

# **NATIONAL INDEX**

OF

## **AGRICULTURAL**

## **FIELD**

## **EXPERIMENTS**

**VOL. 8 PART 3**

## **MAHARASHTRA**

**1960—65**



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## FOREWORD

The I. C. A. R. has adopted the 'Co-ordinated approach' to crop improvement as its strategy in agricultural research. This approach is based on the principle of giving high priority to problem solving research and for the purpose an intimate knowledge of research in progress and trends of results is very essential. To give impetus to this approach, I. C. A. R. started a scheme for collecting data of all field experiments conducted in the country. It was aimed at compilation of agronomic experiments in the country, with a view to indicate the gaps in the knowledge and to avoid duplication. The scheme entitled : "National Index of Field Experiments" is running under the Institute of Agricultural Research Statistics which has rendered a very valuable service by preparing compendia of agricultural field experiments conducted in the country. Two series of the compendia containing results of about 7,200 and 12,000 experiments conducted during the periods 1948-53 and 1954-59 respectively have already been published by the Institute. The present is the third series of compendia and is expected to contain the results of about 18,000 experiments conducted during the period 1960-65.

The number and the types of experiments have been increasing at a fast rate. Further, many of the experiments were being repeated over a number of years. The conclusions drawn from such experiments should take into account the seasonal variations. For this purpose, it was necessary to carry out consolidated analysis of results over years. Thus, the task of compilation, analysis and interpretation of results of experiments being covered in the third series became more formidable compared to those covered in the earlier two series.

The preparation of this compendium has been possible by the whole-hearted co-operation of State Departments of Agriculture, Agricultural Universities and Central Research Institutes who ungrudgingly made the results of their experimental research available. My thanks are due to various officers of these institutions for participating in this work.

I hope that the present series will be followed by periodical publications of similar compendia for later years in order that the availability of results of scientific experiments in agriculture in India may be maintained up-to-date in a consolidated form.

NEW DELHI,  
January 1, 1973.

B. K. SONI  
*Deputy Director General (AS)*  
*Indian Council of Agricultural Research*

## PREFACE

The present set of volumes form Part III in the series of compendia of Agricultural Field Experiments being published under the project of National Index of Field Experiments. Volumes comprising in Parts I and II of the series pertaining to the periods 1948-53 and 1954-59 were published in 1962 and 1965 and contained the results of about 7,200 and 12,000 experiments respectively. The present volumes include results of experiments conducted during the period 1960-65. During the last one decade there has been an enormous increase in agricultural research and experimentation so much so that for the period 1960-65 to which the present volume refer, results of about 18,000 experiments are available.

Like the earlier two series, the compendium for Part III is divided into 15 volumes, one each for (1) Andhra Pradesh, (2) North-Eastern Region (Assam, Manipur, Nagaland, Meghalaya, Tripura, Arunachal Pradesh and Mizoram), (3) Bihar, (4) Gujarat, (5) Kerala, (6) Madhya Pradesh, (7) Maharashtra, (8) Mysore, (9) Orissa, (10) North-Western Region (Punjab, Haryana, Jammu & Kashmir and Himachal Pradesh), (11) Rajasthan, (12) Tamil Nadu, (13) Uttar Pradesh, (14) West Bengal and (15) All Central Institutes. A departure has, however, been made in the presentation of the material contained in each volume. Whereas the results of individual experiments were presented in the volumes of previous series, the present series contain results of pooled statistical analysis of experiments that were conducted for two or more years and concluded during the period 1960-65. In respect of those experiments conducted only for one year, and also those conducted for more than one year but were continuing beyond 1960-65, the results of individual experiments have been presented

The work under the scheme was carried out at the Institute of Agricultural Research Statistics. As it was spread over a number of years, there were changes, in the officers responsible for the scheme. In successive stages, collection and analysis of data were carried out under the guidance of Shri T.P. Abraham, Assistant Statistical Adviser, now Director, National Sample Surveys Organisation, Division of Survey Design and Research and Data Processing, Calcutta, Dr. B.N. Tyagi, Senior Statistician, now Joint Director of Agriculture (Statistics), Uttar Pradesh, Shri M.G. Sardana, Senior Statistician, now Officer on Special Duty, Central Statistical Organisation, Government of India and Shri K.S. Krishnan, Senior Statistician of this Institute. At the preparatory stage, the work of the third series of compendia was looked after by Shri O.P. Kathuria, Junior Statistician, now Statistician in Indian Agricultural Research Institute and Shri R.K. Khosla, Junior Statistician of this Institute. Sarvashri P.P. Rao, M.L. Sahni, Mahesh Kumar, S.L. Garg, and Sh. B.L. Chowhry Statistical staff of the Institute carried out the work in the initial stages.

The final stage of analysis and the printing was carried out under the guidance of Shri P.N. Bhargava, Statistician of the Institute. Sarvashri P.R. Yeri, M.P. Saksena, H.C. Jain, R.K. Jain, J.K. Kapoor, G.L. Khurana, Prabhat Kumar, Kuldip Singh, M.S. Kaushik and P.K. Azad, Statistical staff of the Institute deserve special mention for their careful and painstaking work in the analysis of the data, combining of results of similar experiments and proof reading of the compendia volumes. It is not out of place to mention the names of Shri B.K. Sharma and Shri Narander Kumar typists, for their labourious work in typing the part of Voluminous manuscript of this compendia.

The collection of data of experiments from various research stations, was done by the regional staff of the Institute placed in different States. They deserve to be congratulated for the hard work they have put in.

Thanks are due to the State Departments of Agriculture, the Central Institutes and the Agricultural Universities who made the data of the experiments conducted under their jurisdiction readily available to the staff of the Institute. The I. A. R. S. acknowledges with thanks their willing co-operation without which the consolidation of the results would not have been

possible. The Institute is also thankful to various officers in the State Departments of Agriculture and Agricultural Universities who worked as Regional Supervisors for the project from time to time and provided guidance to the regional staff working in the scheme. The list of the names of the regional supervisors and regional staff of the project is given on the following pages.

D. SINGH

*Director*

*Institute of Agricultural Research Statistics*

*( I. C. A. R. )*

NEW DELHI,  
September 9, 1975

**Regional Supervisors and Regional Staff of the National Index of  
Field Experiments**

Sl. No.	Region & Headquarters	Statistical staff from the Institute of Agricultural Research Statistics	Regional Supervisor
1.	Andhra Pradesh (Hyderabad)	1. Shri C. H. Rao 2. Shri G. V. S. R. Krishna 3. Shri P. R. Yeri	1. Shri P. Govinda Rao, Head of the Agri. Res. Instt. 2. Shri S. Vittal Rao, H. Q. Dy. Director (Research)
2.	Assam (Shillong)	1. Shri A. Sinha 2. Shri K. D. Saha	1. Shri U. C. Borah, Research Officer (Stat.)
3.	Bihar (Sabour)	1. Shri R. K. Jain 2. Shri S. M. G. Saran	1. Shri G. P. Singh, Statistician
4.	Gujarat (Ahmedabad)	1. Shri S. P. Doshi	1. Dr. D. K. Desai, Dy. Director of Agriculture (Stat.) 2. Shri J. B. Trivedi, I/C. Dy. Director (Stat.) 3. Shri R. L. Shah, Dy. Director of Agriculture (Stat.)
5.	Kerala (Trivandrum)	—	1. Shri N. George John, Research Officer 2. Shri G. Rama Chandran Nair, Research Officer 3. Shri K. George, Research Officer
6.	Madhya Pradesh (Bhopal)	1. Shri Rama Rao Patil 2. Shri S. S. Koutaula	1. Shri A. G. Khare, Dy. Director of Agriculture (Stat.)
7.	Maharashtra (Poona)	1. Shri P. R. Yeri 2. Shri B. Ramakrishnan	1. Shri V. G. Sharma, Sr. Statistician 2. Shri G. C. Shaligram, Dy. Statistician 3. Shri D. T. Sawant, Asstt. Statistician
8.	Mysore (Bangalore)	1. Shri K. A. Balakrishnan 2. Shri P. T. N. Nambiar	1. Dr. N. P. Patil, Director of Research
9.	Orissa (Bhubaneswar)	1. Shri Rama Rao Patil	1. Shri B. Mishra, Dy. Director of Agri. (Hq.) 2. Shri A. Mishra, Chief Statistician

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|-----|---|---|--|
| 10. | Punjab, Haryana,<br>Himachal<br>Pradesh, Jammu<br>& Kashmir<br>(Ludhiana) | 1. Shri B. L. Kaistha<br>2. Shri U. N. Dixit<br>3. Shri D. L. Manocha<br>4. Shri M. S. Batra<br>5. Shri D. P. Singh   | 1. Shri P. S. Sahota,<br>Director of Crop Insurance<br>2. Shri Darshan Singh,<br>Asstt. Statistician<br>3. Shri M. S. Pannu,<br>Statistician, Department of<br>Agriculture<br>4. Dr. D. Raghavarao,<br>Prof. & Head, Dept. of<br>Maths. & Stat., P.A.U.,<br>Ludhiana |
| 11. | Rajasthan<br>(Jaipur)   | 1. Shri N. K. Ohri<br>2. Shri C. H. Rao   | 1. Shri H. C. Kothari,<br>Dy. Director (Statistics),<br>Department of Agriculture  |
| 12. | Tamil Nadu<br>(Coimbatore)  | 1. Shri P. Narayanan<br>2. Shri M. V. George  | 1. Shri K. R. Nagaraja Rao,<br>Secretary, Research Council<br>2. Dr. K. Ramakrishnan,<br>Associate Dean<br>3. Dr. D. Daniel Sunderaraj,<br>Principal   |
| 13. | Uttar Pradesh<br>(Lucknow)  | 1. Shri S. N. Bajpai<br>2. Shri M. P. Saksena<br>3. Shri G. N. Bahuguna<br>4. Shri O. P. Sharma<br>5. Shri R. Sharma<br>6. Shri C. B. Tiwari<br>7. Shri R. S. Singh<br>8. Shri A. C. Srivastava | 1. Dr. K. Kishen, Jt. Director<br>of Agriculture (Statistics)<br>2. Shri K. P. Avasthy,<br>Officer-on-Special Duty   |
| 14. | West Bengal<br>(Calcutta)   | 1. Shri A. K. Mukherjee<br>2. Shri A. Sinha   | 1. Shri S. N. Mukherjee,<br>Dy. Director of Agriculture<br>(Statistics)  |
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**ABBREVIATIONS COMMON TO EXPERIMENTS ON ANNUAL AND PERENNIAL  
CROPS AND EXPERIMENTS ON CULTIVATOR'S FIELDS GIVEN IN  
EXPERIMENTAL DATA**

**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 is given in brackets.

Abbreviations adopted for States are as follows :

1.	A.P.	—	Andhra Pradesh	11.	Mn.	—	Manipur
2.	As.	—	Assam	12.	Ms.	—	Mysore
3.	Bh.	—	Bihar	13.	N.L.	—	Nagaland
4.	Gj.	—	Gujarat	14.	Or.	—	Orissa
5.	H.P.	—	Himachal Pradesh	15.	Pb.	—	Punjab
6.	Hr.	—	Haryana	16.	Rj.	—	Rajasthan
7.	J.K.	—	Jammu & Kashmir	17.	T.N.	—	Tamil Nadu
8.	K.	—	Kerala	18.	Tr.	—	Tripura
9.	M.P.	—	Madhya Pradesh	19.	U.P.	—	Uttar Pradesh
10.	Mh.	—	Maharashtra	20.	W.B.	—	West Bengal

For the experiments conducted under the schemes sponsored by the Indian Council of Agricultural Research, like the All India Co-ordinated Agronomic Experiments (Model Agronomic Experiments and Simple Fertilizer Trials) scheme, no serial numbers have been given at the source as the data of these experiments were collected at the headquarters (New Delhi). In such cases, the abbreviation MAE or SFT is given in the bracket against the year in which the experiment is conducted.

