4. M means at the same level of S = 34.5 lb./ac.

WHEAT Rotation I Year 1959.

(i) 740 lb./ac. (ii) (a) 232.0 lb./ac. (b) 59.4 lb./ac. (iii) Effects, 2 np *vs.* $\overline{n+p}$, effects×sub-treatments and manures×effects×2 np *vs.* $\overline{n+p}$ are highly significant. Control *vs.* treated and manures× 2np *vs.* $\overline{n+p}$ are significant. (iv) Av. yield of grain in lb./ac.

Control = 615 lb./ac.

WHEAT Rotation II Year 1959.

(i) 606 lb./ac. (ii) (a) 91.2 lb./ac. (b) 86.2 lb./ac. (iii) Control *vs.* others, 2 np *vs.* $\overline{n+p}$ are highly significant. Effects and effects×sub-treatments are significant. (iv) Av. yield of grain in lb./ac.

Control = 510 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOO	689	650	802	714	FOXO	610	643	590	614
OFO	835	670	696	734	OFXO	597	636	550	594
OOF	603	723	583	636	OOXF	510	650	597	586
FFO	862	762	888	837	FFXO	577	616	656	616
FOF	855	915	955	908	FOXF	636	636	749	674
OFF	623	703	915	747	OFXF	636	537	630	601
FFF	782	994	961	912	FFXF	716	650	888	751
SOO	888	762	656	769	SOXO	557	643	689	630
OSO	590	630	474	565	OSXO	610	577	643	610
OOS	484	563	723	590	OOXS	557	530	563	550
SSO	888	835	1107	943	SSXO	663	530	822	672
SOS	723	716	1127	855	SOXS	656	583	749	663
OSS	517	517	670	568	OSXS	451	570	557	526
SSS	895	796	1054	915	SSXS	497	563	802	621
GOO	809	723	895	809	GOXO	597	683	583	621
OGO	457	636	623	572	OGXO	484	603	544	544
OOG	550	643	636	610	OOXG	603	636	636	625
GGO	815	822	855	831	GGXO	703	530	683	639

Contd.

Contd.

GOG	749	736	1021		835	GOXG	484	650	729	621
OGG	696	776	928		800	OGXG	550	689	610	616
GGG	709	736	882		776	GGXG	494	736	716	649
Mean	715	729	831		758	Mean	580	614	666	620

S.E of difference of two

1. M marginal means = 133.9 lb./ac.
2. S marginal means = 13.0 lb./ac.
3. S means at the same level of M = 59.4 lb./ac.
4. M means at the same level of S = 142.5 lb./ac.

S.E. of difference of two

1. M marginal means = 52.6 lb./ac.
2. S. marginal means = 18.8 lb./ac.
3. S means at the same level of M = 86.2 lb./ac.
4. M means at the same level of S = 87.9 lb./ac.

GROUNDNUT Rotation II Year 1958.

(i) 381 lb./ac. (ii) (a) 178.6 lb./ac. (b) 90.4 lb./ac. (iii) Only 2 np *vs.* $\overline{n+p}$ is significant. (iv) Av. yield of pods in lb./ac.

Control = 344 lb./ac.

GROUNDNUT Rotation II Year 1959.

(i) 161 lb./ac. (ii) (a) 92 0 lb./ac. (b) 51.4 lb./ac. (iii) Only control *vs.* treated is highly significant. (iv) Av. yield of pods in lb./ac.

Control = 146 lb./ac.

	N	P	NP	Mean		N	P	NP	Mean
FOOX	424	384	411	406	XFOO	235	123	162	173
OFOX	471	418	451	447	XOFO	156	179	225	186
OOFX	341	365	418	375	XOOF	142	129	136	136
FFOX	325	229	365	306	XFFO	186	139	166	163
FOFX	530	345	510	462	XFOF	205	199	152	185
OFFX	520	537	438	498	XOFF	149	149	142	147
FFFX	464	384	358	402	XFFF	96	133	133	121
SOOX	292	484	341	372	XSOO	116	123	116	118
OSOX	365	335	351	350	XOSO	142	136	133	137
OOSX	351	580	391	441	XOOS	232	195	258	228
SSOX	401	268	345	338	XSSO	119	139	103	120
SOSX	331	557	351	413	XSOS	199	195	212	202
OSSX	371	285	646	434	XOSS	262	245	179	229
SSSX	288	272	325	295	XSSS	172	129	295	199
GOOX	235	391	328	318	XGOO	149	116	159	141
OGOX	275	411	477	388	XOGO	125	186	99	137
OOGX	321	298	391	337	XOOG	202	159	219	193
GGOX	524	437	550	504	XGGO	133	258	258	216
GOGX	285	325	437	349	XGOG	123	116	119	119
OGGX	325	292	298	305	XOGG	139	159	116	138
GGGX	292	371	411	358	XGGG	136	156	123	138
Mean	368	379	409	385	Mean	163	160	167	163

S.E. of difference of two

1. M marginal means = 103.1 lb./ac.
2. S marginal means = 19.7 lb./ac.
3. S means at the same level of M = 90.4 lb./ac.
4. M means at the same level of S = 126.8 lb./ac.

S.E. of difference of two

1. M marginal means = 53.1 lb./ac.
2. S marginal means = 11.2 lb./ac.
3. S means at the same level of M = 51.4 lb./ac.
4. M means at the same level of S = 67.7 lb./ac.