

INSTITUTE OF AGRICULTURAL RESEARCH STATISTICS

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FIELD

EXPERIMENTS

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1948-53



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FOREWORD

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

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

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

NEW DELHI,
August 20, 1962.

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

PREFACE

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

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

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

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

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

The compendium is divided into 15 volumes one each for (1) Andhra Pradesh (2) Assam, Manipur and Tripura (3) Bihar (4) Gujarat (5) Kerala (6) Madhya Pradesh (7) Madras (8) Maharashtra (9) Mysore (10) Orissa (11) Punjab, Jammu & Kashmir and Himachal Pradesh (12) Rajasthan (13) Uttar Pradesh (14) West Bengal and (15) all Central Institutes. In each volume back-ground information of the respective State regarding its physical features, soils, rainfall and climate, agricultural production and area under different crops is given. A map showing different regions of the State, soils and agricultural research farms is also included. The experiments reported in each volume have been arranged cropwise for each State. All the experiments belonging to a particular crop at various research stations are grouped together. For a particular crop, experiments are arranged according to the following classification :

Manurial (M), Cultural (C), Irrigational (I), Diseases, Pests and Chemicals other than fertilizers (D), Rotational (R), Mixed Cropping (X) and combinations of these wherever they occur (e.g., CM as Cultural-cum-Manurial). Experiments in which crop varieties also form a factor are denoted by adding V to their symbol and are given together (e.g., MV as Manurial-cum-Varietal). The results of an experiment are given along with other basic information such as rotation of crops followed, cultural practices adopted, etc.

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

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

(ii)

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

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

NEW DELHI,
August 16, 1962.

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

REGIONAL SUPERVISORS FOR THE SCHEME OF THE NATIONAL INDEX
OF FIELD EXPERIMENTS

Region and headquarters	Regional Supervisors :
1. ANDHRA PRADESH (HYDERABAD)	SHRI D.V.G. KRISHNAMOORTHY, Deputy Director of Food Production, Andhra Pradesh. SHRI JAGANNATH RAO, Joint Director of Agriculture (Research), Andhra Pradesh. DR. KHADRUDDIN KHAN, Joint Director of Agriculture (Research), Andhra Pradesh. DR. WAHIUDDIN, Headquarters Deputy Director of Agriculture (Research), Andhra Pradesh.
2. ASSAM, MANIPUR AND TRIPURA (SHILLONG)	SHRI L.K. HANDIQUE, Director of Agriculture, Assam. SHRI S. MAJID, Director of Agriculture, Assam. DR. S.R. BAROHA, Director of Agriculture, Assam.
3. BIHAR (SABOUR)	DR. R. RICHARIA, Principal, Agriculture College, Sabour. SHRI R.S. ROY, Principal, Agriculture College, Sabour.
4. KERALA (TRIVANDRUM)	SHRI N. SHANKARA MENON, Director of Agriculture, Kerala. SHRI P.D. NAIR, Director of Agriculture, Kerala.
5. MADHYA PRADESH (GWALIOR)	DR. T.R. MEHTA, Principal, Agriculture College, Gwalior.
6. MADRAS (COIMBATORE)	SHRI C.R. SHESHADRI, Vice-Principal & Secretary, Research Council, Agriculture College, Coimbatore. SHRI P.A. VENKATESWARAN, Vice-Principal & Secretary, Research Council, Agriculture College, Coimbatore. LATE SHRI M. BHAVANI SANKARA RAO, Vice-Principal & Secretary, Research Council, Agriculture College, Coimbatore. SHRI T. NATARAJAN, Agronomist & Secretary, Research Council, Agriculture College, Coimbatore. SHRI A.H. SARMA, Extension Specialist & Secretary, Research Council, Agriculture College, Coimbatore.
7. MAHARASHTRA & GUJARAT (FORMER BOMBAY STATE)	SHRI D.S. RANGA RAO, Statistician, Department of Agriculture, Poona.

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

(iv)

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|--|--|
| 8. MYSORE
(BANGALORE) | SHRI A. ANANT PADMANABHA RAU.
State Statistician, Mysore State. |
| 9. ORISSA
(BHUBANESHWAR) | DR. U.N. MOHANTY,
Dy. Director of Agriculture (H.Q.), Orissa. |
| 10. PUNJAB, JAMMU &
KASHMIR AND HIMACHAL
PRADESH(CHANDIGARH) | SHRI P.S. SAHOTA,
Statistician, Department of Agriculture, Punjab. |
| 11. RAJASTHAN
(JAIPUR) | SHRI H.C. KOTHARI,
Statistician, Department of Agriculture, Rajasthan. |
| 12. UTTAR PRADESH
(LUCKNOW) | DR. K. KISHEN,
Chief Statistician to Govt. of U.P.
Department of Agriculture, U.P. |
| 13. WEST BENGAL
(CALCUTTA) | SHRI S.N. MUKHERJEE,
Statistical Officer,
Directorate of Agriculture,
West Bengal.
DR. S. BASU,
Statistical Officer,
Directorate of Agriculture,
West Bengal. |

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

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

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

Abbreviations adopted for States are as follows :—

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

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

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

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

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

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

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

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

Abbreviations used in the text of the experiments :—

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

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

BASAL CONDITIONS

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

A. For annual crops :

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

B. For perennial crops :

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

C. For experiments on cultivator's 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 seedings per hole. (vi) Period of sowing/planting per hold. (vii) Irrigated or Unirrigated. (viii) Post-sowing/planting cultural operations. (ix) Rainfall during crop season. (x) Period of harvesting.

DESIGN

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

A. For annual crops :

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

B. For perennial crops :

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

C. For experiments on cultivators' fields :

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

(vii)

GENERAL

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

A. For annual crops :

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

B. For perennial crops :

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

C. For experiments on cultivators' fields :

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

GLOSSARY OF VERNACULAR NAMES OF CROPS

Sl. No.	Name of crop	Botanical name	Assamese	Bengali	Oriya	Telugu	Tamil	Malayalam	Kannada	Marathi	Gujarati	Hindi	Punjabi
1.	Paddy	<i>Oryza sativa</i> L.	Dhan	Dhan	Dhano	Vadlu, Biyyamu	Nel	Nellu	Bhatta	Bhat	Dangar	Dhan ; Chawal	Chaul ; Dhan
2.	Wheat	<i>Triticum Sativum</i> Lamk ; <i>Triticum</i> <i>aestivum</i> L.	Gaum ; Ghehu	Gam	Gaham	Godumalu	Kothumai	Gothambu	Godhi	Gahu	Ghahu	Gehon	Kanak
3.	Maize	<i>Zea mays</i> L.	Gom- dhan	Bhutta	Macca	Mokka- jonna	Makka- cholam	Cholam	Musukina jola	Makka	Makkai	Makka	Makki ; Makayee
4.	Jowar	<i>Andropogon sorghum</i> Brot. <i>Sorghum vulgare</i> Pers.	---	Jowar	Juara	Jonna	Cholam	Cholam	Jola	Jowari ; Jondhla	Jowari ; Juar	Jowar Jaur	Jowar
5.	Barley	<i>Hordeum vulgare</i> L.	Ja'dhan	Joba ;	Jaba Barlhi	Barley	Baarli arisi	Barley	Barley akki	Satu ; Jav	Jav	Jau	Jaun
6.	Bajra	<i>Pennisetum typhoides</i> stapf Ex Hubbard.	---	Bajra	Bajra	Sajja	Kambu	Kambu	Sajje	Bajri	Bajri	Bajra	Bajra
7.	Oats	<i>Avena sativa</i> L.	Oats	Jai	Jaie ; Oat	Yavalu	Oat arisi	Oat	Thoke godhi	Jai	Jav	Jaie	Jaur ; Jae
8.	Potato	<i>Solanum tuberosum</i> L.	Alooguti	Alu	Bilati Alu	Bangala dumpa	Uruzhai kilangu	Urala kizangu	Alu gedde	Batata	Aloo ; Batata	Aaloo	Alu
9.	Carrot	<i>Daucus carota</i> L.	Gajor	Gajar	Gajar	Gajara gadda	Kaaret	Carrot	Kempu mulangi	Gajar	Gajar	Gajar	Gajjar
10.	Sweet potato	<i>Ipomoea batatas</i> Lam.	Mitha Aloo	Mishti Alu	Kanda- mula	Chiaga dadumpa	Seeni kilangu	Cheeni kizangu	Genasu	Ratalu	Shakaria	Shakar- kandi	Shakar- kandi
11.	Gram	<i>Cicer arietinum</i> L.	Butmah	Chola	Boot	Sanagalu	Kadalai ; Sundal Kadalai Pattaani	Kadala	Kadale	Harbara	Chana	Chana	Chhole ; Chana
12.	Peas	<i>Pisum arvense</i> L.	Motor	Chota ; Pyramatar	Bada chana	Desavali Batani	---	---	Holada bataani	Vatana ; Matar	Vatana	Muttar	Mattri
13.	Cowpeas	<i>Vigna catiang</i> Walp ; <i>Vigna sinensis</i> Savi	---	Barbati	---	---	Thata payaru	Mambayar	Alasande	Chavli	Chola ; Choli	---	Lobia
14.	Sugarcane	<i>Saccharum officinarum</i> L.	Kuhiar	Akh	---	Cheruku	Karumbu	Karimbu	Kabbu	Oos	Sherdi	Ganna ; Kamad ; Naishakar	Kamad ; Ganna ; Fakh Kapah
15.	Cotton	<i>Gossypium</i> spp.	Kapah	Karpas ; Tula	Kapa	Pratti	Paruthi	Paruthi	Hatti	Kapus	Kapas	Kapas	Kapas

GLOSSARY OF VERNACULAR NAMES OF CROPS

Sl. No.	Name of Crop	Botanical name	Assamese	Bengali	Oriya	Telugu	Tamil	Malayalam	Kannada	Marathi	Gujarati	Hindi	Punjabi
16.	Tobacco	<i>Nicotiana tabacum L.</i>	Dhopat	Tamak	Uanpatra	Pogaku	Pugayilai	Pukayila	Hoge soppa	Tambaku	Tamaku	Tambaku	Tamaku ; Tambaku
17.	Toria (Indian rape)	<i>Brassica competsris var. toria Duthie</i>	Sariah	Tori sarisha	—	Ava	Kadugu	—	—	Saras	Sarsav	Toria	Toria
18.	Sesamum	<i>Sesamum indicum L.</i>	Til	Til	Rasi	Nuvvulu	Ellu	Ellu	Yellu	Til, Tili	Tal	Til	Til
19.	Linseed	<i>Linum usitatissimum L.</i>	Tisi	Tishi	Peshi	Avise	Alivithai	Cherucha navithu	Agase	Javas ; Alsi	Alsi	Alsi	Alsi
20.	Cluster bean (Field Vetch ; guar)	<i>Cyamopsis psoraloides D.C. cyamopsis tetragonaloba Taub</i>	Thupi urahi	Guar	Gunar chhuin	Goruchik-kudu	Kotha var-kai ; Seenia-varaikai	Kothavara	Gori Kayi	Guwar	Gavar	Guar	Guara
21.	Hubam Clover	<i>Melilotus alba var. annua</i>	—	Swet banmethi	Nitkrar	—	—	—	—	—	—	Hubam Clover	—
22.	Berseem	<i>Trifolium alexandrinum L.</i>	—	Barseem	Gini ghasa	—	—	—	—	Barsim gavatt	Barsim	Berseem	Berseem
23.	Vicia Sativa (Common Vetch)	<i>Vicia sativa L.</i>	—	Ankari	Ankari	—	—	—	Kaadu hurli	—	—	Bakla	—
24.	Senji (Indian clover)	<i>Melilotus parviflora Desv.</i>	—	Banmethi	Barsim	—	—	—	—	—	—	Senji	Senji
25.	Panicum antidotale (Blue Panic)	<i>Panicum Antidotale Retz.</i>	—	—	Not known	Australia Dubbugaddi	Australia pul	—	Holada pundrike	Ambadi	Ambadi	Patsan	Sanukra ; Sankukra
26.	Jute	<i>Corchorus spp.</i>	Marapat	Shada pat Tosha pat	Jhota	Janumu	Chanapai	Chanambu	Sanabu	Ioot	Moji Chhunchh	Jute	Patsan
27.	Roselle (Mesta)	<i>Hibiscus sabdariffa L.</i>	Tenga Mora	Mesta	Khata Kauria	Erragogu	Sivappu Kashamkai	—	Kempu-pundrike	Tambdi ambadi	Lal sheria	Patua	—

CONTENTS

	Page
FOREWORD	
PREFACE	(i)
LIST OF ABBREVIATIONS	(v)
GLOSSARY OF VERNACULAR NAMES OF CROPS	(viii)
Central Rice Research Institute, Cuttack :	
Proforma giving the details of experimental station	... 1
Experimental Results (Paddy crop)	... 2
Jute Agricultural Research Institute, Barrackpore (Calcutta) :	
Proforma giving the details of experimental station	... 99
Experimental results (Jute, roselle and mesta)	... 100
Central Tobacco Research Institute, Rajahmundry :	
Proforma giving the details of experimental station	... 107
Experimental results (Tobacco)	... 109
Indian Agricultural Research Institute, New Delhi :	
Proforma giving the details of experimental station	... 143
Experimental results (crop-wise)	
Paddy	... 145
Wheat	... 148
Maize	... 224
Jowar	... 266
	... 266
Bajra	... 269
Oats	... 273
Vegetables (Potato, carrot and sweet potato)	... 282
Pulses (Gram, peas and cowpeas)	... 293
Sugarcane	... 300
Cotton	... 307
Tobacco	... 315
Jute	... 316
Oilseeds (Rape, sesamum and linseed)	... 317
Fodder crops (Jowar, guar, berseem, etc.)	... 323
Mixed crops	... 338
Rotational	... 341

CENTRAL RICE RESEARCH INSTITUTE

CUTTACK

CENTRAL RICE RESEARCH INSTITUTE, CUTTACK

1. Name of the experimental station. Central Rice Research Institute,
2. Tehsil or Taluka. Cuttack.
3. District. Cuttack.
4. Address. Cuttack-4.
5. Year of establishment. 1946.
6. Distance from nearest railway station with the name of nearest railway station. About 3 miles from Cuttack railway station.
7. Programme of Research. To undertake fundamental research in all aspects of rice culture, to investigate such problems which have wide application in the country and to serve as a centre of authoritative information on all matters relating to the rice crop.
8. Normal cropping pattern. Rice-Fallow or Rice-Rice.
9. Type of tract it represents. Main rice growing tract.
10. General description of topography of the experimental area. Uniform. (Plain).
11. Soils.
 - (a) Broad soil types. Alluvial (deposits of the river Mahanadi).
 - (i) Depth. Very deep. (no parent rock obtained even at a depth of 10 to 12.m.)
 - (ii) Colour. Surface soil—ash grey.
 - (iii) Structure. Friable.
 - (b) Chemical analysis if available with pH value. pH-5.3 to 6.9.
 (Indicate the percentage of various constituents analysed for). Total N—0.04 to 0.09 percent.
 Total P—0.03 to 0.06 percent.
 NaH CO₃. extractable P—7 to 30 ppm.
 Organic carbon—0.5 to 1.1 percent (Walkley Black Value)
 K-well supplied with potassium.
 - (c) Mechanical analysis (if available). The soil can be classified as follows
 (Indicate the % of various constituents analysed for).

Sandy loam	} Uplands.
Sandy clay loam	

 Clay loam—medium lands.
 Clay and heavy clay—Lowlands.
12. Normal average rainfall in mms. (month-wise).

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	Total
181.3	258.0	338.0	320.1	254.1	41.5	1.5	14.7	28.8	16.1	19.6	64.7	1538.4

(specify the period on which the average of each month is based . Average for 10 years 1952—53 to 1961—62.
13. Irrigation facilities available ; year from which the facilities were made available. Irrigation facilities are available, from the inception of the Institute.
14. Whether any proper drainage system exists. Yes.
15. Any other information regarding the farm. Location : 20°N, 86°E
77 feet above sea level.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(4). Type :- 'M'.

Object :- To find the residual effect of nitrogeous fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 23.6.1952./7.8.1952. (iv) (a) 4 ploughings, Jaddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand-weeding. (ix) 56.03^o. (x) 27, 28.11.1952.

2. TREATMENTS :

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

(1) 2 levels of N : N₁=20 and N₂=40 lb./ac.(2) 4 sources of N : S₁=A/S, S₂=A/N, S₃=Ammo. Phos. and S₄=Urea.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 12. (iv) (a) 20'×12'. (b) 18'×10'. (v) 1' alround. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1952—contd. (b) —. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1921 lb./ac.
(ii) 379.8 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

Control = 1883 lb./ac.

	S ₁	S ₂	S ₃	S ₄	Mean
N ₁	1907	1832	1969	1907	1904
N ₂	1948	1917	2103	1827	1949
Mean	1927	1874	2036	1867	1926

S.E. of N marginal mean = 54.8 lb./ac.

S.E. of S marginal mean = 77.5 lb./ac.

S.E. of body of table = 109.6 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(19). Type :- 'M'.

Object :- To find the residual effect of nitrogeous fertilizers.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) As per treatments. (ii) (a) Clayey loam. (b) Refer item 11 on page 1. (iii) 23.6.1953/21.7.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) N.A. (ix) 46.02^o. (x) 30.11.1953.

2. TREATMENTS :

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

(1) 2 levels of N : N₁=20 and N₂=40 lb./ac.(2) 5 sources of N : S₁=A/S, S₂=A/N, S₃=Ammo. Phos., S₄=Ammo. Chloride and S₅=Urea.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 8. (iv) (a) 1/174.24 ac. (b) 1/236.74 ac. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 2723 lb./ac.
 (ii) 459.3 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	Control =2682 lb./ac.					Mean
	S ₁	S ₂	S ₃	S ₄	S ₅	
N ₁	2774	2601	2940	2755	2679	2750
N ₂	2698	2623	2604	2705	2892	2704
Mean	2736	2612	2772	2730	2785	2727

S.E. of N marginal mean = 72.6 lb./ac.

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

S.E. of body of table = 162.4 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 48(5).

Type :- 'M'.

Object :—To study the effect of continuous application of A/S with and without lime on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 1.7.1948/14.8.1948. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) N.A. (v) Nil. (vi) T-812 (medium). (vii) Irrigated. (viii) Weeding on 4.10.1948. (ix) 54.35". (x) 14.12.1948.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N₀=0, N₁=20 and N₂=40 lb./ac.

(2) 3 levels of lime: L₀=0, L₁=4 and L₂=8 cwt./ac.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 61.5'×12'. (b) 59.5'×10'. (v) 1 ft. all round. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1948—contd. (b) —. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2296 lb./ac.
 (ii) 113.4 lb./ac.
 (iii) N effect is highly significant, L effect is significant while interaction N×L is not significant.
 (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	Mean
L ₀	1918	2306	2471	2232
L ₁	2110	2348	2430	2296
L ₂	2152	2425	2503	2360
Mean	2060	2360	2468	2296

S.E. of any marginal mean = 32.7 lb./ac.

S.E. of body of table = 56.7 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 49 (9). Type :- 'M'.

Object:—To study the effect of continuous application of A/S with and without lime on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 5.7.1949/4.8.1949. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2-3 weedings with Japanese weeder and hand weeding. (ix) 46.00%. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac(2) 3 levels of lime : $L_0=0$, $L_1=4$ and $L_2=8$ cwt./ac.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) $61.5' \times 12'$. (b) $59.5' \times 10'$. (v) 1' all round. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1948—contd. (b) Yes. (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1975 lb./ac.

(ii) 240.0 lb./ac.

(iii) Only N effect is highly significant.

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

	N_0	N_1	N_2	Mean
L_0	1613	2190	2331	2045
L_1	1611	1889	2228	1909
L_2	1591	1829	2494	1971
Mean	1605	1969	2351	1975

S.E. of any marginal mean = 69.2 lb./ac.

S.E. of body of table = 120.0 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(3). Type :- 'M'.

Object :—To study the effect of continuous application of A/S with and without lime on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) N.A. (b) Refer item 11 on page 1. (iii) 5.7.1949/3.8.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk planting. (c) —. (d) and (e) N.A. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated. (viii) 3 weedings. (ix) 64.47%. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.(2) 3 levels of lime : $L_0=0$, $L_1=4$ and $L_2=8$ cwt./ac.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) $61.5' \times 12'$. (b) $59.5' \times 10'$. (v) 1' all round. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Blast incidence observed on 9.9.1950. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1948—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2331 lb./ac.
- (ii) 119.2 lb./ac.
- (iii) L effect alone is highly significant.
- (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	Mean
L ₀	2051	2023	1976	2017
L ₁	2393	2338	2299	2343
L ₂	2648	2690	2557	2632
Mean	2364	2350	2277	2331

S.E. of any marginal mean = 35.1 lb./ac.

S.E. of body of table = 59.6 lb./ac.

Crop :- Paddy (*Khariif*).

Ref :- C.R.R.I. 51(3). Type :- 'M'.

Object :- To study the effect of continuous application of A/S with and without lime on Paddy crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1.
- (iii) 17.6.1951/1.8.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk planting. (c) —. (d) Nil.
- (e) Nil. (v) As per treatments. (vi) T-1145 (medium). (vii) Irrigated. (viii) Weeding on 5.9.1951.
- (ix) 65.32%. (x) 21.11.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N₀=0, N₁=20 and N₂=40 lb./ac.

(2) 3 levels of lime : L₀=0, L₁=4 and L₂=8 cwt./ac.

Fertilizers applied on 9.8.1951.

3. DESIGN :

- (i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 61.5'×12'. (b) 59.5'×10'. (v) 1' all round. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Nil. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield.
- (iv) (a) 1948—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2544 lb./ac.
- (ii) 140.8 lb./ac.
- (iii) Only N effect is highly significant.
- (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	Mean
L ₀	2435	2582	2779	2599
L ₁	2376	2440	2664	2493
L ₂	2348	2560	2708	2539
Mean	2386	2527	2717	2544

S.E. of any marginal mean = 40.6 lb./ac.

S.E. of body of table = 70.4 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(2). Type :- 'M'.

Object :—To study the effect of continuous application of A/S with and without lime and compost on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 18.6.1952/29.7.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk planting. (c) —. (d) 6''×6''. (e) 2-3 seedling/hole. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2-3 weedings with Japanese weeder and hand weeder. (ix) 56.03''. (x) 2.12.1952.

2. TREATMENTS :

2 strips in one direction :

2 levels of compost : $C_0=0$ and $C_1=100$ md./ac.

9 strips in perpendicular direction to the first direction :

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 lime : $L_0=0$, $L_1=4$ and $L_2=8$ cwt./ac.

3. DESIGN :

(i) Strip-plot. (ii) (a) 2 strips in one direction and 9 strips in its perpendicular direction. (b) N.A. (iii) 4. (iv) (a) 30'×12'. (b) 28'×10'. (v) 1 ft. around. (vi) Yes.

4. GENERAL:

(i) Good. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1948-contd. (modified this year). (b) Yes. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2087 lb./ac.

(ii) (Compost) = 341.9 lb./ac.

(Lime and N)=224.0 lb./ac.

(Interaction) = 194.0 lb./ac.

(iii) N effect is highly significant, interaction $C \times N$ is significant.

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

	N_0	N_1	N_2	Mean	L_0	L_1	L_2
C_0	1629	1974	2314	1972	2039	1921	1957
C_1	1961	2267	2373	2203	2273	2135	2197
Mean	1795	2121	2343	2087	2156	2028	2077
L_0	1855	2171	2441				
L_1	1784	1995	2304				
L_2	1745	2196	2286				

S.E. of difference of two

1. C marginal means = 80.6 lb./ac.
2. N or L marginal means = 64.7 lb./ac.
3. N or L means at the same level of C = 83.5 lb./ac.
4. C means at the same level of N or L = 113.5 lb./ac.
5. means in body of N and L table = 112.0 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(3).

Type :- 'M'.

Object :—To study the effect of continuous application of A/S with and without compost and lime on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 22.6.1953/28.7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 6''×6''. (e) 2-3 seedlings per hole. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated. (viii) Weeding on 5.9.53. (ix) 46.02'' (x) 23, 24.11.1953.

2. TREATMENTS :

2 strips in one direction :

2 levels of compost : $C_0=0$ and $C_1=100$ md./ac.

9 strips in perpendicular direction to the first direction :

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 lime : $L_0=0$, $L_1=4$ and $L_2=8$ cwt./ac.

3. DESIGN :

(i) Strip-plot. (ii) (a) 2 strips in one direction and 9 strips in the perpendicular direction. (b) N.A. (iii) 4. (iv) (a) 30'×12'. (b) 28'×10'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1948—contd. (b) Yes. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2984 lb./ac.

(ii) (Compost) = 181.4 lb./ac.

(Lime and N) = 303.2 lb./ac.

(Interaction) = 305.3 lb./ac.

(iii) C and N effects and interaction C×N are significant.

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

	N_0	N_1	N_2	Mean	L_0	L_1	L_2
C_0	2297	2969	3262	2843	2817	2818	2894
C_1	3007	3202	3163	3124	3144	3030	3198
Mean	2652	3085	3213	2984	2980	2758	3046
L_0	2626	3081	3233				
L_1	2632	3001	2640				
L_2	2700	3174	3264				

S.E. of difference of two

1. C marginal means = 42.76 lb./ac.
2. L or N marginal means = 87.53 lb./ac.
3. L or N means at the same level of C = 124.3 lb./ac.
4. C means at the same level of L or N = 102.5 lb./ac.
5. means in the body of N×L table = 151.6 lb./ac.

Crop :- Paddy (*Kharif*.)

Ref : C.R.R.I. 53 (18). Type:-'M'.

Object:—To study the effect of growing and incorporating *dhaincha* on Paddy yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 22.6.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Broadcast. (c) 80 lb./ac. (d) and (e) —. (v) $\frac{1}{2}$ Nil. (vi) T-124 (late). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 46.2°. (x) 22.11.1953.

2. TREATMENTS :

T₁=Control (no manure).T₂=20 lb./ac. of N as *dhaincha*.T₃=*Dhaincha*+20 lb./ac. of N as A/S.T₄=*Dhaincha*+50 lb./ac. of P₂O₅.T₅=*Dhaincha*+50 lb./ac. of P₂O₅+20 lb./ac. of N as A/S.6 to 8 weeks old *dhaincha* ploughed in *situ* at the time of bushening.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 16'×64'. (b) 14'×62'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Height, tillers and ear-length measurements, straw and grain yield. (iv) (a) 1950—contd. (b) N.A. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2644 lb./ac.

(ii) 254.9 lb./ac.

(iii) Treatment differences are not significant.

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

Treatment	Av. yield
T ₁	2423
T ₂	2724
T ₃	2636
T ₄	2591
T ₅	2847
S.E./mean	=127.5 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(17). Type :- 'M'.

Object :- To find the manurial value of different G.M. and leguminous crops grown in *situ* or brought from outside.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 22.6.1953/30.7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 10'×6'. (e) 2 to 3 seedlings. (v) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 46.02". (x) 9 12.1953.

2. TREATMENTS :

1. *Dhaincha* grown in *situ*.2. *Sesbania Speciosa* grown in *situ*.3. Sannhemp grown in *situ*.4. *Guar* grown in *situ*.5. *C. Streata* grown in *situ*.6. Pillipesara grown in *situ*.7. *Jowar* grown in *situ*.

8. Compost.

9. Cassia leaf brought from outside.

10. *Dhaincha* leaf brought from outside.

11. A/S at 20 lb./ac of N.

12. Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 20'×15'. (b) 18'-4"×13'. (v) 10'×12". (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Height, tiller and ear-length measurements and straw and grain yield (iv) (a) 1953 —N.A. (b) N.A. (c) N.A. (v) (a), (b) Nil. (vi), (vii) Nil.

5. RESULTS :

- (i) 3446 lb./ac.
 (ii) 168.5 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	3716	7.	3438
2.	3206	8.	3285
3.	3586	9.	3482
4.	3526	10.	3508
5.	3353	11.	3738
6.	3232	12.	3279
S.E./mean		= 84.3 lb./ac.	

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(16).

Type :- 'M'.

Object :—To compare the effect of burying *dhaincha* on different dates.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 22.6.1953/17.7.1953.
 (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c)—. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 46.02". (x) 21.11.1953.

2. TREATMENTS :

- T₁=Burying *dhaincha* on 1.5.1953.
 T₂=Burying *dhaincha* on 1.6.1953.
 T₃=Burying *dhaincha* on 1.7.1953.
 T₄=Burying *dhaincha* on 15.7.1953.
 T₅=Burying compost on 15.7.1953 prepared from green matter on 1.5.1953.
 T₆=Burying compost on 15.7.1953 prepared from green matter from on 1.6.1953.

3. DESIGN :

- (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 31'×20'. (b) 29'4"×18'6". (v) 10"×9". (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Nil. (iii) Height, tiller and ear-length measurement, straw and grain yield. (iv) (a) to (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3730 lb./ac.
 (ii) 121.0 lb./ac.
 (iii) Treatment differences are significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
T ₁	3615
T ₂	3815
T ₃	3734
T ₄	3826
T ₅	3845
T ₆	3544
S.E./mean	= 60.5 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(21).

Type :- 'M'.

Object :—To compare different methods of application of A/S.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c)—. (d) Nil. (e) 2 to 3. (v) Nil. (vi) PTB 10 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 46.02". (x) 20.4.1954.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as A/S applied before planting and puddled in.
3. Treatment 2+10 lb./ac. of N as A/S applied as pillets 3 weeks afterwards.
4. 20 lb./ac. of N as A/S applied as pillets 3 weeks after planting.
5. 20 lb./ac. of N as A/S broadcast 3 weeks after transplanting.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 24'×5'. (b) 14.5'×4'. (v) 4'9"×6". (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) N.A. (iii) Height and tiller measurements and straw and grain yield. (iv) (a) 1953—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1995 lb./ac.
 (ii) 166.0 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1697
2.	2125
3.	2148
4.	2110
5.	1896
S.E./mean	=67.77 lb./ac.

Crop :- Paddy. (*Kharif*).

Ref :- C.R.R.I. 53(20).

Type :- 'M'.

Object :- To compare different methods of application of A/S.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 28.7.1953.
 (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 10"×6". (e) 2 to 3. (v) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) 1-3 intercultures with Japanese weeder and one hand weeding.
 (ix) 46.02". (x) 1.12.1953.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N applied before planting and puddled in.
3. 20 lb./ac. of N smeared on roots.
4. 20 lb./ac. of N applied as pillets one month after planting.
5. 20 lb./ac. of N broadcast one month after planting.
 N applied as A/S on 2.8.1953.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 15'×5.83'. (b) 14.5'×4.17'. (v) 9" around. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) N.A. (iii) Height and tiller measurement, straw and grain yield. (iv) (a) 1953—contd. (b) —. (c) —. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2840 lb./ac.
 (ii) 295.4 lb./ac.
 (iii) Treatment differences are significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2579
2.	3011
3.	2622
4.	3191
5.	2795
S.E./mean	=120.6 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(16).

Type :- 'M'.

Object :—To study the effect of deep layering of A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 20.7.1950. (iv) (a) 3 to 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 9"×6". (e) 2 to 3. (v) Nil. (vi) CO. 13 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder. (ix) 64.47". (x) 14.10.1950.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as A/S broadcasted on 28.7.1950.
3. 40 lb./ac. of N as A/S broadcasted on 28.7.1950.
4. 20 lb./ac. of N as A/S deep layered on 28.7.1950.
5. 40 lb./ac. of N as A/S deep layered on 28.7.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 35'×20'. (iii) 9. (iv) (a) 20'×6'. (b) 19'×5'3". (v) 6"×4.5". (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Helminthosporium attack was observed on seeds. 2—3 seeds are attacked in most of the panicles. (iii) Height measurement and number of tillers, effective tillers per plant at time of harvest, straw and grain yield. (iv) (a) No. (b) —. (c) —. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

- (i) 1955 lb./ac.
- (ii) 145.9 lb./ac.
- (iii) Treatment differences are highly significant.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1747
2.	1882
3.	2035
4.	2009
5.	2101
S.E./mean	=48.6 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(14).

Type :- 'M'.

Object :—To compare the efficiency of deep layer application of A/S with that of surface application.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) N.A. (b) Refer item 11 on page 1. (iii) 13.6.1951/2.8.1951. (iv) (a) 2-3 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) Bulk planting. (e) 2 -3. (v) Nil. (vi) T-90 (late) (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand-weeding. (ix) 65.32". (x) 21.12.1951.

2. TREATMENTS :

1. Control (no manure).
2. Deep layer application of manure on 7.9.1951.
3. Surface application of manure on 7.9.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 66'×66'. (iii) 6. (iv) (a) 66'×22'. (b) 64'×20'. (v) 1' around. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) N.A. (iii) Grain and straw yield. (iv) (a) No. (b) —. (c) —. (v) (a) Fakirpada and Nimeisapur (intensive cultivation centres). (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2662 lb./ac.
(ii) 78.2 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2541
2.	2768
3.	2676
S.E /mean	=31.92 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(9).

Type :- 'M'.

Object :-To study the response of Paddy to organic and inorganic manures.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 17.6.1951/27.7.1951.
(iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T 1242 (late). (vii) Irrigated. (viii) 2—3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32". (x) 6.12.1951.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 4 levels of N as compost : $C_0=0$, $C_1=30$, $C_2=60$ and $C_3=90$ lb./ac.
(2) 3 levels of N as A/S : $A_0=0$, $A_1=15$ and $A_2=30$ lb./ac.

3. DESIGN :

- (i) 4×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) $19' \times 30'$. (b) $17' \times 28'$. (v) 1' around.
(vi) Yes.

4. GENERAL :

- (i) Good. (ii) Nil. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1951—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3221 lb./ac.
(ii) 210.5 lb./ac.
(iii) Interaction $C \times A$ is highly significant. C effect is significant. A effect is not significant.
(iv) Av. yield of grain in lb./ac.

	C_0	C_1	C_2	C_3	Mean
A_0	3136	3311	3278	3008	3183
A_1	3100	3180	3286	3348	3229
A_2	3252	3355	3113	3282	3251
Mean	3163	3282	3226	3213	3221

S.E. of C marginal means = 60.8 lb./ac.

S.E. of A marginal means = 52.6 lb./ac.

S.E. of body of table = 105.2 lb./ac.

Crop :- Paddy (*Khariif*).

Ref :- C.R.R.I. 52(9). Type :- 'M'.

Object :—To study the response of Paddy to organic and inorganic manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 18.6.1952/6.8.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T 1242 (late). (vii) Irrigated. (viii) 2—3 intercultures with Japanese weeder and one hand weeding. (ix) 56.03*. (x) 12.12.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as compost : $C_0=0$, $C_1=30$, $C_2=60$ and $C_3=90$ lb./ac.(2) 3 levels of N as A/S : $N_0=0$, and $N_1=15$ and $N_2=30$ lb./ac.

3. DESIGN :

(i) 4×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) $19' \times 30'$. (b) $17' \times 28'$. (v) 1' border around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Height and ear-length measurements. No. of tillers, straw and grain yield. (iv) (a) 1951—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3019 lb./ac.

(ii) 317.0 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	Mean
N_0	2987	3073	3218	2816	3023
N_1	2929	3045	2973	3083	3007
N_2	3097	2964	3083	2969	3028
Mean	3004	3027	3091	2956	3019

S.E. of C marginal means = 91.5 lb./ac.

S.E. of N marginal means = 79.2 lb./ac.

S.E. of body of table = 158.5 lb./ac.

Crop :- Paddy (*Khariif*).

Ref :- C.R.R.I. 53(13). Type :- 'M'.

Object .—To study the response of Paddy to organic and inorganic manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 22.6.1953/31.7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-1242 (late). (vii) Irrigated. (viii) 2 and 3 intercultures with Japanese weeder and one hand weeding. (ix) 46.02*. (x) 21.12.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as compost : $C_0=0$, $C_1=30$, $C_2=60$ and $C_3=90$ lb./ac.(2) 3 levels of N as A/S : $N_0=0$, $N_1=15$ and $N_2=30$ lb./ac.

3. DESIGN :

(i) 4×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) $19' \times 30'$. (b) $17.3' \times 28.3'$. (v) 1 row all round. (vi) Yes.

4. GENERAL :

- (i) Good. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1951—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3639 lb./ac.
 (ii) 290.5 lb./ac.
 (iii) N alone is highly significant.
 (iv) Av. yield of grain in lb /ac.

	C ₀	C ₁	C ₂	C ₃	Mean
N ₀	3079	3369	3546	3637	3408
N ₁	3484	3654	3689	3803	3657
N ₂	3791	3808	3962	3842	3851
Mean	3451	3610	3732	3761	3639

S.E. of C marginal means = 83.9 lb./ac.

S.E. of N marginal means = 72.6 lb./ac.

S.E. of body of table = 145.3 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 48(2). Type :- 'M'.

Object :- To find out the effects of P₂O₅ applied in different ways on Paddy yield.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 24.6.1948/3.8.1948. (iv) (a) 4 ploughings, laddering and levelling. (b) Nil. (c) and (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-812 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 53.45°. (x) 8.12 1948.

2. TREATMENTS :

T₁=Super at 30 lb./ac. of P₂O₅ broadcast on surface of the puddled and levelled land and transplanting done.
 T₂=Puddling, draining of water, making furrows with country plough and then applying 30 lb./ac. of P₂O₅ as Super in furrows.

3. DESIGN :

- (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 60'×8'. (b) 55'×6'. (v) 1' around. (vi) Yes.

4. GENERAL :

- (i) Good. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1948 to 1951. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2587 lb./ac.
 (ii) 62.9 lb./ac.
 (iii) Treatment difference is not significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
T ₁	2592
T ₂	2582
S.E./mean	= 25.68 lb./ac.

Crop :- Paddy (*Kharif*)

Ref :- C.R.R.I. 49 (5). Type :- 'M'.

Object :—To study the best time and method of application of P_2O_5 to Paddy crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Biri*. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 1.7.1949/5.6.1949. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) N-136. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 46'00". (x) 25, 26.10.1949.

2. TREATMENTS :

T_1 =*Biri* crop+30 lb. P_2O_5 applied to *Biri*. T_2 =*Biri* crop+no P_2O_5 applied to *Biri*. T_3 =*Biri* crop+30 lb. P_2O_5 just before transplanting paddy. T_4 =Fallow+30 lb. P_2O_5 at the time of sowing *Biri*. T_5 =Fallow+no P_2O_5 . T_6 =Fallow+30 lb. P_2O_5 just before transplanting paddy.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) 62'×19.5'. (v) 56'×17.5'. (vi) 3'×1'. (vii) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1948 to 1951. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 668.7 lb./ac.
 (ii) N.A.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
T_1	708.1
T_2	593.4
T_3	790.3
T_4	513.4
T_5	551.2
T_6	855.6

Crop :-Paddy (*Kharif*)

Ref :- C.R.R.I. 50(6). Type :- 'M'.

Object :—To study the effect of P_2O_5 , applied directly and through *moong*, on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 17.6.1950/12.7.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) *Beni bhog* (early). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding (ix) 64.47". (x) 13.10.1950.

2. TREATMENTS:

T_1 =*Moong*+50 lb./ac. of P_2O_5 as Super at sowing of *moong*. T_2 =*Moong* alone. T_3 =*Moong*+50 lb./ac. of P_2O_5 as Super at transplanting of Paddy. T_4 =Fallow+50 lb./ac. of P_2O_5 as Super at the time when *moong* was sown in other plots. T_5 =Fallow. T_6 =Fallow+50 lb./ac. of P_2O_5 as Super at transplanting of Paddy.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 62'×14'. (b) 60'×12' (v) 1' all round. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1948 to 1951. (b) No. (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1194 lb/ac.
 (ii) 175.3 lb./ac.
 (iii) Treatment differences are not significant.

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

Treatment	Av. yield
T ₁	1289
T ₂	1125
T ₃	1107
T ₄	1240
T ₅	1119
T ₆	1283
S.E./mean	=87.65 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(5). Type :- 'M'.

Object :—To study the effect of P₂O₅, applied directly and through *moong*, on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 13.6.1951/22.7.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2-3. (v) Nil. (vi) *Benibhog* (early). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32". (x) 24, 25.10.1951.

2. TREATMENTS :

T₁=*Moong*+50 lb./ac. of P₂O₅ as Super at sowing of *moong*, T₂=*Moong* alone, T₃=*Moong*+50 lb./ac. of P₂O₅ as Super at transplanting of Paddy, T₄=Fallow+50 lb./ac. of P₂O₅ as Super at the time when *moong* was sown in other plots, T₅=Fallow, T₆=Fallow+50 lb./ac. of P₂O₅ as Super at transplanting of Paddy.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 62'×14'. (b) 60'×12'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Free from disease. (iii) Height and ear-length measurements, no. of tillers and straw and grain yield. (iv) (a) 1948—1951. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1772 lb./ac.

(ii) 164.6 lb./ac.

(iii) Treatment differences are not significant.

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

Treatment	Av. yield
T ₁	1760
T ₂	1760
T ₃	1821
T ₄	1900
T ₅	1585
T ₆	1808
S.E./mean	=82.3 lb./ac.

Crop :- Paddy (*Kharif*)

Ref :- C.R.R.I. 49(11). Type :- 'M'.

Object :—To study the effect of continuous application of A/S with and without ccmpost on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 5.7.1949/2.8.1949. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted and bulk planted. (c) —. (d) —. (e) 2-3. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 46". (x) 7.12.1949.

2. TREATMENTS :

Main-plot treatments :

2 levels of compost : $C_0=0$ and $C_1=100$ md./ac

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-plot. (ii) (a) 2 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $60' \times 10.5'$. (b) $58' \times 8.5'$. (v) 1' all round. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Blast incidence in heavily manured plots. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) —. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1773 lb./ac.

(ii) (a) 242.4 lb./ac.

(b) 198.5 lb./ac.

(iii) N effect is highly significant. Interaction $C \times N$ is significant. C effect is not significant.

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

	N_0	N_1	N_2	N_3	N_4	Mean
C_0	1532	1624	1987	1906	1683	1746
C_1	1743	1896	2102	1889	2374	1801
Mean	1637	1760	2044	1897	1528	1773

S.E. of difference of two

1. C marginal means = 76.7 lb./ac.
2. N marginal means = 99.2 lb./ac.
3. N means at the same level of C = 140.3 lb./ac.
4. C means at the same level of N¹ = 147.1 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(1).

Type :- 'M'.

Object :—To study the effect of continuous application of A/S with and without compost on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 30.7.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk transplanting. (c) —. (d) and (e) N.A. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2–3 intercultures with Japanese weeder and hand weeder. (ix) 64.47%. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 levels of compost : $C_0=0$ and $C_1=100$ md./ac.

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-plot. (ii) (a) 2 main-plots/block; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $60' \times 10.5'$. (b) $58' \times 8.5'$. (v) 1' all round. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Blast incidence in heavily manured plots. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2421 lb./ac.
(ii) (a) 454.0 lb./ac.
(b) 368.9 lb./ac.
(iii) N effect alone is significant.
(iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	Mean
C ₀	2152	2524	2746	2547	2463	2486
C ₁	2264	2778	2624	2087	2024	2355
Mean	2208	2651	2685	2317	2243	2421

S.E. of difference of two

1. C marginal means =143.6 lb./ac.
2. N marginal means =184.4 lb./ac.
3. N means at the same level of C =260.9 lb./ac.
4. C means at the same level of N =273.9 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(1).

Type :- 'M'.

Object :- To study the effect of continuous application of A/S with and without compost on the yield of Paddy.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1.
(iii) 17.6.1951/30.7.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk planting. (c) —. (d) and
(e) N.A. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 65.32%. (x) 29.11.1951.

2. TREATMENTS :

Main-plot treatments :

2 levels of compost : C₀=0 and C₁=100 md./ac.

Sub-plot treatments :

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

3. DESIGN :

- (i) Split-plot. (ii) (a) 2 main-plots/block; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 60'×10.5'.
(b) 58'×8.5'. (v) 1' all round. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Blast incidence in heavily manured plots. (iii) Height and ear-length measurements, No. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2135 lb./ac.
(ii) (a) 351.2 lb./ac.
(b) 217.4 lb./ac.
(iii) N and N×C effects are highly significant. C effect is not significant.
(iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	Mean
C ₀	1988	2339	2395	2355	1999	2215
C ₁	2319	2361	2155	2077	1364	2055
Mean	2154	2350	2275	2216	1682	2135

S.E. of difference of two

- | | |
|-----------------------------------|----------------|
| 1. C marginal means | =111.1 lb./ac. |
| 2. N marginal means | =108.7 lb./ac. |
| 3. N means at the same level of C | =153.7 lb./ac. |
| 4. C means at the same level of N | =176.7 lb./ac. |

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(1). Type :- 'M'.

Object :—To study the effect of continuous application of A/S with and without compost on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 18.6.1952/31.7.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk planting. (c)—. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2 and 3 intercultures with Japanese weeder and hand weeder. (ix) 56.03". (x) 25.11.1952.

2. TREATMENTS :

Main-plot treatments :

2 levels of compost : $C_0=0$ and $C_1=100$ md./ac.

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-plot. (ii) (a) 2 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 60'×10.5'. (b) 58'×8.5'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2100 lb./ac.
 (ii) (a) 164.4 lb./ac.
 (b) 217.4 lb./ac.
 (iii) Interaction C×N is highly significant. N effect is highly significant. C is not significant.
 (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
C_0	1864	1919	2099	2267	2110	2056
C_1	2052	2419	2328	2222	1702	2145
Mean	1958	2169	2214	2254	1906	2100

S.E. of difference of two

- | | |
|-----------------------------------|----------------|
| 1. C marginal means | = 52.0 lb./ac. |
| 2. N marginal means | =108.7 lb./ac. |
| 3. N means at the same level of C | =153.7 lb./ac. |
| 4. C means at the same level of N | =146.9 lb./ac. |

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(1). Type :- 'M'.

Object :-To study the effect of continuous application of A/S with and without compost on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 22.6.1953/24.7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 10' × 6". (e) 2 to 3. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2 weedings with Japanese double weeder and 1 weeding with hand weeder. (ix) 46.02". (x) 1, 2.12.1953.

2. TREATMENTS :

Main-plot treatments :

2 levels of compost : $C_0=0$ and $C_1=100$ md./ac.

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-plot. (ii) (a) 2 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 60' × 10.5'. (b) 58.33' × 8.83'. (v) 1 row all round. (vi) Yes.

4. GENERAL :

(i) Good. Serious lodging in heavily manured plots on 20.10.1953. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2921 lb./ac.
 (ii) (a) 244.2 lb./ac.
 (b) 299.0 lb./ac.
 (iii) N effect and interaction $C \times N$ are highly significant. C effect is not significant.
 (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
C_0	2162	2729	3232	3272	3013	2882
C_1	2854	3288	3245	3056	2362	2961
Mean	2508	3009	3239	3164	2688	2921

S.E. of difference of two

1. C marginal means = 77.2 lb./ac.
 2. N marginal means = 149.5 lb./ac.
 3. N means at the same level of C = 211.4 lb./ac.
 4. C means at the same level of N = 204.2 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(5). Type :- 'M'.

Object :-To study the response of Paddy to *dhaincha* and A/S.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) [21.6.1950/28.7.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-90. (late) (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 64.47". (x) 20.12.1950.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 4 levels of N as A/S : $N_0=0$, $N_1=10$, $N_2=20$ and $N_3=30$ lb./ac.
 (2) 4 levels of N as *dhaincha* : $D_0=0$, $D_1=10$, $D_2=20$ and $D_3=30$ lb./ac.

3. DESIGN :

(i) 4×4 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 14'×31.5'. (b) 12'×29.5'. (v) 1' all round. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) No. (b), (c) No. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2577 lb./ac.
 (ii) 198.1 lb./ac.
 (iii) Effects of N and D are highly significant while interaction is not significant.
 (iv) Av. yield of grain in lb./ac.

	D ₀	D ₁	D ₂	D ₃	Mean
N ₀	2181	2376	2763	2694	2503
N ₁	2220	2604	2473	2636	2483
N ₂	2429	2745	2655	2733	2640
N ₃	2480	2675	2781	2791	2682
Mean	2327	2600	2668	2713	2577

S.E. of any marginal mean = 49.5 lb./ac.

S.E. of body of the table = 99.1 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(4).

Type :- 'M'.

Object :- To study the response of Paddy to *dhaincha* and A/S.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 17.6.1951/3.8.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-90. (late) (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32". (x) 15, 16.12.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : N₀=0, N₁=10, N₂=20 and N₃=30 lb./ac.

(2) 4 levels of N as *dhaincha* : D₀=0, D₁=10, D₂=20 and D₃=30 lb./ac.

3. DESIGN :

(i) 4×4 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 14'×31.5'. (b) 12'×29.5'. (v) 1' all round. (vi) Yes.

4. GENERAL :

(i) Very satisfactory. (ii) Nil. (iii) Straw, height, tillers, ear-length and yield. (iv) (a) 1950-contd. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2725 lb./ac.
 (ii) 120.6 lb./ac.
 (iii) Effects of N and D are highly significant while interaction is not significant.

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

	D ₀	D ₁	D ₂	D ₃	Mean
N ₀	2327	2844	2701	2693	2641
N ₁	2515	2788	2756	2756	2704
N ₂	2752	2744	2844	2780	2780
N ₃	2708	2806	2890	2697	2775
Mean	2575	2795	2798	2731½	2725

S.E. of any marginal mean = 30.2 lb./ac.
 S.E. of body of table = 60.3 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(3).

Type :- 'M'.

Object :—To study the response of Paddy to *dhanicha* and A/S.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 16.6.1952/31.7.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2-3. (v) Nil. (vi) T-90 (late). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 56.03%. (x) 18.12.1952.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 4 levels of N as A/S : N₀=0, N₁=10, N₂=20 and N₃=30 lb./ac.
 (2) 4 levels of N as *dhanicha* : D₀=0, D₁=10, D₂=20 and D₃=30 lb./ac.

3. DESIGN :

(i) 4×4 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 14'×21½'. (b) 10'×19½'. (v) 2'×1'. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Hight and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1950—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2431 lb./ac.
 (ii) 255.1 lb./ac.
 (iii) Effects of N and D are highly significant while interaction is not significant.
 (iv) Av. yield of grain in lb./ac.

	D ₀	D ₁	D ₂	D ₃	Mean
N ₀	1735	2357	2426	2506	2256
N ₁	2041	2335	2243	2616	2309
N ₂	2375	2760	2603	2725	2616
N ₃	2387	2506	2748	2534	2544
Mean	2134	2489	2505	2595	2431

S.E. of any marginal mean = 63.8 lb./ac.
 S.E. of body of table = 127.5 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(4).

Type :- 'M'.

Object :- To study the response of Paddy to *dhanicha* and A/S.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 23.6.1953/5.8.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-90 (late). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 46.02". (x) 16.12.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : $A_0=0$, $A_1=10$, $A_2=20$ and $A_3=30$ lb./ac.(2) 4 levels of N as *dhanicha* : $D_0=0$, $D_1=10$, $D_2=20$ and $D_3=30$ lb./ac.

3. DESIGN :

(i) 4×4 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) $14' \times 21\frac{1}{2}'$. (b) $12' \times 19\frac{1}{2}'$. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Height and ear length measurements, no. of tillers, straw and grain yield. (iv) (a) 1950—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3033 lb./ac.

(ii) 229.0 lb./ac.

(iii) Effect of A and D is highly significant while interaction is not significant.

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

	D ₀	D ₁	D ₂	D ₃	Mean
A ₀	2429	2782	2984	3118	2831
A ₁	2658	2965	3123	3244	2997
A ₂	2939	3103	3254	3146	3110
A ₃	3016	3228	3313	3220	3194
Mean	2760	3022	3168	3182	3033

S.E. of any marginal mean

= 57.3 lb./ac.

S.E. of body of table

= 114.5 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(15).

Type :- 'M'.

Object :- To study the effects of deep layering and surface application of A/S at different levels on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 2.1.1951/8.2.1951. (iv) (a) 2 to 3 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) CO. 13 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) N.A. (x) 27.4.1951.

2. TREATMENTS :

Main-plot treatments :

3 levels of P_2O_5 as Super : $P_0=0$, $P_1=30$ lb./ac.—surface application and $P_2=30$ lb./ac.—deep layering.

Sub-plot treatments :

7 levels of N as A/S : $N_0=0$, $N_1=10$ lb./ac.—surface application, $N_2=20$ lb./ac.—surface application, $N_3=40$ lb./ac.—surface application, $N_4=10$ lb./ac.—deep layering, $N_5=20$ lb./ac.—deep layering and $N_6=40$ lb./ac.—deep layering.

Super and A/S applied on 22.2.1951.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 7 sub-plots/main-plot. (b) $40\frac{1}{2}' \times 20'$. (iii) 6. (iv) (a) $4\frac{1}{2}' \times 20'$. (b) $4' \times 19\frac{1}{2}'$. (v) 3" around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Stem borer attack observed on 5.3.1951. (iii) Height measurement, no. of tillers, straw and grain yield. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1582 lb./ac.
 (ii) (a) 487.8 lb./ac.
 (b) 139.3 lb./ac.
 (iii) N effect and interaction N×P is highly significant. N vs no N and deep vs surface application is highly significant. P effect is not significant.
 (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	N_5	N_6	Mean
P_0	1402	1340	1497	1508	1458	1871	1798	1553
P_1	1346	1441	1469	1491	1575	1709	1781	1545
P_2	1458	1592	1580	1698	1620	1765	1821	1648
Mean	1402	1458	1515	1566	1551	1782	1800	1582

S.E. of difference of two

1. P marginal means = 106.4 lb./ac.
2. N marginal mean = 46.4 lb./ac.
3. N means at the same level of P = 80.4 lb./ac.
4. P means at the same level of N = 129.9 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(16).

Type :- 'M'.

Object :- To study the effect of deep layering and surface application of P along with N on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer Item 11 on page 1. (iii) 28.7.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32". (x) 24.11.1951.

2. TREATMENTS :

Main-plot treatments :

3 levels of N as A/S : $N_0=0$, $N_1=20$ lb./ac.—surface application and $N_2=20$ lb./ac.—deep layered.

Sub-plot treatments :

4 levels of P_2O_5 as Super : $P_0=0$, $P_1=40$, $P_2=80$ and $P_3=120$ lb./ac.

A/S applied on 20.8.1951 and Super on 28.7.1951.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 4 sub-plots/main-plot. (b) $40.5' \times 15'$. (iii) 6. (iv) (a) N.A. (b) $15' \times 9'$. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 2564 lb./ac.
 (ii) (a) 340.8 lb./ac.
 (b) 274.9 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	2582	2550	2675	2602
P ₁	2525	2592	2511	2543
P ₂	2736	2490	2436	2554
P ₃	2533	2617	2524	2558
Mean	2594	2562	2537	2564

S.E. of difference of two

1. N marginal means = 98.4 lb./ac.
2. P marginal means = 91.6 lb./ac.
3. P means at the same level of N = 158.7 lb./ac.
4. N means at the same level of P = 169.0 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(22). Type :- 'M'.

Object :- To study the effect of deep placement of N in combination with P on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 23.6.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Broadcast. (c) 60 lb./ac. (d) and (e) —. (v) Nil. (vi) PTB 10 (late). (vii) Irrigated. (viii) 2–3 intercultures with Japanese weeder and one hand weeding. 2 bushening. (ix) 46.02". (x) 11, 12.10.1953.

2. TREATMENTS :

Main-plot treatments :

3 levels of N as A/S : N₀=0, N₁=20 and N₂=40 lb./ac.

Sub-plot treatments :

3 levels of P₂O₅ : P₀=0, P₁=50 and P₂=100 lb./ac.A/S applied on 29.7.1953 and P₂O₅ on 27.6.1953.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot. (b) 99'×63'. (iii) 4. (iv) (a) 31'×20'. (b) 28'×17'. (v) 1½' border all round the sub-plots. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 2335 lb./ac.
- (ii) (a) 121.3 lb./ac.
- (b) 93.3 lb./ac.
- (iii) Only N effect is significant.
- (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	Mean
P ₀	2181	2156	2187	2175
P ₁	2449	2393	2372	2405
P ₂	2446	2420	2407	2424
Mean	2359	2323	2322	2335

S.E. of difference of two

1. N marginal means = 49.5 lb./ac.
2. P marginal means = 38.1 lb./ac.
3. P means at the same level of N = 66.0 lb./ac.
4. N means at the same level of P = 73.2 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(22).

Type :- 'M'.

Object :- To study the effect of different minor elements on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 27.6.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Sown in puddled land. (c) —. (d) 9' x 9'. (e) 1 to 2. (v) N.A. (vi) CO. 13. (medium). (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 23.10.1951.

2. TREATMENTS :

Main-plot treatments :

2 doses of N : $N_0=0$ and $N_1=20$ lb./ac.

Sub-plot treatments :

5 minor elements : $M_0=0$, M_1 =Borax at 20 lb./ac., M_2 =Borax at 40 lb./ac., M_3 =CuSO₄ at 10 lb./ac. and M_4 =CuSO₄, at 20 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 5 sub-plots/main-plot. (b) 47½' x 41½'. (iii) 6. (iv) (a) 8'3" x 20". (b) 6'9" x 17'. (v) 2 lines north and 1 line south and lengthwise 3' on both sides east and west. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Germination count and earhead count. (iv) (a) 1951—continuing. (b) No. (c) Yes. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 811 lb./ac.
- (ii) (a) 305.6 lb./ac.
(b) 238.4 lb./ac.
- (iii) Only N effect is highly significant.
- (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean
N_0	493	490	626	706	569	577
N_1	846	979	1078	1063	1253	1044
Mean	670	735	852	885	911	811

S.E. of difference of two

1. N marginal means = 78.9 lb./ac.
2. M marginal means = 97.3 lb./ac.
3. M means at the same level of N = 137.6 lb./ac.
4. N means at the same level of M = 146.2 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(23).

Type :- 'M'.

Object :- To study the effect of different minor elements on the yield of upland Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loamy. (b) Refer item 11 on page 1. (iii) N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) —. (d) N.A. (e) 1 to 2. (v) 20 lb./ac. of N as A/S on 21,22.8.1952. (vi) CO. 13 (early). (vii) Irrigated. (viii) 2 hand weedings. (ix) N.A. (x) 23.10.1952.

2. TREATMENTS :

1. Control (no manner).
2. CuSO_4 at 20 lb./ac. dissolved in water 100 gls./ac.
3. MnSO_4 at 20 lb./ac. dissolved in water 100 gls./ac.
4. ZnSO_4 at 20 lb./ac. dissolved in water 100 gls./ac.
5. Borax at 20 lb./ac. dissolved in water 100 gls./ac.
6. MgSO_4 at 50 lb./ac. dissolved in water 100 gls./ac.
7. Ammonium Molybdate 10 lb./ac. dissolved in water 100 gls./ac.

3. DESIGN :

- (i) R.B.D. (ii) (a) 7. (b) $61' \times 30'$. (iii) 6. (iv) (a) $30' \times 7'$. (b) $28' \times 5'$. (v) One row around. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) N.A. (iii) Straw and grain yield. (iv) (a) 1952-53. (b) No. (c) Nil. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1083 lb./ac.
 (ii) 121.8 lb./ac.
 (iii) Treatment differences are significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1067	5.	1052
2.	1207	6.	992
3.	1042	7.	1067
4.	1157	S.E./mean	=49.7 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 49(17).

Type :- 'M'.

Object :- To study the effect of Boron application on yield and growth of Paddy.

1. BASAL CONDITIONS :

- (i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay Loamy. (b) Refer item 11 on page 1. (iii) N.A./12.8 1949. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) $9' \times 6'$. (e) 1 to 2. (v) 20 lb./ac. of N applied at the time of transplanting. (vi) T-1242 (late). (vii) Irrigated. (viii) 2 hand weedings. (ix) N.A. (x) 20.12.1949.

2. TREATMENTS :

Main-plot treatments :

2 levels of N : $N_0=0$ and $N_1=20$ lb./ac.

Sub-plot treatments :

6 doses of Boron : $B_0=0$, $B_1=5\frac{1}{2}$, $B_2=11$, $B_3=22$, $B_4=44$ and $B_5=88$ lb./ac.

3. DESIGN :

- (i) Split-plot. (ii) (a) 2 main-plots/block, 6 sub-plots/main-plot. (b) $60' \times 29'$. (iii) 5. (iv) (a) $14' \times 9'$. (b) $13' 6" \times 8' 3"$. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) N.A. (iii) Straw yield and ear-head count. (iv) (a) 1949—Continuing. (b) No. (c) Nil. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2562 lb./ac.
 (ii) (a) 285.7 lb./ac.
 (b) 235.2 lb./ac.
 (iii) Only N effect is significant.

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

	B ₀	B ₁	B ₂	B ₃	B ₄	B ₅	Mean
N ₀	2326	2305	2416	2496	2556	2276	2395
N ₁	2532	2753	2828	2794	2682	2771	2728
Mean	2429	2529	2625	2645	2619	2529	2562

S.E. of difference of two

1. N marginal means = 73.8 lb./ac.
2. B marginal means = 105.2 lb./ac.
3. B means at the same level of N = 148.8 lb./ac.
4. N means at the same level of B = 154.9 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(19). Type :- 'M'.

Object :- To study the effect of application of Borax on growth and yield of Paddy.

1. BASAL CONDITIONS :

- (i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loamy soil. (b) Refer item 11 on page 1. (iii) 31.7.1950.
 (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 1 to 2. (v) N.A.
 (vi) T-1145 (medium). (vii) Irrigated. (viii) 2 hand weedings. (ix) N.A. (x) 29.11.1950.

2. TREATMENTS :

6 doses of Borax : B₀=0, B₁=5.5, B₂=11, B₃=22, B₄=44 and B₅=88 lb./ac.

3. DESIGN :

- (i) R.B.D. (ii) (a) 6. (b) 61½' × 129'. (iii) 8. (iv) (a) 30' × 9'. (b) 23' × 7'. (v) 1' around. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) N.A. (iii) Earhead count, grain and straw yield. (iv) (a) 1949—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2544 lb./ac.
 (ii) 131.57 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
B ₀	2538
B ₁	2525
B ₂	2526
B ₃	2537
B ₄	2575
B ₅	2564
S.E./mean	=46.7 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(21). Type :- 'M'.

Object :- To study the effect of application of phosphate on green manuring crops and subsequent effect of both on yield and growth of Paddy.

1. BASAL CONDITIONS :

- (i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loamy. (b) Refer item 11 on page 1. (iii) N.A./31.7.1952.
 (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) —. (d) N.A. (e) 1 to 2. (v) Nil.
 (vi) T-1145 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 17.11.1952.

2. TREATMENTS :

Main-plot treatments :

3 green manures : G_0 =No green manure, G_1 =*Dhaincha* and G_2 =*Pillipesera*.

Sub-plot treatments :

2 levels of N : $N_0=0$ and $N_1=20$ lb./ac.

Sub-sub-plot treatments :

2 levels of P_2O_5 : $P_0=0$ and $P_1=50$ lb./ac.

3. DESIGN :

(i) Split-split-plot. (ii) (a) 3 main-plots/replication, 2 sub-plots/main-plot ; 2 sub-sub-plots/sub-plot. (b) $127' \times 66'$ (iii) 4. (iv) (a) $32' \times 20'$. (b) $30' \times 18'$. (v) 1 row around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain and straw yield, height and number of tillers observations. (iv) (a) No, (b) and (c) —. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2555 lb./ac.
 (ii) (a) 133.6 lb./ac.
 (b) 157.7 lb./ac.
 (c) 132.4 lb./ac.
 (iii) Interaction $N \times G$ alone is significant.
 (iv) Av. yield of grain in lb./ac.

	G_0	G_1	G_2	Mean	P_0	P_1
N_0	2451	2621	2506	2526	2519	2534
N_1	2586	2492	2674	2584	2622	2546
Mean	2519	2557	2590	2555	2571	2540
P_0	2544	2605	2564			
P_1	2494	2509	2616			

S.E. of difference of two

1. G marginal means =47.23 lb./ac.
2. N marginal means =45.52 lb./ac.
3. P marginal means =38.21 lb./ac.
4. N means at the same level of G =78.90 lb./ac.
5. G means at the same level of N =73.07 lb./ac.
6. P means at the same level of G =66.20 lb./ac.
7. G means at the same level of P =66.50 lb./ac.
8. P means at the same level of N =54.05 lb./ac.
9. N means at the same level of P =59.44 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(22). Type :- 'M'.

Object .—To study the effect of different minor elements alone and in combination with N.

1. BASAL CONDITIONS :

(i) (a) and (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) N.A./30.7.1952.
 (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 1 to 2. (v) N.A.
 (vi) T-1145 (medium). (vii) Irrigated. (viii) 2 hand weedings. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments:

2 levels of N : $N_0=0$ and $N_1=20$ lb./ac.

Sub-plot treatments :

7 trace elements : M_0 =Control, M_1 = $CuSO_4$ at 20 lb./ac., M_2 = $MnSO_4$ at 20 lb./ac, M_3 = $ZnSO_4$ at 20 lb./ac., M_4 =Borax at 20 lb./ac., M_5 = $MgSO_4$ at 50 lb./ac. and M_6 =Ammonium Molybdate at 10 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 7 sub-plots/main-plot. (b) 63'×31½'. (iii) 6. (iv) (a) N.A. (b) 6'9"×15'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 1974 lb./ac.
 (ii) (a) 331.8 lb./ac.
 (b) 183.3 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	M ₆	Mean
N ₀	2044	1859	2003	2008	2089	1865	2033	1986
N ₁	1977	1825	2008	1855	1997	2022	2051	1962
Mean	2011	1842	2006	1931	2043	1943	2042	1974

S.E. of difference of two

1. N marginal means = 73.51 lb./ac.
 2. M marginal means = 74.84 lb./ac.
 3. M means at the same level of N = 105.83 lb./ac.
 4. N means at the same level of M = 121.83 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(24). Type :- 'M'.

Object :—To study the effect of minor elements on the yield and growth of Paddy.

1. BASAL CONDITIONS :

(i) (a) and (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 19.6.1952/N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) —. (d) Bulk. (e) 2 to 3. (v) Nil. (vi) CO. 13 (early). (vii) Irrigated. (viii) 2 hand weedings. (ix) N.A. (x) 21.10.1952.

2. TREATMENTS :

Main-plot treatments :

2 levels of N : N₀=0 and N₁=20 lb./ac.

Sub-plot treatments :

7 minor elements : M₀=Control, M₁=20 lb./ac. of Boron, M₂=40 lb./ac. of Boron, M₃=60 lb./ac. of Boron, M₄=10 lb./ac. of Copper, M₅=20 lb./ac. of Copper and M₆=30 lb./ac. of Copper.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication, 7 sub-plots/main-plot. (b) 63½'×47½'. (iii) 4. (iv) (a) 7'6"×23". (b) 6'×21'. (v) 1 row around. (vi) No.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Earhead count and grain/panicle count and straw yield. (iv) (a) 1950—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 841 lb./ac.
 (ii) (a) 311.0 lb./ac.
 (b) 176.0 lb./ac.
 (iii) Only N effect is highly significant.

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

	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅	M ₆	Mean
N ₀	638	526	657	595	685	528	727	622
N ₁	1040	1130	1041	1221	1092	940	967	1062
Mean	839	828	849	908	888	734	847	841

S.E. of difference of two

1. N marginal means = 83.11 lb./ac.
2. M marginal means = 88.00 lb./ac.
3. M means at the same level of N = 124.45 lb./ac.
4. N means at the same level of M = 149.65 lb./ac.

Crop :- Paddy (Second Crop). Ref :- C.R.R.I. 51(23). Type :- 'M'.

Object :—To study the effect of different trace elements.

1. BASAL CONDITIONS :

(i) (a) and (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 27.11.1951/8.1.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c)—. (d) N.A. (e) 1 to 2. (v) N.A. (vi) Ch-47 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding were given to the whole experiment. (ix) N.A. (x) 24.4.1952.

2. TREATMENTS :

Main-plot treatments :

3 applications of N : N₀=no N, N₁=20 lb./ac. of N as surface application and N₂=20 lb./ac. of N as deep application.

Sub-plot treatments :

2 minor elements : M₁=copper and M₂=boron.

Sub-sub-plot treatments :

4 levels of copper and boron : For copper C₀=0, C₁=10, C₂=20, and C₃=30 lb./ac. while for boron : B₀=0, B₁=20, B₂=40 and B₃=60 lb./ac.

3. DESIGN :

(i) Split-split-plot. (ii) (a) 3 main-plots/block ; 2 sub-plots/main-plot and 4 sub-sub-plots/sub-plot. (b) 63.75'×41.50'. (iii) 6. (iv) (a) 20'×4½'. (b) and 18'×3'. (v) 1 border row around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Ear-head count per unit of area, grain and straw yield. (iv) (a) 1951—continuing. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1365 lb./ac.
- (ii) N.A.
- (iii) None of the effects is significant.
- (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	Mean		N ₀	N ₁	N ₂	Mean
C ₀	1310	1260	1643	1404	B ₀	1463	1269	1295	1342
C ₁	1283	1113	1591	1229	B ₁	1339	1521	1483	1448
C ₂	1279	1238	1310	1276	B ₂	1185	1518	1361	1355
C ₃	1257	1301	1425	1328	B ₃	1267	1513	1541	1440
Mean	1282	1228	1492	1334	Mean	1313	1455	1420	1396

S.E.'s N.A.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(8).

Type :- 'M'.

Object :-To compare the effect of deep and dry application of A/S with wet and surface application in low lands.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 16.6.1951/13.7.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-1224 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32". (x) 18, 19.12.1951.

2. TREATMENTS :

M₀=control, M₁=dry application of 20 lb./ac. of N, M₂=dry application of 40 lb./ac. of N, M₃=wet application of 20 lb./ac. of N, M₄=wet application of 40 lb./ac. of N, M₅=application of 20 lb./ac. of N, one month after transplanting, M₆=application of 40 lb./ac. of N one month after transplanting, M₇=dry+one month after transplanting application of 20 lb./ac. of N, M₈=dry+one month after transplanting application of 40 lb./ac. of N, M₉=wet+one month after transplanting application of 20 lb./ac. of N, M₁₀=wet+one month after transplanting application of 40 lb./ac. of N, M₁₁=one month after transplanting+at flowering application of 40 lb./ac. of N, M₁₂=dry+one month after transplanting+at flowering application of 40 lb./ac. of N and M₁₃=wet+one month after transplanting+at flowering application of 40 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 22.5'×18.5'. (b) 20.5'×16.5'. (v) 1' all round. (vi) Yes.

4. GENERAL :

(i) Satisfactory. Lodging on 27.11.1951. (ii) N.A. (iii) Height and ear length measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS .

(i) 2909 lb./ac.
 (ii) 158 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
M ₀	2655	M ₇	2752
M ₁	3009	M ₈	3062
M ₂	3054	M ₉	2792
M ₃	2776	M ₁₀	2990
M ₄	2995	M ₁₁	3100
M ₅	2881	M ₁₂	2898
M ₆	2746	M ₁₃	3014

S.E./mean=79.0 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(7).

Type :- 'M'.

Object :-To compare the effect of deep and dry application of A/S with wet and surface application in medium lands.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 13.6.1951/21.7.51. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) *Benibhog* (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32". (x) 16.10.1951.

2. TREATMENTS :

Please refer to C.R.R.I. 51(8) on page 32.

3. DESIGN :

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) 30.5'×11.5'. (b) 28.5'×9.5'. (v) 1' all round. (vi) Yes.

4. GENERAL :

(i) Satisfactory. Lodging on 17.10.1951. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1883 lb./ac.
(ii) 216.4 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
M ₀	1634	M ₇	1840
M ₁	1779	M ₈	2153
M ₂	2029	M ₉	1852
M ₃	1679	M ₁₀	1850
M ₄	1703	M ₁₁	2064
M ₅	1898	M ₁₂	1884
M ₆	1969	M ₁₃	2028

S.E /mean = 108.2 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(6).

Type :- 'M'.

Object :- To compare the efficiencies of dry, deep and wet application of A/S in low lands.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 16.6.1952/15.7.1952.
(iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-1242 (late). (vii) Irrigated. (viii) Weeding on 14.8.1952. (ix) 56.33". (x) 23.12.1952.

2. TREATMENTS :

- Surface application of 20 lb./ac. of N at planting.
- Surface application of 40 lb./ac. of N at planting.
- Surface application of 20 lb./ac. of N one month after planting.
- Surface application of 40 lb./ac. of N one month after planting.
- Sub-surface dry application of 20 lb./ac. of N.
- Sub-surface dry application of 40 lb./ac. of N.
- Sub-surface pellet application at planting of 20 lb./ac. of N.
- Sub-surface pellet application at planting of 40 lb./ac. of N.
- Sub-surface pellet application one month after planting of 20 lb./ac. of N.
- Sub-surface pellet application one month after planting of 40 lb./ac. of N.
- Sub-surface dry application of 10 lb./ac. of N+surface application one month after planting of 10 lb./ac. of N.
- Sub-surface dry application of 20 lb./ac. of N+surface application one month after planting of 20 lb./ac. of N.
- Sub-surface dry application of 10 lb./ac. of N+sub-surface pellet application one month after planting of 10 lb./ac. of N.
- Sub-surface dry application of 20 lb./ac. of N+sub-surface pellet application one month after planting of 20 lb./ac. of N.
- Surface application of 10 lb./ac. of N+surface application one month after planting of 10 lb./ac. of N.
- Surface application of 20 lb./ac. of N+surface application one month after planting of 20 lb./ac. of N.
- Surface application of 10 lb./ac. of N+sub-surface pellet application one month after planting of 10 lb./ac. of N.
- Surface application of 20 lb./ac. of N+sub-surface pellet application one month after planting of 20 lb./ac. of N.
- Surface application of 20 lb./ac. of N+surface application one month after planting of 10 lb./ac. of N +10 lb./ac. of N one month before flowering.
- Sub-surface dry application of 20 lb./ac. of N+surface application one month after planting of 10 lb./ac. of N+10 lb./ac. of N at flowering.
- Sub-surface dry application of 20 lb./ac. of N+pellet application one month after planting of 10 lb./ac. of N+pellet application at flowering of 10 lb./ac. of N.
- Control—no manure.

Dry application was on 1.7.1952, wet application was on 25.7.1952 and application at flowering on 6.10.1952.

3. DESIGN :

- (i) R.B.D. (ii) (a) 22. (b) N.A. (iii) 4. (iv) (a) 22.5'×11'. (b) 20.5'×9'. (v) 1' around. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. Lodging on 29.10.1952 in heavily manured plots. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2281 lb./ac.
(ii) 206.1 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield	Treatment	Av. yield
1.	2073	9.	2273	17.	2325
2.	2259	10.	2325	18.	2116
3.	2395	11.	2148	19.	2310
4.	2226	12.	2355	20.	2507
5.	2266	13.	2289	21.	2337
6.	2592	14.	2242	22.	1895
7.	2266	15.	2198		
8.	2393	16.	2393		

S.E./mean = 106.2 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(7). Type :- 'M'.

Object :- To compare the efficiencies of dry, deep and wet application of A/S in medium lands.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1.
(iii) 17.6.1952/18.7.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A.
(e) 2-3. (v) Nil. (vi) Ch.-47 (medium). (vii) Irrigated. (viii) Weedings on 28.7.1952 and 16.8.1952.
(ix) 56.03°. (x) 23.10.1952.

2. TREATMENTS :

Please refer to C.R.R.I. 52(6) on page 33.

Dry application on 30.6.1952. at planting and wet application on 18.7.1952. at one month after planting on 20.8.1952. Before flowering application on 2.9.1952.

3. DESIGN :

- (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 30.5' × 6.75'. (b) 28.5' × 4.75'. (v) 1' around. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. Lodging on 15.10.1952. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1245 lb./ac.
(ii) 173.7 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield	Treatment	Av. yield
1.	1316	9.	1039	17.	1242
2.	1470	10.	1171	18.	1135
3.	1267	11.	1309	19.	1348
4.	1284	12.	1277	20.	1380
5.	1165	13.	1274	21.	1216
6.	1033	14.	1229	22.	943
7.	1274	15.	1161		
8.	1477	16.	1387		

S.E./mean = 86.85 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(5). Type :- 'M'.

Object :- To compare the efficiencies of sub-surface, surface and dry application of A/S at different levels and their combinations.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1.
(iii) 20.6.1953/14.7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A.
(e) 2 to 3. (v) Nil. (vi) T-1242 (late). (vii) Irrigated. (viii) 2 weedings. (ix) 46.02°. (x) 18.12.1953.

2. TREATMENTS :

M_0 =control, M_1 =dry application of 20 lb./ac. of N, M_2 =dry application of 40 lb./ac. of N, M_3 =wet application of 20 lb./ac. of N, M_4 =wet application of 40 lb./ac. of N, M_5 =deep application at planting of 20 lb./ac. of N, M_6 =deep application at planting of 40 lb./ac. of N, M_7 =wet application one month after planting of 20 lb./ac. of N, M_8 =wet application one month after planting of 40 lb./ac. of N, M_9 =deep application one month after planting of 20 lb./ac. of N, M_{10} =deep application one month after planting of 40 lb./ac. of N, M_{11} =dry application of 10 lb./ac. of N+10 lb./ac. of N one month after planting, M_{12} =dry application of 20 lb./ac. of N+20 lb./ac. of N one month after planting, M_{13} =dry application of 10 lb./ac. of N+deep application of 10 lb./ac. of N, M_{14} =dry application of 20 lb./ac. of N+Deep application of 20 lb./ac. of N, M_{15} =wet application of 10 lb./ac. of N+wet application of 10 lb./ac. of N one month after planting M_{16} =wet application of 20 lb./ac. of N+wet application of 20 lb./ac. one month after planting of N_1 . M_{17} =wet application of 10 lb./ac. of N+deep application of 10 lb./ac. of N. M_{18} =wet application of 20 lb./ac. of N+deep application of 20 lb./ac. of N, M_{19} =dry application of 20 lb./ac. of N+10 lb./ac. of N one month after planting+10 lb./ac. of N one month before flowering, M_{20} =wet application of 20 lb./ac. of N+10 lb./ac. of N one month after planting+10 lb./ac. of N one month before flowering, M_{21} =dry application of 20 lb./ac. of N+deep application of 10 lb./ac. of N one month after planting+deep application of 10 lb./ac. of N one month before flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 22. (b) N.A. (iii) 4. (iv) (a) $22\frac{1}{2}' \times 11'$. (b) $20'10'' \times 9'3''$. (v) $10''$ around. (vi) Yes.

4. GENERAL :

(i) Good. Lodging on 14.11.1953. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3247 lb./ac.

(ii) 231.8 lb./ac.

(iii) Treatment differences are highly significant.

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

Treatment	Av. yield	Treatment	Av. yield	Treatment	Av. yield
M_0	2573	M_8	3176	M_{16}	3474
M_1	2862	M_9	3039	M_{17}	3095
M_2	3494	M_{10}	3407	M_{18}	3434
M_3	3189	M_{11}	3001	M_{19}	3375
M_4	3230	M_{12}	3422	M_{20}	3496
M_5	3355	M_{13}	3308	M_{21}	3635
M_6	3315	M_{14}	3315		
M_7	2978	M_{15}	3254		
		S.E./mean	115.9 lb./ac.		

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(2). Type :- 'M'.

Object :- To compare the effects of nitrogenous fertilizers at different N levels on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 26.6.1953/29.7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T 1145 (medium). (vii) Irrigated. (viii) 2—3 intercultures with Japanese weeder and one hand weeding. (ix) 46.02°. (x) 16,17.11.1953.

2. TREATMENTS:

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

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

(2) 8 sources of N : $S_1=A/S/N$, $S_2=A/N$, $S_3=A/S$, $S_4=$ Ammo. Phos., $S_5=$ Ammo. Chloride, $S_6=C/N$, $S_7=$ Cal. cyanamide and $S_8=$ Urea.

3. DESIGN :

(i) R.B.D. (ii) (a) 17. (b) N.A. (iii) 4. (iv) (a) $30' \times 9'$. (b) $23' \times 7'8''$. (v) 1 row around. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield.
 (iv) (a) 1949—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2701 lb./ac.
 (ii) 252.6 lb./ac.
 (iii) S effect alone is significant.
 (iv) Av. yield of grain in lb./ac.

	Control = 2799 lb./ac.								
	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	S ₈	Mean
N ₁	3102	2932	2844	2839	2562	2834	2508	2291	2739
N ₂	3021	2627	2600	2466	2367	2982	2707	2440	2651
Mean	3061	2779	2722	2652	2464	2908	2607	2365	2695

S.E. of N marginal mean = 44.7 lb./ac.

S.E. of S marginal mean = 89.3 lb./ac.

S.E. of body of table = 126.3 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(9).

Type :- 'M'.

Object :—To study the efficiency of *dhanicha* and sannhemp grown in *situ* and brought from outside applied alone and in combination with inorganic fertilizers like lime, Super phosphate and A/S.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 20.6.1953/25, 26.7.1953.
 (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 10' × 6'. (e) 2—3 seedlings per hole. (v) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) 2—3 intercultures with Japanese weeder and one hand weeding. (ix) 46.02". (x) 3 to 5.12.1953.

2. TREATMENTS :

All combinations of (1), (2), (3), (4), (5) and (6)

- (1) 2 types of manure : (A₀) sannhemp and (A₁) *dhaincha*.
 (2) 2 methods of application : (B₀) brought from out side and (B₁) in *situ*.
 (3) 2 levels of lime : (C₀) no lime and (C₁) ½ ton/ac. of lime.
 (4) 2 levels of P₂O₅ : (D₀) no P₂O₅ and (D₁) 50 lb./ac. of P₂O₅.
 (5) 2 levels of N : (E₀) 0 and (E₁) 30 lb./ac. of N.
 (6) 2 levels of P₂O₅ to Paddy : (F₀) No P₂O₅/ac. and (F₁) 50 lb./ac. of P₂O₅ F.

3. DESIGN :

- (i) 2⁶ confounded design with ABC, CDE, ADF, BEF, ABDE, BCDF, ACEF interactions confounded.
 (ii) (a) 8 plots/block ; 8 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 32' × 14'. (b) 30'4" × 12'. (v) 1 row length-wise and 2 rows breadth-wise. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) N.A. (iii) Straw and grain, height, tiller and ear-length. (iv) (a) N.A. (b) N.A.
 (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3703 lb./ac.
 (ii) 306.4 lb./ac.
 (iii) Only B effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

(Figs in lb./ac.)

Response with	Introduce	A	B	C	D	E	F
	Mean response	-72.50	349.24	7.18	5.12	4.94	86.62
Type of Manures (A)	Sunhemp	—	310.18	91.56	115.56	3.32	88.56
	Dhaincha	—	388.30	-77.18	-105.32	6.56	84.68
Method of application (B)	in Situ	-111.56	—	76.82	36.68	-83.18	192.32
	Brought from outside	-33.44	—	-62.44	-26.44	93.06	-19.06
Lime (C)	Absence	11.98	418.88	—	31.50	-43.50	73.24
	Presence	-156.88	+279.62	—	-21.26	53.38	100.00
P ₂ O ₅ (D)	Absence	+37.94	380.82	33.56	—	-86.32	120.56
	Presence	-182.94	317.68	-19.18	—	96.18	52.68
N (E)	Absence	-74.12	261.12	-41.24	-86.12	—	189.24
	Presence	-70.88	437.38	55.62	96.38	—	-16.00
P ₂ O ₅ to Paddy (F)	Absence	-70.56	454.94	-6.18	39.06	107.56	—
	Presence	-74.44	243.56	20.56	-28.82	-97.68	—
S.E. of mean response				=54.17 lb./ac.			
S.E. of differential response				=76.6 lb./ac.			

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 49(14).

Type :- 'M'.

Object:—To study the effect of different phosphatic manures in presence or absence of N and lime along with different methods of application on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Loam. (b) Refer item 11 on page 1. (iii) 16.5.1949/20.6.1949. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c)—. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-90 (late) (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 46.00%. (x) 10, 12 and 13.12.1949.

2. TREATMENTS :

Main-plot treatments :

4 manures : M₀=control, M₁=20 lb./ac. of N as A/S, M₂=lime and M₃=20 lb./ac. of N+lime.

Sub-plot treatments :

5 applications of P₂O₅ at 30 lb./ac. : P₀=0, P₁=surface application of Super, P₂=surface application of Agrophos, P₃=placement of Super and P₄=placement of Agrophos.

A/S applied on 1.9.1949 and lime and P₂O₅ from 22 to 24.8.1949,

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 5 sub-plots/main-plot. (b) 137'×124'. (iii) 6. (iv) (a) N.A. (b) 21.5'×7.5'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 2738 lb./ac.
(ii) 321.3 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	P ₄	Mean
M ₀	2747	2626	2650	2520	2745	2558
M ₁	2736	2691	2791	2788	2710	2743
M ₂	2693	2764	2815	2782	2812	2773
M ₃	2828	2774	2580	2834	2866	2775
Mean	2751	2714	2709	2731	2783	2738

S.E. of difference of two

1. N marginal means = 82.9 lb./ac.
2. P marginal means = 53.1 lb./ac.
3. P means at the same level of N = 106.2 lb./ac.
4. N means at the same level of P = 126.1 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(15).

Type :- 'M'.

Object :- To study the effect of lime on N and P availability to Paddy plant, in water-logged low-lands.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) N.A. (b) pH. is about 5.6. (iii) 18.6.1952/23.7.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-1242 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 56.03°. (x) N.A.

2. TREATMENTS :

Main-plot treatments .

2 levels of lime : L₀=0 and L₁=2000 lb./ac. of Cao.

Sub-plot treatments :

3 levels of P₂O₅ : P₀=0, P₁=50 and P₂=100 lb./ac.

Sub-sub-plot treatments :

3 applications of N : N₀=0, N₁=20 lb./ac. applied at surface and N₂=20 lb./ac. applied deep.Lime applied on 23.7.1952 and N, 15 to 20 days afterwards. P₂O₅ applied on 20/21.6.1952.

3. DESIGN :

(i) Split-split-plot. (ii) (a) 2 main-plots/replication, 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) 69.5' × 47.25'. (iii) 3. (iv) (a) 22' × 15.75'. (b) 20' × 13'. (v) 1 row all round. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Height measurements, no. of tillers, straw and grain yield. (iv) (a) 1952—continued. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2873 lb./ac.
- (ii) (a) 16.8 lb./ac.
- (b) 167.3 lb./ac.
- (c) 137.6 lb./ac.
- (iii) Main effects of L and N alone are highly significant.
- (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean	N ₀	N ₁	N ₂
L ₀	2784	2786	2764	2778	2540	2805	2988
L ₁	2902	3050	2955	2969	2837	2965	3105
Mean	2843	2918	2859	2873	2688	2885	3047
N ₀	2657	2725	2683				
N ₁	2860	2942	2854				
N ₂	3012	3087	3041				

S.E. of difference of two		S.E. of difference of two	
1. L marginal means	= 4.6 lb./ac.	6. N means at the same level of P	=79.5 lb./ac.
2. P marginal means	=55.8 lb./ac.	7. P means at the same level of N	=85.6 lb./ac.
3. N marginal means	=45.9 lb./ac.	8. N means at the same level of L	=64.9 lb./ac.
4. P means at the same level of L	=78.9 lb./ac.	9. L means at the same level of N	=53.2 lb./ac.
5. L means at the same level of P	=64.5 lb./ac.		

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53 (23).

Type :- 'M'.

Object :—To study the effect of deep placement of A/S in combination with P_2O_5 on the yield of Paddy in low lands.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 25.6.1953/24.7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) $10' \times 10'$. (e) 2 to 3. (v) Nil. (vi) T-1242 (late). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 46.02°. (x) 15.12.1953.

2. TREATMENTS :

Main-plot treatments

2 levels of lime : $L_0=0$ and $L_1=30$ lb./ac.

Sub-plot treatments :

3 levels of P_2O_5 : $P_0=0$, $P_1=50$ and $P_2=100$ lb./ac.

Sub-sub-plot treatments :

3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.

Lime applied last year and Residual effect is studied this.

3. DESIGN :

(i) Split-split plot. (ii) (a) 2 main-plots/block ; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) $140.75' \times 47.25'$. (iii) 4. (iv) (a) N.A. (b) $13.33' \times 20.83'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Height measurements, no. of tillers, straw and grain yield. (iv) (a) 1952—contd. (b) Yes. (c) Nil. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3015 lb./ac.

(ii) (a) 57.0 lb./ac.

(b) N.A.

(c) 225.3 lb./ac.

(iii) L and N effects are highly significant while other effects are not significant.

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

	P_0	P_1	P_2	Mean	N_0	N_1	N_2
L_0	3005	2967	2941	2971	2384	3105	3424
L_1	2956	3068	3150	3058	2558	3237	3379
Mean	2981	3018	3045	3015	2471	3171	3402
N_0	2388	2434	2591				
N_1	3180	3184	3150				
N_2	3374	3434	3396				

S.E. of difference of two

1. L marginal means =13.4 lb./ac.

2. N marginal means =65.0 lb./ac.

3. N means at the same level of L =92.0 lb./ac.

4. L means at the same level of N =76.3 lb./ac.

Other S.E.'s N.A.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(17).

Type :- 'M'.

Object : -To study the effect of phosphate manuring on Paddy in presence or absence of nitrogen.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 27.11.1951/8.1.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 9' × 6'. (e) 2 and 3. (v) Nil. (vi) Ch-47 (early). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. Date of flowering 20.3.1952. (ix) 65.32°. (x) 26.4.1952.

2. TREATMENTS :

Main-plot treatments :

2 methods of application : M_1 = surface application and M_2 = deep application.

Sub-plot treatments :

3 levels of N : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.

Sub-sub-plot treatments :

4 levels of P_2O_5 : $P_0=0$, $P_1=40$, $P_2=80$ and $P_3=120$ lb./ac.

Application of P_2O_5 alone deep on 19.1.1952 and application of N and P_2O_5 combined (surface) on 20.1.1952.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 3 sub-plots/main-plot ; and 4 sub-sub-plots/sub-plot. (b) 63' 9" × 20'. Sub block : 20' 3" × 20'. (iii) 6. (iv) (a) 4' 6" × 20'. (b) 3' × 18'. (v) 1' × 9". (vi) Yes.

4. GENERAL :

(i) Deep application has given better crop than surface application. (ii) N.A. (iii) Grain and straw yield, height and tiller count. (iv) (a) No. (b) No. (c) Nil. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1398 lb./ac.

(ii) (a) 456.4 lb./ac.

(b) 259.0 lb./ac.

(c) 220.6 lb./ac.

(iii) N effect is highly significant, interaction $N \times M$ is significant. Other effects are not significant.

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

	P_0	P_1	P_2	P_3	Mean	M_1	M_2
N_0	1256	1300	1215	1116	1222	1248	1195
N_1	1388	1376	1373	1437	1394	1288	1499
N_2	1568	1568	1549	1625	1578	1591	1564
Mean	1404	1415	1379	1393	1398		
M_1	1376	1397	1383	1347	1376		
M_2	1432	1432	1374	1439	1419		

S.E. of difference of two

1. M marginal means = 76.1 lb./ac.

2. N marginal means = 52.9 lb./ac.

3. P marginal means = 52.0 lb./ac.

4. N means at the same level of M = 74.8 lb./ac.

5. M means at the same level of N = 97.5 lb./ac.

6. P means at the same level of M = 73.5 lb./ac.

7. M means at the same level of P = 99.2 lb./ac.

8. P means at the same level of N = 90.1 lb./ac.

9. N means at the same level of P = 94.2 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 48(10).

Type :- 'M'.

Object :-To study the effect of P_2O_5 , G.M. and A/S on the yield and growth of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) [28.6.1948/4,5.8.1948. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) Nil. (e) 2—3 seedlings/hill. (v) Nil. (vi) AKP-10. (vii) Irrigated. (viii) N.A. (ix) 54.35°. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 applications of manure : M_0 =control, M_1 =G.M. at 4000 lb./ac. and M_2 =A/S.

Sub-plot treatments :

8 sources to give 30 lb./ac of P_2O_5 : S_0 =Control, S_1 =Super 18%, S_2 =Agrophos. 25%, S_3 =Selecto-phos. 24.5%, S_4 =Hyper phosphate 25—26%, S_5 =Hyper-phosphate 26-27%, S_6 =Hyper-phosphate 28—29%. and S_7 =B.M. 23%.

G.M. applied on 4, 5.8.1948, A/S on 7.9.1948 and P_2O_5 on 4, 5.8.1948.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 8 sub-plots/main-plot. (b) 138'×127'. (iii) 4. (iv) (a) 44'×15'. (b) 42'×13'. (v) 1' border all round. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Hispa attacked in centre. Tops of the crop cut in two fields on 4, 5.9.1948. (iii) Height measurements, no. of tillers, straw and grain yield. (iv) (a) 1948—contd. (b) —. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1915 lb./ac.
 (ii) (a) 181.6 lb./ac.
 (b) 138.2 lb./ac.
 (iii) M and S effects are highly significant while interaction is not significant.
 (iv) Av. yield of grain in lb./ac.

	S_0	S_1	S_2	S_3	S_4	S_5	S_6	S_7	Mean
M_0	1556	1891	1829	1788	1951	1757	1810	1960	1818
M_1	1975	2009	2018	1904	2030	2105	1927	1940	1988
M_2	1956	1962	1870	1894	1903	1977	2012	1945	1940
Mean	1829	1954	1906	1862	1961	1946	1916	1948	1915

S.E. of difference of two

1. M marginal means = 45.4 lb./ac.
 2. S marginal means = 56.4 lb./ac.
 3. S means at the same level of M = 97.7 lb./ac.
 4. M means at the same level of S = 102.1 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 49(15).

Type :- 'M'.

Object :- To determine the residual effect of phosphatic fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) N.A. (iv) (a) 4 ploughings laddering and levelling. (b) Transplanted. (c) —. (d) Bulk planting. (e) 2—3 seedlings/hill. (v) Nil (vi) T-90 (late). (vii) Irrigated. (viii) 2—3 intercultures with Japanese weeder and one hand weeding. (ix) 46.00°. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 applications of manure : M_0 =Control, M_1 =G.M. at 4000 lb./ac. and M_2 =A/S.

Sub-plot treatments :

8 sources to give 30 lb./ac. of P_2O_5 : S_0 =Control, S_1 =Super 18%, S_2 =Agrophos. 25%, S_3 =Selecto-phos. 24.5%, S_4 =Hyper phosphate 25—26%, S_5 =Hyper phosphate 26-27%, S_6 =Hyper phosphate 28—29% and S_7 =B.M. 23%.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block, 8 sub-plots/main-plot. (b) 138'×127'. (iii) 4. (iv) (a) 44'×15'. (b) 42'×13'. (v) 1' all round. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Height measurements, no. of tillers, straw and grain yield. (iv) (a) 1949— contd. (b) —. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1998 lb./ac.
 (ii) (a) 2692 lb./ac.
 (b) 138.7 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	S ₀	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	Mean
M ₀	2088	2091	1986	2094	1932	2031	1993	2002	2027
M ₁	1944	1930	2091	1987	2031	2069	1986	1959	2000
M ₂	1941	2048	1913	1870	1996	2006	2026	1941	1963
Mean	1991	2023	1997	1984	1986	2035	2002	1967	1998

S.E. of difference of two

1. M marginal means = 67.3 lb./ac.
2. S marginal means = 56.6 lb./ac.
3. S means at the same level of M = 98.1 lb./ac.
4. M means at the same level of S = 113.8 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(10).

Type :- 'M'.

Object:—To study the effect of manuring on the incidence of blast.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 10.7.1951/17.8.1951. (iv) (a) 2 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-1145 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32". (x) 5.12.1951.

2. TREATMENTS :

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

- (1) 2 levels of N : N₀=20 and N₁=40 lb./ac.
- (2) 4 sources of N : S₁=*Dhaincha*, S₂=G.N.C., S₃=Compost and S₄=A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 8. (iv) (a) 19'×19'. (b) 17'×17'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1950—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2448 lb./ac.
 (ii) 252.9 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

Control=2151 lb./ac.

	S ₁	S ₂	S ₃	S ₄	Mean
N ₀	2490	2504	2317	2299	2402
N ₁	2773	2483	2492	2526	2568
Mean	2631	2493	2404	2412	2485

- S.E. of N marginal mean = 44.71 lb./ac.
 S.E. of S marginal mean = 63.23 lb./ac.
 S.E. of body of table = 89.42 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 49(4).

Type :- 'M'.

Object: -To find out the response of Paddy to N, P₂O₅, and K₂O with and without basal dressing.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 27.6.1949/2.8.1949. (iv) (a) 3-4 ploughings, laddering and levelling. (b) Bulk planting. (c) ... (d) 6"-8". (e) 2-3. (v) As per treatments (vi) T-1145 (medium). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 46.00". (x) 28, 29.11.1949.

2. TREATMENTS:

Main-plot treatments :

4 organic manures as basal dressing : M₀=No manure, M₁=Compost, M₂=*Dhaincha* as G.M. and M₃=G.N.C.

Sub-plot treatments :

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

(1) 3 levels of N : N₀=0, N₁=20 and N₂=40 lb./ac.

(2) 3 levels of P₂O₅ : P₀=0, P₁=20 and P₂=40 lb./ac.

(3) 3 levels of K₂O : K₀=0, K₁=20 and K₂=40 lb./ac.

27 NPK treatments divided into 3-sub-blocks confounding 2 d.f. of NPK interaction between sub-blocks of 9 treatment combinations and each main-plot consisting of these sub-blocks.

3. DESIGN :

(i) 4 × 3³ split-plot confounding. (ii) (a) 4 main-plots/replication, 3 sub-blocks/main-plot each sub-block consisting of 9 different combinations of NPK treatments confounding 2 d.f. of NPK interaction between sub-blocks ; 9 sub-plots/sub-blocks. (iii) 2. (iv) (a) 12' × 31'. (b) 10' × 29'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Good. Lodging on 20.11.1949. (ii) Silver shoot blast appeared on 12.9.1949. (iii) Height measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) —. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2227 lb./ac.

(ii) (a) 471.3 lb./ac.

(b) 306.7 lb./ac.

(iii) Interaction N × M highly significant. Interaction N × P × K is significant. Others are not significant.

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

	M ₀	M ₁	M ₂	M ₃	Mean	K ₀	K ₁	K ₂	P ₀	P ₁	P ₂
N ₀	1993	1991	2289	2466	2185	2132	2192	2229	2215	2142	2198
N ₁	2276	2207	2256	2338	2269	2327	2255	2227	2209	2368	2232
N ₂	2376	2296	2246	1985	2226	2170	2222	2286	2174	2241	2262
Mean	2215	2165	2264	2263	2227	2210	2223	2247			
P ₀	2192	2118	2233	2253	2199	2264	2147	2186			
P ₁	2207	2230	2282	2281	2250	2179	2278	2293			
P ₂	2245	2146	2277	2255	2231	2186	2244	2262			
K ₀	2199	2184	2231	2225							
K ₁	2184	2154	2324	2229							
K ₂	2262	2157	2237	2334							

S.E. of difference of two

1. M marginal means = 90.7 lb./ac.
2. N, P or K marginal means = 51.1 lb./ac.
3. N, P or K means at the same level of M = 102.2 lb./ac.
4. M means at the same level of N, P or K = 123.3 lb./ac.
5. means of the body of N × P, P × K or N × K tables = 177.1 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(7). Type :- 'M'.