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

For Central Institutes, the corresponding standard abbreviations have been adopted as given below :

C. A. Z. R. I.	—	Central Arid Zone Research Institute.
C. P. C. R. I.	—	Central Plantation Crops Research Institute.
C. P. R. I.	—	Central Potato Research Institute.
C. R. R. I.	—	Central Rice Research Institute.
C. S. S. R. I.	—	Central Soil Salinity Research Institute.
C. T. C. R. I.	—	Central Tuber Crops Research Institute.
C. T. R. I.	—	Central Tobacco Research Institute.
C. T. R. L.	—	Cotton Technological Research Laboratory.
I. A. R. I.	—	Indian Agricultural Research Institute.
I. G. F. R. I.	—	Indian Grassland & Fodder Research Institute.
I. H. R.	—	Institute of Horticultural Research.
I. I. S. R.	—	Indian Institute of Sugarcane Research.
I. L. R. I.	—	Indian Lac Research Institute.
J. A. R. I.	—	Jute Agricultural Research Institute.
J. T. R. L.	—	Jute Technological Research Laboratory.
S. B. I.	—	Sugarcane Breeding Institute.

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

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

C—Cultural ; D—Control of Diseases and Pests ; I—Irrigational ; M—Manurial ; R—Rotational ; V—Varietal and X—Mixed cropping. In factorial experiments, the treatments will be abbreviated as, for example, Cultural-cum-Manurial as CM.

Object :—A statement of the objective of the experiment is given indicating the main crop and the type of the experiment.

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

(i) General mean. (ii) S. E. per plot. (iii) Results of test of significance. (iv) Summary table(s), with critical differences for individual effect means which are significant.

#### Other abbreviations used in the Experimental Data

Kg	=	Kilogram(s)	Dical. Phos.	=	Dicalcium Phosphate
Kg/ha.	=	Kilogram(s) per hectare	Zn. Sul.	=	Zinc Sulphate
N	=	Nitrogen	Cu. Sul.	=	Copper Sulphate
P	=	Phosphate	Mg. Sul.	=	Magnesium Sulphate
K	=	Potash	Mn. Sul.	=	Manganese Sulphate
Nitro. Phos.	=	Nitrogen Phosphate	Ammo. Molybdate	=	Ammonium Molybdate
Ammo. Phos.	=	Ammonium Phosphate	B.	=	Boron
A/S	=	Ammonium Sulphate	Fe. Sul.	=	Ferrous Sulphate
A/S/N	=	Ammonium Sulphate Nitrate	F. M.	=	Fish Manure
C/A/N	=	Calcium Ammonium Nitrate	G. N. C.	=	Groundnut Cake
A/N	=	Ammonium Nitrate	M. C.	=	Municipal Compost
A/C	=	Ammonium Chloride	T. C.	=	Town Compost
C/N	=	Chilean Nitrate	G. M.	=	Green Manure
Mur. Pot.	=	Muriate of Potash	G. L. M.	=	Green Leaf Manure
Pot. Sul.	=	Potassium Sulphate	F. Y. M.	=	Farm Yard Manure
Super.	=	Super Phosphate	C. M.	=	Cattle Manure

The information regarding the particulars of research stations may be obtained under the respective items as given below :

### PARTICULARS OF RESEARCH STATIONS

#### A. General Information :

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

#### B. Normal Rainfall :

Average fortnightly rainfall, specifying the period on which the figures are based.

#### C. Irrigation and Drainage Facilities :

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

#### D. Soil type and Soil analysis :

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

#### E. No. of Experiments :

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

Information under the following heads is to be read against the respective items under experimental data as given on next page.



**BASAL CONDITIONS***A. For experiments on annual crops :*

(i) (a) Crop rotation followed, if any. (b) Previous crop. (c) Manuring of previous crop (State amount and kind). (ii) Soil type. (iii) Date of sowing/planting. (iv) Cultural practices : (a) Preparatory cultivation. (b) Method of sowing. (c) Seed-rate. (d) Spacing. (e) No. of seedlings per hole. (v) Basal manuring given to the whole experiment with time and method of application. (vi) Variety (indicate also early, medium or late). (vii) Irrigated or un-irrigated. (viii) Important post-sowing/planting cultural operations such as weeding, etc. (ix) Rainfall during crop season. (x) Date of harvest.

*B. For experiments on perennial crops :*

(i) Previous history of the experimental area (Give manuring and other operations). (ii) Soil type. (iii) Method of propagation of plants. (iv) Variety. (v) Date and method of sowing/planting (including spacing). (vi) Age of seedlings at the time of planting. (vii) Basal manuring given to the whole experimental area. (viii) Important cultural operations during the experimental year. (ix) Inter-cropping, if any. (x) Irrigated or un-irrigated (If irrigated, give the source, number, interval and intensity of irrigation). (xi) Rainfall during the experimental year. (xii) Date(s) of harvest.

*C. For experiments on cultivator's fields :*

(i) (a) Crop rotation followed, if any. (b) Previous crop. (c) Manuring of previous crop (State amount and kind). (ii) Soil type and soil analysis, if available. (iii) Basal manuring (Give time and method of application). (iv) Variety. (v) Cultural Practices : (a) Preparatory cultivation. (b) Method of sowing. (c) Seed-rate. (d) Spacing. (e) No. of seedlings per hole. (vi) Date of sowing/planting. (vii) Irrigated or un-irrigated. (viii) Important post-sowing/planting cultural operations such as weeding, etc. (ix) Rainfall during crop season. (x) Date of harvest.

**DESIGN***A. For experiments on annual crops :*

(i) Abbreviations for designs : C. R. D.—Completely Randomised Design ; R. B. D.—Randomised Block Design ; L. Sq.—Latin Square ; Fact.—Factorial ; Confd.—Confounded ; other designs and modifications of the above to be indicated in full. (indicate confounded effects, if any). (ii) (a) No. of plots per block (in a split-plot experiment, the number of main-plots per replication as well as the number of sub-plots per main-plot should be given). (b) Block dimensions. (iii) No. of replications. (iv) (a) Gross plot-size. (b) Net plot-size. (v) Border or guard rows kept. (vi) Whether treatments are randomised (independently in each block).

*B. For experiments on perennial crops :*

(i) Abbreviations for designs: C. R. D.—Completely Randomised Design ; R. B. D.—Randomised Block Design ; L. Sq.—Latin Square ; Fact.—Factorial ; Confd.—Confounded ; other designs and modifications of the above to be indicated in full. (indicate confounded effects, if any) (ii) (a) No. of plots per block (in split-plot experiments, the number of main-plots per replication as well as the number of sub-plots per main-plot should be given). (b) Block dimensions. (iii) No. of replications. (iv) (a) Net plot-size. (b) No. of trees per plot (In case of experiments on grasses give plot-size). (v) Border or guard rows kept. (vi) Whether treatments are randomised (independently in each block).

*C. For experiments on cultivator's fields :*

(i) Design with No. of plots/block and No. of replications (In split-plot experiments, the number of main-plots per replication as well as the number of sub-plots per main-plot should be given). (ii) Method of selection of sites with number and distribution of experiments. (iii) (a) Gross plot-size. (b) Net plot-size. (iv) Whether treatments are randomised (independently in each block).

### GENERAL INFORMATION

*A. For experiments on annual crops :*

(i) General crop condition during growth (if lodged, state date of lodging). (ii) Incidence of pests and diseases and control measures taken, if any. (iii) Types of quantitative observations taken. (iv) (a) If the experiment has continued for more than one year, indicate year of commencement and year of termination. (b) Whether treatments assigned to the same plots every year. (c) Reference to combined analysis, if any. (v) Other centres, if any, where the same experiment has been conducted with reference numbers. (vi) Abnormal occurrences such as heavy rains, frost, storm, drought, etc. (vii) Any other important information.

*B. For experiments on perennial crops :*

(i) General crop condition during growth. (ii) Incidence of pests and diseases and control measures taken, if any. (iii) Types of quantitative observations taken. (iv) If the experiment has continued for more than one year, indicate year of commencement and year of termination (Give reference of previous years, if any). (v) Other centres, if any, where the same experiment has been conducted with reference numbers. (vi) Reference to combined analysis, if any. (vii) Abnormal occurrences such as heavy rains, frost, storm, drought, etc. (viii) Any other important information.

*C. For experiments on cultivator's fields :*

(i) General crop condition during growth. (ii) Incidence of pests and diseases and control measures taken, if any. (iii) Types of quantitative observations taken. (iv) In case of repetition in successive years. (a) Year of commencement and termination. (b) Whether treatments assigned to the same plots every year. (c) Reference to combined analysis, if any. (v) In case of repetition at other places, give names with references, if any. (vi) Abnormal occurrences such as heavy rains, drought, etc. (viii) Any other important information.

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**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 aestivum</i> L.	Gaum ; Ghehu	Gam	Gaham	Godumalu	Kothumai	Gothambu	Godhi	Gahu	Ghahu	Gehon	Kanak
3	Jowar	<i>Andropogon Sorghum</i>	—	Jowar	Juara	Jonna	Cholam	Cholam	Jola	Jowari ; Jondhla	Jowari ; Juar	Jowar ; Jaur	Jowar
4	Bajra	<i>Pennisetum typhoides</i> stapf Ex Hubbard	—	Bajra	Bajra	Sajja	Kambu	Kambu	Sajje	Bajri	Bajri	Bajra	Bajra
5	Maize	<i>Zea mays</i> L.	Gom dhan	Bhutta	Macca	Makka- jonna	Makka- cholam	Cholam Makka- chofam	Musukina Jola	Makka	Makkai	Makka	Makki, Makayce
6	Ragi	<i>Eleusine coracana</i> Gaertn	—	Marwa	Mandia	Ragi ; Chodi	Keppai ; Ragi Kelvargu	Muthari Ragi	Ragi	Nagli ; Nachni	Nagli ; Bavto	Ragi ; Mandika ; Marwah	Mandhuka ; Mandhal
7	Wari	<i>Panicum millaceum</i> L.	—	Cheena	Bachari China, Bagamu	Variga	Paniva- ragu	—	Baragu	Wari	Cheno	Chena, Barri	Cheena
8	Kodra	<i>Paspalum scrobiculatum</i> L.	—	Kodo	Kodua	Arikelu ; Arika	Varagu	Varaku	Harka	Kodra	Kodra	Kodon	Kodra
9	Gram	<i>Cicer arietinum</i> L.	Butmah	Chola	Boot	Sanagalu	Kadalai, Sundal- Kadalai	Kadala	Kadale	Harbara	Chana	Chana	Chole ; Chana
10	Red Gram	<i>Cajanus cajan</i> Milsp. ; <i>Cajanus indicus</i> sprengl.	Arhar	Arhar	Harad	Kandulu	Thuvarai	Thuvaran Payaru	Thogari	Tur	Tuver	Arhar	Harhar, Arhar
11	ChinaMung	<i>Phaseolus aureus</i> Roxb	Magumav	Sonamung	Mung	Pacha- pesalu	Pachai- paru Pasi- payaru	Ceru- payaru ; Payaru	Hesaru	Mug	Mag	Moong	Moong, Mug
12	Wal	<i>Dolichos Lablab</i> Var. <i>Lignosus</i>	—	Shim	Simba, Baila	Anapa	Mochchai	Muthira	Avare	Wal	Wal	Sem	—
13	Bhendi	<i>Hibiscus esculentus</i> ; <i>Abelmoschus esculentus</i> moench	Bhendi	Dhenrosh	Vendi	Benda	Bendai kai	Venda	Bende kayi	Bhendi	Bhida ; Bhinda	Bhindi	Bhindi ; Tori
14	Potato	<i>Solanum tuberosum</i> L.	Alooguti	Alu	Bilati Alu	Bangala- dumpa, Urlagadda	Urala Kizhangu	Urala kizangu	Alu gedde	Batata	Aloo, Batata	Aaloo	Alu

GLOSSARY OF VERNACULAR NAMES OF CROPS Contd.

Sl. No.	Name of Crop	Botanical Name	Assamese	Bengali	Oriya	Telugu	Tamil	Malayalam	Kannada	Marathi	Gujarati	Hindi	Punjabi
15	Sugarcane	<i>Saccharum officinarum</i> L.	Kuhiar	Akh	—	Cheruku	Karumbu	Karimbu	Kabbu	Oos	Sherdi	Ganna ; Kamad ; Naishaker	Kamad ; Ganna ; Eakh
16	Tobacco	<i>Nicotiana tobacum</i> L.	Dhopat	Tamak	Uanpatra	Pogaku	Pugayilai	Pukayila	Hoge Soppu	Tambaku	Tamaku	Tambaku	Tamaku ; Tambaku
17	Cotton	<i>Gossypium spp.</i>	Kapah	Karpas ; Tula	Kapa	Pratti	Paruthi	Paruthi	Hatti	Kapus	Kapas	Kapas	Kapah
18	Groundnut	<i>Arachis hypogaea</i> L.	China Badam	Cheena badam	China- badam	Vesurenaga	Nila- kadala i	Nila- kadalai	Kadale kayi	Bhuimug	Bhoising Magafali	Mungphali	Mungfali
19	Sesamum	<i>Sesamum indicum</i> L. <i>sesamum oriental</i> L.	Til	Til	Rasi	Nuvvulu	Ellu	Ellu	Yellu	Til ; Tili	Tal	Til	Til
20	Safflower	<i>Carthamus tinctorius</i> L.	Kusum	Kusum	Kusum	Kusuma	Kusumba	Chand- rukam	Kusube	Kardi	Kosambi	Kusum	Kasumba
21	Linseed	<i>Linum usitatissimum</i> L.	Tisi	Tishi	Peshi	Avise	Alivithai	Cheruch- anavithu	Agase	Javas ; Alsi	Alsi	Alsi	Alsi
22	Niger	<i>Guizotia abyssinica</i> Cass	Sorguja	Sarguaz	Alashi	Verrinu- vvulu	Peyellu	—	Huchellu	Karale ; Kbursani	Ramtal	Ramtil	Tam til
23	Chillies	<i>Capsicum frutescens</i> L.	Jalakiya	Lanka ; marich	Lanka	Mirapa- kaya	Milakai	Mulaku	Menasi- nakayi	Mirchi	Marcha	Lal mirch	Lal mirch
24	Onion	<i>Allium cepa</i> L.	Piyaz	Piaz	Peas ; Ulli	Ulli	Vengayam ; Erangayam	Ulli	Eerulli	Kanda	Dungle ; Kando	Piaz	Ganda ; Payaz
25	Turmeric	<i>Curcuma longa</i> ; <i>Curcum domestica</i> Val.	Halodhi	Halud ; Haldi	Haldi	Pasupu	Manjai	Manjal	Arisina	Halad	Halдар	Haldi	Halad ; Haldi ; Bassar
26	Mango	<i>Mangifera Indica</i> L.	Am	Am	Amba	Mamidi	Mangai	Mawu	Movu	Amba	Keri	Aam	Amb
27	Mosambi	<i>Citrus sinensis</i> Osbeck	Malta ; Mozambique	Mosambi	Mitha ; Kamala	Battayi	Sathugudi ; Cheeni	Madura maranga	Sathku di	Mosambi	Mosambi	Malta ; Mausmee	Malta
28	Banana	<i>Musa paradisiaca</i> L.	Kol	Paka kala	Kadali	Arati	Vazhai- pazum	Vazha	Bale	Kele	Kela	Kela	Kela
29	Grape	<i>Vitis vinifera</i> L.	Angur	Angur	Angur	Draksha	Kodimu- ndri	Munthiri	Drakshi	Drakshe	Darakh	Angoor	Angur bel
30	Cashewnut	<i>Aracardium occidentals</i>	Kaju	Kaju badam	Lanka amba	Jeedima midi	Mundiri	Kasu mave	Godambi	Kaju	Kaju	Kaju	Khaja

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# MAHARASHTRA

(Salient features of experimentation)

The first and second series of the National Index of Field Experiments already published for the period 1948—53 and 1954—59 respectively, gives the general information regarding the agro-climatic regions, extent of irrigation, normal cropping pattern, etc. for this State. Therefore, this information has not been discussed in the present volume.

The results of 1346 experiments conducted during the period 1960-65 have been included in the present volume. In addition to these experiments, results of all those experiments conducted under All India Co-ordinated Experiments of I.C.A.R. are also presented. The volume for the last two series, namely, for the period 1948—53 and 1954—59 contained the results of 975 and 1470 experiments respectively. In the present volume about 1138 experiments were continued for more than one year and which were grouped in 389 groups. The distribution of these experiments according to crop and type are presented in table 1.

TABLE I  
Number of groups and experiments concluded during the period 1960-65  
(Crop-wise and Type-wise)

Crop	Type													Total
	M	MV	C	CV	CM	CMV	I	IM	IMV	IC	D	X	R	
1. Paddy	27(87)	15(41)	3(8)	—	3(10)	—	—	—	—	—	1(2)	—	—	49(148)
2. Wheat	21(52)	3(6)	4(11)	1(2)	1(3)	2(5)	4(11)	4(10)	1(3)	—	—	—	—	41(103)
3. Jowar	32(87)	—	17(57)	1(3)	14(46)	—	2(5)	2(5)	—	—	—	—	—	68(203)
4. Bajra	8(25)	1(3)	1(3)	—	—	—	—	—	—	—	—	—	—	10(31)
5. Ragi	2(4)	—	—	—	—	—	—	—	—	—	—	—	—	2(4)
6. Wari	—	—	—	—	1(3)	—	—	—	—	—	—	—	—	1(3)
7. Gram	1(2)	—	—	—	2(4)	—	—	—	—	—	—	—	—	3(6)
8. China moong	1(5)	—	—	—	—	—	—	—	—	—	—	—	—	1(5)
9. Wal	—	—	3(11)	2(7)	—	—	—	—	—	—	—	—	—	5(18)
10. Sugarcane	26(78)	—	6(17)	1(2)	5(13)	—	3(10)	—	—	1(3)	1(2)	—	—	43(125)
11. Tobacco	2(6)	—	—	—	—	—	—	—	—	—	—	—	—	2(6)
12. Cotton	14(43)	—	12(33)	—	16(52)	—	2(6)	—	—	—	—	—	—	44(134)
13. Groundnut	11(27)	—	2(7)	—	1(3)	—	4(10)	—	—	—	6(18)	—	—	24(65)
14. Sesamum	1(2)	—	—	—	—	—	—	—	—	—	—	—	—	1(2)
15. Safflower	1(2)	—	—	—	—	—	—	—	—	—	—	—	—	1(2)
16. Linseed	1(2)	—	2(7)	—	—	—	—	—	—	—	—	—	—	3(9)
17. Niger	1(3)	—	—	—	—	—	—	—	—	—	—	—	—	1(3)
18. Chillies	—	—	—	—	—	—	1(2)	—	—	—	—	—	—	1(2)
19. Onion	2(4)	—	1(2)	—	—	—	1(2)	—	—	—	—	—	—	4(8)
20. Turmeric	1(2)	—	1(2)	—	1(2)	—	1(2)	—	—	—	—	—	—	4(8)
21. Mango	1(4)	—	1(5)	—	—	—	—	—	—	—	—	—	—	2(9)
22. Mosambi	—	—	—	1(3)	—	—	—	—	—	—	—	—	—	1(3)
23. Banana	1(3)	—	—	—	1(2)	—	—	—	—	—	—	—	—	2(5)
24. Cashewnut	—	—	1(3)	—	2(7)	—	—	—	—	—	—	—	—	3(10)
25. X	—	—	—	—	—	—	—	—	—	—	—	68(203)	—	68(203)
26. R	—	—	—	—	—	—	—	—	—	—	—	—	5(23)	5(23)
Total	154(438)	19(50)	54(166)	6(17)	47(145)	2(5)	18(48)	6(15)	1(3)	1(3)	8(22)	68(203)	5(23)	389(1138)

The above table includes 873 experiments comprised of 301 groups, those experiments concluded during the period under reference while 265 experiments, forming 88 groups continued beyond 1965. There were 210 experiments which were conducted only for one year. The distribution of all experiments according to crop and type of experiments is presented in Table 2.

TABLE—2  
Number of experiments conducted during the period 1960-65.  
(Crop-wise and Type-wise)

Type Crop	M	MV	C	CV	CM	CMV	I	IM	IMV	IC	D	X	R	Total
1. Paddy	107	44	18	1	10	—	1	—	—	—	2	—	—	183
2. Wheat	63	10	13	6	5	5	12	11	3	—	—	—	—	128
3. Jowar	91	5	76	3	53	—	7	6	—	—	—	—	—	241
4. Bajra	30	3	8	—	2	—	—	—	—	—	—	—	—	43
5. Maize	—	—	—	—	1	—	—	—	—	—	—	—	—	1
6. Ragi	4	—	—	—	1	—	—	—	—	—	—	—	—	5
7. Wari	—	—	—	—	3	—	—	—	—	—	—	—	—	3
8. Kodra	—	—	—	—	1	—	—	—	—	—	—	—	—	1
9. Gram	2	—	—	—	6	—	—	—	—	—	—	—	—	8
10. Red gram	—	—	—	—	—	—	—	—	—	—	1	—	—	1
11. Chinamoong	5	—	—	—	—	—	—	—	—	—	—	—	—	5
12. Wal	—	—	11	8	—	—	—	—	—	—	—	—	—	19
13. Bhindi	—	—	—	—	—	—	—	—	—	—	1	—	—	1
14. Potato	—	—	1	—	—	—	—	—	—	—	—	—	—	1
15. Sugarcane	85	—	20	2	14	—	10	1	1	3	4	—	—	140
16. Tobacco	6	—	—	—	—	—	—	—	—	—	—	—	—	6
17. Cotton	48	—	37	—	54	—	7	—	—	—	3	—	—	149
18. Groundnut	48	—	12	—	3	—	14	—	—	—	23	—	—	100
19. Sesamum	2	—	—	—	—	—	—	—	—	—	—	—	—	2
20. Safflower	3	—	—	—	—	—	—	—	—	—	—	—	—	3
21. Linseed	3	—	7	—	—	—	—	—	—	—	—	—	—	10
22. Niger	3	—	1	—	—	—	—	—	—	—	—	—	—	4
23. Chillies	—	—	—	—	—	—	2	—	—	—	2	—	—	4
24. Onion	5	—	3	—	—	—	2	—	—	—	—	—	—	10
25. Turmeric	2	—	2	—	2	—	2	—	—	—	—	—	—	8
26. Mango	5	—	5	—	—	—	—	—	—	—	—	—	—	10
27. Mosambi	—	—	—	3	—	—	—	—	—	—	—	—	—	3
28. Banana	3	—	—	—	3	—	—	—	—	—	—	—	—	6
29. Grape	—	—	—	—	—	—	1	—	—	—	—	—	—	1
30. Cashewnut	—	—	3	—	7	—	—	—	—	—	—	—	—	10
31. X	—	—	—	—	—	—	—	—	—	—	—	217	—	217
32. R	—	—	—	—	—	—	—	—	—	—	—	—	23	23
<b>TOTAL</b>	<b>515</b>	<b>62</b>	<b>217</b>	<b>23</b>	<b>165</b>	<b>5</b>	<b>58</b>	<b>18</b>	<b>4</b>	<b>3</b>	<b>36</b>	<b>217</b>	<b>23</b>	<b>1346</b>

The principal crops of the State are Paddy, Wheat, Jowar, Bajri, Groundnut, Sugarcane and Cotton. The total area accounted by these crops is about 75 % of the gross-cropped area. Nearly the same percentage of the experiments is accounted by these crops in the State. The salient features of experimentation for different crops are discussed below.