Object :- To find out the response of Paddy to N, P₂O₅ and K₂O with and without basal dressing.**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 18, 21.6.1950/31.7.1950 to 5.8.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk planting. (c) —. (d) 6"–8". (e) 2-3. (v) As per treatments. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 64.47". (x) N.A.

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

4 organic manures as basal dressing : M₀=No manure, M₁=Compost, M₂=*Dhaincha* as G.M. and M₃=G.N.C.

Sub-plot treatments :

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

(1) 3 levels of N : N₀=0, N₁=20 and N₂=40 lb./ac.

(2) 3 levels of P₂O₅ : P₀=0, P₁=20 and P₂=40 lb./ac.

(3) 3 levels of K₂O : K₀=0, K₁=20 and K₂=40 lb./ac.

27 NPK treatments divided into 3 sub-blocks confounding 2 d.f. of NPK interaction between sub-blocks of 9 treatment combinations and each main-plot consists of these sub-blocks.

3. DESIGN :

(i) 4 × 3³ split-plot confounding. (ii) (a) 4 main-plots/replication, 3 sub-blocks/main-plot, each sub-block consisting of 9 different combinations of NPK treatments confounding 2 d.f. of NPK interaction between sub-blocks ; 9 sub-plots/sub-block. (b) N.A. (iii) 2. (iv) (a) 12' × 31'. (b) 10' × 29'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. Lodging on 17.10.1950. (ii) N.A. (iii) Height measurements, i.o. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2222 lb./ac.

(ii) (a) 956.9 lb./ac.

(b) 293.9 lb./ac.

(iii) Only N effect is highly significant.

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

	M ₀	M ₁	M ₂	M ₃	K ₀	K ₁	K ₂	P ₀	P ₁	P ₂	Mean
N ₀	1928	2124	2175	2293	2088	2123	2179	2125	2164	2102	2130
N ₁	2032	2266	2243	2362	2227	2198	2252	2266	2179	2233	2226
N ₂	2241	2358	2323	2323	2370	2314	2250	2327	2258	2349	2311
Mean	2067	2249	2247	2326	2228	2212	2227	2239	2200	2228	2222
P ₀	2037	2258	2248	2414	2267	2231	2221				
P ₁	2061	2229	2241	2270	2221	2182	2198				
P ₂	2104	2261	2251	2294	2197	2223	2263				
K ₀	2038	2241	2282	2353							
K ₁	2068	2283	2196	2301							
K ₂	2096	2225	2263	2325							

S.E. of difference of two

1. M marginal means = 184.2 lb./ac.
2. N, P or K marginal means = 49.0 lb./ac.
3. N, P or K means at the same level of M = 98.0 lb./ac.
4. M means at the same level of N, P or K = 200.8 lb./ac.
5. means of body of N × P, N × K or P × K table = 84.8 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(6). Type :- 'M'.

Object :- To find out the response of Paddy to N, P₂O₅ and K₂O with and without basal dressing.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 13.6.1951/20.7.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk planting. (c) —. (d) About 6"–8". (e) 2 to 3. (v) As per treatments. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2–3 inter-cultures with Japanese weeder and one hand weeding. (ix) 65.32". (x) 16, 17.11.1951.

2. TREATMENTS :

Main-plot treatments :

4 organic manures as basal dressing : M₀=No manure, M₁=Compost, M₂=*Dhaincha* as G.M. and M₃=G.N.C.

Sub-plot treatments :

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

(1) 3 levels of N : N₀=0, N₁=20 and N₂=40 lb./ac.

(2) 3 levels of P₂O₅ : P₀=0, P₁=20 and P₂=40 lb./ac.

(3) 3 levels of K₂O : K₀=0, K₁=20 and K₂=40 lb./ac.

27 NPK treatments divided into 3 sub-blocks confounding 2 d.f. of NPK interaction between sub-blocks of 9 treatment combinations and each main-plot consists of these sub-blocks.

3. DESIGN :

(i) 4 × 3³ split-plot confounding. (ii) (a) 4 main-plots/replication, 3 sub-blocks/main-plot, each sub-block consisting of 9 different combinations of NPK treatments confounding 2 d.f. of NPK interaction between sub-blocks, 9 sub-plots/sub-block. (b) N.A. (iii) 2. (iv) (a) 12' × 31'. (b) 10' × 29'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. Lodging on 12 to 14.11.1951. (ii) N.A. (iii) Height measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2448 lb./ac.

(ii) (a) 497.8 lb./ac.

(b) 234.8 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	K ₀	K ₁	K ₂	P ₀	P ₁	P ₂	Mean
N ₀	2301	2358	2528	2483	2411	2367	2474	2430	2420	2402	2417
N ₁	2431	2491	2401	2427	2457	2448	2407	2376	2430	2506	2437
N ₂	2370	2533	2550	2506	2451	2529	2489	2550	2477	2442	2490
Mean	2357	2461	2493	2472	2440	2448	2457	2452	2442	2450	2448
P ₀	2380	2441	2506	2482	2435	2442	2480				
P ₁	2379	2474	2475	2442	2464	2421	2442				
P ₂	2343	2467	2498	2493	2420	2481	2450				
K ₀	2410	2483	2436	2430							
K ₁	2376	2448	2530	2439							
K ₂	2316	2451	2513	2557							

S.E. of difference of two

1. M marginal means = 95.9 lb./ac.
2. N, P or K marginal means = 39.1 lb./ac.
3. N, P or K means at the same level of M = 78.2 lb./ac.
4. M means at the same level of N, P or K = 115.2 lb./ac.
5. means of the body of N × P, N × K or P × K table = 67.8 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(5). Type :- 'M'.

Object :- To find out the response of Paddy to N, P₂O₅ and K₂O with and without basal dressing.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) I rep. 16.6.1952, II rep. 17.6.1952, I rep. 26.7.1952, II rep. 20.7.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk planting. (c) —. (d) About 6"–8". (e) 2 to 3. (v) As per treatments. (vi) T-1145 (medium) (vii) Irrigated. (viii) Weeding on 24.8.1952 and 29.8.1952. (ix) 56.03%. (x) 18 to 20.11.1952.

2. TREATMENTS :

Main-plot treatments :

4 organic manures as basal dressing : M₀=No manure, M₁=Compost, M₂=*Dhaincha* as G.M. and M₃=G.N.C.

Sub-plot treatments :

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

(1) 3 levels of N : N₀=0, N₁=20 and N₂=40 lb./ac.(2) 3 levels of P₂O₅ : P₀=0, P₁=20 and P₂=40 lb./ac.(3) 3 levels of K₂O : K₀=0, K₁=20 and K₂=40 lb./ac.

27 NPK treatments divided into 3 sub-blocks confounding 2 d.f. of NPK interaction between sub-blocks of 9 treatment combinations and each main-plot consists of these sub-blocks.

3. DESIGN :

(i) 4 × 3³ split-plot confounding. (ii) (a) 4 main-plots/replication, 3 sub-blocks/main-plot, each sub-block consisting of 9 different combinations of NPK treatments confounding 2 d.f. of NPK interaction between sub-blocks, 9 sub-plots/sub-block. (b) N.A. (iii) 2. (iv) (a) 12' × 31'. (b) 10' × 29'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory in plots where N₂ is applied. Lodging on 25.10.1952. (ii) N.A. (iii) S raw, height and tillers. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2084 lb./ac.

(ii) (a) 615.5 lb./ac.

(b) 322.7 lb./ac.

(iii) Interaction M × N is highly significant. Other effects are not significant.

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

	M ₀	M ₁	M ₂	M ₃	K ₀	K ₁	K ₂	P ₁	P ₂	Mean	
N ₀	1922	2046	2055	1985	2004	1965	2037	1959	2016	2032	2002
N ₁	2134	2328	1924	2170	2052	2159	2096	2169	2140	2108	2139
N ₂	2303	2258	1811	2066	2122	2043	2154	2127	2151	2051	2110
Mean	2120	2211	1930	2074	2093	2059	2099	2085	2102	2064	2084
P ₀	2103	2187	1950	2100	2124	2074	2057				
P ₁	2185	2207	1960	2059	2101	2085	2121				
P ₂	2072	2238	1881	2063	2053	2018	2120				
K ₀	2062	2253	2037	2019							
K ₁	2165	2189	1829	2054							
K ₂	2132	2191	1925	2149							

S.E. of difference of two

1. M marginal means = 118.5 lb./ac.
2. N, P or K marginal means = 53.8 lb./ac.
3. N, P or K means at the same level of M = 107.6 lb./ac.
4. M means at the same level of N, P or K = 147.4 lb./ac.
5. means of the body of N × P, N × K or P × K table = 93.2 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(6). Type :- 'M'.

Object :—To find out the response of Paddy to N, P₂O₅ and K₂O with and without basal dressing.

1. BASAL CONDITION :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 20, 22.6.1953/27, 23.7.1953 for first and second replications. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk planting. (c)—. (d) About 6"-8". (e) 2 to 3. (v) As per treatments. (vi) T-1145. (medium). (vii) Irrigated. (viii) Hand weeding on 27.8.1953 and 30.8.1953. (ix) 46.02". (x) I replication on 5, 6.12.1953 and II replication on 23 and 24.11.1953.

2. TREATMENTS :

Main-plot treatments :

4 organic manures as basal dressing : M₀=No manure, M₁=Compost, M₂=*Dhaincha* as G.M. and M₃=G.N.C.

Sub-plot treatments :

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

(1) 3 levels of N : N₀=0, N₁=20 and N₂=40 lb./ac.

(2) 3 levels of P₂O₅ : P₀=0, P₁=20 and P₂=40 lb./ac.

(3) 3 levels of K₂O : K₀=0, K₁=20 and K₂=40 lb./ac.

27 NPK treatments divided into 3 sub-blocks confounding 2 d.f. of NPK interaction between sub-blocks of 9 treatment combinations and each main-plot consists of these sub-blocks.

3. DESIGN :

(i) 4 × 3³ split-plot confounding. (ii) (a) 4 main-plots/replication, 3 sub-blocks/main-plot each sub-block consisting of 9 different combinations of NPK treatments confounding 2 d.f. of NPK interaction between sub-blocks ; 9 sub-plots/sub-block. (b) N.A. (iii) 2. (iv) (a) 12' × 31'. (b) 10' × 29'. (v) 1' all round. (vi) Yes.

4. GENERAL :

(i) Good. Yellowing in unmanured plots. (ii) N.A. (iii) Straw height and tiller. (iv) (a) 1949—continued. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2247 lb./ac.

(ii) (a) 866.5 lb./ac.

(b) 290.5 lb./ac.

(iii) Interaction N × P is significant, interaction M × N is highly significant. Other effects are not significant.

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

	M ₀	M ₁	M ₂	M ₃	K ₀	K ₁	K ₂	P ₀	P ₁	P ₂	Mean
N ₀	2091	2282	2442	2121	2321	2178	2203	2288	2343	2071	2234
N ₁	2108	2339	2439	2109	2179	2312	2255	2317	2180	2249	2249
N ₂	2270	2511	2439	1820	2280	2240	2261	2167	2291	2323	2260
Mean	2133	2377	2440	2017	2260	2243	2240	2257	2271	2214	2247
P ₀	2184	2444	2335	2065	2345	2248	2178				
P ₁	2215	2276	2545	2050	2260	2267	2287				
P ₂	2070	2412	2440	1935	2174	2215	2254				
K ₀	2152	2386	2491	2009							
K ₁	2174	2359	2429	2012							
K ₂	2143	2387	2400	2029							

S.E. of difference of two

1. M marginal means = 166.8 lb./ac.
2. N, P or K marginal means = 48.4 lb./ac.
3. N, P or K means at the same level of M = 96.8 lb./ac.
4. M means at the same level of N, P or K = 184.5 lb./ac.
5. means of the body of N × P, N × K or P × K table = 83.9 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 48(12). Type :- 'MV'.

Object :- To find out the effect of G.N.C. and A/S on transplanted Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) V₁ on 25.6.1948 and V₂ on 24.6.1948/21.7.1948. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) 100 md./ac. of compost. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 interculturations with Japanese weeder and one hand weeding. (ix) 54.35%. (x) V₁ on 29.10.1948 and V₂ on 23.11.1948.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V₁=T-608 (medium) and V₂=T-812 (late).

Sub-plot treatments :

3 manures : M₀=0, M₁=40 lb /ac. of N as G.N.C. and M₂=40 lb./ac. of N as A/S.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 3 sub-plots/main-plot. (b) 62'×64'. (iii) 8. (iv) (a) 30'×20'. (b) 28'×18'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Straw weight, height of plant and number of tillers. (iv) (a) No. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2184 lb./ac.
 (ii) (a) 168.6 lb./ac.
 (b) 102.2 lb./ac.
 (iii) V and M effects are significant. Interaction is not significant.
 (iv) Av. yield of grain in lb./ac.

	M ₀	M ₁	M ₂	Mean
V ₁	1508	1840	1867	1738
V ₂	2449	2715	2726	2630
Mean	1979	2278	2297	2184

S.E. of difference of two

1. V marginal means = 48.7 lb./ac.
 2. M marginal means = 36.1 lb./ac.
 3. M means at the same level of V = 51.1 lb./ac.
 4. V means at the same level of M = 64.1 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(21). Type :- 'MV'.

Object :- To compare the effect of A/S on different Paddy varieties.

1. BASAL CONDITIONS :

(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 21.5.1950/8.7.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 3"–4" apart. (e) 1 to 2. (v) 100 md./ac. of compost. (vi) As per treatments. (vii) Irrigated (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) N.A. (x) V₁ to V₄ on 29.9.1950, V₅ and V₆ on 6.10.1950 and the rest on 9.10.1950.

2. TREATMENTS :

Main-plot treatments :

3 levels of N : N₀=0, N₁=30 and N₂=60 lb./ac.

Sub-plot treatments :

8 varieties : V₁=CH-2, V₂=R 9, V₃=Omachi, V₄=Ashahi, V₅=Benibhog, V₆=CH-45, V₇=Adt 4 and V₈=Adt 20.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 8 sub-plots/main-plot. (b) 64'×64'. (iii) 4. (iv) (a) 8'×20'. (b) 6'×18'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Straw yield, height of plant and number of tillers. (iv) (a) No. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1086 lb./ac.
 (ii) (a) 289.6 lb./ac.
 (b) 294.6 lb./ac.
 (iii) M and V effects are significant. Other effects are not significant.
 (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	V ₇	V ₈	Mean
N ₀	815	560	713	614	863	991	1266	1516	917
N ₁	1048	749	642	677	1077	1365	1416	1791	1096
N ₂	994	906	966	739	1410	1407	1746	1791	1245
Mean	952	738	774	677	1117	1254	1476	1699	1086

S E. of difference of two

1. N marginal means = 72.4 lb./ac.
2. V marginal means = 120.3 lb./ac.
3. V means at the same level of N = 208.3 lb./ac.
4. N means at the same level of V = 207.9 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(12).

Type :- 'MV'.

Object :- To find the effect of manured and unmanured conditions on Paddy varieties .

1. BASAL CONDITIONS

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 29.12.1950/1.2.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) As per treatments. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 3.65". (x) 14.5.1951.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) Two levels of manures : M₀=No manure and M₁=Organic manure at 100 mds. of compost/ac. as basal and A/S at 20 lb./ac. of N as top dressing.
- (2) 5 varieties : V₁=DI-4, V₂=PTB-10, V₃=CO-13, V₄=Ch-45 and V₅=Ch-47.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 30'×16'. (b) 28'×14'. (v) 1' allround. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1947—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1022 lb./ac.
 (ii) 190.4 lb./ac.
 (iii) M and V effects are highly significant while their interaction is not significant.
 (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	Mean
M ₀	741	969	879	644	1071	861
M ₁	1154	961	1414	879	1514	1184
Mean	947	965	1146	761	1292	1022

- S.E. of V marginal mean = 67.3 lb./ac.
 S.E. of M marginal mean = 42.6 lb./ac.
 S.E. of body of table = 95.2 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(11).

Type :- 'MV'.

Object :—To find the effect of five varieties of Paddy in manured, and unmanured conditions.

1. BASAL CONDITIONS :

(i) a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 29.12.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Broadcast. (c) N.A. (d) —. (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 3.65". (x) 3.5.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 manures : M_0 =unmanured and M_1 =manured.(2) 5 varieties : V_1 =Ch-47, V_2 =Ch-45, V_3 =CO-13, V_4 =DI-4 and V_5 =PTB-10.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) $30' \times 16'$. (b) $28' \times 14'$. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1947—contd. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1517 lb./ac.

(ii) 178.2 lb./ac.

(iii) M and V effects are highly significant while interaction $M \times V$ is not significant.

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

	V_1	V_2	V_3	V_4	V_5	Mean
M_0	1714	1060	1925	1556	2105	1672
M_1	1463	992	1542	1219	1596	1362
Mean	1588	1026	1733	1387	1850	1517

S.E. of V marginal mean = 63.0 lb./ac.

S.E. of M marginal mean = 39.8 lb./ac.

S.E. of body of table = 89.1 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(13).

Type :- 'MV'.

Object :—To compare the effect of A/S on dwarf Japanese type with Chinese and other types.

1. BASAL CONDITIONS :

(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 21.6.1950/8.7.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 3" to 4". (e) 1 to 2. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 64.47". (x) 29.9.1950.

2. TREATMENTS :

Main-plot treatments :

3 doses of N as A/S : $N_0=0$, $N_1=30$ and $N_2=60$ lb./ac.

Sub-plot treatments :

8 varieties : V_1 =Ch-2, V_2 =R-9, V_3 =Omach, V_4 =Bhat, V_5 =Benibhog, V_6 =Ch-45, V_7 =Adt 4 and V_8 =Adt 20.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 8 sub-plots/main-plot. (b) $64' \times 64'$. (iii) 4. (iv) (a) $20' \times 8'$. (b) $18' \times 6'$. (v) 1' around. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) N A. (iii) Straw, height, tiller count and grain yield. (iv) (a) 1950—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1086 lb./ac.

(ii) (a) 291.7 lb./ac.

(b) 179.1 lb./ac.

(iii) N effect is significant, V effect is highly significant while interaction is not significant.

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

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	V ₇	V ₈	Mean
N ₀	815	560	713	614	863	991	1266	1516	917
N ₁	1048	749	642	677	1077	1365	1416	1791	1096
N ₂	994	906	966	739	1410	1407	1746	1791	1245
Mean	952	738	774	677	1117	1254	1476	1699	1086

S.E. of difference of two

1. N marginal means = 72.9 lb./ac.
2. V marginal means = 73.1 lb./ac.
3. V means at the same level of N = 126.6 lb./ac.
4. N means at the same level of V = 139.1 lb./ac.

Crop :- Paddy (*Khariif*).

Ref :- C.R.R.I. 52(12).

Type :- 'MV'.

Object :—To study the effect of manuring on the incidence of blast disease of Paddy.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 24.7.1952/20, 23.8.1952. (iv) (a) 2 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 56.03" (x) CO-13, 10.11.1952 and others—N.A.

2. TREATMENTS :

Main-plot treatments :

6 varieties : V₁=CO-13 (early), V₂=ASD-1 (medium), V₃=B 76-116 (early), V₄=T-608 (medium), V₅=T-1145 (late) and V₆=T-141 (late).

Sub-plot treatments :

10 manures : M₁=A/S at 20 lb./ac. of N, M₂=G.N.C. at 20 lb./ac. of N, M₃=Compost at 20 lb./ac. of N, M₄=A/S at 40 lb./ac. of N, M₅=G.N.C. at 40 lb./ac. of N, M₆=Compost at 40 lb./ac. of N, M₇=M₁+M₃, M₈=M₁+M₂, M₉=M₂+M₃ and M₁₀=Control.

3. DESIGN :

- (i) Split-plot. (ii) (a) 6 main-plots/block ; 10 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) 18'×10.5'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) N.A. (iii) Straw yield, neck infection percentage and grain yield. (iv) (a) 1950—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1177 lb./ac.

(ii) (a) 383.4 lb./ac.

(b) 178.6 lb./ac.

(iii) V and M effects are highly significant while their interaction is not significant.

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

	M ₁	M ₂	M ₃	M ₄	M ₅	M ₆	M ₇	M ₈	M ₉	M ₁₀	Mean
V ₁	732	842	662	564	648	876	662	862	763	660	727
V ₂	1051	1205	756	797	1032	1183	922	1250	917	696	981
V ₃	667	593	509	687	677	761	648	660	627	478	631
V ₄	850	929	612	655	878	1001	859	1044	847	775	845
V ₅	1800	2033	1495	1826	1946	2083	1867	1978	2088	1567	1868
V ₆	2194	2282	1546	1790	2073	2203	2057	2102	2162	1714	2012
Mean	1216	1314	930	1053	1209	1351	1169	1316	1234	987	1177

S.E. of difference of two

1. V marginal means = 99.0 lb./ac.
2. M marginal means = 59.6 lb./ac.
3. M means at the same level of V = 145.8 lb./ac.
4. V means at the same level of M = 170.1 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 48(6).

Type :- 'MV'.

Object:—To find the effect of G.N.C. and A/S on Paddy on N basis.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) V₁ on 20.6.1948 and V₂ on 27.6.1948. (iv) (a) 4 ploughings, laddering and levelling. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 54.35%. (x) V₁ on 27.10.1948 and V₂ on 19.11.1948.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V₁=T-608 (early) and V₂=T-812 (medium).

Sub-plot treatments :

3 applications of N : N₀=0, N₁=40 lb./ac. of N as G.N.C. and N₂=40 lb./ac. of N as A/S.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 8. (iv) (a) 30'×20'. (b) 28'×18'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1947—contd. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1659 lb./ac.
- (ii) (a) 338.3 lb./ac.
- (b) 161.7 lb./ac.
- (iii) N effect is highly significant and interaction N×V is significant. V effect is not significant.
- (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	Mean
V ₁	1299	1685	1684	1556
V ₂	1308	1939	2038	1762
Mean	1303	1812	1861	1659

S.E. of difference of two

1. V marginal means	= 98.0 lb./ac.
2. N marginal means	= 57.2 lb./ac.
3. N means at the same level of V	= 80.9 lb./ac.
4. V means at the same level of N	= 117.8 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 48(7).

Type :- 'MV'.

Object :—To find the effect of G.N.C. and A/S on transplanted Paddy on N basis.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) V_1 on 25.6.1948, V_2 on 24.6.1948/ V_1 on 21.7.1948. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 54.35". (x) V_1 on 29.10.1948 and V_2 on 23.11.1948.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1 =T-608 (early) and V_2 =T-812 (medium).

Sub-plot treatments :

3 applications of N : N_0 =0, N_1 =40 lb./ac. of N as G.N.C. and N_2 =40 lb./ac. of N as A/S.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 8. (iv) (a) 30'×20'. (b) 25'×18'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1947—contd. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2184 lb./ac.
(ii) (a) 168.6 lb./ac.
(b) 102.2 lb./ac.

(iii) V and N effects are highly significant. Interaction is not significant.

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

	N_0	N_1	N_2	Mean
V_1	1508	1840	1867	1738
V_2	2449	2715	2726	2630
Mean	1978	2277	2296	2184

S.E. of difference of two

1. V marginal means	= 48.7 lb./ac.
2. N marginal means	= 36.1 lb./ac.
3. N means at the same level of V	= 51.1 lb./ac.
4. V means at the same level of N	= 64.1 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(15).

Type :- 'MV'.

Object :- To study the effect of deep layering and surface application of A/S at different levels.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 27.7.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32%. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 varieties : $V_1 = \text{CO-13}$ (early) and $V_2 = \text{T-1145}$ (medium).

Sub-plot treatments :

7 manures : $M_0 = 0$, $M_1 = 20$ lb./ac. of N as A/S (surface), $M_2 = 20$ lb./ac. of N as A/S (deep), $M_3 = 40$ lb./ac. of N as A/S (surface) in single dose, $M_4 = 40$ lb./ac. of N as A/S (deep) in single dose, $M_5 = 40$ lb./ac. of N as A/S (surface) in double dose and $M_6 = 40$ lb./ac. of N as A/S (deep) in double dose.

Fertilizers applied on 17.8.1951 for single dose, while double dose applied on 17.8.1951 (first dose) and 2nd dose on 4.9.1951 (CO-13) and on 27.9.1951 (T-1145).

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block and 7 sub-plots/main-plot. (b) $61' \times 6'' \times 21' \times 6''$. (iii) 4. (iv) (a) N.A. (b) $21.5' \times 7.5'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Straw yield, height measurement, tiller count and grain yield. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1112 lb./ac.
 (ii) (a) 532.4 lb./ac.
 (b) 234.3 lb./ac.
 (iii) Only V effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	M_4	M_5	M_6	Mean
V_1	697	716	559	562	529	675	586	618
V_2	2026	1640	1626	1524	1518	1426	1488	1607
Mean	1361	1178	1092	1043	1023	1050	1037	1112

S.E. of difference of two

1. V marginal means = 142.3 lb./ac.
 2. M marginal means = 117.2 lb./ac.
 3. M means at the same level of V = 165.7 lb./ac.
 4. V means at the same level of M = 209.2 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 49(3).

Type :- 'MV'.

Object :- To find the effect of applying A/S in dry and wet conditions in medium soils.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 18.6.1949/26.7.1949. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 46.00%. (x) V_1 on 20.11.1949 and V_2 on 9.12.1949.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1 =T-1145 (medium) and V_2 =BAM-6 (late).

Sub-plot treatments :

3 applications of N : $N_0=0$, $N_1=20$ lb. of N as A/S in dry condition at ploughing time on 9.7.1949 and $N_2=20$ lb. of N as A/S in wet condition at puddling time on 30.7.1949.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $34' \times 32'$. (b) $32' \times 30'$. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1949 to 1950. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1708 lb./ac.
 (ii) (a) 178.2 lb./ac.
 (b) 141.2 lb./ac.
 (iii) V effect and interaction $N \times V$ are highly significant. N effect is not significant.
 (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
V_1	1519	1456	1487	1487
V_2	1755	2100	1928	1928
Mean	1637	1778	1708	1708

S.E. of difference of two

1. V marginal means = 72.7 lb./ac.
 2. N marginal means = 70.6 lb./ac.
 3. N means at the same level of V = 99.8 lb./ac.
 4. V means at the same level of N = 109.3 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(9).

Type :- 'MV'.

Object :- To compare the effect of applying A/S in dry and wet conditions in medium lands.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 16.6 1950/13 14.7.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2—3 weedings with Japanese weeder and one hand weeding. (ix) 64.47%. (x) V_1 on 14.10.1950 and V_2 on 26.11.1950.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1 =*Benibhog* (early) and V_2 =T 1145 (medium).

Sub-plot treatments :

3 applications of N : $N_0=0$, $N_1=20$ lb./ac. of N as A/S in dry condition at ploughing time on 22.6.1950. and $N_2=20$ lb./ac. of N as A/S in wet condition at puddling time on 18.7.1950.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $32' \times 41'$. (b) $30' \times 39'$. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Very good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1841 lb./ac.
 (ii) (a) 142.1 lb./ac.
 (b) 125.3 lb./ac.
 (iii) V effect is highly significant, N effect is significant while interaction is not significant.

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

	N ₀	N ₁	N ₂	Mean
V ₁	935	1152	1109	1065
V ₂	2398	2784	2668	2617
Mean	1667	1968	1889	1841

S.E. of difference of two

1. V marginal means = 58.0 lb./ac.
2. N marginal means = 62.7 lb./ac.
3. N means at the same level of V = 88.6 lb./ac.
4. V means at the same level of N = 92.7 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 49(2).

Type :- 'MV'.

Object :- To find the effect of applying A/S in dry and wet conditions in low soils.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 18.6.1949/28.7.1949. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2–3 weedings with Japanese weeder and one hand weeding. (ix) 46.00". (x) V₁ on 31.10.1949 and V₂ on 14.11.1949.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V₁=*Benibhog* (early) and V₂=T-1145 (medium).

Sub-plot treatments :

3 applications of N : N₀=0, N₁=20 lb./ac. of N as A/S in dry condition at ploughing time on 9.7.1949 and N₂=20 lb./ac. of N as A/S in wet condition at puddling time on 30.7.1949.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 32'×41'. (b) 30'×39'. (v) 1' allround. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1949—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1691 lb./ac.
- (ii) (a) 178.1 lb./ac.
- (b) 155.7 lb./ac.
- (iii) V effect is highly significant. N effect is significant while their interaction is not significant.
- (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	Mean
V ₁	912	1162	1042	1039
V ₂	2182	2480	2368	2343
Mean	1547	1821	1705	1691

S.E. of difference of two

1. V marginal means = 72.7 lb./ac.
2. N marginal means = 77.8 lb./ac.
3. N means at the same level of V = 110.1 lb./ac.
4. V means at the same level of N = 115.6 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(8).

Type :- 'MV'.

Object :—To compare the effects of applying A/S in dry and wet conditions in low lands.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 21.6.1950/24.7.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 64.47". (x) V_1 on 29.11.1950 and V_2 on 27.12.1950.

2. TREATMENTS :

Main-plot treatments :

2 varieties. V_1 =T-1145 (medium) and V_2 =T-1242 (late).

Sub-plot treatments :

3 applications of N : $N_0=0$, $N_1=20$ lb./ac. of N as A/S in dry condition at ploughing time on 28.6.1950 and $N_2=20$ lb./ac. of N as A/S in wet condition at puddling time on 19.7.1950.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 34'×32'. (b) 32'×30'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1948—contd. (b) Yes. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

- (i) 2174 lb./ac.
 (ii) (a) 172.3 lb./ac.
 (b) 130.9 lb./ac.
 (iii) V effect is significant, N effect is highly significant while their interaction is not significant.
 (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
V_1	1787	2093	2038	1973
V_2	2151	2507	2468	2375
Mean	1969	2300	2253	2174

S.E. of difference of two

1. V marginal means = 70.3 lb./ac.
 2. N marginal means = 65.5 lb./ac.
 3. N means at the same level of V = 92.6 lb./ac.
 4. V means at the same level of N = 103.2 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(28).

Type :- 'MV'.

Object :—To test the performance of 24 late duration varieties under normal and high fertility conditions.

1. BASAL CONDITIONS :

(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loamy. (b) Refer item 11 on page 1. (iii) 27.6.1953/31.7.1953. (iv) (a) 3 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 9'×9'. (e) 1-2 seedlings per hill. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 2 hand weedings. (ix) N.A. (x) N.A.

2. TREATMENTS:

Main-plot treatments :

2 manurings : M_1 =Normal manuring : 4000 lb. of G.M. or compost+100 lb. of A/S+100 lb. of Super and M_2 =Heavy manuring viz. 8000 lb. of G.M. or compost+400 lb. of A/S and 300 lb. of Super.

Sub-plot treatments :

24 varieties : $V_1=AC\ 106$, $V_2=AC\ 120$, $V_3=AC\ 122$, $V_4=AC\ 164$, $V_5=AC\ 290$, $V_6=AC\ 292$, $V_7=AC\ 293$, $V_8=AC\ 296$, $V_9=AC\ 300$, $V_{10}=AC\ 341$, $V_{11}=AC\ 345$, $V_{12}=AC\ 390$, $V_{13}=AC\ 391$, $V_{14}=AC\ 393$, $V_{15}=AC\ 399$, $V_{16}=AC\ 416$, $V_{17}=AC\ 421$, $V_{18}=AC\ 427$, $V_{19}=AC\ 435$, $V_{20}=AC\ 448$, $V_{21}=AC\ 449$, $V_{22}=AC\ 450$, $V_{23}=453$ and $V_{24}=T-1242$ (standard).

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main plots/replication and 24 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $13\frac{1}{2}' \times 2\frac{1}{2}'$ (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Straw and grain yield, length of panicle, 1000 grains weight. (iv) (a) No. (b) No. (c) Nil. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2052 lb./ac.
(ii) (a) 794.4 lb./ac.
(b) 616.5 lb./ac.
(i) Only V effect is highly significant.
(iv) Av. yield of grain in lb./ac.

	M ₁	M ₂	Mean		M ₁	M ₂	Mean
V ₁	1361	1562	1461	V ₁₃	2067	1849	1958
V ₂	1456	2269	1862	V ₁₄	997	1792	1394
V ₃	2351	2476	2663	V ₁₅	2431	2510	2470
V ₄	1188	2168	1678	V ₁₆	2392	2218	2305
V ₅	2095	3221	2658	V ₁₇	1725	2773	2249
V ₆	1787	2005	1896	V ₁₈	2324	2543	2433
V ₇	2067	1591	1829	V ₁₉	896	2179	1537
V ₈	924	1445	1184	V ₂₀	2851	3266	3058
V ₉	1372	1983	1678	V ₂₁	1949	2678	2313
V ₁₀	1681	2665	2173	V ₂₂	1955	2650	2302
V ₁₁	2549	2650	2600	V ₂₃	1148	2431	1789
V ₁₂	1602	1933	1768	V ₂₄	1389	2577	1983
				Mean	1794	2310	2052

S.E. of difference of two

1. M marginal means = 114.7 lb./ac.
2. V marginal means = 308.2 lb./ac.
3. V means at the same level of M = 435.9 lb./ac.
4. M means at the same level of V = 441.9 lb./ac.

Crop :- Paddy (Kharif).

Ref :- C.R.R.I. 53(29).

Type :- 'MV'.

Object :- To test the performance of certain genetic stocks which were tested under high fertility conditions under different levels of fertility.

1. BASAL CONDITIONS :

(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 16.6.1953/14.7.1953. (iv) (a) 3 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) $6' \times 9'$. (e) 2 seedling in case of all varieties except AC 250 for which 1 seedling/hill. (v) Green manure *dhaincha* was buried and puddled. (vi) As per treatments. V_1 to V_{19} are early while V_{20} =standard. (vii) Irrigated. (viii) Weeding seed bed on 2.7.1953. Gap filling on 31.7.1953 and 1.8.1953. (ix) N.A. (x) N.A.

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

2 manurings : M_1 =Normal manuring viz., 4000 lb. of compost or G.M., 100 lb. of A/S in two doses and 100 lb. of Super in one dose and M_2 =Heavy manuring viz., 8000 lb. of compost or G.M., 400 lb. of A/S in two doses and 300 lb. of Super in 1 dose.

Sub-plot treatments :

20 varieties : $V_1=AC\ 113$, $V_2=AC\ 212$, $V_3=AC\ 250$, $V_4=AC\ 460$, $V_5=AC\ 464$, $V_6=AC\ 474$, $V_7=AC\ 475$, $V_8=AC\ 514$, $V_9=AC\ 349$, $V_{10}=AC\ 364$, $V_{11}=AC\ 484$, $V_{12}=AC\ 486$, $V_{13}=AC\ 487$, $V_{14}=AC\ 472$, $V_{15}=AC\ 181$, $V_{16}=AC\ 469$, $V_{17}=AC\ 467$, $V_{18}=AC\ 499$, $V_{19}=AC\ 512$ and $V_{20}=B\ 76$ (standard).

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 20 sub-plots/main-plot. (b) $64' \times 30'$. (iii) 4. (iv) (a) $14' \times 3'$. (b) $12\frac{1}{2}' \times 2'$. (v) 1 row around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Height of plants, number of effective tillers and grain yield. (iv) (a) No. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3032 lb./ac.
 (ii) (a) 448.8 lb./ac.
 (b) 743.1 lb./ac.
 (iii) M effect is significant, V effect is highly significant while interaction is not significant.
 (iv) Av. yield of grain in lb./ac.

	M_1	M_2	Mean		M_1	M_2	Mean
V_1	1764	2662	2213	V_{11}	3001	2596	2798
V_2	3097	3149	3123	V_{12}	4761	4561	4661
V_3	2509	2609	2559	V_{13}	3642	2043	2842
V_4	1638	1686	1662	V_{14}	3955	3376	3665
V_5	3781	4278	4029	V_{15}	3293	1934	2614
V_6	3058	3193	3125	V_{16}	2631	2296	2464
V_7	3554	3716	3635	V_{17}	2352	2426	2389
V_8	2675	2836	2755	V_{18}	2344	2753	2549
V_9	2940	1882	2411	V_{19}	3315	2296	2805
V_{10}	4304	2888	3596	V_{20}	4892	4583	4738
				Mean	3175	2888	3032

S.E. of difference of two

1. M marginal means = 71.0 lb./ac.
2. V marginal means = 371.6 lb./ac.
3. V means at the same level of M = 525.5 lb./ac.
4. M means at the same level of V = 517.0 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 49(10).

Type :- 'MV'.

Object :- To compare the effect of three nitrogenous fertilizers at different levels of N on 3 varieties of different durations.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam pH. 6.2. (b) Refer item 11 on page 1. (iii) 25.6.1949/24.7.1949. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Weeding on 9.9.1949. (ix) 46.00%. (x) V_1 on 3, 4.11.1949, V_2 on 17.11.1949 and V_3 on 9.12.1949.

2. TREATMENTS :

Main-plot treatments :

3 varieties: $V_1=T-608$ (early), $V_2=T-1145$ (medium) and $V_3=T-90$ (late).

Sub-plot treatments :

All combinations of (1) and (2) + a control (N_0)

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

(2) 3 sources of N : $S_1=A/S$, $S_2=A/N$, and $S_3=Urea$.

Fertilizers applied on 25.7.1949 just after planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 20' × 16'. (b) 18' × 14'. (v) 1' all round. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Straw and grain yield, height, tillers and ear-length. (iv) (a) 1949—contd. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2118 lb./ac.

(ii) (a) 369.9 lb./ac.

(b) 213.1 lb./ac.

(iii) V, S and control vs other effects are highly significant. Others are not significant.

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

$V_1N_0=1056$ lb /ac. $V_2N_0=1936$ lb./ac. and $V_3N_0=2096$ lb./ac.

	S ₁	S ₂	S ₃	Mean	N ₁	N ₂
V ₁	1505	1465	1474	1481	1508	1455
V ₂	2425	2283	2461	2390	2341	2438
V ₃	2807	2449	2820	2692	2686	2698
Mean	2246	2066	2252	2188	2178	2197
N ₁	2276	2011	2248			
N ₂	2215	2120	2255			

S.E. of difference of two

- V marginal means = 106.8 lb./ac.
- S marginal means = 61.5 lb./ac.
- N marginal means = 50.2 lb./ac.
- N₁, N₂ means at the same level of V = 87.0 lb./ac.
- V means at the same level of N₁, N₂ = 123.2 lb./ac.
- S means at the same level of V = 106.6 lb /ac.
- V means at the same level of S = 137.7 lb./ac.
- means of the body of N × S table = 87.0 lb./ac.
- V means at the level of N₀ = 171.0 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I., 50(2).

Type :- 'MV'.

Object :—To compare the effects of four nitrogeneous fertilizers at two levels of nitrogen on three varieties of different durations.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) N.A. (b) Refer item 11 on page 1. (iii) 21.6.1950/22 7.50. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) —. (d) N.A. (e) 2 to 3. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) Weeding on 18, 19.8.1950. (ix) 64.47". (x) V₁ on 5, 6.11.1950, V₂ on 26.11.1950 and V₃ on 15.12.1950.

2. TREATMENTS :

Main-plot treatments :

3 varieties : V₁=T-608 (early), V₂=T-1145 (medium) and V₃=T-90 (late).

Sub-plot treatments :

All combinations of (1) and (2)+a control (N₀).

(1) 2 levels of N : N₁=20 and N₂=40 lb./ac.

(2) 4 sources of N : S₁=A/S, S₂=A/N, S₃=Ammo. Phos. and S₄=Urea.

Fertilizers applied on 23.7.1950 just after transplanting.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main plots/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 20' × 12'. (b) 18' × 10'. (v) 1' allround. (vi) Yes.

4. GENERAL :

(i) Satisfactory ; lodging on 27.10.1950 for V₁. (ii) N.A. (iii) Straw and grain yield, height, tillers and ear-length. (iv) (a) 1949—contd. (b) No. (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1869 lb./ac.
 (ii) (a) 522.4 lb./ac.
 (b) 271.8 lb./ac.
 (iii) V, N and control vs treated effects and interaction $S \times V$ are highly significant. S effect is significant. Other effects are not significant.
 (iv) Av. yield of grain in lb./ac.

$V_1N_0=1188$ lb./ac. $V_2N_0=1793$ lb./ac. and $V_3N_0=1578$ lb./ac.

	S ₁	S ₂	S ₃	S ₄	Mean	N ₁	N ₂
V ₁	1389	1358	1464	1386	1399	1335	1463
V ₂	2322	2252	1940	2196	2177	2081	2273
V ₃	2499	1869	2227	2053	2162	12048	2276
Mean	2070	1826	1877	1879	1913	1821	2004
N ₁	1972	1700	1781	1833			
N ₂	2168	1952	1973	1924			

S.E. of difference of two

- V marginal means = 130.6 lb./ac.
- S marginal means = 78.5 lb./ac.
- N marginal means = 55.5 lb./ac.
- N₁, N₂ means at the same level of V = 96.1 lb./ac.
- V means at the same level of N₁, N₂ = 147.2 lb./ac.
- S means at the same level of V = 135.9 lb./ac.
- V means at the same level of S = 175.8 lb./ac.
- means in N × S table = 111.0 lb./ac.
- V means at the level of N₀ = 219.1 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(2).

Type :- 'MV'.

Object :- To compare the effects of four nitrogenous fertilizers at two levels of nitrogen on three varieties of different durations.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 17.6.1951/24.7.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk planting. (c) —. (d) N.A. (e) Nil. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Weeding on 17.8.51. (ix) 65.52%. (x) V₁ on 7.11.1951, V₂ on 20.11.1951 and V₃ on 12.12.1951.

2. TREATMENTS :

Main-plot treatments :

3 varieties : V₁=T-608 (early), V₂=T-1145 (medium) and V₃=T-90 (late).

Sub-plot treatments :

All combinations of (1) and (2) + a control (N₀)

(1) 2 levels of N : N₁=20 and N₂=40 lb./ac.

(2) 4 sources of N : S₁=A/S, S₂=A/N, S₃=Ammono. Phos. and S₄=Urea.

3. DESIGN :

- (i) Split-plot. (ii) (a) 3 main-plots/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 20' × 12'. (b) 18' × 10'. (v) 1' all round. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. Lodging on 27.11.1951 in manured plots (T-90) and on 29.10.1951 (T-1145). (ii) N.A. (iii) Straw and paddy yield, height, tillers and ear-length. (iv) (a) Yes ; 1949—contd. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2019 lb./ac.
 (ii) (a) 439.7 lb./ac.
 (b) 175.9 lb./ac.
 (iii) V, S and control vs manured effects are highly significant. Other effects are not significant.

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

 $V_1N_0=1246$ lb./ac. $V_2N_0=2093$ lb./ac. and $V_3N_0=2243$ lb./ac.

	S ₁	S ₂	S ₃	S ₄	Mean	N ₁	N ₂
V ₁	1553	1443	1505	1515	1504	1441	1568
V ₂	2414	2357	2325	2255	2338	2328	2347
V ₃	2512	2572	2595	2393	2518	2385	2652
Mean	2159	2124	2142	2052	2119	2051	2187
N ₁	2090	2032	2084	1998			
N ₂	2229	2217	2391	2110			

S.E. of the difference of two

- V marginal means = 109.9 lb./ac.
- S marginal means = 50.8 lb./ac.
- N marginal means = 35.9 lb./ac.
- N₁, N₂ means at the same level of V = 62.2 lb./ac.
- V means at the same level of N₁, N₂ = 118.4 lb./ac.
- S means at the same level of V = 88.0 lb./ac.
- V means at the same level of S = 133.7 lb./ac.
- means of the body of N × S table = 71.8 lb./ac.
- V means at the level of N₀ = 156.5 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(8).

Type :- 'MV'.

Object :- To compare the effects of five nitrogenous fertilizers of different nitrogen levels on two varieties of different durations.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 16-6.1952/28.7.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 56.03°. (x) V₁ on 27.11.1952 and V₂ on 8.12.1952.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V₁=T-1145 (medium) and V₂=T-90 (late).

Sub-plot treatments :

All combinations of (1) and (2) + a control (N₀)(1) 2 levels of N : N₁=20 and N₂=40 lb./ac.(2) 5 sources of N : S₁=A/S, S₂=A/N, S₃=Ammono. Phos., S₄=Ammono. chloride and S₅=Urea.

Fertilizers applied on 11.8.1952 after transplanting.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 11 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 25' × 10'. (b) 23' × 8'. (v) 1' in each side. (vi) Yes.

4. GENERAL :

(i) Not very satisfactory. (ii) N.A. (iii) Straw. and grain yield, height, tillers and ear-length. (iv) (a) 1949— contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1736 lb./ac.

(ii) (a) 108.4 lb./ac.

(b) 182.6 lb./ac.

(iii) S and control vs. manured effects, and interactions N × S, N × V and N × S × V are significant. Other effects are not significant.

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

 $V_1 N_0 = 1013 \text{ lb./ac.}$ $V_2 N_0 = 1541 \text{ lb./ac.}$

	S ₁	S ₂	S ₃	S ₄	S ₅	Mean	N ₁	N ₂
V ₁	1759	1589	1797	1681	1544	1674	1447	1901
V ₂	1902	1800	2042	1842	1866	1890	1757	2023
Mean	1830	1695	1919	1762	1705	1782	1602	1962
N ₁	1626	1548	1725	1604	1508			
N ₂	2034	1841	2114	1919	1903			

S.E. of the difference of two

- V marginal means = 24.24 lb./ac.
- S marginal means = 64.56 lb./ac.
- N marginal means = 40.83 lb./ac.
- N₁, N₂ means at the same level of V = 57.74 lb./ac.
- V means at the same level of N₁, N₂ = 47.48 lb./ac.
- S means at the same level of V = 91.30 lb./ac.
- V means at the same level of S = 85.18 lb./ac.
- means of the body of N × S table = 91.30 lb./ac.
- V means at the level of N₀ = 125.26 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 48(8).

Type :- 'MV'.

Object :- To compare the effect of the time of application of manures and mixtures of manures at different levels of N on different varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 25.6.1948/22.7.1948. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) —. (d) N.A. (e) 2-3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 54.35%. (x) V₁ on 9.11.1948 and V₂ on 21.12.1948.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V₁=T-608 (early) and V₂=T-1242 (late).

Sub-plot treatments :

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

(1) 2 levels of N : N₁=20 and N₂=40 lb./ac.(2) 3 sources of N : S₁=A/S, S₂=A/N and S₃=A/S+A/N in equal ratio of N.(3) 3 times of application : T₁=Full at planting, T₂=Full at one month after planting and T₃=Half at planting and half at one month after planting.

3. DESIGN :

(i) Split-plot. (ii) 2 main-plots/block ; 18 sub-plots/main-plot. (iii) 4. (iv) (a) 5' × 32'. (b) 3' × 30'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Straw and grain yield, height, tillers and ear-length. (iv) (a) 1948 to 1950. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) Results are presented as available.

5. RESULTS :

(i) 2326 lb./ac.

(ii) (a) 659.5 lb./ac.

(b) 237.2 lb./ac.

(iii) V effect is highly significant. T effect is significant. Others are not significant.

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

	T ₁	T ₂	T ₃	N ₁	N ₂	V ₁	V ₂	Mean
S ₁	2295	2259	2462	2319	2358	1995	2683	2339
S ₂	2338	2322	2409	2273	2440	1836	2877	2357
S ₃	2425	2169	2253	2327	2237	1821	2713	2282
Mean	2353	2250	2375	2306	2345	1884	2768	2326
V ₁	1891	1894	1866	1823	1994			
V ₂	2814	2606	2883	2790	2746			

S.E. of the difference of two

1. V marginal means = 109.9 lb./ac.
2. N marginal means = 39.5 lb./ac.
3. S or T marginal means = 48.4 lb./ac.
4. N means at the same level of V = 55.9 lb./ac.
5. V means at the same level of N = 116.8 lb./ac.

S.E. of the difference of two

6. S or T means at the same level of V = 68.5 lb./ac.
7. V means at the same level of S or T = 123.3 lb./ac.
8. means of the body of S × T table = 83.9 lb./ac.
9. means of the body of S × N table = 68.5 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 49(12).

Type :- 'MV'.

Object :- To compare the effect of the time of application of manures and mixture of manures at different N levels on different varieties.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 18.6.1949/28, 29.7.1949. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3 (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) (ix) 46.00°. (x) V₁ on 29.9.1949 and V₂ on 1.11.1949.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V₁=T-508 (early) and V₂=T-1242 (late).

Sub-plot treatments :

All combinations of (1), (2) and (3) + a control (N₀)(1) 2 levels of N : N₁=20 and N₂=40 lb./ac.(2) 3 sources of N : S₁=A/S, S₂=A/N and S₃=A/S+A/N in equal ratio of N.(3) 3 times of application of N : T₁=Full at planting, T₂=Full at one month after planting and T₃=Half at planting and half at one month after planting.

3. DESIGN :

- (i) Split-plot. (ii) (a) 2 main-plots/block and 19 sub-plots/main-plot. (iii) 4. (iv) (a) 5' × 32'. (b) 3' × 30'. (v) One foot all round. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Nil. (iii) Straw and grain yield, height, tillers and ear-length. (iv) (a) 1948 to 1950. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1799 lb./ac.
(ii) (a) 1134.6 lb./ac.
(b) 280.3 lb./ac.
(iii) V, N, T and S effects are significant.

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

 $V_1 N_0 = 862$ lb./ac. and $V_2 N_0 = 1946$ lb./ac.

	T ₁	T ₂	T ₃	N ₁	N ₂	V ₁	V ₂	Mean
S ₁	1752	2045	1941	1752	2076	1205	2623	1914
S ₂	1592	1892	1834	1699	1847	1113	2433	1873
S ₃	1571	1899	1859	1704	1849	1128	2425	1776
Mean	1638	1945	1878	1718	1924	1149	2494	1821
V ₁	1070	1200	1171					
V ₂	2207	2691	2585					

S.E. of the difference of two

1. V marginal means
2. N marginal means
3. S or T marginal means
4. V means at the level of N₀

=189.1 lb./ac.
 = 46.7 lb./ac.
 = 57.2 lb./ac.
 =266.6 lb./ac.

S.E. of the difference of two

5. S or T means at the same level of P = 80.9 lb./ac.
6. V means at the same level of S or T = 200.3 lb./ac.
7. means of the body of S×T table = 99.1 lb./ac.
8. means of the body of S×N table = 80.9 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(10).

Type :- 'MV'.

Object :- To compare the effect of time of application of manures and mixture of manures at different N levels on different varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 23, 24.7.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 64.47%. (x) V₁ on 6.11.1950 and V₂ on 20.12.1950.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V₁=T-608 (early) and V₂=T-1242 (late).

Sub-plot treatments :

All combinations of (1), (2) and (3)+a control (N₀)(1) 2 levels of N : N₁=20 and N₂=40 lb./ac.(2) 3 sources of N : S₁=A/S, S₂=A/N and S₃= A/S+ A/N in equal ratio of N.(3) 3 times of applications of : T₁=Full at planting, T₂=Full at one month after planting and T₃=Half at planting and half at one month after planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block and 19 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 5'×32'. (b) 3'×30'. (v) 1 foot all round. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Straw and grain yield, height, tillers and ear-length. (iv) (a) 1948 to 1950. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vi) Results are presented as available.

5. RESULTS :

- (i) 2056 lb./ac.
- (ii) (a) 440.8 lb./ac.
(b) 221.6 lb./ac.
- (iii) V, S, T and N effects are significant.

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

$$N_0V_1=1133 \text{ lb./ac. } N_0V_2=2420 \text{ lb./ac.}$$

	T ₁	T ₂	T ₃	Mean	N ₁	N ₂
S ₁	1997	2271	2056	2108	1987	2228
S ₂	1918	2042	2006	1989	1857	2120
S ₃	2018	2158	2171	2116	2014	2218
Mean	1979	2157	2078	2071	1953	2189
V ₁	1341	1527	1438	1435		
V ₂	2614	2787	2718	2706		

S.E. of the difference of two

1. V marginal means

= 73.5 lb./ac.

2. N marginal means

= 36.9 lb./ac.

3. S or T marginal means

= 45.2 lb./ac.

4. V means at the level of N₀

= 168.5 lb./ac.

S.E. of the difference of two

5. T means at the same level of V

= 64.0 lb./ac.

6. V means at the same level of T

= 90.1 lb./ac.

7. means of the body of S×T table

= 78.4 lb./ac.

8. means of the body of S×N table

= 64.0 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(11).

Type :- 'C'.

Object :- To study the effect of crop sequence and work out its economic value.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 13.6.1951/17.7.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) *Benibhog* (early). (vii) Irrigated. (viii) 2—3 intercultures with Japanese weeder and one hand weeding on 30.8.1951. (ix) 65.32". (x) 22.10.1951.

2. TREATMENTS :

1. Paddy—paddy.
2. Paddy—groundnut sown on 25.6.1951.
3. Groundnut sown on 25.6.1951—paddy.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 30'×20'. (b) 25'×18'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. Lodging on 29.9.1951. (ii) Nil. (iii) Straw, height, tillers and ear-length and grain yield. (iv) (a) and (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) Treatment no. 2 omitted from analysis.

5. RESULTS :

- (i) 1288 lb./ac.
- (ii) 195.3 lb./ac.
- (iii) Treatments do not differ significantly.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1299
2.	No yield
3.	1277
S.E./mean	= 68.5 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(17).

Type :- 'C'.

Object :- To determine the crop sequence in double cropped land.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) Bulk planting. (e) 2 to 3. (v) Nil. (vi) Ch-47 (early). (vii) Irrigated. (viii) 2—3 intercultures with Japanese weeder and one hand weeding. (ix) 64.47". (x) N.A.

2. TREATMENTS :

1. Jute followed by G.M. and followed by 2nd crop of paddy.
2. *Benibhog*+Fallow followed by 2nd crop of paddy.
3. *Benibhog* followed by G.M. and then followed by 2nd crop of paddy.
4. Fallow followed by a crop of T-1242, followed by 2nd crop of paddy.
5. G.M. followed by T-1242, followed by a 2nd crop of paddy.
6. Fallow followed by a crop of T-1145, followed by 2nd crop of paddy.
7. G.M. followed by T=1145 followed by 2nd crop of paddy.

3. DESIGN :

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

4. GENERAL :

- (i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) Yes ; 1950—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2977 lb./ac.
 (ii) 328.3 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1550	5.	3889
2.	2390	6.	3717
3.	2703	7.	2949
4.	3638		

S.E./mean = 164.2 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(19). Type :- 'C'.

Object :- To determine the crop sequence in double cropped lands.

1. BASAL CONDITIONS:

- (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) Bulk planting. (e) 2 to 3. (v) Nil. (vi) Ch-47 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32%. (x) N.A.

2. TREATMENTS :

1. Jute followed by G.M. and followed by 2nd crop of paddy.
2. Ch-47 followed by fallow, followed by 2nd crop of paddy.
3. Ch-47 followed by G M., followed by 2nd crop of paddy.
4. Fallow followed by T-1242, followed by 2nd crop of paddy.
5. G.M. followed by T-1242, followed by 2nd crop of paddy.
6. Fallow followed by T-1145, followed by 2nd crop of paddy.
7. G.M. followed by T-1145, followed by 2nd crop of paddy.

3. DESIGN :

- (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 15'×64'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) Yes, 1950—contd. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2067 lb./ac.
 (ii) 228.0 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1466	5.	2557
2.	1213	6.	2321
3.	1316	7.	2757
4.	2839		

S.E./mean=114.0 lb./ac.

Crop :- Paddy.

Ref :- C.R.R.I. 52(18).

Type :- 'C'.

Object :- To determine the crop sequence in double cropped land.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) Bulk planting. (e) 2 to 3. (v) Nil. (vi) T-1242 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese rotary weeder and hand weeding. (ix) 56.03%. (x) N.A.

2. TREATMENTS :

1. Jute followed by G.M. and then 2nd crop of Paddy.
2. *Benibhog* followed by fallow and then 2nd crop of Paddy.
3. *Benibhog* followed by G.M. and then 2nd crop of Paddy.
4. Fallow followed by T-1242 and then 2nd crop of Paddy.
5. G.M. followed by T-1242 and then 2nd crop of Paddy.
6. Fallow followed by T-1145 and then 2nd crop of Paddy.
7. G.M. followed by T-1145 and then 2nd crop of Paddy.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 64' × 15'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) Yes, 1950—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

First Crop		Second Crop	
(i) 1290 lb./ac.		(i) 840 lb./ac.	
(ii) 291.2 lb./ac.		(ii) 88.2 lb./ac.	
(iii) Treatment differences are highly significant.		(iii) Treatment differences are highly significant.	
(iv) Av. yield of grain in lb./ac.		(iv) Av. yield of grain in lb./ac.	
Treatment	Av. yield	Treatment	Av. yield
1.	510	1.	1210
2.	203	2.	771
3.	219	3.	1097
4.	2092	4.	657
5.	2574	5.	682
6.	1750	6.	729
7.	1679	7.	740
S.E./mean	=145.6 lb./ac.	S.E./mean	=44.1 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 48(11).

Type :- 'C'.

Object :- To find the effect of transplanting Paddy on ridges as practised in Korea.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 24.6.1948/1.8.1948. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T 812. (vii) Irrigated. (viii) 2—3 intercultures with Japanese weeder and one hand weeding. (ix) 54.35%. (x) 28.11.1948.

2. TREATMENTS :

1. Korean method of planting *i.e.* transplanting on 2' ridges alternate with 6' channels.
2. Ordinary method of transplanting.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 16. (iv) (a) 8' × 24'. (b) 7.5' × 19.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Straw, height, tillers, length of the ear head and grain yield. (iv) (a) No. (b) and (c) —. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3452 lb./ac.
- (ii) 174.7 lb./ac.
- (iii) Treatment difference is highly significant.

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

Treatment	Av. yield
1.	3258
2.	3646
S.E./mean	=43.7 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 48(1). Type :- 'C'.

Object :-To find the effect of summer ploughing on Paddy crop in medium soil.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 21.6.1948/6.8.1948. (iv) (a) 6 ploughings, (b) Transplanting. (c) —. (d) and (e) N.A. (v) Nil. (vi) T-1242 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding on 16.5.1948. (ix) 54.35%. (x) N.A.

2. TREATMENTS :

1. Summer ploughing.
2. Summer fallow.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 12'×104'. (b) 10'×102'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1948—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2204 lb./ac.
 (ii) 226.7 lb./ac.
 (iii) Treatment difference is not significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2168
2.	2240
S.E./mean	=65.4 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 49(1). Type :- 'C'.

Object :-To find the effect of summer ploughing on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a), (b) Refer item 11 on page 1. (iii) 23.6.1949/29, 30.7.1949. (iv) (a) 7 ploughings, laddering and levelling. (b) Transplanting. (c) —. (d) and (e) N.A. (v) Nil. (vi) B.A.M. 6 (late) (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding on 22, 23.9.1949. (ix) 46.00%. (x) 3.1.1950.

2. TREATMENTS :

1. Summer ploughing.
2. Summer fallow.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 12'×95'. (b) 10'×93'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1948—contd. (b) No. (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1936 lb./ac.
 (ii) 186.0 lb./ac.
 (iii) Treatment difference is not significant.

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

Treatment	Av. yield
1.	1890
2.	1983
S.E./mean	= 53.7 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(18).

Type :- 'C'.

Object :—To find out the optimum seed rate for the *Aman* crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) As per treatments. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-1242 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32%. (x) N.A.

2. TREATMENTS :

4 seed rates : $R_1=40$, $R_2=60$, $R_3=80$ and $R_4=100$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) $90' \times 29'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) $\frac{1}{2}$ Grain yield. (iv) (a) 1951—contd. (b) N.A. (c) —. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 2073 lb./ac.
 (ii) 261.9 lb./ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
R_1	1836
R_2	1965
R_3	2290
R_4	2199
S.E./mean	= 106.9 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 48(4).

Type :- 'C'.

Object :—To study the effect of single and double transplanting of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 30.6.1948/30.7.1948. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) $9' \times 9'$. (e) 1. (v) Nil. (vi) FR 43 B (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 54.35%. (x) N.A.

2. TREATMENTS :

1. Single transplanting of 30 days old seedlings.
 2. Single transplanting of 60 days old seedlings.
 3. Double transplanting, 1st when 30 days old and 2nd when 60 days old.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) $10\frac{1}{2}' \times 50'$. (b) $9' \times 48\frac{1}{2}'$. (v) 1 row around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Straw, height, tillers and ear-length and grain yield. (iv) (a) 1948—contd. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1930 lb./ac.
 (i) 144.2 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment-	Av. yield
1.	2301
2.	1646
3.	1842
S.E./mean	=51.0 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(14).

Type :- 'C'.

Object :- To find out the best preceding crop to get the maximum Paddy yield.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) As per treatments. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 17.6.1952/17.7.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) *Benibhog* (early). (vii) Irrigated. (viii) 2 to 3 interculturing with Japanese weeder and one hand weeding. (ix) 56.03". (x) 22.10.1952.

2. TREATMENTS :

9 previous crops : C₀=Fallow, C₁=Paddy, C₂=Wheat, C₃=Groundnut, C₄=Cotton, C₅=Rye, C₆=Tori, C₇=*Moong* for seed and C₈=*Moong* as G.M.

3. DESIGN :

- (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 20'×30'. (b) 18'×28'. (v) 1' alround. (vi) Yes.

4. GENERAL :

- (i) Good. (ii) N.A. (iii) Height, ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1951—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1456 lb./ac.
 (ii) 154.1 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
C ₀	1483	C ₅	1423
C ₁	1377	C ₆	1348
C ₂	1465	C ₇	1529
C ₃	1479	C ₈	1434
C ₄	1564		

S.E./mean =77.1 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(14).

Type :- 'C'.

Object :- To find out the best preceding crop to get the maximum Paddy yield.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) As per treatments. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 22.6.1953/13.7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 9"×6". (e) 2 to 3. (v) Nil. (vi) P.T.B. 10 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 46.02". (x) 6, 7.10.53.

2. TREATMENTS :

9 previous crops : C₀=Fallow, C₁=Paddy, C₂=Wheat, C₃=Groundnut, C₄=Cotton. C₅=Rye, C₆=Tori, C₇=*Moong* for seed and C₈=*Moong* as G.M.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 20'×30'. (b) 18'×28'. (v) 1' all round. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Height, ear-length measurements, [no. of tillers, straw and grain yield. (iv) (a) 1951—contd. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2696 lb./ac.
 (ii) 328.6 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
C ₀	2823	C ₅	2938
C ₁	2358	C ₆	2819
C ₂	2449	C ₇	2826
C ₃	2634	C ₈	2620
C ₄	2794		
S.E./mean =164.3 lb./ac.			

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(24).

Type :- 'C'.

Object :—To determine the suitable time of transplanting and broadcasting.

1. BASAL CONDITIONS :

(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 4.7.1953 and 19.7.1953/8.8.1953 and 23.8.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) As per treatments. (c) —. (d) 6"×6". (e) 2. (v) 8000 lb./ac. of *dhaincha*. (vi) T-90 and T-1242 (late). (vii) Irrigated. (viii) Gap filling on 16.8.1953 and weeding on 3.9.1953. (ix) N.A. (x) N.A.

2. TREATMENTS :

T₁=Sown on 4.7.1953 and transplanted on 8.8.1953,
 T₂=Sown on 19.7.1953 and transplanted on 23.8.1953,
 T₃=Broadcast and puddled on 19.7.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 31'×14'. (v) 1 row around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Number of plants, number of ear-heads and weight of straw and grain. (iv) (a) No. (b), (c) —. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

T-90		T-1242	
(i) 2515 lb./ac.		(i) 2699 lb./ac.	
(ii) 486.8 lb./ac.		(ii) 389.5 lb./ac.	
(iii) The treatment differences are not significant.		(iii) Treatment differences are not significant.	
(iv) Av. yield of grain in lb./ac.		(iv) Av. yield of grain in lb./ac.	
Treatment	Av. yield	Treatment	Av. yield
1.	2642	1.	3058
2.	2381	2.	2302
3.	2521	3.	2736
S.E./mean	=198.7 lb./ac.	S.E./mean	=159.0 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(25).

Type :- 'C'.

Object :—To determine the suitable time of planting and broadcasting.

1. BASAL CONDITIONS :

(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 23.6.1953 and 10.7.1953/2.8.1953 and 19.8.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) As per treatments. (c) N.A. (d) 6"×6". (e) 2 to 3. (v) 9000 lb./ac. of *dhaincha*. (vi) T-1145 and T-141 (medium). (vii) Irrigated. (viii) Gap filling no 16.8.1953 and weeding on 3.9.1953. (ix) N.A. (x) 24.11.1953 for T-1145 and 4.12.1953 for T-141.

2. TREATMENTS :

- T₁=Sown on 23.6.1953 and transplanted on 2.8.1953.
 T₂=Sown on 10.7.1953 and transplanted on 19.8.1953.
 T₃=Broadcast and puddled on 19.7.1953.

3. DESIGN :

- (i) R.B.D. (ii) (a) 3 for each variety. (b). N.A. (iii) 6. (iv) (a) N.A. (b) 31'×14'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) N.A. (iii) Number of plants. Total number of ears/plant, weight of straw and grain.
 (iv) (a) to (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- | | |
|--|--|
| T-1145 | T-141 |
| (i) 2729 lb./ac. | (i) 3369 lb./ac. |
| (ii) 653.8 lb./ac. | (ii) 589.8 lb./ac. |
| (iii) Treatment differences are not significant. | (iii) Treatment differences are not significant. |
| (iv) Av. yield of grain in lb./ac. | (iv) Av. yield of grain in lb./ac. |

Treatment	Av. yield	Treatment	Av. yield
1.	2579	1.	3489
2.	2745	2.	3237
3.	2864	3.	3381
S.E /mean	=266.9 lb./ac.	S.E./mean	=240.8 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 49(16).

Type :- 'C'.

Object :- To determine the optimum time of planting and age of seedling.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) As per treatments.
 (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) Bulk planting. (e) 2 to 3.
 (v) 3000—4000 lb. of G.M. in *situ* was applied to the whole experiment. (vi) T-1145 (medium) and T-90 (late).
 (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 46.00%. (x) N.A.

2. TREATMENTS :

Variety : T-1145 (medium)			Variety : T-90 (late)		
Treatment	Age of seedlings in days	Date of planting	Treatment	Age of seedlings in days	Date of planting
1.	30	13.7.1949	1.	35	19.7.1949
2.	40	23.7.1949	2.	45	29.7.1949
3.	30	23.7.1949	3.	35	3.8.1949
4.	40	2.8.1949	4.	45	13.8.1949
5.	30	6.8.1949	5.	35	18.8.1949
6.	40	16.8.1949	6.	45	28.8.1949
7.	20	10.8.1949	7.	30	27.8.1949
8.	30	20.8.1949	8.	40	6.9.1949
			9.	25	5.9.1949
			10.	35	15.9.1949

3. DESIGN :

- (i) C.R.D. (ii), (iii) Each treatment replicated 7 times for each variety. (iv) (a), (b) N.A. (v) N.A. (vi) N.A.

4. GENERAL :

- (i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1949—contd. (b) No. (c) Nil. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

- | | |
|---|---|
| Variety T-1145 | Variety T-90 |
| (i) 2454 lb./ac. | (i) 2290 lb./ac. |
| (ii) 262.6 lb./ac. | (ii) 202.8 lb./ac. |
| (iii) Treatment differences are highly significant. | (iii) Treatment differences are highly significant. |

(iv) Av. yield of grain in lb./ac.				(iv) Av. yield of grain in lb./ac.			
Treatment	Av. yield	Treatment	Av. yield	Treatment	Av. yield	Treatment	Av. yield
1.	2048	5.	2681	1.	2700	6.	2100
2.	2529	6.	2737	2.	2590	7.	2185
3.	2033	7.	2274	3.	2590	8.	2138
4.	2725	8.	2604	4.	2435	9.	2123
				5.	2067	10.	1972
	S.E./mean	=99.3 lb./ac.			S.E./mean	=76.6 lb./ac.	

Crop :- Paddy (*Khari*f).

Ref :- C.R.R.I. 51(20).

Type :- 'C'.

Object :—To determine the optimum time of planting and age of seedling.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) Bulk planting. (e) 2 to 3. (v) Nil. (vi) T-1145 (medium) and T-90 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32%. (x) N.A.

2. TREATMENTS :

Treatment	Variety T-1145			Variety T-90		
	Sowing date	Age of seedlings	Planting date	Sowing date	Age of seedlings	Planting date
1.	10.6.1951	40 days	20.7.1951	10.6.1951	45 days	25.7.1951
2.	20.6.1951	30 days	20.7.1951	20.6.1951	35 days	25.7.1951
3.	20.6.1951	40 days	30.7.1951	25.6.1951	45 days	9.8.1951
4.	30.6.1951	30 days	30.7.1951	4.7.1951	35 days	9.8.1951
5.	30.6.1951	40 days	9.8.1951	9.7.1951	45 days	24.8.1951
6.	9.7.1951	30 days	9.8.1951	19.7.1951	35 days	24.8.1951
7.	9.7.1951	40 days	19.8.1951	24.7.1951	45 days	8.9.1951
8.	19.7.1951	30 days	19.8.1951	3.8.1951	35 days	8.9.1951
9.	19.7.1951	40 days	29.8.1951	8.8.1951	45 days	23.9.1951
10.	29.7.1951	30 days	29.8.1951	18.8.1951	35 days	23.9.1951

Above treatments applied under manured and unmanured conditions for both the varieties separately.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 8. (iv) (a) 29' × 3'.5'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) to (iv) Av. yield in lb./ac.

Treatment	Variety T-1145		Variety T-90	
	Un-manured	Manured	Un-manured	Manured
1.	1712	2065	2092	2174
2.	1739	2092	2038	2038
3.	1793	2282	2092	2391
4.	1875	2228	2092	2446
5.	1902	2201	1956	2228
6.	1842	2201	2147	2255
7.	1739	2119	1902	2147
8.	1739	2065	1956	2092
9.	1630	1603	1712	1848
10.	1521	1848	1658	1712
Mean	1749	2070	1965	2133
C.D. (.05)	140.7 lb./ac.	140.5 lb./ac.	212.4 lb./ac.	232.2 lb./ac.

Treatment differences under manured and unmanured conditions are significant for both varieties.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(17). Type :- 'C'.

Object :- To determine the optimum time of planting and age of seedling.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) As per treatments. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2-3. (v) 100 lb./ac. of A/S. (vi) T-1145 and T-90. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 56.03%. (x) N.A. (xi) N.A.

2. TREATMENTS :

Treatment	Variety T-1145			Variety T-90		
	Sowing date	Age of seedlings	Planting date	Sowing date	Age of seedlings	Planting date
1.	10.6.1952	40 days	20.7.1952	10.6.1952	45 days	25.7.1952
2.	20.6.1952	30 days	20.7.1952	20.6.1952	35 days	25.7.1952
3.	20.6.1952	40 days	30.7.1952	25.6.1952	45 days	9.8.1952
4.	30.6.1952	30 days	30.7.1952	4.7.1952	35 days	9.8.1952
5.	30.6.1952	40 days	9.8.1952	9.8.1952	45 days	24.8.1952
6.	9.7.1952	30 days	9.8.1952	19.7.1952	35 days	24.8.1952
7.	9.7.1952	40 days	19.8.1952	24.7.1952	45 days	8.9.1952
8.	19.7.1952	30 days	19.8.1952	3.8.1952	35 days	8.9.1952
9.	19.7.1952	40 days	29.8.1952	8.8.1952	45 days	23.9.1952
10.	29.7.1952	30 days	20.8.1952	18.8.1952	35 days	23.9.1952

Above treatments applied under manured and unmanured conditions for both the varieties separately.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 8. (iv) (a) 31'×5.5'. (b) 29'×3.5'. (v) 1' around. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) to (iv)

Treatment	Variety T-1145		Variety T-90	
	manured	Unmanured	manured	Unmanured
1.	1746	1188	2683	1800
2.	1766	1257	2541	1807
3.	1576	1243	2296	1576
4.	1732	1169	2459	1637
5.	1685	1325	2031	1229
6.	1549	1379	1841	1229
7.	1665	985	1644	1236
8.	1596	1066	1542	1086
9.	1216	1087	1073	652
10.	1277	1060	1026	713
G.M.	1581	1176	1914	1297
S.E./mean	7.39 lb./ac.	2.99 lb./ac.	4.41 lb./ac.	2.65 lb./ac.
Significance	H.S.	H.S.	H.S.	H.S.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 49(7). Type :- 'C'.

Object :- To find the possibilities of growing two crops of Paddy on the same land.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 24.6.1949/20.7.1949. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) V₁= *Bcnibhog* (early) and V₂=T-1145 (medium). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding on 30.8.1949. (ix) 46.00%. (x) V₁ on 16.10.1949 and V₂ on 16.11.1949.

2. TREATMENTS :

T₁=G.M.—Long Paddy—Short Paddy, T₂=Short Paddy—G.M.—Short Paddy and T₃=Short Paddy—Short Paddy.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 22' × 66'. (b) 20' × 64'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Height, tiller, ear-length, grain and straw yield. (iv) (a) No. (b), (c) —. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1573 lb./ac.
 (ii) 74.32 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of grain in lb./ac.

	T ₁	T ₂	T ₃	Mean
1st crop	1466	1487	1462	1472
2nd crop	1445	2025	1554	1675
Mean	1456	1756	1508	1573

S.E. of T marginal means = 18.58 lb./ac.

S.E. of body of table = 26.28 lb./ac.

Crop :- Paddy (*Khari*).

Ref :- C.R.R.I. 51(13). Type :- 'C'.

Object :—To observe the effect of planting early susceptible variety like CO-13 on different dates and incidence of blast disease.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 18 and 28.6 1951/9 and 21.7.1951. (iv) (a) 2 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) CO-13 (early). (vii) Irrigated. (viii) 2–3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32". (x) 15.10.1951 to 5.11.1951.

2. TREATMENTS :

Main-plot treatments :

2 levels of manuring : M₀=0 and M₁=Manuring.

Sub-plot treatments :

4 planting dates : D₁=19.2.1951, D₂=28.7.1951, D₃=8.8.1951 and D₄=18.8.1951.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 30' × 9½'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Straw, chaff, neck infected tillers. (iv) (a) 1950–1951. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) Analysis appears to be done for sowing dates under manured and unmanured conditions separately as for R.B.D.

5. RESULTS :

Unmanured		Manured	
(i) 624.0 lb./ac.		(i) 441.3 lb./ac.	
(ii) 60.1 lb./ac.		(ii) 120.0 lb./ac.	
(iii) Treatments are highly significantly different.		(iii) Treatments are highly significantly different.	
(iv) Av. yield of grain in lb./ac.		(iv) Av. yield of grain in lb./ac.	
Treatment	Av. yield	Treatment	Av. yield
D ₁	800.0	D ₁	637.6
D ₂	710.8	D ₂	525.8
D ₃	548.4	D ₃	347.4
D ₄	437.0	D ₄	254.3
S.E./mean	=24.54 lb./ac.	S.E./mean	=48.99 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 49(8).

Type :- 'CV'.

Object :- To study the effect of single and double transplanting of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 30.6.1949/30.7.1949 and 29.8.1949. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 9' x 9'. (e) As per treatments. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 46.00". (x) 17.12.1949.

2. TREATMENTS :

Main-plot treatments :

3 varieties : $V_1 = T-90$ (late), $V_2 = T-1242$ (late) and $V_3 = F.R. 43$ (B) late.

Sub-plot treatments :

4 methods of sowing : $T_1 =$ single transplanting 30 days old seedlings, $T_2 =$ single transplanting 60 days old seedlings, $T_3 =$ double transplanting 1st of 30 days old and 2nd of 60 days old seedlings and $T_4 =$ double transplanting 1st (date N.A.) and 2nd of 30 days old seedling.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) Sub-plot 15' x 21'. (b) 13½' x 19½'. (v) 1 row all round. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain weight. (iv) (a) 1948 to 1950. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1902 lb./ac.
 (ii) (a) 221.6 lb./ac.
 (b) 188.0 lb./ac.
 (iii) V and T effects are highly significant. Interaction is not significant.
 (iv) Av. yield of grain in lb./ac.

	T_1	T_2	T_3	T_4	Mean
V_1	2173	1679	2054	1475	1845
V_2	2578	1897	2342	1824	2160
V_3	2001	1472	1916	1419	1702
Mean	2251	1683	2104	1573	1902

S.E. of difference of two

1. V marginal means = 78.3 lb./ac.
 2. T marginal means = 76.7 lb./ac.
 3. T means at the same level of V = 132.9 lb./ac.
 4. V means at the same level of T = 139.3 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(4).

Type :- 'CV'.

Object :- To study the effect of single and double transplanting of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) Transplanting on 10.7.1950, 11.8.1950 and 16.8.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 9' x 9'. (e) As per treatments. (v) Nil. (vi) As per treatments (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 64.47". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 varieties : $V_1 = T-90$ (late), $V_2 = T-1242$ (late).

Sub-plot treatments :

4 methods of sowing : T_1 =single transplanting 30 days old seedlings, T_2 =single transplanting 60 days old seedlings, T_3 =double transplanting 1st of 30 days old and 2nd 60 days old seedlings and T_4 =double transplanting 1st (date N.A.) and 2nd of 30 days old seedlings.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 15'×21'. (b) 13.5'×19.5'. (v) 1 row all round the Plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1948—1950. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2382 lb./ac.
 (ii) (a) 415.9 lb./ac.
 (b) 149.8 lb./ac.
 (iii) Only T effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	T_1	T_2	T_3	T_4	Mean
V_1	2779	2378	2603	1882	2410
V_2	2812	2033	2550	2020	2354
Mean	2795	2205	2576	1951	2382

S.E. of difference of two

1. V marginal means = 120.1 lb./ac.
 2. T marginal means = 61.1 lb./ac.
 3. T means at the same level of V = 86.5 lb./ac.
 4. V means at the same level of T = 141.5 lb./ac.

Crop :- Paddy (Kharif).

Ref :- C.R.R.I. 49(13). Type :- 'CV'.

Object :-To find the suitable second crop variety and the optimum date of planting.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) As per treatments. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 6"×6". (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2—3 intercultures with Japanese weeder and one hand weeding. (ix) 46.00". (x) N.A.

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

6 dates of planting : D_1 =6.10.1949, D_2 =22.10.1949, D_3 =7.11.1949, D_4 =22.11.1949, D_5 =8.12.1949 and D_6 =24.12.1949.

Sub-plot treatments :

6 varieties : V_1 =ASD 1, V_2 =DI 4, V_3 =PTB 10, V_4 =Ch-45, V_5 =Ch-5 and V_6 =CO. 13.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 9'×10½'. (b) 8'×9½'. (v) 1 row all round. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) No. (b) and (c) —. (v) (a) and (b) Nil. (vi) Nil. (vii) Results with 2 dates of planting are available. About others no information is available.

5. RESULTS :

- (i) 901 lb./ac.
 (ii) (a) 239.3 lb./ac.
 (b) 201.9 lb./ac.
 (iii) D effect is highly significant while V effect and interaction DV are significant.
 (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	Mean
D ₁	606	907	954	430	606	842	724
D ₂	1095	907	1525	1054	1054	836	1078
Mean	850	907	1239	742	830	839	901

S.E. of difference of two

1. D marginal means = 69.1 lb./ac.
 2. V marginal means = 105.7 lb./ac.
 3. V means at the same level of D = 142.8 lb./ac.
 4. D means at the same level of V = 147.4 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 48(3).

Type :- 'CV'.

Object :- To find the effect of different spacings on different varieties of Paddy.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) V₁ on 24.6.1948 and V₂ on 25.6.1948/4, 5.8.1948. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) As per treatments. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 54.35". (x) V₁ on 1.12.1948 ; V₂ on 17.12.1948.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 varieties : V₁=T-812 (medium) and V₂=T-1242 (late).
 (2) 3 spacings : S₁=3"×3", S₂=6"×6" and S₃=9"×9".

3. DESIGN :

- (i) 2×3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 15'×15'. (b) 12'×12'. (v) 1.5' around. (vi) Yes.

4. GENERAL :

- (i) Good. (ii) Maximum attack of hispa in S₃ and in plots of closer spacings *i.e.* in order of S₃, S₂, S₁. Attack of thrips just in reverse order. (iii) Straw, height, tillers, ear-length and yield of grain. (iv) (a) 1945 contd. (b) No. (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2934 lb./ac.
 (ii) 118.0 lb./ac.
 (iii) V and S effects are highly significant while their interaction is not significant.
 (iv) Av yield of grain in lb./ac.

	S ₁	S ₂	S ₃	Mean
V ₁	2662	2783	2904	2783
V ₂	2904	3206	3146	3085
Mean	2783	2995	3025	2934

- S.E. of S marginal mean = 34.06 lb./ac.
 S.E. of V marginal mean = 27.81 lb./ac.
 S.E. of body of table = 48.17 lb./ac.

Crop:- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(14). Type :- 'CV'.

Object :-To compare 6 varieties sown on five different dates both in broadcast and transplanted conditions.

1. BASAL CONDITIONS :

(i) (a) Paddy. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) As per treatments. (iv) (a) 4 ploughings, laddering and levelling. (b) As per treatments. (c) N.A. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 64.47%. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 methods of sowing : M_1 =Broadcast and M_2 =Transplanted.

Sub-plot treatments :

3 sowing/transplanting dates : D_1 =11.12.1950, D_2 =26.12.1950 and D_3 =11.1.1951.

Sub-sub-plot treatments :

6 varieties : V_1 =Ch 2, V_2 =Ch 45, V_3 =Ch 47, V_4 =PTB 10, V_5 =DI 4 and V_6 =CO.13.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block, 3 sub-plots/main-plot, 6 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) 11.5'×9.5'. (b) 9.5'×7.5'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Straw, height, tiller count and grain yield. (iv) (a) N.A. (b) N.A. (c) Nil. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2058 lb./ac.

(ii) (a) 319.6 lb./ac.

(b) 619.4 lb./ac.

(c) 510.8 lb./ac.

(iii) M and S effects, and interaction MV are highly significant. Interactions $D \times M$ and $D \times V$ are significant. Other effects are not significant.

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

	V_1	V_2	V_3	V_4	V_5	V_6	Mean	M_1	M_2
D_1	834	960	1596	2035	1599	1315	1380	1179	1581
D_2	2604	2528	2132	2588	2222	2884	2510	1923	3097
D_3	2154	2460	2269	2400	2215	2200	2283	2020	2546
Mean	1864	1996	1999	2341	2012	2133	2058	1707	2408
M_1	1184	1242	1613	2228	1970	2005			
M_2	2544	2750	2385	2455	2053	2260			

S.E. of the difference of two

- | | | |
|-----------------------------------|----------------|---|
| 1. M marginal means | = 53.3 lb./ac. | 6. V means at the same level of M=208.5 lb./ac. |
| 2. D marginal means | =126.4 lb./ac. | 7. M means at the same level of V=197.7 lb./ac. |
| 3. V marginal means | =147.5 lb./ac. | 8. V means at the same level of D=255.4 lb./ac. |
| 4. D means at the same level of M | =178.8 lb./ac. | 9. D means at the same level of V=265.2 lb./ac. |
| 5. M means at the same level of D | =155.4 lb./ac. | |

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 48(9). Type :- 'CM'.

Object :-To study the effect of continuous application of A/S with and without compost on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 24.6.1948/29.7.1948. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2-3 seedlings per hill. (v) Basal manuring of 100 maunds of compost per acre was given to half the experimental plots. (vi) T 812. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding (ix) 54.35%. (x) 5, 7.12.1948.

2. TREATMENTS :

Main-plot treatments :

2 applications of compost : C_0 =No compost and C_1 =Compost.

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.

Sub-sub-plot treatments :

2 toppings : T_0 =No topping and T_1 =Topping.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 5 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) 124'×60'.
(iii) 4. (iv) (a) 30'×10½'. (b) 28'×8½'. (v) 1' around the plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Height measurements, no. of tillers, straw and grain yield. (iv) (a) 1948—contd. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2349 lb./ac.
 (ii) (a) 635.7 lb./ac.
 (b) 518.3 lb./ac.
 (c) 368.9 lb./ac.
 (iii) Effect of C,N,T, interaction $N \times T$ and $C \times T \times N$ are highly significant. Interactions $C \times T$ and $C \times N$ are not significant.
 (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean	T_0	T_1
C_0	2693	2618	2350	2222	1902	2357	2272	2442
C_1	2652	2484	2393	2074	2101	2341	2248	2433
Mean	2672	2551	2371	2148	2001	2349	2260	2437
T_0	2708	2458	2244	2026	1866			
T_1	2636	2644	2499	2270	2137			

S.E. of difference of two

- | | | | |
|-----------------------------------|----------------|-----------------------------------|----------------|
| 1. C marginal means | =142.1 lb./ac. | 6. T means at the same level of C | =116.7 lb./ac. |
| 2. N marginal means | =129.6 lb./ac. | 7. C means at the same level of T | =164.3 lb./ac. |
| 3. T marginal means | =58.3 lb./ac. | 8. T means at the same level of N | =184.4 lb./ac. |
| 4. N means at the same level of C | =259.2 lb./ac. | 9. N means at the same level of C | =224.9 lb./ac. |
| 5. C means at the same level of N | =271.9 lb./ac. | | |

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(7).

Type :- 'CM'.

Object :- To study the effect of cultural and manurial practices on Paddy yield.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 16.8.1953/9, 11.7.1953 and 3.8.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 10"×10". (e) 2-3 seedlings per hole. (v) 40 lb./ac. of P_2O_5 . (vi) T-1242 (late). (vii) Irrigated. (viii) 2-3 intercultural with Japanese weeder and one hand weeding. (ix) 46.02". (x) 26, 27.12.1953.

2. TREATMENTS :

Main-plot treatments :

4 levels of N : $N_0=0$, $N_1=30$, $N_2=60$ and $N_3=90$ lb./ac.

Sub-plot treatments :

4 cuttings : $C_0=0$, $C_1=1$, $C_2=2$ and $C_3=3$ cuttings.

Sub-sub-plot treatments :

3 methods of planting : M_1 =Single transplanting 30 days old seedlings, M_2 =Single transplanting 50 days old seedlings and M_3 =Double transplanting 1st of 30 days old seedlings and 2nd of 20 days old seedlings.

3. DESIGN :

- (i) Split-plot. (ii) (a) 4 main-plots/replication ; 4 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A.
 (iii) 4. (iv) (a) N.A. (b) 1/445.5 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Good. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers straw and grain yield. (iv)
 (a) No. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3475 lb./ac.
 (ii) (a) 772.6 lb./ac.
 (b) 586.4 lb./ac.
 (c) 295.4 lb./ac.
 (iii) C and M effects are highly significant. Others are not significant.
 (iv) Av. yield of grain in lb./ac.

	C ₀	C ₁	C ₂	C ₃	Mean	M ₁	M ₂	M ₃
N ₀	3678	3570	3426	3078	3437	3503	3190	3619
N ₁	3598	3673	3348	3284	3475	3573	3114	3739
N ₂	3921	3640	3525	3265	3587	3670	3286	3805
N ₃	3514	3349	3465	3282	3402	3461	3189	3556
Mean	3677	3588	3441	3227	3475			
M ₁	3740	3604	3539	3325	3552			
M ₂	3367	3282	3168	2963	3195			
M ₃	3925	3787	3615	3393	3680			

S.E. of difference of two

- | | | | |
|-----------------------------------|----------------|-----------------------------------|----------------|
| 1. N marginal means | =157.7 lb./ac. | 6. M means at the same level of N | =104.4 lb./ac. |
| 2. C marginal means | =119.7 lb./ac. | 7. N means at the same level of M | =179.3 lb./ac. |
| 3. M marginal means | = 52.3 lb./ac. | 8. M means at the same level of C | =104.4 lb./ac. |
| 4. C means at the same level of N | =239.4 lb./ac. | 9. C means at the same level of M | =147.0 lb./ac. |
| 5. N means at the same level of C | =260.5 lb./ac. | | |

Crop :- Paddy (*Kharif*)

Ref :- C.R.R.I. 53(11) Type :- 'CM'.

Object :—To test the merits of the various treatment combinations under Japanese method of paddy cultivation.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 24.6.1953/18, 19.7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b), (c) As per treatments. (d) 10"×10". (e) As per treatments. (v) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) As per treatments. (ix) 46.02". (x) 26 to 30.11.1953.

2. TREATMENTS :

All combinations of (1), (2), (3), (4), (5) and (6)

- (1) 2 seed rates : P₁=Local method and P₂=Japanese method.
 (2) 2 seed preparations : Q₁=Local method and Q₂=Japanese method.
 (3) 2 no. of seedings/hole : R₁=Local method and R₂=Japanese method.
 (4) 2 methods of transplanting : S₁=Local method and S₂=Japanese method.
 (5) 2 field manuring : T₁=Local method and T₂=Japanese method.
 (6) 2 interculturing and weeding : U₁=Local method and U₂=Japanese method.

3. DESIGN :

- (i) 2⁶ Conf'd. Fact. with PQR, PSU, RST, QTU, QRSU, PQST, PRTU interactions confounded. (ii) (a) 8 plots/block ; 8 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 60'×15'. (b) 58' 4"×13' 4". (v) 1 row around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. Sprayed with perenox (1 oz. in 2 gallons of water). (iii) Straw, height, tillers and ear-length. (iv) (a) Yes ; 1953—contd. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 4025 lb./ac.

(ii) 363.5 lb./ac.

(iii) Main effect of T is highly significant, while main effects of U is significant. Other effects are not significant.

(iv) Av. response in lb./ac.

Response with	P	Q	R	S	T	U
Mean response	— 63.28	18.34	— 26.10	106.54	—586.54	189.90
P ₁	—	29.32	—110.06	175.06	674.32	204.56
P ₂	—	7.38	57.88	38.00	—498.76	175.24
Q ₁	52.32	—	— 33.44	134.82	—625.56	316.18
Q ₂	— 74.24	—	— 18.76	78.26	—547.50	63.62
R ₁	—147.24	11.00	—	2.00	—575.50	81.00
R ₂	20.68	25.68	—	211.06	—597.56	298.82
S ₁	5.26	46.62	—130.62	—	—452.82	198.00
S ₂	—131.82	5.94	78.44	—	720.26	181.82
T ₁	—151.06	—20.68	— 15.06	— 27.08	—	71.56
T ₂	24.50	57.38	— 37.12	240.26	—	308.24
U ₁	— 48.62	144.62	—135.00	114.62	704.88	—
U ₂	— 77.94	—107.94	82.82	98.44	—468.18	—
S.E. of mean response			=64.26 lb./ac.			
S.E. of differential response			=90.88 lb./ac.			

Crop :- Paddy (*Kharif*).

Ref :- C.R R.I. 53(10).

Type :- 'CM'.

Object :- To compare local and Japanese methods of cultivation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 24.6.1953/22 7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 10"×10". (e) 2-3 seedlings per hole. (v) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) As per treatments. (ix) 46°02'. (x) 7 to 9.12.1953.

2. TREATMENTS :

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

(1) 2 methods of nursery planting : A₁=Japanese and A₂=Local.

(2) 2 methods of transplanting : T₁=Japanese and T₂=Local.

(3) 2 methods of field manuring : M₁=Japanese and M₂=Local.

(4) 2 methods of intercultivation : C₁=Japanese and C₂=Local.

3. DESIGN :

(i) 2⁴ confounding with A×T×M×C interaction confounded. (ii) (a) 8 plots/block ; 2 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 60'×15'. (b) 58' 4"×13' 4". (v) 1 row all round. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (vi) (a) 1953—N.A. (b) N.A. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 4169 lb./ac.
(ii) 312.6 lb./ac.
(iii) M effect alone is highly significant.
(iv) Av. yield of grain in lb./ac.

	A ₁	A ₂	Mean	M ₁	M ₂	C ₁	C ₂
T ₁	4133	4085	4109	4437	3782	4117	4101
T ₂	4093	4364	4229	4544	3913	4181	4277
Mean	4113	4225	4169	4490	3848	4149	4189
C ₁	4049	4249	4149	4513	3785		
C ₂	4177	4201	4189	4468	3910		
M ₁	4399	4581	4490				
M ₂	3827	3868	3848				

S.E. of any marginal mean = 78.15 lb./ac.

S.E. of body of any table = 110.52 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 49(6) Type :- 'CMV'.

Object :- To determine the optimum spacing for planting various varieties of paddy of [different dates of planting under manured and unmanured conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 17.6.1949 and 12.7.1949/As per treatments. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) As per treatments. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 interculturalures with Japanese weeder and one hand weeding. (ix) 46.00°. (x) N.A.

2. TREATMENTS :

3 strips in one direction : times of planting : T₁=24, 25.7.1949, T₂=12, 13.8.1949 and T₃=31.8.1949.

3 strips in perpendicular direction to the above 3 manures : N₀=0, N₁=20 and N₂=40 lb./ac.

Sub-plot treatments (in each of the above)

All combinations of (1) and (2)

(1) 3 varieties : V₁=T-608 (early), V₂=T-1145 (medium) and V₃=T-1242 (late).

(2) 3 spacing : S₁=6'×6', S₂=12'×12' and S₃=18'×18'.

3. DESIGN :

(i) Strip-cum-split plot. (ii) (a) 3 strips in one direction ; 3 strips in perpendicular ; 9 sub-plot/strip. (b) N.A. (iii) 2. (iv) (a) 12'×12'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Straw, height, tillers and ear-length. (iv) (a) Yes ; 1947—contd. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) Nil. (vii) S.E.'s presented as available.

5. RESULTS :

- (i) 1458 lb./ac.
(ii) N.A.
(iii) Main effects of T, M and V are highly significant, S effect is significant while other effects are not significant.

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

	T ₁	T ₂	T ₃	S ₁	S ₂	S ₃	N ₀	N ₁	N ₂	Mean
V ₁	999	993	551	944	870	730	600	942	1002	848
V ₂	1854	1755	1267	1728	1648	1499	1204	1720	1952	1625
V ₃	1906	2148	1649	1945	1932	1828	1409	2122	2173	1901
Mean	1586	1632	1156	1539	1483	1352	1071	1595	1709	1458
N ₀	1110	1290	812	1082	1151	979				
N ₁	1819	1696	1270	1680	1604	1500				
N ₂	1830	1910	1386	1855	1693	1578				
S ₁	1607	1830	1178							
S ₂	1581	1644	1224							
S ₃	1570	1421	1065							

S.E. of T marginal mean = 53.16 lb./ac.
 S.E. of M marginal mean = 104.51 lb./ac.
 S.E. of S or V marginal mean = 50.74 lb./ac.

Crop :- Rice (*Kharif*).

Ref :- C.R.R.I. 50(20).

Type :- 'D'.

Object :- To know the effect of spraying different fungicides in different doses on the incidence of blast disease and to estimate the loss caused by the disease.

1. BASAL CONDITIONS :

(i) (a) and (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 15.7.1951./21.8.1951.
 (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) —. (d) N.A. (e) 1 to 2. (v) Nil.
 (vi) CO-13 (medium). (vii) Irrigated. (viii) 2 hand weedings. (ix) and (x) N.A.

2. TREATMENTS :

1. Bordeaux mixture 5 : 5 : 50.
2. Bordeaux mixture 2½ : 3½ : 50.
3. Perenox, usual dose i.e. 1 oz in 2 gallons of water.
4. Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 12. (iv) 12½' × 40'. (b) 10½' × 38'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Pests : N.A. Disease : Blast disease was observed at the early stages of plant growth, but the incidence had gone down a little by 25.9.1951. (iii) Yield and incidence of blast. (iv) (a) 1950—1951. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1170 lb./ac.
- (ii) 81.74 lb./ac.
- (iii) Treatment differences are highly significant.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1365
2.	1235
3.	1194
4.	884
S.E. mean	= 23.6 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 51(21).

Type :- 'D'.

Object :- To find out the efficiency of insecticide to control patchy diplosis.

1. BASAL CONDITIONS :

(i) (a) and (b) Paddy. (c) N.A. (ii) (a) Clay loamy soil. (b) Refer item 11 on page 1. (iii) 27.6.1951/18.8.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 6' × 6'. (e) 1. (v) N.A. (vi) GEB 24 (late). (vii) Irrigated. (viii) 2—3 intercultures with Japanese weeder and one hand weeding. (ix) and (x) N.A.

2. TREATMENTS :

- | | |
|---------------------------------|--------------------------------------|
| 1. Control. | 5. Gammexane—P520 B.H.C.—0.3 oz. |
| 2. Hexidole—950 B.H.C.—0.3 oz. | 6. Hortex—WP 25 (Y—1 somen)—0.16 oz. |
| 3. Benexide—WP50 B.H.C.—0.3 oz. | 7. Guesarol—550 D.D.T—0.3 oz. |
| 4. Hexiclan—DP50 B.H.C.—0.3 oz. | 8. Sweet flag (distillate) 50 : 50. |
- All insecticides are sprayed at 1% strength. Insecticides 2 to 7 in one gallon of water.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) 134' × 64'. (iii) 4. (iv) (a) N.A. (b) 64' × 14'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) This experiment is meant for the control of pest population. (iii) Number of Grubs, pupae, parasite cocoon and silver shoots. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1915 lb./ac.
(ii) 294.4 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	2057	5.	1861
2.	1894	6.	1825
3.	1815	7.	1800
4.	1835	8.	2234

S.E./mean = 147.2 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(11).

Type :- 'D'.

Object :- To estimate the loss in yield due to blast disease of Paddy and effect of spraying on incidence of blast.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 2.7.1952/24, 25.8.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) CO 13 (early), T-1145 (medium). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 56.03%. (x) T-1145 on 18.12.1952. and CO-131 on 18.11.1952.

2. TREATMENTS :

- Controlling all infection by spraying throughout at weekly intervals.
- Controlling leaf infection by spraying upto boot leaf stage.
- Controlling neck infection by spraying after boot leaf stage.
- Control (no spraying).

3. DESIGN :

(i) R.B.D. (ii) (a) 4 for each variety. (b) N.A. (iii) 12. (iv) (a) 10' × 30'. (b) 10' × 28.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) The disease incidence is not much. (iii) Straw, infected healthy tillers and grain yield. (iv) (a) to (c) N.A. (v) (a), (b) Nil. (vi) Nil. (vii) Analysis was done separately for each variety.

5. RESULTS :

Variety CO-13	Variety T-1145
(i) 1000 lb./ac.	(i) 1672 lb./ac.
(ii) 162.1 lb./ac.	(ii) 315.1 lb./ac.
(iii) Treatment differences are not significant.	(iii) Treatment differences are not significant.

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

Treatment	Av. yield
1.	949
2.	963
3.	1051
4.	1038
S.E./mean	=46.7 lb./ac.

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

Treatment	Av. yield
1.	1809
2.	1796
3.	1485
4.	1598
S.E./mean	=90.9 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(18). Type :- 'D'.

Object —To study the relative efficiency of various herbicides and to find out the better method of the two pre-sowing or post-sowing applications and interaction if any.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 19.6.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) Ch-47 (early). (vii) Irrigated. (viii) Weeding as per treatments. (ix) 56.03%. (x) 29, 30.10.1952.

2. TREATMENTS :

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

(1) Two times of application : T₁=Pre-sowing and T₂=Post-sowing.

(2) 5 herbicides : D₁=Chloroxone, D₂=Phenoxylylene, D₃=2.4.5-T, D₄=Dowicide 100 lb./ac. and D₅=Hand weeding.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 21'×9'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1951—contd. (b) No. (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 274 lb./ac.

(ii) 75.1 lb./ac.

(iii) Treatment differences are highly significant.

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

	Control =180 lb /ac.					Mean
	D ₁	D ₂	D ₃	D ₄	D ₅	
T ₁	112	185	156	157	504	223
T ₂	270	331	368	317	530	363
Mean	191	258	262	237	517	293

S.E. of marginal means of T =16.79 lb./ac.

S.E. of marginal means of D =21.68 lb./ac.

S.E. of body of table =37.60 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(12).

Type :- 'D'.

Object : - To find out the effect of spraying herbicides before and after transplanting in controlling weeds and increasing yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 23.6.1953/18.7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 9'×6'. (e) 2 to 3. (v) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) Weeding as per treatments. (ix) 46.02%. (x) 12.12.1953.

2. TREATMENTS :

1. Control.
2. Hand weeding.
3. Chloroxone.
4. Phenoxylene.
5. 2,4,5-T.
6. 300 lb./ac. of Calcium cyanamide.
7. Chloroxone applied 6 weeks after planting.
8. Phenoxylene applied 6 weeks after planting.
9. 2,4,5-T applied 6 weeks after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 30'×9.5'. (b) 28'×7.5'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Straw, height, tiller, ear-length and grain yield. (iv) (a) 1951-52—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3796 lb./ac.
 (ii) 244.56 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	3646	6.	3285
2.	3843	7.	4024
3.	3753	8.	4199
4.	3789	9.	3790
5.	3833		
S.E./mean	=122.3 lb./ac.		

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(15).

Type :- 'D'.

Object :- To find the best suitable fungicide out of various commercial products for controlling blast.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 23.7.1953/29.8.1953. (iv) (a) 4 ploughings, [laddering and levelling. (b) Transplanted. (c) —. (d) 9'×6". (e) 2-3. (v) Nil. (vi) CO-13 (early). (vii) Irrigated. (viii) 2-3 interculturalures with Japanese weeder and one hand weeding. (ix) 46.02". (x) N.A.

2. TREATMENTS :

6 fungicides : F₀=0 control (no spraying), F₁=Bordeaux mixture, F₂=Perenox, F₃=Coppesan, F₄=Diathane and F₅=Wetcol.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 8. (iv) (a) 29'×8'4". (b) 27'×5'8". (v) 2 rows around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) There was incidence of disease, spraying was done with above fungicides, as per treatments. (iii) Straw, height, tillers and ear-length. (iv) (a) No. (b) Nil. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 661.0 lb./ac.
 (ii) 120.6 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
F ₀	478.6
F ₁	719.7
F ₂	704.1
F ₃	831.9
F ₄	584.0
F ₅	647.5
S.E./mean	=60.3 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(10).

Type :- 'D'.

Object :- To study the relative efficiency of various herbicides and to find out the optimum dose and time of planting.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 17.6.1952/19.7.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) Ch-47 (early). (vii) Irrigated. (viii) N.A. (ix) 56.03". (x) 23,24.10.1952.

2. TREATMENTS :

- | | |
|--|---|
| 1. Control. | 9. Phenoxyene $\frac{2}{3}$ gallon/ac. (once) |
| 2. Hand weeding. | 10. Phenoxyene $\frac{1}{3}$ gallon/ac. (twice) |
| 3. T.C.A. at 100 lb./ac. | 11. Phenoxyene $\frac{1}{2}$ gallon/ac. (twice) |
| 4. Chloroxone 1 lb./ac. of acid (once) | 12. Phenoxyene $\frac{2}{3}$ gallon/ac. (twice) |
| 5. Chloroxone 1 lb./ac. of acid (twice) | 13. 2, 4, 5-T 1 lb./ac. (once) |
| 6. Chloroxone 2 lb./ac. of acid (once) | 14. 2, 4, 5-T 2 lb./ac. (once) |
| 7. Phenoxyene $\frac{1}{3}$ gallon/ac. (once). | 15. 2, 4, 5-T 1 lb./ac. (twice) |
| 8. Phenoxyene $\frac{1}{3}$ gallon/ac. (once) | 16. 2, 4, 5-T 2 lb./ac. (twice) |

3. DESIGN :

(i) R B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 15'×11'. (b) 13'×9'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1951—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1031 lb./ac.
(ii) 156.4 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	850	9.	1236
2.	1044	10.	972
3.	924	11.	1187
4.	895	12.	1069
5.	960	13.	1006
6.	1191	14.	989
7.	1074	15.	999
8.	1024	16.	1069

S.E./mean = 78.2 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(8).

Type :- 'D'.

Object :- To estimate the loss due to incidence of blast disease of Paddy and control it by spraying Bordeaux mixture 5-5-50.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam (b) Refer item 11 on page 1. (iii) 11.7.1953/20,21.8.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) 60 lb./ac. of A/S on 4.9.1953. (vi) CO-13 (early) and T-1145 (medium). (vii) Irrigated. (viii) 2—3 intercultures with Japanese weeder and one hand weeding. (ix) 46.02". (x) N.A.

2. TREATMENTS :

- Dipping in B.M. (5-5-50) at the time of transplanting and spraying at 45, 60, 90 and 97 days after transplanting of CO-13, and at 60, 90, 120 and 135 days after transplanting for T-1145.
- Dipping in B.M. at transplanting and spraying at 45 and 97 days for CO-13, 60 and 135 days for T-1145.
- Dipping at the time of planting and spraying at 45 and 60 days for CO-13, 60 and 90 days for T-1145.
- Spraying at 90 and 97 days for CO-13 and 120 and 115 days for T-1145.
- Control (no dipping and no spraying).

3. DESIGN :

(i) R.B.D. (ii) (a) 5 for each variety. (b) N.A. (iii) 8. (iv) (a) 29'×9'9". (b) 26'9"×7'3". (v) Two rows all round. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Leaf infection appeared 60 days after spraying (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1952—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

Variety T-1145		Variety CO-13	
(i) 2561 lb./ac.		(i) 980 lb./ac.	
(ii) 216.9 lb./ac.		(ii) 147.1 lb./ac.	
(iii) Treatment differences are significant.		(iii) Treatment differences are significant.	
(iv) Av. yield of grain in lb./ac.		(iv) Av. yield of grain in lb./ac.	
Treatment	Av. yield	Treatment	Av. yield
1.	2547	1.	1089
2.	2601	2.	979
3.	2635	3.	926
4.	2689	4.	1013
5.	2334	5.	896
S.E./mean	=76.7 lb./ac.	S.E./mean	=52.0 lb./ac.
Mean infection percentage		Mean infection percentage	
Treatment	Angular values	Treatment	Angular values
1.	14.89 (7.13)	1.	27.37 (21.90)
2.	21.21 (13.38)	2.	31.73 (28.32)
3.	19.26 (11.39)	3.	35.85 (34.95)
4.	15.67 (7.87)	4.	27.29 (25.19)
5.	21.46 (13.82)	5.	35.47 (32.67)
Mean	=18.50	Mean	=31.54

Crop :-Paddy (Kharif).

Ref :-C.R.R.I. 53(26) Type :-'D'.

Object :-To find out the efficiency of dipping the seedlings in B.H.C. for controlling gall fly.

1. BASAL CONDITIONS :

(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loamy. (b) Refer item 11 on page 1. (iii) 25.6.1953/25, 26.7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 6"×6". (e) 1. (v) N.A. (vi) G.E.B. 24 (late). (vii) Irrigated. (viii) 2-3 weedings with Japanese weeder and one hand weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 nursery treatments : N₁=Nursery not dusted, seedling not dipped and N₂=Nursery dusted and seedling dipped.

(2) 5 pre-planting treatments : T₀=Control, T₁=Early dusted, T₂=Late dusted, T₃=Early and late dusted and T₄=Regularly dusted.

3. DESIGN :

(i) 2×5 Fact in R B.D. (ii) (a) 10. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 1/294.32 ac. for replications 1 to 4 and 1/282.9 ac. for replications 5 to 8. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Observations on pests were taken by sampling technique. Sample size of 1'×1' were chosen and 6 samples were examined from each treatment. (iii) Population of insects at the peak period of incidence of gall fly. (iv) (a) N.A. (b) No. (c) Nil. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3111 lb./ac.
 (ii) 202.22 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	T ₄	Mean
N ₁	3120	3103	3175	3188	3038	3125
N ₂	3097	3123	3124	3155	2988	3097
Mean	3108	3113	3150	3171	3013	3111

S.E. of marginal mean of T = 50.56 lb./ac.
 S.E. of marginal mean of N = 31.97 lb./ac.
 S.E. of body of table = 63.95 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 52(19).

Type :- 'D'.

Object :- To find out the efficiency of different insecticides in controlling the incidence of gall fly.

1. BASAL CONDITIONS :

(i) (a) Paddy (b) Paddy. (c) N.A. (ii) (a) Clay loamy soil. (b) Refer item 11 on page 1. (iii) N.A. (iv) (a) 2 ploughings, laddering and levelling. (b) Transplanting. (c) —. (d) 6' × 6'. (e) 1. (v) N.A. (vi) G.E.B. 24 (late). (vii) Irrigated (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

4 concentrations of sprayings and dusting : M₁=0.1 % spraying, M₂=0.2 % spraying, M₃=5 % dusting and M₄=10 % dusting.

Sub-plot treatments :

5 insecticides : D₀=Control, D₁=Sweet flag, D₂=B.H.C, D₃=D.D.T and D₄=B.H.C+D.D.T.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/blocks ; 5 sub-plots/main-plot. (b) 134' × 63'. (iii) 4. (iv) (a) N.A. (b) 24' × 14'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Periodical observations are taken at weekly intervals for incidence of stemborers. (iii) Silver shoots, gurus, pupae etc. (iv) (a) N.A. (b) No. (c) Nil. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1605 lb./ac.
 (ii) (a) 292.1 lb./ac.
 (b) 196.6 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 ₀	1626	1522	1500	1470	1530
D ₁	1591	1583	1725	1728	1657
D ₂	1613	1495	1480	1717	1576
D ₃	1589	1491	1502	1659	1560
D ₄	1658	1883	1642	1626	1702
Mean	1615	1595	1570	1640	1605

S E. of difference of two

1. M marginal means = 92.36 lb./ac.
 2. D marginal means = 69.55 lb./ac.
 3. D means at the same level of M = 139.1 lb./ac.
 4. M means at the same level of D = 154.9 lb./ac.

Crop :- Paddy.

Ref :- C.R.R.I. 52(20).

Type :- 'D'.

Object :—To determine the comparative efficacy of different insecticides (including an indigenous one) in controlling stem-borer.

1. BASAL CONDITIONS :

(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 24.11.1952/10, 11.1.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) —. (d) 6"×6". (e) 1. (v) N.A. (vi) MTU-15 (medium). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) N.A. (x) 1, 2.5.1953.

2. TREATMENTS :

Main-plot treatments :

4 concentrations of sprayings and dusting : $M_1=0.1\%$ spraying, $M_2=0.2\%$ spraying, $M_3=5\%$ dusting and $M_4=10\%$ dusting.

Sub-plot treatments :

5 insecticides : D_0 =Control, D_1 =Sweet flag, D_2 =B.H.C, D_3 =D.D.T and D_4 =B.H.C+D.D.T.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication and 5 sub-plots/main-plot. (b) 132'×94½'. (iii) 4. (iv) (a) N.A. (b) 24'×10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Periodical observations were taken for incidence of stem-borer and other pests. (iii) Silver shoot, grubs, pupae etc. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1367 lb./ac.
 (ii) (a) 373.1 lb./ac.
 (b) 251.9 lb./ac.
 (iii) No effect is significant.
 (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	M_4	Mean
D_0	1446	1283	1098	1421	1312
D_1	1441	1313	1376	1340	1368
D_2	1436	1540	1386	1207	1392
D_3	1422	1395	1014	1345	1294
D_4	1468	1569	1318	1512	1467
Mean	1443	1420	1238	1365	1367

S.E. of difference of two

1. M marginal means = 117.9 lb./ac.
 2. D marginal means = 89.0 lb./ac.
 3. D means at the same level of M = 178.0 lb./ac.
 4. M means at the same level of D = 198.2 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 53(27).

Type :- 'D'.

Object :—To find out the relative efficiency of different insecticides in controlling the incidence of gall fly.

1. BASAL CONDITIONS :

(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 25.6.1953/23, 30.7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 6"×6". (e) 1. (v) N.A. (vi) GEB-24 (late). (vii) Irrigated. (viii) 2-3 hand weedings. (ix) N.A. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

4 concentrations of sprayings and dusting : $M_1=0.1\%$ spraying, $M_2=0.2\%$ spraying, $M_3=5\%$ and $M_4=10\%$ dusting.

Sub-plot treatments :

5 insecticides : D_0 =Control, D_1 =Sweet flag, D_2 =B.H.C, D_3 =D.D.T and D_4 =B.H.C+D.D.T.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 5 sub-plots/main-plot. (b) $126' \times 66'$. (iii) 4. (iv) (a) $22' \times 14'$. (b) $21' \times 13'$. (v) 1 row around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Incidence of pests is given in the table of spraying and dusting. These were taken at the time of emergence of broods. (iii) 4 samples in each sub-plot were examined for silver shoots, parasite, cocoons, grubs and pupae. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2070 lb./ac.
 (ii) (a) 334.8 lb./ac.
 (b) 263.8 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_0	1998	2199	1806	1975	1995
D_1	2227	1894	2115	1908	20.6
D_2	1970	1809	2098	2050	1982
D_3	2046	2374	2060	2226	2177
D_4	2015	2160	2296	2182	2163
Mean	2051	2087	2075	2068	2070

S.E. of difference of two

1. M marginal means =105.9 lb./ac.
 2. D marginal means = 93.3 lb./ac.
 3. D means at the same level of M =186.5 lb./ac.
 4. M means at the same level of D =197.6 lb./ac.

Means % values for incidence of silver shoots (Figs. in brackets are the angular values)

	M_1	M_2	M_3	M_4
D_0	39.07 (37.80)	38.43 (38.29)	43.82 (41.44)	45.00 (42.25)
D_1	37.87 (37.94)	39.61 (39.00)	38.08 (38.12)	37.00 (37.47)
D_2	44.79 (42.02)	40.46 (39.52)	43.13 (41.09)	38.36 (38.29)
D_3	42.09 (40.46)	42.54 (40.69)	34.75 (36.15)	34.09 (35.73)
D_4	45.80 (42.59)	41.33 (39.99)	38.24 (38.17)	36.63 (37.23)

Crop :- Paddy (*Kharif*).

Ref. :- C.R.R.I. 51(12).

Type :- 'DV'.

Object :- To compare the yield of different varieties of Paddy treated with different solutions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 30.651/1.8.51. (iv) (a) 2 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2—3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32%. (x) 26.10.1951.

2. TREATMENTS :

Main-plot treatments :

7 varieties (early) : V_1 =PTB 10, V_2 =Ch 45, V_3 =Ch 47, V_4 =DCA 2, V_5 =DCA 12, V_6 =DCA 14 and V_7 =Benibhog.

Sub-plot treatments :

6 seeds treated with solutions : D_0 =Control, D_1 =Undiluted, D_2 =1/10 dilution, D_3 =1/100 dilution, D_4 =1/1000 dilution and D_5 =1/10000 dilution.

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 6'×16'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (i i) Straw, height, tiller, ear-length and grain yield. (iv) (a) 1949—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 834.4 lb./ac.
 (ii) (a) 329.0 lb./ac.
 (b) 140.0 lb./ac.
 (iii) Only V effect is significant.
 (iv) Av. yield of grain in lb./ac.

	V_1	V_2	V_3	V_4	V_5	V_6	V_7	Mean
D_0	904.0	683.0	751.5	716.1	930.0	862.6	759.8	801.0
D_1	1037.5	623.9	764.5	874.4	914.6	857.9	807.1	840.0
D_2	1038.1	749.2	705.4	961.9	912.2	941.8	846.0	879.2
D_3	879.1	680.6	862.6	879.1	896.9	904.0	729.1	833.1
D_4	934.7	691.3	717.3	784.6	980.8	865.0	784.6	822.6
D_5	980.8	680.6	692.4	824.8	839.0	1006.8	789.3	830.5
Mean	962.4	684.8	749.0	840.2	912.3	906.4	786.0	834.4

S.E. of difference of two

1. V marginal means = 77.6 lb./ac.
2. D marginal means = 30.6 lb./ac.
3. D means at the same level of V = 80.8 lb./ac.
4. V means at the same level of D = 107.0 lb./ac.

Crop :- Paddy (Second crop). Ref :- C.R.R.I. 50(18). Type :- 'DV'.

Object :- To find out the efficacy of insecticides to control stem borer.

1. BASAL CONDITIONS :

(i) (a) and (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 26.12.1950/30, 31.1.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 6'×6'. (e) 1. (v) 1 ton/ac. of compost. (vi) As per treatments. (vii) Irrigated. (viii) 2 hand weedings and one weeding by means of Japanese rotary weeder. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1 =DI-4 and V_2 =PTB 10.

Sub-plot treatments :

5 insecticides : D_0 =Control, D_1 =Mechanical (collecting egg masses once in 4 days), D_2 =B.H.C. (P520) — 0.05 solution i.e. 1½ oz. in one gallon of water, D_3 =D.D.T (G550)—0.1% solution i.e. 1 : 50 gallon of water and D_4 =Hexyclan DP-50 i.e. 1 : 50 gallon of water.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 5 sub-plots/main-plot. (b) 66'×64'. (iii) 4. (iv) (a) N.A. (b) 30'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) This experiment is meant to control the pests population in the field. (iii) Borer attacked tillers and chaff percentage. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) S.E. (a) and S.E. (b) worked out with the help of C.D's given.

5. RESULTS :

- (i) 587 lb./ac.
 (ii) (a) 55.09 lb./ac.
 (b) 78.92 lb./ac.
 (iii) Only V effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	D ₀	D ₁	D ₂	D ₃	D ₄	Mean
V ₁	678	647	633	629	640	645
V ₂	544	548	486	520	542	528
Mean	611	598	559	575	591	587

S.E. of difference of two

1. V marginal means = 17.42 lb./ac.
2. D marginal means = 39.46 lb./ac.
3. D means at the same level of V = 55.80 lb./ac.
4. V means at the same level of D = 52.86 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- C.R.R.I. 50(22). Type :- 'DM'.

Object :- To study the effect of manurial pre-treatment of seed with various chemicals at three concentrations on the yield and quality of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 2 to 4.7.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Sown in puddled land. (c) —. (d) 6" × 4½". (e) 2 (v) N.A. (vi) T-508 (medium). (vii) Irrigated. (viii) Weeding during 3rd to 10th and 16-17th August 1950. (ix) N.A. (x) 12 to 14.11.1950.

2. TREATMENTS :

Main-plot treatments :

2 doses of N : N₀=0 and N₁=20 lb./ac.

Sub-plot treatments :

3 concentrations : M₁=½M, M₂=1M and M₃=2M.

Sub-sub-plot treatments :

12 chemicals : C₀=Control, C₁=KH₂PO₄ ; C₂=K₂HPO₄ ; C₃=K₃PO₄ ; C₄=NH₄H₂PO₄ ; C₅=(NH₄)₂HPO₄ ; C₆=NaH₂PO₄ ; C₇=Na₂HPO₄ ; C₈=(NH₄)₂SO₄ ; C₉=NH₄NO₃ ; C₁₀=Urine soaked and C₁₁=Water soaked.

3. DESIGN :

(i) Split-split-plot. (ii) (a) 2 main-plots/block ; 3 sub-plots/main-plot ; 12 sub-sub-plots/sub-plot. (b) 78' × 54'. (iii) 4. (iv) (a) N.A. (b) 12' × 4½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of blue beetle on 20.8.1950. Sprayed with D.D.T. solution on 21.8.1950. (iii) Straw, height and tiller countings. (iv) (a) 1949-50—contd. (b) No. (c) Nil. (v) (a), (b) N.A. (vii) and (viii) Nil.

5. RESULTS :

- (i) 613 lb./ac.
 (ii) (a), (b) N.A.
 (c) 159.5 lb./ac.
 (iii) C effect and interaction C × M are highly 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	C ₁₀	C ₁₁	Mean	N ₀	N ₁
M ₁	635	620	825	755	720	699	663	766	557	718	185	694	653	571	735
M ₂	571	588	641	716	580	413	667	546	551	640	281	724	576	572	581
M ₃	660	709	722	591	753	241	593	787	692	664	283	626	610	582	639
Mean	622	639	729	687	685	451	641	700	600	674	250	681	613	575	652
N ₀	595	624	751	653	662	357	596	637	594	634	216	579	575		
N ₁	649	654	707	722	707	545	686	762	606	715	283	783	652		

S.E. of difference of two C_i means = 46.05 lb./ac.

Other S.E.'s N.A.

Crop :- Paddy.

Ref :- C.R.R.I. 49(18).

Type :- 'DM'.

Object :—To study the effect of manurial pre-treatment of seed with various chemicals at three concentrations on the yield and quality of Paddy.

1. BASAL CONDITIONS :

- (i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 1, 2.7.1949. (iv) (a) 4 ploughings, laddering and levelling. (b) Sown in puddled land. (c) —. (d) 9" × 9". (e) 2 to 3. (v) Nil. (vi) T-608 (medium). (vii) Irrigated. (viii) Two weedings. (ix) N.A. (x) 8, 9.11.1949.

2. TREATMENTS :

Main-plot treatments :

2 levels of N as A/S : N₀=0 and N₁=20 lb./ac.

Sub-plot treatments :

3 concentrations of chemicals : M₁= $\frac{1}{2}$ M, M₂=1 M and M₃=2 M.

Sub-sub-plot treatments :

11 chemicals : C₀=Control, C₁=KH₂PO₄, C₂=K₂HPO₄, C₃=K₃PO₄, C₄=NH₄(H₂PO₄), C₅=NaH₂PO₄, C₆=Na₂HPO₄, C₇=(NH₄)₂SO₄, C₈=NH₄NO₃, C₉=Cowdung soaked and C₁₀=Water soaked.

3. DESIGN :

- (i) Split-split-plot. (ii) (a) 2 main-plots/replication, 3 sub-plots/main-plot and 11 sub-sub-plots/sub-plot. (b) 57' 9" × 83'. (iii) 4. (iv) (a) 5' 3" × 12'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) N.A. (iii) Straw, height of plant, tiller observations etc. (iv) (a) No. (b) No. (c) Nil. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 756 lb./ac.
 (ii) (a) 551.6 lb./ac.
 (b) 288.6 lb./ac.
 (c) 102.7 lb./ac.
 (iii) Only C 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	C ₁₀	Mean	N ₀	N ₁
M ₁	740	771	847	829	831	857	774	748	857	751	770	798	672	839
M ₂	635	710	745	718	669	723	735	797	723	672	751	716	613	819
M ₃	708	773	791	779	771	777	731	775	775	706	724	755	711	885
Mean	694	751	794	776	757	786	746	774	785	710	748	756	665	847
N ₀	612	653	734	685	653	707	666	678	677	613	640	665		
N ₁	776	849	855	866	860	864	826	869	893	807	856	847		

S.E. of difference of two

1. N marginal means = 67.9 lb./ac.
2. M marginal means = 43.5 lb./ac.
3. C marginal means = 29.6 lb./ac.
4. M means at the same level of N = 61.5 lb./ac.
5. N means at the same level of M = 84.5 lb./ac.
6. C means at the same level of N = 41.9 lb./ac.
7. N means at the same level of C = 78.8 lb./ac.
8. C means at the same level of M = 51.4 lb./ac.
9. M means at the same level of C = 65.5 lb./ac.

JUTE AGRICULTURAL RESEARCH INSTITUTE

BARRACKPORE

PROFORMA GIVING DETAILS OF EXPERIMENTAL STATION.

1. Name of the experimental station. Jute Agricultural Research Institute.
2. Tehsil or Taluka. Barrackpore.
3. District. 24—Parganas.
4. Address. Director, Jute Agricultural Research Institute, Barrackpore, West Bengal.
5. Year of establishment. 1950 (Experiments started from 1952).
6. Distance from nearest railway station with the name of nearest railway station. 12 miles from Howrah Railway Station.
7. Programme of Research. Breeding and genetics, cytogenetics, anatomy, physiology, agronomy agricultural chemistry, mycology and plant pathology and entomology, of jute, mesta and allied fibres.
8. Normal cropping pattern. *Kharif* season—Jute and jute substitutes. *Rabi* season—Pulse, mustard and potato.
9. Type of tract it represents. Alluvial.
10. General description of topography of the experimental area. More or less plain.
11. Soils.
 - (a) Broad soil types. New alluvial; sandy loam.
 - (i) Depth. Five to six feet in depth (below 6 feet : mostly sand ; rock not found).
 - (ii) Colour. Light grey.
 - (iii) Structure. Single grain.
 In a typical soil profile, just below the top 12" layer, there is deposition of loam clay soil of grey colour. The thickness of this layer is about 2 ft. The layers below this are of varying thickness of which some are sandy and some are loamy. Lime concretions are also found at lower depths.
 - (b) Chemical analysis if available with pH value. Organic carbon (W.B. value) —0.5 to 0.8%.
 (Indicate the percentage of various constituents analysed for). Total nitrogen—0.05 to 0.07%.
 Available CaO—0.3 to 0.5%.
 Available P₂O₅—60 to 400 p.p.m.
 Available K₂O—0.04 to 0.07%.
 pH —6.7 to 7.2.
 - (c) Mechanical analysis (if available). Course sand — 1 to 3%
 Fine sand —45 to 50%
 (Indicate the % of various constituents analysed for). Silt —28 to 35%
 Clay —12 to 18%
12. Normal rainfall in inches. (month-wise). (specify the period on which the figures is based).

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	Total
9.93	11.67	10.47	12.15	5.91	0.46	0.15	0.82	0.62	0.40	1.45	3.29	52.23

Average for 10 years 1952—53 to 1961—62.
13. Irrigation facilities available ; year from which the facilities were made available. Proper irrigation is not yet available. Irrigation of some areas done by portable pumps from the adjoining canal. 1952
14. Whether any proper drainage system exists. Yes.
15. Any other information regarding the farm. Latitude : 22°45', Longitude : 88°26' and Altitude : 30'.

Crop :- Jute.

Ref :- J.A.R.I. 52(61).

Type :- 'C'.

Object :-To compare the effect of line sowing with broadcasting.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Jute. (c) Nil. (ii) (a) Light sandy loam. (b) Refer item 11 on page 99. (iii) 23.4.1952. (iv) (a) 5 ploughings and cross ploughing followed by laddering. (b) As per treatments. (c) N.A. (d) As per treatments. (e) —. (v) Compost at 3 ton/ac. at the time of general preparation of land. (vi) D-154 (capsularis, late). (vii) Unirrigated. (viii) Broadcasting—3 hand weedings. No thinning—3 to 4 wheel hoeings between lines. Spacings—1st hand weeding and thinning to proper spacing. 3 to 4 wheel hoeings between lines. (ix) 53.73" approximately. (x) 20.9.1952.

2. TREATMENTS :

1. Broadcasting.
2. No thinning $\times 12''$ spacing.
3. $2'' \times 12''$ spacing.
4. $3'' \times 12''$ spacing.
5. $4'' \times 12''$ spacing.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) $50' \times 16'$. (b) $48' \times 14'$. (v) 1' border around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Stand, green weight and fibre weight. (iv) (a) 1948 to 1952. (b) No. (c) Nil. (v) (a) Carried out at Chinsurah from 1948—51. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2123 lb./ac.
(ii) 156.8 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of fibre in lb./ac.

Treatment	Av. yield
1.	1807
2.	2038
3.	2304
4.	2354
5.	2113
S.E./mean	=78.4 lb./ac.

Crop :- Jute.

Ref :- J.A.R.I. 52(62).

Type :- 'C'.

Object :-To compare the effect of line showing with broadcasting.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Jute. (c) Nil. (ii) (a) Light sandy loam. (b) Refer item 11 on page 99. (iii) 27.4.1952. (iv) (a) 5 ploughings and cross ploughing followed by laddering. (b) As per treatments. (c) N.A. (d) As per treatments. (e) —. (v) Compost at 3 ton/ac. at the time of general preparation of land. (vi) C G. (olitorins, medium). (vii) Unirrigated. (viii) Broadcasting—3 hand weedings. No thinning—3 to 4 wheel hoeings. Spacings—1st hand weeding and thinning to requisite spacing. 3-4 wheel hoeings between lines. (ix) 53.73" approximately. (x) 15.9.1952.

2. TREATMENTS :

1. Broadcasting.
2. No thinning $\times 12''$ spacings.
3. $2'' \times 12''$ spacings.
4. $3'' \times 12''$ spacings.
5. $4'' \times 12''$ spacings.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) $50' \times 16'$. (b) $48' \times 14'$. (v) 1' border around. (vi) Yes.

4. GENERAL :

- (i) Good. (ii) N.A. (iii) Stand, green weight and fibre weight. (iv) (a) 1948 to 1952. (b) No. (c) Nil.
 (v) (a) Carried out from 1948 to 1951 at Chinsurah. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2413 lb./ac.
 (ii) 137.8 lb./ac.
 (iii) Treatment differences are significant.
 (iv) Av. yield of fibre in lb./ac.

Treatment	Av. yield
1.	2166
2.	2463
3.	2408
4.	2518,
5.	2510
S.E./mean	=68.9 lb./ac.

Crop :- Roselle.

Ref :- J.A.R.I. 52(68). Type :- 'C'.

Object :- To study the effect of spacings and stages of harvest on the yield of fibre.

1. BASAL CONDITIONS:

- (i) (a) Nil. (b) Jute. (c) N.A. (ii) (a) Sandy loam. (b) Refer item 11 on page 99. (iii) 29.4.1952. (iv) (a) 4 ploughings and laddering. (b) Broadcast etc. (c) 20 lb./ac. for broadcast sowing and for others according to spacings. (d) As per treatments. (e) —. (v) Compost at 3 ton/ac. applied at the time of general preparation of land. (vi) R.T. 1 (medium). (vii) Unirrigated. (viii) 3 weedings for broadcast sowing 3 weedings and thinning to requisite spacings for others. (ix) 67.75" approximately. (x) As per treatments.

2. TREATMENTS :

Main-plot treatments :

5 spacings : S_1 =Broadcasting, S_2 =No thinning $\times 12''$, S_3 = $2'' \times 12''$, S_4 = $4'' \times 12''$ and S_5 = $5'' \times 12''$.

Sub-plot treatments :

3 harvesting stages : H_1 =At bud (10.11.1952), H_2 =At flowering (14.12.1952) and H_3 =At pod (15.12.1952).

3. DESIGN :

- (i) Split-plot. (ii) (a) 5 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) main-plot $32' \times 17'$; sub-plot N.A. (b) Sub-plot $10' \times 15'$. (v) 1' border around each plot. (vi) Yes.

4. GENERAL :

- (i) Fair. (ii) N.A. (iii) Stand count, green weight and fibre yield. (iv) (a) 1949—1953. (b) No. (c) Nil.
 (v) (a) Conducted at Chinsurah from 1949 to 1951. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1571 lb./ac.
 (ii) (a) 223.6 lb./ac.
 (b) 217.7 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of fibre in lb./ac.

	S_1	S_2	S_3	S_4	S_5	Mean
H_1	1567	1478	1588	1635	1739	1601
H_2	1643	1548	1529	1493	1628	1563
H_3	1580	1478	1510	1691	1455	1543
Mean	1598	1501	1542	1606	1607	1571

S.E. of difference of two	
1. S marginal means	= 74.5 lb./ac.
2. H marginal means	= 56.2 lb./ac.
3. H means at the same level of S	= 120.3 lb./ac.
4. S means at the same level of H	= 125.7 lb./ac.

Crop :- Roselle.

Ref :- J.A.R.I. 53(84).

Type :- 'C'.

Object :- To study the effect of spacing and stages of harvest on the yield of fibre.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Roselle. (c) Compost at 3 ton/ac. (ii) (a) Sandy oam. (b) Refer item 11 on page 99. (iii) 9.5.1953. (iv) (a) 4 ploughings and laddering. (b) Broadcasting etc. (c) 20 lb./ac. for broadcast sowing and for others according to spacing. (d) As per treatments. (e) —. (v) Compost at 3 ton/ac. applied at the time of general preparation of land. (vi) R.T. 1 (medium). (vii) Unirrigated. (viii) 3 weedings for broadcast sowing and 3 weedings and thinning to proper spacing for others. (ix) 55.28" approximately. (x) As per treatments.

2. TREATMENTS :

Main-plot treatments :

5 spacings : S_1 =Broadcasting, S_2 =No thinning $\times 12''$, $S_3=2'' \times 12''$, $S_4=4'' \times 12''$ and $S_5=6'' \times 12''$.

Sub-plot treatments :

3 harvesting stages : H_1 =At bud (9.11.1953), H_2 =At flowering (24.12.1952) and H_3 =At pod (15.12.1952).

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) main-plot $32' \times 17'$; sub-plot N.A. (b) main-plot $30' \times 15'$; sub-plot $10' \times 15'$. (v) 1' border around each main-plot. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Stand count, green weight and fibre yield. (iv) (a) 1949—1953. (b) No. (c) Nil. (v) (a) Conducted at Chinsurah during 1949-1951. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1816 lb./ac.
(ii) (a) 238.1 lb./ac.
(b) 183.0 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of fibre in lb./ac.

	S_1	S_2	S_3	S_4	S_5	Mean
H_1	1835	1743	1832	1761	1774	1789
H_2	1941	1844	1905	1811	1663	1833
H_3	2056	1681	1683	1861	1842	1825
Mean	1944	1756	1807	1811	1760	1816

S.E. of difference of two

1. S marginal means	= 79.4 lb./ac.
2. H marginal means	= 47.3 lb./ac.
3. H means at the same level of S	= 105.6 lb./ac.
4. S means at the same level of H	= 122.5 lb./ac.

Crop :- Roselle.

Ref :- J.A.R.I. 53(81).

Type :- 'C'.

Object :- To find out optimum date of sowing.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Roselle. (c) Nil. (ii) (a) Sandy loam. (b) Refer item 11 on page 99. (iii) As per treatments. (iv) (a) 4-5 ploughings and harrowings. (b) N.A. (c) 15 lb./ac. (d) 12' x 9'. (e) 2 seed/hole at a depth of 3". (v) Compost at 3 ton/ac. broadcasted at the time of general preparation of land. (vi) R.T.I. (medium). (vii) Irrigated. (viii) 3 weedings and wheel hoeing. Thinning once to single plant/point. (ix) 55.28". (x) 3.12.1953.

2. TREATMENTS :

14 sowing dates : $D_1=3.3.1953$, $D_2=17.3.1953$, $D_3=31.3.1953$, $D_4=14.4.1953$, $D_5=28.4.1953$, $D_6=12.5.1953$, $D_7=26.5.1953$, $D_8=9.6.1953$, $D_9=24.6.1953$, $D_{10}=7.7.1953$, $D_{11}=21.7.1953$, $D_{12}=5.8.1953$, $D_{13}=18.8.1953$ and $D_{14}=1.9.1953$.

3. DESIGN :

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) 11' x 9'. (b) 9' x 7'. (v) 1' border around each plot. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Stand, green weight and fibre weight. (iv) (a) 1953 to 1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 575 lb./ac.

(ii) 207.4 lb./ac.

(iii) Treatments are highly significantly different.

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

Treatment	Av. yield	Treatment	Av. yield	Treatment	Av. yield
1.	1236	6.	642	11.	225
2.	1130	7.	548	12.	99
3.	1018	8.	604	13.	90
4.	880	9.	451	14.	28
5.	669	10.	436		

S.E./mean = 103.7 lb./ac.

Crop :- Roselle.

Ref :- J.A.R.I. 51(35).

Type :- 'C'.

Object :- To find the optimum seed rate.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer item 11 on page 99. (iii) 18.6.1951. (iv) (a) 4 ploughings and laddering. (b) N.A. (c) As per treatments (d) and (e) N.A. (v) Compost at 3 ton/ac. at the time of general preparation of land. (vi) R.T. 2 (medium). (vii) Unirrigated. (viii) Weeding thrice by hand. (ix) 48.12". (x) 20.10.1951.

2. TREATMENTS :

7 seed rates : $R_1=5$, $R_2=10$, $R_3=15$, $R_4=20$, $R_5=25$, $R_6=30$ and $R_7=35$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) 24' x 15'. (b) 22' x 13'. (v) 1' border around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Stand, green weight and fibre weight. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1910 lb./ac.

(ii) 161.3 lb./ac.

(iii) Treatments are not significantly different.

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

Treatment	Av. yield	Treatment	Av. yield
R ₁	1827	R ₅	1889
R ₂	2097	R ₆	1879
R ₃	1917	R ₇	1758
R ₄	2005		
	S.E./mean		=72.1 lb./ac.

Crop :- Roselle.**Ref :- J.A.R.I. 52(63).****Type :- 'C'.**

Object :—To find out optimum seed rate.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer item 11 on page 99. (iii) 28.4.1952. (iv) (a) 4 ploughings and laddering. (b) Broadcasted. (c) As per treatments. (d) and (e) —. (v) Compost at 3 ton/ac. applied at the time of general preparation of land. (vi) R.T. 2 (medium). (vii) Unirrigated. (viii) 3 hand weedings. (ix) 61.75%. (x) 29, 30.11.1952.

2. TREATMENTS :

8 seed rates : R₁=5, R₂=10, R₃=15, R₄=20, R₅=25, R₆=30, R₇=35 and R₈=40 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 25'×15' (b) 22'×13'. (v) 1' border around (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Stand, green weight and fibre weight. (iv) (a) 1951—1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 2111 lb./ac.

(ii) 315.3 lb./ac.

(iii) Treatments are highly significantly different.

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

Treatment	Av. yield	Treatment	Av. yield
R ₁	2429	R ₅	2115
R ₂	2463	R ₆	1809
R ₃	2316	R ₇	1849
R ₄	2169	R ₈	1734
	S.E./mean		=141.1 lb./ac.

Crop :- Roselle.**Ref :- J.A.R.I. 53(82).****Type :- 'C'.**

Object :—To find out optimum seed rate.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer item 11 on page 99. (iii) 8.5.1953. (iv) (a) 4 ploughings and laddering. (b) Broadcast. (c) As per treatments. (d) and (e) —. (v) Compost at 3 ton/ac. applied at the time of general preparation of land. (vi) R.T. 2 (medium). (vii) Unirrigated. (viii) Weeding thrice by hand. (ix) 53.82% approximately. (x) 27.11.1953.

2. TREATMENTS :

8 seed rates : R₁=5, R₂=10, R₃=15, R₄=20, R₅=25, R₆=30, R₇=35 and R₈=40 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 24'×15'. (b) 22'×13'. (v) 1' border around. (vi) Yes.

4. GENERAL :

- (i) Good. (ii) N.A. (iii) Stand, green weight and fibre weight. (iv) (a) 1951—1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2163 lb./ac.
 (ii) 285.7 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of fibre in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
R ₁	2191	R ₅	2182
R ₂	2409	R ₆	2144
R ₃	2309	R ₇	1880
R ₄	2177	R ₈	2010

S.E./mean = 127.8 lb./ac.

Crop :- Mesta.

Ref :- J.A.R.I. 52(67).

Type :- 'C'.

Object :- To find out optimum seed rate for Mesta.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Jute. (c) Nil. (ii) (a) Sandy loam. (b) Refer item 11 on page 99. (iii) 27.4.1952. (iv) (a) 4 ploughings and ladderings. (b) Broadcast. (c) As per treatments. (d) and (e) —. (v) Compost at 3 ton/ac. applied at the time of general preparation of land. (vi) M.T. 15 (medium). (vii) Unirrigated. (viii) Weeding and mulching on 13.5.1952 and 2.6.1952. (ix) 49.46" (approximately). (x) Sept., 1952.

2. TREATMENTS :

8 seed rates : R₁=5, R₂=10, R₃=15, R₄=20, R₅=25, R₆=30, R₇=35 and R₈=40 lb./ac.

3. DESIGN :

- (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 14' × 10'. (b) 12' × 8'. (v) 1' border around each plot. (vi) Yes.

4. GENERAL :

- (i) Fair. (ii) Attacked with stem rot on 16.7.1952. Perenox sprayed once on 20.7.1952. (iii) Stand, green weight and fibre yield. (v) (a) 1952 to 1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1269 lb./ac.
 (ii) 163.3 lb./ac.
 (i.i) Treatments are significantly different.
 (iv) Av. yield of fibre in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
R ₁	1044	R ₅	1391
R ₂	1277	R ₆	1236
R ₃	1426	R ₇	1263
R ₄	1244	R ₈	1273

S.E./mean = 73.0 lb./ac.

Crop :- Mesta (Kharif).

Ref :- J.A.R.I. 53(85).

Type :- 'C'.

Object :- To find out optimum seed rate of Mesta.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Mesta. (c) Compost at 3 ton/ac. (ii) (a) Sandy loam. (b) Refer item 11 on page 99. (iii) 16.6.1953. (iv) (a) 4 ploughings and ladderings. (b) Broadcast. (c) As per treatments. (d) and (e) —. (v) Compost at 3 ton/ac. applied at the time of general preparation of land. (vi) M.T. 15 (medium). (vii) Unirrigated. (viii) Weeding and mulching twice (ix) 51.53" approximately. (x) 14.9.1953.

2. TREATMENTS :

8 seed rates : $R_1=5$, $R_2=10$, $R_3=15$, $R_4=20$, $R_5=25$, $R_6=30$, $R_7=35$ and $R_8=40$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) $14' \times 10'$. (b) $12' \times 8'$. (v) 1' border around. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Stand count, green weight and fibre yield. (iv) (a) 1952 to 1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1268 lb./ac.
 (ii) 192.4 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of fibre in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
R_1	1476	R_5	1284
R_2	1503	R_6	1165
R_3	1365	R_7	1079
R_4	1292	R_8	978
S.E./mean		=86.0 lb./ac.	

Crop :- Mesta.

Ref :- J.A.R.I. 53(80).

Type :- 'C'.

Object :- To find out optimum date of sowing.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Mesta. (c) N.A. (ii) (a) Sandy loam. (b) Refer item 11 on page 99. (iii) As per treatments. (iv) (a) 4-5 ploughings and harrowing. (b) and (c) N.A. (d) Plants 6" and rows 1' apart. (e) 2 seeds/hole at a depth of about 3". (v) Compost at 3 ton/ac. applied at the time of general preparation of land. (vi) M.T. 15 (medium). (vii) Irrigated. (viii) 3 weedings and wheel hoeings. Thinning once to single plant/point. (ix) 51.53%. (x) 1.9.1953 for treatments D_1 to D_5 ; 12.9.1953 for treatments D_6 to D_{10} .

2. TREATMENTS :

10 sowing dates : $D_1=3.3.1953$, $D_2=17.3.1953$, $D_3=31.3.1953$, $D_4=14.4.1953$, $D_5=28.4.1953$, $D_6=12.5.1953$, $D_7=26.5.1953$, $D_8=9.6.1953$, $D_9=24.6.1953$ and $D_{10}=7.7.1953$.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) $11' \times 9'$. (b) $9' \times 7'$ (v) 1' border around each plot. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Slight attack of stem-rot. N.A. (iii) Stand, green weight and fibre weight. (iv) 1953 to 1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1014 lb./ac.
 (ii) 200.5 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of fibre in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
D_1	1530	D_6	1334
D_2	1497	D_7	856
D_3	1746	D_8	235
D_4	1434	D_9	83
D_5	1374	D_{10}	55
S.E./Mean		=100.2 lb/ac.	

CENTRAL TOBACCO RESEARCH INSTITUTE

RAJAHMUNDRY

PROFORMA GIVING DETAILS OF EXPERIMENTAL STATION

1. Name of the experimental station. Central Tobacco Research Institute with a farm of about 117 acres.
2. Tehsil or Taluka. Rajahmundry.
3. District. East Godavary.
4. Address. Director, Central Tobacco Research Institute, Rajahmundry.
5. Year of establishment. 1947.
6. Distance from nearest railway station with the name of nearest railway station. Godavary R.S. 1 mile from the Institute and 2½ miles from the farm (Kateru).
7. Programme of research. This Institute is engaged in fundamental and applied research with special reference to F.C.V. tobacco.
8. Normal cropping pattern. Tobacco after tobacco.
9. Type of tract it represents. F.C.V. tobacco tract.
10. General description of topography of the experimental area. The farm is situated at Kateru, 3 miles from Rajahmundry, towards the extreme end of the western side of Kateru village near Godavary bund. The farm is surrounded by F.C.V. tobacco fields.
11. Soils.
 - (a) Broad soil types.
 - (i) Depth. Very deep. The rock is found at a depth of 30 to 52 feet.
 - (ii) Colour.

0—9"—Black

9"—18"—Black

18"—47"—Deep grey.

47"—72"—Deep grey with light patches.

72"—96"—Deep grey with grey patches.
 - (iii) Structure. Angular blocky.
 - (b) Chemical analysis if available with pH value.

Depth (inches)	pH	Organic carbon	Organic Matter	Total N	Available P ₂ O ₅	Total soluble salts	Chlorides
0—9"	8.2	0.48	0.82	0.035	0.033	0.068	0.0012
9—18"	7.5	0.44	0.75	0.029	0.038	0.057	0.0011
18—36"	8.1	0.47	0.80	0.026	0.028	0.053	0.0013
36—54"	8.2	0.49	0.84	0.028	0.031	0.067	0.0012
54—72"	8.2	0.45	0.78	0.026	0.020	0.067	0.0026
72—87"	8.3	0.42	0.73	0.021	0.022	0.078	0.0043
87—120"	8.3	0.42	0.72	0.022	0.013	0.077	0.0036

(c) Mechanical analysis (if available).
(Indicate the % of various constituents analysed for)

Depth (inches)	Coarse sand	Fine sand	Silt	Clay	CaCO ₃
0—9"	1.5	17.0	22.3	56.5	1.5
9—18"	0.6	11.4	25.1	61.8	0.3
18—36"	0.3	12.5	24.8	62.4	0.2
36—54"	0.4	10.8	26.2	63.9	0.1
54—72"	0.4	11.5	25.2	63.3	0.0
72—87"	0.1	13.9	27.0	59.4	0.2
87—120"	0.1	13.8	27.4	60.2	0.0

12. Normal average rainfall in mms (month-wise).

Meteorological week	Month	Rainfall in mms. (Decennial average 1953—62)
23—26	June	162.68
27 - 30	July	203.56
31—35	August	195.34
36—39	September	157.02
40—44	October	222.56
45—48	November	14.49
49—52	December	4.77
1 - 5	January	9.34
6— 9	February	15.45
10—13	March	10.15
14—17	April	12.15
18—22	May	79.88
		<hr/> 1087.39 <hr/>

13. Irrigation facilities available; year from which the facilities were made available. Yes, from 1960.
14. Whether any proper drainage system exists. Yes.
15. Any other information regarding the farm. Nil.

Crop :- Tobacco.

Ref :- C.T.R.I. 49(3).

Type :- 'M'.

Object :- To study the most suitable form in which 'N' can be applied to Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 8.11.1949. (iv) 3 to 4 ploughing with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33" x 33". (e) 1. (v) Nil. (vi) N.A. (vii) Nil. (viii) N.A. (ix) N.A. (x) 24.1.1950 to 31.3.1950.

2. TREATMENTS :

5 sources of N and a control : S₁= Ammo. Phos., S₂=A/S, S₃=A/N, S₄=Pot. Nit. and S₅=G.N.C. Different sources are applied on 24.10.1949 to give 20 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 8. (iv) (a) 16½' x 38½'. (b) 11' x 33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Green leaf and cured leaf yield. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a), (b) N.A. (vi) and (vii) N.A.

5. RESULTS :

- (i) 508 lb./ac.
(ii) 104.9 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of cured leaf in lb./ac.

Treatment	Av. yield
Control	424
S ₁	573
S ₂	522
S ₃	479
S ₄	546
S ₅	501
S.E /mean	=37.1 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 50(4).

Type :- 'M'.

Object :- To study the most suitable form in which 'N' can be applied.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 3 replications on 18.11.1950 while other 5 on 20.11.1950. (iv) (a) 3-4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33" x 33". (e) One. (v) Nil. (vi) N.A. (vii) Nil. (viii) Gaps filled on 26.11.1950. (ix) N.A. (x) 5.2.1951, 19.2.1951, 28.2.1951 and 21.3.1951.

2. TREATMENTS :

4 sources of N and 2 controls : S₁=A/S, S₂= Ammo. Phos. S₃=Pot. Nit and S₄= G.N.C. Different sources applied on 14.11.1950 to give 20 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 8. (iv) (a) 16½' x 38½'. (b) 11' x 33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Green leaf yield, etc. (iv) (a) 1949—1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 866 lb./ac.
(ii) 132 lb./ac.
(iii) Treatment differences are not significant.

(iv) Av. yield of cured leaf in lb./ac.

Treatment	Av. yield
Control	853
S ₁	890
S ₂	850
S ₃	890
S ₄	858
S.E./mean	=46.7 lb./ac.

Crop :- Tobacco.**Ref :- C.T.R.I. 51(6). Type :- 'M'.**

Object :- To compare the effect of different nitrogenous manures on the yield and quality of Cigarette Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sorghum*. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 26.10.1951. (iv) (a) 3-4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33"×33". (e) 1. (v) Nil. (vi) Cigarette Tobacco. (vii) Nil. (viii) Gap filling, hand weeding and interculture with junior hoe. (ix) N.A. (x) 9.1.1952 to 25.2.1952.

2. TREATMENTS :

5 sources of N and a control : S₁= Ammo. Phos., S₂=A/S, S₃=A/N, S₄=Pot. Nit. and S₅=G.N.C. Different sources broadcast 15 days prior to planting to give 20 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) 22'×49.5'. (b) 16.5'×44'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Transplants established very well. Earlier growth was satisfactory. Subsequently the plants suffered badly. Development of leaf was poor. This was probably due to the previous crop of *Sorghum*. (ii) Nil. (iii) Green leaf yield and cured leaf yield. (iv) (a) 1949—1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 349.7 lb./ac.

(ii) 51.24 lb./ac.

(iii) Treatment differences are not significant.

(iv) Av. yield of cured leaf in lb./ac.

Treatments	Av. yield
Control	275.1
S ₁	359.8
S ₂	365.1
S ₃	304.2
S ₄	399.5
S ₅	394.2
S.E./mean	=22.5 lb./ac.

Crop :- Tobacco.**Ref :- C.T.R.I. 52(7). Type :- 'M'.**

Object :- To find out the effect of green manuring with maize and application of F.Y.M. and their residual effect on the yield of Cigarette Tobacco.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 29.10.1952. (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33"×33". (e) 1. (v) Nil. (vi) N.A. (vii) Pot watering on 1.11.1952. (viii) Gap filling and hand weeding. Intercultures with planet junior hoe. (ix) N.A. (x) 27.1.1953 to 24.3.1953.

2. TREATMENTS :

Main-plot treatments :

3 organic treatments : M_0 =Fallow in *Kharif* 1952 ; M_1 =Fallow in *Kharif* 1952 and F.Y.M. at 10 tons/ac. and M_2 =Maize in *Kharif* 1952.

Sub-plot treatments :

2 levels of N : N_0 =No manure and N_1 =20 lb. N/ac. as A/S.

Maize dibbled on 25.7.1952 and buried on 10, 12.9.1953. A/S applied on 25.10.1952.

3. DESIGN :

(i) Split plot. (ii) (a) 3 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) 1/40 ac. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Abnormal season of short rain fall with poor establishment of transplants. The crop improved later on. Fields very high but quality of leaf poor. (ii) Nil. (iii) Green weight, percentage of bright grades and stalk weight, etc. (iv) (a) 1952 and 1953. (b) No. (c) Nil. (v) (a), (b) N.A. (vi) Nil. (vii) Only 5 replications were taken into account for analysis. Experiment was laid out with 8 replications originally.

5. RESULTS :

- (i) 1186 lb./ac.
 (ii) (a) 153.7 lb./ac.
 (b) 146.7 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. wt. of cured leaf in lb./ac.

	M_0	M_1	M_2	Mean
N_0	1207	1146	1167	1173
N_1	1185	1257	1154	1199
Mean	1196	1201	1160	1186

S.E. of difference of two

1. M marginal means =68.73 lb./ac.
 2. N marginal means =53.57 lb./ac.
 3. N means at the same level of M =92.78 lb./ac.
 4. M means at the same level of N =95.02 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 53(7).

Type :- 'M'.

Object :- To find out the residual effect of green manuring with maize and application of F.Y.M. on the yield and quality of Cigarette Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) As per treatments. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) N.A. (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33" x 33". (e) 1. (v) Nil. (vi) N.A. (vii) Nil. (viii) N.A. (ix) 15.16". (x) 13.2.1954 and 17.2.1954.

2. TREATMENTS :

Main-plot treatments :

3 organic treatments : M_0 =Fallow in *Kharif* 1952 ; M_1 =Fallow in *Kharif* 1952 and F.Y.M. at 10 tons/ac. and M_2 =Maize in *Kharif* 1952.

Sub-plot treatments :

2 levels of N : N_0 =No manure and 20 lb. N/ac. as A/S.

Maize dibbled and lined

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 1/40 ac. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Green leaf yield, cured leaf yield and percentage of bright grades. (iv) (a) 1952 to 1953. (b) No. (c) Nil. (v) (a), (b) N.A. (vi) Nil. (vii) 6 replications in the original experiment. But flood made the site of the experiment heterogeneous. Hence only 2 replications in 1953-54 are taken for analysis.

5. RESULTS :

- (i) 830.0 lb./ac.
 (ii) (a) 66.12 lb./ac.
 (b) 261.2 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of cured leaf in lb./ac.

	M ₀	M ₁	M ₂	Mean
N ₀	868	726	676	757
N ₁	664	1251	795	903
Mean	766	988	735	830

S.E. of difference of two

1. M marginal means = 46.75 lb./ac.
2. N marginal means = 150.8 lb./ac.
3. N means at the same level of M = 261.2 lb./ac.
4. M means at the same level of N = 190.5 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 52(8) Type :- 'M'.

Object :- To find out whether C/N can replace A/S in manuring Cigarette Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 12.11.1952. (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33" x 33". (e) 1. (v) Nil. (vi) Cigarette tobacco. (vii) Nil. (viii) Gaps filled on 23.11.1952, 13% interculture with junior hoe on 4.12.1952. (ix) N.A. (x) 9.2.1953 to 10.4.1953.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 levels of F.Y.M. as basal dressing : F₀=0 and F₁=3 ton/ac. of F.Y.M.
- (2) 5 manurial doses : M₀=No manure, M₁=20 lb./ac. of N as A/S, M₂=40 lb./ac. of N as A/S, M₃=20 lb./ac. of N as C/N and M₄=40 lb./ac. of N as C/N.

3. DESIGN :

(i) 2x5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 1/40 ac. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Due to peculiar seasonal condition the crop remained dark green with unmaturing leaves and first picking did not cure well. Subsequent 2 pickings were uniform. Sun cured. The yield of green leaf only could be compared. (ii) Nil. (iii) Only green leaf. (iv) (a) Not continued. (b) and (c) —. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 8463 lb./ac.
 (ii) 718.3 lb./ac.
 (iii) None of the effects is significant.

(iv) Av. yield of green leaf in lb./ac.

	M ₀	M ₁	M ₂	M ₃	M ₄	Mean
F ₀	8900	8336	8300	8253	8966	8551
F ₁	8300	7913	8550	8808	8306	8375
Mean	8600	8125	8425	8531	8636	8463

S.E. of F marginal mean =160.6 lb./ac.

S.E. of M marginal mean =254.0 lb./ac.

S.E. of body of table =359.1 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 52(2). Type :- 'M'.

Object :—To study the effect of time of application of A/S and G.N.C.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow in 1951. (c) Nil. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 28.10.1953. (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33"×33". (e) 1. (v) M.C. at 3 tons/ac. (vi) N.A. (vii) Irrigated. (viii) Gap filling on 17.11.1952, 10% hand weeding on 2.12.1952 interculture with planet junior hoe on 5.11.1952, 28.11.1952 and 10.12.1952. (ix) N.A. (x) 7.1.1953 to 6.3.1953.

2. TREATMENTS :

All combinations of (1), (2) and (3)+one control (no manure).

(1) 2 times of application : T₁=Early mid. September on 27.9.1952 and T₂=Late mid. October on 22.6.1952.(2) 2 sources of N : S₁=A/S and S₂ as G.N.C.(3) 2 levels of N : N₁=20 lb./ac. of N and N₂=40 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) 1/48 ac. (b) 1/69 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Abnormal season of short rain face with poor establishment of transplants. The crop improved late : Fields were very high but quality of leaf poor. (ii) Nil. (iii) Green leaf yield, percentage of bright grades, etc. (iv) (a) Not continued. (b) and (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment laid for 4 replications. Only 3 replications taken into account for analysis.

5. RESULTS :

(i) 983 lb./ac.

(ii) 153.0 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of cured leaf in lb./ac.

Control=950 lb./ac

	S ₁	S ₂	Mean	T ₁	T ₂
N ₁	956	1126	1046	1043	1049
N ₂	998	948	973	1001	945
Mean	982	1037	1010	1022	997
T ₁	950	1094			
T ₂	1013	981			

S.E. of any marginal mean =44.2 lb./ac.

S.E. of body of any table or control mean =62.4 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 52(9).

Type :- 'M'.

Object :- To compare the effects of A/S, Pot. Nit. and A/S/N as sources of N on the yield and quality of Cigarette Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 13.11.1952. (iv) (a) 3 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33" x 33". (e) One. (v) Nil. (vi) Cigarette Tobacco. (vii) Nil. (viii) Gap filling and interculture with junior hoe. (ix) N.A. (x) 10.2.1953 to 10 4.1953.

2. TREATMENTS :

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

(1) 3 sources of N : $S_1=A/S$, $S_2=Pot. Nitrate$ and $S_3=A/S/N$.

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

Manures applied on 8.11.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 1/40 ac. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Abnormal season of short rainfall with poor establishment of transplants. The crop improved later on. Yields very high but quality of leaf poor. (ii) Nil. (iii) Only green leaf yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 8017 lb./ac.

(ii) 644.2 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of green leaf in lb./ac.

	Control = 809 lb./ac.			
	S_1	S_2	S_3	Mean
N_1	8072	7488	8422	7994
N_2	7570	7894	8184	7881
Mean	7821	7691	8303	7938

S.E. of S marginal mean = 227.8 lb./ac.

S.E. of N marginal mean = 186.0 lb./ac.

S.E. of body of table or control mean = 322.1 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 53(2).

Type :- 'M'.

Object :- To compare the effect of A/S, C/N and A/S/N as sources of N on the yield and quality of Cigarette Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 7.11.1953. (iv) (a) 3-4 ploughings with country plough. (b) Seedlings transplanted. (c) 5760 plants/ac. (d) 33" x 33". (e) One. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Gap filling interculturing with the planet junior hoe and ploughing. (ix) 15.16". (x) 23.1.1954 to 7.3.1954.

2. TREATMENTS :

All combinations of (1) and (2)+control (2 plots/block)

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

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

Manures applied as top dressing on 4.11.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 22' x 38.5'. (b) 16.5' x 33.0'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Not satisfactory due to floods in August 1953. (ii) Nil. (iii) Yield of green leaf, cured leaf, percentage of bright grades and stalk weight. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 5933 lb./ac.
(ii) 904.8 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of green leaf in lb./ac.

	Control =5801 lb./ac.			Mean
	S ₁	S ₂	S ₃	
N ₁	6455	5929	5758	6047
N ₂	6088	5785	5847	5907
Mean	6272	5857	5803	5977

S.E. of marginal mean of S or control =261.2 lb./ac.
S.E. of marginal mean of N =213.3 lb./ac.
S.E. of body of table =369.4 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 51(3). Type :- 'M'.

Object :- To find out the difference, if any, between broadcast application and placement of manure in furrows.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 26.10.1951 and 3.11.1951. (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33'×33'. (e) 1. (v) Nil. (vi) N.A. (vii) Nil. (viii) Gap filling and hand weeding. Planet junior cultivator worked. (ix) N.A. (x) 9, 20 and 31.1.1952.

2. TREATMENTS :

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

- (1) 3 levels of N : N₀=0, N₁=20 and N₂=40 lb./ac. of N.
(2) 3 sources of N : S₁=A/S, S₂=G.N.C. and S₃=½ A/S+½ G.N.C.
(3) 2 methods of application of N : M₁=Broadcast and M₂=Drilling.
Manures applied on 26.10.1951 and 2.11.1951.

3. DESIGN :

(i) 3×3×2 Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) 22'×44'. (b) 16.5'×38.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Green leaf yield, etc. (iv) (a) 1951 to 1952. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1047 lb./ac.
(ii) 142.1 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of cured leaf in lb./ac.

	S ₁	S ₂	S ₃	Mean	M ₁	M ₂
N ₁	1074	926	976	992	988	996
N ₂	1059	1051	1040	1050	1049	1051
N ₃	1074	1142	1081	1099	1081	1117
Mean	1069	1040	1032	1047	1039	1055
M ₁	1071	1028	1018	1039		
M ₂	1066	1051	1046	1055		

S.E. of N or S marginal mean	=29.0 lb./ac.
S.E. of M marginal mean	=23.7 lb./ac.
S.E. of body of N×S table	=50.2 lb./ac.
S.E. of body of N×M or S×M table	=41.1 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 52(4). Type :- 'M'.

Object :—To find out the difference between broadcast application and placement of manures in furrows.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Tobacco. (c) As per treatments. (ii) (a) Heavy black soil. Refer item 11 on page 107. (iii) 20.10.1952. (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33"×33". (e) 1. (v) Nil. (vi) N.A. (vii) Nil. (viii) Gap filling, hand weeding and intercultures. (ix) N.A. (x) 17.1.1953 to 21.3.1953.

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 sources of N : $S_1=A/S$, $S_2=G.N.C.$ and $S_3=\frac{1}{2} A/S + \frac{1}{2} G.N.C.$
 (3) 2 methods of application of N : $M_1=Broadcast$ and $M_2=Drilling$.

Manures applied on 6.10.1952.

3. DESIGN :

- (i) 3×3×2 Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) 22'×44'. (b) 16.5'×38.5'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Abnormal season of short rainfall with poor establishment of transplants. The crop improved later. Yields very high but quality of leaf poor. (ii) Nil. (iii) Green leaf weight., percentage of bright grades etc. (iv) (a) 1951 to 1952. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 876.1 lb./ac.
 (ii) 132.1 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of cured leaf in lb./ac.

	S_1	S_2	S_3	Mean	M_1	M_2
N_0	798	870	849	839	817	861
N_1	915	809	947	890	926	854
N_2	888	847	962	899	925	873
Mean	867	842	919	876	889	863
M_0	866	881	921			
M_1	868	803	917			

S.E. of N or S marginal mean	=27.0 lb./ac.
S.E. of M marginal mean	=22.0 lb./ac.
S.E. of body of N×S table	=46.7 lb./ac.
S.E. of body of M×S or M×N table	=38.1 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 52(1).

Type :- 'M'.

Object :-To find out whether the availability of manures to plants under local conditions is influenced by the application of Sulphur and Lime.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 11.11.1952. (iv) (a) 3-4 ploughings with country plough. (b) Seedlings transplanted. (c) 5760 plants/ac. (d) 33"×33". (e) 1. (v) M.C. at 3 ton/ac. broadcast before the onset of monsoon. (vi) N.A. (vii) Nil. (viii) 11% gap filling on 26.11.1952. (ix) N.A. (x) 6.2.1953 to 20.3.1953.

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. of N.

(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=50$ lb./ac. of P_2O_5 .

(3) 3 manures : $M_0=Control$, $M_1=\frac{1}{2}$ ton Sulphur and $M_2=\frac{1}{2}$ ton Lime.

Manures applied on 5, 6.11.1952.

3. DESIGN :

(i) 2×2×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 16.5'×33'. (b) 11'×27.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Abnormal season of short rainfall with poor establishment of transplants. The crop improved later. Fields were very high but quality of leaf was poor. (ii) Nil. (iii) Green leaf and bright grades percentage. (iv) (a) 1952—1953. (b) Nil. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1257 lb./ac.

(ii) 166.5 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of cured leaf in lb./ac.

	N_0	N_1	Mean	P_0	P_1
M_0	1251	1186	1219	1171	1266
M_1	1222	1262	1242	1278	1206
M_2	1314	1306	1310	1333	1286
Mean	1262	1251	1257		
P_0	1246	1275	1261		
P_1	1278	1227	1253		

S.E. of N or P marginal mean

=33.99 lb./ac.

S.E. of M marginal mean

=41.60 lb./ac.

S.E. of body of M×N or M×P table

=58.87 lb./ac.

S.E. of body of N×P table

=47.79 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 53(8).

Type :- 'M'.

Object :-To find out whether the availability of manures to plants under local condition is influenced by application of Sulphur and Lime applied in the previous year.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) As per treatments. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107 (iii) 31.10.1953. (iv) (a) N.A. (b) Transplanted. (c) 5760 plants/ac. (d) 33"×33". (e) One. (v) Nil. (vi) N.A. (vii) Nil. (viii) Gap-filling, hand weeding and intercultures. (ix) 15.16". (x) 18.1.1954 to 28.2.1954,

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. of N.
- (2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=50$ lb./ac. of P_2O_5 .
- (3) 3 manures : $M_0=Control$, $M_1=\frac{1}{2}$ ton Sulphur and $M_2=1\frac{1}{2}$ ton Lime.
Manures applied last year on 5.11.1952.

3. DESIGN :

- (i) $2 \times 2 \times 3$ Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) $16.5' \times 33'$. (b) $11' \times 27.5'$. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) Nil. (iii) Green leaf yield, cured leaf yield and percentage of bright grades. (iv) (a) 1952—1953. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1054 lb./ac.
- (ii) 182.3 lb./ac.
- (iii) Only N effect is significant.
- (iv) Av. yield of cured leaf in lb./ac.

	N_0	N_1	Mean	P_0	P_1
M_0	916	1119	1018	1050	985
M_1	991	1100	1046	996	1095
M_2	1004	1192	1098	1076	1120
Mean	970	1137	1054	1041	1067
P_0	938	1144	1041		
P_1	1003	1130	1067		

S.E. of marginal mean of N or P = 37.21 lb./ac.
 S.E. of marginal mean of M = 45.60 lb./ac.
 S.E. of body of $M \times N$ or $M \times P$ tables = 64.45 lb./ac.
 S.E. of body of $P \times N$ table = 52.62 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 49(1). Type :- 'M'.

Object:—To fix the optimum dose of P in relation to N and K manures.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) and (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 11 and 12.11.1949.
- (iv) (a) 3 to 4 ploughings with country plough. (b) Seedlings transplanted. (c) 5760 plants/ac. (d) $33' \times 33'$. (e) 1. (v) M.C. (details N.A.). (vi) Flue cured tobacco. (vii) Nil. (viii) and (ix) N.A.
- (x) 19.1.1950 to 31.3.1950.

2. TREATMENTS :

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

- (1) 5 levels of P_2O_5 as Super : $P_0=0$, $P_1=25$, $P_2=50$, $P_3=75$ and $P_4=100$ lb./ac.
- (2) 2 levels of N as A/S : $N_0=0$ and $N_1=20$ lb./ac. of N.
- (3) 2 levels of K_2O as Pot. Sul. : $K_0=0$ and $K_1=20$ lb./ac. of K.

Fertilizers applied on 26.10.1949 just before heavy rains (on 27.10.1949).

3. DESIGN :

- (i) 5×2^2 Confd. Fact. Confounding NK interaction. (ii) (a) 10 plots/block and 2 blocks/replication. (b) N.A. (iii) 4. (iv) (a) $16\frac{1}{2}' \times 49\frac{1}{2}'$. (b) $11' \times 44'$. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) The general condition of the crop in all the plots was good. After first heavy rains, there was again 4" of rainfall and harvest was considerably delayed. (ii) Nil. (iii) Green leaf yield, percentage of bright grades.
- (iv) (a) 1949—1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

- (i) 571 lb./ac.
- (ii) 104.1 lb./ac.
- (iii) None of the effects is significant.
- (iv) Av. yield of cured leaf in lb./ac.

	N ₀	N ₁	Mean	K ₀	K ₁
P ₀	546	548	547	556	538
P ₁	556	551	554	581	526
P ₂	580	563	571	572	570
P ₃	536	529	532	532	533
P ₄	622	677	649	661	637
Mean	568	574	571	581	561
K ₀	558	603	581		
K ₁	578	544	561		

S.E. of N or K marginal means	=16.5 lb./ac.
S.E. of P marginal means	=26.0 lb./ac.
S.E. of body of P×N or P×K table	=36.8 lb./ac.
S.E. of body of N×K table	=23.3 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I., 50(3). Type :- 'M'.

Object :- To find out the optimum dose of P₂O₅ to be applied to flue cured Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 19.11.1950 and 20.11.1950. (iv) (a) 3 to 4 ploughings with country plough. (b) Seedlings transplanted. (c) 5760 plants/ac. (d) 33"×33". (e) 1. (v) Nil. (vi) Flue cured tobacco. (vii) Nil. (viii) Gaps filled. Interculture with country plough. (ix) N.A. (x) 29.1.1951 to 30.3.1951.

2. TREATMENTS :

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

- (1) 5 levels of P₂O₅ as Super : P₀=0, P₁=25, P₂=50, P₃=75 and P₄=100 lb./ac.
 - (2) 2 levels of N as A/S : N₀=0 and N₁=20 lb./ac. of N.
 - (3) 2 levels of K₂O as Pot. Sul. : K₀=0 and K₁=20 lb./ac. of K₂O.
- Manures applied on 16.11.1950.

3. DESIGN :

(i) 5×2² Confd. Fact. (NK is confd.) (ii) (a) 10 plots/block and 2 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 11'×44'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. But only three replicates could be planted as the fourth replicate which was planted on 20.11.1950 was green for a long time and was also poorer in growth than the rest. (ii) Incidence of powdery mildew caused some damage to the lower leaves. (iii) Green leaf yield. (iv) (a) 1949—1951. (b) No. (c) No. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment during 1951 failed. Only 3 replications taken into account for analysis.

5. RESULTS :

- (i) 767.7 lb./ac.
- (ii) 107.7 lb./ac.
- (iii) Only N effect is significant.

(iv) Av. yield of green leaf in lb./ac.

	N ₀	N ₁	Mean	K ₀	K ₁
P ₀	639.4	812.4	725.9	732.6	719.3
P ₁	728.8	789.1	758.9	769.1	748.8
P ₂	739.0	871.0	805.0	826.2	783.8
P ₃	724.4	791.7	758.1	788.6	727.5
P ₄	760.1	321.2	790.6	790.5	790.8
Mean	718.3	817.1	767.7	781.4	754.0
K ₀	758.8	804.0			
K ₁	677.8	830.2			

S.E. of N or K marginal means = 17.0 lb./ac.
 S.E. of P marginal means = 26.9 lb./ac.
 S.E. of body of P×N or P×K table = 38.1 lb./ac.
 S.E. of body of N×K table = 24.1 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 51(1). Type :- 'M'.

Object :- To find out the effect of N, P and K on yield and quality of Lanka Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 27, 28.11.1951
 (iv) (a) 3 to 4 ploughings. (b) Seedlings transplanted. (c) 10890 plants/ac. (d) 2'×2'. (e) One. (v) Nil.
 (vi) Lanka Tobacco. (vii) Nil. (viii) Gap filling. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

- (1) 5 levels of N : N₀=0, N₁=15, N₂=30, N₃=45 and N₄=60 lb./ac. of N.
 (2) 2 levels of P₂O₅ : P₀=0 and P₁=50 lb./ac. of P₂O₅.
 (3) 2 levels of K₂O : K₀=0 and K₁=50 lb./ac. of K₂O.

3. DESIGN :

(i) 5×2² Confd. Fact., confounding PK interaction. (ii) (a) 10 plots/block ; 2 blocks/replication. (b) N.A.
 (iii) 3. (iv) (a) 10'×30'. (b) 6'×26'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Green leaf yield etc. (iv) (a) No. (b) —. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1902 lb./ac.
 (ii) 762.0 lb./ac.
 (iii) Only PK interaction is significant. All other effects are not significant.
 (iv) Av. yield of cured leaf in lb./ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	Mean	K ₀	K ₁
P ₀	1776	1976	1352	1946	2051	1820	1530	2110
P ₁	2138	2081	1466	2238	1994	1983	2485	1482
Mean	1957	2028	1409	2092	2023	1902	2008	1796
K ₀	2042	2037	1632	2085	2243			
K ₁	1872	2020	1187	2099	1802			

S.E. of P or K marginal means	=139.1 lb./ac.
S.E. of N marginal means	=220.0 lb./ac.
S.E. of body of N×P or N×K table	=311.1 lb./ac.
S.E. of body of P×K table	=196.7 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 53(4).

Type :- 'M'.

Object :—To find out whether soil pH and availability of manures under local condition are influenced by the application of Sulphur.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco bulk in II and IV replications maize experiment in I and III replications. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 4.11.1953. (iv) (a) N.A. (b) Seedlings transplanted. (c) 5760 plants/ac. (d) 33'×33'. (e) 1. (v) Nil. (vi) Harrison special. (vii) Unirrigated. (viii) Gap filling hand weeding and interculture with planet junior hoe and plough. (ix) 15.16". (x) 18.1.1954 to 27.2.1954.

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.

(2) 3 levels of P_2O_5 : $P_0=0$, $P_1=50$ lb./ac. (as *Kudada* phosphate) and $P_2=50$ lb./ac. as Super.

(3) 2 levels of Sulphur : $S_0=0$ and $S_1=\frac{1}{2}$ ton/ac.

Manure applied as top dressing on 21.10.1953 in replications I and II and on 2.11.1953 in replications III and IV.

3. DESIGN :

(i) $3^2 \times 2$ confd. Fact., Confounding NP and NPS interactions. (ii) (a) 6 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 16.5'×44'. (b) 11.0'×38.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of green leaf, stalk, of curved leaf, percentage of bright grades. (iv) (a) 1953—1954. (b) —. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 7764 lb./ac.

(ii) 898.2 lb./ac.

(iii) Only N effect is significant.

(iv) Av. yield of green leaf in lb./ac.

	P_0	P_1	P_2	Mean	S_0	S_1
N_0	7548	7344	7223	7371	7472	7271
N_1	8114	8279	7582	7992	8214	7769
N_2	7991	8056	7733	7927	7727	8126
Mean	7884	7893	7513	7763	7804	7722
S_0	7897	7961	7555			
S_1	7872	7824	7470			

S.E. of N or P marginal means =183.3 lb./ac.

S.E. of S marginal means =149.7 lb./ac.

S.E. of body of N×P table =317.2 lb./ac.

S.E. of body of S×N or S×P table =259.4 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I., 48(4). Type :- 'M'.

Object :- To find out the dosage of important manures applied singly and in combination for Tobacco crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) No. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 15.11.1948.
 (iv) (a) N.A. (b) Transplanted. (c) 5760 plants/ac. (d) 33"×33". (e) 1. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) Gap filling and hand weeding. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1), (2), (3), (4) and (5)

(1) 2 levels of F.Y.M. : $F_0=0$ and $F_1=3$ ton/ac. (4) 2 levels of Super : $P_0=0$ and $P_1=300$ lb./ac.(2) 2 levels of G.N.C. : $G_0=0$ and $G_1=300$ lb./ac. (5) 2 levels of Pot. Sul. : $K_0=0$ and $K_1=100$ lb./ac.(3) 2 levels of A/S : $N_0=0$ and $N_1=100$ lb./ac.

F.Y.M. applied on 22.10.1948, Super and Pot. Sul. on 24.10.1948 and G.N.C. on 2.12.1948. A/S applied in two equal doses on 30.11.1948 and 6.12.1948.

3. DESIGN :

(i) to (iii) 8×8 Quasi L. Sq. (iv) (a) 22'×38.5'. (b) 16.5'×33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) General growth was fair. After planting there was no rainfall and A/S which was applied late after transplanting could not produce any effect. (ii) Nil. (iii) Height of plant and tobacco yield. (iv) (a) 1948 to 1951. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 684.4 lb./ac.
 (ii) 57.87 lb./ac.
 (iii) Only G effect is significant.
 (iv) Av. yield of green leaf in lb./ac.

	G_0	G_1	N_0	N_1	P_0	P_1	K_0	K_1	Mean
F_0	622.5	717.0	674.7	664.8	676.7	662.7	687.4	652.0	669.7
F_1	662.2	735.9	692.8	705.3	718.7	679.5	664.2	734.0	699.1
Mean	642.3	726.5	683.7	685.1	697.7	671.1	675.8	693.0	684.4
K_0	636.6	715.0	677.3	674.3	714.7	636.9			
K_1	648.0	738.0	690.1	695.9	680.7	705.3			
P_0	654.2	741.2	694.2	701.2					
P_1	630.4	711.8	673.2	669.0					
N_0	642.0	725.4							
N_1	642.6	727.6							

S.E. of any marginal mean
 S.E. of body of any table

=10.23 lb./ac.
 =14.47 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I., 49(5). Type :- 'M'.

Object :- To find out the cumulative and residual effect of manures applied last year on the yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) As per treatments. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107.
 (iii) 23.10.1949/8, 9.11.1949. (iv) (a) N.A. (b) Transplanted. (c) 5760 plants/ac. (d) 33"×33". (e) 1.
 (v) Nil. (vi) N.A. (vii) Nil. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1), (2), (3), (4) and (5)

- (1) 2 levels of F.Y.M. : $F_0=0$ and $F_1=3$ ton./ac. (4) 2 levels of Super : $P_0=0$ and $P_1=300$ lb./ac.
 (2) 2 levels of G.N.C. : $G_0=0$ and $G_1=300$ lb./ac. (5) 2 levels of Pot. Sul. : $K_0=0$ and $K_1=100$ lb./ac.
 (3) 2 levels of A/S : $N_0=0$ and $N_1=100$ lb./ac.

Each treatment plot has been split up into four sub-plots viz 1=one year application in 1948-49, 2 A=2 years application in 1948-49 and 1949-1950, 2C=2 years application in 1948-49 and 1949-1950 and 3 C=3 years application in 1948-49, 1949-50 and 1950-1951. Manures applied on 20.10.1949.

3. DESIGN :

(i) to (iii) 8×8 Quasi L. Sq. (iv) (a) $22' \times 38.5'$. (b) $11' \times 33'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) On account of heavy cyclonic rains in October soon after planting the whole field was under water and so the whole field had to be replanted. Plants established well. The late rains received by the end of February considerably affected the % of bright grades in all the treatments. (ii) Nil. (iii) Green leaf weight and percentage of bright grades. (iv) (a) 1948 to 1951. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 525.3 lb./ac.
 (ii) 289.75 lb./ac.
 (iii) Only N effect is significant.
 (iv) Av. yield of green leaf in lb./ac.

	G_0	G_1	N_0	N_1	P_0	P_1	K_0	K_1	Mean
F_0	514.1	540.1	469.3	584.9	548.9	505.3	499.5	554.7	527.1
F_1	477.2	569.8	448.1	598.9	521.9	525.1	516.0	531.0	523.5
Mean	495.6	554.9	458.7	591.9	535.4	515.2	507.7	542.9	525.3
K_0	497.2	518.1	437.3	578.1	495.0	520.4			
K_1	494.0	591.7	480.1	605.7	575.8	510.0			
P_0	520.0	550.8	480.3	590.5					
P_1	471.2	559.1	437.1	593.3					
N_0	421.9	495.5							
N_1	569.3	614.5							

S.E. of any marginal mean

=51.22 lb./ac.

S.E. of body of any table

=72.44 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 50(6).

Type :- 'M'.

Object :- To find out the cumulative and residual effect of manures applied last year on the yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) As per treatments—applied in 1948. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 13.11.1950. (iv) (a) N.A. (b) Transplanted. (c) 5760 plants/ac. (d) $33'' \times 33''$. (e) one. (v) Nil. (vi) N.A. (vii) Nil. (viii) Gap filling, etc. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1), (2), (3), (4) and (5)

- (1) 2 level of F.Y.M. : $F_0=0$ and $F_1=3$ ton/ac.
- (2) 2 levels of N as G.N.C. : $G_0=0$ and $G_1=20$ lb./ac.
- (3) 2 levels of N as A/S : $N_0=0$ and $N_1=20$ lb./ac.
- (4) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=50$ lb./ac.
- (5) 2 levels of K_2O : $K_0=0$ and $K_1=50$ lb./ac.

Each treatment plot has been split up into four sub plots viz. 1=one year application in 1948-49, 2 A= two years application in 1948-49 and 1950-1951, 2C= two years application in 1948-49 and 1949-1950, and 3 C=3 years application in 1948-49, 1949-50 and 1950-51.

3. DESIGN :

(i) to (iii) 8×8 Quasi L. Sq. (iv) (a) N.A. (b) 1/576 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Tobacco yield. (iv) (a) 1948—1951. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 692.4 lb./ac.
- (ii) 180.6 lb./ac.
- (iii) Main effects of G and N are significant.
- (iv) Av. yield of green leaf in lb./ac.

	G_0	G_1	N_0	N_1	P_0	P_1	K_0	K_1	Mean
F_0	692.5	717.7	654.2	755.0	724.1	686.1	722.1	688.1	705.1
F_1	635.3	724.2	676.2	683.3	701.1	658.3	675.2	684.2	679.7
Mean	663.9	720.9	665.2	719.7	712.6	672.2	698.7	686.1	692.4
K_0	678.5	718.9	690.7	706.9	714.7	655.7			
K_1	649.3	722.9	639.7	732.5	683.5	688.7			
P_0	675.4	749.8	680.9	744.5					
P_1	652.4	692.0	649.5	694.9					
N_0	619.3	710.9							
N_1	708.5	730.9							

S.E. of any marginal mean = 16.0 lb./ac.

S.E. of body of any table = 22.6 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 51(9).

Type :- 'M'.

Object :—To find out the cumulative and residual effect of manures applied last year on the yield and quality of Tobacco.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Tobacco. (c) As per treatments—applied in 1948. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 22.10.1951. (iv) (a) N.A. (b) Transplanted. (c) 5760 plants/ac. (d) $33'' \times 33''$. (e) One. (v) Nil. (vi) N.A. (vii) Nil. (viii) 5% gaps filling 2 hand weedings and 2 intercultures. (ix) N.A. (x) 8, 12.1.1952 and 2, 18.2.1952.

2. TREATMENTS :

All combinations of (1), (2), (3), (4) and (5)

- (1) 2 levels of F.Y.M. : $F_0=0$ and $F_1=3$ ton/ac.
- (2) 2 level of N as G.N.C. : $G_0=0$ and $G_1=20$ lb./ac.
- (3) 2 levels of N as A/S : $N_0=0$ and $N_1=20$ lb./ac.
- (4) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=50$ lb./ac.
- (5) 2 levels of K_2O : $K_0=0$ and $K_1=50$ lb./ac.

Each treatment plot has been split up into four sub plots viz. 1=one year application in 1948-49, 2 A=2 years application in 1948-49 and 1950-1951, 2C=2 years application in 1948-49 and 1949-1950, and 3 C=3 years application in 1948-49, 1949-50 and 1950-51.

3. DESIGN :

(i) to (iii) 8×8 Quasi L. Sq. (iv) (a) N.A. (b) $22' \times 38\frac{1}{2}'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1948—1951. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 601.5 lb./ac.
- (ii) 198.0 lb./ac.
- (iii) Main effect of G alone is significant.
- (iv) Av. yield of green leaf in lb./ac.

	G_0	G_1	N_0	N_1	P_0	P_1	K_0	K_1	Mean
F_0	543.9	609.6	546.7	606.8	594.8	558.6	599.7	553.7	576.7
F_1	603.9	648.5	613.9	638.6	642.8	609.6	625.9	626.5	626.2
Mean	573.9	629.1	580.3	622.7	618.8	584.1	612.8	590.1	601.5
K_0	581.3	644.5	659.4	566.2	647.8	577.8			
K_1	566.5	613.7	501.2	679.2	589.8	590.4			
P_0	594.1	643.5	600.4	673.2					
P_1	553.7	614.7	560.2	608.0					
N_0	543.1	617.5							
N_1	604.7	640.7							

S.E. of any marginal mean

=17.5 lb./ac.

S.E. of body of any table

=24.7 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 48(2).

Type :- 'C'.

Object :—To find out the relation between spacing and yield with respect to early and late planting and also to see if the manner of distribution of spacing around the plants was of any importance.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) As per treatments. (iv) (a) N.A. (b) Transplanted. (c) and (d) As per treatments. (e) 1. (v) Nil. (vi) Flue cured Tobacco. (vii) Nil. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

- (1) 4 spacings : $S_1=39'' \times 39''$ (4124 plants/ac.), $S_2=36'' \times 36''$ (4840 plants/ac.), $S_3=33'' \times 33''$ (5760 plants/ac.) and $S_4=30'' \times 29''$ (7210 plants/ac.).
 (2) 4 designs of spacings : C_1 =Square system, C_2 =Equilateral system, $C_3=3:2$ ratio between and within rows and $C_4=2:1$ ratio between and within rows.
 (3) 2 planting dates : $D_1=22.10.1948$ (early) and $D_2=20.11.1948$ (late).

3. DESIGN :

(i) to (iii) 8×8 Quasi L. Sq. (iv) (a) $33' \times 33'$. (b) Different with different spacings, as per treatments. (v) One row of border around except in case of equilateral system where two rows on one side and one row on the other side. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Final plant height and av. yield of cured leaf etc. (iv) (a) 1948—1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 721 lb./ac.
 (ii) 152.1 lb./ac.
 (iii) Effect due to D and interaction $S \times D$ are significant. No other effect is significant.
 (iv) Av. yield of cured in lb./ac.

	C_1	C_2	C_3	C_4	Mean	D_1	D_2
S_1	686	576	590	747	649	717	582
S_2	644	603	746	733	682	767	597
S_3	693	809	687	846	759	863	654
S_4	815	792	945	617	793	833	752
Mean	709	695	742	735	721		
D_1	845	652	800	882	795		
D_2	573	738	684	589	646		

S.E. of marginal mean of S or C = 38.0 lb./ac.

S.E. of marginal mean of D = 26.9 lb./ac.

S.E. of body of $D \times S$ or $D \times C$ table = 53.8 lb./ac.

S.E. of body of $S \times C$ table = 76.0 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 49(4).

Type :- 'C'.

Object :—To find out the relation between spacing and yield with respect to early and late plantings and also to see if the manner of distribution of space around the plants was of any importance.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sorghum*. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) As per treatments. (iv) (a) N.A. (b) Transplanted. (c) and (d) As per treatments. (e) N.A. (v) 10 lb. of N as A/S. (vi) Cigarette Tobacco. (vii) Nil. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

- (1) 4 spacings : $S_1=39'' \times 39''$ (4124 plants/ac.), $S_2=36'' \times 36''$ (4840 plants/ac.), $S_3=33'' \times 33''$ (5760 plants/ac.) and $S_4=30'' \times 29''$ (7210 plants/ac.).
 (2) 4 designs of spacings : C_1 =Square system, C_2 =Equilateral system, $C_3=3:2$ ratio between and within rows and $C_4=2:1$ ratio between and within rows.
 (3) 2 planting date : $D_1=11.11.1949$ (early) and $D_2=30.11.1949$ (late).

3. DESIGN :

(i) to (iii) 8×8 Quasi L. Sq. (iv) (a) 41'×37½'. (b) Different with different spacings as per treatments. (v) N.A. (vi) Yes.

4. GENERAL :

(i) On account of the cyclonic rains on the 27th and 28 October early planting could not be done in that month as in the previous year. General growth of the crop was poor. Nut grats infestation in patches. (ii) Nil. (iii) Green leaf weight etc. (iv) (a) 1948—1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 314 lb./ac.
 (ii) 100.75 lb./ac.
 (iii) D and S effects are significant. Other effects are not significant.
 (iv) Av. yield of cured leaf in lb./ac.

	C ₁	C ₂	C ₃	C ₄	Mean	D ₁	D ₂
S ₁	291	388	249	221	288	341	235
S ₂	238	336	239	335	287	349	225
S ₃	327	291	319	237	293	351	236
S ₄	495	343	447	271	389	429	348
Mean	336	339	313	266	314		
D ₁	416	369	395	289	367		
D ₂	259	309	231	243	266		

S.E. of marginal means of S or C	=25.19 lb./ac.
S.E. of marginal means of D	=17.81 lb./ac.
S.E. of body of D×S or D×C table	=35.62 lb./ac.
S.E. of body of S×C table	=50.37 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 50(2). Type :- 'C'.

Object :- To study the effect of spacing and systems of planting on yield in relation to the time of planting.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) As per treatments. (iv) (a) N.A. (b) Transplanted. (c) and (d) As per treatments. (e) 1. (v) 15 lb./ac. of N as A/S and 6 C.L./ac. of F.Y.M. (vi) N.A. (vii) Nil. (viii) Gap filling and interculture with rotary junior hand hoe. (ix) N.A. (x) 31.1.1951 to 31.3.1951.

2. TREATMENTS :

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

- (1) 4 spacings : S₁=39"×39" (4124 plants/ac.), S₂=36"×36" (4840 plants/ac.), S₃=33"×33" (5760 plants/ac.) and S₄=30"×29" (7210 plants/ac.).
 (2) 4 designs of spacings : C₁=Square system, C₂=Equilateral system, C₃=3 : 2 ratio between and within rows and C₄=2 : 1 ratio between and within rows.
 (3) 2 planting dates : D₁=18.11.1950 (early) and D₂=1.12.1950 (late).

3. DESIGN :

(i) to (iii) 8×8 Quasi L. Sq. (iv) (a) 41.1'×37.5'. (b) Different with different spacings as per treatments. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Replanting of 1st planting had to be done due to heavy rains during 1st fortnight of November—growth below normal. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1948 to 1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) N.A. (vii) Raw data and result for the experiment conducted during 1951 N.A.

5. RESULTS :

- (i) 441 lb./ac.
- (ii) 68.6 lb./ac.
- (iii) Only D effect is significant.
- (iv) Av. yield of cured leaf in lb./ac.

	C ₁	C ₂	C ₃	C ₄	Mean	D ₁	D ₂
S ₁	445	391	513	464	453	511	395
S ₂	441	457	371	385	413	472	354
S ₃	455	476	469	398	449	543	356
S ₄	409	453	479	451	448	528	369
Mean	437	445	458	425	441	513	369
D ₁	516	526	488	524			
D ₂	359	363	428	325			

S.E. of marginal mean of S or C	=17.15 lb./ac.
S.E. of marginal mean of D	=12.12 lb./ac.
S.E. of body of S×D or C×D table	=24.24 lb./ac.
S.E. of body of S×C table	=34.29 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 48(3). Type :- 'C'.

Object :—To find out the effect of planting seedlings of different ages and size (within the same age) on the quality and yield of Cigarette Tobacco.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) and (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 18.10.1948.
- (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33"×33". (e) 1. (v) N.A. (vi) Cigarette Tobacco. (vii) Nil. (viii) Gap filling and hand weeding. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 3 ages of seedlings : A₁=9 weeks old, A₂=8 weeks old and A₃=7 weeks old.
- (2) 2 sizes of seedlings : S₁=Normal size (large) and S₂=Small size.

3. DESIGN :

- (i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 16½'×49½'. (b) 11'×44'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Poor establishment of seedlings particularly in plots with A₃. Damage was considerably high in two replications. (ii) Nutgram infestation. (iii) Final height of plants. (iv) (a) No. (b) and (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 662 lb./ac.
- (ii) 155.4 lb./ac.
- (iii) None of the effects significant.
- (iv) Av. yield of cured leaf in lb./ac.

	S ₁	S ₂	Mean
A ₁	660	560	610
A ₂	628	557	593
A ₃	776	788	782
Mean	688	635	662

S.E. of A marginal means	=54.94 lb./ac.
S.E. of S marginal means	=44.86 lb./ac.
S E. of body of table	=77.70 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 49(6).

Type :- 'C'.

Object :- To find out how topping at different stages of the plant growth affect the yield and quality of the leaf along with the different plant spacings with a common row spacing.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 14.11.1949. (iv) (a) 3-4 ploughings with country plough. (b) Transplanted. (c) and (d) As per treatments. (e) One. (v) 5 C.L./ac. of M.C. and 100 lb./ac. of A/S. (vi) Cigarette Tobacco. (vii) Nil. (viii) N.A. (ix) N.A. (x) 18.1.1950 to 18.3.1950.

2. TREATMENTS :

Main-plot treatments :

4 spacings (plant to plant) : $S_1=25.0''$; (7603 plants/ac.), $S_2=28.5''$; (6669 plants/ac.), $S_3=33.0''$; (5760 plants/ac.) and $S_4=39.3''$; (4829 plants/ac.) with a common row spacing of 33''.

Sub-plot treatments :

5 stages of topping : T_0 =No topping, T_1 =Topping at bud stage, T_2 =Topping of the bud at emergence with few leaves, T_3 =Topping at the time of flowering and T_4 =Topping where 50% has taken place.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) $33' \times 47' - 11''$; $33' \times 49' - 10.5''$; $33' \times 49' - 6''$; $33' \times 49' - 1.33''$ for S_1 , S_2 , S_3 and S_4 respectively. (b) $27\frac{1}{2}' \times 43' - 9''$; $27\frac{1}{2}' \times 45' - 11\frac{1}{2}''$; $27\frac{1}{2}' \times 44' - 0''$; $27\frac{1}{2}' \times 42' - 6.9''$ for S_1 , S_2 , S_3 and S_4 respectively. (v) N.A. (vi) Yes.

4. GENERAL :

(i) On account of the late rains received during the last week of February 1950. Plants that were topped sucked profusely and the suckers could not be removed in time till the fields became accessible. This greatly vitiated the effect of topping on the yield. (ii) Nil. (iii) Green leaf yield etc. (iv) (a) No. (b) —. (c) —. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 361.9 lb./ac.
(ii) (a) 139.7 lb./ac.
(b) 81.5 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of cured leaf in lb./ac.

	S_1	S_2	S_3	S_4	Mean
T_0	401.2	399.2	367.6	221.6	347.4
T_1	364.4	321.6	315.6	378.6	345.1
T_2	485.4	369.2	433.0	346.8	408.6
T_3	338.4	304.2	375.8	363.2	345.4
T_4	374.2	363.6	371.6	342.2	362.9
Mean	392.7	351.6	372.7	330.5	361.9

S.E. of difference of two

1. S marginal means =39.51 lb./ac.
2. T marginal means =25.77 lb./ac.
3. T means at the same level of S =55.19 lb./ac.
4. S means at the same level of T =60.72 lb./ac.

Crop :- Tobacco.

Ref :- C.R.R.I: 53(5).

Type :- 'C'.

Object :—To find out the influence of direction of rows and population on the incidence of powdery mildew and yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 19, 20.11.1953. (iv) (a) 3-4 ploughings with country plough. (b) Transplanted. (c) —. (d) As per treatments. (e) One. (v) Manure broadcast. (vi) *Chaltram*. (vii) Unirrigated. (viii) Gap filling and interculture first with planet junior hoe and then with plough. (ix) 15.16". (x) 8.2.1953 to 20.3.1953.

2. TREATMENTS :

Main-plot treatments :

2 directions of planting : D_1 =East to West and D_2 =North to South.

Sub-plot treatments :

6 spacings : $S_1=4' \times 1.5'$, $S_2=4' \times 1.75'$, $S_3=4' \times 2'$, $S_4=4' \times 2.25'$, $S_5=4' \times 2.5'$ and $S_6=2.75' \times 2.75'$.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $88' \times 20'$. (b) 1/33 to 1/44 ac. according to spacing. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Not satisfactory. (ii) Nil. (iii) Green leaf yield, cured leaf yield, bright grades percentage and capsule weight. (iv) (a) No. (b) and (c) —. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 5895 lb./ac.

(ii) (a) 1609.0 lb./ac.

(b) 624.0 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of green leaf in lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean
D_1	6074	6311	5853	5533	5230	5737	5790
D_2	6691	5985	6096	5418	5963	5864	6003
Mean	6383	6148	5975	5476	5596	5801	5895

S.E. of difference of two

1. D marginal means = 464.5 lb./ac.
2. S marginal means = 312.0 lb./ac.
3. S means at the same level of D = 441.2 lb./ac.
4. D means at the same level of S = 614.8 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 49(2).

Type :- 'CM'.

Object :—To provide information on the effect of different planting times in conjunction with N, P and K manuring on the yield and quality of crop and to find out the amount of dry matter removed from the soil during the various phases of plant growth at different planting times.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) As per treatments. (iv) (a) 3 to 4 ploughings with country plough. (b) Seedlings transplanted. (c) 5760 plants/ac. (d) $33'' \times 33''$. (e) 1. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS :

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

(1) 4 planting dates : $D_1=11.11.1949$, $D_2=21.11.1949$, $D_3=2.12.1949$ and $D_4=19.12.1949$.

(2) 2 levels of N : $N_0=0$ and $N_1=20$ lb./ac.

(3) 2 levels of P_2O_5 : $P_0=0$ and $P_1=50$ lb./ac.

(4) 2 levels of K_2O : $K_0=0$ and $K_1=50$ lb./ac.

Manure applied in deep furrows.

3. DESIGN :

(i) 4×2^3 Fact. in R.B.D. (ii) (a) 32. (b) N.A. (iii) 2. (one replication set apart for sampling studies and the other for growth and yield studies). (iv) (a) $57\frac{1}{2}' \times 46\frac{1}{2}'$. (b) $20' \times 17'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Due to cyclone October planting postponed. Manuring programme was upset. Only plots with 1st date of planting received manure. Growth sub-normal. Manure for other plots was given in November. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1949—1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Results available only in the fashion they are presented.

5. RESULTS :

(i) 388 lb./ac.

(ii) 101.3 lb./ac.

(iii) Only planting times are significantly different.

(iv) Av. wt. of cured leaf in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
D_1	430	P_0	389
D_2	454	P_1	386
D_3	324	K_0	391
D_4	342	K_1	384
N_0	363		
N_1	413		
	S.E. of D marginal mean		=25.32 lb./ac.
	S.E. of N, P or K marginal mean		=17.90 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 50(1). Type :- 'CM'.

Object :- To study the optimum time of planting in relation to manuring and quality of leaf.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) Nil. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) As per treatments. (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) $33'' \times 33''$. (e) 1. (v) Nil. (vi) N.A. (vii) Nil. (viii) Gap filling. (ix) N.A. (x) 22.1.1951 to 31.3.1951.

2. TREATMENTS :

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

(1) 4 planting dates : $D_1=13.10.1950$, $D_2=28.10.1950$, $D_3=12.11.1950$ and $D_4=27.11.1950$.

(2) 2 levels of N : $N_0=0$ and $N_1=20$ lb./ac.

(3) 2 levels of P_2O_5 : $P_0=0$ and $P_1=50$ lb./ac.

(4) 2 levels of K_2O : $K_0=0$ and $K_1=50$ lb./ac.

3. DESIGN :

(i) 4×2^3 confd. Fact. (ii) (a) 8 plots/block and 4 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) $11' \times 41\frac{1}{2}'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) The rains in second week of October resulted in a no. of gaps so that the first planting was almost similar to second planting in growth. (ii) Nil. (iii) Green leaf wt., etc. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 389 lb./ac.

(ii) 168.7 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of cured leaf in lb./ac.

	N ₀	N ₁	Mean	P ₀	P ₁	K ₀	K ₁
D ₁	390	395	392	462	323	494	292
D ₂	512	409	461	431	491	470	452
D ₃	387	452	419	369	469	380	459
D ₄	239	328	283	215	352	304	263
Mean	382	396	389	369	409	412	367
K ₀	406	418	412	380	444		
K ₁	358	374	367	359	373		
P ₀	367	372	369				
P ₁	398	420	409				

S.E. of D marginal mean = 59.7 lb./ac.
 S.E. of N, P or K marginal mean = 42.1 lb./ac.
 S.E. of body of D×N, D×P or D×K table = 84.2 lb./ac.
 S.E. of body of N×P, N×K or P×K table = 59.7 lb./ac.