*Paddy* :—The area under the crop in the State is about 1370\* thousand hectares, which is of the order of about 7 % of the total cropped area. About 183 experiments were reported on this crop out of which 35 experiments were conducted for one year only while 148 experiments continue for more than a year. The results of such experiments which were continued for more than one year were combined to form groups and the number of such groups were 49. The results for such experiments have also been presented in consolidated form.

About 58 % of the experiments reported were of purely manurial type, 24 % were of manurial-cum-varietal type while the remaining belong to the rest of the classes namely, cultural, cultural-cum-manurial experiments. In the manurial experiments, the treatments tried were different levels of Nitrogen and Phosphate. Levels tried for Nitrogen ranged from 0 to 50 Kg. per hectare while the corresponding range for the Phosphate was 0 to 47 Kg. per hectare. In some of the field trials, time of application of chemical fertilisers and levels of lime were one of the factors in the experiments. In manurial—cum—varietal experiments, varieties namely, Ambemohar, patni—6, Luchai—8, Warangal, Kolamb and Chimansal were mainly tried. The variety Luchai—8 gave the yield of order 35 Q/ha., while Ambemohar and Kolam varieties gave yield on an average 25 Q/ha. Methods of sowing, dates of planting, spacing and methods of cultivation were main treatments for the cultural experiments.

In about 107 experiments design adopted was R. B. D. out of which 47 experiments were factorial in nature. The replication in respect of each experiments varied from two to eight. The split-plot design was adopted in 52 experiments and their replications ranged from four to eight. There were few experiments where counfounding was adopted. The size of the plot adopted was 9.73 square meters in most of the experiments. In some of the experiments the plot as big as 125.35 Square meters was also adopted.

*Wheat* :- The area under the crop in the State is about 886\* thousand hectares which account for about 5% of the total cropped area. There were 128 experiments conducted on the crop in the State out of which 50% were of purely manurial type. In some of the experiments under this type, different levels of Nitrogen, Phosphate and Potash were tried : they ranged from 0 to 90 Kg. per hectare in respect of Nitrogen and 0 to 67 Kg. per hectare for Phosphate and the corresponding range for Potash was 0 to 45 Kg. per hectare. In some of the experiments, the treatment consisted of the sources of Nitrogen, different Micronutrient, Nitro-phosphate. Under cultural experiments treatments tried were spacing and dates of sowing. 26 experiments are reported where frequency of irrigation and level of irrigation formed one of the factors of treatment. The important varieties under study were HY-65, NI-59 and NI-146. The variety HY-65 gave an average yield as 9 Q/ha. while in case of NI-59, the average yield was 7 Q/ha.

55 experiments reported on this crop were laid out in Randomised Block Designs, out of which 20 experiments had treatments factorial in nature. 13 experiments had less than 3 replications while for others the number of replications ranged from 4 to 8. 50 experiments were laid out in split-Plot design, whereas 20 experiments were tried in confounded design. Out of the confounded design experiments, 10 experiments were laid out with single replication. In most of the experiments plot size adopted was 41.77 sq. meters. Though in few experiments the plot as big as 87.80 sq. meters was adopted.

\* Figures taken from Indian Agricultural Statistics, Vol. I, issued by Directorate of Economics and Statistics, Ministry of Food and Agriculture, C.D. and Co-operation for 1964-65.



*Jowar* :- Jowar is one of the principal food crops of the State. The total area under the crop is 6,070\* thousand hectares which is about 32% of the total cropped area in the State. The total number of experiments reported under the crop is 241 which is highest as compared to any other crop of the State. During the period there were 38 experiments which were conducted for the single year while 203 experiments continued for more than one year and these were grouped in 68 groups.

Out of the total experiments reported 40% were of manurial type, 32% were of cultural type while the remaining were accounted for cultural-cum-manurial type and other types. In manurial experiments the levels of Nitrogen and Phosphate ranged between 0 to 45 Kg. per hectare while the corresponding range for Potash was 0 to 90 Kg. per hectare. The maximum level of F.Y.M. was 5,608 kg. per hectare. A few experiments were conducted to study the effect of Micro-nutrients on the yield of the crop. Under the cultural type of the experiments, the factors tried were method of sowing, spacing, inter-cultural practices etc. The main varieties under investigations were NJ-144, Improved-Saoner, M-35-1 and PJ-4 K and these varieties gave an average yield of 20, 18, 15 and 13 Q/ha respectively.

Randomised Block Design was the most common design adopted for the experimental purposes. About 103 experiments were laid out with this design and in 26 experiments the treatments were of factorial nature. The split-plot design was adopted in 55 experiments. In these designs the number of replications varied from 4 to 8. The confounded designs were also adopted and their number were 58, out of which 48 were laid out with 2 replications while in the remaining 1 replication was generally adopted. The plot size adopted for the experiments varied from 13.40 sq. meters to 162.63 sq. meters, though in most of the experiments plot size adopted was 41.77 sq. meters.

*Bajri* :- Bajri crop covered about 1739\* thousand hectares i.e. 9.05% of the total cropped area in the State. Total 43 experiments were reported on this crop. All the experiments were laid out in Randomised Block Design and Variety Bajri-Akola had been most commonly used in the experiments. 30 experiment reported were purely manurial type. The levels of Nitrogen and Phosphate ranged between 0 to 48 kg. per hectare and 0 to 35 kg. per hectare respectively.

*Sugarcane* :- Sugarcane crop covered about 159\* thousand hectares of land in the State. The crop had been grown under irrigated conditions. Total 140 experiments were reported on this crop, out of which 15 experiments were conducted for more than one year and the result of those had been presented in the form of 43 groups.

About 60% of the total experiments reported were of purely manurial type. Different sources of fertilizers, level of manures and different methods and times of applications of fertilizers were few of the factors that were studied. Though the levels of Nitrogen, Phosphate and Potash ranged between 0 to 504 Kg. per hectare, 0 to 168 Kg. per hectare and 0 to 168 Kg. per hectare respectively, the most common dose used was 336 Kg./ha. of Nitrogen, 112 Kg/ha. of Phosphate and 112 Kg/ha of Potash. The compost and Farmyard Manure were applied @ 50cart loads per hectare. In cultural type of experiments, mainly methods of planting, times of planting and harvesting, spacing, effects of previous crops and intercropping were investigated. The varieties studied were Co-419, Co-740 and Co-775.

The experiments laid out in Randomised Block Design numbered 87 experiments and 41 experiments out of these had factorial treatments. 44 experiments were laid out in split-plot design. The number of replications varied between 4 and 8, only two experiments had more than 8 replications. 9 experiments were laid out in confounding design.

*Groundnut* :- Groundnut crop covered 422\* thousand hectares i.e. 5.84% of the total cropped area in the State. In all 100 experiments were reported on this crop, out of which 35 experiments were conducted for single year, whereas 65 experiments were conducted for more than a year. The results of these 65 experiments have been reported in the form of 24 groups.

The typewise distribution of the experiments show that 48 experiments were of manurial type and 23 experiments had insecticides as one of the treatments. In manurial type of experiments the effect of Nitro-phosphates, Micro-nutrients, Spartin and Lime were studied. The levels of fertilizers, viz., Nitrogen, Phosphate and Potash varied from 0 to 90 Kg/ha, 0 to 45 Kg/ha and 0 to 98 Kg/ha respectively. The effect of different, sources of Nitrogen were also studied. The control measures to be adopted for the control of Tikka and Aphids diseases were studied in 23 experiments.

The distribution of experiments shows that 42 experiments were laid out in Randomised Block Design and 27 experiments in Split-plot Design. The number of replications varied between 4 and 8. Remaining experiments were laid in confounded design.

*Cotton* :- Cotton crop covered about 2853\* thousand hectares i.e. 14.85% of the total cropped area in the State. The present volume gives the result of 149 experiments on the crop. About 33% of these experiments were conducted under irrigated conditions. B-147, (Jao-46 and Co-170) were the varieties commonly used. About 33% of the reported experiments were of purely manurial type and 40% of experiments were of cultural-cum-manurial type. Under manurial type experiments the sources of fertilizers, their method of application and the effect of different levels were some of the factors tried. The levels of Nitrogen, Phosphate and Potash varied from 0 to 134 kg/ha, 0 to 89 kg/ha and 0 to 134 kg/ha respectively. In cultural type of experiments, the treatments included were the dates of sowing, methods of sowing, spacing and seed-rate. About 38% of the experiments were laid out in Randomised Block Design and 30% of experiments were laid out in Split-plot confounded design with single replication-

*Miscellaneous crops* :- In addition to the above crops, the experiments were reported on other crops like pulses such as Gram, Redgram, Wal, Moong and Vegetables like Bhindi and Potato. Though Groundnut was the major crop among oil-seeds crops, experiments were also reported on Sesamum, Safflower, Linseed and Niger. A small percentage of experiments were reported on perennial crops like Banana, Cashewnut, Mango and Mosambi.

Apart from the above mentioned experiments which were conducted on single crops, 217 experiments were reported on mixed-cropping experiments. They were conducted with the object of studying the effect of different mixtures, the mixtures were mainly consisted of cereal and leguminous crops.

## PARTICULARS OF RESEARCH STATIONS AND SOIL ANALYSIS

### 1. Agricultural Research Station, (Govt. Expt. Farm), Achalpur.

#### A. General Information :

(i) In Achalpur taluka of Amravati district, 51 km. from Amravati Rly. Stn. with Lat. 21.3° N, Long. 77.5° E, Alt. 402 m. above m.s.l. Flat topography. (ii) Black Cotton Soil tract. (iii) Established in 1928. (iv) Jowar-G—nut-Cotton is the normal cropping pattern. (v) To carry out research and experimental work on various subjects like Agronomic, Varietal, Plant Protection etc. on oilseeds, cotton, jowar crops.

#### B. Normal Rainfall in mm :

Jan.	Feb.	March	April	May	June	
1 2	1 2	1 2	1 2	1 2	1 2	
11 3	1 3	1 3	1 2	3 3	25 27	
July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1 2	1 2	1 2	1 2	1 2	1 2	
37 62	58 23	44 48	34 4	2 —	4 —	399

(The average rainfall data is based on the period 1960—64).

#### C. Irrigation and Drainage Facilities :

(i) (a) and (b) Well irrigation covers about 6 ha. of the area only. (ii) Yes. ; proper drainage system exists.

#### D. Soil type and Soil analysis :

(i) Soil types—Medium clay ; Depth—above 91 cm. in some parts ; Colour—Black and Structure—Granular. (ii) Chemical analysis : Available N—0.03 to 0.09 % ; P<sub>2</sub>O<sub>6</sub>—20 to 40 % ; K<sub>2</sub>O—0.01 to 0.03%. (iii) Mechanical analysis : Sand—10 to 25% ; Silt—12 to 35% and clay—up to 30%.

#### E. No. of Experiments :

Jowar—12, Cotton—16, Groundnut—5, Tobacco—3, Mixed crops—13, Total=49.