Crop :- Tobacco.

Ref :- C.R.R.I. 51(10).

Type :- 'CM'.

Object :- To find out the optimum date of transplanting of Cigarette Tobacco in relation to N, P and K requirements.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page I07. (iii) As per treatments. (iv) (a) 3-4 ploughings with country plough. (b) Seedlings transplanted. (c) 5760 plants/ac. (d) 33'×33' (e) One. (v) 10 ton/ac. of M.C. applied on 18.10.1951. (vi) Cigarette Tobacco. (vii) Nil. (viii) Gap filling interculture with plough in some plots and with plant junior cultivator in others. (ix) N.A. (x) 10.1.1952 to 4, 15.3.1952.

2. TREATMENTS :

Main-plot treatments :

4 dates of planting : D₁=19.10.1951, D₂=1.11.1951, D₃=16.11.1951 and D₄=30.11.1951.

Sub-plot treatments :

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

- (1) 2 levels of N as A/S : N₀=0 and N₁=20 lb./ac.
- (2) 2 levels of P₂O₅ as single Super : P₀=0 and P₁=50 lb./ac.
- (3) 2 levels of K₂O as Pot. Sul. : K₀=0 and K₁=50 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 2 blocks/main-plot and 4 sub-plots/block in main-plot. (b) N.A. (iii) 3. (iv) (a) 22'×49.5'. (b) 16.5'×44'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Green leaf yield etc. (iv) (a) 1949—1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 943 lb./ac.
- (ii) (a) 161.4 lb./ac.
(b) 83.4 lb./ac.
- (iii) None of the effects is significant.

(iv) Av. yield of cured leaf in lb./ac.

	N ₀	N ₁	Mean	P ₀	P ₁	K ₀	K ₁
D ₁	1129	1131	1130	1125	1134	1123	1137
D ₂	972	1022	997	1008	987	966	1028
D ₃	979	925	952	952	951	954	950
D ₄	715	675	695	711	679	693	697
Mean	949	938	943	949	938	934	953
K ₀	936	931	934	946	922		
K ₁	961	945	953	952	954		
P ₀	941	957	949				
P ₁	956	919	938				

S.E. of difference of two

1. marginal mean of D =46.59 lb./ac.
2. marginal mean of N, P or K =17.02 lb./ac.
3. N, P or K means at the same level of D =34.05 lb./ac.
4. D mean at the same level of N, P or K =52.44 lb./ac.
5. mean of N×P, P×K or N×K table =24.07 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 51(5).

Type :- 'CM'.

Object :- To find out the effect of different levels of N/plant with different plant number/ac.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 20.10.1951. (iv) (a) 3-4 ploughings with country plough. (b) Transplanted. (c) and (d) As per treatments. (e) One. (v) Nil. (vi) Cigarette Tobacco. (vii) Nil. (viii) Gap filling hand weeding and interculture with country plough between the rows. (ix) N.A. (x) 8.1.1952 to 7.3.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : N₀=0, N₁=0.78, N₂=1.57 and N₃=2.35 gm./plant.(2) 6 levels of plant number/ac. and spacing : P₀=3872 and 36"×45", P₁=4840 and 36"×36", P₂=5808 and 36"×30", P₃=6776 and 36"×25½", P₄=7744 and 36"×22½" and P₅=8712 and 36"×20".

Manures applied just before planting.

3. DESIGN :

(i) 4×6 Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 3. (iv) (a) 18'×30'. (b) Varying from 1/128 to 1/138 as per treatments. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1951—1954. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Only 3 replications taken into account for analysis, Experiment laid out with 4 replications.

5. RESULTS :

- (i) 1046 lb./ac.
- (ii) 149.9 lb./ac.
- (iii) None of the effects is significant.

(iv) Av. yield of cured leaf in lb./ac.

	P ₀	P ₁	P ₂	P ₃	P ₄	P ₅	Mean
N ₀	955	1139	926	1139	1014	1036	1035
N ₁	882	1088	1058	1176	1132	1058	1066
N ₂	941	1088	999	1051	1102	1051	1039
N ₃	735	1080	1110	1220	1066	1066	1046
Mean	878	1099	1023	1146	1078	1053	1046

S.E. of P marginal mean =43.27 lb./ac.
 S.E. of N marginal mean =35.33 lb./ac.
 S.E. of body of table =86.55 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 52(3).

Type :- 'CM'.

Object :- To find out the effect of different levels of N/plant with different plant number/ac.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 4.11.1952.
 (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) and (d) As per treatments. (e) 1. (v) M.C. at 3 ton/ac. applied just before planting. (vi) N.A. (vii) Nil. (viii) Gap filling, hand weeding and interculture with planet junior hoe. (ix) N.A. (x) 17.1.1953 to 3.3.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : N₀=0, N₁=0.78, N₂=1.57 and N₃=2.35 gm./plant.(2) 6 levels of plant number/ac. and spacing : P₀=3872 and 36"×45", P₁=4840 and 36"×36", P₂=5808 and 36"×30", P₃=6776 and 36"×25½", P₄=7744 and 36"×22½" and P₅=8712 and 36"×20".

Manures applied on 29.10.1952.

3. DESIGN :

(i) 4×6 Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 4. (iv) (a) 1/81 ac. (b) 1/128 to 1/138 ac. (as per spacings). (v) N.A. (vi) Yes.

4. GENERAL :

(i) Abnormal season of short rainfall with poor establishment of transplants. The crop improved later. Fields very high but quality of leaf poor. (ii) Nil. (iii) Green wt., percentage of bright grades, etc. (iv) (a) 1951 to 1954. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1256 lb./ac.
 (ii) 162.8 lb./ac.
 (iii) Only P effect is significant,
 (iv) Av. yield of cured leaf in lb./ac.

	P ₀	P ₁	P ₂	P ₃	P ₄	P ₅	Mean
N ₀	1144	1293	1216	1287	1293	1315	1258
N ₁	1155	1337	1337	1282	1177	1293	1264
N ₂	1111	1161	1128	1199	1359	1441	1233
N ₃	1078	1254	1293	1304	1419	1271	1270
Mean	1122	1261	1244	1268	1312	1330	1256

S.E. of P marginal mean	=40.70 lb./ac.
S.E. of N marginal mean	=33.23 lb./ac.
S.E. of body of table	=81.40 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 53(3). Type :- 'CM'.

Object :- To find out the effect of different levels of N/plant with different plant number/ac.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 11.11.1953. (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) and (d) As per treatments. (e) 1. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Gap filling, hand weeding and interculture with planet junior hoe. (ix) 15.16". (x) 3.2.1954, 18.2.1954 and 6.3.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : $N_0=0$, $N_1=0.78$, $N_2=1.57$ and $N_3=2.35$ gm./plant.

(2) 6 levels of plant number/ac. and spacing : $P_0=3872$ and $36'' \times 45''$, $P_1=4840$ and $36'' \times 36''$, $P_2=5808$ and $36'' \times 30''$, $P_3=6776$ and $36'' \times 25\frac{1}{2}''$, $P_4=7744$ and $36'' \times 22\frac{1}{2}''$, and $P_5=8712$ and $36'' \times 20''$.

Manures applied as top dressing on 9.11.1953.

3. DESIGN :

(i) 4×6 Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 4. (iv) (a) $18' \times 30'$. (b) $12' \times 26'$ and $12' \times 28'$, as per spacings. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Not satisfactory. (ii) Nil. (iii) Green leaf yield, cured leaf yield, bright grades percentage, mean stalk weight and capsule weight. (iv) (a) 1951 to 1954. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2747 lb./ac.
(ii) 633 lb./ac.
(iii) Only N effect is significant.
(iv) Av. yield of green leaf in lb./ac.

	P_0	P_1	P_2	P_3	P_4	P_5	Mean
N_0	2056	2756	2133	2574	2689	2376	2431
N_1	2623	1995	2673	3462	3207	2828	2798
N_2	2260	2767	2772	2458	3141	3103	2750
N_3	3312	2552	2954	3351	3312	2579	3010
Mean	2563	2518	2633	2961	3087	2722	2747

S.E. of P marginal mean	=158.2 lb./ac.
S.E. of N marginal mean	=139.2 lb./ac.
S.E. of body of table	=316.5 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 52(6).

Type :- 'CM'.

Object :- To find out the residual effect of different levels of N per plant applied in the year 1951-52.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) As per treatments. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. 23, 24.10.1952. (iv) (a) 3-4 ploughings with country plough. (b) Seedlings transplanted. (c) and (d) As per treatments. (e) One. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Gap filling, hand weeding and interculture with planet Junior hoe. (ix) N.A. (x) 3.2.1953 to 28.3.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : $N_0=0$, $N_1=0.78$, $N_2=1.57$ and $N_3=2.35$ gm/plant.

(2) 6 levels of population/ac. and spacing : $P_0=3872$ and $36'' \times 45''$, $P_1=4840$ and $36'' \times 36''$, $P_2=5808$ and $36'' \times 30''$, $P_3=6776$ and $36'' \times 25\frac{1}{2}''$, $P_4=7744$ and $36'' \times 22\frac{1}{2}''$ and $P_5=8712$ and $36'' \times 20''$.

3. DESIGN :

(i) 4×6 Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 4. (iv) (a) 1/81 ac. (b) 1/138 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Abnormal season of short rainfall with poor establishment of transplants. The crop improved later. Fields were very high but the quality of leaf was poor. (ii) Nil. (iii) Green weight mean stalk weight. (iv) (a) 1952—1953. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Direct effect of treatments studied vide experiment no C.T.R.I. 51(5).

5. RESULTS :

(i) 849 lb./ac.

(ii) 158.4 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of cured leaf in lb./ac.

	P_0	P_1	P_2	P_3	P_4	P_5	Mean
N_0	733	860	804	838	997	931	861
N_1	799	810	882	882	827	926	854
N_2	926	860	970	882	744	738	853
N_3	733	871	810	711	920	931	829
Mean	798	850	867	828	872	882	849

S.E. of N marginal mean = 32.33 lb./ac.

S.E. of P marginal mean = 39.60 lb./ac.

S.E. of body of table = 79.20 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 53(6).

Type :- 'CM'.

Object :—To find out the residual effect of different levels of N/plant.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) As per treatments. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) N.A. (iv) (a) N.A. (b) Transplanted. (c) and (d) As per treatments. (e) One. (v) Nil. (vi) N.A. (vii) Nil. (viii) N.A. (ix) 15.16%. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : $N_0=0$, $N_1=0.78$, $N_2=1.57$ and $N_3=2.35$ gm/plant.

(2) 6 levels of population/ac. and spacing : $P_0=3872$ and $36'' \times 45''$, $P_1=4840$ and $36'' \times 36''$, $P_2=5808$ and $36'' \times 30''$, $P_3=6776$ and $36'' \times 25\frac{1}{2}''$, $P_4=7744$ and $36'' \times 22\frac{1}{2}''$ and $P_5=8712$ and $36'' \times 20''$.

N as A/S applied in 1952-53 residual effect studied this year.

3. DESIGN :

(i) 4×6 Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 4. (iv) (a) $16.5' \times 33'$. (b) $11' \times 27.5'$. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) Nil. (iii) Only green leaf yield. (iv) (a) 1952—1953. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 5214 lb./ac.
- (ii) 976.3 lb./ac.
- (iii) None of the effects is significant.
- (iv) Av. yield of green leaf in lb./ac.

	P ₀	P ₁	P ₂	P ₃	P ₄	P ₅	Mean
N ₀	5580	4746	5238	5381	4611	4397	4992
N ₁	5215	5230	5223	4770	5365	4984	5131
N ₂	5024	4770	5865	6238	4556	5294	5291
N ₃	4588	5913	5842	6080	5215	5008	5441
Mean	5102	5165	5542	5617	4937	4921	5214

S.E. of N marginal mean = 199.3 lb./ac.
 S.E. of P marginal mean = 244.1 lb./ac.
 S.E. of body of table = 488.2 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 51(8). Type :- 'CM'.

Object :—To find out the optimum requirements of nitrogen in relation to spacing and topping on the yield and quality of Tobacco.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) *Sorghum*. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 31.10.1951 and 1.11.1951. (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) and (d) As per treatments. (e) 1. (v) M.C. at 5 ton/ac. broadcast before the on set of monsoon. (vi) N.A. (vii) Nil. (viii) Gap filling, hand weeding and interculture with planet junior hoe. (ix) N.A. (x) 9 and 12.1.1952, 5 and 21.2.1952.

2. TREATMENTS :

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

- (1) 3 levels of N as A/S : N₀=0, N₁=20 and N₂=40 lb./ac.
- (2) 3 levels of spacing and no. of plants/ac. : S₀=33"×24½"—7690, S₁=33"×28½"—6730 and S₂=33"×33"—5760.
- (3) 3 levels of topping : T₀=No topping, T₁=Topping two weeks before first priming and T₂=Topping a week before first priming.

3. DESIGN :

- (i) 3³ confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 3. (iv) (a) S₀: 22'×51.5', S₁: 22'×51.7', and S₂: 22'×52.6'. (b) S₀: 16.5'×51.5', S₁: 16.5'×51.7' and S₂: 16.5'×52.6'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Early growth satisfactory but after a month the growth was stunted. It was probably due to the previous crop of *sorghum*. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1951—1954. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 275 lb./ac.
- (ii) 51 lb./ac.
- (iii) Only levels of N and spacing effect is significant.

(iv) Av. yield of cured leaf in lb./ac.

	S ₀	S ₁	S ₂	Mean	T ₀	T ₁	T ₂
N ₀	219	206	176	200	212	207	181
N ₁	304	302	270	292	271	317	287
N ₂	349	344	302	332	309	355	331
Mean	291	284	249	275	264	293	266
T ₀	274	289	230				
T ₁	307	300	272				
T ₂	290	264	246				

S.E. of any marginal mean = 10 lb./ac.

S.E. of any mean in the body of table = 17 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 52(5). Type :- 'CM'.

Object :—To find out the optimum requirements of spacing and topping for Cigarette Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 9/15.11.1952. (iv) (a) 3 to 4 ploughings with country plough. (b) Seedlings transplanted. (c) and (d) As per treatments. (e) 1. (v) M.C. at 5 C.L./ac. broadcasted before the on set of monsoon. (vi) Cigarette Tobacco. (vii) Nil. (viii) Gap filling and interculture with planet junior hoe. (ix) N.A. (x) 13.2.1953 to 28.3.1953.

2. TREATMENTS :

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

(1) 3 levels of N as A/S : N₀=0, N₁=20 and N₂=40 lb./ac.(2) 3 levels of spacing and no. of plants/ac. : S₀=33"×24½"—7690, S₁=33"×28½"—6730 and S₂=33"×33"—5760.(3) 3 levels of topping : T₀=No topping, T₁=Topping two weeks before first priming and T₂=Topping a week before 1st priming.

3. DESIGN :

(i) 3³ confd. Fact. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 1/40 ac. (b) 1/53 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Abnormal season of short rainfall with poor establishment of transplants. The crop improved later Fields were very high but quality of leaf was poor. (ii) Nil. (iii) Percentage of bright grades. (iv) (a) 1951—1954. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) For analysis, III replication has not been taken into account. Also the treatment topping has not been taken into account. The reasons are not given in the records without this treatment the total no. of replication for S×N will be 6].

5. RESULTS :

(i) 1152 lb./ac.

(ii) 157.4 lb./ac.

(iii) Only levels of N effect are significant.

(iv) Av. yield of cured leaf in lb./ac.

	N ₀	N ₁	N ₂	Mean
S ₀	1113	1164	1250	1176
S ₁	1111	1092	1173	1125
S ₂	1089	1182	1195	1155
Mean	1104	1146	1206	1152

S.E. of any marginal mean = 37.1 lb./ac.
S.E. of body of table = 64.26 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 53(1).

Type :- 'CM'.

Object :—To find out the optimum requirements of N spacing and topping for Cigarette Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) As per treatments. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 13, 14.11.1953. (iv) (a) 3-4 ploughings with country plough. (b) Transplanting. (c) and (d) As per treatments. (e) One. (v) M.C. at 5 C.L./ac. (vi) *Chaltram*. (vii) Unirrigated. (viii) Gap filling inter-culture with planet Junior hoe and plough. (ix) 15.16". (x) 29.1.1954, 14.2.1954, 1.3.1954 and 18.3.1954.

2. TREATMENTS :

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

(1) 3 levels of N as A/S : N₀=0, N₁=20 and N₂=40 lb./ac.(2) 3 levels of spacing and no. of plants/ac. : S₀=33"×24 $\frac{3}{4}$ "—7690—S₁=33"×28 $\frac{3}{4}$ "—6730 and S₂=33"×33"—5760.(3) 3 levels of topping : T₀=No toppings, T₁=Topping two weeks before first priming, and T₂=Topping a week before first priming.

3. DESIGN :

(i) 3³ Confd. Fact. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 3. (iv) (a) 22'×51.5' (b) 16.5'×51.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Not satisfactory due to floods in August 1953. (ii) Nil. (iii) Cured leaf yield, percentage of bright grades and weight per stalk. (iv) (a) 1951—1954. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 836.6 lb./ac.

(ii) 120.0 lb./ac.

(iii) N effect and interactions N×S, S×T are significant. Other effects are not significant.

(iv) Av. yield of green leaf in lb./ac.

	S ₀	S ₁	S ₂	Mean	T ₀	T ₁	T ₂
N ₀	692.1	644.6	745.9	694.2	677.1	718.4	687.1
N ₁	923.4	869.5	754.6	849.2	834.6	812.1	900.8
N ₂	982.0	949.5	968.3	966.6	934.5	972.0	993.2
Mean	865.8	821.2	822.9	836.6	815.4	834.2	860.4
T ₀	864.6	870.8	710.9				
T ₁	849.6	775.	877.1				
T ₂	883.3	817.1	880.8				

S.E. of any marginal mean of the table = 23.09 lb./ac.
S.E. of any mean in the body of the tables = 40.0 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 43(1).

Type :- 'CM'.

Object :—To provide information on the effect of planting time in conjunction with N manuring on the yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) As per treatments. (iv) (a) 3-4 ploughings with country plough. (b) Seedlings transplanted. (c) 5760 plants/ac. (d) 33' × 33'. (e) One. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

4 dates of planting : $D_1=23.10.1948$, $D_2=15.11.1948$, $D_3=5.12.1948$ and $D_4=24.12.1948$ (discarded).

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : $N_0=0$ and $N_1=20$ lb./ac.

(2) 2 levels of F.Y.M. : $F_0=0$ and $F_1=3$ ton/ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 22' × 38½'. (b) 16.5' × 33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Immediately after the first planting there was rain and this caused a set back to first planting. Growth in the fourth planting was very poor and this was discarded. (ii) Nil. (iii) Plant height. (iv) (a) No. (b) —. (c) —. (v) (a) and (b) N.A. (vi) Nil. (vii) Only first 3 planting dates taken into account for analysis.

5. RESULTS :

(i) 561 lb./ac.

(ii) (a) 141.9 lb./ac.

(b) 117.3 lb./ac.

(iii) Only D effect is significant.

(iv) Av. yield of cured leaf in lb./ac.

	N_0	N_1	Mean	F_0	F_1
D_1	584	604	594	571	618
D_2	638	620	629	677	581
D_3	445	474	459	471	448
Mean	556	566	561	573	549
F_0	563	583			
F_1	548	550			

S.E. of difference of two

1. D marginal means = 50.20 lb./ac.
2. F or N marginal means = 33.86 lb./ac.
3. F or N means at the same level of D = 58.65 lb./ac.
4. D means at the same level of F or N = 65.01 lb./ac.
5. means in the body of F × N table = 47.88 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 50(5).

Type :- 'IM'.

Object :—To study whether judicious application of artificial watering may help the crop together with 'N' manuring and topping.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 18.11.1950. (iv) (a) 3-4 ploughings with country plough. (b) Seedlings transplanted. (c) 5760 plants/ac. (d) 33"×33". (e) One. (v) Nil. (vi) N.A. (vii) Nil. (viii) Gap filling. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

- (1) 3 levels of watering : I_0 =No watering, I_1 =One watering a month after planting and I_2 =Two waterings second watering given 20 days after the 1st.
 (2) 2 levels of N as A/S : N_0 =0 and N_1 =20 lb./ac. of N.
 (3) 2 levels of topping : T_0 =No topping and T_1 =Topping.

3. DESIGN :

- (i) 3×2² Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) 22'×49.5'. (b) 16.5'×44.0'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) Nil. (iii) Green leaf yield and percentage of bright grades. (iv) (a) 1950—1951. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Data analysed as R.B.D.

5. RESULTS :

- (i) 480.5 lb./ac.
 (ii) 61.3 lb./ac.
 (iii) Effects of I and T are significant. Interaction is not significant.
 (iv) Av. yield of cured leaf in lb./ac.

	I_0	I_1	I_2	Mean	T_0	T_1
N_0	431.3	504.5	507.3	481.0	438.5	523.5
N_1	424.1	483.3	532.2	479.9	431.9	527.9
Mean	427.7	493.9	519.7	480.5	435.2	525.7
T_0	382.5	448.7	474.5			
T_1	473.0	539.1	565.0			

S.E. of N or T marginal mean	=14.45 lb./ac.
S.E. of I marginal mean	=17.70 lb./ac.
S.E. of body of I×N or I×T tables	=25.02 lb./ac.
S.E. of body of N×T table	=20.43 lb./ac.

Crop :- Tobacco.

Ref :- C.T.R.I. 51(7).

Type :- 'M'.

Object :—To find out the effect of different levels of irrigation with and without N on the yield and quality of Cigarette Tobacco.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy in *kharif*. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 17.11.1951. (iv) (a) 3 to 4 ploughings with country plough. (b) Seedlings transplanted. (c) 5760 plants/ac. (d) 33"×33". (e) 1. (v) Nil. (vi) Cigarette Tobacco. (vii) As per treatments. (viii) Gap filling. Planet junior cultivator worked once. (ix) N.A. (x) 21.2.1952 to 7.4.1952.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 4 levels of irrigations : I_0 =No irrigation, I_1 =One irrigation 30 days after transplanting, I_2 =One irrigation 50 days after transplanting and I_3 =Two irrigations—first as in I_1 and second as in I_2 .

(2) 2 levels of N as A/S : N_0 =0 and N_1 =20 lb./ac. of N.

3. DESIGN :

(i) 4×2 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) $22' \times 49.5'$. (b) $16.5' \times 44'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Below normal. (ii) Nil. (iii) Green leaf yield, etc. (iv) (a) 1950—1951. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 679.0 lb./ac.
 (ii) 99.84 lb./ac.
 (iii) Only N effect is significant.
 (iv) Av. yield of cured leaf in lb./ac.

	I_0	I_1	I_2	I_3	Mean
N_0	590.8	612.9	639.3	643.7	621.7
N_1	683.4	736.3	762.8	762.8	736.3
Mean	637.1	674.6	701.1	703.3	679.0

S.E. of marginal mean of N levels = 28.82 lb./ac.

S.E. of marginal mean of I levels = 40.76 lb./ac.

S.E. of means in the body of table = 57.64 lb./ac.

INDIAN AGRICULTURAL RESEARCH INSTITUTE

NEW DELHI

PROFORMA GIVING DETAILS OF EXPERIMENTAL STATION

1. Name of the experimental station. Indian Agricultural Research Institute.
2. Tehsil or Taluka. Delhi.
3. District. Delhi.
4. Address. Director, Indian Agricultural Research Institute, New Delhi-12.
5. Year of establishment. 1905 at Pusa in Bihar State, shifted to its present site in Delhi in 1936.
6. Distance from nearest railway station with the name of nearest railway station. About 8 Kilometers west of New Delhi Railway Station.
7. Programme of research. The primary functions of the Institute are to affect improvements in crop production through maintenance of soil fertility, fertilizer use and crop husbandry etc., evolve improved strains of some of the major food and industrial crops resistant to pests and diseases, conduct fundamental studies in breeding methodology, cytogenetics and crop physiology and impart training at post-graduate level in furthering research in the above subjects.
8. Normal cropping pattern. N.A.
9. Type of tract it represents. N.A.
10. General description of topography of the experimental area. N.A.
11. Soil types and soil analysis. Morphological features of the profiles D₁ & D₂ based on the results of two profile samples from the farm belonging to the Division of Botany of the Institute.

Profile	Depth	Description
D ₁	0-4"	Sandy to sandy loam, light brown, single grained, presence of plant roots, slight effervescence with HCl.
	4"-3'-5"	Sandy loam to loam, dark brown in colour, cloddy friable, interspersed with white fibrous deposits of salts. Samples were taken at two depths 4" to 2'-2" and 2'-2" to 3'-5".
	3'-5"-3'-7"	Bed of lime nodules, with soil mixed with them, strong effervescence with HCl.
	3'-7" below	Water table.
D ₂	0-4"	Light brown, sandy, single grained, slight effervescence with HCl.
	4"-1'-1"	Same as above but very compact lime concretions at places, slight effervescence with HCl.
	1'-1"-2'-1"	Slightly darker in colour than above, friable structure not well developed, deposits of salts in fibres at lower depths, effervescence with HCl.
	2'-1"-4'-3"	Loam, darker in colour than above, tinge of chestnut brown, profuse deposits of salt in the form of fibres, structure not well developed but tends to be prismatic, weak effervescence with HCl, very moist at lower levels due to the measures of water table.

Profile	Depth	Clay%	Silt%	Fine sand%	Course sand %
D ₁	0 - 4"	13.28	7.38	54.98	25.85
	4"-2'-2"	21.34	14.44	49.96	13.87
	2'-2"-3'-5"	15.46	19.08	48.21	18.30
	3'-5"-3'-7"	14.00	14.94	53.23	19.70
D ₂	0 - 4"	12.45	10.38	55.95	21.17
	4"-1'-1"	11.14	8.72	55.78	24.38
	1'-1"-2'-1"	9.76	9.80	59.43	21.32
	2'-1"-4'-3"	19.68	14.42	50.39	16.07

Chemical Analysis

Profile	Depth	Total S.S. %	pH	CaCO ₃ %	Org. N %	Organic carbon %	C/N
D ₁	0-4"	.017	8.40	1.78	.026	.20	8.0
	4"-2' 2"	.023	8.51	1.34	.025	.14	5.6
	2' 2"-3' 5"	.127	8.48	2.75	.018	.10	6.0
	3' 5"-3' 7"	.156	8.23	11.83	.015	.07	4.9
D ₂	0-4"	.059	8.26	1.21	.022	.17	8.0
	4"-1' 1"	.063	8.22	1.70	.017	.10	6.0
	1' 1"-2' 1"	.075	7.99	2.00	.019	.09	4.8
	2' 1"-4' 3"	.084	8.20	2.57	.027	.14	5.1

Base Exchange capacity and exchangeable bases

Profile	Depth	b.e.c. me/100 gms. of soil	Exchangeable base Me/100 gm. of soil			Ca/Na	Ca/Na & K
			Na	K	Ca		
D ₁	0-4"	13.50	.49	.07	11.07	22.44	19.54
	4"-2' 2"	16.15	.72	.22	14.75	20.49	15.69
	2' 2"-3' 5"	17.80	.74	.73	15.50	20.95	15.44
	3' 5"-3' 7"	12.10	.65	.44	10.00	15.38	9.17
D ₂	0-4"	12.75	.86	.42	9.25	10.75	7.22
	4"-1' 1"	11.75	.37	.44	8.75	23.65	10.80
	1' 1"-2' 1"	19.65	.49	.36	8.25	10.81	9.70
	2' 1"-4' 3"	15.45	.78	.40	14.88	19.07	12.61

Fusion analysis of clay

Profile	Depth	SiO ₂ %	Fe ₂ O ₃	Al ₂ O ₃	Molecular Ratio	
					SiO ₂ /P ₂ O ₅	SiO ₂ /Al ₂ O ₃
D ₁	0-4"	50.09	9.69	29.79	2.35	2.92
	4"-2' 2"	51.68	13.48	28.07	2.39	2.39
	2' 2"-3' 5"	50.53	12.85	26.69	2.46	3.22
D ₂	0-4"	50.75	15.09	29.66	2.19	2.91
	4"-1' 1"	47.74	14.64	29.42	2.09	2.76
	1' 1"-2' 1"	50.51	14.20	28.80	2.27	2.98
	2' 1"-4' 3"	49.82	12.63	30.10	2.22	2.81

12. Normal average rainfall in cm. About 60 c.m. (annual).
13. Irrigation facilities available; year from which the facilities were made available. Yes; Year N.A.
14. Whether any proper drainage system exists. Yes.
15. Any other information regarding the farm. Latitude 28.4° N, Longitude 77.10° E.

Source.

Tamhane *et al.* Soil of Arid and Semi-Arid Zones of India (Delhi-Ajmer) : Jour. Ind. Soc., Soil Sci. Vol. I, No. 2.

Crop :- Paddy (*Kharif*).

Ref :- I.A.R.I. 51(45). Type :- 'M'.

Object :- To study the effect of different manures applied to Paddy nursery on the yield of paddy crop in unmanured plot.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 8.6.1951/13, 14.7.1951. (iv) (a) Ploughing with country plough, dressing with spade and ploughing with country plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hand weeding. (ix) 11.53°. (x) 29, 30.10.1951.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 4 levels of N : $N_0=0$, $N_1=100$, $N_2=200$ and $N_3=400$ lb./ac. of N.(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=80$ and $P_2=160$ lb./ac. of P_2O_5 .

Sub-plot treatments :

3 sources of N : $S_1=A/S$, $S_2=F.Y.M.$ and $S_3=A/S+F.Y.M.$ in equal proportions.

3. DESIGN :

(i) Split-plot. (ii) (a) 12 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/52 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1948—1951. (b) N.A. (c) N.A. (v) (a) and (b) No (vi) and (vii) Nil.

5. RESULTS :

(i) 1182 lb./ac.

(ii) (a) 474.2 lb./ac.

(b) 252.7 lb./ac.

(iii) S effect alone is significant and others are not significant.

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

	N_0	N_1	N_2	N_3	Mean	S_1	S_2	S_3
P_0	977	1011	1318	1106	1103	1053	1170	1086
P_1	1301	1158	1240	1249	1237	1128	1284	1300
P_2	1301	1154	1128	1240	1206	1083	1258	1277
Mean	1193	1103	1229	1198	1182	1088	1237	1221
S_1	1150	1042	1167	994				
S_2	1210	1184	1245	1309				
S_3	1219	1098	1275	1292				

S.E. of difference of two

1. N marginal means = 111.8 lb./ac.
2. P marginal means = 96.8 lb./ac.
3. S marginal means = 51.6 lb./ac.
4. S means at the same level of N = 103.2 lb./ac.
5. N means at the same level of S = 140.0 lb./ac.
6. S means at the same level of P = 89.3 lb./ac.
7. P means at the same level of S = 121.2 lb./ac.
8. means of the body of $N \times P$ table = 193.6 lb./ac.

Crop :- Paddy (*Kharif*)

Ref :- I.A.R.I. 51 (44). Type :- 'M'.

Object :- To study the effect on soil fertility by growing Wheat after Paddy.

1. BASAL CONDITIONS:

(i) (a) Paddy-Wheat. (b) Paddy. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 20, 21.7.1951.
 (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 31.10.1951.

2. TREATMENTS :

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

- (1) 3 levels of N as A/S : $N_0=0$, $N_1=30$ and $N_2=60$ lb./ac. of N.
 (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=60$ and $P_2=120$ lb./ac. of P_2O_5 .
 (3) 2 levels of K_2O as Pot. Sul. : $K_0=0$ and $K_1=80$ lb./ac. of K_2O .

3. DESIGN :

(i) $3^2 \times 2$ Fact. in R.B.D. (ii) (a) 6 plots/block and 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/22 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1951-N.A. (b) N.A. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2034 lb./ac.
 (ii) 674.7 lb./ac.
 (iii) N effect is highly significant. Interaction $N \times P$ is highly significant, interaction $N \times K$ and $P \times K$ are significant while other effects are not significant.
 (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1
N_0	1507	2241	1966	1905	1822	1989
N_1	1933	1947	1980	1953	1924	1983
N_2	2260	2145	2326	2244	2229	2257
Mean	1900	2111	2091	2034	1992	2076
K_0	1856	2116	2003			
K_1	1944	2106	2179			

S.E. of N or P marginal mean = 137.7 lb./ac.
 S.E. of K marginal mean = 112.4 lb./ac.
 S.E. of body of $N \times P$ table = 238.4 lb./ac.
 S.E. of body of $K \times P$ or $K \times N$ table = 194.8 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- I.A.R.I. 52(60).

Type :- 'M'.

Object :- To determine the nutritional requirement of Pusa soils.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 9 to 11.8.1952. (iv) (a) Ploughing with victory plough twice and *desi* plough twice. (b) to (e) N.A. (v) Nil. (vi) N.P. 130. (vii) to (x) N.A.

2. TREATMENTS :

11 sprayings of micro-nutrients : T_0 =No spraying (control), T_1 =No spraying, T_2 =Zinc sulphate at 25 lb./ac., T_3 =Manganese sulphate at 20 lb./ac., T_4 =Copper sulphate at 20 lb./ac., T_5 =Ferrous sulphate at 100 lb./ac., T_6 =Magnesium sulphate at 100 lb./ac., T_7 =Borax at 15 lb./ac., T_8 =N.A., T_9 =All micro-nutrients and T_{10} =All micro-nutrients.

For all treatments T_1 to T_9 , 40 lb./ac. of N, 60 lb./ac. of P_2O_5 and 30 lb./ac. of K_2O have been applied. Sources for N, P and K are not available.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 48.5'×9'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Damaged by rats. (iii) Grain yield. (iv) (a) 1952—N.A. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) Nil. (vii) The expt. was conducted at Central Botanical Sub-station Pusa (Bihar).

5. RESULTS

- (i) 1091 lb./ac.
 (ii) 190.6 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
T ₀	854	T ₆	1104
T ₁	1117	T ₇	1239
T ₂	1198	T ₈	1017
T ₃	1320	T ₉	1098
T ₄	1158	T ₁₀	828
T ₅	1069		
S.E./mean		=110.0 lb./ac.	

Crop :- Paddy (*Kharif*).

Ref :- I.A.R.I. 53(63).

Type :- 'M'.

Object :- To determine the nutritional requirement of Pusa soils.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 5, 6.8.1953. (iv) (a) 1 ploughing with *empire* plough and 1 ploughing with *desi* plough. (b) to (e) N.A. (v) N.A. (vi) Paddy N.P. 130. (vii) Irrigated. (viii) 2 weedings. (ix) 37.32". (x) 14, 15.12.1953.

2. TREATMENTS :

11 sprayings of micro-nutrients : T₀=No spraying (control), T₁=No spraying, T₂=Zinc sulphate at 25 lb./ac., T₃=Manganese sulphate at 20 lb./ac., T₄=Copper sulphate at 20 lb./ac., T₅=Ferrous sulphate at 100 lb./ac., T₆=Magnesium sulphate at 100 lb./ac., T₇=Borax at 15 lb./ac., T₈=N.A., T₉=All micro-nutrients and T₁₀=All micro-nutrients.

For all treatments T₁ to T₉, 40 lb./ac. of N, 60 lb./ac. of P₂O₅ and 30 lb./ac. of K₂O have been applied. Sources for N, P and K are not available.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 48.5'×9'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1954. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) Nil. (vii) This experiment was conducted at the Central Botanical Sub-station, Pusa (Bihar).

5. RESULTS :

- (i) 2489 lb./ac.
 (ii) 600.6 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
T ₀	1851	T ₆	2944
T ₁	2638	T ₇	2742
T ₂	2635	T ₈	2223
T ₃	2807	T ₉	2657
T ₄	2795	T ₁₀	1597
T ₅	2486		
S.E./mean		=300.3 lb./ac.	

Crop :- Paddy.

Ref :- I.A.R.I. 51(42).

Type :- 'C'.

- Object :- To find out the best method of growing Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 22.7.1951. (iv) (a) Ploughing twice with *desi* plough. (b) Broadcasting. (c) 40 sr./ac. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Twice weeding and thinning. (ix) 13.51". (x) 4 to 7.11.1951.

2. TREATMENTS :

3 cultural treatments : T_1 =Broadcasting at 40 sr./ac., T_2 =Transplanting at 10 sr./ac. and T_3 =Drilling at 20 sr./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 3. (iv) (a) 48'×22.67'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) and (b) No. (vi) Nil. (vii) The experiment was conducted at the Karnal Sub-Station, Karnal (Punjab).

5. RESULTS :

- (i) 1407 lb./ac.
 (ii) 548.5 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
T_1	2301
T_2	587
T_3	1334
S. E./mean	=223.9 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 50(14).

Type :- 'M'.

Object :- To study the residual effect of fertilizers applied to maize in *Kharif* on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) 2 discings with tractor. (b) to (e) N.A. (v) N.A. (vi) N.P. 710. (vii) Irrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

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

- (1) 3 levels of N: $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac.
 (2) 3 levels of P_2O_5 : $P_0=0$, $P_1=40$ and $P_2=80$ lb./ac.
 (3) 2 levels of K_2O : $K_0=0$ and $K_1=60$ lb./ac.

Manures applied to previous crop Maize in *kharif* 1950.

3. DESIGN :

(i) 3×3×2 Fact. confounded. (ii) (a) 6 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 42'×22'. (b) 37'×19'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) *Kharif* 1949—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) N×P two way table is N.A.

5. RESULTS :

- (i) 2296 lb./ac.
 (ii) 453.4 lb./ac.
 (iii) Effects of N, P, N×K and P×K are significant.

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

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁	P ₂
K ₀	1884	2455	2786	2375	1990	2373	2763
K ₁	1818	2119	2715	2217	1849	2410	2391
Mean	1851	2287	2751	2296	1920	2392	2577

S.E. of N or P marginal mean =130.9 lb./ac.

S.E. of K marginal mean =106.9 lb./ac.

S.E. of body of N×K or K×P table =185.1 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(11).

Type :- 'M'.

Object :—To study the residual effect of fertilizers applied to maize in *Kharif* on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Maize-Wheat. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 1.12.1951. (iv) (a) Ploughing twice with *desi* plough on 30.11.1951. (b) to (e) N.A. (v) N.A. (vi) N.P. 710. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 17.4.1952.

2. TREATMENTS :

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

(1) 3 levels of N : N₀=0, N₁=40 and N₂=80 lb./ac.(2) 3 levels of P₂O₅ : P₀=0, P₁=40 and P₂=80 lb./ac.(3) 2 levels of K₂O : K₀=0, and K₁=60 lb./ac.

Manures applied to the previous crop maize.

3. DESIGN :

(i) 3×3×2 Fact. confounded. (ii) (a) 6 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 42'×22'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) The crop had a luxuriant growth in N treated plots which lodged badly after the hail storm on 1.3.1952. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Heavy hail storm on 1.3.1952 and a light hail storm on 15.3.1952. (vii) Nil.

5. RESULTS :

(i) 5.75 lb./ac.

(ii) 52.16 lb./ac.

(iii) N effects is highly significant, P effect and interaction N×P and N×K are significant. Others are not significant.

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

	K ₀	K ₁	Mean	P ₀	P ₁	P ₂
N ₀	370	413	391	357	420	397
N ₁	603	581	591	579	587	611
N ₂	750	735	742	674	689	864
Mean	574	576	575	537	565	624
P ₀	539	535				
P ₁	571	560				
P ₂	614	634				

S.E. of N or P marginal mean	=15.06 lb./ac.
S.E. of K marginal mean	=12.29 lb./ac.
S.E. of body of N×P table	=26.08 lb./ac.
S.E. of body of N×K or P×K table	=21.30 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(22). Type :- 'M'.

Object :- To study the residual effect of fertilizers applied to maize in *Kharif* on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Maize-Wheat. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 3.12.1952. (iv) (a) Ploughing with victory plough on 1.12.1952 and ploughing across with *desi* plough on 2.12.1952. (b) to (e) N.A. (vi) N.A. (vii) N.P-710. (viii) Irrigated. (ix) N.A. (x) 12.4.1953.

2. TREATMENTS :

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

- (1) 3 levels of N : $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac.
 (2) 3 levels of P_2O_5 : $P_0=0$, $P_1=40$ and $P_2=80$ lb./ac.
 (3) 2 levels of K_2O : $K_0=0$ and $K_1=60$ lb./ac.

Manures applied to the previous crop maize.

3. DESIGN :

(i) $3 \times 3 \times 2$ Fact. confounded. (ii) (a) 6 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) $42' \times 22'$. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Prevalence of hot weather in February and March hastened maturity abruptly with the result that grain did not develop fully. (vii) Nil.

5. RESULTS :

- (i) 1502 lb./ac.
 (ii) 114.4 lb./ac.
 (iii) N and P effects are highly significant and interaction N×P is significant.
 (iv) Av. yield of grain in lb./ac.

	K_0	K_1	Mean	P_1	P_2	P_3
N_0	991	1094	1042	960	1006	1161
N_1	1517	1548	1533	1363	1688	1548
N_2	1972	1889	1939	1920	1734	2137
Mean	1493	1510	1502	1414	1478	1615
P_0	1383	1445				
P_1	1404	1548				
P_2	1693	1538				

S.E. of N or P marginal mean	=33.03 lb./ac.
S.E. of K marginal mean	=26.96 lb./ac.
S.E. of body of N×K or P×K table	=46.71 lb./ac.
S.E. of body of N×P table	=57.20 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(20). Type :- 'M'.

Object :—To study the residual effect of fertilizers applied to maize in *Kharif* on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 30.11.1953. (iv) (a) 1 ploughing with victory plough and 4 with *desi* plough. (b) to (e) N.A. (v) N.A. (vi) N.P. 710. (vii) Irrigated. (viii) *Bakharing* on 6.1.1954 and weedings on 9.1.1954 and 11.1.1954. (ix) N.A. (x) 16.4.1954

2. TREATMENTS :

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

(1) 3 levels of N : $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac.(2) 3 levels of P_2O_5 : $P_0=0$, $P_1=40$ and $P_2=80$ lb./ac.(3) 2 levels of K_2O : $K_0=0$ and $K_1=60$ lb./ac.

Manures applied to the previous crop maize.

3. DESIGN :

(i) $3 \times 3 \times 2$ Fact. confounded. (ii) (a) 6 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) $42' \times 22'$. (b) $37' \times 19'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949 (*kharif*)—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1138 lb./ac.
(ii) 248.5 lb./ac.
(iii) N effect is highly significant, P effect is significant and others are not significant.
(iv) Av. yield of grain in lb./ac.

	K_0	K_1	Mean	P_0	P_1	P_2
N_0	541	682	611	645	631	558
N_1	1159	1166	1163	1071	1224	1193
N_2	1645	1637	1641	1673	1049	2200
Mean	1115	1162	1138	1130	968	1317
	1090	1170				
P_1	906	1030				
P_2	1349	1284				

S.E. of N or P marginal mean = 71.7 lb./ac.
S.E. of K marginal mean = 58.6 lb./ac.
S.E. of body of $N \times K$ or $P \times K$ table = 101.5 lb./ac.
S.E. of body of $N \times P$ table = 124.3 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 50(13). Type :- 'M'.

Object :—To find out the relative efficiency of different forms of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 10.11.1950. (iv) (a) Tractor ploughings on 8.6.1950, grubbing on 29.8.1950 and discing on 3, 6.10.1950. (b) Sown by *kera*. (c) 70 lb./ac. (d) and (e) N.A. (v) N.A. (vi) N.P.52. (vii) Irrigated. (viii) Weeding on 8.2.1951. (ix) 2.8°. (x) 17.4.1951.

2. TREATMENTS :

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

(1) 4 sources of N : $S_1=A/S$, $S_2=A/N$, S_3 =Sodium nitrate and S_4 =Urea.

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

Manures applied on 2.1.1951 about 52 days after sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 8. (iv) (a) $43' \times 17'$. (b) $41' \times 15'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. Lodging on 25.3.1951 due to rains. (ii) Loose-smut, brown-rust appeared after lodging in the 1st week of March 1951. (iii) Grain yield. (iv) (a) 1949—1950. (b) No. (c) N.A. (v) (a) and (b) No. (vi) October 1950—February 1951 practically dry. Heavy rains and high velocity of wind on 25, 27.3.1951 lodged the crop. After few days of sun-shine the crop came up a little, specially in no manure plots. Practically no loss. (vii) Nil.

5. RESULTS :

(i) 1788 lb./ac.

(ii) 227.1 lb./ac.

(iii) Control vs other and N effects are highly significant. S is significant.

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

Control = 1385 lb./ac.

	S_1	S_2	S_3	S_4	Mean
N_1	1687	1772	1828	1625	1728
N_2	1851	2052	2032	1864	1950
Mean	1769	1912	1930	1745	1839

S.E. of marginal mean of S = 56.77 lb./ac.

S.E. of marginal mean of N = 40.15 lb./ac.

S.E. of body of table = 80.30 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51 (13).

Type :- 'M'.

Object :- To find out the relative efficiency of different forms of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 17.11.1951. (iv) (a) Tractor ploughings and tractor grubbing twice on 16.11.1951 after soaking doze. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 5, 11.4, 1952.

2. TREATMENTS :

All combinations of (1) and (2)+2 extra treatments

(1) 4 sources of N : $S_1=A/S$, $S_2=A/N$, S_3 =Sodium Nitrate and S_4 =Urea.

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

2 extra treatments : T_0 =Control and $T_1=60$ lb./ac. of P_2O_5 +40 lb./ac. of K_2O .

60 lb./ac. of P_2O_5 as Selecto-super+40 lb./ac. of K_2O as Pot. Sul. applied to all combinations of (1) and (2).

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 8. (iv) (a) 1/60 ac. (b) 1/70 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1949—1951. (b) No. (c) N.A. (v) (a) and (b) No. (vi) The crop was heavily damaged, ear heads broken and the crop badly lodged due to hail storm on 1.3.1952. (vii) Nil.

5. RESULTS :

- (i) 120.8 lb./ac.
(ii) 24.74 lb./ac.
(iii) Only control vs treated differ highly significantly.
(iv) Av. yield of grain in lb./ac.

$T_0=95.9$ lb./ac. and $T_1=77.0$ lb./ac.

	S ₁	S ₂	S ₃	S ₄	Mean
N ₁	132.3	121.8	121.1	131.6	126.7
N ₂	126.0	135.8	139.3	126.7	131.9
Mean	129.2	128.8	130.2	129.2	129.3

S.E. of S marginal mean = 6.18 lb./ac.
S.E. of N marginal mean = 4.37 lb./ac.
S.E. of body of table or selective treatments = 8.74 lb./ac.

Crop :- Wheat (*Rabi*).

Ref:- I.A.R.I. 52(10). Type :- 'M'.

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

1. BASAL CONDITIONS :

- (i) (a) Wheat-Maize. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 14.11.1952 (iv) (a) 1 double discing, 1 single grubbing and 1 double grubbing. (b) to (e) N.A. (v) Nil. (vi) N.P. 760. (vii) Irrigated. (viii) Weeding and hand hoeing. (ix) N.A. (x) 5, 8.4.1953.

2. TREATMENTS :

- Control.
- A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅.
- A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+Potash at 100 lb./ac. of K₂O.
- F.Y.M. at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+Potash at 100 lb./ac. of K₂O.
- Castor cake at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+Potash at 100 lb./ac. of K₂O.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38'×29'. (b) 36'×27'. (v) 1' around. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 1276 lb./ac.
(ii) 290.5 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	829
2.	1884
3.	1795
4.	848
5.	1026
S.E./mean	= 118.6 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(15).

Type :- 'M'.

Object :- To study the effect of inorganic and organic manures on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 11.11.1953. (iv) (a) Dry victory plough given on 12.12.1953 and *desi* plough on 9 and 10.11.1953. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 *bakharing* and 1 weeding. (ix) N.A. (x) 20.4.1954.

2. TREATMENTS :

1. Control.
2. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P_2O_5 .
3. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P_2O_5 +Potash at 100 lb./ac. of K_2O .
4. F.Y.M. at 60 lb./ac. of N+Super at 100 lb./ac. of P_2O_5 +Potash at 100 lb./ac. of K_2O .
5. Castor cake at 60 lb./ac. of N+Super at 100 lb./ac. of P_2O_5 +Potash at 100 lb./ac. of K_2O .

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38'×29'. (b) 36'×27'. (v) 1' on each side. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952 to 1956. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1252 lb./ac.
- (ii) 314.3 lb./ac.
- (iii) Treatments do not differ significantly.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1085
2.	1430
3.	1256
4.	1061
5.	1385
S.E./mean	= 128.3 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(26).

Type :- 'M'.

Object :- To study the response of fertilizers and their residual effect with and without direct manuring of cereal.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 12.11.1951. (iv) (a) 1 ploughing with victory plough and 2 with *desi* plough. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 6.4.1952.

2. TREATMENTS :

1. No manure.
2. 120 lb./ac. of P_2O_5 .
3. 120 lb./ac. of P_2O_5 +40 lb./ac. of N.
4. 120 lb./ac. of P_2O_5 +40 lb./ac. of N+80 lb./ac. of K_2O .
5. 120 lb./ac. of P_2O_5 +80 lb./ac. of K_2O .
6. No manure (Fallow in previous season).

The treatments were applied to previous legumes. This year, in plots with treatment 1,40 lb./ac. of N as A/S was applied to wheat.

3. DESIGN :

(i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 84'×26'. (b) 78'×20'. (v) 3' on each side. (vi) Yes.

4. GENERAL :

(i) Slow in the beginning but later on good. (ii) Loose smut. Smutted plants rouged. (iii) Grain yield. (iv) (a) 1948—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1261 lb./ac.
(ii) 310.2 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1650
2.	1065
3.	1003
4.	1606
5.	1249
6.	991
S.E./mean	=126.6 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 50(53).

Type :- 'M'.

Object :- To study the effect of the time of turning in the sannhemp crop with and without fertilizers on the yield of Wheat.

1. BASAL CONDITIONS :

- (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 2.11.1950. (iv) (a) 1 grubbing, 2 ploughings and 2 discing. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 13.4.1951 to 16.4.1951.

2. TREATMENTS :

Main-plot treatments :

4 times of ploughing in of sannhemp : M_1 =After 4 weeks of sowing, M_2 =After 6 weeks of sowing, M_3 =After 8 weeks of sowing and M_4 =After 10 weeks of sowing.

Sub-plot treatments :

4 applications of manures to sannhemp : S_1 =Super at 80 lb./ac. of P_2O_5 at sowing sannhemp, S_2 =A/S at 15 lb./ac. of N at burying of sannhemp, S_3 = S_1 + S_2 and S_4 =No fertilizers.

Super applied on 14.7.1950, A/S on 11.8.1950, 31.8.1950, 12.9.1950, 25, 26.9.1950. Sannhemp sown on 14.7.1950 while ploughed in M_1 on 11.8.1950, in M_2 on 31.8.1950, in M_3 on 12.9.1950 and in M_4 on 25, 26.9.1950.

3. DESIGN :

- (i) Split-plot. (ii) (a) 4 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 35'×20'. (b) 32'×17'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Germination was uniform. Growth in general was well. (ii) Attack of white ants was observed in 2nd and 3rd week of December 1950. (iii) Grain yield. (iv) (a) 1950-N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1590 lb./ac.
(ii) (a) 314.3 lb./ac.
(b) 162.9 lb./ac.
(iii) M effects and interaction M×S are highly significant while S effects is significant.
(iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	M_4	Mean
S_1	1701	1431	2092	1651	1719
S_2	1611	1441	1741	1341	1533
S_3	1521	1501	1962	1521	1626
S_4	1391	1361	1902	1281	1484
Mean	1556	1433	1924	1448	1590

S.E. of difference of two

- | | |
|-----------------------------------|-----------------|
| 1. M marginal means | = 111.1 lb./ac. |
| 2. S marginal means | = 57.6 lb./ac. |
| 3. S means at the same level of M | = 115.2 lb./ac. |
| 4. M means at the same level of S | = 149.3 lb./ac. |

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(54).

Type :- 'M'.

Object :—To study the effect of time of turning in a green manuring crop (sannhemp) with and without fertilizers on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 13.11.1951. (iv) (a) Tractor ploughing and tractor discing to sannhemp and country ploughing and tractor discing twice to wheat. (b) to (c) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 7, 8.4.1952.

2. TREATMENTS :

Main-plot treatments :

4 times of ploughing of Sannhemp : M_1 = Sannhemp buried after 4 weeks on 9.8.1951, M_2 = Sannhemp buried after 6 weeks on 1.9.1951, M_3 = Sannhemp buried after 8 weeks on 14.9.1951, M_4 = Sannhemp buried after 10 weeks on 29.9.1951 and 1.10.1951.

A/S applied on each burying.

Sub-plot treatments :

4 applications of manures to sannhemp : S_1 = Super at 80 lb./ac. of P_2O_5 at sowing sannhemp, S_2 = A/S at 15 lb./ac. of N at burying sannhemp, S_3 = $S_1 + S_2$ and S_4 = No manure.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination normal. The growth due to various treatments was distinct. Treatments M_3 and M_4 showed good growth in comparison to M_1 and M_2 . Crop lodged completely due to hail storm on 1.3.1952. (ii) Aphid attack. (iii) Grain yield. (iv) (a) 1950—1953. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1190 lb./ac.,
 (ii) (a) 195.8 lb./ac.
 (b) 241.9 lb./ac.

(iii) M and S effects are highly significant. Interaction $M \times S$ is significant.

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

	M_1	M_2	M_3	M_4	Mean
S_1	1301	990	1650	1320	1315
S_2	1063	825	1173	1136	1049
S_3	1338	1136	1888	1448	1452
S_4	990	788	1063	936	944
Mean	1173	935	1443	1210	1190

S.E. of difference of two

- | | |
|-----------------------------------|------------------|
| 1. M marginal means | = 69.23 lb./ac. |
| 2. S marginal means | = 85.54 lb./ac. |
| 3. S means at the same level of M | = 171.07 lb./ac. |
| 4. M means at the same level of S | = 163.51 lb./ac. |

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(55).

Type :- 'M'.

Object :—To study the effect of the time of turning in of the green manuring crop (Sannhemp) with and without fertilizers.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 1.11.1952. (iv) (a) Tractor discing twice and country ploughing twice. (b) Sown with drill. (c) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weeding on 23.1.1953 and 2, 3.2.1953. (ix) N.A. (x) 29, 30.3.1953.

2. TREATMENTS :

Main-plot treatments :

4 times of ploughing in of sannhemp : M_1 =Sannhemp buried after 4 weeks, M_2 =Sannhemp buried after 6 weeks and M_3 =Sannhemp buried after 8 weeks and M_4 =Sannhemp buried after 10 weeks Super broadcasted on 2.7.1952.

Sub-plot treatments :

4 applications of manures to sannhemp. S_1 =Super 80 lb./ac. P_2O_5 at sowing of sannhemp, S_2 =A/S at 15 lb./ac. N at burying in of sannhemp, S_3 = S_1 + S_2 and S_4 =No manure.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 acre. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination normal and growth satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) *Kharif* 1950—N.A. (b) No. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1938 lb./ac.
 (ii) (a) 333.3 lb./ac.
 (b) 337.4 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
S_1	1493	1980	2419	2053	1986
S_2	1907	2016	2181	2043	2037
S_3	1750	2107	2401	1888	2036
S_4	1686	1470	1870	1750	1694
Mean	1709	1893	2218	1933	1938

S.E. of difference of two

1. M marginal means =117.8 lb./ac.
2. S marginal means =119.3 lb./ac.
3. S means at the same level of M =238.6 lb./ac.
4. M means at the same level of S =237.8 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(69)

Type :- 'M'.

Object :—To study the effect of turning in a green manuring crop (sannhemp) with and without fertilizer.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 13.11.1953. (iv) (a) Ploughing with *desi* plough and tractor discing. (b) Wheat sown with M. drill. (c) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 13.4.1954.

2. TREATMENTS :

Main-plot treatments :

4 times of ploughing in of sannhemp : M_1 = Sannhemp buried after 4 weeks on 3.8.1953, M_2 = Sannhemp buried after 6 weeks on 17.8.1953, M_3 = Sannhemp buried after 8 weeks on 31.8.1953 and M_4 = Sannhemp buried after 10 weeks on 14.9.1953.

Sub-plot treatments :

4 applications of manures to sannhemp : S_1 = Super at 80 lb. P_2O_5 at sowing sannhemp, S_2 = A/S at 15 lb. of N at burying in of sannhemp, S_3 = $S_1 + S_2$ and S_4 = No manure.

A/S applied on each burying of sannhemp and Super applied on 6.7.1953.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 acre. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory. Crop growth normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—N.A. (b) No. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1519 lb./ac.

(ii) (a) 198.3 lb./ac.

(b) 120.9 lb./ac.

(iii) M and S effects are highly significant while interaction $M \times S$ is not significant.

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

	M_1	M_2	M_3	M_4	Mean
S_1	1542	1707	1898	1488	1659
S_2	1285	1489	1590	1238	1400
S_3	1567	1664	1860	1491	1645
S_4	1240	1266	1637	1343	1371
Mean	1409	1531	1746	1390	1519

S.E. of difference of two

1. M marginal means = 70.12 lb./ac.
2. S marginal means = 42.75 lb./ac.
3. S means at the same level of M = 85.50 lb./ac.
4. M means at the same level of S = 101.96 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 48(2).

Type :- 'M'.

Object :- To compare the efficiency of N from different sources along with two green manures in Fallow—Wheat rotation.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

1. G.M. sannhemp (in *situ*).
2. G.M. cowpeas (in *situ*).
3. Rape cake at 40 lb./ac. of N.
4. Castor cake at 40 lb./ac. of N.
5. F.Y.M. at 40 lb./ac. of N.
6. Leaf compost at 40 lb./ac. of N.
7. A/S at 40 lb./ac. of N.
8. Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 8. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1944—1949. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1808 lb./ac.
 (ii) 232.9 lb./ac.
 (iii) Treatments differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	2000	5.	1539
2.	1868	6.	1901
3.	1868	7.	1909
4.	1662	8.	1720

S.E./mean = 82.36 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(53). Type :- 'M'.

Object :- To study the effect of low doses of P_2O_5 on Wheat.

1. BASAL CONDITIONS :

- (i) (a) Cowpea—Wheat. (b) Cowpea. (c) Nil. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

- | | |
|--|---|
| 1. F.Y.M. at 16 lb./ac. of P_2O_5 . | 8. Super+F.Y.M. to give 32 lb./ac. of P_2O_5 in 1 : 3 ratio. |
| 2. F.Y.M. at 32 lb./ac. of P_2O_5 . | 9. Super+F.Y.M. to give 64 lb./ac. of P_2O_5 in 1 : 7 ratio. |
| 3. F.Y.M. at 64 lb./ac. of P_2O_5 . | 10. Super+F.Y.M. to give 32 lb./ac. of P_2O_5 in 3 : 1 ratio. |
| 4. Super at 16 lb./ac. of P_2O_5 . | 11. Super+F.Y.M. to give 64 lb./ac. of P_2O_5 in 7 : 1 ratio. |
| 5. Super at 32 lb./ac. of P_2O_5 . | 12. No manure. |
| 6. Super at 64 lb./ac. of P_2O_5 . | 13. Fallow. |
| 7. Super+F.Y.M. to give 16 lb./ac. of P_2O_5 in 1 : 1 ratio. | |

These treatments were applied to the first three crops of berseem.

3. DESIGN :

- (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) to (v) N.A. (vi) Yes.

4. GENERAL :

- (i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1941—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1307 lb./ac.
 (ii) N.A.
 (iii) N.A.
 (iv) Av yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1053	8.	1226
2.	1325	9.	1498
3.	1498	10.	1399
4.	1168	11.	1654
5.	1391	12.	1045
6.	1679	13.	741
7.	1308		

S.E./mean = N.A.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51 (31).

Type :- 'M'.

Object :- To study the effect of low doses of P_2O_5 on Wheat.

1. BASAL CONDITIONS :

- (i) (a) Fallow-Wheat. (b) Fallow. (c) Nil. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS :

1. F.Y.M. at 16 lb./ac. of P_2O_5 .
2. F.Y.M. at 32 lb./ac. of P_2O_5 .
3. F.Y.M. at 64 lb./ac. of P_2O_5 .
4. Super at 16 lb./ac. of P_2O_5 .
5. Super at 32 lb./ac. of P_2O_5 .
6. Super at 64 lb./ac. of P_2O_5 .
7. Super+F.Y.M. (1 : 1) at 16 lb./ac. of P_2O_5 .
8. Super +F.Y.M. (1 : 3) at 32 lb./ac. of P_2O_5 .
9. Super +F.Y.M. (1 : 7) at 64 lb./ac. of P_2O_5 .
10. Super +F.Y.M. (3 : 1) at 32 lb./ac. of P_2O_5 .
11. Super +F.Y.M. (7 : 1) at 64 lb./ac. of P_2O_5 .
12. No manure.
13. Fallow.

These treatments were applied to first three crops of berseem.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 12. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1941—1953. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1375 lb./ac.
(ii) 342.3 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1226	8.	1448
2.	1300	9.	1539
3.	1547	10.	1514
4.	1136	11.	1794
5.	1391	12.	946
6.	1753	13.	946
7.	1333		

S.E./mean

=98.81 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(76).

Type :- 'M'.

Object :- To study the effect of low doses of P_2O_5 on Wheat.

1. BASAL CONDITIONS :

(i) (a) Cowpea-Wheat. (b) Cowpea. (c) Nil. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS :

1. F.Y.M. at 16 lb./ac. of P_2O_5 .
2. F.Y.M. at 32 lb./ac. of P_2O_5 .
3. F.Y.M. at 94 lb./ac. of P_2O_5 .
4. Super at 16 lb./ac. of P_2O_5 .
5. Super at 32 lb./ac. of P_2O_5 .
6. Super at 64 lb./ac. of P_2O_5 .
7. Super+F.Y.M. to give 16 lb./ac. of P_2O_5 in 1 : 1 ratio.
8. Super+F.Y.M. to give 32 lb./ac. of P_2O_5 in 1 : 3 ratio.
9. Super+F.Y.M. to give 64 lb./ac. of P_2O_5 in 1 : 7 ratio.
10. Super+F.Y.M. to give 32 lb./ac. of P_2O_5 in 3 : 1 ratio.
11. Super+F.Y.M. to give 64 lb./ac. of P_2O_5 in 7 : 1 ratio.
12. No manure.
13. Fallow.

These treatments were applied to first three crops of berseem.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1941—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1365 lb./ac.
(ii) N.A.
(iii) N.A.

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

Treatment	Av. yield	Treatment	Av. yield
1.	1259	8.	1218
2.	1358	9.	1489
3.	1300	10.	1679
4.	1275	11.	1456
5.	1358	12.	1448
6.	1646	13.	930
7.	1325		
S.E./mean		=N.A.	

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(56).

Type :- 'M'.

Object :- To study the effect of low doses of P_2O_5 on Wheat.

1. BASAL CONDITIONS :

(i) (a) Fallow—Wheat. (b) Fallow. (c) Nil. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS :

- | | |
|---|---|
| 1. F.Y.M. at 16 lb./ac. of P_2O_5 . | 8. Super+F.Y.M. to give 32 lb./ac. of P_2O_5 in 1 : 3 ratio. |
| 2. F.Y.M. at 32 lb./ac. of P_2O_5 . | 9. Super+F.Y.M. to give 64 lb./ac. of P_2O_5 in 1 : 7 ratio. |
| 3. F.Y.M. at 64 lb./ac. of P_2O_5 . | 10. Super+F.Y.M. to give 32 lb./ac. of P_2O_5 in 3 : 1 ratio. |
| 4. Super at 16 lb./ac. of P_2O_5 . | 11. Super+F.Y.M. to give 64 lb./ac. of P_2O_5 in 7 : 1 ratio. |
| 5. Super at 32 lb./ac. of P_2O_5 . | 12. No manure. |
| 6. Super at 64 lb./ac. of P_2O_5 . | 13. Fallow. |
| 7. Super+F.Y.M. to give 16 lb./ac. P_2O_5 in 1 : 1 ratio. | |

These treatments were applied to the first three crops of berseem.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 12. (iv) (a), (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1941 to 1953. (b) Yes. (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1770 lb./ac.
(ii) 484.7 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield.	Treatment	Av. yield
1.	1572	8.	1703
2.	1720	9.	2008
3.	1695	10.	2131
4.	1654	11.	2065
5.	1901	12.	1251
6.	2641	13.	1037
7.	1637		
S.E./mean		=139.9 lb./ac.	

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(41).

Type :- 'M'.

Object :- To study the effect of low doses of P_2O_5 on Wheat.

1. BASAL CONDITIONS :

(i) (a) Cowpea—Wheat. (b) Cowpea. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS:

1. F.Y.M. at 16 lb./ac. of P_2O_5
2. F.Y.M. at 32 lb./ac. of P_2O_5
3. F.Y.M. at 64 lb./ac. of P_2O_5
4. Super at 16 lb./ac. of P_2O_5
5. Super at 32 lb./ac. of P_2O_5
6. Super at 64 lb./ac. of P_2O_5
7. Super+F.Y.M. to give 16 lb./ac. of P_2O_5 in 1 : 1 ratio.
8. Super+F.Y.M. to give 32 lb./ac. of P_2O_5 in 1 : 3 ratio.
9. Super+F.Y.M. to give 64 lb./ac. of P_2O_5 in 1 : 7 ratio.
10. Super+F.Y.M. to give 32 lb./ac. of P_2O_5 in 3 : 1 ratio.
11. Super+F.Y.M. to give 64 lb./ac. of P_2O_5 in 7 : 1 ratio.
12. No manure.
13. Fallow.

These treatments were applied to the first three crops of berseem.

3. DESIGN :

- (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) N.A. (iv) (a), (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1941 to 1953. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1446 lb./ac.
 (ii) and (iii) N.A.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1218	8.	1465
2.	1432	9.	1835
3.	1670	10.	1835
4.	1547	11.	1580
5.	1646	12.	1481
6.	1646	13.	1218
7.	1456		
	S.E./mean		=N.A.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(36).

Type :- 'M'.

Object :- To study the effect of low doses of P_2O_5 on Wheat.

1. BASAL CONDITIONS :

- (i) (a) Fallow—Wheat. (b) Fallow. (c) Nil. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS :

1. F.Y.M. at 16 lb./ac. of P_2O_5 .
2. F.Y.M. at 32 lb./ac. of P_2O_5 .
3. F.Y.M. at 64 lb./ac. of P_2O_5 .
4. Super at 16 lb./ac. of P_2O_5 .
5. Super at 32 lb./ac. of P_2O_5 .
6. Super at 64 lb./ac. of P_2O_5 .
7. Super+F.Y.M. (1 : 1) at 16 lb./ac. of P_2O_5 .
8. Super+F.Y.M. (1 : 3) at 32 lb./ac. of P_2O_5 .
9. Super+F.Y.M. (1 : 7) at 64 lb./ac. of P_2O_5 .
10. Super+F.Y.M. (3 : 1) at 32 lb./ac. of P_2O_5 .
11. Super+F.Y.M. (7 : 1) at 64 lb./ac. of P_2O_5 .
12. No manure.
13. Fallow.

3. DESIGN :

- (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 12. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1941—1953. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

- (i) 1584 lb./ac.
 (ii) 600.7 lb./ac.
 (iii) Treatments do not differ significantly.

(iv) Av. yield of grain in lb./ac.			
Treatment	Av. yield	Treatment	Av. yield
1.	1514	8.	1391
2.	1473	9.	1646
3.	1901	10.	1481
4.	1761	11.	1596
5.	1547	12.	1588
6.	1769	13.	1267
7.	1662		

S.E./mean = 173.4 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(52). Type :- 'M'.

Object :- To study the effect of manuring on the yield of Berseem and the residual effect on the rotational crops.

1. BASAL CONDITIONS:

(i) (a) Berseem—maize—wheat—*jowar*. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 29.11.1951. (iv) (a) Ploughing with country plough. (b) to (e) N.A. (v) N.A. (vi) N.P.165. (vii) Irrigated. (viii) N.A. (ix) 3.24". (x) 12.4.1952.

2. TREATMENTS:

Main-plot treatments:

7 combinations of N and P₂O₅: M₁=Ammono. Phos. at 80 lb./ac. of P₂O₅, M₂=Ammono. Phos. at 160 lb./ac. of P₂O₅, M₃=Super at 80 lb./ac. of P₂O₅+A/S to supply N as in M₁, M₄=Super at 160 lb./ac. of P₂O₅+A/S to supply N as in M₂, M₅=Super at 80 lb./ac. of P₂O₅, M₆=Super at 160 lb./ac. of P₂O₅ and M₇=No manure.

Sub-plot treatments:

3 levels of K₂O as Pot. Sul.: K₀=0, K₁=40 and K₂=80 lb./ac.
(Manures added to berseem in 1950—1951)/ac.

3. DESIGN:

(i) Split-plot. (ii) (a) 7 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 43'×25'. (b) 39'×21'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1946—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) Very badly damaged by the hailstorm more than 80%. The produce of different plots got mixed up by the severe dust storm and therefore grain yield per plot could not be recorded for the individual plots. (vii) Nil.

5. RESULTS:

- (i) 3720 lb./ac.
(ii) (a) 1249 lb./ac.
(b) 819.2 lb./ac.
(iii) M effect and interaction M×K are significant while K effect is not significant.
(iv) Av. yield of grain in lb./ac.

	M ₁	M ₂	M ₃	M ₄	M ₅	M ₆	M ₇	Mean
K ₀	3392	4412	4611	4902	3882	3869	2332	3915
K ₁	4200	3829	4279	3657	3710	4333	2014	3717
K ₂	3525	3113	3339	4810	3458	3869	2584	3528
Mean	3706	3785	4076	4453	3683	4023	2310	3720

S.E. of difference of two

1. M marginal means = 510.0 lb./ac.
2. K marginal means = 218.9 lb./ac.
3. K means at the same level of M = 579.3 lb./ac.
4. M means at the same level of K = 695.5 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(7).

Type :- 'M'.

Object :- To study the efficiency of fertilisers and their suitable combinations on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 4 and 5.11.1953. (iv) (a) 1 ploughing with victory plough, 1 with *desi* plough, 2 discings and 2 levellings. (b) Sowing in furrows by *desi* plough. (c) 80 lb./ac. (d), (e) N.A. (v) N.A. (vi) N.P. 716. (vii) Irrigated. (viii) *Bakharing* on 5.12.1953. (ix) N.A. (x) 15 to 16.4.1954.

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 sources of N : $S_1=A/S$, $S_2=Ammono. Nit.$ and $S_3=Urea$.(3) 3 levels of N : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.

3 extra treatments :

$T_1=60$ lb./ac. of N as A/S+40 lb./ac. of P_2O_5 as triple super, $T_2=40$ lb./ac. of N as A/S+80 lb./ac. of P_2O_5 as triple super and $T_3=60$ lb./ac. of N as A/S+80 lb./ac. of P_2O_5 as triple super.

3. DESIGN :

(i) 3^3 Conf'd. with three extra treatments. (ii) (a) 12 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) N.A. (b) $23' \times 47' 4''$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. Severe lodging in Feb. 1954. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) No. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Results of 3 extra treatments are not presented.

5. RESULTS :

(i) 1623 lb./ac.

(ii) 196.1 lb./ac.

(iii) P effect and interaction $N \times P$ are highly significant. Others are not significant.

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

 $N_0P_0=1242$ lb./ac., $N_0P_1=1391$ lb./ac., $N_0P_2=1663$ lb./ac.

	P_2	P_3	Mean	S_1	S_2	S_3
N_1	1611	1639	1649	1602	1648	1650
N_2	1750	1865	1801	1805	1949	1663
Mean	1680	1752	1725	1703	1798	1656
S_1	1669	1704	1736	1703		
S_2	1762	1904	1728	1798		
S_3	1609	1648	1711	1656		

S.E. of S and P marginal mean = 56.6 lb./ac.

S.E. of N marginal mean = 46.2 lb./ac.

S.E. of body of $N \times P$ or $N \times S$ table = 80.1 lb./ac.S.E. of body of $S \times P$ table = 98.0 lb./ac.S.E. of P means at the level of N_0 = 80.1 lb./ac.Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(12).

Type :- 'M'.

Object :- To study the response of organic manures alone and in combination with inorganic manures.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 16.11.1952. (iv) (a) 1 ploughing by victory plough, 3 by *desi* plough and 3 harrowings. (b) to (c) N.A. (v) Nil. (vi) N.P. 760. (vii) Irrigated. (viii) One hoeing. (ix) N.A. (x) 15 to 17.4.1952.

2. TREATMENTS :

1. Control.
2. 60 lb./ac. of N as A/S+100 lb./ac. of P_2O_5 as Super.
3. 60 lb./ac. of N as A/S+100 lb./ac. of P_2O_5 as Super+100 lb./ac. of K_2O as Pot. Sul.
4. 60 lb./ac. of N as F.Y.M.+100 lb./ac. of P_2O_5 as Super+100 lb./ac. of K_2O as Pot. Sul.
5. 60 lb./ac. of N as Castor cake+100 lb./ac. of P_2O_5 as Super+100 lb./ac. of K_2O as Pot. Sul.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38'×29'. (b) 36'×27'. (v) 1' on each side. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 368.9 lb./ac.
 (ii) 90.35 lb./ac.
 (iii) Treatments differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	193.4
2.	529.1
3.	505.2
4.	295.4
5.	321.7
S.E./mean	=36.89 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 50(4). Type :- 'M'.

Object:—To study the relative efficiency of N in bulky or semi-bulky organic manures and inorganic fertilizers on Wheat.

1. BASAL CONDITIONS:

- (i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item {11 on page 143. (iii) 12.11.1950. (iv) (a) Grubbing with tractor and discing twice. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) One weeding with *khurpi*. (ix) N.A. (x) N.A.

2. TREATMENTS :

- | | |
|-------------------------------|-------------------------------|
| 1. Control. | 7. 20 lb./ac. of N as G.N.C. |
| 2. 40 lb./ac. of N as F.Y.M. | 8. 40 lb./ac. of N as G.N.C. |
| 3. 60 lb./ac. of N as F.Y.M. | 9. 60 lb./ac. of N as G.N.C. |
| 4. 80 lb./ac. of N as F.Y.M. | 10. 80 lb./ac. of N as G.N.C. |
| 5. 100 lb./ac. of N as F.Y.M. | 11. 20 lb./ac. of N as A/S. |
| 6. 120 lb./ac. of N as F.Y.M. | 12. 40 lb./ac. of N as A/S. |

3. DESIGN :

- (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) 33'×22'. (b) 31'×20'. (v) 1' on each side. (vi) Yes.

4. GENERAL :

- (i) Good. (ii) Yellow rust. (iii) Grain yield. (iv) (a) 1949—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2948 lb./ac.
 (ii) 384.3 lb./ac.
 (iii) Treatments differ highly significantly

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

Treatment	Av. yield	Treatment	Av. yield
1.	2781	7.	2789
2.	2419	8.	2995
3.	2896	9.	3151
4.	2946	10.	3349
5.	3110	11.	2946
6.	2921	12.	3069
S.E./mean		=134.9 lb./ac.	

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(6). Type :- 'M'.

Object :- To study the relative efficiency of N in bulky or semi-bulky organic manures and inorganic fertilizers on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 16.11.1951. (iv) (a) Ploughing by victory plough ; beaming and ploughing by country plough. Horse hoe cultivator for mixing manure, grubbing twice by tractor and beaming. (b) to (e) N.A. (v) No. (vi) C. 518. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 12.4.1952.

2. TREATMENTS :

1. No manure.	7. 20 lb./ac. of N as G.N.C.
2. 40 lb./ac. of N as F.Y.M.	8. 40 lb./ac. of N as G.N.C.
3. 60 lb./ac. of N as F.Y.M.	9. 60 lb./ac. of N as G.N.C.
4. 80 lb./ac. of N as F.Y.M.	10. 80 lb./ac. of N as G.N.C.
5. 100 lb./ac. of N as F.Y.M.	11. 20 lb./ac. of N as A/S.
6. 120 lb./ac. of N as F.Y.M.	12. 40 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) 33'×22'. (b) 31'×20'. (v) 1' on each side. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1206 lb./ac.
(ii) 232.9 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1105	7.	1117
2.	1112	8.	1354
3.	1133	9.	1391
4.	1163	10.	1527
5.	1121	11.	1180
6.	1098	12.	1220
S.E./mean		=82.35 lb./ac.	

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(5). Type :- 'M'.

Object :- To study the relative efficiency of N in bulky or semi-bulky organic manures and inorganic fertilizers on Wheat.

. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 10.11.1952. (iv) (a) Ploughing with victory plough thrice and *desi* plough twice. (b) to (e) N.A. (v) Nil. (vi) N.P. 710. (vii) Irrigated. (viii) Weeding once. (ix) N.A. (x) 3/4.5.1953.

2. TREATMENTS :

- | | |
|-------------------------------|-------------------------------|
| 1. No manure. | 7. 20 lb./ac. of N as G.N.C. |
| 2. 40 lb./ac. of N as F.Y.M. | 8. 40 lb./ac. of N as G.N.C. |
| 3. 60 lb./ac. of N as F.Y.M. | 9. 60 lb./ac. of N as G.N.C. |
| 4. 80 lb./ac. of N as F.Y.M. | 10. 80 lb./ac. of N as G.N.C. |
| 5. 100 lb./ac. of N as F.Y.M. | 11. 20 lb./ac. of N as A/S. |
| 6. 120 lb./ac. of N as F.Y.M. | 12. 40 lb./ac. of N as A/S. |

3. DESIGN :

- (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) 33'×22'. (b) 31'×20'. (v) 1' on each side. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 1654 lb./ac.
(ii) 286.3 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1442	7.	1624
2.	1414	8.	1791
3.	1581	9.	1861
4.	1572	10.	2002
5.	1484	11.	1721
6.	1572	12.	1782

S.E./mean=101.2 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(52). Type :- 'M'.

Object :- To determine the optimum interval between the application of F.Y.M. and sowing of Wheat to obtain the maximum yield.

1. BASAL CONDITIONS :

- (i) (a) Wheat—Maize. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.11.1952. (iv) (a) 2 discings by tractor and 5
- desi*
- ploughings. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) Weeding and hoeing. (ix) N.A. (x) 8 to 15.4.1953.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2) + a control (T_0D_0 =no manure)

- (1) 4 times of application of F.Y.M. :
- $T_1=3$
- months,
- $T_2=2$
- months,
- $T_3=1$
- month and
- $T_4=1$
- week before sowing.

- (2) 3 doses of F.Y.M. :
- $D_1=2\frac{1}{2}$
- ,
- $D_2=5$
- and
- $D_3=10$
- tons/ac.

Sub-plot treatments :

2 levels of N as A/S : $N_0=0$ and $N_1=10$ lb./ac.

3. DESIGN :

- (i) Split-plot. (ii) (a) 13 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) Main-plot : 32'×35' and sub-plot : 32'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 1036 lb./ac.
(ii) (a) 284.3 lb./ac.
(b) 273.0 lb./ac.
(iii) Only N effect is highly significant.

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

	T ₀ D ₀	T ₁ D ₁	T ₁ D ₂	T ₁ D ₃	T ₂ D ₁	T ₂ D ₂	T ₂ D ₃	T ₃ D ₁	T ₃ D ₂	T ₃ D ₃	T ₄ D ₁	T ₄ D ₂	T ₄ D ₃	Mean
N ₀	836	1081	1059	892	1081	1030	1064	1030	972	848	1096	904	1110	1000
N ₁	1030	1125	1147	1293	965	1018	1035	1059	1094	1011	1103	1191	855	1071
Mean	933	1103	1103	1092	1023	1024	1050	1044	1033	930	1100	1048	982	1036

S.E. of difference of two

1. TD marginal means =142.2 lb./ac.
2. N marginal means = 53.5 lb./ac.
3. N means at the same level of TD =193.0 lb./ac.
4. TD means at the same level of N =197.1 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(55).

Type :- 'M'.

Object :-To determine the optimum interval between the application of F.Y.M. and sowing of Wheat to obtain the maximum yield.

1. BASAL CONDITIONS :

(i) (a) Wheat-Maize. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 4.12.1953. (iv) (a) 1 ploughing with victory plough and 3 with *desi* plough. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) *Bakharing*. (ix) N.A. (x) 17, 18.4.1954.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)+a control (T₀D₀=no manure)

(1) 4 times of application of F.Y.M. : T₁=3 months, T₂=2 months, T₃=1 month and T₄=1 week before sowing.

(2) 3 doses of F.Y.M. : D₁=2½, D₂=5 and D₃=10 tons/ac. of F.Y.M.

Sub-plot treatments :

2 levels of N as A/S : N₀=0 and N₁=10 lb./ac. of N as A/S.

3. DESIGN :

(i) Split-plot. (ii) (a) 13 main-plots/block and 2 sub-plots/main plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) Main-plot : 32'×36' ; Sub-plot : 32'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1460 lb./ac.

(ii) (a) 313.7 lb./ac.

(b) 560.1 lb./ac.

(iii) None of the effects is significant.

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

	T ₀ D ₀	T ₁ D ₁	T ₁ D ₂	T ₁ D ₃	T ₂ D ₁	T ₂ D ₂	T ₂ D ₃	T ₃ D ₁	T ₃ D ₂	T ₃ D ₃	T ₄ D ₁	T ₄ D ₂	T ₄ D ₃	Mean
N ₀	1556	1499	1444	1319	1591	1589	1452	1371	1435	1239	1268	1555	1320	1434
N ₁	1389	1376	1848	1525	1668	1601	1355	1494	1364	1199	1414	1636	1453	1486
Mean	1472	1438	1646	1422	1630	1595	1404	1432	1400	1219	1341	1596	1386	1460

S.E. of difference of two

1. D marginal means =156.8 lb./ac.
2. N marginal means =109.8 lb./ac.
3. N means at the same level of TD =396.0 lb./ac.
4. TD means at the same level of N =381.7 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 50(6).

Type :- 'M'.

Object :—To study the soil fertility building capacity of manures applied to berseem in rotation by their effect on the succeeding Wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 6.11.1950. (iv) (a) Discing twice and grubbing twice. (b) to (e) N.A. (v) Nil. (vi) N.P. 710. (vii) Irrigated. (viii) 1 lever harrow and 1 weeding. (ix) 2.71". (x) 4.5. 1951.

2. TREATMENTS :

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

(1) 2 levels of P_2O_5 as Super : $P_1=50$ and $P_2=100$ lb./ac.

(2) 2 levels of K_2O as Pot. Sul. : $K_0=0$ and $K_1=80$ lb./ac.

Manures applied to the previous crop of maize.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) $60' \times 27'$. (b) $58' \times 25'$. (v) 1' on each side. (vi) Yes

4. GENERAL :

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

5. RESULTS :

(i) 738.2 lb./ac.

(ii) 167.8 lb./ac.

(iii) Treatments differ significantly.

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

	Control = 605.6 lb./ac.		
	P_1	P_2	Mean
K_0	785.8	718.3	752.0
K_1	785.8	795.7	790.8
Mean	785.8	757.0	771.4

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

S.E. of body of table or control mean = 68.5 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(7).

Type :- 'M'.

Object :—To build up soil fertility by Phosphate manuring of berseem and to study the residual effect on Wheat in rotation.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 16.11.1951. (iv) (a) 1 ploughing with tractor, discing, one ploughing with *desi* plough and again with tractor. (b) to (e) N.A. (v) No. (vi) N.P. 710. (vii) Irrigated. (viii) N.A. (ix) 0.86". (x) 17.4.1952.

2. TREATMENTS :

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

(1) 2 levels of P_2O_5 as Super : $P_1=50$ and $P_2=100$ lb./ac.

(2) 2 levels of K_2O as Pot. Sul. : $K_0=0$ and $K_1=80$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) $58' \times 25'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Badly lodged. (ii) Nil. (iii) Grain yield. (iv) (a) 1946—1951. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1140 lb./ac.
(ii) 193.4 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	Control = 1172 lb./ac.		
	P ₁	P ₂	Mean
K ₀	1061	1162	1111
K ₁	1121	1186	1154
Mean	1091	1174	1133

S.E. of any marginal mean = 55.85 lb./ac.

S.E. of body of table or control mean = 78.99 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 50(8).

Type :- 'M'.

Object :—To study the effect of phosphatic manuring of berseem with and without K and N and to study the residual effect on the subsequent Wheat crop.

1. BASAL CONDITIONS :

- (i) (a) Berseem-Maize-Cotton-Wheat. (b) Cotton. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 26.11.1950. (iv) (a) One ploughing with victory plough and two with *desi* plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:

- Control (no manure).
- 25 lb./ac. of N as A/S+120 lb./ac. of P₂O₅ as Super.
- 50 lb./ac. of N as A/S+120 lb./ac. of P₂O₅ as Super.
- 100 lb./ac. of N as A/S+120 lb./ac. of P₂O₅ as Super.
- 120 lb./ac. of N as A/S+120 lb./ac. of P₂O₅ as Super.
- 120 lb./ac. of P₂O₅ as Super.
- 100 lb./ac. of N as A/S+120 lb./ac. of P₂O₅ as Super+120 lb./ac. of K₂O as Pot. Sul.
- Fallow.

Manures applied to the previous crop cotton.

3. DESIGN :

- (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 1136 lb./ac. (i) 1382 lb./ac.
(ii) 154.7 lb./ac. (ii) 261.7 lb./ac.
(iii) Treatments differ highly significantly. (iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac. (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	867
2.	1211
3.	1208
4.	1271
5.	1200
6.	1191
7.	1294
8.	848
S.E./mean	= 63.36 lb./ac.

Treatment	Av. yield
1.	921
2.	1521
3.	1558
4.	1841
5.	1234
6.	1244
7.	1812
8.	924
S.E./mean	= 106.8 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(8).

Type :- 'M'.

Object :—To study the effect of phosphatic manuring of berseem with and without K and N and to study the residual effect on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Berseem—Cotton. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 2.12.1952. (iv) (a) Ploughing with victory plough and with *desi* plough. (b) to (e) N.A. (v) Nil. (vi) N.P. 710. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 12.4.1953.

2. TREATMENTS :

1. Control (no manure).
 2. 120 lb./ac. of P_2O_5 as Super.
 3. Treat. (2)+120 lb./ac. of K_2O as Pot. Sul.
 4. Treat. (2)+25 lb./ac. of N as A/S.
 5. Treat. (2)+50 lb./ac. of N as A/S.
 6. Treat. (2)+100 lb./ac. of N as A/S.
 7. Treat. (3)+100 lb./ac. of N as A/S.
 8. Fallow (in berseem season).
- Manures applied to Berseem during the previous year.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1943—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 903 lb./ac.
 (ii) 147.3 lb./ac.
 (iii) Treatment differences are significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	621	5.	1008
2.	846	6.	1154
3.	912	7.	1176
4.	960	8.	549
S.E./mean		=60.14 lb./ac.	

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(30).

Type :- 'M..

Object :—To study the effect of manured, unmanured, one, two or three years ley farming on soil fertility as judged by the yields of subsequent maize and Wheat crops.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 29.10.1951. (iv) (a) 1 ploughing with victory plough, 2 ploughings with *desi* plough and preparatory tillage. (b) to (e) N.A. (v) Nil. (vi) C. 518. (vii) Irrigated. (viii) 1 hoeing with *oudh* plough. (ix) N.A. (x) 7.4.1952.

2. TREATMENTS :

Main-plot treatments :

9 treatments (ley farming) : T_1 =One year ley—full dose. T_2 =One year ley—no manure, T_3 =Two years ley—full dose. T_4 =Two years ley—manured once. T_5 =Two years ley—no manure. T_6 =Three years ley—full dose every year, T_7 =Three years ley—full dose two consecutive years. T_8 =Three years ley—full dose once and T_9 =Three years ley—no manure.

Sub-plot treatments :

4 G.M. treatments : M_1 =Dich Anubilats Viciasative, M_2 =Vicia Luceern. M_3 =Rhoders and M_4 =Maize—wheat rotation.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 th of an acre. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1949 -1953. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Information given as available. Classification is N.A. Description of (1) to (5) in the results for main-plots N.A.

5. RESULTS :

- (i) 547.7 lb./ac.
 (ii) (a) 150.6 lb./ac.
 (b) 125.9 lb./ac.
 (iii) Effect of T is significant Effect of M and interaction T × M are highly significant.
 (iv) Av. yield of grain in lb./ac.

	(1)	(2)	(3)	(4)	(5)	Mean
M ₁	559.5	659.9	619.6	479.7	380.2	539.8
M ₂	659.9	700.3	700.3	559.5	619.6	647.9
M ₃	559.4	577.6	479.7	440.2	479.7	507.3
M ₄	640.2	399.9	539.8	419.7	479.7	495.9
Mean	604.8	584.4	584.8	474.8	489.8	547.7

S.E. of difference of two

1. T marginal means = 53.49 lb./ac.
2. M marginal means = 29.62 lb./ac.
3. M means at the same level of T = 88.89 lb./ac.
4. T means at the same level of M = 68.54 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(71).

Type :- 'M'.

Object :- To study the effect of manured, unmanured, one, two or three years ley farming on soil fertility as judged by the yields of subsequent maize and Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 16.11.1952. (iv) (a) Ploughing with victory plough and *desi* plough, preparatory tillage and grubbing with tractor. (b) to (e) N.A. (v) Nil. (vi) C. 518. (vii) Irrigated. (viii) *Bakharing* and hoeing with *oudh* plough. (ix) N.A. (x) 7.4.1953.

2. TREATMENTS :

Main-plot treatments

9 treatments (ley farming) : T₁=One year ley-full dose of manure, T₂=One year ley—no manure, T₃=Two years ley—twice manured, T₄=Two years ley—once manured, T₅=Two years ley—no manure, T₆=Three years ley—thrice manured, T₇=Three years ley—twice manured, T₈=Three years ley—once manured and T₉=Three years ley—no manure.

Sub-plot treatments :

4 G.M. treatments : M₁=Dich and hume mixture, M₂=Cenchus, M₃=Rhodes and M₄=Maize and wheat rotation.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block and 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) Normal. (ii) No. (iii) Grain yield. (iv) (a) 1949—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 762.9 lb./ac.
 (ii) (a) 160.0 lb./ac.
 (b) 190.4 lb./ac.
 (iii) Only M effect is significant.
 (iv) Av. yield of grain in lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	T ₈	T ₉	Mean
M ₁	860.7	749.7	741.4	733.2	741.4	762.0	753.8	753.8	770.3	762.9
M ₂	655.8	733.2	737.3	741.4	753.8	758.0	749.7	758.0	741.4	736.5
M ₃	737.3	733.2	758.0	749.7	745.6	737.3	758.0	737.4	762.4	746.5
M ₄	741.4	745.6	729.1	729.1	729.1	737.3	741.4	737.4	737.5	746.4
Mean	748.0	740.4	741.4	738.3	742.5	748.6	750.7	746.6	752.1	762.9

S.E. of difference of two

1. T marginal means =56.5 lb./ac.
 2. M marginal means =31.7 lb./ac.
 3. M means at the same level of T =63.4 lb./ac.
 4. T means at the same level of M =91.6 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(53).

Type :- 'M'.

Object :—To study the effect of manured, unmanured, one, two and three years ley farming on soil fertility as judged by soil structure.

1. BASAL CONDITIONS:

- (i) (a) Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 25.10.1953. (iv) (a) Ploughing with victory plough and *desi* plough. (b) to (e) N.A. (v) N.A. (vi) N.P-175. (vii) Irrigated. (viii) *Bakharing* on 1.12.1953 and 24.12.1953. (ix) N.A. (x) 14.4.1954.

2. TREATMENTS:

Main-plot treatments .

9 treatments (ley farming) : T₁=One year ley—full dose, T₂=One year ley—no manure, T₃=Two year ley—full dose, T₄=Two years ley—manured once, T₅=Two years ley—no manure T₆=Three years ley—full dose every year, T₇=Three years ley—2 consecutive years, T₈=Three [years ley—once and T₉=Three years ley—no manure.

Sub-plot treatments :

4 G.M. treatments : G₁=Dich Amublates, viciasative, G₂=Vicia lucame, G₃=Rhodes and G₄=Maize—wheat rotation.

3. DESIGN :

- (i) Split-plot. (ii) (a) 9 main-plots/replication and 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) N.A. (ii) Effected by loose-smut. (iii) Grain yield. (iv) (a) 1949—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 610 lb./ac.
 (ii) (a) 115.7 lb./ac.
 (b) 124.4 lb./ac.
 (iii) Only T effect is significant.

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

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	T ₈	T ₉	Mean
M ₁	620	570	480	560	570	560	740	700	720	613
M ₂	510	580	620	460	690	600	670	660	680	608
M ₃	570	510	690	600	650	690	750	670	710	649
M ₄	590	570	540	560	600	560	650	540	530	571
Mean	572	558	582	545	627	602	702	642	660	610

S.E. of difference of two

1. T marginal means =40.9 lb./ac.
2. M marginal means =29.3 lb./ac.
3. M means at the same level of T =87.9 lb./ac.
4. T means at the same level of M =83.3 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53 (13). Type :- 'M'.

Object :—To study the residual effect of fertilizers, applied to berseem, on Wheat crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 1.12.1953. (iv) (a) 1 ploughing with victory plough and 5 by *desi* plough. (b) to (e) N.A. (v) Nil. (vi) N.P. 710. (vii) Irrigated. (viii) *Bakharing* on 7.1.1954. (ix) N.A. (x) 16.4.1954.

2. TREATMENTS :

1. Control (no manure).
 2. 120 lb./ac. of P₂O₅ as Super.
 3. Treat. (2)+120 lb./ac. of K₂O as Pot. Sul.
 4. Treat. (2)+25 lb./ac. of N as A/S.
 5. Treat. (2)+50 lb./ac. of N as A/S.
 6. Treat. (2)+100 lb./ac. of N as A/S.
 7. Treat. (3)+100 lb./ac. of N as A/S.
 8. Fallow (during berseem season).
- Manures applied to berseem crop during 1951-52.

3. DESIGN :

- (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 36'×18'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1948—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1081 lb./ac.
(ii) 193.4 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	807	5.	1260
2.	1147	6.	1311
3.	1133	7.	1219
4.	1121	8.	648

S.E./mean =78.95 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(73). Type :- 'M'.

Object :-To study the effect of organic and inorganic phosphatic fertilizers, applied to berseem on Wheat.

1. BASAL CONDITIONS :

(i) (a) Berseem-Cowpea-Wheat. (b) Cowpea. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 22.11.1952. (iv) (a) 3 ploughings with victory plough, 2 ploughing with *desi* plough. (b) Sown with monarch drill. (c) 2 md./ac. (d) and (e) N.A. (v) N.A. (vi) C-518. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 10.4.1953 to 13.4.1953.

2. TREATMENTS :

- | | |
|---------------------------------------|--|
| 1. Control (no manure). | 8. F.Y.M. at 8 lb./ac. of P_2O_5 +8 lb./ac. of P_2O_5 as Super. |
| 2. F.Y.M. at 16 lb./ac. of P_2O_5 . | 9. F.Y.M. at 24 lb./ac. of P_2O_5 +8 lb./ac. of P_2O_5 as Super. |
| 3. F.Y.M. at 32 lb./ac. of P_2O_5 . | 10. F.Y.M. at 56 lb./ac. of P_2O_5 +8 lb./ac. of P_2O_5 as Super. |
| 4. F.Y.M. at 64 lb./ac. of P_2O_5 . | 11. F.Y.M. at 8 lb./ac. of P_2O_5 +Super at 24 lb./ac. of P_2O_5 . |
| 5. Super at 16 lb./ac. of P_2O_5 . | 12. F.Y.M. at 8 lb./ac. of P_2O_5 +Super at 56 lb./ac. of P_2O_5 . |
| 6. Super at 32 lb./ac. of P_2O_5 . | 13. Fallow. |
| 7. Super at 64 lb./ac. of P_2O_5 . | |

Manurial treatments applied to berseem.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 63'×15'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 1773 lb./ac.
(ii) 471.5 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1254	8.	1638
2.	1574	9.	1702
3.	1720	10.	2004
4.	1693	11.	2133
5.	1656	12.	2069
6.	1925	13.	1034
7.	2645		

S.E./mean =192.5 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 50(10)

Type :- 'M'.

Object :-To study the comparative value of various green manuring crops from the point of view of organic matter and plant food ingredients in promoting the yield of subsequent Wheat crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 13.11.1950. (iv) (a) Tractor grubbing and discing twice. (b) to (e) N.A. (v) Nil. (vi) N.P. 718. (vii) Irrigated. (viii) Hoeing on 10.2.1951. (ix) N.A. (x) 17.4.1951 to 19.4.1951 and 25.4.1951.

2. TREATMENTS :

Main-plot treatments :

6 G.M. crops : G_0 =Fallow, G_1 =Guar, G_2 =Sunhemp, G_3 =Cowpea and G_4 =Soyabean, G_5 =*Dhaincha*.

Sub-plot treatments :

2 levels of P_2O_5 as Super : P_0 =0 and P_1 =80 lb./ac. of P_2O_5 .

Wheat is grown in all the plots in the subsequent season.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 64'×11½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Removal of smutted plants on 28.2.1951 and 10.3.1951. (iii) Grain yield. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1858 lb./ac.
 (ii) (a) 309.0 lb./ac.
 (b) 241.2 lb./ac.
 (iii) Only G effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	G ₀	G ₁	G ₂	G ₃	G ₄	G ₅	Mean
P ₀	1490	1935	2040	1755	1935	1920	1846
P ₁	1490	2110	1995	1900	1855	1875	1871
Mean	1490	2022	2018	1827	1895	1897	1858

S.E. of difference of two

1. G marginal means = 126.2 lb./ac.
2. P marginal means = 56.8 lb./ac.
3. P means at the same level of G = 139.2 lb./ac.
4. G means at the same level of P = 160.0 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(16).

Type :- 'M'.

Object :—To study the comparative value of various green manuring crops in point of view of organic matter and from plant food ingredients in promoting the yield of subsequent Wheat crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 5, 6.11.1952. (iv) (a) Ploughing with *desi* plough twice. Preparing land with *desi* plough twice after soaking. (b) to (e) N.A. (v) N.A. (vi) N.P.718. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 31.3.1952 to 3.4.1953.

2. TREATMENTS :

Main-plot treatments :

6 G.M. crops : G₀=Control (Fallow), G₁=*Guar*, G₂=*Sunhemp*, G₃=*Cowpea*, G₄=*Soyabean* and G₅=*Dhaincha*.

Sub-plot treatments :

2 levels of P₂O₅ as Super : P₀=0 and P₁=80 lb./ac. of P₂O₅.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 64' × 11½'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 2002 lb./ac.
 (ii) (a) 576.0 lb./ac.
 (b) 324.0 lb./ac.
 (iii) None of the effects is significant.

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

	G ₀	G ₁	G ₂	G ₃	G ₄	G ₅	Mean
P ₀	1800	1950	2050	2080	2130	2050	2010
P ₁	1820	2350	1920	1870	2030	1980	1995
Mean	1810	2150	1985	1975	2080	2015	2002

S E. of difference of two

1. G marginal mean =235.1 lb./ac.
2. P marginal mean = 76.4 lb./ac.
3. P mean at the same level of G =187.1 lb./ac.
4. G mean at the same level of P =269.8 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :-I.A.R.I. 53(17).

Type :- 'M'.