### 2. Agricultural Research Station, Akluj.

#### A. General Information :

(i) In Malsiras taluka of Sholapur district, 45 Km. from Pandharpur Rly. Stn., with Lat. 17.9° N, Long. 75.0° E. It has got a general slope from West to East, secondary slopes Southern and Northern side. (ii) Less rainfall tract. (iii) Established in 1940. (iv) Sugar-cane—Jowar—Sugarcane is main cropping pattern. (v) Varietal, agronomic experiments on sugarcane.

#### B. Normal Rainfall in cm. :

Jan.	Feb.	March	April	May	June	
1 2	1 2	1 2	1 2	1 2	1 2	
— —	— 0.5	— 0.6	0.6 0.6	0.3 1.8	5.0 2.1	
July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1 2	1 2	1 2	1 2	1 2	1 2	
1.8 3.8	3.9 1.7	7.5 8.8	3.7 2.3	2.7 —	— 0.1	47.9

(Average rainfall data is based on the period 1960—64).

**C. Irrigation and Drainage Facilities :**

(i) (a) and (b) Irrigation facilities exist since 1940. (ii) Proper drainage system exists.

**D. Soil type and Soil analysis :**

(i) Soil types—Clay soil ; Depth—61 cm. majority of the soil ; Colour—Blackish ; Structure—Clay. (ii) Chemical analysis : Av.  $P_2O_5$ —0.005% ; Av.  $K_2O$ —0.02—0.06%. (iii) Mechanical analysis : Soil texture—Clay ; Soil reduction—8.5 to 9.0% ; Moisture holding Capacity—30 to 40%.

**E. No. of Experiments :**

Sugarcane—16 ; Total=16.

**3. Agricultural Research Station (Govt. Expt. Farm), Akola.****A. General Information :**

(i) In Akola Taluka of Akola district. 6.3 Km. from Akola Rly. Stn. with Lat.—20-7° N, Long.—77-0° E, Alt.—282 M. above m.s.l. Average slope of the land is less than 0.5%. (ii) Black cotton soil tract. (iii) Established in 1906. (iv) Cotton, Jowar and Groundnut. (v) Agronomic soil drainage and plant protection experimentation on Cotton, Jowar and Groundnut. To produce nucleus and foundation seeds of principle crops viz. Cotton, Jowar and Groundnut.

**B. Normal Rainfall data in m. m. :**

Jan.		Feb.		March		April		May		June		July	
1	2	1	2	1	2	1	2	1	2	1	2	1	2
9	3	—	4	3	13	8	—	4	13	38	111	102	120
Aug.		Sept.		Oct.		Nov.		Dec.		Total			
1	2	1	2	1	2	1	2	1	2				
88	78	93	72	77	18	9	—	23	1	887			

(The average rainfall data is based on the period 1960—64).

**C. Irrigation and Drainage Facilities :**

(i) (a) and (b) Irrigation facilities available since 1926. (ii) Proper drainage system exists.

**D. Soil type and Soil analysis :**

(i) Soil types—black soil ; Depth—90 to 120 cm. ; Colour—Black ; Structure—Blacky and Shelly. (ii) Chemical and Mechanical analysis recorded upto the depth (0 to 38 cm.). Organic matter—0.627% ; p.H.—8.6 ; Total  $P_2O_5$ —0.188 available  $P_2O_5$ —0.003% ; Total  $K_2O$ —0.474 available  $K_2O$ —0.032%. (iii) Mechanical analysis :—(1) Clay—49.25% ; (2) Silt—24.75% ; (3) Fine sand—14.92% ; (4) Coarse sand—2.12% ; (5)  $CaCO_3$ —5.20% and (6) Moisture—3.39%.

**E. No. of Experiments :**

Jowar—21, Red gram—1, Cotton—19, Groundnut—8, Mixed crops—14, Rotational experiments—6, Total=69.

**4. Agricultural College Farm, Akola.****A. General Information :**

(i) to (v) Same as Agricultural Research Station, Akola.

B. and C. Same as Agricultural Research Station, Akola.

*D. Soil type and Soil analysis :*

(i) Black soil. (ii) and (iii) Not done.

*E. No. of Experiments :*

Wheat—3, Jowar—3, Cotton—7, Groundnut—8, Mixed crops—9, Total=30.

**5. Taluka Seed Multiplication Farm, Amgaon.**

*A. General Information :*

(i) In Bhandara district about 400 m. from Amgaon Rly. Stn. on S.E. Rly. Through the middle part of the farm goes Amgaon Deori Road. The source of irrigation is local Tank. The farm area is improved one. (ii) N.A. (iii) Established in 1958. (iv) Kh.: Paddy and Rabi crops viz. Gram, Linseed, Wheat etc. (v) Experiments are conducted like lime experiments and no research.

*B. Normal Rainfall data :*

Not Available.

*C. Irrigation and Drainage Facilities :*

(i) There are two parts of the farm and irrigates only 4 ha. area. There is also one local tank which irrigates nearly. 12 to 14 ha. (ii) N.A.

*D. Soil type and Soil analysis :*

(i) Soil types—Medium black ; Depth upto 1.52 m. ; Colour—Gray ; Structure—Clay. (ii) and (iii) N.A.

*E. No. of Experiments :*

Paddy—2, Total=2.

**6. Government Experimental Farm, Amravati.**

*A. General Information :*

(i) In Amravati district, Lat.—20.9° N, Long.—77.8° E and Alt.—370 m. above m.s.l. The land is undulating. (ii) N.A. (iii) Started in 1953 by M.P. Government and then completed by the Community Project Block in 1956. (iv) Cotton—Jowar—Groundnut—Tur—Wheat—Gram etc. (v) The important function of the farm is the multiplication and distribution of improved seed of all major crops.

*B. Normal Rainfall in m. m. :*

June	July	Aug.	Sept.	Oct.	Nov. to May	Total
138	240	183	121	42	99	823

(Av. rainfall data is based on the period 1956—63).

*C. Irrigation and Drainage Facilities :*

(i) (a) and (b) One well with ample water supply fitted with an electric motor pump. since 1956. (ii) No proper drainage system exists.

**D. Soil type and Soil analysis :**

(i) Medium black, shallow, Medium to poor soil. (ii) Chemical analysis : Total Nitrogen—0.0605% ; available nitrogen—0.0103% ; Total  $P_2O_5$ —0.1317% ; available  $P_2O_5$ —0.00054% ; Total  $K_2O$ —0.3615% ; available  $K_2O$ —0.037% ; Organic matter—1.086% ; pH—7.95. (iii) Mechanical analysis : (at 0 to 41 cm. depth in percentage) : Clay—40.25 ; Silt—24.50 ; Fine sand—24.40 ; Coarse sand—1.11 ;  $CaCO_3$ —6.36 and moisture—3%.

**E. No. of Experiments :**

Jowar—3, Cotton—4, Total=7.

**7. Regional Research Centre (Pirracom), Amravati.****A. General Information :**

(i) In Amravati taluka of Amravati district, 4.8 Km. from Amravati Railway Station with Lat. 20.9° N, Long. 77.8° E and Alt. 370 m. above m.s.l. The land is undulating. (ii) Black Cotton Soil. (iii) Established in 1953. (iv) Cotton—Jowar—Groundnut is the normal cropping pattern. (v) Research on Breeding as well as Agronomic type experiments are carried out on Cotton, oilseeds and millets.

**B. Normal Rainfall in m.m. :**

Jan		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	12	1	4	4	7	1	8	1	6	48	114	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
148	142	143	64	87	86	34	30	4	—	39	—	983

(The average rainfall data based on the period 1960—64).

**C. Irrigation and Drainage Facilities :**

(i) (a) and (b) Nil. (ii) Proper drainage system exist.

**D. Soil type and Soil analysis :**

(i) Soil type : Morand No. 2 ; Depth—15 to 40 cm., Colour—Brownish, Structure—Heavy to Light Soils. (ii) Chemical analysis—pH 7.2 to 8.00. (iii) Mechanical analysis—N.A.

**E. No. of Experiments :**

Jowar—1, Cotton—7, Total=8.

**8. Friut Research Station, Aurangabad.****A. General Information :**

(i) In Aurangabad taluka of Aurangabad district with Lat.—19.5° N, Long.—76° E, Alt.—581 m. 0.1 to 2% slope had drainage. No. undulating and slopy land. (ii) It represents Deccan tract. (iii) Established in 1941. (iv) (a) Kharif—Vegetables, green manuring fodder, jowar. (b) Rabi—Vegetables. (c) Summer—Vegetables (Excluding fruit crops). (v) (1) Irrigation-cum-mulching trials on Anabshati. (2) Observational trial on performance of seedless lemon vs. K. lime. (These crops are taken as subsidiary crops.)

**B. Normal Rainfall in cm :**

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	—	—	—	—	3.4	0.7	—	—	3.2	4.8	0.2	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
5.1	10.4	6.8	7.1	2.5	2.9	0.5	2.1	0.4	0.2	—	—	50.3

(Average rainfall in cm. based on the data for the period 1962—64).

**C. Irrigation and Drainage Facilities :**

(i) (a) and (b) Facilities are available since 1941. (ii) No ; proper drainage system exists.

**D. Soil type and Soil analysis :**

(i) Soil types—Light to medium black ; Depth—61—91 cm. ; Colour Black to lime whitish ; Structure—medium. (ii) Chemical analysis : pH.—7.85 to 8.25, Soluble salts as conductivity—0.32 to 0.40, organic carbon—0.4 to 1.0%, Av. N—210 to 380 Kg/ha., Av. P<sub>2</sub>O<sub>5</sub>—10 to 130 Kg/ha. (iii) Mechanical analysis : N.A.

**E. No. of Experiments :**

Grape—1, Total=1.

**9. Agricultural Research Station (Central Res. Station), Badnapur.****A. General Information :**

(i) In Jalna taluka of Aurangabad district, about 2.4 Km from Badnapur Rly. Stn. on South central Railway with Lat.—19.50°, Long.—75.43°, Alt.—580 m. Fields are even where. Trials are taken in different Blocks every year. (ii) Deccan Plateau, Deep Black and Light Black Cotton Soil tract. (iii) Established in 1951, (iv) *Kharif Season* : Groundnut, Cotton, Tur, Bajra, Kh. Jowar, Mung, Castor, Niger, etc. ; *Rabi season* : Wheat, Gram, Rabi Jowar, Linseed, Soyabean, Safflower etc. (v) Research Programme : Research work is carried out at this research station on pulses i.e. Tur, Urid, Mung, Cowpea, Gram, Pea, Lathyrus, Wheat, Cotton and oilseeds i.e. Groundnut, Sesamum, Niger, Sunflower, Soyabean, Castor, Safflower, linseed and includes Agronomic experiments on time of sowing, spacing, irrigation and application of fertilizers, Breeding work including selection and hybridization to evolve new varieties, Entomological and Pathological experiments for the control of pests and diseases.

**B. Normal Rainfall in m.m. :**

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
0.3	—	—	0.1	0.3	0.3	0.2	0.6	0.4	1.2	2.6	2.6	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
1.2	4.3	2.5	2.6	3.4	2.5	1.5	0.5	0.3	0.4	0.7	0.2	28.7

(Av. rainfall data is based on the period 1960—64.)

**C. Irrigation and Drainage Facilities :**

(i) (a) and (b) : Irrigation facilities from well are available since long. From 1964—65, Canal Dudhana project irrigates about 60 ha. (ii) Most of the area is well drained except the *chepan* land which is about 14 ha. out of 120 ha. area under cultivation. Artificial drainage system has not been set up as yet.

**D. Soil type and Soil analysis :**

(i) Broad soils: types Light—Medium, Heavy, Chepan. Depth: It varies from 6" to 36" ; Colour—Deep black to chocolate colour ; Structure—Clayey. (ii) Mechanical analysis : (a) Coarse sand—0.17 to 9.47% ; (b) Fine sand—6.94 to 24.09% ; (c) Silt—12.05 to 25.78% ; (d) Clay—33.25 to 68.73%. (iii) Chemical analysis : Total Nitrogen—0.02 to 0.08% ; Available Phosphate—0.003 to 0.005% ; Available Potash—0.0025% to 0.008% ; Calcium-carbonate—5.00 to 15.00% ; pH—7.3 to 9.0. C.E.C.—45.8%.

**E. No. of Experiments :**

Wheat—16, *Jowar*—3, Groundnut—3, Safflower—2, Niger—3, Mixed crops—21, Total=48.

**10. Trial-cum-Demonstration Farm, Bhir.****A. General Information :**

(i) In Bhir district, Nearest Rly. Sta., Jalna. The hilly tract. (ii) N.A. (iii) Established in 1960 (iv) Cotton, Sugarcane. (v) Demonstration Farm.

**B. Normal Rainfall :**

Av. annual rainfall 65 to 70 cm. (Monthly rainfall data—N.A.).

**C. Irrigation and Drainage Facilities :**

(i) (a) and (b) The Bendsura Project for Research irrigation only. Water is made available for *Kharif* if there is storage (as protection irrigation). (ii) Proper drainage system exists.

**D. Soil type and Soil analysis :**

(i) Broad soil type : Medium black. (ii) and (iii) N.A.

**E. No. of Experiments :**

Wheat—6, *Jowar*—3. Total=9.

**11. Agricultural School, Borgaon.****A. General Information :**

(i) In Satara district 32 Km. from Satara Rly. Sta. with Lat.—17.4° N, Long—74.1° E, Alt.—678 m. (m. s. l.). Being at the base of the hill lands are steepy. (ii) Deccan plateau tract. (Southern part of Maharashtra State). (iii) Established in 1947. (iv) *Kharif*, *Jowar* and Groundnut are the main crops. *Bajra* in *Kharif* and Wheat in *Rabi* are taken on small scale to the extent irrigation facilities-permit. (v) Being an educational institution imparting training in agriculture to the students mainly from rural area, no research programme is undertaken.



**B. Normal Rainfall in cm. :**

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	—	—	—	—	1.0	2.0	1.0	4.8	12.1	1.9	6.8	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
18.5	14.0	15.0	5.7	7.1	13.1	2.9	5.6	3.3	6	2.2	—	116.6

(Av. fortnightly, rainfall in cm. based on the data for the period 1960—64).

**C. Irrigation and Drainage Facilities:**

(i) (a) and (b) Seasonal irrigation through the wells dug up from time to time. (ii) Soils are originally well drained.

**D. Soil type and Soils analysis :**

(i) Broad soil types—Medium Alkaline : Depth—Depth ranges from 23 cm. to 45 cm. on an average ; Colour—Light black and reddish brown ; Structure—Coarse granular and crumb. (ii) Chemical analysis : Total soluble salts—0.2 to 0.5% ; Calcium carbonates—5 to 10% ; Phosphates—5 to 20 mgm. ; Nitrates—Low.

**E. No. of Experiments :**

Jowar—3, Total—3.

**12. Agricultural Research Station, Buldana.****A. General Information :**

(i) In Chikhali taluka Buldana district 44 Km. from Malkapur Rly. Stn. (C. Rly.) with Lat.—22.5° N, Long.—76.2° E, Alt.—365.8 m. The experimental area is levelled and well drained. Uniform soil is selected for experiments. (ii) Medium type of soil, Ghat tract. (iii) Established in 1928. (iv) Cotton, Groundnut, Jowar ; Other crops. (v) Agronomic experiments conducted.

**B. Normal rainfall in cm :**

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec	Total
1.0	1.2	1.4	0.9	2.2	13.8	22.9	18.7	14.3	11.5	2.5	1.3	91.7

(Av. rainfall in cm. based on the data for the period 1960—64).

**C. Irrigation and Drainage Facilities :**

(i) (a) and (b) No irrigation facilities are available at the farm. This farm utilizes water from Municipal Sangam Tank for irrigation to Rabi crops. (ii) No proper drainage system exists. The soils of the tract are well drained.

**D. Soil type and Soil analysis :**

(i) Broad soil type—Medium type ; Depth—30 to 45 cm. ; Colour—Faint ; Structure—Normal. (ii) and (iis) Not done.

**E. No. of Experiments :**

Cotton- 7, Groundnut—2, Mixed crops—11, Total—20.

**13. Agricultural Research Station, Chas.****A. General Information :**

(i) In Ahmednagar taluka of Ahmednagar district 13 Km. from Ahmednagar Rly. Stn. with Lat.—18°8' N, Long. 74°4' E, Alt.—676 m. This station is in the southern part of Ahmednagar District, which is frequently attacked by scarcity due to uncertain and scanty rainfall. The yearly average rainfall is 30 cm. The maximum temperature range is 100° F to 105° F and minimum 25° F to 40° F. (ii) The topography of this tract is undulating. (iii) Established in 1942. (iv) *Kharif*: Bajri, Tur, Mung and Groundnut; *Rabi*: Sawan Safflower. (v) Agronomical practices.

**B. Normal Rainfall in cm :**

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	—	—	—	0.1	0.7	0.1	—	0.2	1.7	2.3	0.8	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
1.4	2.2	1.8	0.8	5.2	4.0	1.9	1.3	1.4	1.3	3.6	—	30.8

(Av. fortnightly rainfall in cm. based on the data for the period 1950—64).

**C. Irrigation and Drainage Facilities :**

(i) and (ii) No.

**D. Soil type and Soil analysis :**

(i) Broad soil types—(i) Normal 54% ; (ii) Eroded 46% ; Depth—(a) Deep black soil—depth more than 45 cm. (b) Medium soil—depth more than 23 to 45 cm ; (c) Light soil—depth above 23 cm. Colour—Black and Brown. (ii) Chemical analysis and (iii) Mechanical analysis : N.A.

**E. No. of Experiments :**

Jowar—16, Bajri—11, Groundnut—2, Mixed crops—8, Total=37.

**14. Agricultural Research Station, Deolali.****A. General Information :**

(i) In Rahuri taluka of Ahmednagar district 18 km. from Rahuri Rly. Stn. with Lat.—19°5' N, Long.—74°5' E, Alt.—528m. It is a levelled land, (ii) Low rainfall area of Deccan canal tract. (iii) Established in 1940. (iv) Sugarcane, Jowar, Wheat, Gram. (v) Experiment on Sugarcane crop as per instruction received from the Sugarcane specialist S. R. S. Padegaon.

**B. Normal rainfall :**

Jan.		Feb.		March		April		May		June		July	
1	2	1	2	1	2	1	2	1	2	1	2	1	2
—	—	—	—	0.1	1.2	1.5	—	1.2	3.3	3.5	5.6	3.2	7.1
Aug.		Sept.		Oct.		Nov.		Dec.		Total			
1	2	1	2	1	2	1	2	1	2				
2.1	0.7	9.5	5.4	3.6	8.2	1.2	—	3.2	0.6	61.2			

(Av. fortnightly rainfall in cm. based on the data for the period 1960-64).

**C. Irrigation and Drainage Facilities :**

(i) (a) & (b) : Irrigation facilities available since 1940. (ii) No proper drainage system exists.

**D. Soil type and Soil analysis :**

(i) Board soil types—Sandy loam to clay soil; Depth—30 to 61 cm.; Colour—Blackish brown. (ii) Chemical analysis : Total Nitrogen—Not available; Organic matter or carbon—Not Available; Available  $K_2O$  and Total  $K_2O$  (if available) —0.02 to 0.06; Available  $P_2O_5$  and Total  $P_2O_5$  (if available)—0.05 to 0.01; Exchangable Ca—40 to 60%; Total salt—0.5 to 1.0%; pH value—8.0 to 9.0 (iii) Mechanical analysis : Coarse sand—1.0%; Fine sand—11.2%; Silt—20.7%; Clay—46.3%; Free Lime or  $CaCO_3$ —60%; Moisture holding capacity—20 to 40%.

The figures are taken from the charts received from the sugarcane specialist, S. R. S. Padegaon (1958).

**E. No. of Experiments :**

Sugarcane—12, Total=12.

**15. Agricultural College Farm, Dhulia.****A. General Information :**

(i) In Dhulia taluka of Dhulia district 4.8 Km. from Dhulia Rly. Stn. with Lat.—20.5°N, Long.—74.5°E, Alt.—246m. The Research Farm in general is situated on a level ground. (ii) It is situated in Scarcity Agroclimatic zone of Maharashtra. (iii) Established in 1960-61 (iv) (a) Medium soils ; Cotton—Jowar—G. nut ; (b) Light soils : Nilva—*Moong*—or *Udid*; *Bajri*—*Tur* or *Moong* or *Udid*; (c) Very light soils ; *Bajri*—Kharif ; (d) Irrigated soils : Irrigated Cotton G. nut ; Wheat ; Chillies—Green manuring—Vegetables crops ; Lucarn—Lucern—Maize (Kh.)—Berseem (*Rabi*). (v) Experiments on hybrid *Jowar*, Groundnut Hy. *Bajri* Wheat regarding N P.K. requirement, sowing date, irrigation requirement are conducted.

**B. Normal Rainfall in cm :**

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
0.2	—	—	—	1.0	4.2	5.7	3.8	3.7	2.3	0.7	0.2	21.8

(Av. monthly rainfall in cm. based on data for the period 1960-64).

**C. Irrigation and Drainage Facilities :**

(i) (a) & (b) : Well irrigation for 39—40 ha. irrigation facilities available from 1962-63. (ii) Specific drainage system do not exist.

**D. Soil type and Soil analysis :**

(i) Broad soil types—Medium Black type; Depth—61 to 135 cm.; Colour—Surface soils Dark brown, Subsoil Light brown; Structure—Surface soil—Granular, Subsoil—Blacky.

(ii) Chemical analysis :	% on oven dry basis.	Year of analysis.
Organic carbon	0.45 to 0.65	1964
Total Nitrogen	0.05 to 0.07	—do—
T. S. S.	0.1 to 0.18	—do—
Free $CaCO_3$	8.0 to 10.00	—do—
Total $P_2O_5$ (Hcl. Soluble)	0.06 to 0.1	—do—
Total $K_2O$ ( , )	0.6 to 0.9	—do—
pH(not in percentage).	8.0	—do—
CEC (not in %)	40 to 50	—do—
	M.e./100 gms.	

(iii) Mechanical analysis : Clay—44 to 55% ; Silt—15 to 25% ; Sand—20 to 25% ;  $CaCO_3$ —5 to 10.

*E. No. of Experiments :*

*Jowar*—9, *Cotton*—12, *Groundnut*—3, *Mixed crops*—24, *Total*=48.

**16. Agricultural Research Station, Dhulia.***A. General Information :*

(i) In Dhulia taluka of Dhulia district 4 km. from Dhulia Rly. Stn. with Lat.—21°4'N Long.—74°5' E, Alt.—25 m. In general the area of the Farm is levelled having a slope from South to North. (ii) It represents Scarcity, Zone. (iii) Established in 1947. (iv) 1. Kh.-*Jowar, Mung, Udid, Tur, Rabi*—*Jowar* and *Bajra*; 2. *Groundnut, Sesamum, Castor*; 3. *Wheat, Gram*; (v) Improvement of Cereal, pulses & Oilseed crops in Maharashtra State.

*B. Normal Rainfall in cm :*

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
0.2	—	—	—	—	—	—	—	0.1	1.1	1.1	3.2	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
2.6	3.0	2.6	1.7	2.0	1.3	2.3	0.1	0.2	0.6	0.2	—	22.3

(Av. fortnightly rainfall data in cm, based on the data for the period 1960-64)

*C. Irrigation and Drainage Facilities :*

(i) (a) & (b) Yes, from the year 1953. (ii) NIL.