Object :—To study the comparative value of various green manuring crops in point of view of organic matter and from plant food ingredients in promoting the yield of subsequent Wheat crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 11.11.1953. (iv) (a) 3 discing with the help of disc harrow. 3 ploughings by *desi* plough followed by *sohaga* every time. (b) to (e) N.A. (v) No. (vi) N.P. 718. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 10, 11.4.1954.

2. TREATMENTS :

Main-plot treatments :

6 G.M. crops : G₀=Fallow (control), G₁=*Guar*, G₂=*Sannhemp*, G₃=*Cowpea*, G₄=*Soyabean* and G₅=*Dhaincha*.

Sub-plot treatments :

2 levels of P₂O₅ as Super : P₀=0 and P₁=80 lb./ac. of P₂O₅.

G.M. crops are incorporated in the soil on 28.9.1951.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 1/60 ac. (b) 1/71.5 ac. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 1312 lb./ac.
- (ii) (a) 152.2 lb./ac.
- (b) 115.2 lb./ac.
- (iii) G effect alone is highly significant.
- (iv) Av. yield of grain in lb./ac.

	G ₀	G ₁	G ₂	G ₃	G ₄	G ₅	Mean
P ₀	867	1352	1487	1373	1123	1412	1269
P ₁	812	1632	1577	1418	1120	1572	1355
Mean	840	1492	1532	1396	1122	1492	1312

S.E. of difference of two

1. G marginal mean =62.14 lb./ac.
2. P marginal mean =27.15 lb./ac.
3. P mean at the same level of G =66.65 lb./ac.
4. G mean at the same level of P =77.95 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(47).

Type :- 'M'.

Object :—To study the effect of Wheat *bhusa* buried along with artificial manures on the yield of Wheat.

1. BASAL CONDITIONS :

- (i) (a) Maize—Wheat. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 13.11.1952.
 (iv) (a) Ploughing with victory [plough and tractor grubbing twice. (b) to (e) N.A. (v) N.A. (vi) N.A.
 (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 16, 17.4.1953.

2. TREATMENTS :

Main-plot treatments :

3 levels of *bhusa* : $S_0=0$, $S_1=20$ and $S_2=30$ md./ac.

Sub-plot treatments :

5 doses of manures : $M_0=0$, $M_1=20$ lb./ac. of N, $M_2=40$ lb./ac. of N, $M_3=60$ lb./ac. of N and $M_4=16$ lb./ac. of N+60 lb./ac. of P_2O_5 +40 lb./ac. of K.N applied as A/S. Manures applied in S_1 and S_2 plots on 14.7.1952 and in S_0 plot on 11.11.1952.

3. DESIGN :

- (i) Split-plot. (ii) (a) 3 main-plots/replication and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 29.0'×37.5'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1658 lb./ac.

(ii) (a) 847.5 lb./ac.

(b) 395.0 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	Mean
S_0	1736	1769	1465	1201	1489	1532
S_1	1991	1753	1860	1629	1637	1774
S_2	1893	1629	1547	1605	1670	1669
Mean	1873	1717	1624	1478	1599	1658

S.E. of difference of two

1. S marginal means =267.3 lb./ac.

2. M marginal means =161.2 lb./ac.

3. M means at the same level of S =279.2 lb./ac.

4. S means at the same level of M =320.5 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(48).

Type :- 'M'.

Object :—To study the effect of Wheat *bhusa* buried along with artificial manures on the yield of Wheat.

1. BASAL CONDITIONS :

- (i) (a) Maize—Wheat. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 5.11.1953. (iv) (a) Dry ploughing with victory and *desi* plough and land prepared with tractor disc. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) Gap filling on 4.12.1953. (ix) N.A. (x) 24 to 26.4.1954.

2. TREATMENTS :

Main-plot treatments:

3 levels of *bhusa* : $S_0=0$, $S_1=20$ and $S_2=30$ md./ac.

Sub-plot treatments :

5 doses of manures : $M_0=0$, $M_1=20$ lb./ac. of N, $M_2=40$ lb./ac. of N, $M_3=60$ lb./ac. of N and $M_4=16$ lb./ac. of N+60 lb./ac. of P_2O_5 +40 lb./ac. of K.Fertilizers in main-plot S_0 were applied on 5.11.1953.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 37.5'×29'. (b) 35.5'×27'. (v) 1' on either side. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1601 lb./ac.
 (ii) (a) 274.0 lb./ac.
 (b) 238.6 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	M ₀	M ₁	M ₂	M ₃	M ₄	Mean
S ₀	1489	1679	1547	1744	1531	1598
S ₁	1687	1613	1654	1605	1761	1664
S ₂	1572	1432	1580	1465	1654	1541
Mean	1583	1574	1594	1605	1649	1601

S.E. of difference of two

1. S marginal means = 86.4 lb./ac.
2. M marginal means = 97.4 lb./ac.
3. M means at the same level of S = 168.7 lb./ac.
4. S means at the same level of M = 174.0 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(15).

Type :- 'M'.

Object :—To study the effect of organic and inorganic manures applied to Wheat.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat—Maize—Peas. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 14.11.1952. (iv) (a) Double discing, single grubbing and double grubbing. (b) to (e) N.A. (v) N.A. (vi) N.P.760. (vii) Irrigated. (viii) Weeding and hand hoeing during 3 and 6.2.1953. (ix) N.A. (x) 5 to 8.4.1953.

2. TREATMENTS :

1. Control.
 2. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅.
 3. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+Pot. Sul. at 100 lb./ac. of K₂O.
 4. F.Y.M. at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+Pot. Sul. at 100 lb./ac. of K₂O.
 5. Castor at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+Pot. Sul. at 100 lb./ac. of K₂O.
- Organic manures were applied fully to maize in *kharif* and inorganic manures half to maize in *kharif* and half to wheat in *rabi*.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38'×29'. (b) 36'×27'. (v) 1' on each side. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1952—N.A. (b) Yes (up to 1956 *kharif*). (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1745 lb./ac.
 (ii) 330.8 lb./ac.
 (iii) Treatment differences are significant.

Treatment	Av. yield
1.	1203
2.	2443
3.	2209
4.	1312
5.	1558
S.E./mean	=135.0 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 50(49).

Type :- 'M'.

Object :—To find out the optimum dose of N for Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 8, 9.11.1950. (iv) (a) 2 tractor ploughings and 3 discing. (b) Sown by *kaira* (behind *desi* plough). (c) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) Weeding with *khurpi*. (ix) N.A. (x) 24.4.1951.

2. TREATMENTS :

11 levels of N with P and K manures and a control : $N_0=0$, $N_1=10$, $N_2=20$, $N_3=30$, $N_4=40$, $N_5=50$, $N_6=60$, $N_7=70$, $N_8=80$, $N_9=90$ and $N_{10}=100$ lb./ac. of N each with 60 lb./ac. of P_2O_5 and 40 lb./ac. of K_2O .

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) $43' \times 17'$. (b) $41' \times 15'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of smuts—rogueing and burning the effected plants. (iii) Grain yield. (iv) (a) 1949—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2369 lb./ac.
- (ii) 317.7 lb./ac.
- (iii) Treatment differences are significant.
- (iv) Av. yield of grain in lb./ac.

Control=1488 lb./ac.			
Treatment	Av. yield	Treatment	Av. yield
N_0	1582	N_6	2516
N_1	1800	N_7	2532
N_2	2143	N_8	3014
N_3	2281	N_9	3005
N_4	2533	N_{10}	3019
N_5	2520		

S.E./mean=112.3 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(54).

Type :- 'M'.

Object :—To find out the optimum dose of N for Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 17.11.1951. (iv) (a) Tractor ploughing and grubbing, again tractor grubbing twice. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) Rouging on 28.3.1952. (ix) N.A. (x) 19/20.4.1952.

2. TREATMENTS :

11 levels of N with P and K manures and a control : $N_0=0$, $N_1=10$, $N_2=20$, $N_3=30$, $N_4=40$, $N_5=50$, $N_6=60$, $N_7=70$, $N_8=80$, $N_9=90$ and $N_{10}=100$ lb./ac. of N each with 60 lb./ac. of P_2O_5 and 40 lb./ac. of K_2O .

Agrophos and Potash were given before sowing and N was given with 1st irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) $43' \times 17'$. (b) $41' \times 15'$. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 1310 lb./ac.
- (ii) 292.9 lb./ac.
- (iii) Treatments do not differ significantly.
- (iv) Av. yield of grain in lb./ac.

Control=1144 lb./ac.			
Treatment	Av. yield	Treatment	Av. yield
N_0	1094	N_6	1325
N_1	1086	N_7	1316
N_2	1135	N_8	1316
N_3	1053	N_9	1646
N_4	1218	N_{10}	1489
N_5	1901		
S.E./mean		=103.6 lb./ac.	

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(53).

Type :- 'M'.

Object :- To find out the optimum dose of N for Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 12, 13.11.1952. (iv) (a) 1 ploughing with victory plough and 2 by *desi* plough. Preparing land with *desi* plough twice. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weeding once. (ix) N.A. (x) 18.4.1953.

2. TREATMENTS :

11 levels of N with P and K manures and a control : $N_0=0$, $N_1=10$, $N_2=20$, $N_3=30$, $N_4=40$, $N_5=50$, $N_6=60$, $N_7=70$, $N_8=80$, $N_9=90$ and $N_{10}=100$ lb./ac. of N each with 60 lb./ac. of P_2O_5 and 40 lb./ac. of K_2O .

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) $17' \times 39'$. (b) $36' \times 15'$. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 2942 lb./ac.
- (ii) 367.9 lb./ac.
- (iii) Treatments differ significantly.

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

	Control	= 2632 lb./ac.		
Treatment	Av. yield		Treatment	Av. yield
N ₀	2753		N ₆	2938
N ₁	2713		N ₇	2995
N ₂	2914		N ₈	3260
N ₃	2793		N ₉	3221
N ₄	2986		N ₁₀	3187
N ₅	2906			
	S.E./mean			= 112.3 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(46).

Type :- 'M'.

Object :- To find out the optimum dose of N for Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 9, 10.10.1953. (iv) (a) 1 mould board plough one double discing and ploughing. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) *Bakharing* and weeding. (ix) N.A. (x) 4.4.1954.

2. TREATMENTS :

11 levels of N with P and K manures and a control: N₀=0, N₁=10, N₂=20, N₃=30, N₄=40, N₅=50, N₆=60, N₇=70, N₈=80, N₉=90 and N₁₀=100 lb./ac. of N each with 60 lb./ac. of P₂O₅ and 40 lb./ac. of K₂O.

N applied as A/S half at sowing and half at the time of 1st irrigation, and P₂O₅ as Super at sowing. A/S and Super applied by broadcast on 4, 5, 9.11.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) The growth and stand of crop was excellent except in control plots till the crop lodged. Lodging was very marked in highly manured N plots and negligible in low N plots. No lodging in control plots. (ii) Mild attack of brown rust and later on black rust in some plots. (iii) Grain yield. (iv) (a) 1953—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2059 lb./ac.
(ii) 297.4 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

	Control	= 1647 lb./ac.		
Treatment	Av. yield		Treatment	Av. yield
N ₀	1851		N ₆	2136
N ₁	1863		N ₇	2221
N ₂	2000		N ₈	2279
N ₃	2039		N ₉	2319
N ₄	2106		N ₁₀	2128
N ₅	2125			
	S.E./mean			= 112.3 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(77).

Type :- 'M'.

Object :—To study the differential response of three Wheat varieties at different levels of fertilizers.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 10.11.1953. (iv) (a) Discing, grubbing, making bunds for irrigation and ploughing with *desi* plough on 6, 7.11.1953. (b) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) Bakharing and weeding. (ix) N.A. (x) 28, 29.4.1954.

2. TREATMENTS :

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

- (1) 3 levels of N as A/S : $N_0=0$ lb./ac., $N_1=20$ lb./ac. and $N_2=40$ lb./ac.
 (2) 3 levels of P_2O_5 as Super : $P_0=0$ lb./ac., $P_1=20$ lb./ac. and $P_2=40$ lb./ac.
 (3) 3 varieties : $V_1=Local$, $V_2=N.P. 718$ and $V_3=N.P. 775$.

3. DESIGN :

(i) 3^3 confounded factorial. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) One. (iv) (a) $20\frac{1}{2}' \times 54'$. (b) $15' \times 48'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. Lodging in April. (ii) Light to medium attack of yellow brown rust and black rust. (iii) Grain yield. (iv) (a) 1953—N.A. (b) N.A. (c) N.A. (v) (a), (b) No. (vi) The weather during the growing period was normal except the storm in April which caused lodging. (vii) Nil.

5. RESULTS :

- (i) 1640 lb./ac.
 (ii) 1557 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	V_1	V_2	V_3
N_0	1214	1748	1809	1590	1537	1697	1537
N_1	2041	1668	1688	1799	1567	1769	2061
N_2	1355	1718	1517	1530	1305	1779	1506
Mean	1537	1711	1671	1640	1470	1748	1701
V_1	1496	1396	1517	1470			
V_2	1567	1728	1950	1748			
V_3	1547	2010	1547	1701			

S.E. of any marginal mean = 519.0 lb./ac.
 S.E. of body of any table = 898.9 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(44).

Type :- 'M'.

Object :—To find out the influence of compost on humus formation and on crop yield.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 19.11.1952. (iv) (a) Tractor discing and grubbing twice. Preparing land for sowing. (b) to (e) N.A. (v) N.A. (vi) N.P. 760. (vii) Irrigated. (viii) Hand hoeing from 3.2.1953 to 6.2.1953. (ix) N.A. (x) 14, 15.4.1953.

2. TREATMENTS :

All combinations of (1) and (2) + 3 levels of N as A/S.

(1) 3 sources of N : S_1 =Plastered trench compost, S_2 =Above ground, heap compost and S_3 =Exposed pit compost.

(2) 3 levels of N : M_1 =40, M_2 =80 and M_3 =120 lb./ac. of N.

3 levels of N as A/S : N_0 =0, N_1 =20 and N_3 =40 lb./ac. of N.

Fertilizers applied on 19.11.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 24.66' × 30'. (b) 22.66' × 28'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952 (*kharif*)—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 979 lb./ac.

(ii) 336.5 lb./ac.

(iii) Treatment differences are highly significant.

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

N_0 =934 lb./ac. ; N_1 =1201 lb./ac. ; N_2 =1664 lb./ac.

	M_1	M_2	M_3	Mean
S_1	885	776	961	874
S_2	975	639	947	854
S_3	748	1105	913	922
Mean	869	840	940	883

S.E. of any marginal mean = 79.3 lb./ac.

S.E. of body or N means = 137.4 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(46).

Type :- 'M'.

Object :- To study the influence of compost on humus formation and on crop yield.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 24.11.1953.

(iv) (a) Dry victory ploughing, soaking and preparation of land. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Bakharing and weeding. (ix) N.A. (x) 19.4.1954.

2. TREATMENTS :

All combinations of (1) and (2) + 3 levels of N as A/S.

(1) 3 sources of N : S_1 =Plastered trench compost, S_2 =Above ground, heap compost and S_3 =Exposed pit compost.

(2) 3 levels of N : M_1 =40, M_2 =80 and M_3 =120 lb./ac. of N.

3 levels of N as A/S : N_0 =0, N_1 =20 and N_2 =40 lb./ac. of N.

Fertilizers applied on 23.11.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 24.5' × 30'. (b) 22.66' × 28'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952 *kharif*—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS :

- (i) 1243 lb./ac.
 (ii) 294.6 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

$N_0=1170$ lb./ac. ; $N_1=1507$ lb./ac. ; $N_2=1493$ lb./ac.

	M ₁	M ₂	M ₃	Mean
S ₁	1043	1261	1404	1236
S ₂	1288	1081	1558	1176
S ₃	1138	1263	1111	1171
Mean	1156	1202	1224	1194

S.E any marginal mean = 69.46 lb./ac.

S.E. of body or N mean = 120.3 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 49(5).

Type :- 'M'.

Object :- To test the efficiency of different organic manures on Wheat.

1. BASAL CONDITIONS :

- (i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 6.11.1949. (iv) (a) Tractor discing on 4.11.1949. (b) to (e) N.A. (v) Nil. (vi) N.P.165. (vii) Irrigated. (viii) Weeding on 17.1.1950. (ix) N.A. (x) 1st week of April 1949.

2. TREATMENTS :

1. Sanhemp (G.M.) grown *in situ*.
2. Cowpea (G.M.) grown *in situ*.
3. Mustard cake at 40 lb./ac. of N.
4. Castor cake at 40 lb./ac. of N.
5. F.Y.M. at 40 lb./ac. of N.
6. Leaf compost at 40 lb./ac. of N.
7. A/S at 40 lb./ac. of N.
8. Control.

3. DESIGN :

- (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 72' × 36'. (b) 66' × 30'. (v) 3' on each side. (vi) Yes.

4. GENERAL :

- (i) G.M. plots have better growth. (ii) Sulphur dusting to check rust. (iii) Grain yield. (iv) (a) 1944 -1949. (b) N.A. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1432 lb./ac.
 (ii) 259.6 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	2094	5.	1170
2.	1665	6.	1192
3.	1434	7.	1434
4.	1316	8.	1148

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

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 50(47). Type :- 'M'.

Object :- To test the effect of organic manures and fertilizers on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) and (c) N.A. (ii) (a) Refer item 11 on page 143. (iii) Wheat on 19.11.1950 and *guar* on 15.7.1950. (iv) (a) 1 ploughing, grubbing and discing with tractor. (b) to (e) N.A. (v) N.A. (vi) N.P.750. (vii) Irrigated. (viii) Weeding on 13.2.1951. (ix) 3.46". (x) 21.4.1951.

2. TREATMENTS :

Main-plot treatments :

4 organic manures : M_0 =No manure, M_1 =*Guar* as G.M. at 60 lb./ac. of N, M_2 =Castor cake at 60 lb./ac. of N and M_3 =F.Y.M. at 60 lb./ac. of N.

Sub-plot treatments :

5 inorganic manures : T_0 =No manure, T_1 =A/S at 40 lb./ac. of N, T_2 =Super at 80 lb./ac. of P_2O_5 , T_3 =(T_1)+(T_2) and T_4 =(T_3)+Pot. Sul. at 60 lb./ac. of K_2O .

Guar buried on 8.9.1950 and Super, in *guar* plots, as bone Super, given on 8.9.1950. A/S and Pot. Sul. applied on 16.11.1950. F.Y.M. and Castor cake applied on 15.11.1950 and in their sub-plots, bone Super was given on 24.10.1950, Pot. Sul. and A/S were given on 16.11.1950. In the unmanured main-plot, the fertilizers are applied at sowing time by placement, with *desi* plough.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 51'×24'. (b) 49'×22'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 1538 lb./ac.
 (ii) (a) 100.2 lb./ac.
 (b) 33.6 lb./ac.
 (iii) Only T effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	T_0	T_1	T_2	T_3	T_4	Mean
M_1	1218	1528	1595	1467	1797	1521
M_2	1763	1615	1629	1831	1884	1744
M_3	1380	1333	1561	1568	1588	1486
M_4	1299	1353	1353	1467	1541	1403
Mean	1415	1457	1534	1583	1702	1538

S.E. of difference of two

1. M marginal means = 25.87 lb./ac.
 2. T marginal means = 9.70 lb./ac.
 3. T means at the same level of M = 19.40 lb./ac.
 4. M means at the same level of T = 31.15 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(50). Type :- 'M'.

Object :- To test the effect of organic manures and fertilizer on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize—Wheat. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) *Guar* on 2.7.1952 and wheat on 7, 10.11.1952. (iv) (a) Ploughing with victory and *desi* plough, discing and beaming. (b) to (e) N.A. (v) N.A. (vi) N.P.760. (vii) Irrigated. (viii) N.A. (ix) 15.81". (x) *Guar* : 7.9.1953 and Wheat : 7 to 11.4.1953.

2. TREATMENTS :

Main-plot treatments :

4 organic manures : M_0 =No manure, M_1 =Guar as G.M. at 60 lb./ac. of N, M_2 =Castor cake at 60 lb./ac. of N and M_3 =F.Y.M. at 60 lb./ac. of N.

Sub-plot treatments :

5 inorganic manures : T_0 =No manure, T_1 =A/S at 40 lb./ac. of N, T_2 =Super at 80 lb./ac. of P_2O_5 , $T_3=(T_1)+(T_2)$ and $T_4=(T_3)+Pot. Sul.$ at 60 lb./ac. of K_2O .

To Guar plots Super was given at sowing time on 2.7.1952, F.Y.M. during 26 to 30.9.1952 and castor cake on 5.11.1952. A/S and Pot. Sul. to manured main-plots on 4.11.1952. Fertilizers to unmanured main-plots at sowing time during 7 to 10.11.1952.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 51'×24'. (b) 48'×21'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS:

- (i) 1417 lb./ac.
 (ii) (a) 305.1 lb./ac.
 (b) 165.3 lb./ac.
 (iii) T effect is highly significant and interaction is significant, while M effect is not significant.
 (iv) Av. yield of grain in lb./ac.

	T_0	T_1	T_2	T_3	T_4	Mean
M_0	1154	1487	994	1582	1392	1322
M_1	1400	1590	1534	1629	1668	1564
M_2	1275	1598	1361	1465	1577	1455
M_3	1106	1469	1137	1452	1478	1328
Mean	1234	1536	1256	1532	1529	1417

S.E. of difference of two

1. M marginal means = 78.77 lb./ac.
 2. T marginal means = 47.71 lb./ac.
 3. T means at the same level of M = 95.42 lb./ac.
 4. M means at the same level of T = 116.20 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(52).

Type :- 'M'.

Object :- To test the effect of organic manures and fertilizers on the yield of Wheat.

1. BASAL CONDITIONS :

- (i) (a) Wheat-Maize-Wheat. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 15.11.1953.
 (iv) (a) Discing with tractor twice, ploughing with *desi* plough and beaming. (b) to (e) N.A. (v) N.A.
 (vi) N.P. 760. (vii) Irrigated. (viii) Weeding. (ix) 5.30°. (x) N.A.

TREATMENTS :

Main-plot treatments :

4 organic manures : M_0 =No manure, M_1 =Guar as G.M. at 60 lb./ac. of N, M_2 =Castor cake at 60 lb./ac. of N and M_3 =F.Y.M. at 60 lb./ac. of N.

Sub-plot treatments :

5 inorganic manures : T_0 =No manure, T_1 =A/S at 40 lb./ac. of N, T_2 =Super at 80 lb./ac. of P_2O_5 , $T_3=(T_1)+(T_2)$ and $T_4=(T_3)+Pot. Sul.$ at 50 lb./ac. of K_2O .

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 51'×24'. (b) 48'×21'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 - N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 352.9 lb./ac.
 (ii) (a) 240.3 lb./ac.
 (b) 259.2 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	T ₄	Mean
M ₀	289.6	325.9	290.5	289.6	297.9	298.7
M ₁	395.0	443.5	385.1	409.0	409.0	408.3
M ₂	281.4	360.4	313.5	353.0	381.0	337.9
M ₃	353.0	383.5	361.2	365.3	369.5	366.5
Mean	329.8	378.3	337.6	354.2	364.4	352.9

S.E. of difference of two

1. M marginal means = 62.04 lb./ac.
2. T marginal means = 74.82 lb./ac.
3. T means at the same level of M = 149.64 lb./ac.
4. M means at the same level of T = 147.53 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(27).

Type :- 'M'.

Object :- To study the effect of soyabean grown for grain, fodder and G.M. on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Soyabean-Wheat. (b) Soyabean. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 2.11.1951. (iv) (a) Ploughing with *desi* plough twice. (b) to (e) N.A. (v) Nil. (vi) N.P. 775. (vii) Irrigated. (viii) Hoing with *oudh* plough. (ix) N.A. (x) 22.3.1952.

2. TREATMENTS :

1. Soyabean for grain—Wheat.
2. Soyabean for fodder—Wheat.
3. Soyabean for G.M.—Wheat.
4. Fallow—Wheat.

3. DESIGN :

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

4. GENERAL :

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

5. RESULTS :

(i) 1375 lb./ac.
 (ii) 254.8 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	823
2.	1385
3.	1405
4.	1887

S.E./mean = 127.4 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(33).

Type :- 'M'.

Object :—To study the effect of soyabean grown for grain, fodder and G.M. on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Soyabean—Wheat. (b) Soyabean. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 3.12.1952. (iv) (a) Ploughing with *desi* plough twice. (b) to (e) N.A. (v) N.A. (vi) N.P. 775. (vii) Irrigated. (viii) Rouging once. (ix) N.A. (x) 5.4.1953.

2. TREATMENTS :

1. Soyabean for grain—Wheat.
2. Soyabean for fodder—Wheat.
3. Soyabean for G.M.—Wheat.
4. Fallow—Wheat.

3. DESIGN :

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

4. GENERAL :

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

5. RESULTS :

- (i) 1329 lb./ac.
 (ii) 134.9 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	883
2.	1103
3.	1605
4.	1726
S.E./mean	=67.5 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(29).

Type :- 'M'.

Object :—To study the effect of soyabean grown for grain, fodder and G.M. on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Soyabean—Wheat. (b) Soyabean. (c) Super at 85 lb./ac. of P_2O_5 . (ii) (a) and (b) Refer item 11 on page 143. (iii) 2.11.1953. (iv) (a) Ploughing by victory plough once, with *desi* plough twice. (b) N.A. (c) 1 md./ac. (d) and (e) N.A. (v) Nil. (vi) N.P. 775. (vii) Irrigated. (viii) *Bakharing*. (ix) N.A. (x) 4 to 8.4.1953.

2. TREATMENTS :

1. Soyabean for grain—Wheat.
2. Soyabean for fodder—Wheat.
3. Soyabean for G.M.—Wheat.
4. Fallow—Wheat.

3. DESIGN :

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

4. GENERAL :

(i) Normal. (ii) Attack of smuts. (iii) Yield of fodder. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS :

- (i) 0.48 ton/ac.
 (ii) 0.05 ton/ac.
 (iii) Treatment differences are highly significant.

(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	0.34
2.	0.46
3.	0.53
4.	0.61
S.E./mean	=0.03 ton/ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 48(18).

Type :- 'M'.

Object :—To study the response of phosphatic manuring of berseem and its residual effect on Wheat after taking maize crop.

1. BASAL CONDITIONS :

(i) (a) Berseem—Maize—Wheat. (b) Maize. (c) Nil. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.11.1948. (iv) (a) 4 discings. (b) to (e) N.A. (v) F.Y.M. at 10 ton/ac. (vi) C.518. (vii) Irrigated. (viii) Lever harrow on 21.12.1948. (ix) 0.94". (x) 19 to 22.4.1949.

2. TREATMENTS :

- No manure.
 - B.M. at 120 lb./ac. of P_2O_5 .
 - Ammo. Phos. at 120 lb./ac. of P_2O_5 .
 - Super at 120 lb./ac. of P_2O_5 .
 - B.M. at 60 lb./ac. of P_2O_5 +Ammo. Phos. at 60 lb./ac. of P_2O_5 .
 - B.M. at 60 lb./ac. of P_2O_5 +Super at 60 lb./ac. of P_2O_5 .
- Treatments are given to berseem during 1947.

3. DESIGN :

(i) R.B.D. (ii) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 16.5'×33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1944—1948. (b) and (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- 2683 lb./ac.
- 275.6 lb./ac.
- Treatment differences are not significant.
- Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2765
2.	2621
3.	2774
4.	2642
5.	2564
6.	2732
S E./mean	= 159.1 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 48(14).

Type :- 'M'.

Object :—To study the effect of phosphatic manuring of berseem without any basal manure.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.11.1948. (iv) (a) Discing 4 times. (b) to (e) N.A. (v) Nil. (vi) C.518. (vii) Irrigated. (viii) Lever harrow on 21.12.1948. (ix) 0.94". (x) 22.4.1949 and 2.5.1949.

2. TREATMENTS :

1. No manure.
2. B.M. at 120 lb./ac. of P_2O_5 .
3. Ammo. Phos. at 120 lb./ac. of P_2O_5 .
4. Super at 120 lb./ac. of P_2O_5 .
5. B.M. at 60 lb./ac. of P_2O_5 +Ammo. Phos. at 60 lb./ac. of P_2O_5 .
6. B.M. at 60 lb./ac. of P_2O_5 +Super at 60 lb./ac. of P_2O_5 .

Treatments applied last year.

3. DESIGN :

- (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) $16.5' \times 33'$. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) Mild attack of brown rust. (iii) Grain yield. (iv) (a) 1944—1948. (b) and (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1934 lb./ac.
 (ii) 181.0 lb./ac.
 (iii) Treatment differences are significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2012
2.	1657
3.	2204
4.	1844
5.	2097
6.	1793
S.E./mean	= 104.5 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 48(4).

Type :- 'M'.

Object :—To study the residual effect of phosphatic manures on berseem and then on Wheat.

1. BASAL CONDITIONS :

- (i) (a) Berseem-Guar-Wheat-Guar-Wheat. (b) *Guar*. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 19.11.1948. (iv) (a) Discing 4 times and grubbing once. (b) to (e) N.A. (v) Nil. (vi) C-518. (vii) Irrigated. (viii) N.A. (ix) 1.44". (x) 27.4.1949.

2. TREATMENTS :

1. No manure.
2. Super at 60 lb./ac. of P_2O_5 .
3. Super at 120 lb./ac. of P_2O_5 .
4. (2)+80 lb./ac. of K_2O .
5. (3)+80 lb./ac. of K_2O .
6. (4)+A/S at 30 lb./ac. of N.
7. (5)+A/S at 30 lb./ac. of N.
8. (2)+A/S at 30 lb./ac. of N.
9. Super at 120 lb./ac. of P_2O_5 +A/S at 30 lb./ac. of N.
10. Super at 30 lb./ac. of P_2O_5 +F.Y.M. at 30 lb./ac. of P_2O_5 .
11. Super at 60 lb./ac. of P_2O_5 +F.Y.M. at 60 lb./ac. of P_2O_5 .

Treatments applied to berseem in 1946.

3. DESIGN :

- (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) $58' \times 25'$. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Attack of orange rust. (iii) Grain yield. (iv) (a) 1946—1948. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1740 lb./ac.
 (ii) 329.9 lb./ac.
 (iii) Treatment differences are not significant.

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

Treatment	Av. yield	Treatment	Av. yield
1.	1818	7.	1558
2.	1772	8.	1462
3.	1757	9.	1679
4.	1637	10.	1892
5.	1701	11.	2027
6.	1841		

S.E./mean = 134.7 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 48(3).

Type :- 'M'.

Object :—To study the effect of phosphatic manuring on berseem and its residual effect on Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 19.11.1948. (iv) (a) to (e) N.A. (v) N.A. (vi) C.518. (vii) Irrigated. (viii) N.A. (ix) 0.94". (x) 24.4.1949.

2. TREATMENTS :

- | | |
|--|--|
| 1. No manure. | 7. (5)+A/S at 30 lb./ac. of N. |
| 2. Super at 60 lb./ac. of P ₂ O ₅ . | 8. (2)+A/S at 30 lb./ac. of N. |
| 3. Super at 120 lb./ac. of P ₂ O ₅ . | 9. (3)+A/S at 30 lb./ac. of N. |
| 4. (2)+80 lb./ac. of K ₂ O. | 10. ½ of (2)+F.Y.M. at 30 lb./ac. of P ₂ O ₅ . |
| 5. (3)+80 lb./ac. of K ₂ O. | 11. ½ of (3)+F.Y.M. at 60 lb./ac. of P ₂ O ₅ . |
| 6. (4)+A/S at 30 lb./ac. of N. | |

Treatments applied to Berseem in 1946.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 58'×25'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of rust. (iii) Grain yield. (iv) (a) 1946—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1855 lb./ac.
(ii) 350.5 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1486	7.	1767
2.	1656	8.	1987
3.	1972	9.	1624
4.	2242	10.	1892
5.	1759	11.	1995
6.	2030		

S.E./mean = 143.1 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 48(6).

Type :- 'M'.

Object :—To build up soil fertility through phosphatic manuring of berseem in Berseem—Guar—Wheat rotation.

1. BASAL CONDITIONS :

(i) (a) Berseem—Guar—Wheat. (b) Guar. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) C.518. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

- No manure.
- Super at 60 lb./ac. of P₂O₅.
- Super at 120 lb./ac. of P₂O₅.

4. Super at 60 lb./ac. of P_2O_5 +80 lb./ac. of K_2O .
5. Super at 120 lb./ac. of P_2O_5 +80 lb./ac. of K_2O .
6. Super at 120 lb./ac. of P_2O_5 +80 lb./ac. of K_2O +A/S 30 lb./ac. of N.
7. Super at 60 lb./ac. of P_2O_5 +80 lb./ac. of K_2O +A/S 30 lb./ac. of N.
8. Super at 60 lb./ac. of P_2O_5 +A/S at 30 lb./ac. of N.
9. Super at 120 lb./ac. of P_2O_5 +A/S at 30 lb./ac. of N.
10. Super at 30 lb./ac. of P_2O_5 +F.Y.M. at 30 lb./ac. of P_2O_5 .
11. Super at 60 lb./ac. of P_2O_5 +F.Y.M. at 60 lb./ac. of P_2O_5 .

3. DESIGN :

- (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 50'×25'. (b) N.A. (v) N.A. (vi) Yes

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) No. of tillers per plant. (iv) (a) 1946—1948. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS :

- (i) 4.44 tillers/plot.
 (ii) 1.12 tillers/plot.
 (iii) Treatment differences are not significant.
 (iv) Av. no. of tillers per plant.

Treatment	Av. no. of tillers	Treatment	Av. no. of tillers
1.	4.3	7.	3.9
2.	4.2	8.	4.8
3.	4.3	9.	5.2
4.	4.0	10.	4.0
5.	5.1	11.	4.3
6.	4.7		
S.E./mean		=0.46 tillers/plot.	

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 48(5).

Type :- 'M'.

Object :—To build up soil fertility through phosphatic manuring of berseem in rotation.

1. BASAL CONDITIONS :

- (i) (a) Berseem—*Guar*—Wheat. (b) *Guar*. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) C. 518. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. No manure.
2. Super at 60 lb./ac. of P_2O_5 .
3. Super at 120 lb./ac. of P_2O_5 .
4. Super at 60 lb./ac. of P_2O_5 +4 Pot. Sul. at 80 lb./ac. of K_2O .
5. Super at 120 lb./ac. of P_2O_5 +Pot. Sul. at 80 lb./ac. of K_2O .
6. Super at 60 lb./ac. of P_2O_5 +Pot. Sul. at 80 lb./ac.+A/S at 30 lb./ac. of N.
7. Super at 120 lb./ac. of P_2O_5 +Pot. Sul. at 80 lb./ac.+A/S at 30 lb./ac. of N.
8. Super at 60 lb./ac. of P_2O_5 +A/S at 30 lb./ac. of N.
9. Super at 120 lb./ac. of P_2O_5 +A/S at 30 lb./ac. of N.
10. Super at 30 lb./ac. of P_2O_5 +F.Y.M. at 30 lb./ac. of P_2O_5 .
11. Super at 60 lb./ac. of P_2O_5 +F.Y.M. at 60 lb./ac. of P_2O_5 .

3. DESIGN :

- (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) 58'×25'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Number of tillers per plant. (iv) (a) 1946—1948. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 5.2 tillers/plot.
 (ii) 1.37 tillers/plot.
 (iii) Treatment differences are not significant.

(iv) Av. no. of tillers/plot.

Treatment	Av. no. of tillers	Treatment	Av. no. of tillers
1.	4.9	7.	5.2
2.	5.7	8.	4.5
3.	4.9	9.	5.5
4.	4.4	10.	4.9
5.	5.2	11.	5.5
6.	6.2		
	S.E./mean		=0.56 tillers/plot.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 49(6).

Type :- 'M'.

Object :—To build up soil fertility through phosphatic manuring of berseem in rotation.

1. BASAL CONDITIONS :

(i) (a) Berseem-Guar-Wheat. (b) *Guar*. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) C-518. (vii) to (x) N.A.

2. TREATMENTS :

1. Control.
2. 60 lb./ac. of P_2O_5 as Super.
3. 120 lb./ac. of P_2O_5 as Super.
4. Treatment (2)+80 lb./ac. of K_2O as Pot. Sul.
5. Treatment (3)+80 lb./ac. of K_2O as Pot. Sul.
6. Treatment (4)+30 lb./ac. of N as A/S.
7. Treatment (5)+30 lb./ac. of N as A/S.
8. Treatment (2)+30 lb./ac. of N as A/S.
9. Treatment (3)+30 lb./ac. of N as A/S.
10. 30 lb./ac. of P_2O_5 as Super+30 lb./ac. of P_2O_5 as F.Y.M.
11. Treatment (2)+60 lb./ac. of P_2O_5 as F.Y.M.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 58'×25'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) No. of tillers per plant. (iv) (a) 1946—1949. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 4.33 tillers/plant.
- (ii) 3.41 tillers/plant.
- (iii) Treatment differences are not significant.
- (iv) Av. number of tiller per plant.

Treatment	Av. no. of tillers	Treatment	Av. no. of tillers
1.	4.6	7.	4.3
2.	4.1	8.	4.4
3.	3.9	9.	5.4
4.	3.9	10.	3.9
5.	4.9	11.	3.9
6.	4.3		
	S.E./mean		=1.39 tillers/plant.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 48(12).

Type :- 'M'.

Object :—To study the effect of phosphatic manuring of berseem on Wheat, with sannhemp as basal dressing.

1. BASAL CONDITIONS :

(i) (a) No. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.11.1948. (iv) (a) 3 discings and grubbing. (b) to (e) N.A. (v) Sannhemp as G.M. (vi) C-518. (vii) Irrigated. (viii) Lever harrow worked on 17.12.1948. (ix) 0.94". (x) 30.4.1949.

2. TREATMENTS :

1. No manure.
2. B.M. at 120 lb./ac. of P_2O_5 .
3. Ammo. Phos. at 120 lb./ac. of P_2O_5 .
4. Super at 120 lb./ac. of P_2O_5 .
5. B.M. at 60 lb./ac. of P_2O_5 +Ammo. Phos. at 60 lb./ac. of P_2O_5 .
6. B.M. at 60 lb./ac. of P_2O_5 +Super at 60 lb./ac. of P_2O_5 .

Treatments were given to berseem in 1947—1948.

3. DESIGN :

- (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 16.5'×35'. (v) N.A. (vi) Yes.

4. GENERAL ;

- (i) Poor at several places due to lack of moisture. (ii) Nil. (iii) Grain yield. (iv) (a) 1944—1948. (b) and (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1896 lb./ac.
 (ii) 401.5 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2021
2.	1725
3.	2121
4.	1814
5.	2018
6.	1680
S.E./mean	=231.8 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(52).

Type :- 'M'.

Object :- To find out suitable manure mixture for Wheat.

1. BASAL CONDITIONS :

- (i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 21.11.1953. (iv) (a) Ploughing with victory plough once. Preparing land with *desi* plough twice. (b) to (e) N.A. (v) N.A. (vi) N.P. 761. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:

1. 50 lb./ac. of A/S+140 lb./ac. of G.N.C.
2. 50 lb./ac. of A/S+364 lb./ac. of G.N.C.
3. 70 lb./ac. of Ammo. Phos.+364 lb./ac. of G.N.C.
4. 100 lb./ac. of A/S+280 lb./ac. of G.N.C.+875 lb./ac. of Super.
5. 50 lb./ac. of A/S+140 lb./ac. of G.N.C.+44 lb./ac. of Super.
6. 100 lb./ac. of A/S+280 lb./ac. of G.N.C.+140 lb./ac. of Super.
7. 70 lb./ac. of Ammo. Phos.+196 lb./ac. of G.N.C.+60 lb./ac. of Super.
8. 100 lb./ac. of A/S+50 lb./ac. of triple Super.
9. 200 lb./ac. of A/S+100 lb./ac. of triple Super.
10. 100 lb./ac. of A/S.
11. 200 lb./ac. of A/S.
12. Control.

3. DESIGN :

- (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 acre. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 1687 lb./ac.
(ii) 210.6 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1728	7.	1818
2.	1670	8.	1662
3.	1720	9.	1563
4.	1572	10.	1761
5.	1712	11.	1761
6.	1712	12.	1563
S.E./mean		=105.3 lb./ac.	

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(27).

Type :- 'M'.

Object :—To study optimum time of the application of fertilizers to Wheat.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 17.11.1953. (iv) (a) Ploughing with victory plough, disced twice, levelling, ploughing and harrowing. (b) Sown with seed drill. (c) to (e) N.A. (v) No. (vi) N.P. 710. (vii) Irrigated. (viii) Bakharing and weeding. (ix) N.A. (x) 16.4.1954.

2. TREATMENTS :

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

(1) 2 times of application : T_1 =At time of sowing. T_2 =At the time of first irrigation.(2) 3 sources of N : S_1 =A/S. S_2 =Ammono. Nitrate and S_3 =Urea.

Application of A/S, A/N and Urea on 11.11.1953 and second application on 8.1.1954.

3. DESIGN :

- (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) 22'×49.5'. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Severe lodging. (ii) Mild rust attack on border plants, earheads damaged by rats. (iii) Grain yield. (iv) (a) 1953—1954. (b) No. (c) N.A. (v) (a), (b) No. (vi) The wind storm on 19.2.1954 caused severe lodging. (vii) Nil.

5. RESULTS :

- (i) 1500 lb./ac.
(ii) 68.64 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	Mean
T_1	1588	1379	1528	1498
T_2	1594	1468	1558	1540
Mean	1591	1423	1543	1519

S.E. of S marginal means =24.27 lb./ac.
S.E. of T marginal means =19.82 lb./ac.
S.E. of body of table or control mean =34.32 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 50(21).

Type :- 'M'.

Object :- To study the optimum time of application of fertilizers to Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item:11 on page 143. (iii) 17.11.1950. (iv) (a) Tractor grubbing and discing twice. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 25.4.1951.

2. TREATMENTS :

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

(1) 4 sources of N : $S_1=A/S$, $S_2=A/S/N$, $S_3=C/N$ and $S_4=Urea$.(2) 3 times of application of N : $T_1=At$ sowing, $T_2=At$ 1st irrigation and $T_3=At$ 2nd irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $34' \times 15'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Sulphur dusting against rust on 5.2.1951 and 20.2.1951. (iii) Grain yield. (iv) (a) 1950—N.A. (b) N.A. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1298 lb./ac.

(ii) 312.0 lb./ac.

(iii) Treatment differences are not significant.

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

	Control = 1088 lb./ac.			
	T_1	T_2	T_3	Mean
S_1	1340	1220	1180	1247
S_2	1440	1350	1260	1350
S_3	1400	1510	1240	1383
S_4	1210	1380	1260	1283
Mean	1347	1365	1235	1316

S.E. of T marginal mean

= 78.0 lb./ac.

S.E. of S marginal mean

= 90.1 lb./ac.

S.E. of body of table

= 156.0 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(2).

Type :- 'M'.

Object :- To study the residual effect of fertilizers added to 5 successive Wheat crops on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 9.11.1951. (iv) (a) Tractor ploughing, discing and ploughing with *desi* plough. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

(1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac. of N.(2) 3 levels of P_2O_5 as Supur : $P_0=0$, $P_1=80$ and $P_2=160$ lb./ac. of P_2O_5 .(3) 3 levels of K_2O as Pot. Sul. : $K_0=0$, $K_1=80$ and $K_2=160$ lb./ac. of K_2O .(4) 3 levels of lime : $L_0=No$ lime, $L_1=Lime$ at 5 mds./ac. and $L_2=Lime$ at 10 mds./ac.C/N was added to N_1 and N_2 plots on 31st December and 3rd, 4th January along with irrigation. Fertilizers added to 5 successive crops.

3. DESIGN :

(i) 3^4 confounding. (ii) (a) 9 plots/block and 9 blocks/replications. (b) N.A. (iii) 2. (iv) (a) $28' \times 26'.3"$. (b) $25' \times 23'.3"$. (v) $1\frac{1}{2}'$ around. (vi) Yes.

4. GENERAL :

(i) Excellent growth. Lodging first took place during March 1952. (ii) N.A. (iii) Grain yield. (iv) (a) 1945—N.A. (b) N.A. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data N.A. Therefore two way tables could not be prepared.

5. RESULTS :

(i) 925.5 lb./ac.

(ii) N.A.

(iii) N.A.

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

Treatment	Av. yield	Treatment	Av. yield
N_0	824	K_0	878
N_1	936	K_1	902
N_2	1017	K_2	995
P_0	771	L_0	906
P_1	890	L_1	902
P_2	1115	L_2	969
	S.E./mean	=N.A.	

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(60).

Type :- 'M'.

Object :—To study the effect of P on the yield of berseem and its residual effect on cowpea yield and also to study the residual effect on Wheat after berseem-cowpea and berseem-fallow rotation.

1. BASAL CONDITIONS :

(i) Berseem-Cowpea-Wheat. (b) Cowpea. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 2.12.1951. (iv) (a) Four ploughings by *desi* plough each followed by harrowing done after *palewa*. (b) Monarch drill. (c) 5 mds./ac. (d) and (e) N.A. (v) N.A. (vi) C-518. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 17,18.4.1952.

2. TREATMENTS :

Main-plot treatments :

13 manurial treatments: $M_0=0$, M_1 =F.Y.M., at 16 lb./ac. of P_2O_5 , M_2 =F.Y.M. at 32 lb./ac. of P_2O_5 , M_3 =F.Y.M. at 64 lb./ac. of P_2O_5 , M_4 =Super at 16 lb./ac. of P_2O_5 , M_5 =Super at 32 lb./ac. of P_2O_5 , M_6 =Super at 64 lb./ac. of P_2O_5 , M_7 =Super at 8 lb./ac. of P_2O_5 +F.Y.M. at 8 lb./ac. of P_2O_5 , M_8 =Super at 8 lb./ac. of P_2O_5 +F.Y.M. at 24 lb./ac. of P_2O_5 , M_9 =Super at 8 lb./ac.+F.Y.M. at 56 lb./ac. of P_2O_5 , M_{10} =F.Y.M. at 8 lb./ac.+Super at 24 lb./ac. of P_2O_5 , M_{11} =F.Y.M. at 8 lb./ac.+Super at 56 lb./ac. of P_2O_5 and M_{12} =Fallow for berseem.

Sub-plot treatments :

2 rotations: T_1 =Cowpea-Wheat and T_2 =Fallow-Wheat.
Manurial treatments applied to berseem crop.

3. DESIGN :

(i) Split-plot. (ii) (a) 13 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) $63' \times 15'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Slight infection of wheat smut. (iii) Grain yield. (iv) (a) N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Hail-storm occurred on 1.3.1952. (vii) Nil.

5. RESULTS :

(i) 1338 lb./ac.

(ii) (a) 209.5 lb./ac.

(b) 152.1 lb./ac.

(iii) Only T effect is highly significant.

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

	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅	M ₆	M ₇	M ₈	M ₉	M ₁₀	M ₁₁	M ₁₂	Mean
T ₁	944	1228	1301	1549	1137	1373	1754	1331	1446	1537	1512	1797	950	1374
T ₂	986	1053	1325	1500	1168	1391	1682	1307	1228	1500	1398	1658	744	1303
Mean	965	1140	1313	1525	1153	1382	1718	1319	1337	1519	1455	1727	847	1338

S.E. of difference of two

1. M marginal means =120.9 lb./ac.
2. T marginal means = 34.4 lb./ac.
3. T means at the same level of M =124.2 lb./ac.
4. M means at the same level of T =149.5 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(71).

Type :- 'M'.

Object :—To study the residual effect of phosphatic manuring of berseem on Wheat.

1. BASAL CONDITIONS :

(i) (a) Berseem-Cowpea-Wheat. (b) Cowpea. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.11.1953. (iv) (a) Dry victory and *desi* ploughing. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) *Bakharing* and weeding. (ix) N.A. (x) 17.4.1954.

2. TREATMENTS :

Main-plot treatments :

13 manurial treatments : M₀=0, M₁=F.Y.M. at 16 lb./ac. of P₂O₅, M₂=F.Y.M. at 32 lb./ac. of P₂O₅, M₃=F.Y.M. at 64 lb./ac. of P₂O₅, M₄=Super at 16 lb./ac. of P₂O₅, M₅=Super at 32 lb./ac. of P₂O₅, M₆=Super at 64 lb./ac. of P₂O₅, M₇=Super at 8 lb./ac. of P₂O₅+F.Y.M. at 8 lb./ac. of P₂O₅, M₈=Super at 8 lb./ac. of P₂O₅+F.Y.M. at 24 lb./ac. of P₂O₅, M₉=Super at 8 lb./ac.+F.Y.M. at 56 lb./ac. of P₂O₅, M₁₀=F.Y.M. at 8 lb./ac.+Super at 24 lb./ac. of P₂O₅, M₁₁=F.Y.M. at 8 lb./ac.+Super at 56 lb./ac. of P₂O₅ and M₁₂=Fallow for berseem.

Sub-plot treatments :

2 rotations : T₁=Cowpea-Wheat and T₂=Fallow-Wheat.

Manurial treatments applied to berseem crop.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 6. (v) (a) N.A. (b) 63' × 15'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) After cowpea 1542 lb./ac.

After fallow 19.33 lb./ac.

(ii) After cowpea 390.8 lb./ac.

After fallow 5.00 lb./ac.

(iii) Treatment differences are not significant.

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

Treatment	Av. yield	Av. yield	Treatment	Av. yield	Av. yield
	After cowpea, after fallow			After cowpea, after fallow.	
1.	1219	18.38	8.	1467	16.94
2.	1429	17.98	9.	1837	20.95
3.	1670	23.07	10.	1837	17.98
4.	1549	21.36	11.	1584	19.45
5.	1650	18.80	12.	1479	19.33
6.	1646	21.47	13.	1219	15.42
7.	1459	20.13			

S.E./mean (after cowpea) =159.6 lb./ac.

S.E./mean (after fallow) = 2.04 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(79).

Type :- 'M'.

Object :—To study the effect of method of application of different P_2O_5 fertilizers on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sugarcane. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 27.11.1953. (iv) (a) Victory ploughing, tractor ploughing, discing and twice ploughing with *desi* plough. (b) to (e) N.A. (v) N.A. (vi) N.P. 710. (vii) Irrigated. (viii) Weeding and *bakharing*. (ix) N.A. (x) 24.4.1954.

2. TREATMENTS :

All combinations of (1), (2) and (3) and two control (no manure) plots.

(1) 3 sources of P_2O_5 : S_1 =Super, S_2 =Nitro. Phos. and S_3 =Ammono. Phos.(2) 2 levels of P_2O_5 : P_1 =15 lb./ac. and P_2 =30 lb./ac. of P_2O_5 .(3) 2 methods of placement : M_1 =By broadcast before final cultivation and M_2 =2½" below seed. P_2O_5 broadcast on 25, 26.11.1953 and place at depth on 27.11.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 3. (iv) (a) 23½'×47'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) The plants, at later stage, were slightly affected by black stem-rust. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1566 lb./ac.

(ii) 212.3 lb./ac.

(iii) None of the effects is significant.

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

	Control =1666 lb./ac.					
	S_1	S_2	S_3	Mean	M_1	M_2
P_1	1552	1585	1582	1573	1563	1583
P_2	1590	1416	1570	1525	1420	1631
Mean	1571	1500	1576	1549	1491	1607
M_1	1443	1428	1603			
M_2	1699	1573	1548			

S.E. of M or P marginal mean

=50.1 lb./ac.

S.E. of S marginal mean

=61.3 lb./ac.

S.E. of body of $M \times S$ or $P \times S$ table or control

=86.7 lb./ac.

S.E. of body of $M \times P$ table

=70.8 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(10).

Type :- 'M'.

Object :—To find out the amount of F.Y.M. which is equivalent to the corresponding amount of A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 13.11.1953. (iv) (a) Two ploughings with *desi* plough, single discing with tractor, double ploughing and planking. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weeding twice. (ix) N.A. (x) 11.4.1954.

2. TREATMENTS :

1. No manure.

7. 20 lb./ac. of N as G.N.C.

2. 40 lb./ac. of N as F.Y.M.

8. 40 lb./ac. of N as G.N.C.

3. 60 lb./ac. of N as F.Y.M.

9. 60 lb./ac. of N as G.N.C.

4. 80 lb./ac. of N as F.Y.M.

10. 80 lb./ac. of N as G.N.C.

5. 100 lb./ac. of N as F.Y.M.

11. 20 lb./ac. of N as A/S.

6. 120 lb./ac. of N as F.Y.M.

12. 40 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 7. (iv) (a) 33'×22'. (b) 31'×20'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—N.A. (b) N.A. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 1617 lb./ac.

(ii) 808.9 lb./ac.

(iii) Treatment differences are highly significant.

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

Treatment	Av. yield	Treatment	Av. yield
1.	1341	7.	1721
2.	1401	8.	1578
3.	1502	9.	1726
4.	1607	10.	1726
5.	1575	11.	1721
6.	1705	12.	1799
S.E./mean		=311.0 lb./ac.	

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(14).

Type :- 'M'.

Object :- To find the fertility building value of *Guar* along with P_2O_5 and micro-nutrients on Wheat.

1. BASAL CONDITIONS :

(i) (a) *Guar*-Wheat-*Guar*. (b) *Guar*. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 3.12.1951. (iv) (a) 4 ploughings. (b) to (e) N.A. (v) N.A. (vi) N.P. 760. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 17, 18..14952.

2. TREATMENTS :

- Guar* harvested for tops.
- Guar* buried as G.M.
- Guar* grown with 60 lb./ac. of P_2O_5 at sowing, harvested for tops.
- Guar* grown with 60 lb./ac. of P_2O_5 at sowing, buried as G.M.
- Guar* grown with 60 lb./ac. of P_2O_5 +Borax 5 lb./ac.+molybdenum 1 lb./ac. at sowing, harvested for tops.
- Guar* grown with 60 lb./ac. of P_2O_5 +Borax 5 lb./ac. +molybdenum 1 lb./ac. at sowing, buried as G.M.
- Guar* tops buried as obtained from treatment 1.
- Guar* tops buried as obtained from treatment 3.
- Guar* tops buried as obtained from treatment 5.
- Control (fallow in *kharif*).

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 45'×15'. (b) 41'×11'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Severe lodging in February. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Damage due to hail storm and squalls was about 70 to 80%. (vii) Nil.

5. RESULTS :

(i) 415.8 lb./ac.

(ii) 115.2 lb./ac.

(iii) Treatments differ highly significantly.

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

Treatment	Av. yield	Treatment	Av. yield
1.	325.0	6.	464.1
2.	594.9	7.	397.4
3.	377.7	8.	412.2
4.	454.2	9.	452.4
5.	381.8	10.	288.8
S.E./mean		=47.04 lb./ac.	

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(21).

Type :- 'M'.

Object :—To find the fertility building value of *Guar* along with P_2O_5 and micro-nutrients on Wheat.

1. BASAL CONDITIONS :

(i) (a) *Guar-Wheat-Guar*. (b) *Guar*. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 16.11.1952. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 4.4.1953.

2. TREATMENTS :

1. *Guar* harvested for tops.
2. *Guar* buried as G.M.
3. *Guar* grown with 60 lb./ac. of P_2O_5 at sowing, harvested for tops.
4. *Guar* grown with 60 lb./ac. of P_2O_5 at sowing, buried as G.M.
5. *Guar* grown with 60 lb./ac. of P_2O_5 +Borax 5 lb./ac.+molybdenum 1 lb./ac. at sowing, harvested for tops.
6. *Guar* grown with 60 lb./ac. of P_2O_5 +Borax 5 lb./ac.+molybdenum 1 lb./ac. at sowing, buried as G.M.
7. *Guar* tops buried as obtained from treatment 1.
8. *Guar* tops buried as obtained from treatment 3.
9. *Guar* tops buried as obtained from treatment 5.
10. Control (fallow in *kharif*).

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6 (iv) (a) 45'×15'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack by white ants. (iii) Grain yield. (iv) (a) 1951—1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Hot winds at the end of January hastened the maturity of the crop, resulting in low yield. (vii) Nil.

5. RESULTS :

- (i) 1858 lb./ac.
 (ii) 255.9 lb./ac.
 (iii) Treatments differ highly significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1487	6.	2408
2.	1877	7.	1683
3.	1795	8.	1875
4.	2396	9.	1896
5.	1745	10.	1422

S.E./mean

=104.5 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(21).

Type :- 'M'.

Object :—To find the fertility building value of *Guar* along with P_2O_5 and micro-nutrients on Wheat.

1. BASAL CONDITIONS :

(i) (a) *Guar-Wheat-Guar*. (b) Soyabean (fodder). (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 24.11.1953. (iv) (a) Ploughing with victory plough and 6 ploughings with *desi* plough. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) Weeding and *bakharing*. (ix) N.A. (x) 16.4.1954.

2. TREATMENTS :

1. *Guar* harvested for tops.
2. *Guar* buried as G.M.
3. *Guar* grown with 60 lb./ac. of P_2O_5 at sowing, harvested for tops.
4. *Guar* grown with 60 lb./ac. of P_2O_5 at sowing, buried as G.M.
5. *Guar* grown with 60 lb./ac. of P_2O_5 +Borax at 5 lb./ac.+molybdenum 1 lb./ac. at sowing, harvested for tops.
6. *Guar* grown with 60 lb./ac. of P_2O_5 +Borax at 5 lb./ac.+molybdenum at 1 lb./ac. at sowing, buried as G.M.

7. *Guar* tops buried as obtained from treatment 1.
8. *Guar* tops buried as obtained from treatment 3.
9. *Guar* tops buried as obtained from treatment 5.
10. Control (fallow in *kharif*).

3. DESIGN :

- (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 45'×15'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1951—1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1168 lb./ac.
- (ii) 229.6 lb./ac.
- (iii) Treatments differ significantly.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1000	6.	1221
2.	1195	7.	1260
3.	1039	8.	1273
4.	1403	9.	1233
5.	1130	10.	922

S.E./mean=93.75 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(54).

Type :- 'M'.

Object :- To study the effect of organic and inorganic manuring on the yield of crops in rotations.

1. BASAL CONDITIONS to 4. GENERAL.

Please refer to No. 52(54) under *BAJRA*.

RESULTS :

- (i) 1390 lb./ac.
- (ii) (a) 336.0 lb./ac.
(b) 162.0 lb./ac.
- (iii) Main effect of N alone is highly significant.
- (iv) Av. yield of grain in lb./ac.

	F ₀	F ₁	F ₂	F ₃	F ₄	Mean
N ₀	1236	1284	1344	1260	1332	1291
N ₁	1320	1320	1524	1428	1584	1435
N ₂	1380	1368	1572	1452	1441	1443
Mean	1312	1324	1480	1380	1452	1390

S.E. of difference of two

1. F marginal means = 122.6 lb./ac.
2. N marginal means = 45.8 lb./ac.
3. N means at a level of F = 102.6 lb./ac.
4. F means at a level of N = 136.2 lb./ac.

Crop :- Wheat.

Ref :- I.A.R.I. 52(27).

Type :- 'C'.

Object :- To study the effect of sowing premature and mature seed of *kharif* crops on the yield.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 4, 5.11.1952. (iv) (a) 1 *palewa*, 2 tractor discings, 2 *sohaga* and tractor grubbing. (b) to (e) N.A. (v) Nil. (vi) Wheat NP-760 and C-581, barley NP-13, gram NP-58 and peas NP-29. (vii) Unirrigated. (viii) Weeding. (ix) N.A. (x) May, 1953.

2. TREATMENTS :

1. Sowing fully mature seed.
2. Sowing one week premature seed.
3. Sowing 2 weeks premature seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 3 for each of wheat NP-760 and C-518, barley, gram and peas crop. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Above normal. Lodging in NP-760 wheat. (ii) Smut in C-518 wheat. (iii) Yield of grain (iv) (a) 1952 —N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data is N.A. Results of other crops may be seen under relevant crops.

5. RESULTS :

Wheat NP-760		Wheat C-518	
(i) 2997 lb./ac.		(i) 3411 lb./ac.	
(ii) 188.5 lb./ac.		(ii) 181.5 lb./ac.	
(iii) Treatments do not differ significantly.		(iii) Treatments do not differ significantly.	
(iv) Av. yield of grain in lb./ac.		(iv) Av. yield of grain in lb./ac.	
Treatment	Av. yield	Treatment	Av. yield
1.	3455	1.	3817
2.	3295	2.	3490
3.	2241	3.	2927
S.E./mean	=66.64 lb./ac.	S.E./mean	=64.18 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(32).

Type :- 'C'.

Object :- To study the growth and development of premature seed of Wheat, Barley, Gram and Peas.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 4, 5.11.1953. (iv) (a) 4 *desi* ploughings. (b) to (e) N.A. (v) Nil. (vi) Wheat N.P. 760, Wheat C. 518, Barley N.P. 13, Gram N.P. 58 and Peas N.P. 29. (vii) N.A. (viii) *Bakharing* in wheat. (ix) N.A. (x) May 1954.

2. TREATMENTS :

1. Sowing fully matured seed.
2. Sowing one week premature seed.
3. Sowing two weeks premature seed,

3. DESIGN :

(i) R.B.D. (ii) (a) 3 for each crop. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 1/80 acre. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Peas and gram crop remained very poor. (ii) N.A. (iii) Grain yield (Wheat, Barley, Gram, Peas) (iv) (a) 1952 to 1954. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Experiment conducted on 5 crops as given under item (vi) in Basal conditions. Results of the other crops are given under relevant crops.

5. RESULTS :

Wheat N.P. 760		Wheat C. 518	
(i) 2274 lb./ac.		(i) 2305 lb./ac.	
(ii) 118.5 lb./ac.		(ii) 128.4 lb./ac.	
(iii) Treatments differ highly significantly.		(iii) Treatments differ highly significantly.	

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

Treatment	Av. yield
1.	2590
2.	2284
3.	1947
S.E./mean	=41.97 lb./ac.

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

Treatment	Av. yield
1.	2505
2.	2263
3.	2147
S.E./mean	=45.26 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(16).

Type :- 'CM'.

Object :- To study the effect of frequency of cultivation with and without weeding and nitrogenous fertilizers on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 12.11.1951. (iv) (a) As per treatments. (b) Sown by monarch drill. (c) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weeding twice. (ix) N.A. (x) 2 to 6.4.1952.

2. TREATMENTS :

Main-plot treatments :

4 levels of ploughings : $C_1=3$ ploughings, $C_2=6$ ploughings, $C_3=9$ ploughings and $C_4=12$ ploughings.

Sub-plot treatments :

2 levels of N as A/S : N_0 =no manure and $N_1=40$ lb./ac. of N.

Sub-sub-plot treatments :

3 levels of weedings : W_0 =no weeding, W_1 =one weeding, and W_2 =two weedings
A/S applied on 11.11.1951.

3. DESIGN :

(i) Split-plot (main-plots in L. sq.). (ii) (a) 4 main-plots/block, 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) $53.3' \times 20'$. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. Crop badly damaged and completely lodged due to hail-storm on 1.5.1952. (ii) N.A. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 593 lb./ac.

(ii) (a) 182.7 lb./ac.

(b) 156.3 lb./ac.

(c) 59.2 lb./ac.

(iii) C, N and M effects are all highly significant. All two factor interactions are significant while three factor interaction is not significant.

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

	N_0	N_1	Mean	W_0	W_1	W_2
C_1	282	472	377	308	450	373
C_2	520	643	581	519	647	578
C_3	565	880	722	615	800	752
C_4	578	808	693	534	820	726
Mean	486	701	593	494	679	607
W_0	397	591	494			
W_1	564	795	679			
W_2	498	716	607			

S.E. of difference of two

1. C marginal means	=52.73 lb./ac.	6. W means at the same level of C	=29.60 lb./ac.
2. N marginal means	=36.84 lb./ac.	7. C means at the same level of W	=58.01 lb./ac.
3. W marginal means	=17.09 lb./ac.	8. W means at the same level of N	=24.17 lb./ac.
4. N means at the same level of C	=63.81 lb./ac.	9. N means at the same level of W	=41.79 lb./ac.
5. C means at the same level of N	=69.43 lb./ac.		

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(24). Type :- 'CM'.

Object :- To study the effect of frequency of cultivation with and without weeding and nitrogenous fertilizers on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 8.11.1952. (iv) (a) As per treatments. (b) Simplex seed drill. (c) 1 md/ac. of seed. (d) and (e) N.A. (v) N.A. (vi) N.P.-775. (vii) I.rigated. (viii) Weeding twice. (ix) N.A. (x) 30.3.1953 ; 1.4.1953.

2. TREATMENTS :

Main-plot treatments :

4 levels of ploughings: $C_1=3$ ploughings, $C_2=6$ ploughings, $C_3=9$ ploughings and $C_4=12$ ploughings.

Sub-plot treatments :

2 levels of N as A/S : $N_0=$ and $N_1=40$ lb./ac. of N.

Sub-sub-plot treatments :

3 levels of weeding : $W_0=$ No weeding, $W_1=$ One weeding and $W_2=2$ weedings.

A/S applied on 6, 7.11.1951.

3. DESIGN :

(i) Split-plot. (main-plot in L. Sq.). (ii) (a) 4 main-plots/block 2 sub-plots/main-plot and 3 sub-sub plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) $53.3' \times 20'$ (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

Germination was visible on 4th to 7th day. The early stand of crop was quite good. The manured and more cultivated plots showed in general better growth. It was differently invisible between manured and unmanured plots. No lodging. (ii) Attack of loose smut on wheat rouging was done to check the attack. (iii) Grain yield. (iv) (a) 1951-1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1758 lb./ac.

(ii) (a) 176.07 lb./ac.

(b) 50.19 lb./ac.

(c) 181.03 lb./ac.

(iii) Effects of C and N are highly significant interaction $C \times N$ is significant while others are not significant.

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

	N_0	N_1	Mean	W_0	W_1	W_2
C_1	1335	1618	1477	1464	1461	1506
C_2	1558	1770	1664	1626	1691	1675
C_3	1814	2007	1910	1857	1957	1915
C_4	1898	2065	1981	1954	1987	2003
Mean	1651	1865	1758	1725	1774	1775
W_0	1647	1803	1725			
W_1	1660	1888	1774			
W_2	1646	1904	1775			

S.E. of difference of two

- | | | | |
|-----------------------------------|----------------|-----------------------------------|----------------|
| 1. C marginal means | =50.83 lb./ac. | 6. W means at the same level of C | =90.52 lb./ac. |
| 2. N marginal means | =11.83 lb./ac. | 7. C means at the same level of W | =89.70 lb./ac. |
| 3. W marginal means | =52.26 lb./ac. | 8. W means at the same level of N | =73.91 lb./ac. |
| 4. N means at the same level of C | =20.49 lb./ac. | 9. N means at the same level of W | =61.50 lb./ac. |
| 5. C means at the same level of N | =52.86 lb./ac. | | |

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(24).

Type :- 'CM'.

Object :—To study the effect of frequency of cultivation with and without weeding and nitrogenous fertilizers on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 7.11.1953. (iv) (a) As per treatments. (b) Seed sown with *monarch* drill. (c) 1 md/ac, (d) Rows 9' apart. (e) N.A. (v) N.A. (vi) N.P.775. (vii) Irrigated. (viii) Weeding was done with *khurpi*. (ix) N.A. (x) 16.4.1954.

2. TREATMENTS :

Main-plot treatments :

4 levels of ploughings : $C_1=3$ ploughings, $C_2=6$ ploughings, $C_3=9$ ploughings and $C_4=12$ ploughings.

Sub-plot treatments :

2 levels of N as A/S : $N_0=0$ and $N_1=40$ lb./ac. of N.

Sub-sub-plot treatments :

3 levels of weeding : $W_0=$ No weeding, $W_1=$ One weeding and $W_2=2$ weedings.

A/S applied on 2.11.1953.

3. DESIGN :

(i) Split-plot (main-plots in L. Sq.). (ii) (a) 4 main-plots/block, 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) $53.3' \times 20'$. (b) N.A. (v) N.A. (vi) N.A.

4. GENERAL :

(i) Poor stand. (ii) Nearly 30 to 35% infection of smut. (iii) Grain yield. (iv) (a) 1951—1953. (b) Yes (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 993 lb./ac.

(ii) (a) 196.65 lb./ac.

(b) 222.16 lb./ac.

(c) 62.53 lb./ac.

(iii) Effect of C and W are highly significant. Interaction $N \times W$ is significant. Others are not significant.

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

	N_0	N_1	Mean	W_0	W_1	W_2
C_1	857	857	857	815	845	908
C_2	949	910	930	927	896	967
C_3	1269	1040	1154	982	1117	1367
C_4	1068	994	1031	903	992	1198
Mean	1036	950	993	907	962	1110
W_0	935	880	907			
W_1	989	936	962			
W_2	1185	1034	1110			

S.E. of difference of two

- | | | | |
|-----------------------------------|----------------|-----------------------------------|----------------|
| 1. C marginal means | =56.77 lb./ac. | 6. W means at the same level of C | =31.26 lb./ac. |
| 2. N marginal means | =45.35 lb./ac. | 7. C means at the same level of W | =62.25 lb./ac. |
| 3. W marginal means | =15.63 lb./ac. | 8. W means at the same level of N | =22.11 lb./ac. |
| 4. N means at the same level of C | =90.70 lb./ac. | 9. N means at the same level of W | =48.81 lb./ac. |
| 5. C means at the same level of N | =85.65 lb./ac. | | |

S.E. of difference of two

1. B marginal means = 312.7 lb./ac. 13. M means at the same level of N = 87.55 lb./ac.
2. M marginal means = 77.83 lb./ac. 14. N means at the same level of S = 60.10 lb./ac.
3. S marginal means = 95.33 lb./ac. 15. S means at the same level of N = 107.22 lb./ac.
4. N marginal means = 34.70 lb./ac. 16. P means at the same level of B = 40.07 lb./ac.
5. P marginal means = 28.33 lb./ac. 17. B means at the same level of P = 313.95 lb./ac.
6. M means at the same level of B = 31.78 lb./ac. 18. P means at the same level of M = 40.07 lb./ac.
7. B means at the same level of M = 322.25 lb./ac. 19. M means at the same level of P = 82.83 lb./ac.
8. S means at the same level of B = 38.92 lb./ac. 20. P means at the same level of S = 49.07 lb./ac.
9. B means at the same level of S = 331.50 lb./ac. 21. S means at the same level of P = 101.45 lb./ac.
10. N means at the same level of B = 49.07 lb./ac. 22. means of body of M×S table = 134.81 lb./ac.
11. B means at the same level of N = 315.20 lb./ac. 23. means of body of N×P table = 49.07 lb./ac.
12. N means at the same level of M = 49.07 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(48).

Type :- 'CM',

Object :- To study the effect of organic and inorganic manuring on the yield of crops in 3 rotations :
1. *Bajra*-Wheat 2. Fallow-Wheat and 3. *Bajra*-fallow.

1. BASAL CONDITIONS :

- (i) (a) and (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 1.11.1953.
(iv) (a) Ploughing with victory plough, ploughing thrice with *desi* plough and beaming twice. (b) to (e) N.A. (v) N.A. (vi) N.P.775. (vii) Irrigated. (viii) *Bakharing* and weeding. (ix) 5.30". (x) 18.4.1954.

2. TREATMENTS :

Main-plot treatments :

2 rotations : $R_1 = \text{Bajra-wheat}$ and $R_2 = \text{Fallow-wheat}$.

Sub-plot treatments :

5 levels of F.Y.M. : $F_0 = 0$, $F_1 = 2\frac{1}{2}$, $F_2 = 5$, $F_3 = 10$ and $F_4 = 20$ ton/ac. of F.Y.M.

Sub-sub-plot treatments :

3 levels of N : $N_0 = 0$, $N_1 = 20$ and $N_2 = 40$ lb./ac.Manures are applied to *Bajra* in R_1 and to wheat in R_2 . N is applied as A/S.

3. DESIGN :

- (i) Split-plot. (ii) (a) 2 main-plots/replication, 5 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) $58' \times 12\frac{1}{2}'$. (b) $55' \times 9\frac{1}{2}'$. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Good in R_2 and poor in R_1 . Considerable lodging all over in R_2 due to heavy growth and rain and strong wind in III week of February, 1954. No lodging in R_1 . (ii) Mild attack of rust (yellow and black, comparatively more rust in R_2 due to lodging, smut attack about 4% of the plants affected. (iii) Grain yield. (iv) (a) 1952-N.A., (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1345 lb./ac.
(ii) (a) 198.5 lb./ac.
(b) 174.9 lb./ac.
(c) 118.7 lb./ac.
(iii) Effect of R is highly significant, effects of N and interaction $R \times N$ are significant, while all others are not significant.
(iv) Av. yield of grain in lb./ac.

	F_0	F_1	F_2	F_3	F_4	Mean	N_0	N_1	N_2
R_1	558	521	567	530	660	567	541	569	590
R_2	2051	2111	2116	2185	2157	2124	2017	2151	2204
Mean	1304	1316	1341	1357	1409	1345	1279	1360	1397
N_0	1228	1186	1311	1311	1350	1279			
N_1	1311	1367	1367	1360	1395	1360			
N_2	1374	1395	1346	1401	1471	1397			

S.E. of difference of two

- | | | |
|-----------------------------------|----------------|---|
| 1. R marginal means | =41.84 lb./ac. | 6. N means at the same level of R=43.34 lb./ac. |
| 2. F marginal means | =58.30 lb./ac. | 7. R means at the same level of N=54.81 lb./ac. |
| 3. N marginal means | =30.65 lb./ac. | 8. N means at the same level of F=68.53 lb./ac. |
| 4. F means at the same level of R | =82.45 lb./ac. | 9. F means at the same level of N=86.65 lb./ac. |
| 5. R means at the same level of F | =84.79 lb./ac. | |

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 50(61).

Type :- 'M'.

Object:—To study the depth of cultivation with and without inversion of soil on the yield of fallow—Wheat.

1. BASAL CONDITIONS :

- (i) (a) Maize—wheat. (b) Maize. (c) N.A. (ii) (a) Light soil. (b) Refer item 11 on page 143. (iii) 5.11.1950. (iv) (a) As per treatments. (b) Sown behind *desi* plough by '*Pona*'. (c) to (e) N.A. (v) N.A. (vi) C-518. (vii) Irrigated. (viii) Hoeing with *Bakhar*. (ix) N.A. (x) 22, 24.4.1951.

2. TREATMENTS :

Main-plot treatments :

- 4 cultural treatments : C₁=Ploughing 9"–10" depth with tractor plough in the first instance followed by normal cultivation with tractor implement (7 times). C₂=Ploughing 5" depth with soil inverting (Disc) plough by bullocks in the first instance followed by normal cultivation with country plough (8 times). C₃=Country plough (8 times). C₄=Tractor discing (7 times).

Sub-plot treatments :

- 4 levels of N as F.Y.M. : N₀=0, N₁=40, N₂=80 and N₃=120 lb./ac.
F.Y.M. spread on 19, 20, 27 and 28.10.1950.

3. DESIGN :

- (i) Split-plot. (ii) (a) 4 main-plots/block, 4 sub-plots/main plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/40 acre. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) The seeds germinated after 6 days of sowing, i.e. on 11.11.1952. Growth very good. No difference in the growth of various cultural treatments. Crop lodged. (ii) Slight smut infection. Smut earheads were roughed. (iii) Grain yield. (iv) (a) Yes ; 1950–1954. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2780 lb./ac.
(ii) (a) 447.7 lb./ac.
(b) 249.3 lb./ac.
(iii) Only C effect is highly significant.
(iv) Av. yield of grain in lb./ac.

	C ₁	C ₂	C ₃	C ₄	Mean
N ₀	2473	2599	2619	2533	2556
N ₁	2759	2879	2906	2719	2816
N ₂	2666	3019	2786	2781	2813
N ₃	2853	2979	3226	2686	2936
Mean	2688	2194	2884	2680	2780

S.E. of difference of two	
1. C marginal means	=182.8 lb./ac.
2. N marginal means	=101.8 lb./ac.
3. N means at the same level of C	=203.6 lb./ac.
4. C means at the same level of N	=179.7 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 50(11).

Type :- 'M'.

Object :- To study the effect of depth of cultivation with and without inversion on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Heavy soil. (b) Refer item 11 on page 143. (iii) 5.11.1950. (iv) (a) As per treatments. (b) Sown with *desi* plough. (c) to (e) N.A. (v) N.A. C-518. (vi) Irrigated. (vii) Hoeing with *Oudh* plough. (ix) N.A. (x) 19.4.1951.

2. TREATMENTS :

Main-plot treatments :

4 cultural treatments : C₁=Tractor ploughing 9"-10" depth with soil inverting followed by normal cultivation with tractor implement (Discing). C₂=5" depth, bullock soil inverting plough followed by normal cultivation with country plough. C₃=Country plough and C₄=Tractor discing.

Sub-plot treatments :

4 levels of N as F.Y.M. : N₀=0, N₁=40, N₂=80 and N₃=120 lb./ac. of N.
F.Y.M. applied on 19, 20, 27 to 29.10.1953.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 3. (a) 1/40 acre. (b) 1/52 acre] (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Loose smut. Mild attack of aphids. (iii) Grain yield. (iv) (a) Yes ; 1950 to 1954. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Some area towards north was water-logged. (vii) Nil.

5. RESULTS :

- (i) 1967 lb./ac.
(ii) (a) 370.3 lb./ac.
(b) 444.3 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
N ₀	1876	1569	1788	1876	1777
N ₁	2033	2786	2069	1428	2079
N ₂	2182	1893	1972	1780	1957
N ₃	1937	2033	2086	2165	2055
Mean	2007	2070	1979	1812	1967

S.E. of difference of two

1. C marginal means	=151.2 lb./ac.
2. N marginal means	=181.4 lb./ac.
3. N means at the same level of C	=362.8 lb./ac.
4. C means at the same level of N	=348.7 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(18). Type :- 'CM'.

Object :- To study the effect of depth of cultivation with and without inversion on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) Heavy soil. (b) Refer item 11 on page 143. (iii) 5.11.1951. (iv) (a) As per treatments. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 9.4.1952.

2. TREATMENTS :

Main-plot treatments :

4 cultural treatments : C₁=Tractor ploughing 9"-10" followed by normal cultivation with tractor disc, C₂=5" bullock soil inverting *victory* plough followed by normal cultivation with *desi* plough, C₃=Country plough and C₄=Tractor discing.

Sub-plot treatments :

4 levels of N as F.Y.M. : N₀=0, N₁=40, N₂=80 and N₃=120 lb./ac. of N.

F.Y.M. spread on 12.9.1951.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 40'×26.5'. (b) 36'×23'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 2103 lb./ac.

(ii) (a) 274.8 lb./ac.

(b) 346.4 lb./ac.

(iii) Main effect of C is highly significant and effect of N is significant while interaction is not significant.

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

	C ₁	C ₂	C ₃	C ₄	Mean
N ₀	2032	2092	1863	1735	1981
N ₁	2190	2131	2184	1788	2073
N ₂	2223	2237	2283	1933	2169
N ₃	2158	2269	2329	1959	2189
Mean	2151	2182	2165	1856	2103

S.E. of difference of two

1. C marginal mean = 97.1 lb./ac.
2. N marginal mean = 122.4 lb./ac.
3. N mean at the same level of G = 244.8 lb./ac.
4. C mean at the same level of N = 233.3 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(18).

Type :- 'CM'.

Object :- To study the depth of cultivation with and without inversion on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) to (c) N.A. (ii) (a) Heavy soil. (b) Refer item 11 on page 143. (iii) 14, 15.11.1952. (iv) (a) As per treatments. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) *Bakharing*; hoeing with *oudh* plough. (ix) N.A. (x) 12, 15.7.1953.

2. TREATMENTS :

Main-plot treatments :

4 cultural treatments : C_1 =Tractor ploughing 9"-10" deep followed by tractor grubber and disc, C_2 =Bullock driven victory plough 6" (inversion)+country plough, C_3 =Country plough alone and C_4 =Tractor discing alone.

Sub-plot treatments :

4 levels of N as F.Y.M. : $N_0=0$, $N_1=40$, $N_2=80$ and $N_3=120$ lb./ac. of N.
F.Y.M. spread on 21.9.1952.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/40 ac. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1950-1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data N.A.

5. RESULTS :

- (i) 2247 lb./ac.
(ii) (a) 483.8 lb./ac.
(b) 332.4 lb./ac.
(iii)
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
C_1	2074	N_0	2000
C_2	2343	N_1	2148
C_3	2469	N_2	2287
C_4	2103	N_3	2553
S.E./mean	=121.0 lb./ac.	S.E./mean	=83.11 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(26).

Type :- 'CM'.

Object :- To study the depth of cultivation with and without inversion on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) Heavy soil. (b) Refer item 11 on page 143. (iii) 16.11.1953. (iv) (a) As per treatments. (b) Sown with drill. (c) N.A. (d) 9" between rows. (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) *bakharing*. (ix) N.A. (x) 21, 22.4.1954.

2. TREATMENTS :

Main-plot treatments

4 cultural treatments : C_1 =Tractor ploughing 9"-10" deep followed by tractor grubber, C_2 =Bullock victory plough 5" to 6" deep followed by country plough, C_3 =Country plough 4"-5" and C_4 =Tractor disc 3"-4".

Sub-plot treatments :

4 levels of N as F.Y.M. : $N_0=0$, $N_1=40$, $N_2=80$ and $N_3=120$ lb./ac of N.
F.Y.M. applied on 12, 15.9.1953.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/40 ac. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1273 lb./ac.
(ii) (a) 165.4 lb./ac.
(b) 162.9 lb./ac.
(iii) Effects of C and N are significant. Interaction is not significant.

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

	C ₁	C ₂	C ₃	C ₄	Mean
N ₀	1402	1090	1388	1317	1299
N ₁	1131	1265	1553	1265	1305
N ₂	1285	1388	1470	1502	1411
N ₃	1450	1358	1502	1481	1447
Mean	1317	1275	1478	1021	1273

S.E. of difference of two

1. C marginal means = 58.48 lb./ac.
2. N marginal means = 57.60 lb./ac.
3. N means at the same level of C = 115.20 lb./ac.
4. C means at the same level of N = 115.83 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 50(3).

Type :- 'CM'.

Object :—To study the effect of Napier grass on the soil fertility and yield of subsequent cereal crops under manured and unmanured conditions.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Wheat on 11.12.1950 and 12.11.1950. (iv) (a) Ploughing with *desi* plough (wheat plots), 10.11.1950. (b) N.A. (c) 80 lb./ac. (d) and (e) N.A. (v) 40 lb./ac. of N as A/S on 22.2.1951 to Napier plots. (vi) N.A. (vii) Irrigated. (viii) Wheat *bakharing* on 30.12.1950 and hoeing grass plots with horse hoe on 31.12.1950. (ix) N.A. (x) Napier on 22.4.1951 and wheat on 20.4.1951.

2. TREATMENTS :

Main-plot treatments :

4 rotational treatments : R₁=Control, (maize-wheat rotation), R₂=Napier (2 years)—maize-wheat, R₃=Napier (3 years)—Maize-wheat and R₄=Napier (4 years)—maize-wheat.

Sub-plot treatments :

2 levels of manure : M₀=No manure and M₁=Manure at 40 lb./ac. of N as F.Y.M.+A/S.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 37' × 29.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1953. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) Only wheat yield was taken into consideration.

5. RESULTS :

- (i) 1094 lb./ac.
- (ii) 216.0 lb./ac.
- (iii) Treatments do not differ significantly.
- (iv) Av. yield of wheat grain in lb./ac.

Treatment	Av. yield
M ₀	954
M ₁	1234
S.E./mean	= 88.2 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(4).

Type :- 'CM'.

Object :- To study the effect of Napier grass on the soil fertility and yield of subsequent cereal crops under manured and unmanured conditions.

1. BASAL CONDITIONS :

(i) (a), (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Wheat : 6.11.1951 and Napier on 27, 29.11.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hoeing with *Oudh* plough only wheat 15.12.1951. Hoeing Napier with *desi* plough on 29.12.1951 and hoeing wheat with *Oudh* plough on 2.1.1952. (ix) N.A. (x) Wheat on 16.4.1952 and Napier on 23.5.1952.

2. TREATMENTS :

Main-plot treatments :

4 crop rotations : R_1 =Control : Maize and Wheat, R_2 =Napier (2 years)—Maize and Wheat, R_3 =Napier (3 years)—Maize and Wheat and R_4 =Napier (4 years)—Maize and Wheat.

Sub-plot treatments :

2 manures : $M_0=0$ and $M_1=40$ lb./ac. of N as A/S.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 acre. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 (*Kharif*) to 1953. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) The analysis was done only for wheat crop.

5. RESULTS :

(i) 470.2 lb./ac.
(ii) 120.0 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
M_0	396.9
M_1	543.6
S.E./mean	=48.9 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(4).

Type :- 'CM'.

Object : To study the effect of Napier grass on the soil fertility and yield of subsequent cereal crops under manured and unmanured conditions.

1. BASAL CONDITIONS :

(i) (a), (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Wheat on 30, 31.10.1952, Napier 16, 17.11.1952. (iv) (a) Ploughing with victory plough once and twice with *desi* plough. (b) to (e) N.A. (v) Nil. (vi) Wheat C-518. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Napier on 13.5.1953 and Wheat on 5.9.1953.

2. TREATMENTS :

Main-plot treatments :

4 crop rotations : R_1 =Control : Maize and Wheat, R_2 =Napier (2 years)—Maize and Wheat, R_3 =Napier (3 years)—Maize and Wheat and R_4 =Napier (4 years)—Maize and Wheat.

Sub-plot treatments :

2 manures : $M_0=0$ and $M_1=40$ lb./ac. of N as A/S.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication and 2 sub-plots/main plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 acre. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 446.6 lb./ac.
 (ii) (a) 67.2 lb./ac.
 (b) 29.6 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	R ₁	R ₂	Mean
M ₀	380.0	440.0	410.0
M ₁	466.7	500.0	483.3
Mean	423.3	470.0	446.6

S.E. of difference of two

1. R marginal means =27.43 lb./ac.
 2. M marginal means =12.08 lb./ac.
 3. M means at the same level of R =17.10 lb./ac.
 4. R means at the same level of M =29.98 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(4).

Type :- 'CM'.

Object :- To study the effect of Napier grass on the soil fertility and yield of subsequent cereal crops under manured and unmanured conditions.

1. BASAL CONDITIONS:

- (i) (a) and (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 29.10.1953.
 (iv) (a) 1 ploughing with victory plough 7.9.1953, 2 Harrowing (spring harrow) 23.5.1953 and ploughing with *desi* plough thrice. (b) N.A. (c) 1 md/ac. (d) and (e) N.A. (v) N.A. (vi) N.P-710.
 (vii) Irrigated. (viii) *Bakharing* 12.11.1953. (ix) N.A. (x) 4.4.1954.

2. TREATMENTS :

Main-plot treatments :

4 crop rotation : R₁=Control : Maize and Wheat, R₂=Napier (2 years)—Maize and Wheat, R₃=Napier (3 years)—maize and Wheat and R₄=Napier (4 years)—Maize and Wheat.

Sub-plot treatments :

2 manures : M₀=0 and M₁=40 lb./ac. of N as A/S.

3. DESIGN :

- (i) Split-plot. (ii) (a) 4 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 818 lb./ac.
 (ii) (a) 192.0 lb./ac.
 (b) 84.0 lb./ac.
 (iii) R effect is significant, M effect is highly significant and Interaction is not significant.
 (iv) Av. yield of grain in lb./ac.

	R ₁	R ₂	R ₃	Mean
M ₀	707	687	874	758
M ₁	847	780	1007	878
Mean	777	733	940	818

S.E. of difference of two

1. R marginal means	=78.38 lb./ac.
2. M marginal means	=28.00 lb./ac.
3. M means at the same level of R	=48.50 lb./ac.
4. R means at the same level of M	=85.56 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 50(40).

Type :- 'CMV'.

Object :- To find out the optimum seed-rate of Wheat varieties under manured and unmanured conditions.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 13, 14.11.1950. (iv) (a) Ploughing with tractor and discing. (b) N.A. (c) As per treatments. (d) N.A. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 17.4.1951 to 1.5.1951.

2. TREATMENTS :

Main-plot treatments :

5 seed rates : $R_1=50$, $R_2=65$, $R_3=80$, $R_4=95$ and $R_5=110$ lb./ac.

Sub-plot treatments :

2 varieties : $V_1=N.P. 165$ and $V_2=C-518$.

Sub-sub-plot treatments :

2 levels of N as A/S : $N_0=0$ and $N_1=20$ lb./ac. of N.

3. DESIGN :

(i) Split-plot in L. Sq. (ii) (a) 5 main-plots/block, 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/48.4 ac. (v) N.A. (vi) N.A.

4. GENERAL :

(i) N.A. (ii) Removal of plants attacked by smut on 3, 4.3.1951. (iii) Grain yield. (iv) (a) 1950—1953. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1774 lb./ac.

(ii) N.A.

(iii) N effect is highly significant and interaction $N \times V$ is significant while all others are not significant.

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

	R_1	R_2	R_3	R_4	R_5	Mean	N_0	N_1
V_1	1694	1975	1921	1619	2050	1852	1849	1856
V_2	1488	1631	1941	1779	1641	1696	1583	1809
Mean	1591	1803	1931	1699	1845	1774	1716	1832
N_0	1532	1728	1912	1590	1817	1716		
N_1	1650	1878	1950	1808	1873	1832		

S.E.'s N.A.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 51(15).

Type :- 'CMV'.

Object :- To find out the optimum seed-rate of Wheat varieties under manured and unmanured conditions.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 16, 17.11.1951. (iv) (a) Preparatory cultivation 2 victory ploughings, 1 *desi* ploughing discing and grubbing twice levelling and again ploughing with *desi* plough twice. (b) N.A. (c) As per treatments. (d) Rows 9' apart. (e) N.A. (v) N.A. (vi) As per treatments. (vii) N.A. (viii) No. (ix) N.A. (x) N.P. 165—10.4.1952 ; C-518—17.4.1952.

2. TREATMENTS:

Main-plot treatments :

5 seed rates : $R_1=50$, $R_2=65$, $R_3=80$, $R_4=95$ and $R_5=110$ lb./ac.

Sub-plot treatments :

2 varieties : $V_1=N.P. 165$ and $V_2=C-518$.

Sub-sub-plot treatments :

2 levels of N as A/S : $N_0=0$ and $N_1=20$ lb./ac. of N.

A/S broadcaste before sowing.

3. DESIGN :

(i) Split-plot in L. Sq. (ii) (a) 5 main-plots/block, 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) $58.5' \times 11'$. (v) N.A. (vi) N.A.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1086 lb./ac.
 (ii) (a) 291.2 lb./ac.
 (b) 336.8 lb./ac.
 (c) 408.4 lb./ac.
 (iii) V effect is highly significant and interaction, $N \times S$, $S \times V$, $V \times N$ are all significant while other effects are not significant.
 (iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean	N_0	N_1
V_1	1192	1317	1317	1170	1359	1271	1231	1311
V_2	769	863	900	1026	944	900	786	1015
Mean	981	1090	1108	1098	1151	1086	1009	1163
N_0	893	1022	1010	996	1122	1009		
N_1	1069	1157	1206	1201	1181	1163		

S.E. of difference of two

- | | | | |
|-----------------------------------|------------------|-----------------------------------|-----------------|
| 1. R marginal means | = 92.06 lb./ac. | 6. N means at the same level of R | = 182.6 lb./ac. |
| 2. V marginal means | = 67.35 lb./ac. | 7. R means at the same level of N | = 158.6 lb./ac. |
| 3. N marginal means | = 81.68 lb./ac. | 8. N means at the same level of V | = 115.5 lb./ac. |
| 4. V means at the same level of R | = 150.60 lb./ac. | 9. V means at the same level of N | = 105.9 lb./ac. |
| 5. R means at the same level of V | = 167.40 lb./ac. | | |

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(23).

Type :- 'CMV'.

Object :- To find out the optimum seed-rate of Wheat varieties under manured and unmanured conditions.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 3.11.1952. (iv) (a) 3 ploughings with *desi* plough. Discing and grubbing twice. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) Interculture once. (ix) N.A. (x) 15, 20.4.1953.

2. TREATMENTS :

Main-plot treatments :

5 seed rates : $R_1=50$, $R_2=65$, $R_3=80$, $R_4=95$ and $R_5=110$ lb./ac.

Sub-plot treatments :

2 varieties : $V_1=N.P. 165$ and $V_2=C-518$.

Sub-sub-plot treatments :

2 levels of N as A/S : $N_0=0$, and $N_1=20$ lb./ac. of N.

3. DESIGN :

(i) Split-plot in L. Sq. (ii) (a) 5 main-plots/block, 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 62.5'×15'. (v) N.A. (vi) N.A.

4. GENERAL :

(i) Normal. (ii) Loose smut. (iii) Grain yield. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1802 lb./ac.
 (ii) (a) 1266 lb./ac.
 (b) 390.0 lb./ac.
 (c) 391.0 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	R ₁	R ₂	R ₃	R ₄	R ₅	Mean	N ₀	N ₁
V ₁	1500	1789	1791	1931	1907	1784	1752	1815
V ₂	1349	1626	1851	2305	1972	1821	1783	1859
Mean	1425	1708	1821	2118	1940	1802	1767	1837
N ₀	1519	1696	1781	2049	1791	1767		
N ₁	1330	1719	1861	2186	2089	1837		

S.E. of the difference of two

- | | | | |
|-----------------------------------|----------------|-----------------------------------|----------------|
| 1. R marginal means | =400.3 lb./ac. | 6. N means at the same level of R | =174.8 lb./ac. |
| 2. V marginal means | = 78.0 lb./ac. | 7. R means at the same level of N | =419.0 lb./ac. |
| 3. N marginal means | = 78.2 lb./ac. | 8. N means at the same level of V | =110.3 lb./ac. |
| 4. V means at the same level of R | =174.4 lb./ac. | 9. V means at the same level of N | =110.5 lb./ac. |
| 5. R means at the same level of V | =418.9 lb./ac. | | |

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(23).

Type :- 'CMV'.

Object :—To find out the optimum seed-rate of Wheat varieties under manured and unmanured conditions.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 20, 21.11.1953. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) Weeding once. (ix) N.A. (x) 19, 20.4.1954.

2. TREATMENTS :

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

- 3 varieties : V₁=NP-710, V₂=NP-718 and V₃=NP-775.
- 3 levels of N as A/S : N₀=0, N₁=20 and N₂=40 lb./ac. of N.
- 3 seed rates : R₁=50, R₂=80 and R₃=110 lb./ac.

Manures to be applied in two doses, half before sowing on 19.11.1953 and half with first irrigation on 9.1.1954.

3. DESIGN :

(i) 3³ Fact. confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 24'×35' (b) 22'×33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal, heavy lodging. (ii) Brown rust in N.P-710 (iii) Grain yield. (iv) (a) N.A.—1953. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Heavy rains in February 1954. (vii) Nil.

5. RESULTS :

- (i) 1867 lb./ac.
(ii) 261.7 lb./ac.
(iii) Main effects of N and V are significant others are not significant.
(iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	Mean	N ₀	N ₁	N ₂
R ₁	1872	2118	1925	1972	1936	1925	2054
R ₂	1594	1765	1883	1747	1958	1466	1819
R ₃	1733	1861	2054	1883	1947	1722	1979
Mean	1733	1915	1954	1867	1947	1705	1950
N ₀	1786	1861	2193	1947			
N ₁	1594	1851	1669	1705			
N ₂	1819	2032	2000	1950			

S.E. of any marginal mean = 61.68 lb./ac.

S.E. of body of any table = 106.80 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 50(32).

Type :- 'CMV'.

Object :—To study the effect of N on different varieties of Wheat when sown on different dates.

1. BASAL CONDITIONS :

(i) (a) No. (b) Cowpeas. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 20.10.1950, 15.11.1950 and 9.12.1950. (iv) (a) Ploughing with victory plough after cowpeas once and 1 ploughing with *desi* plough. (b) to (e) N.A. (v) 30 lb./ac. of P₂O₅ as super and 20 lb./ac. of K₂O as Pot. sul. (vi) As per treatments. (vii) Irrigated. (viii) Roguing 5,6,4.1951. (ix) N.A. (x) 7 to 16.4.1951.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D₁=20.10.1950, D₂=15.11.1950 and D₃=10.12.1950.

Sub-plot treatments :

3 varieties : V₁=N.P-165, V₂=N.P-710 and V₃=N.P-771.

Sub-sub-plot treatments :

5 levels of N : N₀=0, N₁=20 lb./ac. of N at sowing, N₂=20 lb./ac. of N with 1st irrigation after sowing, N₃=40 lb./ac. of N at sowing and N₄=40 lb./ac. of N with final irrigation after sowing.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 3 sub-plots/main-plot and 5 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 50'×20'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) 1948—1949. (b) N.A. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5 RESULTS :

- (i) 1142 lb./ac.
(ii) (a) 295.2 lb./ac.
(b) 396.1 lb./ac.
(c) 219.0 lb./ac.
(iii) Sub-sub-plot treatments differ highly significantly. Main-plot and sub-sub-plot treatments do not differ significantly. Interaction is not significant.

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

	D ₁	D ₂	D ₃	Mean	V ₁	V ₂	V ₃
N ₀	757	849	1036	881	875	898	869
N ₁	1205	1330	1287	1274	1267	1336	1220
N ₂	873	955	1084	971	1049	926	937
N ₃	1289	1510	1361	1387	1407	1414	1339
N ₄	1138	1249	1214	1200	1196	1280	1125
Mean	1052	1179	1196	1142	1159	1171	1098
V ₁	1117	1114	1245				
V ₂	1134	1280	1099				
V ₃	906	1142	1246				

S.E. of difference of two

- | | | | |
|----------------------------|------------------|----------------------------|-------------------|
| 1. D marginal means | = 53.90 lb./ac. | 6. N means at a level of D | [= 89.41 lb./ac. |
| 2. V marginal means | = 72.31 lb./ac. | 7. D means at a level of N | = 96.44 lb./ac. |
| 3. N marginal means | = 51.62 lb./ac. | 8. N means at a level of V | = 89.41 lb./ac. |
| 4. V means at a level of D | = 125.25 lb./ac. | 9. V means at a level of N | = 107.81 lb./ac. |
| 5. D means at a level of V | = 115.60 lb./ac. | | |

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(11).

Type :- 'IM'.

Object:—To study the effect of irrigation and manures on the growth, yield and water requirements of Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 11.11.1953. (iv) (a) 4 ploughing with victory plough, 6 ploughing, with *desi* plough and double discing with tractor. (b) N.A. (c) 1 md./ac. (d) and (e) N.A. (v) N.A. (vi) N.P-710. (vii) Irrigated. (viii) One weeding. (ix) N.A. (x) 6,7.4.1954.

2. TREATMENTS :

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

(1) 3 levels of irrigation : I₁=1, I₂=2 and I₃=3 irrigations.(2) 3 levels of N as A/S : N₀=0, N₁=20 and N₂=40 lb./ac. of N.(3) 3 levels of P₂O₅ as super : P₀=0, P₁=20 and P₂=40 lb./ac. of P₂O₅.

3. DESIGN :

(i) 3³ Fact. confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) 1/2 N.A. (iii) 2. (iv) (a) 44'×20', (b) 40'×18' (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Black ants. (iii) Grain yield. (iv) (a) 1953-N.A. (b) N.A. (c) N.A. (v) (a), (b) No. (vi) N.A. (vii) Raw data N.A.

5. RESULTS :

(i) 2174 lb./ac.

(ii) 205.54 lb./ac.

(iii) N.A.

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

Treatment	Av. yield.	Treatment	Av. yield.	Treatment	Av. yield
N ₀	1967	P ₀	2002	I ₁	2018
N ₁	2153	P ₁	2163	I ₂	2232
N ₂	2402	P ₂	2358	I ₃	2273
S.E./mean	=83.93 lb./ac.	S.E./mean	=83.93 lb./ac.	S.E./mean	=83.93 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 52(72).

Type :- 'IMV'.

Object :- To study the effect of different doses of N along with different number of Irrigations on three different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 19, 20. 11.1952. (iv) (a) Tractor grubbing twice, *desi* ploughing, tractor discing crosswise on 18.11.1952. (b) to (e) N.A. (v) 80 lb./ac. of P_2O_5 as super and A/S. applied at the time of sowing. (vi) As per treatments. (vii) Irrigated. (viii) Weeding done with *Khurpi*. (ix) N.A. (x) 1.5.1953.

2. TREATMENTS :

All combinations of (1), (2) & (3).

(1) 3 varieties : $V_1=N.P. 710$ $V_2=N.P. 718$ and $V_3=N.P. 775$.

(2) 3 levels of N as A/S : $N_0=No$ manures, $N_1=20$ and $N_2=40$ lb./ac. of N.

(3) 3 levels of irrigations : $I_1=One$ Irrigation, $I_2=Two$ Irrigations and $I_3=Three$ Irrigations.

3. DESIGN :

(i) 3^3 Fact. confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) $50' \times 17'$ (b) $48' \times 15'$. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Below Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1952-N.A. (b) N.A. (c) N.A. (v) (a), (b) No. (vi) & (vii) Nil.

5. RESULTS :

(i) 1639 lb./ac.

(ii) 297.2 lb./ac.

(iii) N effect is highly significant, interaction $V \times N$ is significant. Other effects are not significant.

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

	N_0	N_1	N_2	Mean	I_1	I_2	I_3
V_1	1238	1926	1883	1682	1593	1775	1680
V_2	1032	1766	2117	1638	1616	1764	1535
V_3	1041	1723	2027	1597	1541	1632	1619
Mean	1104	1805	2009	1639	1583	1724	1611
I_1	1088	1890	1771	1583			
I_2	1167	1883	2121	1724			
I_3	1056	1642	2135	1611			

S.E. of any marginal mean = 70.05 lb./ac.

S.E. of body of any table = 121.3 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 53(72).

Type :- 'IMV'.

Object :- To study the effect of varying doses of irrigation and N doses on the yield of Wheat varieties.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 2.11.1953. (iv) (a) Victory ploughing, *desi* ploughing 4 times crosswise 4th week October, 1953. (b) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) May 1954.

2. TREATMENTS :

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

(1) 3 varieties : $V_1=NP-710$, $V_2=N.P-718$ and $V_3=N.P-775$.

(2) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac. of N.

(3) 3 levels of irrigation : $I_1=One$ irrigation. $I_2=Two$ irrigations and $I_3=3$ irrigations.

3. DESIGN :

(i) 3^3 Fact. confounded. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) $48' \times 18'$. (b) $48' \times 15'$. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 1228 lb./ac.
(ii) 172.5 lb./ac.
(iii) Only V and I effects are significant.
(iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	Mean	I ₁	I ₂	I ₃
V ₁	1095	1449	1244	1263	1167	1344	1277
V ₂	1195	1126	1082	1134	1074	1105	1223
V ₃	1290	1254	1318	1287	1239	1174	1449
Mean	1193	1276	1215	1228	1160	1208	1317
I ₁	1105	1205	1169	1160			
I ₂	1205	1257	1662	1208			
I ₃	1270	1367	1313	1317			

S.E. of marginal means

=40.65 lb./ac.

S.E. of the body of the table

=70.41 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- I.A.R.I. 48(1).

Type :- 'D'.

Object :—To find out the efficiency of spraying methexan on the yield of Wheat.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.P-165. (vii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 levels of spraying : T₀=No spraying before sowing and T₁=Spraying methexan before sowing.

Sub-plot treatments :

4 weeding treatments : W₀=No weeding, W₁=Weeding with hand, W₂=Spraying weedicide once after sowing and W₃=Spraying weedicide twice after sowing.

3. DESIGN :

- (i) Split-plot. (ii) (a) 2 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 36' × 36'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 1245 lb./ac.
(ii) (a) 395.8 lb./ac.
(b) 216.4 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	W ₀	W ₁	W ₂	W ₃	Mean
T ₀	951	1554	1280	1157	1236
T ₁	1228	1280	1294	1217	1255
Mean	1089	1417	1287	1187	1245

S.E. of difference of two

- | | |
|-----------------------------------|----------------|
| 1. T marginal means | =139.9 lb./ac. |
| 2. W marginal means | =108.2 lb./ac. |
| 3. W means at the same level of T | =153.0 lb./ac. |
| 4. T means at the same level of W | =192.7 lb./ac. |

Crop :- Maize (*Kharif*)

Ref :- I.A.R.I 49 (3) Type :- 'M'.

Object :—To Study the residual effect of fertilizers applied to Maize in *Kharif* on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Maize-Wheat. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on Page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

- (1) 3 levels of N : $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac.
 (2) 3 levels of P_2O_5 : $P_0=0$, $P_1=40$ and $P_2=80$ lb./ac.
 (3) 2 levels of K_2O : $K_0=0$, and $K_1=60$ lb./ac.

3 DESIGN :

(i) $3^2 \times 2$ Confd. Fact. (ii) (a) 3 blocks/replication and 6 plots/block. (NP and NPK are partially confounded.) (b) N.A. (iii) 2. (iv) (a) N.A. (b) $42' \times 22'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949 (*Kharif*) to 1953. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) & (vii) Nil.

5. RESULTS:

- (i) 2427 lb./ac.
 (ii) 396.6 lb./ac.
 (iii) N effect alone is significant.
 (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1
N_0	2037	2186	2144	2122	2051	2194
N_1	2482	2728	2539	2583	2609	2557
N_2	2393	2565	2766	2575	2516	2634
Mean	2304	2493	2483	2427	2392	2462
K_0	2232	2382	2562			
K_1	2377	2604	2404			

- | | |
|---|----------------|
| S.E. of N or P marginal means | =114.5 lb./ac. |
| S.E. of K marginal means | = 93.5 lb./ac. |
| S.E. of body of $N \times P$ table | =229.0 lb./ac. |
| S.E. of body of $N \times K$ or $P \times K$ tables | =161.9 lb./ac. |

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 50(58).

Type :- 'M'.

Object :-To study the residual effect of fertilizers applied to Maize in *kharif* on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Maize-Wheat. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 2,3.7.1950. (iv) (a) Ploughing with *desi* plough twice. (b) to (e) N.A. (v) N.A. (vi) Yellow No. 2. (vii) Irrigated. (viii) Thinning, horse hoeing, weeding twice and filling gaps. (ix) N.A. (x) 4.10.1950.

2. TREATMENTS :

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

- (1) 3 levels of N as A/S : $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac.
 (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=40$ and $P_2=80$ lb./ac.
 (3) 2 levels of K_2O as Pot. Sul. : $K_0=0$ and $K_1=60$ lb./ac.

3. DESIGN :

(i) $3^2 \times 2$ Confd. Fact. (ii) (a) 3 blocks/replication and 6 plots/block. (NP and NPK are partially confounded). (b) N.A. (iii) 2. (iv) (a) $42' \times 22'$. (b) $37' \times 19'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Spraying maize crop with D.D.T. (iii) Grain yield. (iv) (a) 1949 (*kharif*)—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2069 lb./ac.
 (ii) 281.4 lb./ac.
 (iii) Main effect of N is highly significant. Interactions $N \times P$ and $N \times K$ are significant. Others are not significant.
 (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1
N_0	1519	2046	2307	1957	1539	1663
N_1	1627	2509	2076	2071	2220	2199
N_2	1658	2076	2803	2179	2469	2324
Mean	1601	2210	2395	2069	2076	2062
K_0	2004	2034	2190			
K_1	1911	2107	2169			

S.E. of N or P marginal mean	= 81.2 lb./ac.
S.E. of K marginal mean	= 66.3 lb./ac.
S.E. of body of $N \times P$ table	= 162.4 lb./ac.
S.E. of body of $P \times K$ or $N \times K$ table	= 114.9 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 51(59).

Type :- 'M'.

Object :-To study the residual effect of fertilizers applied to Maize in *kharif* on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Maize-Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 31.7.1951. (iv) (a) Ploughing with victory plough, tractor discing and tractor grubbing (b) to (e) N.A. (v) N.A. (vi) Yellow No. 2. (vii) Irrigated. (viii) Horse hoeing, weeding and earthing up. (ix) N.A. (x) 4, 5.11.1951.

2. TREATMENTS :

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

- (1) 3 levels of N as A/S : $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac.
 (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=40$ and $P_2=80$ lb./ac.
 (3) 2 levels of K_2O as Pot. Sul. : $K_0=0$ and $K_1=60$ lb./ac.

3. DESIGN :

(i) $3^2 \times 2$ Confd. Fact. (ii) (a) 3 blocks/replication and 6 plots/blocks. (NP and NPK are partially confounded). (b) N.A. (iii) 2. (iv) (a) N.A. (b) $42' \times 22'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1949 (*kharif*)—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1685 lb./ac.
 (ii) 302.8 lb./ac.
 (iii) Main effects of N and P differ highly significantly. Interaction $N \times P$ and $N \times K$ are significant. Others are not significant.
 (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean	K ₀	K ₁
N ₀	1120	1114	1184	1139	1045	1234
N ₁	1326	2339	1750	1805	1909	1701
N ₂	2012	2092	2233	2112	2005	2219
Mean	1486	1848	1722	1685	1653	1718
K ₀	1322	1890	1748			
K ₁	1650	1807	1697			

S.E. of N or P marginal mean = 87.4 lb./ac.
 S.E. of K marginal mean = 71.4 lb./ac.
 S.E. of body of $N \times P$ table = 174.8 lb./ac.
 S.E. of body of $N \times K$ or $P \times K$ table = 123.6 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 52(75). Type :- 'M'.

Object :- To study the residual effect of fertilizers applied to Maize in *Kharif* on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 25.7.1952.
 (iv) (a) Ploughing with victory plough and *desi* plough. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Bullock hoeing, weeding and earthing up. (ix) N.A. (x) N.A.

2. TREATMENTS :

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

- (1) 3 levels of N : N₀=0, N₁=40 and N₂=80 lb./ac.
 (2) 3 levels of P₂O₅ : P₀=0, P₁=40 and P₂=80 lb./ac.
 (3) 2 levels of K₂O : K₀=0 and K₁=60 lb./ac.

3. DESIGN :

(i) $3^2 \times 2$ Confd. Fact. (ii) (a) 3 blocks/replication and 6 plots/block. (NP and NPK are partially confounded). (b) N.A. (iii) 2. (iv) (a) N.A. (b) $42' \times 22'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949 (*kharif*)—1953. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Crop suffered a lot due to utter failure of rains in September. (vii) Nil.

5. RESULTS :

- (i) 1045 lb./ac.
 (ii) 346.4 lb./ac.
 (iii) Only main effect of N differs highly significantly.

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

	P ₀	P ₁	P ₂	Mean	K ₀	K ₁
N ₀	767	842	681	763	681	846
N ₁	823	1324	1009	1052	1097	1007
N ₂	1293	1324	1343	1320	1176	1464
Mean	961	1163	1011	1045	985	1106
K ₀	813	1167	974			
K ₁	1110	1159	1048			

S.E. of N or P marginal mean

=100.0 lb./ac.

S.E. of K marginal mean

= 81.6 lb./ac.

S.E. of body of N×P table

=200.0 lb./ac.

S.E. of body of P×K or N×K table

=141.4 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 53(74).

Type :- 'M'.

Object :—To study the residual effect of fertilizers applied to Maize in *kharif* on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 5.7.1953.
 (iv) (a) Ploughing with victory plough and twice with *desi* plough. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Hand weeding, bullock hoeing, thinning and earthing. (ix) N.A. (x) 7.10.1953. Stripping on 11.10.1953 ; shelling on 26.10.1953.

2. TREATMENTS :

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

- (1) 3 levels of N as C/N. : N₀=0, N₁=40 and N₂=80 lb./ac.
 (2) 3 levels of P₂O₅ as Super : P₀=0, P₁=40 and P₂=80 lb./ac.
 (3) 2 levels of K₂O as Pot. Sul. : K₀=0 and K₁=60 lb./ac.

3. DESIGN :

(i) 3²×2 Confd. Fact. (ii) (a) 3 blocks/replication and 6 plots/block. (NP and NPK are partially confounded).
 (b) N.A. (iii) 2. (iv) (a) N.A. (b) 42'×22'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949 (*kharif*)—1953. (b) Yes. (c) N.A. (v) (a), (b) No.
 (vi) and (vii) Nil.

5. RESULTS :

- (i) 1400 lb./ac.
 (ii) 423.2 lb./ac.
 (iii) N effect is highly significant. Interaction N×K is significant. Others are not significant.
 (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean	K ₀	K ₁
N ₀	682	835	706	741	732	750
N ₁	1451	1567	1378	1465	1707	1225
N ₂	1762	1893	2323	1993	1974	2012
Mean	1298	1432	1469	1400	1471	1329
K ₀	1313	1492	1607			
K ₁	1284	1371	1331			

S.E. of N or P marginal mean	=122.2 lb./ac.
S.E. of K marginal mean	= 99.7 lb./ac.
S.E. of body of N×P table	=244.3 lb./ac.
S.E. of body of N×K or P×K table	=172.8 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 52(78).

Type :- 'M'.

Object :- To study the response of barley to different doses of N and P and its residual effect on Maize fodder.

1. BASAL CONDITIONS :

(i) (a) Barley-Maize. (b) Barley. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 30.7.1952. (iv) (a) Ploughing with victory plough and preparing the field. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) Hoeing on 25.8.1952. (ix) N.A. (x) 15.10.1952 to 19.10.1952.

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) 2 varieties : V_1 =Pusa-13 and V_2 =Kanpur-251.

3. DESIGN :

(i) $3^2 \times 2$ Fact. Confd. (ii) (a) 3 blocks/replication and 6 plots/block. (NP and NPV are partially confounded). (b) N.A. (iii) 4. (iv) (a) $38' \times 25'$. (b) $36' \times 23'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Fodder yield. (iv) (a) 1951 to N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 6.51 ton/ac.
 (ii) 1.027 ton/ac.
 (iii) Levels of N differ highly significantly, interaction $P \times V$ is significant. Others are not significant.
 (iv) Av. yield of fodder in ton/ac.

	N_0	N_1	N_2	Mean	V_1	V_2
P_0	6.19	6.59	6.70	6.49	6.91	6.08
P_1	6.03	5.80	7.43	6.42	6.40	6.43
P_2	6.16	6.64	7.04	6.61	6.13	7.10
Mean	6.13	6.34	7.06	6.51	6.48	6.54
V_1	5.87	6.63	6.94			
V_2	6.39	6.06	7.17			

S.E. of N or P marginal mean	=0.296 ton/ac.
S.E. of V marginal mean	=0.242 ton/ac.
S.E. of body of N×P table	=0.592 ton/ac.
S.E. of body of N×V or P×V table	=0.419 ton/ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 53 (76).

Type :- 'M'.

Object :—To study the response of different doses of N and P on barley varieties and residual effect on Maize fodder.

1. BASAL CONDITIONS :

(i) (a) Barley-Maize. (b) Barley. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 6.6.1953 and 9.6.1953. (iv) (a) Dry ploughing with victory plough and with *desi* plough. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) Hoeing and weeding. (ix) N.A. (x) 17.8.1953 and 23.8.1953 to 28.8.1953.

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) 2 varieties : V_1 =Pusa N.P-13 and V_2 =Kanpur-251.

3. DESIGN :

(i) $3^2 \times 2$ Confd. Fact. (ii) (a) 3 blocks/replication and 6 plots/block. (NP and N^2P^2V are partially confounded). (b) N.A. (iii) 4. (iv) (a) $38' \times 25'$. (b) $36' \times 23'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Fodder yield. (iv) (a) 1951 (*Rabi*)—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 7.83 ton/ac.

(ii) 0.65 ton/ac.

(iii) Main effects N and P are significant. Others are not significant.

(iv) Av. yield of fodder in ton/ac.

	N_0	N_1	N_2	Mean	V_1	V_2
P_0	8.81	8.26	8.05	8.37	8.69	8.06
P_1	6.86	8.16	7.81	7.62	7.44	7.80
P_2	7.36	7.72	7.38	7.48	7.40	7.57
Mean	7.68	8.05	7.75	7.83	7.84	7.81
V_1	7.42	8.33	7.78			
V_2	7.94	7.77	7.71			

S.E. of N or P marginal mean

=0.13 ton/ac.

S.E. of V marginal mean

=0.11 ton/ac.

S.E. of body of $N \times P$ table

=0.25 ton/ac.

S.E. of body of $N \times V$ or $P \times V$ table

=0.19 ton/ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 52(7).

Type :- 'M'.

Object :—To study the residual effect of phosphatic manuring of berseem with and without K and N on Maize.

1. BASAL CONDITIONS :

(i) (a) Maize—Berseem—Cotton—Wheat. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 13, 15.7.1952. (iv) (a) Ploughing with victory plough and with *desi* plough. (b) to (c) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hand hoeing, bullock hoeing and earthing up. (ix) N.A. (x) 18.10.1952.

2. TREATMENTS :

1. 0 lb./ac. of N+0 lb./ac. of P_2O_5 +0 lb./ac. of K_2O (Control).
2. 0 lb./ac. of N+120 lb./ac. of P_2O_5 +0 lb./ac. of K_2O .
3. 0 lb./ac. of N+120 lb./ac. of P_2O_5 +120 lb./ac. of K_2O .
4. 100 lb./ac. of N+120 lb./ac. of P_2O_5 +0 lb./ac. of K_2O .
5. 25 lb./ac. of N+120 lb./ac. of P_2O_5 +0 lb./ac. of K_2O .
6. 50 lb./ac. of N+120 lb./ac. of P_2O_5 +0 lb./ac. of K_2O .
7. 100 lb./ac. of N+120 lb./ac. of P_2O_5 +120 lb./ac. of K_2O .
8. Fallow in berseem season.

Source of fertilizers N.A. Treatments applied to berseem in *Rabi* 1951-1952.

3. DESIGN :

- (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1948—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS :

- (i) 1557 lb./ac.
 (ii) 254.3 lb./ac.
 (iii) Treatments differ highly significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1232	5.	1636
2.	1568	6.	1647
3.	1613	7.	1736
4.	1702	8.	1322

S.E./mean = 103.8 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 50(43).

Type :- 'M'.

Object :- To study the effect of green manuring on Maize.

1. BASAL CONDITIONS :

- (i) (a) N.A. (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 15, 16.7.1950.
 (iv) (a) Ploughing with *desi* plough twice. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) No. (viii) Horse hoe, hand hoeing and thinning. (ix) 0.7". (x) 25, 26.10.1950.

2. TREATMENTS :

Main-plot treatments :

8 G.M. crops : G_1 =Berseem, G_2 =*Senji*, G_3 =*Methra*, G_4 =*Khesari*, G_5 =Gram, G_6 =Peas, G_7 =Lentil and G_8 =Fallow (control).

Sub-plot treatments :

2 levels of P_2O_5 as Super : P_0 =Control (no P_2O_5) and P_1 =80 lb./ac.

3. DESIGN :

- (i) Split-plot. (ii) (a) 8 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 acre. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—N.A. (b) N.A. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1277 lb./ac.
 (ii) (a) 307.0 lb./ac.
 (b) 724.6 lb./ac.
 (iii) P effect alone is significant.

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

	G ₁	G ₂	G ₃	G ₄	G ₅	G ₆	G ₇	G ₈	Mean
P ₀	1230	1515	1080	1080	1320	1885	960	960	1254
P ₁	1500	1290	1155	1350	1350	1260	1410	1095	1301
Mean	1365	1403	1117	1215	1335	1573	1185	1027	1277

S.E. of difference of two

1. Main-plot treatment means =153.5 lb./ac.
2. Sub-plot treatment means =181.1 lb./ac.
3. Sub-plot treatment means at the same level of main-plot treatment mean=512.4 lb./ac.
4. Main-plot treatment means at the same level of sub-plot treatment mean=393.5 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 53(16).

Type :- 'M'.

Object :—To determine the interval between application of F.Y.M. and sowing of wheat to obtain the maximum yield.

1. BASAL CONDITIONS :

- (i) (a) Wheat-Maize. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 11.6.1953 and 15.6.1953. (iv) (a) Dry ploughing with *victory* plough, land prepared with *desi* plough twice. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Hoeing with [*desi* plough and weeding. (ix) N.A. (x) 17.8.1953 to 22.8.1953.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2) +a control (T₀F₀)(1) 4 times of application of F.Y.M. : T₁=3 months, T₂=2 months, T₃=1 month and T₄=1 week before sowing.(2) 3 levels of F.Y.M. : F₁=2.5, F₂=5 and F₃=10 ton/ac.

Sub-plot treatments :

2 levels of N as A/S : N₀=0 and N₁=10 lb./ac.

3. DESIGN :

- (i) Split-plot. (ii) (a) 13 main-plots/block ; 2 sub-plots/main plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 18'×32.' (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 9.77 ton/ac.
 (ii) (a) 4.69 ton/ac.
 (b) 1.48 ton/ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of fodder in ton/ac.

	T ₀ F ₀	T ₁ F ₁	T ₁ F ₂	T ₁ F ₃	T ₂ F ₁	T ₂ F ₂	T ₂ F ₃	T ₃ F ₁	T ₃ F ₂	T ₃ F ₃	T ₄ F ₁	T ₄ F ₂	T ₄ F ₃	Mean
N ₀	7.28	6.80	10.92	9.84	10.33	10.13	11.52	9.54	11.64	9.78	9.10	9.77	10.62	9.79
N ₁	7.13	6.71	10.34	10.95	11.45	10.65	9.60	9.60	10.68	10.21	8.74	9.52	11.26	9.76
Mean	7.20	6.75	10.63	10.40	10.89	10.39	10.56	9.57	11.16	9.99	8.92	9.64	10.94	9.77

S.E. of difference of two

1. Main-plot treatment means = 2.340 ton/ac.
2. Sub-plots treatment means = 0.290 ton/ac.
3. Sub-plot treatment means at the same level of main-plot treatment mean = 1.045 ton/ac.
4. Main-plot treatment means at the same level of sub-plot treatment mean = 2.459 ton/ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 51(48).

Type :- 'M'.

Object :- To study the residual effect of manures applied to wheat on Maize.

1. BASAL CONDITIONS :

- (i) (a) Wheat—Maize. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143.
 (iii) 4.7.1951. (iv) (a) Tractor ploughing and tractor discing. Bullock ploughing with *desi* plough and beaming 3.7.1951. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Hoeing, thinning and weeding. (ix) 6.82". (x) 18.11.1951.

2. TREATMENTS :

Main-plot treatments :

- 4 organic manures : M_0 =No manure, M_1 =Green manuring with *guar* at 60 lb./ac. of N, M_2 =Castor cake at 60 lb./ac. of N and M_3 =F.Y.M. at 60 lb./ac. of N.

Sub-plot treatments :

- 5 doses of fertilizer : T_0 =No manure, T_1 =A/S at 40 lb./ac. of N, T_2 =Super at 80 lb./ac. of P_2O_5 , T_3 =A/S at 40 lb./ac. of N+Super at 80 lb./ac. of P_2O_5 , and T_4 =A/S at 4 lb./ac. of N+Super at 80 lb./ac. of P_2O_5 +60 lb./ac. of K_2O as Pot. Sul..

3. DESIGN :

- (i) Split-plot. (ii) (a) 4 main-plots/replication ; 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 51'×24'.
 (b) 48'×22½'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Poor. (ii) Slight attack of mildew and short stem-borer. (iii) Grain yield. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 302.2 lb./ac.
 (ii) (a) 384.3 lb./ac.
 (b) 135.8 lb./ac.
 (iii) Only M effect is significant.
 (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	Mean
T_0	179.4	553.0	213.9	239.4	296.4
T_1	231.2	532.4	286.3	219.7	317.4
T_2	218.1	377.7	311.0	277.3	296.0
T_3	207.4	460.8	219.7	320.9	302.2
T_4	179.4	512.6	226.3	277.3	298.9
Mean	203.1	487.3	251.4	266.9	302.2

S.E. of difference of two

1. M marginal means = 99.22 lb./ac.
2. T marginal means = 39.20 lb./ac.
3. T means at the same level of M = 78.40 lb./ac.
4. M means at the same level of T = 121.50 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 53(51).

Type :- 'M'.

Object :—To study the effect of organic manures and fertilizers on the yield of crops in the rotation Wheat-Maize-Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat-Maize-Wheat. (b) Wheat (manured). (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 28.6.1953. (iv) (a) Ploughing with victory plough, ploughing with *desi* plough and beaming. (b) to (e) N.A. (v) N.A. (vi) Yellow No. 2. (vii) Irrigated. (viii) Hoeing by *desi* plough; thinning, hoeing by horse-hoe and hand weeding. (ix) 15.81". (x) 6.10.1953.

2. TREATMENTS :

Main-plot treatments :

4 organic manures : M_0 =No manure, M_1 =Guar as G.M., M_2 =Castor cake at 60 lb./ac. of N and M_3 =F.Y.M.

Sub-plot treatments :

5 fertilizers : T_0 =No fertilizer, T_1 =40 lb./ac. of N as A/S, T_2 =80 lb./ac. of P_2O_5 as Super, T_3 =40 lb./ac. of N as A/S+80 lb./ac. of P_2O_5 as Super and T_4 =40 lb./ac. of N as A/S+80 lb./ac. of P_2O_5 as Super+60 lb./ac. of K_2O as Pot. Sul.

Manures applied to wheat crop in 1952.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 51'×24'. (b) 48'×22'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor to fair. No lodging. (ii) Slight attack of stem borer. (iii) Grain yield. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 500.4 lb./ac.
 (ii) (a) 552.1 lb./ac.
 (b) 144.8 lb./ac.
 (iii) M effect is significant and T effect is highly significant, while interaction is not significant.
 (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	Mean
T_0	274.8	604.8	329.1	460.0	417.2
T_1	384.3	697.0	469.9	659.9	552.8
T_2	284.7	641.8	410.6	474.0	452.8
T_3	343.1	728.2	469.9	490.4	507.9
T_4	316.0	959.4	475.5	553.0	571.5
Mean	320.6	726.2	427.4	527.5	500.4

S.E. of difference of two

1. Main-plot treatment means = 142.6 lb./ac.
 2. Sub-plot treatment means = 41.8 lb./ac.
 3. Sub-plot treatment means at the same level of main-plot treatment = 83.6 lb./ac.
 4. Main-plot treatment means at the same level of sub-plot treatment = 161.0 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 51(5).

Type :- 'M'.

Object :—To compare the residual efficiency of N in F.Y.M., G.N.C. and A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (c) N.A. (v) to (x) N.A.

2. TREATMENTS :

- | | |
|-------------------------------|-------------------------------|
| 1. No manure. | 7. 20 lb./ac. of N as G.N.C. |
| 2. 40 lb./ac. of N as F.Y.M. | 8. 40 lb./ac. of N as G.N.C. |
| 3. 60 lb./ac. of N as F.Y.M. | 9. 60 lb./ac. of N as G.N.C. |
| 4. 80 lb./ac. of N as F.Y.M. | 10. 80 lb./ac. of N as G.N.C. |
| 5. 100 lb./ac. of N as F.Y.M. | 11. 20 lb./ac. of N as A/S. |
| 6. 120 lb./ac. of N as F.Y.M. | 12. 40 lb./ac. of N as A/S. |

3. DESIGN :

- (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) 33'×22'. (b) 31'×20'. (v) 1' on each side. (vi) Yes.

4. GENERAL :

- (i) and (ii) N.A. (iii) Fodder yield. (iv) (a) 1949—1951. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 10.45 ton/ac.
(ii) 2.95 ton/ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield	Treatment	Av. yield
1.	10.20	7.	10.71
2.	10.37	8.	10.17
3.	10.39	9.	10.58
4.	9.56	10.	11.63
5.	9.58	11.	10.30
6.	11.20	12.	10.77

S.E./mean=1.04 ton/ac.

Crop :- Maize (*Kharif*).**Ref :- I.A.R.I. 52(35).****Type :- 'M'.**

Object :—To study the residual effect of different phosphatic manures on Maize.

1. BASAL CONDITIONS :

- (i) (a) No. (b) Berseem. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 16.6.1952. (iv) (a) Ploughing with victory and
- desi*
- plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hoeing with
- oudh*
- plough. (ix) N.A. (x) 19, 20.8.1952.

2. TREATMENTS :

- | | |
|------------------------|--------------------------|
| 1. Agro. Phos. | 7. Magnesium phosphate. |
| 2. Ammo. Phos. | 8. Reno hyper phosphate. |
| 3. A/S. | 9. Rock phosphate. |
| 4. B.M. | 10. Selecto phosphate. |
| 5. Bone Super. | 11. Super. |
| 6. Bone Super compost. | 12. Control. |

Fertilizers are applied to give 80 lb. P₂O₅ or 80 lb./ac. of N. These treatments were applied to berseem in 1950.**3. DESIGN :**

- (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 17'×64'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) Nil. (iii) Fodder yield. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 15.31 ton/ac.
(ii) 2.40 ton/ac.
(iii) Treatments do not differ significantly.

(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield	Treatment	Av. yield
1.	15.09	7.	15.12
2.	16.28	8.	17.74
3.	15.13	9.	14.81
4.	17.15	10.	15.13
5.	14.19	11.	15.45
6.	13.82	12.	13.77

S.E./mean = 0.99 ton/ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 51(25).

Type :- 'M'.

Object :—To study the response of berseem to fertilizers and comparing the residual effects with direct manuring of cereals.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 7.7.1951 and Resownon 2.8.1951. (iv) (a) 2 tractor discings and ploughing with *desi* spring harrow twice. (b) to (e) N.A. (v) 40 lb./ac. of N as A/S. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 27 to 30.9.1951.

2. TREATMENTS :

- No manure.
- Super at 120 lb./ac. of P_2O_5 .
- A/S at 40 lb./ac. of N+Super at 120 lb./ac. of P_2O_5 .
- A/S at 40 lb./ac. of N+Super at 20 lb./ac. of P_2O_5 +Pot. Sul. at 80 lb./ac. of K_2O .
- Super at 20 lb./ac. of P_2O_5 +Pot. Sul. at 80 lb./ac. of K_2O .
- Fallow in previous season.

3. DESIGN :

(i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 84'×26'. (b) 78'×20'. (v) 3' on each side. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Fodder yield. (iv) (a) 1950—N.A. (b) and (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- 7.64 ton/ac.
- 10.56 ton/ac.
- Treatments do not differ significantly.
- Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	8.25
2.	7.78
3.	7.44
4.	7.98
5.	7.40
6.	7.01
S.E./mean	= 4.31 ton/ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 52(43).

Type :- 'M'.

Object :—To study the influence of compost on humus formation and on crop yield.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.7.1952. (iv) (a) Ploughing with victory plough and preparing the field. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weeding, hoeing and thinning. (ix) N.A. (x) 10.11.1952 to 15.11.1952.

2. TREATMENTS :

1. No manure.
2. Compost (plastered trench) at 40 lb./ac. of N.
3. Compost (plastered trench) at 80 lb./ac. of N.
4. Compost (plastered trench) at 120 lb./ac. of N.
5. Compost (over ground heap) at 40 lb./ac. of N.
6. Compost (over ground heap) at 80 lb./ac. of N.
7. Compost (over ground heap) at 120 lb./ac. of N.
8. Compost (exposed pit) at 40 lb./ac. of N.
9. Compost (exposed pit) at 80 lb./ac. of N.
10. Compost (exposed pit) at 120 lb./ac. of N.
11. A/S at 20 lb./ac. of N.
12. A/S at 40 lb./ac. of N.

3. DESIGN :

- (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 24.66' × 30'. (b) 22.66' × 28'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952 (*kharif*)—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 949 lb./ac.
 (ii) 438.0 lb./ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	792	7.	966
2.	882	8.	952
3.	1021	9.	993
4.	1029	10.	890
5.	690	11.	1118
6.	980	12.	1070
S.E./mean		=178.8 lb./ac.	

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 53(45).

Type :- 'M'.

Object :—To study the influence of compost on humus formation and on crop yield.

1. BASAL CONDITIONS :

- (i) (a) Maize—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 28.6.1953. (iv) (a) Land prepared with *desi* plough thrice. Soaking dose given. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weeding and hoeing. (ix) N.A. (x) 2 to 4.10.1953.

2. TREATMENTS :

1. No manure.
2. Compost (plastered trench) at 40 lb./ac. of N.
3. Compost (plastered trench) at 80 lb./ac. of N.
4. Compost (plastered trench) at 120 lb./ac. of N.
5. Compost (over ground heap) at 40 lb./ac. of N.
6. Compost (over ground heap) at 80 lb./ac. of N.
7. Compost (over ground heap) at 120 lb./ac. of N.
8. Compost (exposed pit) at 40 lb./ac. of N.
9. Compost (exposed pit) at 80 lb./ac. of N.
10. Compost (exposed pit) at 120 lb./ac. of N.
11. A/S at 20 lb./ac. of N.
12. A/S at 40 lb./ac. of N.

Compost applied on 6.6.1953 and fertilizers on 28.6.1953.

3. DESIGN :

- (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 24.5' × 30'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952 (*kharif*)—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1100 lb./ac.
 (ii) 302.8 lb./ac.
 (iii) Treatments differ significantly.

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

Treatment	Av. yield	Treatment	Av. yield
1.	802	7.	1742
2.	994	8.	782
3.	1214	9.	1049
4.	1193	10.	1076
5.	720	11.	1145
6.	1029	12.	1454

S.E./mean = 123.6 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 50(17).

Type :- 'M'.

Object :- To study the effect of placement of fertilizers on yield of Maize and its residual effect on Oats.

1. BASAL CONDITIONS :

(i) (a) No. (b) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 28 and 29.7.1950. (iv) (a) Ploughing with double *desi* plough, ploughing with tractor, grubbing, beaming and harrowing twice. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hoeing with horse hoe and weeding. (ix) N.A. (x) 23.11.1950.

2. TREATMENTS :

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

(1) 3 methods of application of fertilizers : M_1 = Broadcasting of fertilizers, M_2 = Fertilizers placed $2\frac{1}{2}$ " deep in the seed line and M_3 = Fertilizers placed $4\frac{1}{2}$ " deep in the seed line.

(2) 3 levels of P_2O_5 as Super : P_1 = 40 lb./ac., P_2 = 60 lb./ac. and P_3 = 120 lb./ac.

(3) 3 levels of N as A/S : N_1 = 20 lb./ac., N_2 = 30 lb./ac. and N_3 = 60 lb./ac.

3. DESIGN :

(i) 3^3 Confd. fact.. (ii) (a) 9. (b) N.A. (iii) 2. (iv) (a) N.A. (b) $128' \times 12\frac{1}{2}'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Very adversely affected by water logging and weeds. (ii) Mild attack of borer. (iii) Grain yield. (iv) (a) 1949-1950. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 361.2 lb./ac.

(ii) 153.98 lb./ac.

(iii) None of the effects is significant.

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

	N_1	N_2	N_3	Mean	M_1	M_2	M_3
P_1	315.4	376.6	351.6	347.9	326.7	338.0	378.9
P_2	251.8	401.6	399.3	350.9	406.1	270.0	376.6
P_3	360.7	267.7	526.3	384.9	326.7	478.7	349.4
Mean	309.3	348.6	425.7	361.2	353.2	362.2	368.3
M_1	363.0	319.9	376.6				
M_2	222.3	410.6	453.7				
M_3	342.6	315.4	446.9				

S.E. of any marginal means

= 36.29 lb./ac.

S.E. of body of any table

= 62.86 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 51(1).

Type :- 'M'.

Object :—To study the effect of placement of fertilizers on yield of Maize and its residual effect on oats.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 4.7.1951. (iv) (a) Ploughing with tractor, discing twice and beaming. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Hoeing and weeding. (ix) N.A. (x) 28.10.1951.

2. TREATMENTS :

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

(1) 3 methods of application of fertilizers : M_1 = Broadcasting of fertilizers, M_2 = Fertilizers placed $2\frac{1}{2}$ " deep in the seed line and M_3 = Fertilizers placed $4\frac{1}{2}$ " deep in the seed line.

(2) 3 levels of P_2O_5 as Super : P_1 = 40 lb./ac., P_2 = 60 lb./ac. and P_3 = 120 lb./ac.

(3) 3 levels of N as A/S : N_1 = 20 lb./ac., N_2 = 30 lb./ac. and N_3 = 60 lb./ac.

3. DESIGN :

(i) 3^3 Confd. Fact. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) $109' \times 10'$. (b) $105' \times 6'$. (v) 2' on each side. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Grain yield. (iv) (a) 1949–1951. (b) N.A. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1161 lb./ac.
 (ii) 205.2 lb./ac.
 (iii) Only levels of N differ highly significantly.
 (iv) Av. yield of grain in lb./ac.

	N_1	N_2	N_3	Mean	M_1	M_2	M_3
P_1	1096	1027	1331	1151	1155	1161	1138
P_2	1084	1110	1259	1151	1046	1343	1063
P_3	1007	1049	1485	1180	1055	1269	1217
Mean	1062	1062	1358	1161	1085	1258	1139
M_1	969	1072	1215				
M_2	1187	1086	1500				
M_3	1031	1028	1359				

S.E. of any marginal mean

= 48.37 lb./ac.

S.E. of body of any table

= 83.77 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 50(5).

Type :- 'M'.

Object :—To study soil fertility building by manuring berseem in berseem-guar-berseem-wheat-maize rotation.

1. BASAL CONDITIONS :

(i) (a) Berseem-Guar-Berseem-Guar-Berseem-Guar-Wheat-Maize-Wheat. (b) Guar. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 31.7.1950. (iv) (a) Ploughing with tractor, grubbing, ploughing with victory plough, and harrowing across. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Hoeing with hand hoe. (ix) 13.19. (x) 31.10.1950.

2. TREATMENTS:

1. No manure.
 2. Super at 50 lb./ac. of P_2O_5 .
 3. Super at 100 lb./ac. of P_2O_5 .
 4. Super at 50 lb./ac. of P_2O_5 +80 lb./ac. of K_2O .
 5. Super at 100 lb./ac. of P_2O_5 +80 lb./ac. of K_2O .
- Manures applied to previous crop of berseem.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 3. (iv) (a) 60'×27'. (b) 58'×25'. (v) 1' on each side. (vi) Yes.

4. GENERAL :

- (i) Poor. (ii) Mild attack of borer. (iii) Fodder yield. (iv) (a) 1946—1951. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3.86 ton/ac.
- (ii) 0.64 ton/ac.
- (iii) Treatments differ significantly.
- (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	3.75
2.	2.48
3.	4.60
4.	4.61
5.	1.75
S.E./mean	=0.37 ton/ac.

Crop :- Maize (*Khari*).

Ref :- I.A.R.I. 52(14).

Type :- 'M'.

Object :- To study the building of soil fertility through organic and artificial fertilizers in a legume rotation.

1. BASAL CONDITIONS :

- (i) (a) Maize—Wheat—Maize—Peas. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 19.7.1952. (iv) (a) Dry victory ploughing, irrigated before sowing. Land prepared twice with *desi* plough. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) N.A. (x) 21.10.1952 to 23.10.1952.

2. TREATMENTS :

1. Control.
2. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P_2O_5 .
3. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P_2O_5 +Pot. Sul. at 100 lb./ac. of K_2O .
4. F.Y.M. at 60 lb./ac. of N+Super at 60 lb./ac. of P_2O_5 +Pot. Sul. at 100 lb./ac. of K_2O .
5. Castor cake at 60 lb./ac. of N+Super at 60 lb./ac. of P_2O_5 +Pot Sul. at 100 lb./ac. of K_2O .

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 38'×29'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1952—N.A. (b) Yes (except in 1956 *Rabi*). (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 615 lb./ac.
- (ii) 173.6 lb./ac.
- (iii) Treatments do not differ significantly.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	499
2.	535
3.	653
4.	524
5.	866
S.E./mean	= 70.87 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. (52)65.

Type :- 'M'.

Object :—To study the response of Maize to seed soaking.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 26, 28.7.1952. (iv) (a) to (e) N.A. (v) N.A. (vi) Maize yellow. (vii) N.A. (viii) Horse hoeing and weeding with *khurpi*. (ix) N.A. (x) Middle of Oct. 1952.

2. TREATMENTS :

1. No soaking.
2. Soaking seed in 5% A/S sol.
3. Soaking seed in 5% Super sol. (neutralised with lime).
4. Soaking seed in 5% Ammo. Phos. sol.
5. Soaking seed in water.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 36'×33'. (b) 34'×31'. (v) 1' on each side. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1951—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1435 lb./ac.
- (ii) 148.3 lb./ac.
- (iii) Treatments differ significantly.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1407
2.	1242
3.	1572
4.	1522
5.	1434
S.E./mean	=60.54 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 53(58).

Type :- 'M'.

Object :—To study the response of Maize to seed soaking.

1. BASAL CONDITIONS :

(i) (a) No. (b) Oats. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 22.7.1953. (iv) (a) *Desi* ploughing 4 times cross wise. (b) to (e) N.A. (v) Nil. (vi) Maize yellow. 2. (vii) Unirrigated. (viii) Gap filling and horse hoeing. (ix) N.A. (x) 4th week of Oct. 1953.

2. TREATMENTS :

1. No soaking of seeds.
2. Soaking seed in 5% sol. of A/S.
3. Soaking seed in 5% sol. of Super.
4. Soaking seed in 5% sol. of Ammo. Phos.
5. Soaking seed in water.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/47 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Bird attack. (iii) Grain yield. (iv) (a) 1951—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1515 lb./ac.
- (ii) 181.9 lb./ac.
- (iii) Treatments do not differ significantly.

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

Treatment	Av. yield
1.	1348
2.	1498
3.	1654
4.	1654
5.	1420
S.E./mean	=74.26 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 51(51).

Type :- 'M'.

Object :- To study the residual effect of manuring on Maize.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Berseem. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 8.7.1951. (iv) (a) Tractor ploughing, tractor discing and ploughing with *desi* plough. (b) Sowed with *kera*. (c) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) Hoeing and weeding. (ix) 6.82%. (x) 6.11.1951.

2. TREATMENTS :

Main-plot treatments :

7 doses of fertilizers : F₁= Ammo. Phos. at 80 lb./ac. of P₂O₅, F₂= Ammo. Phos. at 160 lb./ac. of P₂O₅, F₃= Super at 80 lb./ac. of P₂O₅+A/S to supply N as in F₁, F₄= Super at 160 lb./ac. of P₂O₅+A/S to supply N as in F₂, F₅= Super at 80 lb./ac. of P₂O₅, F₆= Super at 160 lb./ac. of P₂O₅ and F₇= No manure.

Sub-plot treatments :

3 levels of K₂O as Pot. Sul. : K₀=0, K₁=40 and K₂=80 lb./ac.

Treatments applied to berseem in 1950—1951.

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 43'×25' (b) 40½'×22½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1946—N.A. (b) and (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 296.4 lb./ac.

(ii) (a) 184.4 lb./ac.

(b) 79.5 lb./ac.

(iii) K effect alone is significant.

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

	F ₁	F ₂	F ₃	F ₄	F ₅	F ₆	F ₇	Mean
K ₀	264.3	339.3	239.3	223.8	272.6	177.4	372.6	269.9
K ₁	245.2	364.3	198.8	245.2	282.1	303.6	436.9	296.6
K ₂	313.1	390.5	258.3	304.8	330.9	313.1	348.8	322.8
Mean	274.2	364.7	232.1	257.9	295.2	264.7	386.1	296.4

S.E. of difference of two

1. main-plot treatment means

=75.3 lb./ac.

2. sub-plot treatment means

=21.3 lb./ac.

3. sub-plot treatment means at the same level of main-plot treatment mean

=56.2 lb./ac.

4. main-plot treatment means at the same level of sub-plot treatment mean

=88.2 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 48(7).

Type :- 'M'.

Object :- To study the residual effect of manuring Berseem on the subsequent Maize crop.

1. BASAL CONDITIONS :

(i) (a) Berseem—Fallow—Wheat—Maize—Berseem and Berseem—Maize—Wheat—Maize—Berseem. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

1. No manure.
2. B.M. at 120 lb./ac. of P_2O_5 .
3. Ammo. Phos. at 120 lb./ac. of P_2O_5 .
4. Super at 120 lb./ac. of P_2O_5 .
5. B.M. at 60 lb./ac. of P_2O_5 +Ammo. Phos. at 60 lb./ac. of P_2O_5 .
6. B.M. at 60 lb./ac. of P_2O_5 +Super at 60 lb./ac. of P_2O_5 .

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 165'×33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) No. (iii) Grain yield. (iv) (a) 1944—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (ii) 948 lb./ac.
 (ii) 78.4 lb./ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1021
2.	712
3.	896
4.	1101
5.	1021
6.	939
S.E./mean	= 45.3 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 48(8).

Type :- 'M'.

Object :- To study the residual effect of manuring Berseem on the subsequent Maize crop.

1. BASAL CONDITIONS :

(i) (a) Berseem—Fallow—Wheat—Maize—Berseem and Berseem—Maize—Wheat—Maize—Berseem. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

1. No manure.
2. B. M. at 120 lb./ac. of P_2O_5 .
3. Ammo. Phos. at 120 lb./ac. of P_2O_5 .
4. Super at 120 lb./ac. of P_2O_5 .
5. B.M. at 60 lb./ac. of P_2O_5 +Ammo. Phos. at 60 lb./ac. of P_2O_5 .
6. B.M. at 60 lb./ac. of P_2O_5 +Super at 60 lb./ac. of P_2O_5 .

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 165'×33'. (v) No. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1944—1948. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) N.A. (vii) Nil.

5. RESULTS :

- (i) 726 lb./ac.
 (ii) 169.0 lb./ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	776
2.	621
3.	659
4.	803
5.	720
6.	776
S.E./mean	=97.6 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 48(9).

Type :- 'M'.

Object :- To study the residual effect of manuring Berseem on the subsequent Maize crop.

1. BASAL CONDITIONS :

(i) (a) Berseem-Fallow-Wheat-Maize-Berseem and Berseem-Maize-Wheat-Berseem-Maize. (b) Berseem.
 (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

- No manure.
- B.M. at 120 lb./ac. of P_2O_5 .
- Ammo. Phos. at 120 lb./ac. of P_2O_5 .
- Super at 120 lb./ac. of P_2O_5 .
- B.M. at 60 lb./ac. of P_2O_5 +Ammo. Phos. at 60 lb./ac. of P_2O_5 .
- B.M. at 60 lb./ac. of P_2O_5 +Super at 60 lb./ac. of P_2O_5 .

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 165'×33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1944—1948. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) N.A. (vii) Nil.

5. RESULTS :

- (i) 1736 lb./ac.
 (ii) 254.4 lb./ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1754
2.	1688
3.	1749
4.	1664
5.	1784
6.	1778
S.E./mean	=146.9 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 48(10).

Type :- 'M'.

Object :- To study the residual effect of manuring Berseem on the subsequent Maize crop.

1. BASAL CONDITIONS :

(i) (a) Berseem—Fallow—Wheat—Maize—Berseem and Berseem—Maize—Wheat—Berseem—Maize—Berseem. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

1. No manure.
2. B.M. at 120 lb./ac. of P_2O_5 .
3. Ammo. Phos. at 120 lb./ac. of P_2O_5 .
4. Super at 120 lb./ac. of P_2O_5 .
5. B.M. at 60 lb./ac. of P_2O_5 +Ammo. Phos. at 60 lb./ac. of P_2O_5 .
6. B.M. at 60 lb./ac. of P_2O_5 +Super at 60 lb./ac. of P_2O_5 .

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 165'×33'. (v) No. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Fodder yield. (iv) (a) 1944—1948. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1.46 ton/ac.
- (ii) 0.16 ton/ac.
- (iii) Treatments do not differ significantly.
- (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	1.47
2.	1.40
3.	1.50
4.	1.50
5.	1.52
6.	1.42
S.E./mean	=0.09 ton/ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 48(11).

Type :- 'M'.

Object :- To find out the residual effect of the phosphate manuring of Berseem on the subsequent Maize crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 19.7.1948. (iv) (a) Tractor ploughing and discing. (b) to (e) N.A. (v) Nil. (vi) and (vii) N.A. (viii) 2 hoeings. (ix) 19". (x) 27.10.1948.

2. TREATMENTS :

1. No manure.
2. B.M. at 120 lb./ac. of P_2O_5 .
3. Ammo. Phos. at 120 lb./ac. of P_2O_5 .
4. Super at 120 lb./ac. of P_2O_5 .
5. B.M. at 60 lb./ac. of P_2O_5 +Ammo. Phos. at 60 lb./ac. of P_2O_5 .
6. B.M. at 60 lb./ac. of P_2O_5 +Super at 60 lb./ac. of P_2O_5 .

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 165'×33'. (v) N.A. (vi) No.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1944—1948. (b) No. (c) N.A. (v) (a) and (b) Yes. (vi) and (vii) Nil.

5. RESULTS :

- (i) 948 lb./ac.
 (ii) 247.2 lb./ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1021
2.	712
3.	896
4.	1101
5.	1021
6.	939
S.E./mean	=142.7 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 48(15).

Type :- 'M'.

Object :—To study the residual effect of phosphatic manuring of Berseem on subsequent Maize crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) Berseem and sunnhemp. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.7.1948. (iv) (a) Tractor discing and grubbing. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) 2 horse hoeing. (ix) 21.53". (x) 22 to 25.10.1948.

2. TREATMENTS :

- No manure.
 - B.M. at 120 lb./ac. of P_2O_5 .
 - Ammo. Phos. at 120 lb./ac. of P_2O_5 .
 - Super at 120 lb./ac. of P_2O_5 .
 - B.M. at 60 lb./ac. of P_2O_5 +Ammo. Phos. at 60 lb./ac. of P_2O_5 .
 - B.M. at 60 lb./ac. of P_2O_5 +Super at 60 lb./ac. of P_2O_5 .
- Manures applied to previous crop.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 33'×165'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1944—1948. (b) N.A. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS :

- (i) 1755 lb./ac.
 (ii) 444.3 lb./ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1754
2.	1928
3.	1749
4.	1664
5.	1665
6.	1772
S.E./mean	=286.5 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 48(16).

Type :- 'M'.

Object :- To study the residual effect of phosphatic manuring of Berseem with F.Y.M. as a basal dose on Maize crop.

1. BASAL CONDITIONS :

- (i) (a) No. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 20.7.1948.
 (iv) (a) Tractor ploughing and discing. (b) to (e) N.A. (v) F.Y.M. at 10 ton/ac. (vi) N.A. (vii) N.A.
 (viii) 2 horse hoeings. (ix) 16.30". (x) 7 to 9.10.1948.

2. TREATMENTS :

1. No manure.
2. B.M. at 120 lb./ac. of P_2O_5 .
3. Ammo. Phos. at 120 lb./ac. of P_2O_5 .
4. Super at 120 lb./ac. of P_2O_5 .
5. B.M. at 60 lb./ac. of P_2O_5 +Ammo. Phos. at 60 lb./ac. of P_2O_5 .
6. B.M. at 60 lb./ac. of P_2O_5 +Super at 60 lb./ac. of P_2O_5 .

3. DESIGN :

- (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 33' x 165'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Fodder yield. (iv) (a) 1944—1948. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS :

- (i) 1.78 ton/ac.
 (ii) 0.19 ton/ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	1.79
2.	1.70
3.	1.82
4.	1.81
5.	1.85
6.	1.73
S.E./mean	=0.11 ton/ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 48(17).

Type :- 'M'.

Object :- To study the residual effect of phosphatic manuring of Berseem without any basal manure on Maize crop.

1. BASAL CONDITIONS :

- (i) (a) No. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 19.7.1948.
 (iv) (a) Tractor ploughing and discing. (b) to (e) N.A. (v) Nil. (vi) and (vii) N.A. (viii) 2 hoeings.
 (ix) 14.15". (x) 27.10.1948.

2. TREATMENTS :

1. No manure.
2. B.M. at 120 lb /ac. of P_2O_5 .
3. Ammo. Phos. at 120 lb./ac. of P_2O_5 .
4. Super at 120 lb./ac. of P_2O_5 .
5. B.M. at 60 lb./ac. of P_2O_5 +Ammo. Phos. at 60 lb./ac. of P_2O_5 .
6. B.M. at 60 lb./ac. of P_2O_5 +Super at 60 lb./ac. of P_2O_5 .

3. DESIGN :

- (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 33' x 165'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1944—1948. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 948 lb./ac.
 (ii) 1073 lb./ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1021
2.	712
3.	896
4.	1101
5.	1021
6.	938
S.E./mean	=619.5 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 53(14).

Type :- 'M'.

Object :- To study the effect of inorganic and organic manures on the yield of cereals.

1. BASAL CONDITIONS :

- (i) (a) Maize—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 27.6.1953. (iv) (a) 4 ploughings with *desi* plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 3 weedings. (ix) N.A. (x) 28 to 30.9.1953.

2. TREATMENTS :

- Control.
- A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅.
- A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+Pot. Sul. at 100 lb./ac. of K₂O.
- F.Y.M. at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+Pot. Sul. at 100 lb./ac. of K₂O.
- Castor cake at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+Pot. Sul. at 100 lb./ac. of K₂O. F.Y.M. applied on 9.6.1953 and fertilizers on 26.6.1953.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38'×29'. (b) 36'×27'. (v) 1' on each side. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 1199 lb./ac.
 (ii) 181.85 lb./ac.
 (iii) Treatments differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	951
2.	1221
3.	1215
4.	1150
5.	1459
S.E./mean	=74.2 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 52(11).

Type :- 'M'.

Object :- To study the effect of inorganic manures on the yield of cereals.

1. BASAL CONDITIONS :

- (i) (a) Maize—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 19.7.1952. (iv) (a) 1 ploughing with victory plough and 2 with *desi* plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 weedings and 2 hoeings with horse hoe. (ix) N.A. (x) 24 to 26.10.1925

2. TREATMENTS :

1. Control.
2. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P_2O_5 .
3. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P_2O_5 +Pot. Sul. at 100 lb./ac. of K_2O .
4. F.Y.M. at 60 lb./ac. of N+Super at 100 lb./ac. of P_2O_5 +Pot. Sul. at 100 lb./ac. of K_2O .
5. Caster cake at 60 lb./ac. of N+Super at 100 lb./ac. of P_2O_5 +Pot. Sul. at 100 lb./ac. of K_2O .

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38'×29'. (b) 36'×27'. (v) 1' alround. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 1142 lb./ac.
 (ii) 273.2 lb./ac.
 (iii) Treatments differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	921
2.	1236
3.	969
4.	1258
5.	1328
S.E./mean	=111.5 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 52(13).

Type :- 'M'.

Object :- To study the effect of inorganic and organic manures on the yield of crops in rotation.

1. BASAL CONDITIONS :

- (i) (a) Maize-Wheat-Maize-Peas. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 27.6.1953. (iv) (a) 4 ploughings with *desi* plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 28.9.1953 to 20.10.1953.

2. TREATMENTS :

1. Control.
2. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P_2O_5 .
3. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P_2O_5 +Pot. Sul. at 100 lb./ac. of K_2O .
4. F.Y.M. at 60 lb./ac. of N+Super and Pot. Sul. to make up P_2O_5 and K_2O as in treatment 3.
5. Castor cake at 60 lb./ac. of N+Super and Pot. Sul. to make up P_2O_5 and K_2O as in treatment 3.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38'×29'. (b) 36'×27'. (v) 1' alround. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—N.A. (b) Yes (except in 1956). (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1061 lb./ac.
 (ii) 385.1 lb./ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1150
2.	1157
3.	1011
4.	1064
5.	924
S.E./mean	=157.2 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 49(4).

Type :- 'M'.

Object :- To study the effect of direct and indirect manuring of cereals in rotation with *Rabi* legume.

1. BASAL CONDITIONS :

(i) (a) and (b) *Rabi* legumes. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. No manure to legume ; 40 lb./ac. of N to cereal.
2. A/S at 40 lb./ac. of N+Super at 120 lb./ac. of P_2O_5 of N to legume.
3. Super at 120 lb./ac. of P_2O_5 +80 lb./ac. of K_2O to legume.
4. Super at 120 lb./ac. of P_2O_5 +Potash [dose N.A.].
5. 80 lb./ac. of K_2O to legume but no manure to cereal.
6. Manure to cereal.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 84'×26'. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 1.65 ton/ac.
- (ii) 0.60 ton/ac.
- (iii) Treatments do not differ significantly.
- (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	2.03
2.	1.44
3.	1.67
4.	1.55
5.	1.51
6.	1.69
S.E./mean	=0.245 ton/ac.

Crop :- Maize (*Kharif*).

Ref :- I A.R.I. 53(9).

Type :- 'M'.

Object :- To study the effect of different combinations of N, P_2O_5 and K_2O on Maize crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 25.6.1953. (iv) (a) Ploughing with empire plough, 1 with *desi* plough and 2 harrowings. (b) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) 1 lever harrowing, 1 hoeing with *desi* plough and ridging. (ix) 48.44". (x) 5, 6.10.1953.

2. TREATMENTS :

1. No manure.
2. F.Y.M. at 8000 lb./ac.
3. Rape cake at 40 lb./ac. of N.
4. A/S at 20 lb./ac. of N.
5. Pot. Sul. at 25 lb./ac. of K_2O .
6. Super at 40 lb./ac of P_2O_5 .
7. Treat. 5+6.
8. Treat. 4+5+6.
9. Treat. 4+6.
10. Treat. 4+5.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 10. (iv) (a) 44'×24'. (b) 37.5'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Top and stem borers and some cases of mosaic. (iii) N.A. (iv) (a) 1932—1956. (b) and (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 365.2 lb./ac.
- (ii) 118.6 lb./ac.
- (iii) Treatment differences are highly significant.

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

Treatment	Av. yield	Treatment	Av. yield
1.	289.5	6.	308.7
2.	458.9	7.	260.8
3.	557.0	8.	468.8
4.	371.1	9.	378.7
5.	229.9	10.	328.2
S.E./mean		=41.9 lb./ac.	

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 51(29).

Type :- 'M'.

Object :- To study the effect of manured, unmanured, one, two and three year ley farming on soil fertility as judged by the yields of Maize and Wheat crops.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 5, 6, 7, 1951. (iv) (a) Ploughing with victory plough, *desi* plough and preparatory tillage before sowing. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hoeing with horse hoe and weeding. (ix) N.A. (x) 11, 12 and 16, 10, 1951.

2. TREATMENTS :

Main-plot treatments :

9 treatments (ley farming) : T_1 =one year ley—full dose, T_2 =one year ley—no manure, T_3 =two year ley—full dose, T_4 =two year ley—manure applied once, T_5 =two year ley—no manure, T_6 =three year ley—full dose every year, T_7 =three year ley—full dose for two consecutive years, T_8 =three year ley—full dose once, T_9 =three year ley—no manure.

Sub-plot treatments :

4 G.M. treatments : M_1 =*Dich. Amlatum Vicia Visula*, M_2 =*Vicia lucerne*, M_3 =Rhodes and M_4 =Maize—wheat rotation.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 acre. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Yes ; 1949—1953. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Raw data N.A. Information given as available. Clarification is N.A. Description of (1) to (5) in the results for main-plots N.A.

5. RESULTS :

(i) 813 lb./ac.

(ii) (a) N.A.

(b) 130.0 lb./ac.

(iii) Sub-plot treatments differ significantly.

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

	1	2	3	4	5	Mean
M_1	955	852	917	829	792	869
M_2	860	757	978	844	908	869
M_3	810	792	855	815	817	818
M_4	690	679	702	714	699	697
Mean	829	770	863	801	804	813

S.E. per treatment mean for sub-plot treatments=22.98 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 52(70).

Type :- 'M'.

Object :—To study the effect of manured, unmanured, one, two and three year ley farming on soil fertility as judged by the yields of Maize and Wheat crops.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 19.7.1952. (iv) (a) Ploughing with victory plough and discing with tractor twice. (b) to (e) N.A. (v) Nil. (vi) Maize yellow No. 2. (vii) Irrigated. (viii) Hoeing with horse hoe, *desi* hoe, thinning and weeding. (ix) N.A. (x) 23.10.1952.

2. TREATMENTS :

Main-plot treatments :

9 treatments (ley farming) : T_1 =one year ley—full dose, T_2 =one year ley—no manure, T_3 =two year ley—full dose, T_4 =two year ley—manure applied once, T_5 =two year ley—no manure, T_6 =three year ley—full dose every year, T_7 =three year ley—full dose for two consecutive years, T_8 =three year ley—full dose once and T_9 =three year ley—no manure.

Sub-plot treatments :

4 G.M. treatments : M_1 =*Dich. Amlatum Vicia Visula*, M_2 =*Vicia lucerne*, M_3 =Rhodes and M_4 =Maize—wheat rotation.

3. DESIGN :

(i) (a) Split-plot. (ii) (a) 9 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 acre. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Last two replications showed poor growth as crop could not be sown with irrigation. (ii) N.A. (iii) Grain yield. (iv) (a) Yes ; 1949—1953. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 379 lb./ac.

(ii) (a) 255.4 lb./ac.

(b) 104.2 lb./ac.

(iii) Main-plot treatments and sub-plot treatments do not differ significantly. Interaction is significant.

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

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	Mean
M_1	500	470	430	326	350	350	380	296	326	381
M_2	410	340	440	340	480	316	310	290	266	355
M_3	370	300	586	312	426	420	410	350	500	408
M_4	480	356	306	270	280	440	440	306	466	372
Mean	440	367	441	312	384	382	385	311	389	379

S.E. of the difference of two

1. main-plot treatment means = 63.8 lb./ac.

2. sub-plot treatment means = 17.4 lb./ac.

3. sub-plot treatment means at the same level of main-plot treatment mean = 73.7 lb./ac.

4. main-plot treatment means at the same level of sub-plot treatment mean = 110.6 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 53(50).

Type :- 'M'.

Object :—To study the effect of manured, unmanured, one, two and three years ley farming on soil fertility as judged by the yields of Maize and Wheat crops.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18 to 20.6.1953. (iv) (a) 1 ploughing with victory and *desi* plough and preparing land for sowing. (b) to (e) N.A. (v) Nil. (vi) Maize yellow No. 2. (vii) Irrigated. (viii) Lever harrowing, hoeing with horse hoe, thinning and weeding. (ix) N.A. (x) 28.9.1953 to 5.10.1953.

2. TREATMENTS :

Main-plot treatments :

9 treatments (ley farming) : T_1 =one year ley—full dose, T_2 =one year ley—no manure, T_3 =two year ley—full dose, T_4 =two year ley—manure applied once, T_5 =two year ley—no manure, T_6 =three year ley—full dose every year, T_7 =three year ley—full dose for two consecutive years, T_8 =three year ley—full dose once and T_9 =three year ley—no manure.

Sub-plot treatments :

4 G.M. treatments : M_1 =*Dich. Amlatum Vicia Visula*, M_2 =*Vicia lucerne*, M_3 =Rhodes and M_4 =Maize—wheat rotation.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) No. (vi) Yes.

4. GENERAL :

(i) Sub normal growth. (ii) Monkeys damaged the crop. (iii) Grain yield. (iv) (a) Yes ; 1949—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 632 lb./ac.
 (ii) (a) 311.9 lb./ac.
 (b) 205.7 lb./ac.
 (iii) Main-plot treatments differ significantly, sub-plot treatments differ highly significantly while interaction is not significant.
 (iv) Av. yield of grain in lb./ac.

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	Mean
M_1	670	580	680	570	510	980	830	700	1089	734
M_2	610	620	530	370	490	719	620	590	759	590
M_3	629	510	759	500	540	780	850	600	1010	686
M_4	759	400	513	390	510	550	490	510	520	516
Mean	667	528	620	458	512	757	698	600	844	632

S.E. of difference of two

- main-plot treatment means =110.3 lb./ac.
- sub-plot treatment means = 48.6 lb./ac.
- sub-plot treatment means at the same level of main-plot treatment mean =145.6 lb./ac.
- main-plot treatment means at the same level of sub-plot treatment mean =172.8 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I:A.R.I. 50(18).

Type :- 'CM'.

Object :- To study the best cultural treatment in combination with best method of application of fertilizers to Maize.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 20.7.1950. (iv) (a) As per treatments. (b) Sown in lines with *Oudh* plough and *kerā*. (c) N.A. (d) 2½' apart. (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) As per treatments. (ix) 5". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

Number of ploughings : C_1 =two, C_2 =four and C_3 =six ploughings.

Sub-plot treatments :

5 cultural operations : H_1 =one interculture, H_2 =two intercultural, H_3 =three intercultural, H_4 =four intercultural and H_5 =removal of weeds.

Sub-sub-plot treatments :

2 methods of application of manures : M_1 =in plough sole and M_2 =on top of furrow.

Interculture done with bullock hoe. 5,000 lb. of manure mixture of N, P and K in the ratio 1 : 2 : 1 applied as M_1 and M_2 on 20.7.1950.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replications ; 5 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 865.5 lb./ac.
 (ii) (a) 454.2 lb./ac.
 (b) 109.8 lb./ac.
 (c) 285.0 lb./ac.
 (iii) Main effect of H and interaction $C \times H$ are highly significant. All others are not significant.
 (iv) Av. yield of grain in lb./ac.

	H ₁	H ₂	H ₃	H ₄	H ₅	Mean	M ₁	M ₂
C ₁	738.7	810.0	768.7	1053.7	693.7	813.0	843.0	783.0
C ₂	933.7	948.7	877.5	821.2	825.0	881.2	867.0	895.5
C ₃	877.5	997.5	956.3	840.1	840.0	902.3	855.0	949.5
Mean	850.0	918.7	867.5	905.0	786.2	865.5	855.0	876.0
M ₁	870.0	940.0	900.0	885.0	785.0			
M ₂	830.0	897.5	835.0	925.0	787.5			

S.E. of difference of two

- | | | | |
|-----------------------------------|------------------|-----------------------------------|------------------|
| 1. C marginal means | = 101.6 lb./ac. | 6. M means at the same level of C | = 90.12 lb./ac. |
| 2. H marginal means | = 31.69 lb./ac. | 7. C means at the same level of M | = 119.90 lb./ac. |
| 3. M marginal means | = 52.03 lb./ac. | 8. M means at the same level of H | = 116.30 lb./ac. |
| 4. H means at the same level of C | = 54.89 lb./ac. | 9. H means at the same level of M | = 88.17 lb./ac. |
| 5. C means at the same level of H | = 112.80 lb./ac. | | |

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 51(24).

Type :- 'CM'.

Object :- To study the best cultural treatment in combination with best method of application of fertilizer to Maize.

1. BASAL CONDITIONS :

(i) a) Nil. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 31.7.1951. (v) (a) *Oudh* ploughing. (b) and (c) N.A. (d) 2½' apart. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hoings and as per treatments. (ix) N.A. (x) 1, 8.11.1951.

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

Number of ploughings : C₁=two, C₂=four and C₃=six ploughings.

Sub-plot treatments :

4 cultural operations : H₁=one interculture, H₂=two intercultural, H₃=three intercultural and H₄=removal of weeds.

Sub-sub-plot treatments :

3 methods of application of manures : M_1 =in plough sole, M_2 =on top of furrow and M_3 =broadcast. Interculture done with bullock hoe. 5,000 lb. of manures mixture, in 1 : 2 : 1 ratio, of N, P, K applied as M_1 , M_2 and M_3 .

3. DESIGN :

- (i) Split-plot. (ii) (a) 3 main-plots/replication, 4 sub-plots/main-plot, 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1954. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1500 lb./ac.
 (ii) (a) 339.0 lb./ac.
 (b) 209.8 lb./ac.
 (c) 351.4 lb./ac.
 (iii) Main effect of H is highly significant and main effect of M is significant. Interaction C×H is highly significant while the rest are all not significant.
 (iv) Av. yield of grain in lb./ac.

	H ₁	H ₂	H ₃	H ₄	Mean	M ₁	M ₂	M ₃
C ₁	1482	1577	1772	1230	1515	1726	1559	1260
C ₂	1495	1425	1628	1401	1487	1605	1529	1327
C ₃	1425	1375	1564	1633	1499	1801	1415	1281
Mean	1467	1459	1655	1421	1500	1711	1501	1289
M ₁	1674	1657	1947	1566				
M ₂	1484	1491	1657	1370				
M ₃	1242	1229	1360	1327				

S.E. of difference of two

- | | | | |
|-----------------------------------|----------------|-----------------------------------|----------------|
| 1. C marginal means | = 69.2 lb./ac. | 6. M means at the same level of C | =124.2 lb./ac. |
| 2. H marginal means | = 49.5 lb./ac. | 7. C means at the same level of M | =122.8 lb./ac. |
| 3. M marginal means | = 71.7 lb./ac. | 8. M means at the same level of H | =143.5 lb./ac. |
| 4. H means at the same level of C | = 85.7 lb./ac. | 9. H means at the same level of M | =127.1 lb./ac. |
| 5. C means at the same level of H | =101.4 lb./ac. | | |

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 52(32).

Type :- 'C'.

Object :- To study the best cultural treatment in combination with best method of application of fertilizer to Maize.

1. BASAL CONDITIONS:

- (i) (a) Nil. (b) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 28, 30.7.1953. (iv) (a) As per treatments. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) 3, 8.10.1953.

2. TREATMENTS :

Main-plot treatments :

Number of ploughings : C₁=two, C₂=four and C₃=six ploughings.

Sub-plot treatments :

4 cultural operations : H₁=one interculture, H₂=two intercultures, H₃=three intercultures and H₄=removal of weeds.

Sub-sub-plot treatments :

3 methods of application of manures : M₁=in plough sole, M₂=on top of furrow and M₃=broadcast. Interculture done with bullock hoe. 5,000 lb. of manures mixture, in 1 : 2 : 1 ratio, of N, P, K applied as M₁, M₂ and M₃.

3. DESIGN :

- (i) Split-plot. (ii) (a) 3 main-plots/replication ; 4 sub-plots/main-plot ; 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/72 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data is N.A.

5. RESULTS :

- (i) 1178 lb./ac.
 (ii) (a) 353.7 lb./ac.
 (b) 205.6 lb./ac.
 (c) 193.6 lb./ac.
 (iii) Main effects of C, H and M are not significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield	Treatment	Av. yield
C ₁	1261	H ₁	1133	M ₁	1163
C ₂	1130	H ₂	1170	M ₂	1163
C ₃	1144	H ₃	1163	M ₃	1208
		H ₄	1245		
S.E./mean	=62.52 lb./ac.	S.E./mean	=42.0 lb./ac.	S.E./mean	=28.0 lb./ac.

Crop :- Maize.

Ref :- I.A.R.I. 52(28).

Type :- 'C'.

Object :—To study the effect of sowing premature and mature seed of *Kharif* crops on their yield.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 29 and 30.7.1952. (iv) (a) Tractor ploughing, tractor discing and *desi* ploughing cross-wise in 3rd week of July 1953. (b) to (e) N.A. (v) N.A. (vi) Maize yellow No. 2, Maize T-41, *Bajra* Local, *Jowar* white Purhi, *Jowar* local and cow-peas 397. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Oct. and Nov. 1952.

2. TREATMENTS :

1. Sowing fully mature seeds.
2. Sowing 1 week premature seeds.
3. Sowing 2 week premature seeds.

3. DESIGN :

(i) R.B.D. (ii) (a) 3 for each crop. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 30'×27'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor in cowpeas and *jowar*. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1952—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data N.A. Experiment conducted with 3 treatments on 6 crops as given under item (vi) in basal conditions. Results for other crops given under respective crops.

5. RESULTS :

Maize yellow No. 2	Maize T-41
(i) 4475 lb./ac.	(i) 4139 lb./ac.
(ii) 492.8 lb./ac.	(ii) 336.0 lb./ac.
(iii) Treatments differ significantly.	(iii) Treatments differ significantly.
(iv) Av. yield in lb./ac.	(iv) Av. yield in lb./ac.

Treatment	Av. yield
1.	4764
2.	4618
3.	4043
S.E./mean	=201.2 lb./ac.

Treatment	Av. yield
1.	4380
2.	4123
3.	3915
S.E./mean	=137.2 lb./ac.

Crop :- Maize.

Ref :- I.A.R.I. 53(31)

Type :- 'C'.

Object :- To study the effect of sowing premature and mature seed on their yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on 143. (iii) Maize and *bajra* on 25.7.1953 and *jowar* and cowpeas on 28.7.1953. (iv) (a) 1 Tractor ploughing, 4 *desi* ploughings and *sohaga*. (b) to (e) N.A. (v) Nil. (vi) Maize yellow No. 2, Maize T-41, *Bajra* local, *Jowar* local and cowpeas U-397. (vii) No. (viii) 1 hoeing with *oudh* plough. (ix) N.A. (x) Oct. and Nov. 1953.

2. TREATMENTS :

1. Sowing fully mature seeds.
2. Sowing 1 week pre-mature seeds.
3. Sowing 2 weeks pre-mature seeds.

3. DESIGN :

(i) R.B.D. (ii) (a) 3 for each crop. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of grain. (iv) (a) 1952 to 1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data N.A. Experiments conducted with 3 treatments on 5 crops as given under item (vi) in basal conditions. Results for other crops are given under respective crops.

5. RESULTS :

Maize yellow No. 2		Maize T-41	
(i) 2011 lb./ac.		(i) 2186 lb./ac.	
(ii) N.A.		(ii) N.A.	
(iii) Treatment differences are significant.		(iii) Treatment differences are significant.	
(iv) Av. yield of grain in lb./ac.		(iv) Av. yield of grain in lb./ac.	
Treatment	Av. yield	Treatment	Av. yield
1.	2332	1.	2596
2.	2172	2.	2321
3.	1530	3.	1640
	S.E./mean N.A.		S.E./mean N.A.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 51 (19) Type :- 'CM'.

Object :- To study the effect of basal dose, fertilizer placement and spacing with different levels of N and P to maize and to study the residual effect on the following crop.

1. BASAL CONDITIONS :

(i) (a) Maize-oats (b) N.A. (c) N.A. (ii) (a) & (b) Refer item 11 on page 143. (iii) 11,12.7.51. (iv) (a) Double discing. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Hoeing, earthing, thinning and weeding. (ix) 2.7". (x) 21 to 24.10.1951.

2. TREATMENTS :

Main plot treatments :

2 levels of F.Y.M. as basal dressing : $B_0=0$ and $B_1=20$ lb./ac. of N as F.Y.M.

Sub-plot treatments : All combinations of (1) and (2)

- (1) 2 methods of fertilizer application : M_1 =Broadcasting and M_2 =placement.
- (2) 3 spacings between rows : $S_1=2'$, $S_2=2\frac{1}{2}'$ and $S_3=3'$.

Sub-sub-plot treatments : All combinations of (1) and (2)

- (1) 3 levels of N as A/S : $N_1=20$, $N_2=40$ and $N_3=60$ lb./ac. of N.
- (2) 2 levels of P_2O_5 as Super with 20 lb./ac. of K_2O as Pot. Sul. : $P_1=40$ and $P_2=80$ lb./ac. of P_2O_5 .

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block, 6 sub-plots/main-plot and 6 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) $48' \times 24'$. (b) $S_1=44' \times 20'$; $S_2=42.5' \times 20'$ and $S_3=42' \times 20'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) *Phadka* bores. (iii) Grain yield. (iv) (a) 1949—1951. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) & (vii) Nil.

5. RESULTS :

- (i) 1315 lb./ac.
(ii) (a) 1153 lb./ac.
(b) 616 lb./ac.
(c) 286 lb./ac.
(iii) N and P effects are highly significant. All other effects are not significant.
(iv) Av. yield of maize in lb/ac.

	S ₁ M ₁	S ₁ M ₂	S ₂ M ₁	S ₂ M ₂	S ₃ M ₁	S ₃ M ₂	Mean	B ₀	B ₁
N ₁ P ₁	987	965	1166	1362	1348	1226	1176	1065	1287
N ₁ P ₂	1386	1124	1107	1317	1313	801	1175	1099	1251
N ₂ P ₁	1299	1299	1525	1157	1387	1063	1288	1267	1310
N ₂ P ₂	1742	1312	1671	1195	1569	1044	1422	1459	1385
N ₃ P ₁	1497	1677	1484	1352	1620	827	1409	1378	1441
N ₃ P ₂	1662	1711	1262	1127	1560	1400	1420	1376	1465
Mean	1429	1348	1369	1252	1466	1060	1315	1274	1357
B ₀	1346	1365	1452	1136	1390	953			
B ₁	1545	1331	1286	1367	1543	1167			

.E. of difference of two :

1. Main plot treatment means =192.2 lb./ac.
2. Sub-plot treatment means =177.8 lb./ac.
3. Sub-sub plot treatment means = 82.56 lb./ac.
4. Sub-plot treatment means at the same level of main-plot treatment =251.5 lb./ac.
5. Main-plot treatment means at the same level of sub-plot treatment =299.5 lb./ac.
6. Sub-sub plot treatment means at the same level of main-plot treatment =116.7 lb./ac.
7. Main-plot treatment means at the same level of sub-sub plot treatment =220.0 lb./ac.
8. Sub-sub plot treatment means at the same level of sub-plot treatment =202.2 lb./ac.
9. Sub-plot treatment means at the same level of sub-sub-plot treatment =256.3 lb./ac.

Crop :- Maize (*Kharif*).

Ref:- I.A.R.I. 50(19).

Type :- 'CM'.

Object :—To study the depth of cultivation with and without inversion on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 13.7.1950. (iv) (a) As per treatments. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Nil. (viii) 2 hoeings with horse hoe. (ix) N.A. (x) 26 to 28.10.1950.

2. TREATMENTS:

Main-plot treatments :

4 methods of ploughing : C₁=9" deep tractor ploughing in 1st instance followed by normal cultivation with tractor implement (disc). C₂=Ploughing 5" deep with soil inverting plough by bullock in 1st instance followed by normal cultivation with country plough and C₃=Ploughing with country plough. C₄=Tractor discing.

Sub-plot treatments :

4 levels of N as F.Y.M. : N₀=0, N₁=40, N₂=80 and N₃=120 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/40 acre. (v) N.A. (vi) Yes.

4. GENERAL:

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

5. RESULTS :

- (i) 1163 lb./ac.
 (ii) (a) 674.7 lb./ac.
 (b) 370.3 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	N ₃	Mean
C ₁	1186	1393	1373	1406	1340
C ₂	860	953	1053	1159	1006
C ₃	913	1133	973	1346	1091
C ₄	1160	1186	1120	1400	1216
Mean	1030	1166	1130	1328	1163

S.E. of difference of two

1. C marginal means = 275.7 lb./ac.
 2. N marginal means = 151.4 lb./ac.
 3. C means at the same level of N = 302.8 lb./ac.
 4. N means at the same level of C = 379.3 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 51(17).

Type:-'CM'.

Object : -To study the effect of depth of cultivation with and without inversion on the yield of Maize.

1. BASAL CONDITIONS :

- (i) (a) No. (b) N.A. (c) N.A. (ii) (a) Heavy soil. (b) Refer item 11 on page 143. (iii) 6.8.1951.
 (iv) (a) As per treatments. (b) Seed sown with *desi* plough. (c) N.A. (d) 2½' apart in rows. (e) N.A.
 (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Horse hoeing. (ix) N.A. (x) 1.11.1951.

2. TREATMENTS :

Main-plot treatments :

4 methods of ploughing : C₁=Tractor ploughing 9" to 10" deep followed by tractor discing. C₂=5" to 6" deep bullock soil inverting plough followed by country plough. C₃=ploughing with country plough and C₄=Tractor discing.

Sub-plot treatments :

4 levels of N as F.Y.M. : N₀=0, N₁=40, N₂=80 and N₃=120 lb./ac.
 F.Y.M. spread on 23 and 25.6.1951.

3. DESIGN :

- (i) Split-plot. (ii) (a) 4 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a), (b) 1/40 acre.
 (v) Nil. (vi) N.A.

4. GENERAL :

- (i) Germination satisfactory. Growth of the crop in general poor due to late sowing. (ii) N.A. (iii) Grain yield. (iv) (a) 1950-1954. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Maize crop failed in 1950 due to heavy rain and water logging. (vii) Nil.

5. RESULTS :

- (i) 747 lb./ac.
 (ii) (a) 222.4 lb./ac.
 (b) 146.0 lb./ac.
 (iii) None of the effects is significant.

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

	N ₀	N ₁	N ₂	N ₃	Mean
C ₁	840	763	1039	1054	924
C ₂	748	710	725	795	745
C ₃	595	717	871	817	750
C ₄	595	595	565	527	571
Mean	695	696	800	798	747

S.E. of difference of two

1. C marginal means = 90.8 lb./ac.
2. N marginal means = 59.6 lb./ac.
3. N means at the same level of C = 119.2 lb./ac.
4. C means at the same level of N = 123.9 lb./ac.

Crop :- Maize (*Kharif*)

Ref :- I.A.R.I. 52(19)

Type :- 'CM'.

Object :- To study the effect of depth of cultivation with and without inversion on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 28.7.1952. (iv) (a) As per treatments. (b) Sown with monarch drill. (c) N.A. (d) 2' apart in rows. (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) 1 weeding and 2 hoeings. (ix) N.A. (x) 5.11.1952.

2. TREATMENTS :

Main-plot treatments :

4 types of ploughing : C₁=Tractor ploughing 9"-10" deep followed by tractor discing, C₂=Bullock soil inversion plough (victory) 5" to 6" deep followed by country plough, C₃=Ploughing with country plough and C₄=Tractor discing.

Sub-plot treatments :

4 levels of N as F.Y.M. : N₀=0, N₁=40, N₂=80 and N₃=120 lb./ac.

F Y.M. spread on 3, 4.7.1952.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 40' x 26.5'. (b) N.A. (v) N.A. (vi) N.A.

4. GENERAL :

(i) Germination satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1950-N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1002 lb./ac.

(ii) (a) 371.9 lb./ac.

(b) 342.3 lb./ac.

(iii) Main-plot treatments differ significantly. Sub-plot treatments differ highly significantly. Interaction is not significant.

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

	C ₁	C ₂	C ₃	C ₄	Mean
N ₀	759	950	700	410	705
N ₁	1170	920	1170	710	993
N ₂	1120	1070	1100	780	1018
N ₃	1560	1280	1280	1050	1292
Mean	1152	1055	1062	738	1002

S.E. of difference of two

1. Main-plot treatment means =131.6 lb./ac.
2. Sub-plot treatment means =120.9 lb./ac.
3. Sub-plot treatment means at the same level of main-plot treatment =241.9 lb./ac.
4. Main-plot treatment means at the same level of sub-plot treatment =175.3 lb./ac.

Crop :- Maize (*Kharif*)

Ref :- I.A.R.I. 53(25)

Type :- 'CM'.

Object :- To study the effect of depth of cultivation with and without inversion on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

4 types of ploughing : C_1 =Tractor ploughing 9"-10" deep followed by tractor discing, C_2 =Bullock soil inversion plough (victory) 5" to 6" deep followed by country plough, C_3 =Ploughing with country plough and C_4 =Tractor discing.

Sub-plot treatments :

4 levels of N as F.Y.M. : $N_0=0$, $N_1=40$, $N_2=80$ and $N_3=120$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 acre. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of grain. (iv) (a) 1950—1954. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 826.3 lb./ac.

(ii) (a) 55.13 lb./ac.

(b) 27.97 lb./ac.

(iii) Main-plot treatments and interaction are significant. Sub-plot treatments are highly significant.

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

	C_1	C_2	C_3	C_4	Mean
N_0	600	830	840	1080	837
N_1	630	640	750	850	718
N_2	870	960	1100	1130	1015
N_3	560	750	760	870	735
Mean	665	795	862	982	826

S.E. of difference of two

1. Main-plot treatment means =19.49 lb./ac.
2. Sub-plot treatment means = 9.89 lb./ac.
3. Sub-plot treatment means at the same level of main-plot treatment =19.78 lb./ac.
4. Main-plot treatment means at the same level of sub-plot treatment =39.20 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 52(30).

Type :- 'CM'.

Object :- To study the response of Hubam clover for fodder, seed and green manuring and its effect on soil fertility as judged by the yield of following Maize.

1. BASAL CONDITIONS :

(i) (a) Hubam clover—Maize. (b) Hubam clover. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.7.1952. (iv) (a) Ploughing once with victory and twice with *desi* plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hoing, thinning and weeding. (ix) N.A. (x) 2.11.1952 and 17.11.1952.

2. TREATMENTS :

Main-plot treatments :

4 levels of P_2O_5 : $P_0=0$, $P_1=40$, $P_2=80$ and $P_3=120$ lb./ac.

Sub-plot treatments :

6 uses of clover : C_1 =Hubam clover grown for seed, C_2 =Hubam clover left for seed after one cutting, C_3 =Hubam clover green manured, C_4 =Hubam clover left after one cutting, C_5 =Hubam clover left after two cuttings and C_6 =Hubam clover grown for fodder.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication and 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data N.A.

5. RESULTS :

(i) 758 lb./ac.

(ii) (a) N.A.

(b) N.A.

(iii) Treatments do not differ significantly.

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

Treatment	Av. yield	Treatment	Av. yield
P_0	856	C_1	963
P_1	572	C_2	987
P_2	844	C_3	662
P_3	761	C_4	634
		C_5	700
		C_6	604

S.E.'s are not available.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 53(38).

Type :- 'CM'.

Object :—To study the response of Hubam clover to different doses of phosphatic manures grown for fodder, seed and green manuring and its effect on soil fertility as judged by the yield of following Maize crop.

1. BASAL CONDITIONS :

(i) (a) Hubam clover—Maize. (b) Hubam clover. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.7.1953. (iv) (a) Ploughing with *desi* plough. (b) N.A. (c) 18 seers. (d) and (e) N.A. (v) N.A. (vi) Maize yellow No. 2. (vii) Irrigated. (viii) 2 hoeings, weeding and filling up gaps. (ix) N.A. (x) 25 and 26.10.1953.

2. TREATMENTS :

Main-plot treatments :

4 levels of P_2O_5 : $P_0=0$, $P_1=40$, $P_2=80$ and $P_3=120$ lb./ac.

Sub-plot treatments :

6 uses of clover : C_1 =Hubam clover grown for seed, C_2 =Hubam clover left for seed after one cutting, C_3 =Hubam clover green manured, C_4 =Hubam clover left after one cutting, C_5 =Hubam clover left after two cuttings and C_6 =Hubam clover grown for fodder.

3. DESIGN

(i) Split-plot. (ii) (a) 4 main-plots/replication and 6 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) and (ii) N.A. (iii) Grain yield. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1045 lb./ac.
- (ii) (a) 384.0 lb./ac.
- (b) 235.0 lb./ac.
- (iii) C effect alone is highly significant.
- (iv) Av. yield of grain in lb./ac.

	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	Mean
P ₀	1464	975	791	827	998	923	926
P ₁	1622	1083	619	785	860	821	965
P ₂	1393	1152	771	796	1222	1035	1061
P ₃	1574	1241	866	939	1374	942	1156
Mean	1513	1113	762	837	1114	930	1045

S.E. of difference of two

- 1. P marginal means = 128.0 lb./ac.
- 2. C marginal means = 95.9 lb./ac.
- 3. C means at the same level of P = 191.8 lb./ac.
- 4. P means at the same level of C = 265.7 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 53(34).

Type :- 'CM'.

Object :- To study the effect of different fertilizers and cultural practices on the yield of Maize.

1. BASAL CONDITIONS:

- (i) (a) Maize-Oats. (b) Oats. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) As per treatments.
- (iv) (a) Ploughing with victory and *desi* plough. (b) to (e) N.A. (v) N, P and K at 80, 60 and 20 lb./ac. respectively. (vi) N.A. (vii) Irrigated. (viii) 2 cuttings for each main-plot, hoeing, thinning and weeding.
- (ix) N.A. (x) D₁-22, 23.9.1953, D₂-14.10.1953 and D₃-1.11.1953/9.11.1953.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D₁=18.6.1953, D₂=21.6.1953 and D₃=1.7.1953.

Sub-plot treatments :

3 earthings : E₁=No, E₂=1 and E₃=2 earthings.

Sub-sub-plot treatments :

3 times of application of fertilizers : T₁=Full dose at the time of sowing, T₂= $\frac{1}{2}$ dose at sowing and $\frac{1}{2}$ at 1st earthing and T₃= $\frac{1}{3}$ dose at sowing, $\frac{1}{3}$ at 1st earthing and $\frac{1}{3}$ at 2nd earthing.Fertilizer mixture was applied to give 80 lb. of N, 60 lb. of P₂O₅ and 20 lb. of K₂O.

3. DESIGN :

- (i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) 34'×25'. (b) 30'×21'. (v) 2' around. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1951-1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1212 lb./ac.
- (ii) (a) 515.8 lb./ac.
- (b) 203.7 lb./ac.
- (c) 201.0 lb./ac.
- (iii) Main effects D, T and interaction D×T and D×E are significant. E effect is highly significant. Others are not significant.

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

	D ₁	D ₂	D ₃	Mean	T ₁	T ₂	T ₃
E ₁	1414	884	1187	1162	1158	1080	1247
E ₂	1481	956	833	1090	1155	910	1204
E ₃	1850	1149	1155	1385	1267	1360	1527
Mean	1582	996	1058	1212	1193	1117	1326
T ₁	1561	984	1034				
T ₂	1518	755	1077				
T ₃	1666	1250	1063				

S.E. of difference of two

- | | | | |
|-----------------------------------|------------------|-----------------------------------|------------------|
| 1. D marginal means | = 85.97 lb./ac. | 6. T means at the same level of E | = 82.07 lb./ac. |
| 2. E marginal means | = 33.95 lb./ac. | 7. E means at the same level of T | = 82.44 lb./ac. |
| 3. T marginal means | = 33.51 lb./ac. | 8. E means at the same level of D | = 83.16 lb./ac. |
| 4. T means at the same level of D | = 82.07 lb./ac. | 9. D means at the same level of E | = 139.25 lb./ac. |
| 5. D means at the same level of T | = 138.82 lb./ac. | | |

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 52(3).

Type :- 'CM'.

Object :- To study the effect of Napier grass on soil fertility and on the yield of subsequent cereal crops.

1. BASAL CONDITIONS :-

(i) (a) No. (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Maize 22.7.1952 and Napier 23, 24.6.1952. (iv) (a) Digging Napier roots of 2 years age, ploughing with victory plough once and twice with *desi* plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hoeing with *oudh* plough. (ix) N.A. (x) Maize 7.10.1952 and Napier 28.8.1952.

2. TREATMENTS :

Main-plot treatments :

4 rotations : R₁=Control ; Maize—Wheat, R₂=Napier (2 yrs)—Maize—Wheat, R₃=Napier (3 yrs)—Maize—Wheat and R₄=Napier (4 yrs)—Maize—Wheat.

Sub-plot treatments :

2 manures : M₀=No manure and M₁=40 lb./ac. of N as A/S.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of maize grain and napier fodder. (iv) (a) 1949—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Crop failed due to early closure of monsoon and irrigations were also given late. (vii) Raw data N.A. Therefore results could not be presented in the proper form.

5. RESULTS :

(i) to (iv) Av. yield of Maize in lb./ac.

Av. yield of Napier grass in lb./ac.

	R ₁	R ₂	Mean	Treatment	Av. yield
M ₀	381.0	427.9	404.4	Manured	47849
M ₁	468.2	515.1	491.6	Unmanured	40066
Mean	424.6	471.5	448.0		

Crop :- Maize (*Kharif*).

Ref :- I.A.R.I. 53(3)

Type :- 'CM'.

Object :- To study the effect of Napier grass on soil fertility and on the yield of subsequent cereal crops.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Maize on 10.6.1953, Napier on 8, 9.7.1953. (iv) (a) Digging roots of Napier grass of 3 years age, ploughing with victory and *desi* plough. (b) to (e) N.A. (v) Nil. (vi) Maize yellow No. 2. (vii) Irrigated. (viii) Ploughing with *desi* plough and weeding. (ix) N.A. (x) Cowpeas : 9, 10.7.1953, Napier 20.8.1953. and Maize 3 to 6.9.1953.

2. TREATMENTS :

Main-plot treatments :

4 rotations : R_1 =Control : Maize-wheat, R_2 =Napier (2 years)—maize-wheat, R_3 =Napier (3 years)—maize-wheat and R_4 =Napier (4 years)—maize-wheat.

Sub-plot treatments :

2 manures : M_0 =No manure and M_1 =40 lb./ac. of N as A/S.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 acre. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Fodder yield. (iv) (a) 1950—1953. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Only 3 main-plots are taken for analysis.

5. RESULTS :

- (i) 3.52 ton/ac.
 (ii) (a) 0.79 ton/ac.
 (b) 0.53 ton/ac.
 (iii) Only M effect is significant.
 (iv) Av. yield of fodder in ton/ac.

	R_1	R_2	R_3	Mean
M_0	3.10	3.30	2.86	3.09
M_1	4.25	4.00	3.59	3.95
Mean	3.68	3.65	3.22	3.52

S.E. of difference of two

1. R marginal means =0.323 ton/ac.
 2. M marginal means =0.177 ton/ac.
 3. M means at the same level of R =0.307 ton/ac.
 4. R means at the same level of M =0.388 ton/ac.

Crop :-Maize.

Ref :- I.A.R.I. 53(127).

Type :- 'CM'.

Object :- To study the effect of different manures on crop yield with different rotations.

1. BASAL CONDITIONS :

(i) (a) First year : Maize+oats, second year : Maize+peas, third year : Maize+wheat, fourth year : Maize+gram. (4 year rotation to be conducted 8 course for rotation). (b) Oats. (c) As per treatments. (ii) (a) Light loam. (b) N.A. (iii) 25.6.1953. (iv) (a) 4 to 6 *desi* ploughings. (b) and (c) N.A. (d) Between rows= $2\frac{1}{2}$ ', within row= $1\frac{1}{2}$ '. Rows to run east to west. (e) Thinned to one strong seedling per hole. (v) Nil. (vi) Pusa yellow (medium). (vii) Unirrigated. (viii) Intercultivation and weeding. (ix) 42.39°. (x) 5.10.1953.

2. TREATMENTS :

- | | |
|--|--------------------------------------|
| 1. Control. | 6. Super at 80 lb./ac. of P_2O_5 . |
| 2. F.Y.M. at 8000 lb./ac. | 7. Tr. 4+Tr. 5. |
| 3. Rape cake at 40 lb./ac. of N. | 8. Tr. 4+Tr. 6. |
| 4. A/S at 40 lb./ac. of N | 9. Tr. 5+Tr. 6. |
| 5. Pot. Sul. at 50 lb /ac. of K_2O . | 10. Tr. 4+Tr. 5+Tr. 6. |

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 44' x 24'. (b) 37.5' x 18'. (v) Yes. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Weight of cob and grain. (iv) (a) 1953—1961 (8th year of the Expt.). (b) Yes. (c) Nil. (v) (a) No. (b) Nil. (vi) Nil. (vii) Experiment conducted at Botanical Sub-station, Pusa (Bihar).

5. RESULTS :

- (i) 377 lb./ac.
(ii) 57.43 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	276	6.	325
2.	467	7.	315
3.	572	8.	425
4.	386	9.	270
5.	250	10.	485
	S.E./mean	=28.71 lb./ac.	

Crop :Maize.

Ref :- I.A.R.I. 51(41)

Type :- 'D'.

Object : - To study the effect of soaking seeds of Maize in dilute solutions of fertilizers on the yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) and (b) Refer item 11 on page 143. (iii) Maize 6.7.1951 and Oats N.A. (iv) (a) Maize : Tractor ploughing and discing 1st week July 1951. Oats : *Desi* plough twice after *Palewa* on 1.12.1951. (b) to (e) N.A. (v) C/N top dressed in Oats on 17.1.1952 along with irrigation. (vi) N.A. (vii) Irrigated. (viii) Hoeing in maize twice on August 1951 and hoeing in oats 1st week of Feb. 1952. (ix) N.A. (x) Maize Oct. 1951 and oats May 1952.

2. TREATMENTS :

Soaking of seeds.

1. No soaking.
2. Soaking in 5% solution of A/S.
3. Soaking in 5% solution of Super.
4. Soaking in 5% solution of Amm. Phos.
5. Soaking in water.

3. DESIGN :

(i) R.B.D. (ii) (a) 5 each for maize and oats. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 38' x 23'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Maize poor and oats normal. (ii) Nil. (iii) Yield of grain for maize and oat crops. (iv) (a) 1951—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Results of experiment conducted for oats crop may be seen under relevant crop.

5. RESULTS :

- (i) 717 lb./ac.
(ii) 233.7 lb./ac.
(iii) Treatments differ highly significantly.

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

Treatment	Av. yield
1.	890
2.	704
3.	296
4.	696
5.	996
S.E./mean	=95.45 lb./ac.

Crop :- Jowar.**Ref :- I.A.R.I. 53(31 a)****Type :- 'C'.**Object :—To study the effect of premature and mature seed on the yield of *Jowar*.**1. BASAL CONDITIONS to 4. GENERAL.**

Please refer to No. I.A.R.I. 53(31) under MAIZE.

5. RESULTS :

- (i) 116.8 lb./ac.
- (ii) N.A.
- (iii) Treatments differ significantly.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	138.2
2.	115.2
3.	97.1

Crop :- Barley (*Rabi*).**Ref :- I.A.R.I. 51(55).****Type :- 'MV'.**

Object :—To study the response of varieties of Barley to the application of N and P.

1. BASAL CONDITIONS :

- (i) (a) Barley-Maize. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 5.12.1951. (iv) (a) Double discing and three ploughings. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 7.4.1952.

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) 2 varieties : $V_1=Pusa-13$ and $V_2=C-521$.

3. DESIGN :

- (i) $3 \times 3 \times 2$ Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) $38' \times 25'$. (b) $33' \times 20'$. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Medium to heavy lodging in plots manured with N. (ii) N.A. (iii) Grain yield. (iv) (a) 1951 -N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Hailstorm on 1.3.1952. (vii) Nil.

5. RESULTS :

- (i) 1122 lb./ac.
- (ii) 257.6 lb./ac.
- (iii) Main effects of N and V are significant. Others are not significant.

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

	N ₀	N ₁	N ₂	Mean	V ₁	V ₂
P ₀	888	1119	1132	1046	1230	862
P ₁	970	1175	1284	1143	1340	946
P ₂	928	1155	1449	1177	1320	1034
Mean	929	1150	1220	1122	1297	947
V ₁	1096	1296	1498			
V ₂	761	1003	1078			

S.E. of marginal mean of N or P 52.6 lb./ac.
 S.E. of marginal mean of V 45.2 lb./ac.
 S.E. of body of N×P table 91.1 lb./ac.
 S.E. of body of P×V or N×V table 73.6 lb./ac.

Crop :- Barley (*Rabi*).

Ref :- I.A.R.I. 52(77)

Type :- 'MV'.

Object :—To study the response of varieties of Barley to the application of N and P.

1. BASAL CONDITIONS :

(i) (a) Barley-Maize. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 30.10.1952.
 (iv) (a) *Desi* ploughing and tractor discing. (b) to (e) N.A. (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 N as A/S : N₀=0, N₁=20 and N₂=40 lb./ac. of N.(2) 3 levels of P₂O₅ : P₀=0, P₁=30 and P₂=60 lb./ac. of P₂O₅.(3) 2 varieties of barley : V₁=Pusa 13 and V₂=Kanpur 251.