*D. Soil type and Soil analysis :*

(i) Broad soil—; types : *Medium Black*, Depth—45 to 91 cm; Colour—*Medium black*; Structure—*Clayloam soil* (ii) & (iii) N. A.

*E. No. of Experiments :*

*Jowar*—5, *Groundnut*—1, *Mixed crops*—3, *Total*=9

**17. Agricultural Research Station, Digraj.***A. General Information :*

(i) In Miraj taluka of Sangli district 6.4 Km. from Sangli Rly. Stn. with Lat. 16.8°N, Long. 74°6' E, Alt.—546m. It is a fairly levelled land. (ii) It represent *Krishna Valley* type of tract. (iii) Established in 1958. (iv) *Kharif, Jowar—Tur—Groundnut* (v) *Milletts, Pulses & Oilseeds*. (a) To evolve high yielding suitable varieties by bulk sample selection in *Jowar, Groundnut, Tur*. (b) To conduct agronomic and Breeding trials on above crops.

*B. Normal Rainfall in cm :*

Jan.		Feb.		March		April		May		June		July	
1	2	1	2	1	2	1	2	1	2	1	2	1	2
—	—	—	0.4	0.1	0.6	3.8	1.7	2.7	7.9	1.6	3.5	10.8	6.3
Aug.		Sept.		Oct.		Nov.		Dec.		Total			
1	2	1	2	1	2	1	2	1	2				
5.2	2.6	4.8	6.5	6.6	3.6	2.8	0.3	1.0	0.3	73.1			

(Av. fortnightly rainfall in cm, based on the data for the period 1960-69).

**C. Irrigation and Drainage Facilities :**

(i) (a) & (b) No irrigational facilities are available. (ii) Yes; Proper drainage system exists.

**D. Soil type and Soil analysis :**

(i) Broad soil type—Medium Black; Depth—About 3.05m; Colour—Black; Structure—Clay loam. (ii) Chemical analysis: Calcium carbonates—5.0 to 10%; Soil Reaction (pH)—8.5 to 9.0; Total soluble salts—0.2 to 0.5; Available Phosphate—5.0 to 10.0 mg%; Available Potash—20.0 to 40.0 mg%. (iii) Mechanical analysis : N. A.

**E. No. of Experiments :**

*Jowar*—16, *Tobacco*—3, *Groundnut*—11, *Mixed crops*—5, Total=35

**18. Taluka Seed Multiplication Farm, Dongargaon.****A. General Information :**

(i) In Bhandara taluka of Bhandara district 13 Kms. away from Bhandara Road. The general topography of the experimental area is plane topography. (ii) Paddy tract. (iii) Established in 1960. (iv) (a) Paddy (*Kharif*); (b) Wheat, Gram (*Rabi*); (No crop rotation followed) (v) N.A.

**B. Normal Rainfall :**

Information : N. A.

**C. Irrigation and Drainage Facilities :**

(i) (a) & (b) Irrigation facility is available (ii) No proper drainage system.

**D. Soil type and Soil analysis :**

(i) Broad soil types—; N.A.; Depth—15 to 61 cm; Colour—Ash. (Bhurkat) ; Structure—Light Stickey. (ii) Chemical analysis : pH—6.5 to 8.1 ;  $P_2O_5$ —14.32 to 26.80 Kg /ha.  $K_2O$ —269 to 392 Kg/ha. (iii) Mechanical analysis : N.A.

**E. No. of Experiments :**

Paddy—3, Total=3.

**19. Agricultural Research Station, Gadhinglaj.****A. General Information :**

(i) In Gadhinglaj taluka of Kolhapur district 48 Km. from Ghataprabha Rly. Stn. Having gradual slope from East to West. (ii) Medium Rainfall. (iii) Established in 1958-59. (iv) Selection work. (v) *Jowar*, Tur, Paddy, Chilly, *Udid*; Gram.

**B. Normal Rainfall in cm :**

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	—	—	1.4	0.3	0.7	1.3	2.6	5.1	12.8	3.9	7.2	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
20.6	13.5	36.6	25.3	5.8	12.6	10.9	5.7	0.5	—	1.9	0.2	168.6

(Av. fortnightly rainfall in cm. based on the data for the period 1960-64).

**C. Irrigation and Drainage Facilities :**

(i) (a) &amp; (b) Nil (ii) Fair drainage.

**D. Soil type and Soil analysis :**(i) Broad soil types—Medium ; Depth—91 cm. ; Colour—Black ; Structure—Clay  
(ii) Chemical analysis : pH—7.0 to 8.0 (iii) Mechanical analysis: N.A.**E. No. of Experiments :***Jowar*—2, Total=2**20. Trial-cum-Demonstration Farm, Golegaon.****A. General Information :**(i) In Hingoli taluka of Parbhani district nearest Rly. Stn. is Chondi, with Lat.—19.1° N Long.—76.2° E, Alt. 402 m. The soils of the farm lie on undulating topography. (ii) Black cotton soil tract. (iii) N. A. (iv) *Jowar*, Chillies in *Kharif* and wheat in *Rabi* (v) To find out doses of manures and interval of irrigation to crops which are grown in this tract.**B. Normal Rainfall in cm :**

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
—	0.3	1.9	0.6	1.2	24.0	26.0	32.5	10.6	1.2	—	—	98.3

(Av. rainfall in cm. based on the data for the period 1963-64).

**C. Irrigation and Drainage Facilities :**

(i) (a) &amp; (b); Canal irrigation is available from 63-64. (ii) No. the plan has been prepared for work.

**D. Soil type and Soil analysis :**

(i) Broad soil types—N.A. ; Depth—above 91 cm. ; Colour—Yellowish brown to gray colour; Structure—Single grain to columnar in structure. (ii) Chemical analysis : 1. pH.—8.0 to 9.5. 2. Total soluble salts — 0.5 to 1.0 % ; 3. Calcium carbonate — 1.0 to 15 % ; 4. Clay—20 to 60% ; 5. Exchangable Calcium—20 to 60 m.c. % . 6. Sodium Saturation—0.0 to 15%. 7. Total Nitrogen—0.02 to 0.6%. 8. Available Phosphate—0.005 to more than 0.2% 9. Available Potash less than 0.02 to 0.05. 10. Moisture holding capacity—20 to 50%. (iii) Mechanical analysis : N.A.

**E. No. of Experiments :**Wheat—4, *Jowar*—3, Chillies—2, Total=9**21. Agricultural Research Station, Hatkhamba.****A. General Information :**(i) In Ratnagiri district. It is situated about 17.6 Km. from Ratnagiri on Ratnagiri—Kolhapur road. (ii) The soils are derived from laterite rock and very poor in fertility, known as *Warker*. (iii) Established in 1921. (iv) N. A. (v) To evolve better strains of *Nagli*, *Wari* and *Kodra* and also to carry out agronomic research on *Nagli*.**B. Normal Rainfall :**

Information : N.A.

C. *Irrigation and Drainage Facilities :*

(i) and (iii) Nil.

D. *Soil type and Soil analysis :*

(i) Reddish brown, 15 cm. deep, rocky in structure. (ii) and (iii) N.A.

E. *No. of Experiments :*Ragi (*Nagli*)—1, *Wari*—3, *Kodra*—1, Total=5**22. Agricultural Research Station, Igatpuri.**A. *General Information :*

(i) In Igatpuri taluka of Nasik district about 1 Km. from Igatpuri Rly. Stn. with Lat.—19°7'N, Long.—73°6'E, Alt.—585·8 m. Experimental fields are located at the base of the hills. Soils along the hill slope is the experimental area for *Nagli*, *Niger* and at lower level (low lying) Plain field for Paddy experiments are located. (ii) *Mawal tract*. (iii) Established in 1941. (iv) Paddy, *Nagli*, *Wari*, *Niger* in *Kharif* and *Wal*, Lentil, Pea, Gram in *Rabi*. (v) Plant breeding, Agronomic Experimental and multiplication on small scale.

B. *Normal Rainfall in cm :*

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	0·1	0·2	—	—	1·0	—	—	1·1	4·3	8·4	18·9	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
87·5	51·9	56·6	39·9	25·4	22·1	7·3	3·5	1·0	1·6	—	1·4	332·2

(Av. normal rainfall in cm. based on the data for the period 1960—64).

C. *Irrigation and Drainage Facilities :*

(i) (a) &amp; (b) No. (ii) Yes ;

D. *Soil type and Soil analysis :*

(i) Broad soil types—Soils derived from Deccan tract. Depth 10—45 cm. (Fairly deep) ; Colour—From Medium black to dark grey ; Structure—Murumor rock under lying the soils (Clay loam). (ii) Chemical analysis ; 1. Nitrogen—0·11% ; 2. Organic carbon—0·71% ; 3. Available  $P_2O_5$ —5·21% ; 4. Available  $K_2O$ —19·0% ; 5 pH—5·9. (iii) Mechanical analysis : N.A.

E. *No. of Experiments :*Paddy—12, *Ragi (Nagli)*—2, *Wal*—9, *Niger*—1, Total=24.**23. Agricultural Research Station, Jalgaon.**A. *General Information :*

(i) In East Khandesh district, Lat.—21°N, Long.—75°30' E and Alt.—201 m. The land is plain with some fields having very gentle slopes. (ii) Deep black cotton tract. (iii) Established in 1913. (iv) *Jowar*—Cotton—Groundnut—*Moong*—*Urid* and *Tur* in *Kharif* and Wheat and Gram in *Rabi*. (v) Agronomic research on the crops like, Cotton, Groundnut, *Jowar*, *Urid* and *Moong* is carried out.

**B. Normal Rainfall in cm :**

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
0.5	0.2	—	0.1	—	0.9	0.2	—	—	0.6	4.9	12.5	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
13.1	8.9	11.3	6.1	5.1	5.5	5.1	0.5	1.1	1.0	1.7	0.5	

(Av. fortnightly rainfall in cm. based on the data for the period 1960—64).

**C. Irrigation and Drainage Facilities :**

- (i) (a) and (b) The well water is being salty there is no other irrigation facility.  
(ii) Proper drainage system exists.

**D. Soil type and Soil analysis :**

(i) Deep black with yellowish sub-soil upto 3.96 m. (ii) Chemical analysis : Total carbonates—4.85% ; Organic carbon—0.74% ; Total Nitrogen—0.0455% ; C/N ratio—11.636 ; Calcium 55.62 mg./100 gm. ; Magnesium 4.85 mg/100 gm. ; Sodium and Potassium—30.7 mg/100 gm. ; base exchange capacity—70.50 mg/100 gm. ; pH—7.4. (iii) Mechanical analysis : Organic matter—1.27% ; Sand—8.23% ; Silt—16.05% ; Clay—69.60% ; Moisture—14.08% @ ; maximum water holding capacity—71.73, sticky point moisture—52.14.

**E. No. of Experiments :**

*Jowar*—10, *Cotton*—3, *Groundnut*—22, *Sesamum*—2, *Mixed crops*—13, *Rotational*—6, Total=56.

**24. Agricultural Research Station, Jeur.****A. General Information :**

(i) In Karamala taluka of Sholapur district 4.8 Km. from Jeur Rly. Stn. ; Lat.—18.2° N, Long.—75.2° E and Alt.—521 m. A famine tract. General slope from East to West. (ii) Deccan tract. (iii) Established in 1942. (iv) *Bajra*, *Tur* and *Groundnut* in *Kharif* and *Jowar*, Gram in *Rabi*. (v) To find out economic ways and means to grow above crops in scarcity tract of the state.