Fertilizers applied on 29.10.1952.

3. DESIGN :

(i) 3×3×2 Fact, in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) 38'×25'. (b) 36'×23'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 2072 lb./ac.

(ii) 302.2 lb./ac.

(iii) Main effect of N is highly significant, main effect of P and interactions N×P and V×P are significant, while others are not significant.

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

	N ₀	N ₁	N ₂	Mean	V ₁	V ₂
P ₀	1762	1936	2127	1942	2007	1876
P ₁	1650	2048	2498	2069	2167	1970
P ₂	1713	2209	2696	2206	2185	2227
Mean	1712	2064	2440	2072	2120	2024
V ₁	1782	2082	2496			
V ₂	1641	2047	2384			

1. S.E. of N or P marginal mean	= 61.69 lb./ac.
2. S.E. of V marginal mean	= 50.36 lb./ac.
3. S.E. of body of N×P table	= 106.80 lb./ac.
4. S.E. of body of N×V or P×V table	= 87.22 lb./ac.

Crop :- Barley (*Rabi*).

Ref :- I.A.R.I. 53 (75).

Type :- 'MV'.

Object :- To study the response of varieties of Barley to the application of N and P.

1. BASAL CONDITIONS :

(i) (a) Barley—Maize. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 30.10.1953 and 31.10.1953. (iv) (a) One victory and 2 *desi* ploughings and preparation of land with *desi* plough. (b) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 1 weeding and taking out smutted plants. (ix) N.A. (x) 22 to 24.3.1954.

2. TREATMENTS :

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

- (1) 3 levels of N : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
 (2) 3 levels of P_2O_5 : $P_0=0$, $P_1=30$ and $P_2=60$ lb./ac.
 (3) 2 varieties : $V_1=N.P. 13$ and $V_2=Kanpur 251$.

3. DESIGN :

(i) $3 \times 3 \times 2$ Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) $38' \times 25'$. (b) $36' \times 23'$. (v) 1' around. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 2087 lb./ac.
 (ii) 725.4 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean	V_1	V_2
P_0	2052	1910	2098	2020	2113	1927
P_1	2048	2229	2016	2098	2157	2038
P_2	2311	2081	2042	2145	2227	2063
Mean	2137	2073	2052	2087	2166	2009
V_1	2183	2183	2131			
V_2	2091	1964	1973			

S.E. of marginal mean of N or P	= 74.0 lb./ac.
S.E. of marginal mean of V	= 60.4 lb./ac.
S.E. of body of N×P table	= 128.2 lb./ac.
S.E. of body of N×V or P×V table	= 104.7 lb./ac.

Crop :- Barley.

Ref :- I.A.R.I. 53(32 b).

Type :- 'C'.

Object :- To study the effect of sowing premature and mature seeds on Barley yield.

1. BASAL CONDITIONS to 4. GENERAL.

Please refer to No. I.A.R.I. 53(32) on WHEAT.

5. RESULTS :

- (i) 2510 lb./ac.
- (ii) 218.9 lb./ac.
- (iii) Treatments differ highly significantly.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2834
2.	2487
3.	2210
S.E./mean	=77.35 lb./ac.

Crop :- Barley (*Rabi*).

Ref :- I.A.R.I. 52(27 b).

Type :- 'C'.

Object :- To study the effect of sowing premature and mature seed on Barley yield.

1. BASAL CONDITIONS to 4. GENERAL :

Please refer to No. I.A.R.I. 52(27) on WHEAT.

5. RESULTS :

- (i) 4040 lb./ac.
- (ii) 311.8 lb./ac.
- (iii) Treatments do not differ significantly.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	3530
2.	3305
3.	5284
S.E./mean	= 110.26 lb./ac.

Crop :- Bajra (*Kharif*).

Ref :- I.A.R.I. 52(54).

Type :- 'M'.

Object :- To study the effect of organic and inorganic manuring on the yield of crops in rotations.

1. BASAL CONDITIONS :

- (i) (a) As per treatments. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 28.7.1952
- (iv) (a) 1 ploughing and 2 discings with tractor and 1 beaming. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) 1 weeding and 1 hoeing. (ix) 12.89'. (x) 11 to 24.10.1952 ; 21.10.1952 to 8.11.1952.

2. TREATMENTS :

Main-plot treatments :

3 crop rotations : $R_1 = \text{Bajra-Wheat}$, $R_2 = \text{Fallow-Wheat}$ and $R_3 = \text{Bajra-Fallow}$.

Sub-plot treatments :

5 levels of F.Y.M. : $F_0 = 0$, $F_1 = 2.5$, $F_2 = 5$, $F_3 = 10$ and $F_4 = 20$ ton/ac.

Sub-sub-plot treatments :

3 levels of N as Sod. Nit. : $N_0 = 0$, $N_1 = 20$ and $N_2 = 40$ lb./ac.Manures applied to Bajra in R_1 and R_3 and to Wheat in R_2 . F.Y.M. applied on 8.7.1952 and Sod. Nit. on 2.9.1952.

3. DESIGN :

- (i) Split-plot. (ii) (a) 3 main-plots/replication ; 5 sub-plots/main-plot ; 3 sub-sub-plots/sub-plot. (b) N.A.
- (iii) 3. (iv) (a) N.A. (b) 53' x 12}'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Fairly good on the whole. (ii) Green ear disease (*sclerospora*—*graminicola*) 4% attack on harvest. *Pyrilla*-incidence severe as the nearby Sugarcane was affected badly. (iii) Grain yield. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) For wheat the number of replications is 5 and for *Bajra* 6.

5. RESULTS:

- (i) 999.0 lb./ac.
 (ii) (a) 200.4 lb./ac.
 (b) 152.4 lb./ac,
 (iii) None of the effects is significant.
 (iv) Av. yield of bajra in lb./ac.

	N ₀	N ₁	N ₂	Mean
F ₀	958	909	973	947
F ₁	945	1008	1007	987
F ₂	985	921	967	958
F ₃	922	1017	1047	995
F ₄	1074	1124	1130	1109
Mean	977	996	1025	999

S.E. of difference of two

1. F marginal means = 66.8 lb./ac.
2. N marginal means = 39.4 lb./ac.
3. N means at the same level of F = 88.2 lb./ac.
4. F means at the same level of N = 98.1 lb./ac.

Crop :- *Bajra* (*Kharif*).

Ref :- I.A.R.I. 53(47).

Type :- 'M'.

Object :- To study the effect of organic and inorganic manuring on the yield of crops in rotations.

1. BASAL CONDITIONS:

(i) (a) to (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 1, 2.7.1953. (iv) (a) 5 ploughings and 2 beamings. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Nil. (viii) Weeding and hoeing with horse hoe. (ix) 15.71". (x) I picking 15 to 23.9.1953 II picking on 7 to 13.10.1953.

2. TREATMENTS:

Main-plot treatments:

3 crop rotations : R₁=*Bajra*—Wheat, R₂=Fallow—Wheat and R₃=*Bajra*—Fallow.

Sub-plot treatments:

5 levels of F.Y.M. : F₀=0, F₁=2.5, F₂=5, F₃=10 and F₄=20 ton/ac.

Sub-sub-plot treatments:

3 levels of N as Sod. Nit. : N₀=0, N₁=20 and N₂=40 lb./ac.

Manures applied to *Bajra* in R₁ and R₃ and to Wheat in R₂. F.Y.M. applied during 7 to 12.6.1953 and Sod. Nit. on 1, 2.7.1953.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/replication, 5 sub-plots/main-plot, 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 58' × 12½'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Fair to good. Better in R₃ rotation. (ii) Green ear disease in about 8% of ears. Smut attack in about 28% of ears. (iii) Grain yield. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Only 2 replications are taken for analysis of *Bajra*.

5. RESULTS :

- (i) 1456 lb./ac.
 (ii) (a) 314.3 lb./ac.
 (b) 566.1 lb./ac.
 (c) 218.1 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
F ₀	1177	—	1505	1341	1259	1333	1424
F ₁	1201	—	1629	1415	1317	1366	1563
F ₂	1259	—	1374	1017	1193	1259	1506
F ₃	996	—	1835	1415	1226	1448	1572
	1563	—	2032	1802	1605	1786	2016
Mean	1234	—	1679	1456	1316	1440	1613
N ₀	1119	—	1522				
N ₁	1210	—	1662				
N ₂	1382	—	1843				

S.E. of difference of two

1. R marginal means = 81.15 lb./ac. 6. N means at the same level of F = 125.92 lb./ac.
 2. F marginal means = 188.70 lb./ac. 7. F means at the same level of N = 214.90 lb./ac.
 3. N marginal means = 56.31 lb./ac. 8. F means at the same level of R = 326.85 lb./ac.
 4. N means at the same level of R = 97.53 lb./ac. 9. R means at the same level of F = 303.39 lb./ac.
 5. R means at the same level of F = 113.70 lb./ac.

Crop :- Bajra (*Kharif*).

Ref :- I.A.R.I. 53(51).

Type :- 'M'.

Object :—To determine the optimum level of N for top dressing and its time of application in relation to different spacings between rows of *Bajra* crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 1st Rep. 28.7.1953 ; 2nd Rep. 1 8.1953. (iv) (a) Tractor discing, *desi* ploughing and working with cultivator. (b) N.A. (c) 6 srs./ac. (d) As per treatments. (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Removal of *Baru* grass and weeding. (ix) N.A. (x) 15, 16.10.1953.

2. TREATMENTS :

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

1. 3 levels of N as A/S : N₁=20, N₂=40 and N₃=60 lb./ac.
 2. 3 times of application of N : T₁=full dose at sowing, T₂=half at sowing and half at tillering and T₃= $\frac{1}{3}$ at sowing+ $\frac{1}{3}$ at tillering+ $\frac{1}{3}$ at earing.
 3. 3 spacings : S₁=9', S₂=12' (Control) and S₃=15'.

3. DESIGN :

(i) 3³ confd. (ii) (a) 3 blocks of 9 plots each. (b) N.A. (iii) 2. (iv) (a) 14'×62.2'. (b) 12'×60'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1953—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) There was heavy rains after sowing of the crop. Delayed sowing in second replication, due to heavy rains on 29.7.1953. (vii) Nil.

5. RESULTS :

- (i) 916 lb./ac.
(ii) 188.46 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	S ₁	S ₂	S ₃	Mean	T ₁	T ₂	T ₃
N ₁	890	850	950	897	940	910	840
N ₂	850	990	890	910	960	880	890
N ₃	1030	860	930	940	980	910	930
Mean	923	900	923	916	960	900	887
T ₁	950	920	1010				
T ₂	900	870	930				
T ₃	920	910	830				

S.E. of any marginal mean
S.E. of body of table

=44.43 lb./ac.
=76.95 lb./ac.

Crop :- Bajra.

Ref :- I.A.R.I. 53(31b).

Type :- 'C'.

Object :- To study the effect of premature and mature seed on the yield of Cowpeas.

1. BASAL CONDITIONS to 4. GENERAL.

Please refer to No. I.A.R.I. 53 (31) under MAIZE.

5. RESULTS :

- (i) 203.5 lb./ac.
(ii) N.A.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	236.2
2.	207.4
3.	167.0

Crop :- Bajra.

Ref :- I.A.R.I. 52(28b).

Type :- 'C'.

Object :- To study the effect of sowing premature and mature seed on Bajra yield.

1. BASAL CONDITIONS to 4. GENERAL.

Please refer to No. I.A.R.I. 52 (28) under MAIZE.

5. RESULTS:

- (i) 3347 lb /ac.
(ii) 156.8 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	3445
2.	3393
3.	3203

S.E./mean =64.0 lb./ac.

Crop :- Oats (*Rabi*).

Ref :- I.A.R.I. 50(9).

Type :- 'M'.

Object :—To determine the nutritional requirements of Indian soils.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Oats on 4.11.1950, Tobacco on 17.1.1951 and Rape on 6.11.1950. (iv) (a) Tractor discing twice. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) *Bakharing* to rape and oats on 29.12.1950. Hand hoeing to tobacco on 8.2.1951. Topping and suckering of tobacco on 16.4.1951 and 17.4.1951. (ix) N.A. (x) Rape on 5.4.1951. Oats on 8, 9.4.1951 while tobacco N.A.

2. TREATMENTS :

- | | |
|---|---|
| 1. Control. | 5. Treatment 2+Zinc sul. at 5 lb./ac. |
| 2. N at 40 lb./ac.+P ₂ O ₅ at 60 lb./ac.+K ₂ O at 30 lb./ac. | 6. Treatment 2+Borax at 5 lb./ac. |
| 3. Treatment 2+Mag. sul. at 10 lb./ac. | 7. Treatment 2+Fe. sul. at 5 lb./ac. |
| 4. Treatment 2+Mag. sul. at 5 lb./ac. | 8. Treatment 2+Treatments 3, 4, 5, 6 and 7. |

3. DESIGN :

(i) R.B.D. (ii) (a) 8 for each crop. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 35'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) 20% locust attack on rape on 29.1.1951. (iii) Rape and oats seed yield. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) No observations were taken on the field of tobacco. Results of experiment on rape may please be seen under the relevant crop.

5. RESULTS :

- (i) 2401 lb./ac.
(ii) 513.5 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1832	5.	2497
2.	2385	6.	2480
3.	2394	7.	2618
4.	2593	8.	2411
	S.E./mean	=256.7 lb./ac.	

Crop :- Oats (*Rabi*).

Ref :- I.A.R.I. 51(8).

Type :- 'M'.

Object :—To determine the nutritional requirement of Indian soils.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) Oats : 29.11.1951, Rape : 29.9.1951, 24.10.1951 (Resowing) and Tobacco (Transplanting) on 23, 24, 25.1.1952. (iv) (a) Oats ploughing with victory plough on 26.10.1951 with *desi* plough on 24.11.1951 and 29.11.1951. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Tobacco—hand hoeing from 8.2.1952 to 11.2.1952 and from 10.3.1952 to 14.3.1952, oats—micro nutrients sprayed on 14, 15.2.1952 and rape micro nutrients sprayed on 14.2.1952. (ix) N.A. (x) Oats : 27 to 31.3.1952 and Rape 14 to 18.3.1952.

2. TREATMENTS :

- | | |
|---|---|
| 1. Control. | 5. Treatment 2+Zinc Sul. at 5 lb./ac. |
| 2. N at 40 lb./ac.+P ₂ O ₅ at 60 lb./ac.+K ₂ O at 30 lb./ac. | 6. Treatment 2+Borax at 3 lb./ac. |
| 3. Treatment 2+Mag. Sul. at 10 lb./ac. | 7. Treatment 2+Fe. Sul. at 5 lb./ac. |
| 4. Treatment 2+Mag. Sul. at 5 lb./ac. | 8. Treatment 2+Treatments 3, 4, 5, 6 and 7. |

3. DESIGN :

(i) R.B.D. (ii) (a) 8 for oats, rape and tobacco. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 35'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. little lodging by hail storm. (ii) N.A. (iii) Yield of grain and tobacco leaf. (iv) (a) 1950 to 1951. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Results of experiments on rape and tobacco may be seen under the relevant crops.

5. RESULTS :

- (i) 2116 lb./ac.
 (ii) 91.34 lb./ac.
 (iii) Treatments differ highly significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1161	5.	2287
2.	2252	6.	2270
3.	2252	7.	2311
4.	2158	8.	2406

S.E./mean = 45.67 lb./ac.

Crop :- Oats.

Ref :- I.A.R.I. 50(15).

Type :- 'M'.

Object :—To study the relative utility of mixed cropping *khari*f cereals and cowpea in different proportions over individual cropping and to study their residual effect on the succeeding Oats crop.

1. BASAL CONDITIONS :

- (i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.11.1950. (iv) (a) Tractor grubbing on 17.11.1950. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Lever harrowing in December, 1950. (ix) N.A. (x) April, 1951.

2. TREATMENTS :

- | | |
|---|---|
| 1. Maize alone for seed. | 10. Maize+Cowpeas 1 : $\frac{3}{4}$ for grain. |
| 2. Jowar alone for fodder. | 11. Maize+Cowpeas 1 : $\frac{1}{4}$ for grain. |
| 3. Bajra alone for seed. | 12. Jowar+Cowpeas 1 : 1 for fodder. |
| 4. Maize alone for seed with F.Y.M. at 10 ton/ac. | 13. Jowar+Cowpeas 1 : $\frac{3}{4}$ for fodder. |
| 5. Jowar alone for fodder with F.Y.M. at 10 ton/ac. | 14. Jowar+Cowpeas 1 : $\frac{1}{4}$ for fodder. |
| 6. Bajra alone for seed with F.Y.M. at 10 ton/ac. | 15. Bajra+Cowpeas 1 : 1. |
| 7. Cowpeas alone for fodder. | 16. Bajra+Cowpeas 1 : $\frac{3}{4}$. |
| 8. Cowpeas alone for seed. | 17. Bajra+Cowpeas 1 : $\frac{1}{4}$. |
| 9. Maize+Cowpeas 1 : 1 for grain. | 18. Fallow during <i>khari</i> f. |

3. DESIGN :

- (i) R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 52'×20'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Poor. (ii) Insects in previous cowpeas crop. (iii) Grain yield. (iv) (a) 1949—N.A. (b) and (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 962 lb./ac.
 (ii) 808.0 lb./ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	931	10.	1036
2.	774	11.	994
3.	827	12.	1015
4.	1068	13.	964
5.	827	14.	869
6.	910	15.	1057
7.	1026	16.	1015
8.	1214	17.	911
9.	1120	18.	764

S.E./mean = 404.0 lb./ac.

Crop :- Oats (*Rabi*).

Ref :- I.A.R.I. 50(31).

Type :- 'M'.

Object :—To study the effect of placement of fertilizers on yield of maize and their residual effect on Oats.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 28.11.1950. (iv) (a) 2 discings, grubbing twice and beaming. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 25.4.1951.

2. TREATMENTS :

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

(1) 3 methods of application of fertilizers : M_1 =Broadcast, M_2 =Fertilizers placed $2\frac{1}{2}$ " deep in seed line and M_3 =Fertilizers placed $4\frac{1}{2}$ " deep in seed line.

(2) 3 levels of P_2O_5 as super : $P_1=40$, $P_2=60$ and $P_3=120$ lb./ac.

(3) 3 levels of N as A/S : $N_1=20$, $N_2=30$ and $N_3=60$ lb./ac.

Treatments applied to *kharif* Maize in 1950.

3. DESIGN :

(i) 3^3 confounded. (ii) (a) 9 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) N.A. (b) $128' \times 12\frac{1}{2}'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Patchy growth. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—1950. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 812.2 lb./ac.

(ii) 172.9 lb./ac.

(iii) Interaction $P \times M$ alone is highly significant.

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

	N_1	N_2	N_3	Mean	M_1	M_2	M_3
P_1	830.4	694.2	848.5	791.0	825.8	748.7	798.6
P_2	884.8	803.1	821.3	836.4	848.5	807.7	853.0
P_3	730.5	785.0	912.0	809.2	939.3	685.2	803.1
Mean	815.2	760.8	860.6	812.2	871.2	747.2	818.2
M_1	1070.8	762.3	780.4				
M_2	667.0	680.6	893.9				
M_3	707.8	839.4	907.5				

S.E. of any marginal mean

=40.8 lb./ac.

S.E. of body of any table

=70.6 lb./ac.

Crop :- Oats (*Rabi*).

Ref :- I.A.R.I. 51(3).

Type :- 'M'.

Object :—To study the effect of placement of fertilizers on yield of maize and the residual effect on Oats.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 16.11.1951. (iv) (a) Discing twice with tractor, grubbing twice and beaming. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Harrowing on 18.11.1951. (ix) N.A. (x) 10.4.1952.

2. TREATMENTS :

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

(1) 3 methods of application of fertilizers : M_1 =Broadcast, M_2 =Fertilizers placed $2\frac{1}{2}$ " deep in seed line and M_3 =Fertilizers placed $4\frac{1}{2}$ " deep in seed line.

(2) 3 levels of P_2O_5 as super : $P_1=40$, $P_2=60$ and $P_3=120$ lb./ac.

(3) 3 levels of N as A/S : $N_1=20$, $N_2=30$ and $N_3=60$ lb./ac.

Treatments applied to *kharif* Maize in 1951.

3. DESIGN :

(i) 3³ confounded. (ii) (a) 9 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 109'×10'. (b) 107'×9'. (v) 1' on each side of length and $\frac{1}{2}$ ' on each side of width. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) N.A. (iii) Grain yield. (iv) (a) 1949—1951. (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1031 lb./ac.
 (ii) 267.3 lb./ac.
 (iii) Main effect of N alone is highly significant.
 (iv) Av. yield of grain in lb./ac.

	N ₁	N ₂	N ₃	Mean	M ₁	M ₂	M ₃
P ₁	885	928	1219	1011	965	923	1144
P ₂	1010	1004	1138	1051	1046	1055	1052
P ₃	814	825	1455	1031	1113	971	1010
Mean	903	919	1271	1031	1041	983	1069
M ₁	905	916	1303				
M ₂	956	878	1114				
M ₃	848	963	1395				

S.E. of any marginal mean = 63.0 lb./ac.

S.E. of body of any table = 109.1 lb./ac.

Crop :- Oats.

Ref :- I.A.R.I. 51(41 a).

Type :- 'M'.

Object :- To study the effect of soaking seeds of Oats in dilute solutions of fertilizers on the yield.

1. BASAL CONDITIONS to 4. GENERAL :

Please refer to No. I.A.R.I. 51(41) under MAIZE.

5. RESULTS :

(i) 1573 lb./ac.
 (ii) 842.6 lb./ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1461
2.	1382
3.	1735
4.	1604
5.	1683
S.E./mean	=344.0 lb./ac.

Crop :- Oats (*Rabi*).

Ref :- I.A.R.I. 52(64).

Type :- 'M'.

Object :- To study the effect of soaking seed in solutions of fertilizers.

1. BASAL CONDITIONS :

(i) (a) Oats-Maize. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 6.11.1952. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Nil. (viii) Hoeing with *oudh* plough. (ix) N.A. (x) April 1953.

2. TREATMENTS :

1. No soaking.
2. Soaking in 5% A/S solution.
3. Soaking in 5% Super (neutralised with lime).
4. Soaking in 5% Ammo. Phos. solution.
5. Soaking in water.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 40'×15'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1951—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1299 lb./ac.
- (ii) 439.2 lb./ac.
- (iii) Treatment differences are not significant.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1387
2.	1182
3.	1336
4.	1303
5.	1289
S.E./mean	=179.3 lb./ac.

Crop :- Oats (*Rabi*).

Ref :- I.A.R.I. 53(59).

Type 'M'.

Object :—To study the effect of soaking seeds in solution of fertilizers.

1. BASAL CONDITIONS :

(i) (a) No. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 9.11.1953. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) April 1954.

2. TREATMENTS :

1. No soaking.
2. Soaking in 5% A/S solution.
3. Soaking in 5% Super (neutralised with lime).
4. Soaking in 5% Ammo. Phos. solution.
5. Soaking in water.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 42'×20'. (b) 40'×18'. (v) 1' on each side. (vi) Yes.

4. GENERAL :

(i) Below normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1218 lb./ac.
- (ii) 193.4 lb./ac.
- (iii) Treatments do not differ significantly.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1111
2.	1275
3.	1326
4.	1255
5.	1121
S.E./mean	=78.99 lb./ac.

Crop :- Oats (*Rabi*).

Ref :- I.A.R.I. 52(38).

Type :- 'CM'.

Object :- To study the residual effect of different cultural practices and manures, applied to maize, on the succeeding Oat crop.

1. BASAL CONDITIONS :

(i) (a) Maize--Oats. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) As per treatments. (iv) (a) Tractor ploughing and preparing land with *desi* plough. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) One hoeing, thinning and weeding. After every earthing bunds are prepared with hand. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : $D_1=18.6.1952$, $D_2=7.7.1952$ and $D_3=27.7.1952$.

Sub-plot treatments :

3 earthings : $E_0=No$, $E_1=1$ and $E_2=2$ earthings.

Sub-sub-plot treatments :

3 times of application of fertilizers : $T_1=Full$ dose at sowing, $T_2=\frac{1}{2}$ at sowing + $\frac{1}{2}$ four weeks after sowing and $T_3=\frac{1}{3}$ at sowing + $\frac{1}{3}$ four weeks after sowing + $\frac{1}{3}$ six weeks after sowing.

Fertilizers applied as a mixture of N, P and K at 80, 60 and 20 lb. respectively.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block, 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) $34' \times 25'$. (b) $30' \times 21'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Grain yield. (iv) (a) 1951—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1413 lb./ac.
 (ii) (a) 691.1 lb./ac.
 (b) 375.2 lb./ac.
 (c) 340.6 lb./ac.
 (iii) Main effects of D, E and T are significant. Others are not significant.
 (iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	Mean	T_1	T_2	T_3
E_0	1219	1783	1593	1531	1472	1764	1357
E_1	1173	1564	1391	1376	1374	1098	1656
E_2	1259	1259	1478	1332	1213	1374	1409
Mean	1217	1535	1487	1413	1353	1412	1474
T_1	1138	1535	1386				
T_2	1185	1518	1535				
T_3	1328	1553	1541				

S.E. of difference of two

- | | | | |
|-----------------------------------|----------------|-----------------------------------|----------------|
| 1. D marginal means | =162.8 lb./ac. | 6. T means at the same level of D | =139.1 lb./ac. |
| 2. E marginal means | = 88.4 lb./ac. | 7. D means at the same level of T | =198.6 lb./ac. |
| 3. T marginal means | = 80.3 lb./ac. | 8. T means at the same level of D | =296.8 lb./ac. |
| 4. E means at the same level of D | =176.7 lb./ac. | 9. E means at the same level of T | =143.9 lb./ac. |
| 5. D mean at the same level of E | =205.3 lb./ac. | | |

Crop :- Oats (*Rabi*).

Ref :- I.A.R.I. 53(33).

Type :- 'CM'.

Object :—To study the residual effect of different cultural practices and manures, applied to maize, on the succeeding Oats crop.

1. BASAL CONDITIONS :

(i) (a) Maize—Oats. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) As per treatments. (iv) (a) Ploughing with victory plough on 6.10.1953. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 16, 17 and 18.4.1952.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : $D_2=21.6.1953$, $D_2=18.7.1953$ and $D_3=1, 4.8.1953$.

Sub-plot treatments :

3 earthings : $E_0=No$, $E_1=1$ and $E_2=2$ earthings.

Sub-sub-plot treatments :

3 times of application of fertilizers : $T_1=Full$ dose at sowing, $T_2=\frac{1}{2}$ at sowing + $\frac{1}{2}$ four weeks after sowing and $T_3=\frac{1}{2}$ at sowing + $\frac{1}{2}$ four weeks after sowing + $\frac{1}{2}$ six weeks after sowing.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $34' \times 25'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1951—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1116 lb./ac.

(ii) (a) 373.6 lb./ac.

(b) 247.7 lb./ac.

(c) 199.1 lb./ac.

(iii) None of the effects or interactions are significant.

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

	D_1	D_2	D_3	Mean	T_1	T_2	T_3
E_0	1061	1031	1304	1132	1108	1097	1190
E_1	1052	1104	1184	1113	1099	1099	1143
E_2	1105	1040	1159	1102	1030	1151	1124
Mean	1073	1058	1216	1116	1079	1116	1152
T_1	1073	1019	1145				
T_2	1055	1032	1143				
T_3	1090	877	1242				

S.E. of difference of two

- D marginal means = 88.1 lb./ac.
- E marginal means = 58.4 lb./ac.
- T marginal means = 46.9 lb./ac.
- E means at the same level of D = 101.1 lb./ac.
- D means at the same level of E = 120.7 lb./ac.
- T means at the same level of D = 81.3 lb./ac.
- D means at the same level of T = 110.3 lb./ac.
- T means at the same level of E = 81.3 lb./ac.
- E means at the same level of T = 88.4 lb./ac.

Crop :- Oats (*Rabi*).

Ref :- I.A.R.I. 50(24).

Type :- 'CM'.

Object :- To study the effect of spacing, fertilizers and their method of application on maize crop and the residual effect on Oats.

1. BASAL CONDITIONS :

(i) (a) Oats-Maize. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 8.12.1950. (iv) (a) Double discing was done along with double beaming with bullocks. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 22.4.1951.

2. TREATMENTS :

Main-plot treatments :

2 levels of basal manure : B_0 =Nil and B_1 =F.Y.M. at 20 lb./ac. of N.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 methods of application of fertilizers : M_1 =Broadcast and M_2 =Placement.

(2) 3 spacings between rows : $S_1=2'$, $S_2=2\frac{1}{2}'$ and $S_3=3'$.

Sub sub-plot treatments :

All combinations of (1) and (2)

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

(2) 2 levels of $P_2O_5+K_2O$: P_1 =Super at 40 lb./ac. of P_2O_5 +Pot. Sul. at 20 lb./ac. of K_2O and P_2 =Super at 80 lb./ac. of P_2O_5 +Pot. Sul. at 20 lb./ac. of K_2O .

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 6 sub-plots/main-plot and 6 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) $48' \times 24'$. (b) $44' \times 20'$. (v) 2' on each side. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1949-1951. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1651 lb./ac.
 (ii) (a) 186.2 lb./ac.
 (b) 286.8 lb./ac.
 (c) 241.7 lb./ac.
 (iii) Only sub-sub-plot treatments differ highly significantly.
 (iv) Av. yield of grain in lb./ac.

	S_1M_1	S_1M_2	S_2M_1	S_2M_2	S_3M_1	S_3M_2	Mean	B_0	B_1
N_1P_1	1077	1219	1191	1076	1180	1011	1126	1215	1037
N_1P_2	1139	1349	1153	1147	1236	959	1164	1242	1086
N_2P_1	1603	1596	1576	1742	1711	1432	1610	1666	1554
N_2P_2	1541	1479	1525	1723	1672	1582	1587	1735	1438
N_3P_1	2302	2178	2486	2063	2347	2242	2269	2396	2143
N_3P_2	1943	2209	2184	2229	2068	2256	2148	2220	2077
Mean	1600	1672	1686	1663	1702	1581	1651	1745	1556
B_0	1592	1714	1821	1832	1857	1657			
B_1	1609	1629	1550	1495	1547	1504			

S.E. of difference of two

- | | |
|--|-----------------|
| 1. Main-plot marginal means | = 31.0 lb./ac. |
| 2. Sub-plot marginal means | = 82.8 lb./ac. |
| 3. Sub-sub-plot marginal means | = 69.8 lb./ac. |
| 4. Sub-plot means at the same level of main-plot treatment | = 95.3 lb./ac. |
| 5. Main-plot means at the same levels of sub-plot treatment | = 98.7 lb./ac. |
| 6. Sub-sub-plot means at the same level of main-plot treatment | = 111.3 lb./ac. |
| 7. Main-plot means at the same level of sub-sub-plot treatment | = 117.1 lb./ac. |
| 8. Sub-sub-plot means at the same level of sub-plot treatment | = 170.9 lb./ac. |
| 9. Sub-plot means at the same level of sub-sub-plot treatment | = 176.6 lb./ac. |

Crop :- Oats (*Rabi*).

Ref :- I.A.R.I. 51(20)

Type :- 'CM'.

Object :—To study the effect of spacing, fertilizers and their method of application on maize crop and the residual effect on Oats.

1. BASAL CONDITIONS :

(i) (a) Maize-Oats. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 4.12.1951. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Last week of April 1952.

2. TREATMENTS :

Main-plot treatments :

2 levels of basal manure : B_0 =Nil and B_1 =F.Y.M. at 20 lb./ac. of N.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 methods of applications of fertilizers : M_1 =Broadcast and M_2 =Placement.

(2) 3 spacings between rows : S_1 =2', S_2 =2½' and S_3 =3'.

Sub-sub-plot treatments :

All combinations of (1) and (2)

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

(2) 2 levels of $P_2O_5+K_2O$: P_1 =Super at 40 lb./ac. of P_2O_5 +Pot. Sul. at 20 lb./ac. of K_2O and P_2 =Super at 80 lb./ac. of P_2O_5 +Pot. Sul. at 20 lb./ac. of K_2O .

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 6 sub-plots/main-plot and 6 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) 48'×42'. (b) 44'×20'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—1951. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 764 lb./ac.

(ii) (a) 1368 lb./ac.

(b) 225.6 lb./ac.

(c) 216.7 lb./ac.

(iii) Only sub-sub-plots treatments differ significantly.

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

	S_1M_1	S_1M_2	S_2M_1	S_2M_2	S_3M_1	S_3M_2	Mean	B_0	B_1
N_1P_1	755	621	723	723	846	587	709	611	807
N_1P_2	856	668	758	761	780	638	744	677	810
N_2P_1	693	604	689	784	628	726	687	689	685
N_2P_2	814	657	875	711	832	936	804	856	752
N_3P_1	787	799	717	774	628	834	756	710	803
N_3P_2	866	894	925	869	783	968	884	865	903
Mean	795	707	781	770	750	781	764	735	793
B_0	757	674	788	693	772	726			
B_1	834	740	775	847	727	838			

S.E. of difference of two

1. Main-plot marginal means =228.1 lb./ac.
2. Sub-plot marginal means = 65.1 lb./ac.
3. Sub-sub-plot marginal means = 62.6 lb./ac.
4. Sub-plot means at the same level of main-plot =241.9 lb./ac.
5. Main-plot means at the same level of sub-plot = 88.5 lb./ac.
6. Sub-sub-plot means at the same level of main-plot =243.1 lb./ac.
7. Main-plot means at the same level of sub-sub-plot = 92.1 lb./ac.
8. Sub-sub-plot means at the same level of sub-plot =153.2 lb /ac.
9. Sub-plot means at the same level of sub-sub-plot =154.3 lb./ac.

Crop :- Potato (*Rabi*).

Ref :- I.A.R.I. 51(57).

Type :- 'M'.

Object :- To find out the optimum dose and the best method of application of the fertilizers.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 25.10.1951. (iv) (a) One ploughing with *desi* plough and laying out by victory plough. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) One weeding and two earthings. (ix) N.A. (x) 2.4.1952 and 3.4.1952.

2. TREATMENTS :

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

(1) 3 levels of N : $N_1=40$, $N_2=80$ and $N_3=120$ lb./ac. of N.(2) 3 levels of P_2O_5 : $P_1=30$, $P_2=60$ and $P_3=90$ lb./ac. of P_2O_5 .(3) 3 depths of placement : D_0 =Broadcast, D_1 =In rows 1" under the water and D_2 =In 2 row, 2½" to the side and 1" under the other.

Fertilizers applied on 25.10.1952.

3. DESIGN :

(i) 3^3 Fact. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) 24'×20'. (b) 24'×16'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of potato. (iv) (a) 1951—N.A. (b) and (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1.01 ton/ac.

(ii) 0.139 ton/ac.

(iii) Effect of N is highly significant. Interaction $N \times P$ and $N \times D$ are significant. Others are not significant.

(iv) Av. yield of Potato in ton/ac.

	N_1	N_2	N_3	Mean	D_0	D_1	D_2
P_1	0.87	1.02	1.06	0.98	0.99	0.93	1.02
P_2	0.89	1.03	1.13	1.02	1.00	1.00	1.05
P_3	0.90	1.03	1.19	1.04	1.05	1.08	0.99
Mean	0.89	1.02	1.13	1.01	1.01	1.00	1.02
D_0	0.88	1.00	1.16				
D_1	0.91	1.03	1.07				
D_2	0.87	1.04	1.15				

S.E. of any marginal mean

=0.033 ton/ac.

S.E. of body of any table

=0.057 ton/ac.

Crop :- Potato (*Rabi*).

Ref :- I.A.R.I. 52(79).

Type :- 'M'.

Object :- To study the effect of depth of ploughing and placement of fertilizers on the yield of Potato.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 17 and 18.10.1952. (iv) (a) One ploughing with tractor, one with victory plough, 13 with *desi* plough, discing and grubbing once. (b) to (e) N.A. (v) F.Y.M. at 120 mds broadcast as basal dose. (vi) D.R.R. (vii) Irrigated. (viii) 2 earthings and hoeing by wallace horse hoe and *khurpi*. (ix) N.A. (x) 2 to 9.3.1953.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 ploughings : $C_1=9'$ deep tractor ploughing followed by tractor cultivator, $C_2=5'$ deep ploughing by victory plough followed by country plough and $C_3=5'$ deep ploughing by country plough.(2) 2 placement of fertilizers : P_1 =Placement with plough sole and P_2 =Top dressed.

Sub-plot treatments :

4 levels of fertilizers : $F_1=120$ lb./ac. of N, $F_2=80$ lb./ac. of N+80 lb./ac. of P_2O_5 +40 lb./ac. of K_2O , $F_3=120$ lb./ac. of N+80 lb./ac. of P_2O_5 +40 lb./ac. of K_2O and $F_4=160$ lb./ac. of N+80 lb./ac. of P_2O_5 +40 lb./ac. of K_2O .

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $38.5' \times 12.5'$. (b) $38.5' \times 9.0'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of late blight. (iii) Yield of potato. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 6.77 ton/ac.
(ii) (a) 0.99 ton/ac.
(b) 1.14 ton/ac.
(iii) Main effect of F is highly significant. Other effects and interactions are not significant.
(iv) Av. yield of potato in ton/ac.

	C_1	C_2	C_3	Mean	P_1	P_2
F_1	5.72	5.07	5.14	5.31	5.18	5.45
F_2	7.35	6.61	7.00	6.99	7.10	6.87
F_3	7.54	7.43	7.28	7.42	7.67	7.05
F_4	7.66	7.57	6.88	7.37	7.60	7.14
Mean	7.07	6.67	6.58	6.77		
P_1	6.92	6.91	6.83	6.89		
P_2	7.22	6.42	6.32	6.65		

S.E. of difference of two

1. C marginal means =0.17 ton/ac. 5. C means at the same level of F=0.38 ton/ac.
2. P marginal means =0.14 ton/ac. 6. F means at the same level of P =0.51 ton/ac.
3. F marginal means =0.33 ton/ac. 7. P means at the same level of F =0.44 ton/ac.
4. F means at the same level of C =0.40 ton/ac. 8. means of body of C×P table =0.35 ton/ac.

Crop :- Potato (Rabi).

Ref :- I.A.R.I. 53(78).

Type :- 'CM'.

Object :- To study the effect of depth of ploughing and placement of fertilizers on the yield of Potato.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18, 19.10.1953. (iv) (a) One ploughing by victory and seven by *desi* plough and 3 grubblings. (b) to (e) N.A. (v) N.A. (vi) D.R.R. (vii) Irrigated. (viii) 2 earthings. (ix) N.A. (x) 24 to 27.2.1954.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

- (1) 3 ploughings : $C_1=10''$ deep ploughing by tractor+tractor operation, $C_2=6''$ deep ploughing by victory plough+*desi* plough and $C_3=4''-5''$ deep ploughing by country plough.

- (2) 2 placement of fertilizers : P_1 =placement and P_2 =top dressing.

Sub-plot treatments :

4 levels of fertilizers : $F_1=120$ lb./ac. of N, $F_2=80$ lb./ac. of N+80 lb./ac. of P_2O_5 +40 lb./ac. of K_2O , $F_3=120$ lb./ac. of N+80 lb./ac. of P_2O_5 +40 lb./ac. of K_2O and $F_4=160$ lb./ac. of N+80 lb./ac. of P_2O_5 +40 lb./ac. of K_2O .

Fertilizers applied just before planting.

3. DESIGN :

- (i) Split-plot. (ii) (a) 6 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $38.5' \times 12.5'$. (b) $38.5' \times 9'$. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Very good but affected by frost in the latter stage. (ii) After frost, late attack of blight on the unaffected portion of leaves. (iii) Yield of potato. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 10.39 ton/ac.
 (ii) (a) 0.176 ton/ac.
 (b) 0.243 ton/ac.
 (iii) Main effects of C, P and F are highly significant. Interactions are not significant.
 (iv) Av. yield of potato in ton/ac.

	C_1	C_2	C_3	Mean	F_1	F_2	F_3	F_4
P_1	10.40	10.13	9.44	9.99	8.79	10.21	10.39	10.57
P_2	11.29	10.74	10.32	10.78	9.75	10.94	10.87	11.57
Mean	10.85	10.43	9.88	10.39	9.27	10.58	10.63	11.07
F_1	9.93	9.22	8.66					
F_2	10.63	10.29	10.81					
F_3	11.53	10.50	9.86					
F_4	11.30	11.74	10.17					

S.E. of difference of two

- | | | | |
|-----------------------------------|----------------|-----------------------------------|----------------|
| 1. C marginal means | = .051 ton/ac. | 5. C means at the same level of F | = .111 ton/ac. |
| 2. P marginal means | = .057 ton/ac. | 6. F means at the same level of P | = .099 ton/ac. |
| 3. F marginal means | = .070 ton/ac. | 7. P means at the same level of F | = .091 ton/ac. |
| 4. F means at the same level of C | = .121 ton/ac. | 8. mean of body of C×P table | = .062 ton/ac. |

Crop :- Potato (*Rabi*).

Ref :- I.A.R.I. 51(18).

Type :- 'CM'.

Object :- To study the effect of date of sowing, time of application of fertilizers and spacing between rows on Potato yield.

1. BASAL CONDITIONS :

- (i) (a) N.A. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) As per treatments. (iv) (a) Preparing seed beds by *desi* plough after irrigating the land. (b) to (e) N.A. (v) A/S at 120 lb./ac. of N, Super at 60 lb./ac. of P_2O_5 and Pot. Sul. at 40 lb./ac. of K_2O . (vi) N.A. (vii) Irrigated. (viii) 1st and 2nd earthing twice in each main-plot. (ix) N.A. (x) 25.3.1952 to 2.4.1952.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : $D_1=25.9.1951$, $D_2=15.10.1951$ and $D_3=5.11.1951$.

Sub-plot treatments :

3 spacings between rows : $S_1=1\frac{1}{2}'$, $S_2=2'$ and $S_3=2\frac{1}{2}'$.

Sub-sub-plot treatments :

3 times of application of fertilizers : T_1 =Full dose at sowing, $T_2=\frac{1}{2}$ at sowing+ $\frac{1}{2}$ at first earthing and $T_3=\frac{1}{2}$ at sowing+ $\frac{1}{2}$ at first earthing+ $\frac{1}{2}$ at second earthing.

Fertilizers given as under basal manuring.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot ; 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $30' \times 15'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Negligible attack of mosaic. (iii) Yield of potato. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 5.51 ton/ac.
 (ii) (a) 0.98 ton/ac.
 (b) 0.44 ton/ac.
 (c) 0.48 ton/ac.
 (iii) S and T effects are highly significant. All interactions are significant while D effect is not significant.
 (iv) Av. yield of potato in ton/ac.

	S_1	S_2	S_3	Mean	T_1	T_2	T_3
D_1	5.06	5.13	3.98	4.72	5.14	5.35	3.68
D_2	7.09	6.62	4.92	6.21	7.00	6.30	5.33
D_3	6.44	5.53	4.84	5.60	7.19	5.66	3.97
Me n	6.20	5.76	4.58	5.51	6.44	5.77	4.33
T_1	7.05	6.74	5.54				
T_2	6.81	5.79	4.69				
T_3	4.72	4.76	3.51				

S.E. of difference of two

- | | | | |
|-----------------------------------|---------------|-----------------------------------|---------------|
| 1. D marginal means | =0.23 ton/ac. | 6. T means at the same level of S | =0.19 ton/ac. |
| 2. S marginal means | =0.10 ton/ac. | 7. S means at the same level of T | =0.22 ton/ac. |
| 3. T marginal means | =0.11 ton/ac. | 8. S means at the same level of D | =0.17 ton/ac. |
| 4. T means at the same level of D | =0.19 ton/ac. | 9. D means at the same level of S | =0.27 ton/ac. |
| 5. D means at the same level of T | =0.03 ton/ac. | | |

Crop :- Potato (Rabi).

Ref :- I.A.R.I. 52(40).

Type :- 'CM'.

Object :—To study the effect of date of sowing, time of application of fertilizers and spacing between rows on Potato yield.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) As per treatments. (iv) (a) Preparing seed beds by *desi* plough after irrigating the land. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) 1st and 2nd earthing thrice in each main-plot. (ix) N.A. (x) 7, 8, 10 to 12.4.1953.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : $D_1=24.9.1952$, $D_2=14.10.1952$ and $D_3=4.11.1952$.

Sub-plot treatments :

3 spacings between the rows : $S_1=1\frac{1}{2}'$, $S_2=2'$ and $S_3=2\frac{1}{2}'$.

Sub-sub-plot treatments :

3 time of application of fertilizers : $T_1=$ Full dose at sowing, $T_2=\frac{1}{2}$ at sowing + $\frac{1}{2}$ at 1st earthing and $T_3=\frac{1}{2}$ at sowing + $\frac{1}{2}$ at 1st earthing + $\frac{1}{2}$ at 2nd earthing.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) $30' \times 15'$. (b) $26' \times 13'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Heavy attack of mosaic, and cut-worm. (iii) Yield of potato. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 13.26 ton/ac.
 (ii) (a) 1.76 ton/ac.
 (b) 0.71 ton/ac.
 (c) 0.67 ton/ac.
 (iii) D effect is significant, T and S effects are highly significant and interactions are significant.
 (iv) Av. yield of potato in ton/ac.

	S_1	S_2	S_3	Mean	T_1	T_2	T_3
D_1	12.30	10.73	7.39	10.14	10.05	11.29	9.08
D_2	16.89	14.51	11.57	14.32	14.91	15.28	12.79
D_3	17.49	14.44	14.06	15.33	17.53	16.24	12.22
Mean	15.56	13.23	11.01	13.26	14.16	14.27	11.36
T_1	16.99	13.35	12.15				
T_2	16.22	15.09	11.49				
T_3	13.48	11.23	9.38				

S.E. of difference of two

- | | | | |
|-----------------------------------|---------------|-----------------------------------|---------------|
| 1. D marginal means | =0.41 ton/ac. | 6. T means at the same level of S | =0.27 ton/ac. |
| 2. S marginal means | =0.17 ton/ac. | 7. S means at the same level of T | =0.28 ton/ac. |
| 3. T marginal means | =0.16 ton/ac. | 8. S means at the same level of D | =0.29 ton/ac. |
| 4. T means at a level of D | =0.28 ton/ac. | 9. D means at the same level of S | =0.23 ton/ac. |
| 5. D means at the same level of T | =0.47 ton/ac. | | |

Crop :- Potato (*Rabi*).

Ref :- I.A.R.I. 53(45). Type :- 'CM'.

Object :- To study the effect of sowing, time of application of fertilizers and spacing between the rows of Potato.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) As per treatments. (iv) (a) Ploughed twice with *desi* plough. The bunds and channels were prepared with victory plough. (b) to (e) N.A. (v) A/S at 6.19 lb., Super at 1.50 lb. and Pot. Sul. at 0.83 lb. for each sub-plot. (vi) N.A. (vii) Irrigated. (viii) Weeding and twice earthing. (ix) N.A. (x) 31.3.1954 ; 1 to 3.4.1954.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D_1 , D_2 and $D_3 = \text{N.A.}$

Sub-plot treatments :

3 spacings between rows : $S_1 = 1\frac{1}{2}'$, $S_2 = 2'$ and $S_3 = 2\frac{1}{2}'$.

Sub-sub-plot treatments :

3 times of application of fertilizer : $T_1 = \text{Whole}$ at the time of sowing, $T_2 = \frac{1}{2}$ at sowing + $\frac{1}{2}$ at the first earthing and $T_3 = \frac{1}{2}$ at sowing + $\frac{1}{2}$ at first earthing + $\frac{1}{2}$ at 2nd earthing.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $30' \times 15'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of potato. (iv) (a) 1951—N.A. (b) and (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1.79 ton/ac.

(ii) (a) 0.75 ton/ac.

(b) 0.53 ton/ac.

(c) 0.39 ton/ac.

(iii) Effects of D and T are highly significant. S effect is significant. Others are not significant.

(iv) Av. yield of potato in ton/ac.

	S_1	S_2	S_3	Mean	T_1	T_2	T_3
D_1	1.25	1.38	1.10	1.24	1.29	1.35	1.09
D_2	2.46	2.29	1.90	2.22	2.51	2.10	2.05
D_3	1.89	1.99	1.81	1.90	2.08	1.82	1.79
Mean	1.87	1.89	1.60	1.79	1.96	1.76	1.64
T_1	2.02	1.99	1.86				
T_2	1.94	1.82	1.51				
T_3	1.64	1.85	1.44				

S.E. of difference of two

1. D marginal means = 0.177 ton/ac.
2. S marginal means = 0.125 ton/ac.
3. T marginal means = 0.092 ton/ac.
4. T means at the same level of D or S = 0.159 ton/ac.
5. D means at the same level of T = 0.219 ton/ac.
6. S means at the same level of T = 0.180 ton/ac.
7. S means at the same level of D = 0.216 ton/ac.
8. D means at the same level of S = 0.250 ton/ac.

Crop :- Potato (*Rabi*).

Ref :- I.A.R.I. 51(34).

Type :- 'IM'.

Object:—To study the effect of manuring and irrigation along with different depth of furrows on the yield of Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 27.10.1951. (iv) (a) One ploughing and one cross ploughing. (b) to (e) N.A. (v) 100 md. of F.Y.M./ac. (vi) N.A. (vii) Irrigated. (viii) Weeding after every irrigation. (ix) 2.83". (x) 5, 6.4.1952.

2. TREATMENTS :

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

1. No. of irrigations : $I_1=5$, $I_2=7$ and $I_3=9$ irrigations.
2. Depth of furrows : $F_1=4\frac{1}{2}$ ", $F_2=6$ " and $F_3=9$ " deep.
3. 3 levels of N : $N_1=40$, $N_2=80$ and $N_3=120$ lb./ac.

3. DESIGN :

(i) 3^3 factorial. (ii) (a) 9. (b) N.A. (iii) 2. (iv) (a) N.A. (b) $24' \times 15'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fairly good. (ii) Negligible attack of mosaic. (iii) Yield of potato. (iv) (a) No. (b) No. (c) N.A. (v) (a), (b) No. (vi) Crop damaged by hail storm. (vii) Nil.

5. RESULTS :

- (i) 5.05 ton/ac.
- (ii) 0.47 ton/ac.
- (iii) N and V effects are highly significant. Interaction $F \times I$ and $F \times N$ are significant. Others are not significant.
- (iv) Av. yield of potato in ton/ac.

	N_1	N_2	N_3	Mean	F_1	F_2	F_3
I_1	4.25	4.57	4.43	4.42	3.70	4.59	4.94
I_2	5.05	5.68	5.31	5.35	4.93	6.12	4.98
I_3	4.99	5.83	5.35	5.39	4.62	6.26	5.29
Mean	4.76	5.37	5.03	5.05	4.42	5.66	5.07
F_1	4.27	4.67	4.32				
F_2	4.93	6.48	5.58				
F_3	5.09	4.95	5.17				

S.E. of any marginal mean
S.E. of body of any table

=0.11 ton/ac.
=0.19 ton/ac.

Crop :- Potato.

Ref :- I.A.R.I. 53(68).

Type :- 'IM'.

Object :- To study the effect of depth of furrows, N and irrigation on the yield of Potato.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 24.10.1953. (iv) (a) 4 cross ploughing by *desi* plough. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) 2 earthings. (ix) N.A. (x) 1st week of March 1954.

2. TREATMENTS :

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

- (1) No. of irrigations : $I_1=5$, $I_2=7$ and $I_3=9$ irrigations.
- (2) Depth of furrows : $F_1=4\frac{1}{2}$ ", $F_2=6$ " and $F_3=9$ " deep.
- (3) 3 levels of N : $N_1=40$, $N_2=80$ and $N_3=120$ lb./ac.

3. DESIGN :

(i) 3^3 confounded factorial. (ii) (a) 9. (b) N.A. (iii) 2. (iv) (a) 1/121 ac. (b) 1/200 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Below normal. (ii) Nil. (iii) Yield of potato. (iv) (a) 1951—N.A. (b) No. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Raw data N.A.

5. RESULTS :

- (i) 4.07 ton/ac.
(ii) 0.85 ton/ac.
(iii) None of effects is significant.
(iv) Av. yield of potato in ton/ac.

Treatment	Av. yield	Treatment	Av. yield	Treatment	Av. yield
I ₁	3.84	F ₁	3.92	N ₁	3.93
I ₂	4.37	F ₂	4.12	N ₂	4.16
I ₃	4.01	F ₃	4.18	N ₃	4.12
S.E./mean		=0.20 ton/ac.			

Crop :- Carrot (*Rabi*).

Ref :- I.A.R.I. 52(63).

Type :- 'CM'.

Object :- To study the effect of different methods of cultivation and fertilizer application on the yield of Carrots.

1. BASAL CONDITIONS :

- (i) (a) No. (b) and (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 3, 14, 10, 1952. (iv) (a) to (e) As under treatments. (v) B.D. of F.Y.M. at 120 md./ac. (vi) N.A. (vii) Irrigated. (viii) weeding and thinning (ix) N.A. (x) 7, 9 to 22, 24.3.1953.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

- (1) 3 ploughings : C₁=9" to 10" deep ploughing by tractor, C₂=5" deep by mould bord plough and C₃=5" deep by country plough.
(2) 2 methods of applying fertilizers : M₁=Placement with plough sole and M₂=Broadcast.

Sub-plot treatments :

- (3) 3 fertilizer mixtures : N₁=80 lb./ac. of N+80 lb./ac. of P₂O₅+40 lb./ac. of K₂O, N₂=120 lb./ac. of N+80 lb./ac. of P₂O₅+40 lb./ac. of K₂O and N₃=120 lb./ac. of N.

Source of fertilizers N.A.

3. DESIGN :

- (i) Split-plot. (ii) (a) 6 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/69 ac. (b) 1/79 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) Nil. (iii) Yield of carrot. (iv) (a) 1952-N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 21.88 ton/ac.
(ii) (a) 5.37 ton/ac.
(b) 4.70 ton/ac.
(iii) M effect alone is significant.
(iv) Av. yield of carrot in ton./ac.

	C ₁	C ₂	C ₃	Mean	N ₁	N ₂	N ₃
M ₁	22.11	20.40	21.02	21.18	21.83	20.79	20.91
M ₂	20.83	22.83	24.09	22.58	22.85	24.64	20.26
Mean	21.47	21.61	22.55	21.88	22.34	22.72	20.59
N ₁	22.15	22.59	22.27				
N ₂	23.92	21.43	22.80				
N ₃	18.35	20.82	22.59				

S.E. of difference of two

1. C marginal means	=1.55 ton/ac.
2. M marginal means	=1.27 ton/ac.
3. N marginal means	=1.36 ton/ac.
4. N means at the same level of C	=2.35 ton/ac.
5. C means at the same level of N	=2.46 ton/ac.
6. N means at the same level of M	=1.92 ton/ac.
7. M means at the same level of N	=2.83 ton/ac.
S.E. of body of C×M table	=1.55 ton/ac.

Crop :- Carrot (*Rabi*).

Ref :- I.A.R.I. 53(60).

Type :- 'CM'.

Object —To study the effect of different methods of cultivation and fertilizer application on the yield of Carrots.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 15 and 16 10. 1953. (iv) and (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) Gap-filling, thinning and weeding. (ix) N.A. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 ploughings : $C_1=9''$ to $10''$ deep ploughing by tractor, $C_2=5''$ deep by mould bord plough and $C_3=5''$ deep by country plough.

(2) 2 methods of applying fertilizers : $M_1=$ Placement with plough sole and $M_2=$ Broadcast.

Sub-plot treatments :

(3) 3 fertilizer mixtures : $N_1=80$ lb./ac. of N+80 lb./ac. of P_2O_5 +40 lb./ac. of K_2O , $N_2=120$ lb./ac. of N+80 lb./ac. of P_2O_5 +40 lb./ac. of K_2O and $N_3=120$ lb./ac. of N.

Source of fertilizers N.A.

3. DESIGN :

(i) Split-plot. (ii) 6 main-plots/block and 3 sub-plots/main-plot. (iii) 4. (iv) 1/60 ac. (b) 1/70 ac. (v) Yes. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 8.11 ton/ac.
 (ii) (a) 42.38 ton/ac.
 (b) 26.26 ton/ac.
 (iii) Interaction main-plot × sub-plot is highly significant.
 (iv) Av. yield of carrot in ton/ac.

	C_1	C_2	C_3	Mean	N_1	N_2	N_3
M_1	7.00	5.69	7.11	6.60	6.84	6.69	6.27
M_2	11.31	9.31	8.29	9.64	10.55	9.26	9.10
Mean	9.16	7.50	7.70	8.12	8.69	7.97	7.68
N_1	9.76	8.29	8.03				
N_2	9.13	7.11	7.68				
N_3	8.58	7.09	7.38				

S. E. of difference of two

1. C marginal means	=12.23 ton/ac.
2. M marginal means	= 9.99 ton/ac.
3. N marginal means	= 7.58 ton/ac.
4. N means at the same level of C	=13.13 ton/ac.
5. C means at the same level of N	=16.27 ton/ac.
6. N means at the same level of M	=10.72 ton/ac.
7. M means at the same level of N	=17.64 ton/ac.
S.E. of body of C×M table	=12.23 ton/ac.

Crop :- Sweet Potato (*Kharif*).

Ref :- I.A.R.I. 52(67).

Type :- 'CV'.

Object :-To study the effect of different cultural practices on different varieties of Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 4 to 7.7.1952. (iv) (a) Ploughing with tractor and *desi* plough twice and making ridges. (b) Ridge planting. (c) to (e) N.A. (v) F.Y.M. at 5 ton/ac. (vi) As per treatments. (vii) Irrigated. (viii) Weeding and thinning. (ix) 13.44". (x) February, 1953.

2. TREATMENTS :

Main-plot treatments :

2 methods of ploughing : P₁=On flat and P₂=On ridges.

Sub-plot treatments :

2 varieties : V₁=T.S.T. white and V₂=F.A. 17.

Sub-sub-plot treatments :

3 spacings between lines : S₁=6, S₂=9 and S₃=12 inches.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) 28'×28'. (b) 26'×26'. (v) 1' on each side. (vi) Yes.

4. GENERAL :

(i) Fairly good. (ii) Attack of stem weevil and leaf roller. (iii) Potato yield. (iv) (a) 1952—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1.05 ton/ac.
(ii) (a) 0.41 ton/ac.
(b) 0.76 ton/ac.
(c) 0.36 ton/ac.
(iii) V effect alone is highly significant.
(iv) A . yield potato in ton/ac.

	P ₁	P ₂	Mean	V ₁	V ₂
S ₁	0.95	1.13	1.04	0.61	1.46
S ₂	1.11	1.05	1.08	0.73	1.42
S ₃	0.92	1.14	1.03	0.52	1.54
Mean	0.99	1.10	1.05	0.62	1.47
V ₁	0.59	0.64			
V ₂	1.39	1.56			

S.E. of difference of two

- | | | | |
|-----------------------------------|---------------|-----------------------------------|---------------|
| 1. P marginal means | =0.12 ton/ac. | 6. S means at the same level of V | =0.18 ton/ac. |
| 2. V marginal means | =0.22 ton/ac. | 7. V means at the same level of S | =0.26 ton/ac. |
| 3. S marginal means | =0.13 ton/ac. | 8. V means at the same level of P | =0.30 ton/ac. |
| 4. S means at the same level of P | =0.18 ton/ac. | 9. P means at the same level of V | =0.16 ton/ac. |
| 5. P means at the same level of S | =0.19 ton/ac. | | |

Crop :- Sweet Potato (*Kharif*).

Ref :- I.A.R.I. 53(56),

Type :- 'CV':

Object :- To study the effect of different cultural practices on different varieties of Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.6.1953 to 22.6.1953. (iv) (a) Ploughing with victory plough, *desi* plough, tractor and levelling. (b) to (e) N.A. (v) F.Y.M. at 10 ton/ac. and A/S at 20 lb./ac. of N. (vi) N.A. (vii) Irrigated. (viii) Weeding and hoeing. (xi) 25.35°. (x) 17.12.1953 to 9.1.1954.

2. TREATMENTS :

Main-plot treatments :

2 methods of ploughing : P₁=On flat and P₂=On ridges.

Sub-plot treatments :

2 varieties : V₁=T.S.T. white and V₂=F.A. 17.

Sub-sub-plot treatments :

3 spacings between lines : S₁=6, S₂=9 and S₃=12 inches.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) 30' × 24'. (b) 28' × 21'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Stem weevil-spraying of D.D.T. (iii) Yield of sweet potato. (iv) (a) 1952—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2.14 ton/ac.
(ii) (a) 0.67 ton/ac.
(b) 1.19 ton/ac.
(c) 0.81 ton/ac.
(iii) V effect alone is highly significant.
(iv) Av. yield of sweet potato in ton/ac.

	P ₁	P ₂	Mean	V ₁	V ₂
S ₁	1.80	2.31	2.06	1.26	2.86
S ₂	2.28	2.15	2.22	1.50	2.93
S ₃	1.94	2.34	2.14	1.06	3.22
Mean	2.01	2.27	2.14	1.27	3.00
V ₁	1.22	1.33			
V ₂	2.80	3.20			

S.E. of difference of two

- | | | | |
|-----------------------------------|---------------|-----------------------------------|---------------|
| 1. P marginal means | =0.19 ton/ac. | 6. S means at the same level of V | =0.33 ton/ac. |
| 2. V marginal means | =0.34 ton/ac. | 7. V means at the same level of S | =0.36 ton/ac. |
| 3. S marginal means | =0.23 ton/ac. | 8. V means at the same level of P | =0.48 ton/ac. |
| 4. S means at the same level of P | =0.33 ton/ac. | 9. P means at the same level of V | =0.39 ton/ac. |
| 5. P means at the same level of S | =0.39 ton/ac. | | |

Crop :- Gram (*Rabi*).

Ref :- I.A.R.I. 52(27c).

Type :- 'C'.

Object :—To study the effect of sowing premature and mature seeds on Gram yield.

1. BASAL CONDITIONS to 4. GENERAL.

Please refer to I.A.R.I. 52(27) on WHEAT.

5. RESULTS :

- (i) 1576 lb./ac.
- (ii) 297.9 lb./ac.
- (iii) Treatments do not differ significantly.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1986
2.	1484
3.	1259
S.E./mean	=105.3 lb./ac.

Crop :- Gram.

Ref :- I.A.R.I. 53(32c).

Type :- 'C'.

Object :—To study the effect of sowing premature and mature seeds on Gram yield.

1. BASAL CONDITIONS to 4. GENERAL :

Please refer to I.A.R.I. 53(32) on WHEAT.

5. RESULTS :

- (i) 94³ lb./ac.
- (ii) 207.4 lb./ac.
- (iii) Treatments differ highly significantly.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1209
2.	941
3.	695
S E./mean	=73.23 lb./ac.

Crop :- Peas.

Ref :- I.A.R.I. 53(16).

Type :- 'M'.

Object :—To study the effect of inorganic and organic manures on the yield of crops in the rotation of cereals.

1. BASAL CONDITIONS :

(i) (a) Maize-Wheat-Maize-Peas. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page.143. (iii) 28.10.1953. (iv) (a) Dry victory plough and *desi* plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) N.A. (viii) *Bakharing* on 27.11.1953, weeding on 5.1.1954 and weeding on 17.2.1954 to 18.2.1954. (ix) N.A. (x) 23.3.1954.

2. TREATMENTS :

- 1. Control.
 - 2. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅.
 - 3. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+K at 100 lb./ac. of K₂O.
 - 4. F.Y.M. at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+K at 100 lb./ac. of K₂O.
 - 5. Castor cake at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+100 lb./ac. of K₂O.
- Organic manures (F.Y.M. and Castor cake) to be applied to maize in full dose and artificial manures half to maize and half to peas.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38'×29'. (b) 36'×27'. (v) 1' around. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1955. (b) Yes. (c) N.A. (v) (a), (b) No. (iv) Nil. (vii) Nil.

5. RESULTS :

- (i) 1013 lb./ac.
 (ii) 314.3 lb./ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	874
2.	1045
3.	1170
4.	946
5.	1029
S.E./mean	=128.4 lb./ac.

Crop :- Peas (*Rabi*).

Ref :- I.A.R.I. 51(58). Type :- 'MV'.

Object :- To study the effect of placement of Super at different depths and at different levels on Pea varieties.

1. BASAL CONDITIONS :

- (i) (a) N.A. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 17.10.1951. (iv) (a) *Palewa* followed by *desi* plough twice. (b) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) Gap-filling was done on 1st week of Dec. 1951. (ix) N.A. (x) 1st and 2nd week of April, 1952.

2. TREATMENTS :

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

- (1) 3 varieties : V_1 =N P. 29, V_2 =Phillipare smooth and V_3 =Delroyche comments.
 (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=40$ and $P_2=80$ lb./ac.
 (3) 3 depth of placement of Super : D_1 =Broadcast, D_2 =Placed $2\frac{1}{2}$ " below seed and D_3 =Placed $4\frac{1}{2}$ " below seed.

Super placement was done along with sowing in P_0 , P_1 , P_2 .

3. DESIGN :

- (i) 3^3 confounded factorial. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) $52' \times 14'$. (b) $52' \times 10'$. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) The crop was very heterogeneous. (ii) N.A. (iii) Grain yield. (iv) (a) 1951—N.A. (b) No. (c) N.A. (v) (a), (b) No. (vi) Hail storm on 1st march 1952 damaged the crop considerably. (vii) Raw data N.A. Hence the two way tables could not be presented.

5. RESULTS :

- (i) 498.4 lb./ac.
 (ii) N.A.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield	Treatment	Av. yield
V_1	565.3	D_1	548.0	P_0	478.1
V_2	469.0	D_2	464.9	P_1	478.9
V_3	460.8	D_3	482.2	P_2	538.1

Crop :- Peas (*Rabi*).

Ref :- I.A.R.I. 53(123).

Type :- 'M'.

Object :—To study the effect of different manures on crop yield with different rotations.

1. BASAL CONDITIONS:

(i) (a) First year : Maize-Oats, Second year : Maize-Peas, Third year : Maize-Wheat and Fourth year Maize- Gram (8 course rotation). (b) Maize. (c) As per treatments. (ii) (a) Light loam. (b) N.A. (iii) 30.10.1953. (iv) (a) 4 *desi* ploughings. (b) Sown behind the plough. (c) 24 seers/ac. (d) Row to Row-1' apart. (e) —. (v) Nil. (vi) N.P. 29 (medium). (vii) Unirrigated. (viii) Weeding. (ix) 2.17" (x) 23.2.1954.

2. TREATMENTS :

- | | |
|---|---|
| 1. Control. | 6. Super at 80 lb./ac. of P ₂ O ₅ . |
| 2. F.Y.M. at 8000 lb./ac. | 7. Treatment 4+Treatment 5. |
| 3. Rape cake at 40 lb./ac. of N. | 8. Treatment 4+Treatment 6. |
| 4. A/S at 40 lb./ac. of N. | 9. Treatment 5+Treatment 6. |
| 5. Pot. Sul. at 50 lb./ac. of K ₂ O. | 10. Treatment 4+Treatment 5+Treatment 6. |

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 10. (iv) (a) 44'×24'. (b) 42'×22'. (v) 1' around the plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1933-1961 (8th year of the expt.). (b) Yes. (c) Nil. (v) (a) No. (b) Nil. (vi) Nil. (vii) The experiment was conducted at the Botanical Sub-station, Pusa (Bihar).

5. RESULTS :

- (i) 927.4 lb./ac.
(ii) 85.49 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	699	6.	990
2.	1406	7.	727
3.	1083	8.	1011
4.	733	9.	882
5.	748	10.	995
	S.E./mean		=27.04 lb./ac.

Crop :- Peas (*Rabi*).

Ref :- I.A.R.I. 53(8).

Type :- 'M'.

Object :—To study the effect of manures on the yield of Pea crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) As per treatments. (ii) (a) and (b) N.A. (i i) 21, 30.11.1953. (iv) (a) 1 ploughing with empire plough and one with *desi* plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Nil. (viii) 1 hoeing with wallace horse hoe and 1 weeding. (ix) 1.08". (x) 23 to 26.2.1954.

2. TREATMENTS :

- | | |
|--|---|
| 1. No manure. | 6. Super at 40 lb./ac. of P ₂ O ₅ . |
| 2. F.Y.M. 8000 lb./ac. | 7. Treatment 4+Treatment 5. |
| 3. Rape cake 40 lb./ac. of N. | 8. Treatment 4+Treatment 6. |
| 4. A/S 20 lb./ac. of N. | 9. Treatment 5+Treatment 6. |
| 5. Pot. Sul. 25 lb./ac. of K ₂ O. | 10. Treatment 4+Treatment 5+Treatment 6. |
- Application of F.Y.M. on 5th June, Rape cake on 9th June, fertilizers on 16th and again Rape cake on 24th August 1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 10. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Wilt in the plots where F.Y.M. was applied. (iii) Grain yield. (iv) (a) 1932—1953. (b) and (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) The experiment was conducted at the Botanical Sub-station, Pusa (Bihar).

5. RESULTS :

- (i) 802 lb./ac.
 (ii) 297.0 lb./ac.
 (iii) Treatments differ highly significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	604	6.	857
2.	1217	7.	629
3.	937	8.	874
4.	634	9.	763
5.	647	10.	1046

S.E./mean = 60.9 lb./ac.

Crop :- Peas (*Rabi*).

Ref :-I.A.R.I. 52 (27 a)

Type :- 'C'.

Object :-To study the effect of sowing premature and mature seeds on Peas yield.

1. BASAL CONDITIONS to 4. GENERAL

Please refer to No. I.A.R.I. 52 (27) on WHEAT

5. RESULTS :

- (i) 2142 lb./ac.
 (ii) 309.5 lb./ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2681
2.	2456
3.	1289
S.E./mean	=109.4 lb./ac.

Crop :-Peas

Ref :-I.A.R.I. 53(32a)

Type :-'C'

Object :-To study the effect of sowing premature and mature seeds on Peas yield.

1. BASAL CONDITIONS to 4. GENERAL.

Please refer to No. I.A.R.I. 53(32) on WHEAT.

5. RESULTS :

- (i) 948 lb./ac.
 (ii) 216.4 lb./ac.
 (iii) Treatments differ highly significantly.
 (iv) Av.yield of grain in lb./ac.

Treatment	Av. yield
1.	1165
2.	972
3.	706
S.E./mean.	=76.5 lb./ac.

Crop :- Cowpeas (*Kharif*).

Ref :- I.A.R.I. 50(59).

Type :- 'M'.

Object :- To study the effect of phosphatic manuring of berseem and its residual effect on Cowpeas.

1. BASAL CONDITIONS :

(i) (a) Berseem—Cowpeas—Berseem—(Wheat after 3 years). (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 23.7.1950. (iv) (a) 1 ploughing with victory plough and 2 ploughings with *desi* plough. (b) to (e) N.A. (v) N.A. (vi) and (vii) N.A. (viii) 3 hoeings with *desi* plough. (ix) N.A. (x) 4 to 9.10.1950.

2. TREATMENTS :

- | | |
|---------------------------------------|--|
| 1. F.Y.M. at 16 lb./ac. of P_2O_5 . | 7. Super at 8 lb./ac. of P_2O_5 +F.Y.M. at 8 lb./ac. of P_2O_5 . |
| 2. F.Y.M. at 32 lb./ac. of P_2O_5 . | 8. Super at 8 lb./ac. of P_2O_5 +F.Y.M. at 24 lb./ac. of P_2O_5 . |
| 3. F.Y.M. at 64 lb./ac. of P_2O_5 . | 9. Super at 8 lb./ac. of P_2O_5 +F.Y.M. at 56 lb./ac. of P_2O_5 . |
| 4. Super at 16 lb./ac. of P_2O_5 . | 10. F.Y.M. at 8 lb./ac. of P_2O_5 +Super at 24 lb./ac. of P_2O_5 . |
| 5. Super at 32 lb./ac. of P_2O_5 . | 11. F.Y.M. at 8 lb./ac. of P_2O_5 +Super at 56 lb./ac. of P_2O_5 . |
| 6. Super at 64 lb./ac. of P_2O_5 . | 12. No manure. |
| | 13. Fallow in berseem season. |

Treatments applied to previous crop berseem.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 63'×15'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Fodder yield. (iv) (a) 1948—1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Replications I and II were comparatively more breedy than other replications.

5. RESULTS :

- (i) 4.30 ton/ac.
(ii) 0.95 ton/ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield	Treatment	Av. yield
1.	3.99	8.	4.22
2.	4.67	9.	5.42
3.	4.59	10.	4.41
4.	4.07	11.	4.49
5.	4.09	12.	3.13
6.	4.96	13.	4.32
7.	3.59		
	S.E./mean		=0.39 ton/ac.

Crop :- Cowpeas (*Kharif*).

Ref :- I.A.R.I. 51(61).

Type :- 'M'.

Object :- To study the effect of P on the yield of berseem and the residual effect on the yield of Cowpeas.

1. BASAL CONDITIONS :

(i) (a) Berseem—Cowpeas—Berseem (Wheat after 3 years). (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 6.7.1951, resowing on 31.7.1951. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 27.10.1951, 28.10.1951 and 29.10.1951.

2. TREATMENTS :

- | | |
|---------------------------------------|--|
| 1. F.Y.M. at 16 lb./ac. of P_2O_5 . | 7. Super at 8 lb./ac. of P_2O_5 +F.Y.M. at 8 lb./ac. of P_2O_5 . |
| 2. F.Y.M. at 32 lb./ac. of P_2O_5 . | 8. Super at 8 lb./ac. of P_2O_5 +F.Y.M. at 24 lb./ac. of P_2O_5 . |
| 3. F.Y.M. at 64 lb./ac. of P_2O_5 . | 9. Super at 8 lb./ac. of P_2O_5 +F.Y.M. at 56 lb./ac. of P_2O_5 . |
| 4. Super at 16 lb./ac. of P_2O_5 . | 10. F.Y.M. at 8 lb./ac. of P_2O_5 +Super at 24 lb./ac. of P_2O_5 . |
| 5. Super at 32 lb./ac. of P_2O_5 . | 11. F.Y.M. at 8 lb./ac. of P_2O_5 +Super at 56 lb./ac. of P_2O_5 . |
| 6. Super at 64 lb./ac. of P_2O_5 . | 12. No manure. |
| | 13. Fallow in berseem season. |

Treatments applied to previous crop berseem.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 63'×15'. (v) N.A. (vi) Yes.

4 GENERAL:

- (i) Poor. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1948-1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) No rains, scarcity of water, dry and hot weather. (vii) Nil.

5. RESULTS :

- (i) 1.62 ton/ac.
 (ii) 0.97 ton/ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1.33	8.	1.17
2.	1.80	9.	1.82
3.	1.42	10.	1.58
4.	1.22	11.	1.76
5.	2.46	12.	1.31
6.	1.53	13.	2.08
7.	1.62		

S.E./mean

=0.40 ton/ac.

Crop :- Cowpeas (*Kharif*).

Ref :- I.A.R.I. 52 (14).

Type :- 'M'.

Object :- To study the effect of the yield of P on berseem and residual effect on Cowpeas yield..

1. BASAL CONDITIONS :

- (i) (a) Berseem—Cowpeas (Wheat after 3 years). (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.6.1952. (iv) (a) Preparing land with *desi* plough. After harvesting wheat, land ploughed twice and sowing done with third ploughing. (b) N.A. (c) 46 srs/ac. (d) and (e) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) 29,30.8.1952.

2. TREATMENTS :

- | | |
|--|---|
| 1. F.Y.M. at 16 lb./ac. of P ₂ O ₅ . | 7. Super at 8 lb./ac. of P ₂ O ₅ +F.Y.M. at 8 lb./ac. of P ₂ O ₅ . |
| 2. F.Y.M. at 32 lb./ac. of P ₂ O ₅ . | 8. Super at 8 lb./ac. of P ₂ O ₅ +F.Y.M. at 24 lb./ac. of P ₂ O ₅ . |
| 3. F.Y.M. at 64 lb./ac. of P ₂ O ₅ . | 9. Super at 8 lb./ac. of P ₂ O ₅ +F.Y.M. at 56 lb./ac. of P ₂ O ₅ . |
| 4. Super at 16 lb./ac. of P ₂ O ₅ . | 10. F.Y.M at 8 lb./ac. of P ₂ O ₅ +Super at 24 lb./ac. of P ₂ O ₅ . |
| 5. Super at 32 lb./ac. of P ₂ O ₅ . | 11. F.Y.M at 8 lb./ac. of P ₂ O ₅ +Super at 56 lb./ac. of P ₂ O ₅ . |
| 6. Super at 64 lb./ac. of P ₂ O ₅ . | 12. No manure. |
| | 13. Fallow in berseem season. |

Treatments applied to berseem.

3. DESIGN :

- (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 63'×15'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1948-54. (b) Yes. (c) N.A. (a) and (b) No (vi) and (vii) Nil.

5. RESULTS :

- (i) 2.41 ton/ac.
 (ii) 0.85 ton/ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield	Treatment	Av. yield
1.	2.21	8.	3.05
2.	1.80	9.	2.01
3.	2.29	10.	2.82
4.	2.30	11.	2.71
5.	2.58	12.	2.57
6.	2.88	13.	2.06
7.	2.06		

S.E./mean

= 0.35 ton/ac.

Crop :- Cowpeas (*Kharif*).

Ref :- I.A.R.I. 53(73).

Type :- 'M'.

Object :- To study the effect of P_2O_5 on the yield of berseem and its residual effect on Cowpeas yield.

1. BASAL CONDITIONS :

(i) (a) Berseem-Cowpeas-Berseem (Wheat after 3 years). (b) Wheat. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 20 to 22.6.1953. (iv) (a) 1 dry ploughing with victory plough and preparation of land. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) N.A. (x) 1.9.1953 to 3.9.1953.

2. TREATMENTS :

- | | |
|---------------------------------------|--|
| 1. F.Y.M. at 16 lb./ac. of P_2O_5 . | 7. Super at 8 lb./ac. of P_2O_5 +F.Y.M. at 8 lb./ac. of P_2O_5 . |
| 2. F.Y.M. at 32 lb./ac. of P_2O_5 . | 8. Super at 8 lb./ac. of P_2O_5 +F.Y.M. at 24 lb./ac. of P_2O_5 . |
| 3. F.Y.M. at 64 lb./ac. of P_2O_5 . | 9. Super at 8 lb./ac. of P_2O_5 +F.Y.M. at 56 lb./ac. of P_2O_5 . |
| 4. Super at 16 lb./ac. of P_2O_5 . | 10. F.Y.M. at 8 lb./ac. of P_2O_5 +Super at 24 lb./ac. of P_2O_5 . |
| 5. Super at 32 lb./ac. of P_2O_5 . | 11. F.Y.M. at 8 lb./ac. of P_2O_5 +Super at 56 lb./ac. of P_2O_5 . |
| 6. Super at 64 lb./ac. of P_2O_5 . | 12. No manure. |
| | 13. Fallow in berseem season. |

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 63'×15'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of green fodder. (iv) (a) 1948—1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3.41 ton/ac.
(ii) 0.80 ton/ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield	Treatment	Av. yield
1.	2.85	8.	3.13
2.	3.83	9.	2.89
3.	3.21	10.	3.14
4.	4.31	11.	3.40
5.	3.17	12.	3.14
6.	3.69	13.	3.74
7.	3.88		

S.E./mean

=0.33 ton/ac.

Crop :- Cowpeas.

Ref :- I.A.R.I. 52(28 c).

Type :- 'C'.

Object :- To study the effect of sowing premature and mature seed on Cowpeas yield.

1. BASAL CONDITIONS to 4. GENERAL :

Please refer to No. I.A.R.I. 52(28) under MAIZE.

5. RESULTS :

- (i) 2909 lb./ac.
(ii) 20.16 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield in lb./ac.

Treatment	Av. yield
1.	3165
2.	2855
3.	2706
S.E./mean	=8.23 lb./ac.

Crop :- Cowpeas.

Ref :- I.A.R.I. 53(31 c).

Type :- 'C'.

Object :—To study the effect of premature and mature seed on the yield of Cowpeas.

1. BASAL CONDITIONS to 4. GENERAL :

Please refer to No. I.A.R.I. 53(31) under MAIZE.

5. RESULTS :

- (i) 422.1 lb./ac.
(ii) N.A.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	562.8
2.	464.9
3.	238.6

Crop :- Sugarcane.

Ref :- I.A.R.I. 50(1).

Type :- 'MV'.

Object :—To study the effect of N on different Sugarcane varieties.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 2nd week of March 1950.
(iv) (a) Tractor ploughing and tractor discing. (b) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Horse hoeing and weeding. (ix) N.A. (x) End of April 1951.

2. TREATMENTS :

Main-plot treatments :

6 varieties : $V_1=CO-312$, $V_2=CO-647$, $V_3=CO-622$, $V_4=CO-655$, $V_5=CO-659$ and $V_6=CO-680$.

Sub-plot treatments :

4 levels of N as A/S : $N_0=0$, $N_1=40$, $N_2=80$ and $N_3=120$ lb./ac.

3. DESIGN :

- (i) Split-plot. (ii) (a) 6 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 75'×18'. (b) 75'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. Lodging took place. (ii) Top borer. (iii) Yield of sugarcane. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 23.73 ton/ac.
(ii) (a) 7.27 ton/ac.
(b) 2.31 ton/ac.
(iii) V and N effects are highly significant while interaction is not significant.
(iv) Av. yield of sugarcane in ton/ac.

	V_1	V_2	V_3	V_4	V_5	V_6	Mean
N_0	19.04	23.13	22.35	23.32	23.64	23.40	22.48
N_1	20.54	25.81	22.89	20.87	23.45	24.99	23.09
N_2	21.15	25.87	25.06	21.52	25.55	26.17	24.22
N_3	23.08	27.08	24.69	22.82	26.77	26.09	25.09
Mean	20.95	25.52	23.75	22.13	24.85	25.16	23.73

S.E. of difference of two

1. V marginal means =2.97 ton/ac.
2. N marginal means =0.77 ton/ac.
3. N means at the same level of V =1.89 ton/ac.
4. V means at the same level of N =3.39 ton/ac.

Crop :- Sugarcane.

Ref :- I.A.R.I. 51(1).

Type :- 'MV'.

Object :- To study the effect of N on different Sugarcane varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 10 to 12.3.1951. (iv) (a) Tractor ploughing, disc hoeing and grubbing. (b) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) N.A. (viii) Harrowed on March 31.3.1951. (ix) N.A. (x) N.A.

2. TREATMENTS & 3. DESIGN :

Please refer to No. I.A.R.I. 50(1) on page 300.

4. GENERAL :

(i) Suffered from draught. Heterogenous growth. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1950 to N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 9.34 ton/ac.
 (ii) (a) 2.08 ton/ac.
 (b) 1.95 ton/ac.
 (iii) Only V effect is highly significant.
 (iv) Av. yield of cane in ton/ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	Mean
N ₀	9.83	10.33	10.46	8.01	10.21	6.23	9.18
N ₁	9.00	9.89	9.10	10.10	8.92	4.83	8.64
N ₂	10.42	13.26	8.77	9.08	9.13	7.02	9.61
N ₃	8.64	13.80	12.78	10.70	8.63	5.12	9.89
Mean	9.47	11.82	10.28	9.47	9.22	5.80	9.34

S.E. of difference of two

1. V marginal means = 0.85 ton/ac.
 2. N marginal means = 0.65 ton/ac.
 3. N means at the same level of V = 1.59 ton/ac.
 4. V means at the same level of N = 1.62 ton/ac.

Crop :- Sugarcane.

Ref :- I.A.R.I. 52(2).

Type :- 'MV'.

Object :- To study the effect of N on different Sugarcane varieties.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 16 to 18.3.1952. (iv) (a) Ploughing with *desi* plough and *sohaga*. (b) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) N.A. (viii) Earthing up in July 1952. (ix) N.A. (x) N.A.

2. TREATMENTS & 3. DESIGN :

Please refer to No. I.A.R.I. 50(1) on page 300.

4. GENERAL :

(i) N.A. (ii) Pyrilla and top-borer. (iii) Yield of sugarcane. (iv) (a) 1950 to N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) & (vii) Nil.

5. RESULTS :

- (i) 13.10 ton/ac.
 (ii) (a) 1.37 ton/ac.
 (b) 3.87 ton/ac.
 (iii) Only V effect is highly significant.

(iv) Av. yield of sugarcane in ton/ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	Mean
N ₀	14.50	15.34	10.75	10.28	12.77	8.84	12.07
N ₁	14.72	16.40	12.88	12.26	13.21	9.43	13.14
N ₂	15.27	16.81	12.70	12.29	13.29	9.73	13.69
N ₃	15.52	16.99	11.96	13.69	14.79	10.02	13.84
Mean	15.00	16.40	12.07	12.11	13.50	9.51	13.10

S.E. of difference of two

1. V marginal means = 0.56 ton/ac.
2. N marginal means = 1.29 ton/ac.
3. N means at the same level of V = 3.16 ton/ac.
4. V means at the same level of N = 2.79 ton/ac.

Crop :- Sugarcane.

Ref :- I.A.R.I. 53(2).

Type :- 'MV'.

Object :—To study the effect of N on different Sugarcane varieties.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a), (b) Refer item]11 on page 143. (iii) 12, 13.2.1953. (iv) (a) Tractor ploughing and discing. (b) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) Hoeing after 1st irrigation. (ix) N.A. (x) N.A.

2. TREATMENTS and 3. DESIGN :

Please refer to No. I.A.R.I. 50(1) on page 300.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of [sugarcane. (iv) (a) 1950 to N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 18.98 ton/ac.
- (ii) (a) 3.14 ton/ac.
(b) 1.78 ton/ac.
- (iii) Only N effect is highly significant.
- (iv) Av. yield of sugarcane in ton/ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	Mean
N ₀	19.08	19.56	16.13	19.59	16.32	20.62	18.55
N ₁	18.92	21.57	17.19	20.54	18.96	22.17	19.89
N ₂	17.98	20.19	17.92	19.97	19.21	21.59	19.48
N ₃	16.54	19.20	16.73	16.50	15.45	23.60	18.00
Mean	18.13	20.13	16.99	19.15	17.48	21.99	18.98

S.E. of difference of two

1. V marginal means = 1.28 ton/ac.
2. N marginal means = 0.59 ton/ac.
3. N means at the same level of V = 1.45 ton/ac.
4. V means at the same level of N = 1.79 ton/ac.

Crop :- Sugarcane.

Ref :- I.A.R.I. 50(37).

Type :- 'CMV'.

Object :—To study the effect of different depths of cultivation and different doses of N and P on two varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a), (b) Refer item 11 on page 143. (iii) 14 to 19.3.1950. (iv) (a) As per treatments. (b) to (e) N.A. (v) 10 ton/ac. of F.Y.M. (vi) As per treatments. (vii) Irrigated. (viii) Horse hoeing on 10.5.1950 and weeding in May and June. (ix) N.A. (x) Last week of April, 1951.

2. TREATMENTS :

Main-plot treatments :

3 ploughings : C_1 = Desi ploughing 3"-4" deep, C_2 = Tractor ploughing 6" deep + discing + grubbing and C_3 = Tractor ploughing 10" deep + discing + grubbing.

Sub-plot treatments :

2 varieties : V_1 = CO. 312 and V_2 = CO. 453.

Sub-sub-plot treatments :

All combinations of (1 and 2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac.

(2) 2 levels of P_2O_5 as super : $P_0=0$ and $P_1=80$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 2 sub-plots/main-plot and 6 sub-sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 62' × 21'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Slightly heterogenous. (ii) Top borer. (iii) Yield of sugarcane. (iv) (a) 1950 to N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 22.78 ton/ac.

(ii) (a) 8.57 ton/ac.

(b) 8.84 ton/ac.

(c) 3.78 ton/ac.

(iii) N effect is highly significant. P effect and interactions $NP \times C$ and $NP \times V$ are significant.

(iv) Av. yield of sugarcane in ton/ac.

	N_0P_0	N_0P_1	N_1P_0	N_1P_1	N_2P_0	N_2P_1	Mean	V_1	V_2
C_1	19.61	20.12	24.24	24.92	21.83	25.35	22.68	20.43	24.93
C_2	14.09	19.58	22.85	21.10	24.32	24.73	21.11	20.60	21.63
C_3	13.92	18.84	25.84	27.88	26.67	29.18	24.56	24.90	24.22
Mean	17.54	19.51	24.31	24.63	24.27	26.42	22.78	21.98	23.59
V_1	17.55	16.76	22.26	23.65	24.95	26.69			
V_2	17.54	22.27	26.37	25.61	23.60	26.16			

S.E. of difference of two

- C marginal means = 2.02 ton/ac.
- V marginal means = 1.70 ton/ac.
- NP marginal means = 1.26 ton/ac.
- V means at the same level of C = 2.95 ton/ac.
- C means at the same level of V = 2.90 ton/ac.
- NP means at the same level of C = 2.18 ton/ac.
- C means at the same level of NP = 2.84 ton/ac.
- NP means at the same level of V = 1.78 ton/ac.
- V means at the same level of NP = 2.35 ton/ac.

Crop :- Sugarcane.

Ref :- I.A.R.I. 51(36).

Type :- 'CMV'.

Object :- To study the effect of different depths of cultivation and different doses of N and P on two varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a), (b) Refer item 11 on page 143. (iii) 14 to 18.3.1951. (iv) (a) As per treatments. (b) to (e) N.A. (v) 10 ton/ac. of F.Y.M. (vi) As per treatments. (vii) Irrigated. (viii) Lever harrowing on 21.3.1951, hand hoeing on 19 to 23.5.1951, horse hoeing in June 1951 and earthing up from 3 to 6.7.1951. (ix) N.A. (x) June 1952.

2. TREATMENTS :

Main plot treatments :

3 ploughings : C_1 = Desi ploughing 3"-4" deep, C_2 = Tractor ploughing 6" deep + discing + grubbing and C_3 = Tractor ploughing 10" deep + discing + grubbing.

Sub-plot treatments :

2 varieties : V_1 = CO.312 and V_2 = CO.453.

Sub-sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=80$ and $N_2=160$ lb./ac.

(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=80$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 2 sub-plots/main-plot and 6 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) 51' x 27'. (b) 45' x 21'. (v) 3' on each side. (vi) Yes.

4. GENERAL :

(i) Below normal. (ii) Pyrilla. Top borer. (iii) Yield of sugarcane. (iv) (a) 1950 to N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

3. RESULTS :

(i) 18.5 ton/ac.

(ii) (a) 4.67 ton/ac.

(b) 2.04 ton/ac.

(c) 2.32 ton/ac.

(iii) Levels of V and N differ highly significantly. Interaction $V \times C$ is significant. Levels of C not significant. Interaction $V \times NP$ is significant while $C \times NP$ is not significant.

(iv) Av. yield of sugarcane in ton/ac.

	N_0P_0	N_0P_1	N_1P_0	N_1P_1	N_2P_0	N_2P_1	Mean	V_1	V_2
C_1	14.50	14.98	18.25	18.97	18.10	18.01	17.12	18.38	15.85
C_2	16.31	16.73	18.44	19.74	20.34	22.04	18.94	19.15	18.72
C_3	18.86	18.95	21.47	19.09	19.34	19.18	19.48	21.05	17.91
Mean	16.56	16.85	19.39	19.26	19.26	19.74	18.51	19.53	17.49
V_1	18.66	18.09	20.76	19.37	19.70	20.59			
V_2	14.46	15.61	18.02	19.16	18.82	18.89			

S.E. of difference of two

- | | | | |
|-----------------------------------|---------------|------------------------------------|---------------|
| 1. C marginal means | =1.10 ton/ac. | 6. NP means at the same level of C | =1.34 ton/ac. |
| 2. V marginal means | =0.39 ton/ac. | 7. C means at the same level of NP | =1.65 ton/ac. |
| 3. NP marginal means | =0.77 ton/ac. | 8. NP means at the same level of V | =1.09 ton/ac. |
| 4. V means at the same level of C | =0.68 ton/ac. | 9. V means at the same level of NP | =1.07 ton/ac. |
| 5. C means at the same level of V | =1.20 ton/ac. | | |

Crop :- Sugarcane.

Ref :- I.A.R.I. 52(58)

Type :- 'CMV'.

Object :- To study the effect of different depths of cultivation, and different doses of N and P on two varieties of sugarcane.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 11 to 15. 3. 1952. (iv) (a) As per treatments. (b) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) N.A. (viii) Horse hoeing in April and May, weeding and earthing up in July, 1952. (ix) N.A. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 ploughings : C_1 = Desi ploughing 3"-4" depth, C_2 = Tractor ploughing 6" + discing + grubbing and C_3 = Tractor ploughing 10" + discing + grubbing.

Sub-plot treatments :

2 varieties : V_1 = CO 312 and V_2 = CO 453.

Sub-sub-plot treatments :

All combinations of (1) and (2).

(1) 3 levels of N as A/S : $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac.

(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=80$ lb./ac.

3. DESIGN :

(i) Split plot. (ii) (a) 3 main-plots/block, 2 sub-plots/main-plot and 6 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/50. ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Suffered from draught. (ii) Pyrilla effect. (iii) Yield of sugarcane. (iv) (a) 1950 to N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 22.96 ton/ac.

(ii) (a) 1.18 ton/ac.

(b) 1.57 ton/ac.

(c) 2.14 ton/ac.

(iii) Effects due to C, NP and interaction $V \times C$ are significant, V effect is highly significant while other effects are not significant.

(iv) Av. yield of sugarcane in ton/ac.

	N_0P_0	N_0P_1	N_1P_0	N_1P_1	N_2P_0	N_2P_1	Mean	V_1	V_2
C_1	19.00	18.65	21.91	23.80	23.41	24.87	21.94	25.70	18.18
C_2	21.33	23.10	25.60	25.33	23.35	24.70	23.90	28.69	19.12
C_3	22.03	22.74	23.66	22.20	23.74	23.84	23.04	28.84	17.23
Mean	20.79	21.50	23.72	23.78	23.50	24.47	22.96	27.74	18.18
V_1	24.46	26.71	28.86	28.80	27.71	29.91			
V_2	17.11	16.28	18.59	18.76	19.28	19.03			

S.E. of difference of two

- | | | | |
|-----------------------------------|---------------|------------------------------------|---------------|
| 1. C marginal means | =0.28 ton/ac. | 6. NP means at the same level of C | =1.24 ton/ac. |
| 2. V marginal means | =0.30 ton/ac. | 7. C means at the same level of NP | =1.16 ton/ac. |
| 3. NP marginal means | =0.71 ton/ac. | 8. NP means at the same level of V | =1.09 ton/ac. |
| 4. V means at the same level of C | =0.52 ton/ac. | 9. V means at the same level of NP | =0.95 ton/ac. |
| 5. C means at the same level of V | =0.46 ton/ac. | | |

Crop :- Sugarcane.

Ref :- I.A.R.I. 52(31).

Type :- 'DM'.

Object :—To study the relative efficiency of some weedicides along with nitrogeous fertilizers on the weed control and correlated yield on sugarcane.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 15, 16.3.1952. (iv) (a) Tractor ploughing, tractor discings and *desi* ploughing. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 25 to 29.4 1953.

2. TREATMENTS :

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

(1) 3 sources of N : $S_1=A/S$, $S_2=C/N$ and $S_3=Cal. Nitrate$.

(2) 3 levels of N : $N_1=40$, $N_2=80$ and $N_3=120$ lb./ac.

(3) 3 weedicides : $W_0=0$, $W_1=Distox$ at 0.5 lb./ac. and $W_2=Cobalt Sulphate$ at 15 lb./ac.

3. DESIGN :

(i) 3^3 Fact. confd. (ii) (a) 9. (b) N.A. (iii) 2. (iv) (a) $50' \times 17.5'$. (b) $50' \times 12.5'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Below normal. (ii) *Pyrilla* affected the crop. (iii) Yield of sugarcane. (iv) (a) 1952 to 1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data N.A.

5. RESULTS :

- (i) 17.60 ton/ac.
 (ii) 3.97 ton/ac.
 (iii) S effect alone is highly significant.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield	Treatment	Av. yield	Treatment	Av. yield
S_1	16.19	N_1	17.10	W_0	17.72
S_2	17.19	N_2	17.29	W_1	17.53
S_3	19.46	N_3	18.42	W_2	17.55
S.E./mean	=0.94 ton/ac.	S.E./mean	=0.94 ton/ac.	S.E./mean	=0.94 ton/ac.

Crop :- Sugarcane.

Ref :- I.A.R.I. 53(37).

Type :- 'DM'.

Object :—To study the relative efficiency of some weedicides along with nitrogeous fertilizers on the weed control and correlated yield on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 3rd week of February, 1953. (iv) (a) Victory ploughing, *desi* ploughing and *sohaga*. (b) to (e) N.A. (v) Nil. (vi) CO. 312. (vii) N.A. (viii) One earthing up. (ix) and (x) N.A.

2. TREATMENTS :

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

(1) 3 sources of N : $S_1=A/S$, $S_2=C/N$ and $S_3=Cal. Nitrate$.

(2) 3 levels of N : $N_1=40$, $N_2=80$ and $N_3=120$ lb./ac.

(3) 3 weedicides : $W_0=0$, $W_1=Distox$ at 0.5 lb./ac. and $W_2=Cobalt Sulphate$ at 15 lb./ac.

3. DESIGN :

(i) 3^3 Fact. confounded. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) $60' \times 17.5'$. (b) $60' \times 12.5'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Slightly poor in southern field. (ii) Top borer infected the crop. (iii) Sugarcane yield. (iv) (a) 1952 to 1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 17.51 ton/ac.
 (ii) 3.85 ton/ac.
 (iii) Only N effect is highly significant.

(iv) Av. yield of sugarcane in ton/ac.

	S ₁	S ₂	S ₃	Mean	W ₀	W ₁	W ₂
N ₁	15.31	16.56	20.43	17.43	17.31	17.75	17.23
N ₂	16.53	14.93	20.76	17.41	17.72	17.67	16.84
N ₃	16.25	16.10	20.74	17.70	16.74	19.20	17.15
Mean	16.03	15.86	20.64	17.51	17.26	18.21	17.07
W ₀	15.34	15.58	20.86				
W ₁	16.66	16.05	21.93				
W ₂	16.10	15.97	19.14				

S.E. of any marginal mean = 0.91 ton/ac.
 S.E. of body of any table = 1.57 ton/ac.

Crop :- Cotton.

Ref :- I.A.R.I. 50(7).

Type :- 'M'.

Object :- To find out the residual effect of combinations of N, P and K, applied to berseem on succeeding Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Berseem—Maize—Berseem—Cotton—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 5.6.1950. (iv) (a) One ploughing with victory plough and two ploughings with *desi* plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 4 horse hoeings, 1 thinning and 1 weeding. (ix) N.A. (x) 1st picking on 12, 19.10.1950 and 2nd picking on 20, 23.11.1950.

2. TREATMENTS :

1. Control (no manure).
 2. P₂O₅ at 120 lb./ac.
 3. P₂O₅ at 120 lb./ac.+K₂O at 120 lb./ac.
 4. N at 100 lb./ac.+P₂O₅ at 120 lb./ac.
 5. N at 25 lb./ac.+P₂O₅ at 120 lb./ac.
 6. N at 50 lb./ac.+P₂O₅ at 120 lb./ac.
 7. N at 100 lb./ac.+P₂O₅ at 120 lb./ac.+K₂O at 120 lb./ac.
 8. Fallow.
- Manures applied to previous berseem crop.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1948—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1295 lb./ac.
 (ii) 48.55 lb./ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1144	5.	1274
2.	1242	6.	1311
3.	1236	7.	1389
4.	1391	8.	1373
S.E./mean	=19.82 lb./ac.		

Crop :- Cotton.

Ref :- I.A.R.I. 52(6).

Type :- 'M'.

Object :—To study the residual effect of combinations of N, P and K, applied to berseem crop, on succeeding Cotton crop.

1. - BASAL CONDITIONS :

(i) (a) Wheat-Berseem-Cotton. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 7.5.1953. (iv) (a) 1 ploughing with victory plough and 1 with *desi* plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 bullock hoeings and 2 thinnings. (ix) N.A. (x) 1st picking 14 to 20.10.1952. 2nd picking 9 to 16.11.1952.

2. TREATMENTS :

1. Control (no manure). 5. N at 25 lb./ac.+P₂O₅ at 120 lb./ac.
2. P₂O₅ at 120 lb./ac. 6. N at 50 lb./ac.+P₂O₅ at 120 lb./ac.
3. P₂O₅ at 120 lb./ac.+K₂O at 120 lb./ac. 7. N at 100 lb./ac.+P₂O₅ at 120 lb./ac.+K₂O at 120 lb./ac.
4. N at 100 lb./ac.+P₂O₅ at 120 lb./ac. 8. Fallow.
Manures applied to berseem in *Rabi* 1951—52.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Mild attack of jassid and white fly on 26.7.1953. (iii) Yield of *kapas*. (iv) (a) 1948—1953 N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1571 lb./ac.
(ii) 118.5 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1319	5.	1601
2.	1579	6.	1625
3.	1601	7.	1734
4.	1699	8.	1412
S.E./mean		=48.4 lb./ac.	

Crop :- Cotton.

Ref :- I.A.R.I. 53(19).

Type :- 'M'.

Object :—To study the residual effect of combinations of N, P and K, applied to berseem crop, on succeeding Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Cotton-Berseem-Maize. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) F-216. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control (no manure). 5. N at 25 lb./ac.+P₂O₅ at 120 lb./ac.
2. P₂O₅ at 120 lb./ac. 6. N at 50 lb./ac.+P₂O₅ at 120 lb./ac.
3. P₂O₅ a. 120 lb./ac.+K₂O at 120 lb./ac. 7. N at 100 lb./ac.+P₂O₅ at 120 lb./ac.+K₂O at 120 lb./ac.
4. N at 100 lb./ac.+P₂O₅ at 120 lb./ac. 8. Fallow.
Manures applied to berseem in *Rabi* 1952—53.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1948—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1288 lb./ac.
(ii) 89.69 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1120	5.	1361
2.	1345	6.	1341
3.	1383	7.	1305
4.	1317	8.	1129
S.E./mean		=36.62 lb./ac.	

Crop :- Cotton.

Ref :- I.A.R.I. 52(39).

Type :- 'MV'.

Object :—To study the performance of different varieties of Cotton under local conditions and their response to nitrogenous manuring.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 2, 3 May, 1952. (iv) (a) Three ploughings. (b) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 4 weedings, 1 thinning and 1 gap filling. (ix) N.A. (x) 2nd week of November, 1952 and last week of December, 1952.

2. TREATMENTS :

Main-plot treatments :

8 varieties : $V_1=M-4$, $V_2=F.216$, $V_3=F.216/3$, $V_4=F.216/14$, $V_5=23.F$, $V_6=100.F$, $V_7=M.A.$ V and $V_8=B.C. 68$.

Sub-plot treatments :

2 doses of N : N_0 =No manure and N_1 =20 lb./ac. of N as C/N and 20 lb./ac. of N as A/S.

Manures applied on 11.7.1952 and 3.9.1952.

3. DESIGN :

(i) Split-plot. (ii) (a) 8 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 33'×25'. (b) 31'×23'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Red leaf disease more in N_0 plots than in N_1 plots. Pink boll worm effected all the plots uniformly. (iii) *Kapas* yield. (iv) (a) 1952—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1578 lb./ac.
(ii) (a) 109.4 lb./ac.
(b) 79.5 lb./ac.
(iii) Main effects of V and N are highly significant while their interaction is significant.
(iv) Av. yield of *kapas* in lb./ac.

	V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	Mean
N_0	1591	1661	1558	1640	1341	1442	1445	1168	1493
N_1	1759	1850	1722	1846	1506	1578	1652	1385	1662
Mean	1675	1755	1642	1743	1424	1511	1599	1276	1578

S.E. of difference of two

1. V marginal means =54.7 lb./ac.
2. N marginal means =19.9 lb./ac.
3. N means at the same level of V =56.2 lb./ac.
4. V means at the same level of N =67.6 lb./ac.

Crop :- Cotton.

Ref :- I.A.R.I. 51(10).

Type :- 'CV'.

Object :—To find out the effect of different spacings and dates of sowing on different varieties of Cotton.

1. BASAL CONDITIONS :

(i) (a) No. (b) Berseem. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) As per treatments. (iv) (a) Twice grubbed and once disced. (b) to (e) N.A. (v) G.N.C. A/S, Linseed cake, Castor cake and chillies cake : dose N.A. Berseem buried in March, 1951. (vi) American cotton. (vii) Irrigated. (viii) 2 intercultures, 2 weedings, 2 hoeings and 1 thinning. (ix) 9.5°. (x) Picking on 12, 18.10.1951 to 23.11.1951 and 28.11.1951 to 13.12.1951.

2. TREATMENTS :

Main-plot treatments :

4 dates of sowing : $D_1=24.4.1951$, $D_2=14.5.1951$, $D_3=25.5.1951$ and $D_4=10.6.1951$.

Sub-plot treatments :

4 varieties : $V_1=M-4$, $V_2=F-216$, $V_3=F-320$ and $V_4=L. SS$.

Sub-sub-plot treatments :

3 spacings : $S_1=3'$, $S_2=2.5'$ and $S_3=2'$.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/blocks, 4 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $23.5' \times 37.5'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Sowing was affected due to locust. Red leaf blight severe in V_1 and V_3 . (iii) *Kapas* yield. (iv) (a) 1950–1953. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1258 lb./ac.
(ii) (a) 320.0 lb./ac.
(b) 249.0 lb./ac.
(c) 166.9 lb./ac.
(iii) Main effect of D is highly significant. V and $D \times V$ are significant. Others are not significant.
(iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	D_4	Mean	S_1	S_2	S_3
V_1	1295	1403	1396	1142	1309	1259	1334	1334
V_2	1294	1347	1190	985	1204	1219	1157	1238
V_3	1480	1326	1366	1157	1332	1321	1345	1331
V_4	1591	1170	1191	806	1189	1151	1270	1147
Mean	1415	1311	1286	1022	1258	1237	1276	1262
S_1	1353	1334	1287	975				
S_2	1442	1344	1264	1055				
S_3	1450	1256	1307	1037				

S.E. of difference of two

- | | | | |
|-----------------------------------|-----------------|-----------------------------------|----------------|
| 1. D marginal means | = 65.3 lb./ac. | 6. S means at the same level of D | = 59.0 lb./ac. |
| 2. V marginal means | = 50.8 lb./ac. | 7. D means at the same level of S | = 81.2 lb./ac. |
| 3. S marginal means | = 29.5 lb./ac. | 8. S means at the same level of V | = 59.0 lb./ac. |
| 4. V means at the same level of D | = 101.7 lb./ac. | 9. V means at the same level of S | = 70.0 lb./ac. |
| 5. D means at the same level of V | = 109.6 lb./ac. | | |

Crop :- Cotton.

Ref :- I.A.R.I. 52(17).

Type :- 'CV'.

Object :- To find out a suitable variety for Delhi tract with optimum time of sowing and spacing in between lines.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 25th April, 10th May, 25th May and 10th June. (iv) (a) 1 ploughing by victory plough, double discing by tractor, grubbing and levelling by *karha*. (b) to (e) N.A. (v) Berseem ploughed in as G.M. (vi) American Cotton. (vii) Irrigated. (viii) 7 hoeing and 3 weedings. (ix) 24.24". (x) Picking from middle of Oct. to first week of January.

2. TREATMENTS :

Main-plot treatments :

4 dates of sowing : $D_1=25.4.1952$, $D_2=10.5.1952$, $D_3=25.5.1952$ and $D_4=10.6.1952$.

Sub-plot treatments :

4 varieties : $V_1=M-4$, $V_2=F-216$, $V_3=F-320$ and $V_4=L.SS$.

Sub-sub-plot treatments :

3 spacings line to line : $S_2=3'$, $S_1=2.5'$ and $S_3=2'$.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 4 sub-plots/main-plot ; 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) $23.5' \times 37.5'$ (b) 1/60. ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) No. (iii) Yield of *kapas*. (iv) (a) 1950—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1062 lb./ac.

(ii) (a) 368.7 lb./ac.

(b) 251.4 lb./ac.

(c) 109.3 lb./ac.

(iii) Main effects of D, V and S are highly significant. Others are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	D_4	Mean	S_1	S_2	S_3
V_1	1245	938	1005	672	965	914	930	1051
V_2	1412	1091	1222	863	1147	1006	1165	1271
V_3	1428	1046	1212	833	1130	1049	1132	1209
V_4	1370	1041	983	635	1007	973	990	1060
Mean	1364	1029	1106	751	1062	986	1054	1148
S_1	1243	981	1031	688				
S_2	1366	1009	1082	759				
S_3	1482	1098	1204	806				

S.E. of difference of two

- | | | | |
|-----------------------------------|-----------------|-----------------------------------|----------------|
| 1. D marginal means | = 75.3 lb./ac. | 6. S means at the same level of D | = 38.6 lb./ac. |
| 2. V marginal means | = 51.3 lb./ac. | 7. D means at the same level of S | = 81.6 lb./ac. |
| 3. S marginal means | = 19.3 lb./ac. | 8. S means at the same level of V | = 38.6 lb./ac. |
| 4. V means at the same level of D | = 102.7 lb./ac. | 9. V means at the same level of S | = 60.3 lb./ac. |
| 5. D means at the same level of V | = 116.5 lb./ac. | | |

Crop :- Cotton.

Ref :- I.A.R.I. 53(18).

Type :- 'CV'.

Object:—To find out a suitable variety for Delhi tract with optimum time of sowing and spacing in between lines.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 25.4.1953, 18.5.1953 and 10.6.1953. (iv) (a) Ploughing twice with *desi* plough preparing land with *desi* plough after soaking twice and beaming. (b) to (e) N.A. (v) G.N.C. at 213 lb./ac. applied on 30/31. 7.1953. (vi) American cotton. (vii) Irrigated. (viii) 3 weedings, 3 thinnings and 3 hoeings. (ix) and (x) N.A.

2. TREATMENTS :

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

(1) 3 dates of sowing : $D_1=25.4.1953$, $D_2=18.5.1953$ and $D_3=10.6.1953$.

(2) 3 varieties : $V_1=F-216$, $V_2=F-320$ and $V_3=M-4$.

(3) 3 spacings : $S_1=1\frac{1}{2}'$, $S_2=2'$ and $S_3=2\frac{1}{2}'$.

3. DESIGN :

(i) 3^3 Fact. in R.B.D. (ii) (a) 27 (b) N.A. (iii) 4. (iv) (a) N.A. (b) $30' \times 24'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1950—1953. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1629 lb./ac.
 (ii) 617.1 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	Mean	V_1	V_2	V_3
S_1	1991	1794	1341	1712	1761	1712	1662
S_2	1753	1588	1382	1580	1712	1415	1505
S_3	1868	1744	1201	1605	1687	1341	1786
Mean	1868	1712	1308	1629	1720	1489	1687
V_1	1967	1786	1415				
V_2	1753	1605	1111				
V_3	1893	1744	1415				

S.E. of any marginal means =102.8 lb./ac.
 S.E. of body of any table =178.1 lb./ac.

Crop :- Cotton.

Ref :- I.A.R.I. 52 (49).

Type :- 'CM'.

Object :—To study the effect of depths of ploughing and method of application of fertilizers.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18, 19.5.1952. (iv) (a) As per treatments. (b) to (e) N.A. (v) N.A. (vi) F-216. (vii) Irrigated. (viii) 1 weeding by *khurpi*, 2 hoeings with bullock hoe and 1 thinning. (ix) N.A. (x) 3 pickings from 22.9.1952 to 4.12.1952.

2. TREATMENTS :

Main-plot treatments :

3 depths of ploughing : $A_1=9''$ to $10''$ deep ploughing by tractor followed by grubbing, $A_2=5''$ to $6''$ deep ploughing by bullock soil turning, plough followed by country plough and $A_3=4''$ to $5''$ deep ploughing by country plough.

Sub-plot treatments :

2 methods of application : B_1 =Broadcast and B_2 =Placement.

Sub-sub-plot treatments :

4 manures : $M_1=A/S$ at 40 lb./ac. of N, $M_2=G.N.C.$ at 40 lb./ac. of N, $M_3=A/S$ at 40 lb./ac. of N+ Selecto Phos. at 80 lb./ac. of P_2O_5 and $M_4=G.N.C.$ at 40 lb./ac.+Agro. Phos. at 80 lb./ac. of P_2O_5 .

Manures applied on 18, 19.5.1952.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 2 sub-plots/main-plot and 4 sub-sub-plots/sub-plot. (b) N.A. (iii) 5. (iv) (a) $30' \times 21'$ (b) $27' \times 18'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Very minor attack of jassids and pink ball worm. (iii) Yield of *kapas*. (iv) (a) 1952-1954. (b) No. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1555 lb./ac.

(ii) (a) 297.0 lb./ac.

(b) 197.5 lb./ac.

(c) 142.4 lb./ac.

(iii) Main effects of A and M are highly significant and main effect of B is significant. Others are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	M_1	M_2	M_3	M_4	Mean	B_1	B_2
A_1	1321	1489	1346	1406	1391	1370	1412
A_2	1553	1634	1577	1603	1592	1562	1622
A_3	1546	1755	1633	1791	1681	1607	1755
Mean	1473	1626	1519	1600	1555	1513	1596
B_1	1420	1586	1523	1522			
B_2	1526	1665	1515	1677			

S.E. of difference of two

- | | | | |
|-----------------------------------|---------------|-----------------------------------|---------------|
| 1. A marginal means | =66.3 lb./ac. | 6. M means at the same level of A | =63.7 lb. ac. |
| 2. B marginal means | =35.5 lb./ac. | 7. A means at the same level of M | =86.4 lb./ac. |
| 3. M marginal means | =36.8 lb./ac. | 8. M means at the same level of B | =52.0 lb./ac. |
| 4. B means at the same level of A | =62.7 lb./ac. | 9. B means at the same level of M | =57.9 lb./ac. |
| 5. A means at the same level of B | =82.7 lb./ac. | | |

Crop :- Cotton.

Ref :- I.A.R.I. 53(50).

Type :- 'CM'.

Object :- To study the effect of depth of ploughing and method of application of fertilizers.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 14 to 17.5.1953. (iv) (a) As per treatments. (b) to (e) N.A. (v) N.A. (vi) F-216. (vii) Irrigated. (viii) 3 hoeings and 3 weedings with *khurpi*. (ix) N.A. (x) Picking from 28.9.1953, to 4 10.1953.

2. TREATMENTS :

Main-plot treatments :

3 depths of ploughing : A_1 =Tractor ploughing 9"-10" deep followed by grubbing. A_2 =Bullock victory plough 5"-6" deep followed by country plough and A_3 =4"-5" deep country plough.

Sub-plot treatments :

2 methods of application of manure : B_1 =Broadcast and B_2 =Placement.

Sub-sub-plot treatments :

4 manures : M_1 =A/S at 40 lb./ac. of N, M_2 =G.N.C. at 40 lb./ac. of N, M_3 =A/S 40 lb./ac. of N+Super at 80 lb./ac. of P_2O_5 and M_4 =G.N.C. at 40 lb./ac. of N+Super at 80 lb./ac. of P_2O_5 .

Manures applied at the time of sowing.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 2 sub-plots/main-plot and 4 sub-sub-plots/sub-plot. (b) N.A. (iii) 5. (iv) (a) 30'×21'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1952-1954. (b) No. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS :

- (i) 1384 lb./ac.
 (ii) (a) 378.5 lb./ac.
 (b) 186.0 lb./ac.
 (c) 99.6 lb./ac.
 (iii) Main effect of B alone is highly significant.
 (iv) Av. yield of *kapas* in lb./ac.

	M_1	M_2	M_3	M_4	Mean	B_1	B_2
A_1	1336	1333	1452	1460	1395	1483	1308
A_2	1450	1468	1523	1351	1448	1503	1393
A_3	1419	1322	1232	1262	1308	1359	1257
Mean	1402	1374	1402	1358	1384	1448	1319
B_1	1396	1479	1435	1484			
B_2	1408	1269	1368	1231			

S.E. of difference of two

- | | | | |
|-----------------------------------|---------------|-----------------------------------|---------------|
| 1. A marginal means | =84.7 lb./ac. | 6. M means at the same level of A | =44.5 lb./ac. |
| 2. B marginal means | =33.9 lb./ac. | 7. A means at the same level of M | =93.0 lb./ac. |
| 3. M marginal means | =25.7 lb./ac. | 8. M means at the same level of B | =35.4 lb./ac. |
| 4. B means at the same level of A | =58.9 lb./ac. | 9. B means at the same level of M | =46.3 lb./ac. |
| 5. A means at the same level of B | =94.3 lb./ac. | | |

Crop :- Tobacco.

Ref :- I.A.R.I. 53(44).

Type :- 'M'.

Object :- To study the effect of different levels of N, P and K on Tobacco.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 12, 13.2.1953. (iv) (a) 1 ploughing with victory plough and 2 with *desi* plough. (b) and (c) N.A. (d) 2½' between rows and 2' between plants (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 4.6.1953 to 7.6.1953.

2. TREATMENTS :

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

(1) 3 levels of N : $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac.

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

(3) 3 levels of K_2O : $K_0=0$, $K_1=40$ and $K_2=80$ lb./ac.

3. DESIGN :

(i) 3^3 Factorial confounded. (ii) (a) 9. (b) N.A. (iii) 2. (iv) (a) $46\frac{1}{2}' \times 17\frac{1}{2}'$. (b) $42' \times 12\frac{1}{2}'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) The growth was normal. (ii) 1 to 2% plants effected by stem-rot. (iii) Yield of tobacco leaf. (iv) (a) 1952-N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1216 lb./ac.
 (ii) 156.5 lb./ac.
 (iii) Levels of N alone differ significantly.
 (iv) Av. yield of tobacco leaf in lb./ac.

	N_0	N_1	N_2	Mean	K_0	K_1	K_2
P_0	1026	1214	1238	1159	1155	1144	1179
P_1	1010	1373	1261	1215	1312	1172	1160
P_2	1126	1349	1350	1275	1255	1261	1308
Mean	1054	1312	1283	1216	1241	1192	1216
K_0	1053	1380	1290				
K_1	1061	1308	1208				
K_2	1050	1248	1350				

S.E. of any marginal mean
 S.E. of body of any table

=45.2 lb./ac.
 =78.3 lb./ac.

Crop :- Tobacco.

Ref :- I.A.R.I. 51(8b).

Type :- 'M'.

Object :- To determine the nutritional requirements of Indian soils.

1. BASAL CONDITIONS to 4. GENERAL.

Please refer to No. I.A.R.I. 51(8) under OATS.

5. RESULTS :

- (i) 956.2 lb./ac.
 (ii) 66.65 lb./ac.
 (iii) Treatments differ highly significantly.
 (iv) Av. yield of tobacco leaf in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	258	5.	1011
2.	1011	6.	1037
3.	1192	7.	1067
4.	1115	8.	1037

S.E./mean =33.33 lb./ac.

Crop :- Jute (*Kharif*).

Ref :- I.A.R.I. 52(63).

Type :- 'CV'.

Object :—To find out the higher yielding variety when sown at different times.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) As per treatments. (iv) (a) Victory plough once and *desi* plough thrice. (b) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 14.8.1952, 2.9.1952, 19.9.1952 and 6.10.1952.

2. TREATMENTS :

Main-plot treatments :

4 dates of sowing : $D_1=25.3.1952$, $D_2=15.4.1952$, $D_3=5.5.1952$ and $D_4=20.5.1952$.

Sub-plot treatments :

2 varieties : $V_1=D-154$ and $V_2=O-40$ 25.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $16' \times 16'$. (b) $15' \times 15'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of fibre and seed. (iv) (a) 1951—1953. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1742 lb./ac.
 (ii) (a) 364.8 lb./ac.
 (b) 549.3 lb./ac.
 (iii) Only V effect is highly significant.
 (iv) Av. yield of jute fibre in lb./ac.

	D_1	D_2	D_3	D_4	Mean
V_1	1056	989	1642	1425	1278
V_2	2178	2129	2313	2204	2206
Mean	1617	1559	1977	1814	1742

S.E. of difference of two

1. D marginal means =182.4 lb./ac.
 2. V marginal means =194.2 lb./ac.
 3. V means at the same level of D =388.4 lb./ac.
 4. D means at the same level of V =329.7 lb./ac.

Crop :- Jute (*Kharif*).

Ref :- I.A.R.I. 53(55).

Type :- 'CV'.

Object :—To find out the higher yielding variety when sown at different times.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) As per treatments. (iv) (a) 3 ploughings with *desi* plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 11.8.1953, 28.8.1953, 18.9.1953 and 8.10.1953.

2. TREATMENTS :

Main-plot treatments :

4 dates of sowing : $D_1=25.3.1953$, $D_2=15.4.1953$, $D_3=5.5.1953$ and $D_4=25.5.1953$.

Sub-plot treatments :

2 varieties : $V_1=D-154$ and $V_2=O-40-753$.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $16' \times 16'$. (b) $15' \times 15'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (ii) Yield of jute fibre. (iv) (a) 1951—1953. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 769 lb./ac.
 (ii) (a) 335.7 lb./ac.
 (b) 204.1 lb./ac.
 (iii) Main effects of D and V are significant. Interaction is not significant.
 (iv) Av. yield of jute fibre in lb./ac.

	D ₁	D ₂	D ₃	D ₄	Mean
V ₁	757	699	658	362	619
V ₂	1029	1259	675	716	920
Mean	893	979	667	539	769

S.E. of difference of two

1. D marginal means = 167.9 lb./ac.
2. V marginal means = 72.2 lb./ac.
3. V means at the same level of D = 144.3 lb./ac.
4. D means at the same level of V = 196.3 lb./ac.

Crop :- Rape.

Ref :- I.A.R.I. 50(9a).

Type :- 'M'.

Object :- To determine the nutritional requirements of Indian soils.

1. BASAL CONDITIONS to 4. GENERAL.

Please refer to I.A.R.I. 50(9) under OATS.

5. RESULTS :

- (i) 453.3 lb./ac.
 (ii) 102.0 lb./ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of seed in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	257.6	5.	393.3
2.	389.2	6.	384.3
3.	389.2	7.	395.0
4.	434.5	8.	366.2
S.E./mean		= 51.02 lb./ac.	

Crop :- Rape.

Ref :- I.A.R.I. 51(8a).

Type :- 'M'.

Object :- To determine the nutritional requirements of Indian soils.

1. BASAL CONDITIONS to 4. GENERAL.

Please refer to No. I.A.R.I. 51(8) under OATS.

5. RESULTS :

- (i) 1302 lb./ac.
 (ii) 117.7 lb./ac.
 (iii) Treatments do not differ significantly.

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

Treatment	Av. yield	Treatment	Av. yield
1.	1040	5.	1361
2.	1331	6.	1361
3.	1346	7.	1331
4.	1361	8.	1285

S.E./mean = 59.25 lb./ac.

Crop :- Sesamum (*Kharif*).

Ref :- I.A.R.I. 52(61).

Type :- 'M'.

Object :- To study the effect of different forms of organic and inorganic manures in combination with P on the yield of Sesamum.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 4.7.1952. (iv) (a) 1 ploughing with victory plough. 2 with *desi* and one with tractor. (b) to (c) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 6 to 13, 16.10.1952, and 21 to 26.10.52.

2. TREATMENTS :

Main-plot treatments :

3 sources of N : $S_1=A/S$, $S_2=F.Y.M.$ and $S_3=G.N.C.$

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N : $N_0=0$, $N_1=30$ and $N_2=60$ lb./ac.(2) 2 levels of P_2O_5 : $P_0=0$ and $P_1=80$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 33' x 22'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor germination (ii) Nil. (iii) Yield of sesamum. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 441 lb./ac.

(ii) (a) 176.1 lb./ac.

(b) 238.6 lb./ac.

(iii) None of the effects is significant.

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

	N_0P_0	N_1P_0	N_2P_0	N_0P_1	N_1P_1	N_2P_1	Mean
S_1	361	486	468	444	508	402	445
S_2	407	518	632	534	301	444	473
S_3	387	471	294	490	357	429	405
Mean	385	492	465	489	389	425	441

S.E. of difference of two

1. S marginal means = 51.0 lb./ac.
2. NP marginal means = 97.4 lb./ac.
3. NP means at the same level of S = 168.7 lb./ac.
4. S means at the same level of NP = 162.2 lb./ac.

Crop :- Sesamum (*Kharif*).

Ref :- I.A.R.I. 53(62).

Type :- 'M'.

Object :—To study the effect of different forms of 'N' organic and inorganic in contrast with P manures.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 21.6.1953. (iv) (a) 3 ploughings with *desi* plough and one with victory plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hoeing with *oudh* and horse plough, *ker*a and weeding. (ix) N.A. (x) 6.10.1953.

2. TREATMENTS :

Main-plot treatments :

3 sources of N : $S_1=A/S$, $S_2=F.Y.M.$ and $S_3=G.N.C.$

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N : $N_0=0$, $N_1=30$ and $N_2=60$ lb./ac.(2) 2 levels of P_2O_5 : $P_0=0$ and $P_1=80$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination good. (ii) Virus disease. (iii) Yield of sesamum. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 223.8 lb./ac.
 (ii) (a) 108.6 lb./ac.
 (b) 133.3 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of sesamum in lb./ac.

	N_3P_0	N_1P_0	N_2P_0	N_0P_1	N_1P_1	N_2P_1	Mean
S_1	275.6	199.1	288.8	166.2	215.6	267.4	249.3
S_2	177.7	244.4	200.8	219.7	144.8	182.7	195.0
S_3	222.2	138.2	292.9	232.9	232.9	244.4	227.1
Mean	225.5	194.2	260.8	206.5	224.6	231.2	223.8

S.E. of difference of two

1. S marginal means = 31.3 lb./ac.
 2. NP marginal means = 54.4 lb./ac.
 3. NP means at the same level of S = 76.8 lb./ac.
 4. S means at the same level of NP = 91.6 lb./ac.

Crop :- Linseed (*Rabi*).

Ref :- I.A.R.I. 50 (22).

Type :- 'MV'.

Object :—To see the effect of nitrogenous manures on Linseed varieties.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 7.11.1950. (iv) (a) 2 ploughings, 2 beamings, 2 harrowings with spring tooth harrow and levelling with *ker*a. (b) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 11 to 14.4.1951.

2. TREATMENTS :

All combinations of (1) and (2)

1. 4 varieties : $V_1=N.P.-21$, $V_2=B-5128$, $V_3=Dakota$ flax and $V_4=Sheycone$ flax.
 2. 2 levels of N : $N_0=0$ and $N_1=20$ lb./ac of N.

3. DESIGN :

(i) 4×2 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 19'×25'. (b) 17'×23'. (v) 1' on each side. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of linseed. (iv) (a) No. (b) No. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 457.4 lb./ac.

(ii) 93.01 lb./ac.

(iii) V and N effects are highly significant while interaction is not significant.

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

	V ₁	V ₂	V ₃	V ₄	Mean
N ₀	435.5	392.7	396.3	324.9	399.8
N ₁	621.2	524.8	556.9	357.0	515.0
Mean	553.3	458.7	476.6	340.9	457.4

S.E. of V marginal mean =32.88 lb./ac.

S.E. of N marginal mean =23.25 lb./ac.

S.E. of body of table =46.50 lb./ac.

Crop :- Linseed (*Rabi*).

Ref :- I.A.R.I. 51(28).

Type :- 'MV'.

Object :—To study the relative performance of some improved American variety in relation with doses of N.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.10.1951. (iv) (a) 1 *palewa* and 1 *desi* ploughing. (b) to (e) N.A. (v) Nil. (vi) to (ix) N.A. (x) April, May, 1952.

2. TREATMENTS :

All combinations of (1) and (2)

1. 4 varieties: V₁=N.P. 21, V₂=B. 5128, V₃=Dakota flax and V₄=Sheycone flax.

2. 3 levels N as C/N : N₀=0. N₁=20 and N₂=40 lb./ac.

3. DESIGN :

(i) 3×4 fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 47'×16'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Below normal. (ii) N.A. (iii) Yield of linseed. (iv) (a) 1949—N.A. (b) N.A. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 407 lb./ac.

(ii) 80.64 lb./ac.

(iii) V effect alone is highly significant.

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

	V ₁	V ₂	V ₃	V ₄	Mean
N ₀	425	541	341	205	378
N ₁	434	546	375	314	417
N ₂	443	589	353	311	424
Mean	434	559	356	277	407

S.E. of marginal means of V =23.28 lb./ac.

S.E. of marginal means of N =20.16 lb./ac.

S.E. of body of table =40.32 lb./ac.

Crop :- Linseed (*Rabi*)

Ref :- I.A.R.I. 52(59).

Type :- 'MV'.

Object :—To study the effect of placement of fertilizers on different varieties of Linseed.

1. BASAL CONDITIONS :

(i) (a) No. - (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 30 and 31.10.1952 and 4, 5.11.1952. (iv) (a) 3 ploughings with *desi* plough, 2 tractor discings and 1 tractor grubbing. (b) to (c) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 2 weedings. (ix) N.A. (x) 31.3.1953 to 9.4.1953.

2. TREATMENTS :

Main-plot treatments :

3 varieties : V_1 =R.R. 10, V_2 =R.R. 236 and V_3 =N.P. 12.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.

(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=60$ lb./ac.

Sub-sub-plot treatments :

2 methods of application : M_1 =Broadcast and $M_2=3\frac{1}{2}$ " deep placement.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block, 6 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 27' x 23'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of linseed. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

3. RESULTS :

(i) 884.0 lb./ac.

(ii) (a) 241.1 lb./ac.

(b) 288.8 lb./ac.

(c) 148.6 lb./ac.

(iii) NP effect is highly significant, $V \times M$ and $V \times NP$ effects and interactions are significant while others are not significant.

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

	N_0P_0	N_0P_1	N_1P_0	N_1P_1	N_2P_0	N_2P_1	Mean	M_1	M_2
V_1	731	741	846	791	1095	929	855	894	817
V_2	755	680	886	785	753	700	760	762	757
V_3	985	906	967	1015	997	1353	1037	978	1096
Mean	823	776	900	863	948	994	884	878	890
M_1	862	783	897	828	947	949			
M_2	784	768	901	899	950	1039			

S.E. of difference of two

- | | | | |
|------------------------------------|-----------------|------------------------------------|----------------|
| 1. V marginal means | = 49.2 lb./ac. | 6. M means at the same level of V | = 42.9 lb./ac. |
| 2. NP marginal means | = 83.4 lb./ac. | 7. V means at the same level of M | = 57.8 lb./ac. |
| 3. M marginal means | = 24.8 lb./ac. | 8. M means at the same level of NP | = 60.7 lb./ac. |
| 4. NP means at the same level of V | = 144.4 lb./ac. | 9. NP means at the same level of M | = 93.7 lb./ac. |
| 5. V means at the same level of NP | = 140.6 lb./ac. | | |

Crop :- Linseed (*Rabi*).

Ref :- I.A.R.I. 53(65).

Type :- 'MV'.

Object :- To study the effect of placement of fertilizers on different varieties of Linseed.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 14/15.10.1953. (iv) (a) Tractor grubbing, 2 ploughings with *desi* plough and 2 tractor ploughings. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 3 weedings. (ix) N.A. (x) 3, 7, 19, 20 and 23.4.1954.

2. TREATMENTS :**Main-plot treatments:**3 varieties : $V_1 = \text{R.R. 10}$, $V_2 = \text{R.R. 236}$ and $V_3 = \text{N.P. 12}$.**Sub-plot 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) 2 levels of P_2O_5 : $P_0 = 0$ and $P_1 = 60$ lb./ac.**Sub-sub-plot treatments :**2 methods of application : $M_1 = \text{Broadcast}$ and $M_2 = 3\frac{1}{2}''$ deep placement.**3. DESIGN :**

(i) Split-plot. (ii) (a) 3 main-plots/replication, 6 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $27' \times 23'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of linseed. (iv) (a) 1951—1956. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 758.5 lb./ac.
 (ii) (a) 188.7 lb./ac.
 (b) 148.0 lb./ac.
 (c) 145.6 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of linseed in lb./ac.

	N_0P_0	N_0P_1	N_1P_0	N_1P_1	N_2P_0	N_2P_1	Mean	M_1	M_2
V_1	649.2	872.4	753.2	686.4	734.9	756.3	742.1	698.5	785.7
V_2	772.1	766.5	708.3	733.8	721.4	775.5	746.3	745.8	746.7
V_3	763.1	762.0	795.8	796.9	772.3	833.1	787.2	775.1	799.2
Mean	728.1	800.3	752.4	739.0	742.9	788.3	758.5	739.8	777.2
M_1	699.6	734.1	743.1	729.6	763.5	768.1			
M_2	756.7	866.4	760.9	748.4	722.3	808.5			

S.E. of difference of two

1. V marginal means = 38.5 lb./ac. 6. M means at the same level of V = 42.0 lb./ac.
 2. NP marginal means = 42.7 lb./ac. 7. V means at the same level of M = 48.7 lb./ac.
 3. D marginal means = 24.3 lb./ac. 8. M means at the same level of NP = 59.5 lb./ac.
 4. NP means at the same level of V = 74.0 lb./ac. 9. NP means at the same level of M = 59.9 lb./ac.
 5. V means at the same level of NP = 77.8 lb./ac.

Crop :- Jowar (*Kharif*).

Ref :- I.A.R.I. 50(42).

Type :- 'M'.

Object :- To study the effect of manuring on the yield of berseem and the residual effect on the following maize, wheat and *Jowar* crops.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) Berseem. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 25.6.50. (iv) (a) Ploughing with tractor, grubbing and beaming and harrowing twice after sowing. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) 24.99°. (x) 29.9.50.

2. TREATMENTS:

Main-plot treatments:

7 levels of N and P fertilizers: $M_0=0$, M_1 = Ammo. Phos. at 80 lb./ac. of P_2O_5 , M_2 = Ammo. Phos. at 160 lb./ac. of P_2O_5 , M_3 = Super at 80 lb./ac. of P_2O_5 +A/S at 80 lb./ac. of N, M_4 = Super at 160 lb./ac. of P_2O_5 +A/S at 160 lb./ac. of N, M_5 = Super at 80 lb./ac. of P_2O_5 and M_6 = Super at 160 lb./ac. of P_2O_5 .

Sub-plot treatments:

3 levels of K_2O as Pot. Sul.: $K_0=0$, $K_1=40$ lb./ac. and $K_2=80$ lb./ac. of K_2O . Fertilizers applied to previous berseem crop.

3. DESIGN:

(i) Split-plot. (ii) (a) 7 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 43'x25'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Growth was poor on the whole. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1946—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Growth affected adversely due to water logging caused by rains in July and August. (vii) Nil.

5. RESULTS:

(i) 2.98 ton/ac.
(ii) (a) 1.09 ton/ac.
(b) 0.59 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of fodder in ton/ac.

	M_0	M_1	M_2	M_3	M_4	M_5	M_6	Mean
K_0	2.38	3.48	3.29	3.20	3.14	3.00	3.10	3.08
K_1	1.98	3.40	3.40	3.50	2.68	2.68	3.40	3.31
K_2	2.34	2.51	2.81	2.73	3.50	2.44	3.69	2.86
Mean	2.23	3.13	3.17	3.14	3.11	2.71	3.40	2.98

S.E. of difference of two

1. main-plot treatment means = 0.45 ton/ac.
2. sub-plot treatment means = 0.16 ton/ac.
3. sub-plot treatment means at the same level of main-plot treatment = 0.43 ton/ac.
4. main-plot treatment means at the same level of sub-plot treatment = 1.33 ton/ac.

Crop :- Jowar.

Ref :- I.A.R.I. 52(28a).

Type :- 'C'.

Object :- To study the effect of sowing premature and mature seed on *Jowar* yield.

1. BASAL CONDITIONS to 4. GENERAL.

Please refer to No. I.A.R.I. 52(28) under MAIZE.

5. RESULTS:

Jowar :- White *Purhi*

- (i) 3579 lb./ac.
- (ii) 112.0 lb./ac.
- (iii) Treatments differ highly significantly.

Jowar :- local

- (i) 5983 lb./ac.
- (ii) 112.0 lb./ac.
- (iii) Treatments differ highly significantly.

(iv) Av. yield of fodder in lb./ac.		(vi) Av. yield of fodder in lb./ac.	
Treatment	Av. yield	Treatment	Av. yield
1.	4197	1.	6265
2.	3459	2.	6781
3.	3082	3.	4904
S.E./mean	=45.72 lb./ac.	S.E./mean	=45.72 lb./ac.

Crop :- Guar (*Kharif*).

Ref :- I.A.R.I. 51(12).

Type :- 'M'.

Object :- To find out the response of *Guar* to P and application of micro-nutrients and its effect on Wheat.

1. BASAL CONDITIONS:

(i) (a) *Guar-Wheat-Guar*. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 5.7.1951.
 (iv) (a) Ploughing twice. (b) Seed sown in furrows behind plough with *ker*. (c) to (e) N.A. (v) N.A.
 (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 29th and 31st Aug. and 1st Sept. 1951.

2. TREATMENTS :

1. *Guar* without P₂O₅ removed.
2. *Guar* without P₂O₅ buried.
3. *Guar* with 60 lb./ac. of P₂O₅ removed.
4. *Guar* with 60 lb./ac. of P₂O₅ buried.
5. *Guar* with 60 lb./ac. of P₂O₅+Borax 5 lb./ac.+Molybdenum 1 lb./ac. removed.
6. *Guar* with 60 lb./ac. of P₂O₅+Borax 5 lb./ac.+Molybdenum 1 lb./ac. buried.
7. *Guar* from treatment 1 buried.
8. *Guar* from treatment 3 buried.
9. *Guar* from treatment 5 buried.
10. Fallow.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 45'×15'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Fodder yield. (iv) (a) 1951—1954. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Raw data is N.A.

5. RESULTS :

- (i) 0.56 ton/ac.
 (ii) N.A.
 (iii) N.A.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	0.51
2.	0.60
3.	0.54
4.	0.59
5.	0.58
6.	0.57
S E./mean	=N.A.

Crop :- Guar (*Kharif*).

Ref :- I.A.R.I. 52(20).

Type :- 'M'.

Object :- To find the response of *Guar* to P and application of micro-nutrients and their effect on Wheat.

1. BASAL CONDITIONS :

(i) (a) *Guar-Wheat-Guar*. (b) Wheat. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A.
 (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS :

1. *Guar* without P_2O_5 removed.
2. *Guar* without P_2O_5 buried.
3. *Guar* with 60 lb./ac. of P_2O_5 removed.
4. *Guar* with 60 lb./ac. of P_2O_5 buried.
5. *Guar* with 60 lb./ac. of P_2O_5 +Borax 5 lb./ac.+Molybdenum 1 lb./ac. removed.
6. *Guar* with 60 lb./ac. of P_2O_5 +Borax 5 lb./ac.+Molybdenum 1 lb./ac. buried.
7. *Guar* from treatment 1 buried.
8. *Guar* from treatment 3 buried.
9. *Guar* from treatment 5 buried.
10. Fallow.

3. DESIGN :

- (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 45'×15'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Yield of *Guar* fodder. (iv) (a) 1951—1954. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 7.04 ton/ac.
 (ii) 0.84 ton/ac.
 (iii) Treatments differ highly significantly.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	5.23
2.	6.78
3.	6.92
4.	7.58
5.	7.85
6.	7.92
S.E./mean	=0.34 ton/ac.

Crop :- Hubam Clover (*Rabi*). Ref :- I.A.R.I. 51(23). Type :- 'CM'.

Object :—To study the response of Hubam Clover grown for fodder, seed and green manuring and its effect on soil fertility as judged by the yield of following maize crop.

1. BASAL CONDITIONS :

- (i) (a) Hubam Clover—Maize. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 21.11.1951. (iv) (a) 1 ploughing with victory plough, 2 discings with tractor and 2 grubblings. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 22.3.1952, 2.5.1952 and 9.6.1952.

2. TREATMENTS :

Main-plot treatments :

4 levels of P_2O_5 : $P_0=0$, $P_1=40$, $P_2=80$ and $P_3=120$ lb./ac.

Sub-plot treatments :

6 cultural practices : C_1 =Hubam Clover grown for seed, C_2 =Hubam Clover left for seed after one cutting, C_3 =Hubam Clover grown for green manuring, C_4 =Hubam Clover grown after one cutting, C_5 =Hubam Clover grown after two cuttings and C_6 =Hubam Clover grown for fodder.

3. DESIGN :

- (i) Split-plot. (ii) (a) 4 main-plots/replication and 6 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) and (ii) N.A. (iii) Yield of fodder. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Raw data N.A. (vii) Nil.

5. RESULTS :

- (i) 0.76 ton/ac.
 (ii) N.A.
 (iii) N.A.

(iv) Av. yield of fodder in ton/ac.

	P ₀	P ₁	P ₂	P ₃	Mean
C ₃	0.48	0.35	0.41	0.41	0.41
C ₄	0.89	0.78	0.82	0.83	0.83
C ₅	0.98	0.89	0.95	0.94	0.94
C ₆	0.83	0.83	0.87	0.89	0.86
Mean	0.79	0.71	0.76	0.77	0.76

S.E.—N.A.

Crop :- Hubam Clover (*Rabi*). Ref :- I.A.R.I. 52(29). Type :- 'CM'.

Object :- To study the response of Hubam Clover grown for fodder, seed and green manuring and its effect on soil fertility as judged by the yield of following maize crop.

1. BASAL CONDITIONS :

(i) (a) Maize—Hubam Clover. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 29.11.1952. (iv) (a) 1 ploughing with victory plough and 2 with *desi* plough. (b) N.A. (c) 20 lb./ac. (d) and (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 31.3.1953, 1.4.1953, 5.5.1953 and 5.5.1953.

2. TREATMENTS :

Main-plot treatments :

4 levels of P₂O₅ : P₀=0, P₁=40, P₂=80 and P₃=120 lb./ac.

Sub-plot treatments :

6 cultural practices : C₁=Hubam Clover grown for seed, C₂=Hubam Clover left for seed after one cutting, C₃=Hubam Clover grown for green manuring, C₄=Hubam Clover grown after one cutting, C₅=Hubam Clover grown after two cuttings and C₆=Hubam Clover grown for fodder.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 6 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) and (ii) N.A. (iii) Yield of fodder. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data N.A.

5. RESULTS :

(i) 6.47 ton/ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of fodder in ton/ac.

	P ₀	P ₁	P ₂	P ₃	Mean
C ₃	3.43	3.70	3.40	4.36	3.72
C ₄	6.12	6.35	6.77	6.80	6.51
C ₅	7.91	8.54	7.82	8.25	8.13
C ₆	7.56	6.74	7.86	7.34	7.38
Mean	6.26	6.33	6.46	6.69	6.44

S.E.—N.A.

Crop :-Hubam Clover (*Rabi*).

Ref :-I.A.R.I. 53(39). Type :-'CM'.

Object :-To study the response of different doses of phosphatic manures on Hubam Clover grown for fodder, seed and green manuring and its effect on soil fertility as judged by yield of following crop of maize.

1. BASAL CONDITIONS :

(i) (a) Maize—Hubam Clover. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 17.11.53. (iv) (a) 1 ploughing with victory plough and 2 with *desi* plough. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments :

4 levels of P_2O_5 : $P_0=0$, $P_1=40$, $P_2=80$ and $P_3=120$ lb./ac.

Sub-plot treatments :

6 cultural practices : C_1 =Hubam Clover grown for seed, C_2 =Hubam Clover grown for seed after one cutting, C_3 =Hubam Clover grown for green manuring, C_4 =Hubam Clover grown for green manuring after one cutting, C_5 =Hubam Clover grown for green manuring after two cuttings and C_6 =Hubam Clover grown for fodder.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 6 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) N.A. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data. N.A.

5. RESULTS :

(i) 7.74 ton/ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of fodder in ton/ac.

	P_0	P_1	P_2	P_3	Mean
C_3	7.02	5.73	7.07	6.19	6.50
C_4	9.50	8.50	9.22	8.92	9.04
C_5	7.47	10.03	8.99	7.98	8.62
C_6	6.63	6.68	7.10	6.81	6.80
Mean	7.66	7.74	8.10	7.48	7.74

S.E.—N.A.

Crop :-Berseem (*Rabi*).

Ref :-I.A.R.I. 48(13).

Type :-'M'.

Object :-To study the response of phosphatic manuring of Berseem with and without K and N.

1. BASAL CONDITIONS :

(i) (a) Manured berseem followed by unmanured Maize-Wheat-Maize. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

7 manures : M_0 =Control, M_1 =Ammono. Phos. 80 lb./ac. of P_2O_5 , M_2 =Ammono. Phos. 160 lb./ac. of P_2O_5 , M_3 =Super 80 lb./ac. of P_2O_5 , M_4 =Super 160 lb./ac. of P_2O_5 , M_5 =Super 80 lb./ac. of P_2O_5 +A/S 80 lb./ac. of N and M_6 =Super 160 lb./ac. of P_2O_5 +A/S 80 lb./ac. of N.

Sub-plot treatments :

3 levels of K_2O as Pot. Sul. : $K_0=0$, $K_1=40$ and $K_2=80$ lb./ac.

3. DESIGN :

- (i) Split-plot. (ii) (a) 7 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) 43'×24'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1946—1949. (b) N.A. (c) N.A. (v) (a) and (b) No. (vi) N.A. (vii) Raw data and number of replication is N.A. Therefore the results are not complete.

5. RESULTS :

- (i) 30.82 ton/ac.
 (ii) N.A.
 (iii) Main-plot treatments alone differ significantly.
 (iv) Av. yield of fodder in lb./ac.

	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅	M ₆	Mean
K ₀	24.96	30.22	35.73	30.57	30.34	26.81	31.92	30.08
K ₁	25.03	30.66	35.31	30.12	32.43	30.17	33.43	31.02
K ₂	24.62	32.31	34.76	31.88	32.68	27.28	36.04	31.35
Mean	24.87	31.06	35.27	30.86	31.82	28.09	33.80	30.82

S.E.—N.A.

Crop :- Berseem (*Rabi*).

Ref :- I.A.R.I. 50(41).

Type :- 'M'.

Object :- To study the effect of manuring on the yield of Berseem and the residual effect on the following maize, wheat and *jowar*.

1. BASAL CONDITIONS :

- (i) (a) N.A. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 2.11.1950. (iv) (a) Discing twice. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 2.91°. (x) 18.1.1951, 26.2.1951, 28.3.1951, 28.4.1951 and 29.5.1951.

2. TREATMENTS :

Main-plot treatments :

7 manures : M₀=Control, M₁=Ammo. Phos. 80 lb./ac. of P₂O₅, M₂=Ammo. Phos. 160 lb./ac. of P₂O₅, M₃=Super 80 lb./ac. of P₂O₅, M₄=Super 160 lb./ac. of P₂O₅, M₅=Super 80 lb./ac. of P₂O₅+A/S 80 lb./ac. of N and M₆=Super 160 lb./ac. of P₂O₅+A/S 80 lb./ac. of N.

Sub-plot treatments :

3 levels of K₂O as Pot. Sul. : K₀=0, K₁=40 and K₂=80 lb./ac.

3. DESIGN :

- (i) Split-plot. (ii) (a) 7 main-plots/block, 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 43'×25'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) N.A. (iii) Fodder yield. (iv) (a) 1946—1947; N.A. (b) N.A. (c) N.A. (iv) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 22.16 ton/ac.
 (ii) (a) 8.23 ton/ac.
 (b) 2.62 ton/ac.
 (iii) Main effect of M is highly significant. M×K is significant.

(iv) Av. yield of fodder in ton/ac.

	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅	M ₆	Mean
K ₀	8.55	25.28	23.19	20.04	22.50	22.57	25.29	21.77
K ₁	7.52	25.91	26.57	21.87	25.65	24.33	25.03	22.41
K ₂	9.10	22.61	24.85	23.89	27.78	21.40	26.53	22.31
Mean	8.39	24.60	26.54	21.93	25.31	22.77	25.62	22.16

S.E. of difference of two

1. M marginal means = 3.36 ton/ac.
2. K marginal means = 0.70 ton/ac.
3. K means at the same level of M = 1.86 ton/ac.
4. M means at the same level of K = 3.68 ton/ac.

Crop :- Berseem (*Rabi*).

Ref :- I.A.R.I. 50(60).

Type :- 'M'.

Object :- To study the effect of P on the yield of Berseem and residual effect on the subsequent crop.

1. BASAL CONDITIONS :

(i) (a) Berseem-Cowpeas-Berseem. (b) Cowpeas. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 3, 4.11.1950. (iv) (a) 1 tractor discing (double), 2 grubblings and 1 discing. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 25.1.1951 ; 5.3.1951 and 1.4.1951.

2. TREATMENTS :

1. No manure.
2. F.Y.M. at 16 lb./ac. of P₂O₅.
3. F.Y.M. at 32 lb./ac. of P₂O₅.
4. F.Y.M. at 64 lb./ac. of P₂O₅.
5. Super at 16 lb./ac. of P₂O₅.
6. Super at 32 lb./ac. of P₂O₅.
7. Super at 64 lb./ac. of P₂O₅.
8. Super at 8 lb./ac. of P₂O₅+F.Y.M. at 8 lb./ac. of P₂O₅.
9. Super at 8 lb./ac. of P₂O₅+F.Y.M. at 24 lb./ac. of P₂O₅.
10. Super at 8 lb./ac. of P₂O₅+F.Y.M. at 56 lb./ac. of P₂O₅.
11. F.Y.M. at 8 lb./ac. of P₂O₅+Super at 24 lb./ac. of P₂O₅.
12. F.Y.M. at 8 lb./ac. of P₂O₅+Super at 56 lb./ac. of P₂O₅.
13. Fallow.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 6. (iv) (a) 63'×15'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of berseem fodder and seed. (iv) (a) 1948—1954. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Crop in unmanured plots remained stunted in growth and the colour of the leaves was predominantly red till 2nd cutting. (vii) Nil.

5. RESULTS :

Fodder

- (i) 8.39 ton/ac.
(ii) 1.94 ton/ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	0.78
2.	2.77
3.	6.22
4.	9.09
5.	6.34
6.	9.97
7.	13.34
8.	5.86
9.	8.00
10.	13.07
11.	11.02
12.	14.23
S.E./mean	=0.79 ton/ac.

Seed

- (i) 233.7 lb./ac.
(ii) 52.66 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of seed in lb./ac.

Treatment	Av. yield
1.	32.1
2.	147.3
3.	204.1
4.	280.6
5.	197.5
6.	260.8
7.	302.0
8.	204.9
9.	259.2
10.	323.4
11.	282.2
12.	307.7
S.E./mean	=21.49 lb./ac.

Crop :- Berseem (*Rabi*).

Ref :- I.A.R.I. 50(20).

Type :- 'M'.

Object :- To study the residual effect of different forms of phosphates on the following maize-berseem and maize-fodder crops.

1. BASAL CONDITIONS :

(i) Maize-Berseem-Maize. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 8, 9.11.1950. (iv) (a) Tractor plough at the end of October 1950. Grubbing twice after tractor ploughing. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 5 cuttings from 31.1.1951 to 27.5.1951.

2. TREATMENTS :

- | | |
|--------------------------|---------------------------|
| 1. Agro. Phos. | 7. Mg. Phosphate. |
| 2. Ammo. Phos. | 8. Reno. hyper Phosphate. |
| 3. A/S. | 9. Rock Phosphate. |
| 4. B.M. | 10. Selecto Phosphate. |
| 5. Bone Super. | 11. Super. |
| 6. Bone Sulphur compost. | 12. Control. |

These sources give 80 lb./ac. of N or P₂O₅.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 17'×64'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor till 2nd cutting. (ii) Locust attack. (iii) Yield of fodder. (iv) (a) 1948—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 9.02 ton/ac.
(ii) 3.53 ton/ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield	Treatment	Av. yield
1.	7.85	7.	6.39
2.	17.35	8.	7.39
3.	10.14	9.	6.37
4.	12.35	10.	5.96
5.	9.71	11.	8.29
6.	8.47	12.	7.98

S.E /mean = 1.44 ton/ac.

Crop :- Berseem (*Rabi*).

Ref :- I.A.R.I. 50(25).

Type :- 'M'.

Object :—To study the response of berseem to fertilizers and comparison of residual effects with direct manuring of cereals.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 12.10.1950. (iv) (a) Tractor ploughing once, tractor discings 4 and 1 grubbing. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Seed mixed with spring time harrow after broadcasting. (ix) N.A. (x) 5 cuttings from 30.12.1950 to 10.5.1951.

2. TREATMENTS :

1. No manure.
2. 120 lb./ac. of N.
3. 40 lb./ac. of N+120 lb./ac. of P₂O₅.
4. 120 lb./ac. of P₂O₅+80 lb./ac. of K₂O.
5. 40 lb./ac. of N+120 lb./ac. of P₂O₅+80 lb./ac. of K₂O.
6. Fallow in *Rabi*.

3. DESIGN :

(i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/20 ac. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 23.88 ton/ac.

(ii) 2.97 ton/ac.

(iii) Treatments differ highly significantly.

(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	12.96
2.	28.33
3.	28.94
4.	30.54
5.	29.85
6.	12.70
S.E./mean	=1.21 ton/ac.

Crop :- Berseem (*Rabi*).

Ref :- I.A.R.I. 53(64).

Type :- 'M'.

Object :- To study the relative value of different phosphatic manures.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 30.10.1950. (iv) (a) 1 ploughing with victory plough and 2 with *desi* plough. (b) to (e) N.A. (v) 10 oz./plot of A/S. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 1st cutting on 7/8.1.1954, 2nd cutting on 23/26.2.1954 and 3rd cutting on 25/27.3.1954.

2. TREATMENTS :

- Control.
- Rock Phos. at 100 lb./ac. of P_2O_5 .
- Super at 50 lb./ac. of P_2O_5 +Rock Phos. at 50 lb./ac. of P_2O_5 .
- Super at 100 lb./ac. of P_2O_5 .
- B.M. at 100 lb./ac. of P_2O_5 .
- Farm B.M. powder at 100 lb./ac. of P_2O_5 .
- B.M. grade I at 100 lb./ac. of P_2O_5 .
- B.M. grade II at 100 lb./ac. of P_2O_5 .
- B.M. grade III at 100 lb./ac. of P_2O_5 .
- Trichi-nodules at 100 lb./ac. of P_2O_5 .
- Trichi-nodules at 50 lb./ac. of P_2O_5 +Super at 50 lb./ac. of P_2O_5 .
- Super at 50 lb./ac. of P_2O_5 .

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 27'×20'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of fodder. (iv) (a) 1953—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) N.A. (vii) Nil.

5. RESULTS :

(i) 7.18 ton/ac.

(ii) 2.45 ton/ac.

(iii) Treatments differ highly significantly.

(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield	Treatment	Av. yield
1.	5.84	7.	5.32
2.	7.56	8.	6.06
3.	8.03	9.	5.66
4.	9.75	10.	7.08
5.	5.54	11.	9.82
6.	5.50	12.	9.94

S.E./mean =1.09 ton/ac.

Crop :- Berseem (*Rabi*).

Ref :- I.A.R.I. 51(9).

Type :- 'M'.

Object :—To study the effect of phosphatic manuring of Berseem with and without K and N on rotation of crops.

1. BASAL CONDITIONS :

(i) (a) Wheat—Berseem—Cotton. (b) Seed cotton. (c) Nil. (ii) (a) and (b) Refer item 11 on page 143. (iii) 12.10.1951. (iv) (a) 2 ploughings with victory plough and 2 with *desi* plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 22.12.1952, 24.1.1951, 3.3.1952, 26.3.1952 and 25.4.1952.

2. TREATMENTS :

1. Control.
2. P_2O_5 at 120 lb./ac.
3. P_2O_5 at 120 lb./ac. + K_2O at 120 lb./ac.
4. N at 100 lb./ac. + P_2O_5 at 120 lb./ac.
5. N at 25 lb./ac. + P_2O_5 at 120 lb./ac.
6. N at 50 lb./ac. + P_2O_5 at 120 lb./ac.
7. N at 100 lb./ac. + P_2O_5 at 120 lb./ac. + K_2O at 120 lb./ac.
8. Fallow in *Rabi*.

Sources of fertilizers N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 36' × 18'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Crop lodged on account of heavy rains. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1948—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

- (i) 25.56 ton/ac
 (ii) 1.08 ton/ac.
 (iii) Treatments differ highly significantly.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	10.43
2.	26.05
3.	26.16
4.	27.67
5.	27.77
6.	28.78
7.	32.04
S.E /meau	=0.44 ton/ac.

Crop :- Berseem (*Rabi*).

Ref :- I.A.R.I. 52(9).

Type :- 'M'.

Object :—To study the residual effect of phosphatic manuring of Berseem with and without K and N on rotation of crops.

1. BASAL CONDITIONS :

(i) (a) Wheat—Berseem—Cotton. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 21 and 22.10.52. (iv) (a) 1 ploughing with victory plough and beaming across. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 2, 3.1.53, 24.2.53, 27.3.53 and 30.4.53.

2. TREATMENTS :

1. Control.
2. P_2O_5 at 120 lb./ac.
3. P_2O_5 at 120 lb./ac. + K_2O at 120 lb./ac.
4. N at 100 lb./ac. + P_2O_5 at 120 lb./ac.
5. N at 25 lb./ac. + P_2O_5 at 120 lb./ac.
6. N at 50 lb./ac. + P_2O_5 at 120 lb./ac.
7. N at 100 lb./ac. + P_2O_5 at 120 lb./ac. + K_2O at 120 lb./ac.
8. Fallow in *Rabi*.

Applied to berseem in *Rabi* 1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of fodder. (iv) (a) 1948—53. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 15.80 ton/ac.
 (ii) 1.73 ton/ac.
 (iii) Treatments differ highly significantly.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	6.77
2.	16.75
3.	16.75
4.	17.57
5.	17.51
6.	17.47
7.	17.78
S.E./mean	= 0.71 ton/ac.

Crop :- Berseem (*Rabi*).

Ref :- I.A.R.I. 53(12).

Type :- 'M'.

Object :- To study the effect of phosphatic manuring of Berseem with and without K and N on rotation of crops.

1. BASAL CONDITIONS :

(i) (a) Cotton-Berseem-Wheat. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 9.10.53. (iv) (a) 4 ploughings with *desi* plough and mixing the fertilizers with *desi* plough. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:

- Control.
- P₂O₅ at 120 lb./ac.
- P₂O₅ at 120 lb./ac.+K₂O at 120 lb./ac.
- N at 100 lb./ac.+P₂O₅ at 120 lb./ac.
- N at 25 lb./ac.+P₂O₅ at 120 lb./ac.
- N at 50 lb./ac.+P₂O₅ at 120 lb./ac.
- N at 100 lb./ac.+P₂O₅ at 120 lb./ac.+K₂O at 120 lb./ac.
- Fallow in *Rabi*.

Fertilizers applied in *Rabi* 1951. Source is N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of berseem fodder. (iv) (a) 1948—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 41.05 ton/ac.
 (ii) 2.50 ton/ac.
 (iii) Treatments differ significantly.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	18.53
2.	44.63
3.	42.78
4.	45.95
5.	43.75
6.	44.10
7.	47.64
S.E./mean	= 1.02 ton/ac.

Crop :- Berseem (*Rabi*).

Ref :- I.A.R.I. 52(62).

Type :- 'IM'.

Object :- To find out the optimum number of irrigations for different levels of N and P_2O_5 .

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 8 to 11.11.1952. (iv) (a) 1 ploughing with *desi* plough and 1 beaming with victory plough. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigate. (viii) N.A. (ix) N.A. (x) 4, 5.1.1953.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

1. 2 levels of N as A/S : $N_0=0$ and $N_1=30$ lb./ac.
2. 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=60$ and $P_2=120$ lb./ac.

Sub-plot treatments :

3 levels of irrigation with 3^r intensity : $I_1=10$, $I_2=14$ and $I_3=18$ irrigations.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 27' × 20'. (b) 26' × 18'. (v) $\frac{1}{2}$ ' × 1'. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 33.50 ton/ac.
- (ii) (a) 4.427 ton/ac.
(b) 2.080 ton/ac.
- (iii) Main effects of N, P and I are highly significant. Others are not significant.
- (iv) Av. yield of fodder in ton/ac.

	P_0	P_1	P_2	Mean	I_1	I_2	I_3
N_0	29.09	30.31	34.16	31.19	26.65	32.24	34.67
N_1	31.70	37.10	38.63	35.81	30.12	36.83	40.49
Mean	30.39	33.70	36.40	33.50	28.38	34.53	37.58
I_1	26.61	28.16	30.38				
I_2	30.92	34.80	37.87				
I_3	33.65	38.15	40.94				

S.E. of difference of two

1. N marginal means = 0.852 ton/ac.
2. P marginal means = 1.043 ton/ac.
3. I marginal means = 0.490 ton/ac.
4. I means at the same level of N = 0.980 ton/ac.
5. N means at the same level of I = 1.447 ton/ac.
6. I means at the same level of P = 1.201 ton/ac.
7. P means at the same level of I = 1.772 ton/ac.
8. means of body of N × P table = 1.476 ton/ac.

Crop :- Vicia Sativa (*Rabi*).

Ref :- I.A.R.I. 53(30).

Type :- 'CM'.

Object :- To study the effect of different doses of phosphatic fertilizer and the number of cuttings on the yield of Vicia Sativa.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 3.11.1953. (iv) (a) Ploughing with *desi* plough twice on 1.11.1953. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 21.1.1954, 22.3.1954 and 6.3.1954.

2. TREATMENTS :

All combinations of (1) and (2)

1. 4 levels of P_2O_5 : $P_0=0$, $P_1=40$, $P_2=80$ and $P_3=120$ lb./ac.
2. Number of cuttings : $C_1=One$ and $C_2=Two$ cuttings.

3. DESIGN :

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

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Fodder yield. (iv) (a) 1953—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 11.32 ton/ac.
- (ii) 0.24 ton/ac.
- (iii) Main effect of C and interaction $P \times C$ are highly significant. P effect is significant. Others are not significant.
- (iv) Av. yield of fodder in ton/ac.

	P_0	P_1	P_2	P_3	Mean
C_1	10.87	10.93	10.63	10.71	10.79
C_2	11.47	12.09	11.60	12.23	11.85
Mean	11.17	11.51	11.12	11.47	11.32

S.E. of P marginal means = 0.06 ton/ac.
 S.E. of C marginal means = 0.08 ton/ac.
 S.E. of body of table = 0.12 ton/ac.

Crop :- Hubam Clover and Senji (*Rabi*). Ref :- I.A.R.I. 51(47). Type :- 'M'

Object :- To study the response of Hubam Clover—Senji mixture in two proportions to phosphatic manuring.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 27.11.1951. (iv) (a) Ploughing with victory on 14.11.1951 and one with *desi* on 22.11.1951. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weeding on 26.2.1952. (ix) N.A. (x) Senji Hubam : 1.3.1952, and 27.4.1952, Hubam Clover : 29.3.1952, 30.4.1952 and 3, 4.6.1952.

2. TREATMENTS :

All combinations of (1) and (2)

1. Types of G.M. : $G_1=Hubam\ Clover$, $G_2=Senji$, $G_3=Hubam\ Clover+Senji\ ratio\ (1:1)$ and $G_4=Hubam\ Clover+Senji\ (3:2)$.
2. 3 levels of P_2O_5 : $P_0=0$, $P_1=40$ and $P_2=80$ lb./ac. of P_2O_5 .

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of G.M. (iv) (a) 1951—1954. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 4.78 ton/ac.
- (ii) 0.73 ton/ac.
- (iii) G effect is highly significant. P effect and interaction $P \times G$ is significant.

(iv) Av. yield of green manure in ton/ac.

	G ₁	G ₂	G ₃	G ₄	Mean
P ₀	5.08	3.33	3.67	5.57	4.41
P ₁	5.62	3.33	4.03	5.54	4.63
P ₂	4.79	4.73	6.02	5.69	5.60
Mean	5.16	3.80	4.57	5.60	4.78

S.E. of G marginal mean =0.24 ton/ac.

S.E. of P marginal mean =0.21 ton/ac.

S.E. of body of table =0.42 ton/ac.

Crop :- Hubam Clover and Senji (*Rabi*). Ref :- I.A.R.I. 52(66). Type :- 'M'.

Object :- To study the response of Hubam Clover—Senji mixture in two proportions to phosphatic manuring.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) As under treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 27.11.1953.
 (iv) (a) Ploughing with *desi* plough twice. (b) to (e) N.A. (v) Applied single super 36 seers with 20% P₂O₅. (vi) N.A. (vii) Irrigated. (viii) Weeding 22, 24.2.1953. (ix) N.A. (x) 25.2.1953, 26.3.1953, 8 and 9.5.1953 and 6.6.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) Types of G.M. : G₁=Hubam Clover, G₂=Senji, G₃=Hubam Clover+Senji (1 : 1) and G₄=Hubam Clover+Senji (3 : 2).(2) 3 levels of P₂O₅ : P₀=0, P₁=40 and P₂=80 lb./ac. of P₂O₅.

. DESIGN :

(i) 4×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 7.45 ton/ac.

(ii) 1.10 ton/ac.

(iii) Only P effect is significant.

(iv) Av. yield of green manure in ton/ac.

	G ₁	G ₂	G ₃	G ₄	Mean
P ₀	8.62	8.62	10.58	3.27	7.77
P ₁	4.13	4.22	7.34	8.26	5.96
P ₂	9.84	7.01	7.61	9.79	8.56
Mean	7.53	6.62	8.51	7.11	7.45

S.E. of G marginal mean =0.37 ton/ac.

S.E. of P marginal mean =0.32 ton/ac.

S.E. of body of table =0.64 ton/ac.

Crop :- Hubam Clover and Senji (Rabi). Ref :- I.A.R.I. 53(57). Type :- 'M'.

Object :- To study the response of Hubam Clover, Senji and Hubam and Senji mixture in two proportions to phosphatic manuring.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 30.11.1953. (iv) (a) Ploughing with victory plough (thrice). (b) N.A. (c) 20 lb./ac. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Weeding on 17.2.1954. (ix) N.A. (x) 8.3.1954, 23.3.1954 and 30.4.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) Types of G.M. : G_1 =Hubam clover, G_2 =Senji, G_3 =Hubam+Senji (1 : 1) and G_4 =Hubam +Senji (3 : 2).

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

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Sub-normal. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Due to late rains the growth was sub-normal. (vii) Nil.

5. RESULTS :

(i) 6.69 ton/ac.

(ii) 0.92 ton/ac.

(iii) Only G effect is highly significant.

(iv) Av. yield of green manure in ton/ac.

	G_1	G_2	G_3	G_4	Mean
P_0	7.61	4.28	6.57	6.24	6.18
P_1	9.60	3.71	6.54	8.50	7.09
P_2	9.95	4.52	8.12	6.63	6.80
Mean	8.39	4.17	7.07	7.13	6.69

S.E. of G marginal mean = 0.31 ton/ac.
 S.E. of P marginal mean = 0.27 ton/ac.
 S.E. of body of table = 0.53 ton/ac.

Crop :- Penium antedotale (Kharif). Ref :- I.A.R.I. 53(61). Type :- 'CM'.

Object :- To study the effect of N and optimum interval of cutting.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 24, 25.8.1953. (iv) (a) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 1 hoeing with *desi* plough and 1 weeding. (ix) N.A. (x) 10.3.1954, 29.3.1954, 9.4.1954, 19.4.1954, 29.5.1954 and 6.11.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N : $N_0=0$, $N_1=40$, $N_2=80$ and $N_3=120$ lb./ac.

(2) 3 intervals of cutting : $C_1=20$, $C_2=30$ and $C_3=40$ days.

3. DESIGN :

(i, 4×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 7.93 ton/ac.
- (ii) 0.96 ton/ac.
- (iii) Treatments differ highly significantly.
- (iv) Av. yield of fodder in ton/ac.

	N ₀	N ₁	N ₂	N ₃	Mean
C ₁	6.40	7.35	7.73	9.24	7.68
C ₂	7.13	8.04	8.46	9.62	8.31
C ₃	5.93	7.52	8.63	9.10	7.79
Mean	6.49	7.64	8.27	9.32	7.93

S.E. of N marginal mean = 0.32 ton/ac.
 S.E. of C marginal mean = 0.28 ton/ac.
 S.E. of body of table = 0.55 ton/ac.

Crop :- Maize and Sesamum (*Kharif*). Ref :- I.A.R.I. 52(36). Type :- 'X'.

Object :—To study the response of mixed cropping of Maize and Sesamum.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) No. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 20, 21.7.1952. (iv) (a) 1 ploughing with victory plough on 21, 23.5.1952, tractor discing on 31.5.1952 and ploughing with *desi* on 5.7.1952 and 16.7.1952. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Nil. (viii) 2 weedings. (ix) N.A. (x) 26 to 28.10.1952.

2. TREATMENTS :

1. Sesamum pure in lines.
2. Maize pure in lines.
3. Sesamum and maize in separate rows (full rate).
4. Sesamum and maize in separate rows (full rate).
5. Sesamum and maize in separate rows ($\frac{1}{2}$ rate).
6. Sesamum and maize in same row ($\frac{1}{2}$ rate).

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

- (i) 176.65 Rs./ac.
- (ii) 45.60 Rs./ac.
- (iii) Treatments differ higher significantly.
- (iv) Av. value in Rs./ac.

Treatment	Av. value
1.	45.65
2.	258.85
3.	181.35
4.	230.25
5.	156.65
6.	187.15
S.E./mean	= 18.61 Rs./ac.

Crop :- Sesamum and Maize (*Kharif*). Ref :- I.A.R.I. 53(28). Type :- 'X'.

Object :—To study the effects of mixed cropping of Sesamum and Maize.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 17.6.1953. (iv) (a) 1 ploughing with victory plough, 1 with *desi* plough and one tractor discing. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 weeding and 1 hoeing with hand hoe. (ix) N.A. (x) 22, 23, 26 to 28.9.1953.

2. TREATMENTS :

1. Sesamum pure in lines.
2. Maize pure in lines.
3. Sesamum+Maize in separate rows (full rate).
4. Sesamum+Maize in same row (full rate).
5. Sesamum+Maize in separate rows ($\frac{1}{2}$ rate).
6. Sesamum+Maize in same row ($\frac{1}{2}$ rate).

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of sesamum and maize. (iv) (a) 1952—1956. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

RESULTS :

- (i) 165.48 Rs./ac.
- (ii) 51.60 Rs./ac.
- (iii) Treatments differ highly significantly.
- (iv) Av. value in Rs./ac.

Treatment	Av. value
1.	70.03
2.	189.28
3.	199.94
4.	135.43
5.	155.97
6.	192.21
S.E./mean	=21.06 Rs./ac.

Crop :- Linseed, Wheat and Gram (*Rabi*). Ref :- I.A.R.I. 53(54). Type :- 'X'.

Object :- To find out suitable crop mixture of Wheat, Gram and Linseed.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 5.11.1953. (iv) (a) 1 ploughing with victory plough, twice tractor discing and preparing with *desi* plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hoeing with *oudh* plough and weeding. (ix) N.A. (x) 16, 17, 19.4.1954.

2. TREATMENTS :

1. Linseed pure in lines.
2. Wheat pure in lines.
3. Gram pure in lines.
4. Linseed+gram (2 : 1).
5. Linseed+wheat (4 : 1).
6. Linseed+gram+wheat (4 : 1 : 1).
7. Linseed+gram (1 : 1).
8. Linseed+wheat (1 : 1).
9. Linseed+wheat+gram (2 : 1 : 1).

3. DESIGN :

(i) 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) N.A. (ii) N.A. (iii) Yield of linseed, wheat and gram. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) to (iv) Av. yield in lb./ac.

Treatment	1	2	3	4	5	6	7	8	9	Significance	S.E./mean
Linseed	1094	—	—	832	348	439	640	171	220	H.S.	85.58
Wheat	—	1972	—	—	1453	802	—	1478	1513	H.S.	151.40
Gram	—	—	1445	N.A.	—	100	1089	—	325	H.S.	218.06

Crop :-Wheat, Gram and Linseed (*Rabi*). Ref :-I.A.R.I. 52(69). Type :-'X'.

Object :-To find out suitable crop mixture of Wheat, Gram and Linseed.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 31.10.1952 and 1.11.1952. (iv) (a) Ploughing with *desi* plough and tractor. (b) to (e) N.A. (v) Nil. (vi) and (vii) N.A. (viii) *Bakharing*. (ix) N.A. (x) 4 to 30.4.1953.

2. TREATMENTS :

1. Linseed pure in lines.
2. Wheat pure in lines.
3. Gram pure in lines
4. Linseed+gram (2 : 1)
5. Linseed+wheat (2 : 1).
6. Linseed+gram+wheat (4 : 1 : 1).
7. Linseed+gram (1 : 1).
8. Linseed+wheat (1 : 1).
9. Linseed+wheat+gram (2 : 1 : 1).

3. DESIGN :

(i) 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) Good. (ii) N.A. (iii) Yield of gram, linseed and wheat. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) to (iii) N.A.

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

Treatment	1	2	3	4	5	6	7	8	9
Linseed	587	—	—	496	45	157	458	14	37
Wheat	—	3773	—	—	2885	2764	—	2961	2895
Gram	—	—	1213	457	—	76	795	—	133

Other details N.A.

Crop :-Paddy and Berseem.

Ref :-I.A.R.I. 50(28).

Type :- 'M'.

Object :-To study the relative merits of direct and indirect manuring of Paddy and Berseem with A/S and Super.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 28.10.1950. (iv) (a) Victory ploughing. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 8, 9.1.1951, 12.2.1951 and 10.3.1951.

2. TREATMENTS :

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

(1) 2 crops : C_1 =Paddy and C_2 =Berseem.

(2) 3 levels of N as A/S : $N_0=0$, $N_1=30$ and $N_2=60$ lb./ac.

(3) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=80$ and $P_2=160$ lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 51'×10'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1948—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Yield of treatment N_2P_1 in Rep. IV is not available for Paddy and has been estimated by missing plot technique.

5. RESULTS :

PADDY

- (i) 626 lb./ac.
 (ii) 115.9 lb./ac.
 (iii) Only P effect is significant.
 (iv) Av. yield of paddy in lb./ac.

BERSEEM

- (i) 663 lb./ac.
 (ii) 89.72 lb./ac.
 (iii) Only P effect is significant.
 (iv) Av. yield of berseem in lb./ac.

	P ₀	P ₁	P ₂	Mean		P ₀	P ₁	P ₂	Mean
N ₀	555	641	725	640	N ₀	589	661	737	662
N ₁	589	676	676	647	N ₁	495	770	728	664
N ₂	520	625	622	589	N ₂	574	628	784	662
Mean	555	648	674	626	Mean	553	686	760	663

- S.E. of N or P marginal mean
 (excluding N₂ and P₁) = 33.5 lb./ac.
 S.E. of N₂ or P₁ marginal mean = 35.8 lb./ac.
 S.E. of body of table (excluding
 N₂P₁ mean) = 57.9 lb./ac.

- S.E. of N or P marginal mean = 44.86 lb./ac.
 S.E. of body of table = 25.90 lb./ac.

Crop :- Wheat and Peas (*Rabi*). Ref :- I.A.R.I. 50(45). Type :- 'R'.

Object :—To test the economics of different *Kharif* and *Rabi* crop combinations as compared to green manuring.

1. BASAL CONDITIONS :

- (i) (a) and (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Maize and groundnut on 7, 14.7.1950 while wheat on 14/15.11.1950. (iv) (a) Tractor ploughing on 7.6.1950 and tractor grubbing on 26.6.1950 for *kharif*, victory plough on 28.10.1950 and *desi* plough twice on 5 and 7.11.1950 for *rabi* crops. (b) to (e) N.A. (v) N.A. (vi) Wheat NP-4. (vii) Irrigated. (viii) Hoeing of maize and groundnut on 9.8.1950 to 11.8.1950. Thinning of maize on 24, 25.8.1950. Weeding, hoeing and earthing for groundnut and maize on 19.8.1950. Earthing up of maize on 23, 25.8.1950. Weeding for wheat on 7, 9.2.1951. (ix) N.A. (x) Maize and groundnut on 16, 17.10.1950 while wheat on 10.4.1951 to 13.4.1951.

2. TREATMENTS :

<i>Kharif</i>	<i>Rabi</i>
1. Maize	Fallow
2. Fallow	Wheat
3. Maize	Wheat
4. Maize, with F.Y.M. at 10 ton/ac.	Wheat
5. Maize	Peas
6. Sannhemp green manured at 60 lb./ac. of P ₂ O ₅ .	Wheat
7. Groundnut with 60 lb./ac. of P ₂ O ₅ .	Wheat
8. Sannhemp manured in alternate rows of Maize with 60 lb./ac. of P ₂ O ₅ .	Wheat

3. DESIGN :

- (i) R.B.D. (ii) (a), (b) N.A. (iii) 8. (iv) (a) N.A. (b) 60' × 20'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) Removal of smut-affected plants on 28.2.1951. (iii) Yield of grain and pod, etc. (iv) (a) 1950—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) N.A. (vii) Nil.

5. RESULTS :

- | Economics value | Maize and Groundnut yield. |
|---------------------------------------|----------------------------|
| (i) 143.6 Rs./ac. | (i) N.A. |
| (ii) 89.5 Rs./ac. | (ii) N.A. |
| (iii) Treatments differ significantly | (iii) N.A. |

(iv) Av. net income in Rs./ac.		(iv) Av. yield in lb./ac.	
Treatment	Av. income	Treatment	Av. yield
1.	48.6	1.	850
2.	164.3	2.	—
3.	154.4	3.	771
4.	169.0	4.	1050
5.	130.5	5.	917
6.	214.0	6.	—
7.	85.2	7.	49.4
8.	182.6	8.	726
S.E./mean	=31.64 Rs./ac.	S.E./mean	=N.A.

Crop :- Wheat and Peas (*Rabi*). Ref :- I.A.R.I. 51(38). Type :- 'R'.

Object :—To study the economics of having different *Kharif* crops preceding Wheat and Peas crops in the *Rabi* season.

1. BASAL CONDITIONS :

(i) (a) As per treatments. (b) Maize and sannhemp. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) Peas on 2.11.1951 and wheat on 14 and 29.11.1951. (iv) (a) Peas : victory ploughing, *desi* ploughing and planking on 24.10.1951, wheat : ploughing, *desi* ploughing and planking on 2, 3 and 4 .10.1951 (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Weeding on 18.2.1952. (ix) N.A. (x) Peas on 21.3.1952 and wheat on 3, 24.4.1952 and 16.4.1952.

2. TREATMENTS :

<i>Kharif</i> 1951	<i>Rabi</i> 1951
1. Maize.	Fallow
2. Fallow.	Wheat
3. Maize.	Wheat
4. Maize with F.Y.M. at 10 ton/ac.	Wheat
5. Maize.	Peas
6. Sannhemp with 60 lb./ac. of P ₂ O ₅ .	Wheat
7. Groundnut with 60 lb./ac. of P ₂ O ₅ .	Wheat
8. Sannhemp manured with P ₂ O ₅ in alternate rows of maize.	Wheat

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 33'×31'. (b) 31'×29'. (v) 1' on each side. (vi) Yes.

4. GENERAL:

(i) Good. Lodging occurred. (ii) N.A. (iii) Yield of wheat grain. (iv) (a) 1950—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1153 lb./ac.
(ii) 241.9 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	—	5.	—
2.	1462	6.	1543
3.	832	7.	1002
4.	865	8.	1212
S.E./mean	=98.7 lb./ac.		

Crop :- Wheat-Peas (*Rabi*).

Ref :- I.A.R.I. 51(50).

Type :- 'R'.

Object :—To study the economics of different *Kharif* and *Rabi* crop combinations in comparison to green manured crop of Wheat.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) *Kharif* crops on 21.7.1951, Peas on 2.11.1951, Wheat on 14.11.1951 and 29.11.1951. (iv) (a) *Kharif* crops : Levelling on 9, 10, 13 and 22.7.1951. making ridges on 23.7.1951. Peas : Victory plough, cross plough by *desi* plough and planking on 24.10.1951. *Desi* plough and planking on 1.11.1951, cross plough by *desi* plough and planking on 2.11.1951. Wheat : Plough by victory plough and cross plough by *desi* and planking on 2 to 4.11.1951. Plough and cross plough by *desi* plough on 12 and 14.11.1951. Plough and cross plough by *desi* plough on 29.11.1951 (treatment 7). (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) *Kharif* crops : Hoeing on 9, 11.8.1951 and 8.9.1951. Weeding on 24.8.1951 and 11, 27.9.1951 and earthing up on 10.9.1951. Ploughing in fallow plots on 11.2.1952 by *desi* plough weeding on 18.2.1952. (ix) N.A. (x) Maize on 16 to 24, 26, 27.10.1951, Groundnut on 27, 28.11.1951 while Sannhemp green manured on 29.8.1951, Peas on 21.3.1952 and Wheat 3, 4 and 16.4.1952.

2. TREATMENTS :

<i>Kharif</i>	<i>Rabi</i>
1. Maize.	Fallow
2. Fallow.	Wheat
3. Maize.	Wheat
4. Maize with F.Y.M. at 10 ton/ac.	Wheat
5. Maize.	Peas
6. Sannhemp green manured at 60 lb./ac. of P ₂ O ₅ .	Wheat
7. Groundnut with 60 lb./ac. of P ₂ O ₅ .	Wheat
8. Sannhemp green manured at 60 lb./ac. of P ₂ O ₅ with alternate rows of maize.	Wheat

F.Y.M. applied on 17.7.1951. Super applied on 14.7.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 33'×31'. (b) 31'×29'. (v) 1' around. (vi) Yes.

4. GENERAL :

(i) Treatments 2, 6, 8, 4, 3 and 7 came in succession, best growth in 2. On the whole, lodging worked out is 40%. Crop of heavy growth has lodged extensively. (ii) Some ear heads were affected by smut. No pests. (iii) Grain yield. (iv) (a) 1950—N.A. (b) No. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS :

Economic value	Maize yield
(i) 236.3 Rs./ac.	(i) 1233 lb./ac.
(ii) 79.2 Rs./ac.	(ii) 695.6 lb./ac.
(iii) Treatments differ significantly.	(iii) Treatments do not differ significantly.
(iv) Av. net income in Rs./ac.	(iv) Av. yield of grain in lb./ac.

Treatment	Av. income	Treatment	Av. yield
1.	152.6	1.	1405
2.	296.9	2.	—
3.	307.7	3.	1464
4.	202.3	4.	1210
5.	238.4	5.	1152
6.	258.7	6.	—
7.	167.6	7.	—
8.	265.9	8.	933

S.E./mean = 32.35 Rs./ac.

S.E./mean = 283.9 lb./ac.

Crop :- Wheat-Peas (*Rabi*).

Ref :- I. A. R. I. 52(42).

Type :- 'R'.

Object :—To study the economics of different *Kharif* and *Rabi* crop combinations as compared to green manuring.

1. BASAL CONDITIONS:

(i) (a), (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) *Kharif* crops on 4.7.1952 and 23, 24.10.1952. (iv) (a) Ploughing with victory plough once; ploughing with *desi* plough twice. Preparing land with *desi* plough twice after soaking dose. (b) to (e) N.A. (v) N.A. (vi) Wheat : N.P. 4 and Peas : N.P. 29. (vii) Irrigated. (viii) One weeding and thinning for *Kharif* crops, hoeing for peas and weeding for wheat. (ix) N.A. (x) Maize and *Moong* on 6, 9.10.1952 and Sannhemp buried on 18.8.1952, Peas on 11.3.1953 and Wheat on 19.3.1953.

2. TREATMENTS :

<i>Kharif</i>	<i>Rabi</i>
1. Maize	Fallow
2. Fallow	Wheat
3. Maize	Wheat
4. Maize+10 ton/ac. of F.Y.M.	Wheat
5. Maize	Peas
6. Sannhemp (G.M.)	Wheat
7. <i>Mung</i>	Wheat
8. Maize+Sannhemp, in alternate rows, G.M.	Wheat

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 33'×31'. (b) 31'×29'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Disease observed in *Moong* crop. The plants turned black and died. (iii) Grain yield. (iv) (a) 1950—N.A. (b) No. (c) N.A. (v) (a), (b) No. (vi) N.A. (vii) Raw data N.A. Results are available as given under item 5.

5. RESULTS :

<i>Kharif crops</i>		<i>Rabi crops</i>	
(i) to (iii) N.A.		(i) to (iii) N.A.	
(iv) Av. yield of grain in lb./ac.		(iv) Av. yield of grain in lb./ac.	
Treatment	Av. yield	Treatment	Av. yield
1.	1145 (Maize)	1.	—
2.	—	2.	1421 (Wheat)
3.	1179 (Maize)	3.	942 (Wheat)
4.	1285 (Maize)	4.	1169 (Wheat)
5.	1285 (Maize)	5.	1799 (Peas)
6.	16723 (Maize)	6.	1227
7.	—	7.	1164
8.	1067 (Maize)	8.	805

Crop :- As under treatments.

Ref :- I.A.R.I. 53(43).

Type :- 'R'.

Object :—To study the economics of different *Kharif* and *Rabi* crop combinations as compared to F.Y.M.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) *Kharif* crops : 26, 27.6.1953, *Rabi* crops ; on 27.10.1953. (iv) (a) Ploughed with the victory plough ; Preparing land with *desi* plough twice and beaming. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing on 27.7.1953 and 1 weeding on 20, 21.8.1953, 1 weeding on 26, 27.12.1953 for wheat and peas. (ix) N.A. (x) Maize on 1, 2.10.1953, Sannhemp on 5.8.1953, Peas on 16.3.1953 and Wheat on 1.4.1954.

2. TREATMENTS :

<i>Kharif crops</i>	<i>Rabi crops</i>
1. Maize	Fallow
2. Fallow	Wheat
3. Maize	Wheat
4. Maize+10 ton/ac. of F.Y.M.	Wheat
5. Maize	Peas
6. Sannhemp G.M.	Wheat
7. Soyabeans	Wheat
8. Maize+Sannhemp in alternate rows, G.M.	Wheat

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 31'×29'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1950—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 347.9 Rs./ac.
(ii) 39.8 Rs./ac.
(iii) Treatments differ highly significantly.
(iv) Av. net income in Rs./ac.

- MAIZE yield
(i) to (iii) N.A.
(iv) Av. yield of maize in lb./ac.

Treatment	Av. value
1.	220.9
2.	270.0
3.	400.1
4.	491.4
5.	424.2
6.	379.2
7.	192.0
8.	405.1
S.E./mean	= 16.26 Rs./ac.

Treatment	Av. yield
1.	1702 (Maize)
2.	—
3.	1518 (Maize)
4.	1988 (Maize)
5.	1615 (Maize)
6.	20263 (Sannhemp)
7.	202 (Soyabean)
8.	1639 (Maize)

Crop :- Wheat-Peas-Potato-Berseem (*Rabi*). Ref :- I.A.R.I. 51(22). Type :- 'R'.

Object :- To find out a suitable rotation for Delhi tract.

1. BASAL CONDITIONS :

- (i) (a) As per treatments. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Wheat on 26, 29.11.1951, Peas on 31.10.1951, Potato on 11.10.1951 and Berseem on 21.9.1951, 8.10.1951, 6, 7.12.1951. (iv) (a) Wheat—dry ploughing with *desi* plough twice, preparing land with *desi* plough twice, and beaming. Peas—dry ploughing with *desi* plough once, preparing land with *desi* plough twice and beaming. Potato—dry ploughing with *desi* plough thrice. Berseem—dry ploughing. (b) to (e) N.A. (v) Wheat : A/S at 20 lb./ac. of N except in G.M. plot. Berseem—A/S at 3 srs/plot. (vi) N.A. (vii) Irrigated. (viii) Wheat—weeding on 27, 8.2.1952, Peas—Hoeing with *desi* plough on 30.11.1951 to 2.12.1951, Potato—Earthing up on 9.11.1951 and Berseem—Thinning on 4, 29 and 31.12.1951. (ix) N.A. (x) Wheat from 4 to 8.4.1952, Potato on 18, 26.2.1952 and Berseem on 11, 12.1.1952, 18, 26.2.1952 and 17, 18.4.1952.

2. TREATMENTS :

	<i>Kharif I</i>	<i>Rabi I</i>	<i>Kharif II</i>	<i>Rabi II</i>	<i>Kharif III</i>	<i>Rabi III</i>
A	Maize and Cowpeas	Wheat	Fallow	Wheat	—	—
B	Sannhemp	Potato	Maize	Peas	—	—
C	Cotton	Berseem	Fallow	Wheat	—	—
D	Maize and Cowpeas	Wheat	Cotton	Berseem	—	—
E	Maize	Potato	Sugarcane	Sugarcane	—	—
F	Sannhemp	Wheat	Maize	Peas	—	—
G	Fallow	Wheat	Fallow	Peas	Cotton	Fallow
H	Fallow	Wheat	Cotton	Fallow	Sugarcane	Sugarcane
I	Cowpeas	Wheat	Fallow	Peas	Maize	Berseem
J	Sannhemp	Wheat	Fallow	Potato	Sugarcane	Sugarcane

3. DESIGN :

- (i) R.B.D. (ii) (a) and (b) N.A. (iii) 4. (iv) (a) 41'×61'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Yield of wheat grain, peas, potato and berseem fodder. (iv) (a) 1951—1956. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) The results as available are given.

5. RESULTS :

WHEAT		BERSEEM	
Treatment	Av. yield	Treatment	Av. yield
A ₁	600	C ₁	24375
A ₂	625	D ₂	24066
C ₂	583	I ₃	40225
D ₁	458	POTATO	
F ₁	566	B ₁	2224
G ₁	685	E ₁	3765
H ₁	629	J ₂	1782
I ₁	520	PEAS	
J ₁	615	B ₂	881
permanent plot	720	F ₂	657
		G ₂	703
		I ₂	586

Crop :- Cowpeas, Sugarcane and Cotton (*Kharif*). Ref :- I.A.R.I. 53(27). Type 'R'.

Object :- To find out suitable rotation for Delhi tract.

1. BASAL CONDITIONS :

(i) (a, and (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Cotton :- 21.4.53, Maize, Cowpeas—29 and 30.5.53, Sannhemp—18.6.53, Maize 28.6.53 and Sugarcane—7, 10.3.53. (iv) (a) Cotton :- Ploughing with victory plough once, with *desi* thrice preparing level with *desi* plough. Maize and Cowpeas :- Beaming after soaking dose, ploughing twice, preparing land with *desi* plough after soaking dose. Sannhemp—Preparing land with *desi* plough twice after soaking dose. Maize—Victory ploughing once, *desi* twice preparing land with *desi* plough twice and beaming. Sugarcane - Preparing land with *desi* plough thrice and beaming. (b) to (e) N.A. (v) Cotton—1400 lb. of F.Y.M./plot, Maize and Cowpeas—G.N.C. at 400 lb./ac. + 20 lb./ac. of N as C/N and 10 lb./ac. N on 28.6.53. Sannhemp—700 lb./ac. of F.Y.M./plot and 6½ lb./ac of Ammo. Phos. at sowing time. Maize—700 lb./ac. F.Y.M. per plot. Sugarcane—1400 lb./ac. of F.Y.M. (vi) Nil. (vii) Irrigated. (viii) Cotton :- Hoeing, interculturing with *desi* plough on 2.6.53. Maize—Weeding 4 times. (ix) N.A. (x) Cotton—30.9.53, Cowpeas 5,8.8.1953, 8,11.8.1953., Maize—3.10.53 and Sugarcane 9.2.1954. to 18.2.1954.

2. TREATMENTS to 4. GENERAL:

Please refer to No. I.A.R.I. 51(22) on page 345.

5. RESULTS :

MAIZE

- (i) 1692 lb./ac.
 (ii) 243.6 lb./ac.
 (iii) Treatments differ significantly.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
B ₂	1925
E ₁	1628
F ₂	1318
I ₃	1899
S.E./mean	=121.8 lb./ac.

COTTON

- (i) 1376 lb./ac.
 (ii) 669.8 lb./ac.
 (iii) Treatments differ significantly.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
C ₁	1220
D ₂	1517
G ₃	1461
H ₂	1306
S.E./Mean	=334.9 lb./ac.

SUGARCANE

- (i) 74256 lb./ac.
 (ii) 9671.8 lb./ac.
 (iii) Treatments differ significantly.
 (iv) Av. yield of sugarcane in lb./ac.

Treatment	Av. yield
E ₂	72845
H ₃	69717
J ₃	80206
S.E./mean	=4835.9 lb./ac.

MAIZE and COWPEAS

- (i) 25576 lb./ac.
 (ii) 16110 lb./ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield in lb./ac.

Treatment	Av. yield
A ₁	24429
D ₁	27302
I ₁	24998
S.E./mean	=8054.9 lb./ac.

Crop :- Wheat-Peas-Potato-Berseem (*Rabi*). Ref :- I.A.R.I. 52(26). Type :- 'R'.

Object :- To find out a suitable rotation for Delhi tract.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Peas on 18, 20.10.1952, Wheat on 26, 30.10.1952, Potato on 17.10.1952 and Berseem on 8.10.1952. (iv) (a) Peas—ploughing with victory plough once, 5 times with *desi* plough. Wheat ploughing with victory plough once, *desi* plough twice, preparing land with *desi* plough. Potato—ploughing with victory plough once, with *desi* twice, preparing land with *desi* plough thrice and Berseem—preparing land with victory plough once and preparing land with *desi* plough twice except in cotton plots. (b) to (e) N.A. (v) N.A. (vi) Potato : D.R.R, Wheat : N.P. 775 and Peas : N.P. 29. (vii) Irrigated. (viii) Peas—*bakharing* once, Wheat—weeding and Potato—hoeing. (ix) N.A. (x) Peas on 12, 14.3.1953, Wheat on 23, 24.3.1953, Potato on 24.2.1953 and 2.3.1953 and Berseem on 13.12.1952 to N.A.

2. TREATMENTS to 4. GENERAL :

Please refer to No. I.A.R.I. 51(22) on page 345.

5. RESULTS :

WHEAT		POTATO	
Treatment	Av. yield	Treatment	Av. yield
A ₁	1562	E ₁	21913
A ₂	1612	B ₁	20896
C ₂	2220	J ₂	23433
D ₁	1891	BERSEEM	
F ₁	2249	C ₁	39399
G ₁	2241	D ₂	44475
H ₁	1889	I ₃	63664
J ₁	2149	PEAS	
Permanent plot	1807	B ₂	1212
		F ₂	1283
		G ₂	1275
		I ₂	1165

Crop :- Wheat-Potato-Peas-Berseem (*Rabi*). Ref :- I.A.R.I. 53(35). Type :- 'R'.

Object :—To find out a suitable rotation for Delhi tract.

1. BASAL CONDITIONS :

- (i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Wheat from 31.10.1953 to 2.11.1953. (iv) (a) Wheat—ploughing with victory plough, *desi* plough, preparing land with plough and beaming. Peas—ploughing with victory plough and discing. Preparing land with *desi* plough and beaming. (b) to (e) N.A. (v) 20 lb./ac. of N as A/S+60 lb./ac. of P₂O₅ as Ammo. Phos. (vi) Wheat : N.P. 775 and Peas : N.P. 29. (vii) Irrigated. (viii) Wheat—weeding on 8, 18.12.1953 and Peas—weeding on 16, 22.11.1953. (ix) N.A. (x) Wheat on 4, 6.4.1954 and Peas on 16.3.1954.

2. TREATMENTS to 4. GENERAL.

Please refer to No. I.A.R.I. 51 (22) on page 345.

5. RESULTS :

WHEAT		POTATO	
(i) 1979 lb./ac.		(i) 14020 lb./ac.	
(ii) 174.48 lb./ac.		(ii) 1685.2 lb./ac.	
(iii) Treatments differ highly significantly.		(iii) Treatments do not differ significantly.	
(iv) Av. yield of grain in lb./ac.		(iv) Av. yield of potato in lb./ac.	
Treatment	Av. yield	Treatment	Av. yield
A ₁	1670	B ₁	15489
A ₂	1678	E ₁	14018
C ₂	2131	J ₂	12552
D ₁	2024	S.E./mean	=842.6 lb./ac.
F ₁	1967	BERSEEM	
G ₁	2172	Treatment	Av. yield
H ₁	2107	C ₁	31589
I ₁	2000	C ₂	39526
J ₁	2065	C ₃	57975
S.E./mean	= 87.39 lb./ac.	PEAS	
		B ₂	1275
		F ₂	820
		G ₂	1462
		I ₂	1266

Crop :-Maize-Cotton-Cowpeas-Sugarcane (*Kharif*). Ref :-I.A.R.I. 51(21). Type :-'R'.

Object :- To find out a suitable rotation for Delhi tract.

1. BASAL CONDITIONS :

(i) (a) As per treatments. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A.
(iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS to 4. GENERAL :

Please refer to No. I.A.R.I. 51(22) on page 345.

5. RESULTS : (i) to (iii)

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

MAIZE		COTTON	
Treatment	Av. yield	Treatment	Av. yields
B ₂	1062	C ₁	955
E ₁	983	D ₂	971
F ₂	959	G ₃	996
I ₃	864	H ₂	987
Permanent plot	592	Permanent plot	930
SUGARCANE		MAIZE and COWPEAS	
E ₂	51659	A ₁	17691
H ₃	47586	D ₁	24612
J ₃	50137	I ₁	21872
Permanent plot	40120		

Crop :-Maize-Cotton-Cowpeas (*Kharif*). Ref :-I.A.R.I. 52(25). Type :-'R'.

Object :- To find out a suitable rotation for Delhi tract.

1. BASAL CONDITIONS :

(i) (a) As per treatments. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Maize and cowpeas : 31.5.52 ; cotton 21.4.1952 and 20.5.1952. Maize 27.6.1952. and G.M. 13.6.1952. (iv) (a) Ploughing with victory plough and *desi* plough, preparing land with *desi* plough twice after soaking dose. (b) to (e) N.A. (v) F.Y.M. at 5 ton/ac. C/N at 20 lb./ac. of N on 31.5.1952. (vi) N.A. (vii) Irrigated. (viii) Hoeing with *oudh* plough on 14 and 25.6.52. (ix) N.A. (x) 9.8.52 to 12.8.52.

2. TREATMENTS to 4. GENERAL :

Please refer to No. I.A.R.I. 51(22) on page 345.

5. RESULTS :

(i) to (iii) N.A.

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

MAIZE		COTTON	
Treatment	Av. yield	Treatment	Av. yield
B ₂	1699	C ₁	1137
E ₁	1448	D ₂	1004
F ₂	1424	G ₃	1224
I ₃	1399	H ₂	1253
Permanent plot	1025	Permanent plot	905
SUGARCANE		MAIZE and COWPEAS	
E ₂	41126	A ₁	30372
H ₃	44986	D ₁	30986
J ₃	43101	I ₁	33992
Permanent plot	45446		