**B. Normal Rainfall in cm :**

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	—	—	0.1	—	0.9	1.1	0.1	1.4	8.1	8.8	6.1	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
3.7	6.6	4.7	3.2	9.9	8.5	4.4	1.8	5.5	—	0.4	—	

(Av. fortnightly rainfall in cm., based on the data for the period 1960-64)

**C. Irrigation and Drainage Facilities :**

- (i) and (ii) Nil.



**D. Soil type and Soil analysis :**

(i) Black soil. Depth : of 91 cm. (ii) Chemical analysis : pH—8.50 to 8.80 ; total soluble salt—0.20 to 0.30% ; Calcium carbonate—10.00 to 14.00% ; Organic carbon—0.64 to 0.92% ; Organic matter—1.10 to 1.38% ; Moisture—7.00 to 9.05% ; Exchangeable calcium—55.00 to 65.00 m.e.% ; Exchangeable magnesium—7.00 to 15.50 m.e.% ; Exchangeable sodium Potassium—0.50 to 3.50 m.e.% ; Available Phosphate 9.00 to 13.00 mg.% ; Available Potash—20.17 to 35.00 mg.% ; Total Nitrogen—0.03 to 6.05% . (iii) Mechanical analysis : Coarse sand—2.00 to 5.00% ; Fine sand 3.00 to 10.00% ; Silt—10.00 to 16.50% ; Clay—55.25 to 65.60% .

**E. No. of Experiments :**

*Jowar*—19, *Bajra*—10, Groundnut—1, Mixed crops—7, Total=37.

**25. Agricultural Research Station, Karad.****A. General Information :**

(i) In North Satara district 4 Km. from Karad Rly. Stn. Lat.—17°3' N, Long.—74°3' E, Alt.—579 m. (ii) Transition zone of Sahyadri mountains. (iii) Established in 1946 (New lands acquired in 1959). (iv) *Jowar*—Groundnut. (v) To conduct research for botanical improvement of principal cereal crops viz., *Kharif* and *Rabi Jowar*, *Bajra* and Oilseed crops, Pulses, Matki and Gram.

**B. Normal rainfall in cm :**

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
—	—	0.4	1.0	10.5	6.8	37.6	13.9	14.4	9.0	3.5	1.0	98.1

(Av. rainfall in cm. based on the data for the period 1961-64).

**C. Irrigation and Drainage Facilities :**

(i) and (ii) No.

**D. Soil type and Soil analysis :**

(i)	Depth	Broad soil type	Colour	Structure
	upto 30 cm.	Shallow	Dull yellow	Light (Murred)
	30—61 cm.	Medium	Medium black	Medium
	61—91 cm.	Heavy	Black	Heavy.

(ii) Chemical analysis : Nitrogen—0.042 to 0.062, Available  $P_2O_5$ —2.01 to 5.59 mg., Available Potash—6.60 to 11.35 mg. ; Organic Carbon—0.21 to 0.51 mg. ; pH.—6.8 to 8.0 ; Exchangeable Ca—16.80 to 24.08 ; Ex. Mg. 3.91 to 13.92. (iii) Mechanical analysis : Calcium carbonate—0.04 to 0.64 % ; Coarse sand—1.50 to 9.42 ; Fine sand—7.79 to 32.28 ; Silt—11.50 to 43.0 ; Clay—22.50 to 67.50.

**E. No. of Experiments :**

*Jowar*—1, Total=1.

**26. Taluka Seed Multiplication Farm, Karanja.****A. General Information :**

(i) In Gondia taluka of Bhandara district 4.8 Km. from Gondia Rly. Stn. The land is Morand No. 2 with *Khari* and *Sihar* type having rich and compact texture. (ii) Paddy tract.

(iii) Established in 1958. (iv) 1. *Kharif* season :—Paddy in fields and Tur on borders. 2. *Rabi* season : Wheat, Linseed, Gram. 3. Summer season :—Vegetables viz. *Bhindi*, Guar, Tomatoes Onion and Coriander. (v) To multiply the newly recommended varieties of crops received from the research station i.e. produce the foundation seed from the nucleus seed and supply the same to the progressive cultivators.

*B. Normal Rainfall in cm :*

Jan.		Feb.		March.		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	0.2	0.1	0.7	0.1	0.3	0.6	0.5	0.5	0.6	6.1	9.1	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
23.3	18.8	17.1	29.3	40.7	8.0	4.2	0.6	—	—	2.9	—	163.7

(Av. fortnightly rainfall in cm. based on the data for the period 1960-64).

*C. Irrigation and Drainage Facilities :*

(i) (a) and (b) The facilities are available to certain extent : as 5 ha. of land is under the farm and the irrigational water is distributed to 3.6 to 4.5 ha. of the area from the Malguzari tank once in the year. (ii) No drainage system.

*D. Soil type and Soil analysis :*

(i) Broad soil type—Morand No. II ; Depth—122 cm. ; Colour—Yellowish Red ; Structure—Sandy clay. (ii) and (iii) Not Available.

*E. No. of Experiments :*

Paddy—3, Total=3.

**27. Agricultural Research Station, Karjat.**

*A. General Information :*

(i) In Karjat taluka of Kolaba district 0.4 Km. from Karjat Rly. Stn. with Lat.—18°55' N, Long.—73°18' E, Alt.—51.7 m. All the experimental Paddy field are fairly levelled and the bunds are covered with perennial grasses (ii) Konkan ract. (iii) Established in 1919. (iv) 1. paddy after Paddy. 2. Paddy—Wal. (v) Research work is executed through different sections viz. Agronomy, Botany, Agricultural Chem. Plant Pathology, Physiology, etc.

*B. Normal Rainfall in cm :*

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	0.1	0.7	—	—	—	—	—	1.0	2.6	10.7	43.0	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
95.7	73.6	74.3	35.4	26.6	23.9	11.3	1.1	0.7	0.1	0.3	—	401.1

(Av. fortnightly rainfall in cm. based on the data for the period 1960-64).

*C. Irrigation and Drainage Facilities :*

(i) (a) and (b) Irrigation facilities are not available. (ii) Open drain system is followed.

*D. Soil type and Soil analysis :*

(i) Broad soil types—Clay loam; Depth—25 to 30 cm.; Colour—Greyish black; Structure—Granular structure. (ii) Chemical analysis: pH.—6.3 to 6.6, Total exchangeable bases—40 to 45%, Av.  $P_2O_5$ —14% mg., Av.  $K_2O$ —Traces. (iii) Mechanical analysis: Gravel 6%, Course sand—8%; Fine sand—28%; Silt—34%; Clay—20%.

*E. No. of Experiments :*

Paddy—33, Wal—7, Total=40.

**28. Agricultural Research Station, Kashti.***A. General Information :*

(i) In Srigonda taluka of Ahmednagar district 8 Km. from Srigonda Road Rly. Stn. The land levelled. Some plots are water lodged due to shallowing of nala. (ii) Deccan canal tract. (iii) Established in 1959-60. (iv) Rainfed *Bajra—Jowar*. (v) To find out suitable cropping pattern for canal area.

*B. Normal Rainfall :*

Information : N.A.

*C. Irrigation and Drainage Facilities :*

(i) (a) and (b) Yes, from 1967-68 onwards. (ii) Yes; but it is insufficient.

*D. Soil type and Soil analysis :*

(i) Broad soil type—Deep black to shallow; Depth—15 cm. to 91 cm.; Colour—Black to Brown; Structure—Fine. (ii) Chemical analysis: pH.—7.5 to 9; Sodium Salacknies up to 25%; Clay—20 to 60%; Total soluble salt—Less than 0.5% to more than 2%; Exchangeable calcium—20 to 70 me %; Total Nitrogen 0.02 to 0.10%; Available  $P_2O_5$ —10 mgm%; Calcium Carbonate—20%; Available Potash—Up to 60 mg.%. (iii) Mechanical analysis : N.A.

*E. No. of Experiments :*

Wheat—1, Total=1.

**29. Trial-cum-Demonstration Farm, Khasapur.***A. General Information :*

(i) In Paranda taluka of Osmanabad district 25 Km. away from Barshi Rly. Stn. (S.C.R.) The total area of the fram is 27 ha., out of which only 20 ha. Land is cultivatable. Half of the portion of the land is medium to light and half of the land is medium to heavy black in structure. (ii) *Rabi* track mostly crops grown here in *Rabi* season (*R. Jowar*, Wheat, Vegetables, Gram). (iii) Established in 1958-59. (iv) *Kharif*: Vegetables sunflower; Hy. *Jowar*, Turmeric; Sugarbeet; Cotton; Paddy, Soyabean; Ginger etc.; *Rabi*: Vegetable, Wheat, Pea, *Jowar* etc. (v) (1) To find out the requirement of Manurial doses and requirement of canal water to the various crops. (2) Trials and Demonstrations (Methods) to the cultivators under the command of Khasapur Chandni Project.

*B. Normal Rainfall in cm :*

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	—	—	1.3	—	4.5	—	0.2	1.6	0.5	3.4	3.4	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
5.9	5.3	2.5	9.4	8.3	14.3	2.5	4.6	0.6	—	0.6	—	68.9

(Av. fortnightly rainfall in cm. based on the data for the period 1960-65).

**C. Irrigation and Drainage Facilities :**

(i) (a) and (b) Irrigation facilities are available from 1959 by Khasapur Project (ii) Yes, but all area is not yet covered.

**D. Soil type and Soil analysis :**

(i) Broad soil types—Medium deep black to medium light shallow ; Depth—9 to 10 cm. ; Colour—Light redish to medium black ; Structure -Medium—fine. (ii) and (iii) N.A.

**E. No. of Experiments :**

Wheat—7, Jowar—6, Total=13.

**30. Agricultural Research Station, Khopoli.****A. General Information :**

(i) In Khalapur taluka of Kolaba district 3.2 Km. from Khopoli Rly. Stn, with Lat.—18.56° N, Long.—73.18° E, Alt.—52 m. Light soil and well drained, derived from trap rock and Medium black and porous, (ii) Konkan tract. (iii) Established in 1951. (iv) Paddy after Paddy. (v) Breeding and Agronomic experiments.

**B. Normal Rainfall in cm :**

(Av. rainfall 243.8 cm. to 457.2 cm. per annum).

(The figure is based on the data for the period 1960-64. Monthly data is N.A.)

**C. Irrigation and Drainage Facilities :**

(i) Yes. since 1952. (ii) Yes ; proper drainage system exists.

**D. Soil type and Soil analysis :**

(i) Broad soil type—Medium black ; Depth—23 cm. to 30 cm. ; Colour—black. (ii) Chemical analysis : pH —7.3 ; K<sub>2</sub>O—8.02 ; P<sub>2</sub>O<sub>5</sub>—32.4. (iii) Mechanical analysis : N.A.

**E. No. of Experiments.**

Paddy—17, Ragi—2, Total=19.

**31. Regional Sugarcane Research Sub-Station, Kolhapur.****A. General Information :**

(i) In Hatchangale taluka of Kolhapur distt. 3.2 Km. from Gandhinagar Rly. Stn. (ii) General soil type of the farm is alluvial clay and river broder soils are of South loam type. (iii) Established in 1956 (iv) Paddy—Sugarcane—fallow—Paddy. The cane is planted after the harvest of the paddp crop, which is taken as rotational crop.

**B. Normal Rainfall in cm :**

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	—	—	0.2	0.2	0.3	1.2	3.2	7.9	3.3	2.3	17.5	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
26.5	9.2	18.3	5.5	3.2	11.6	5.9	2.9	3.2	0.1	—	2.3	124.8

(Av. fortnightly rainfall in cm. based on the data for the period 1960—64).

*C. Irrigation and Drainage Facilities :*

(i) (a) and (b) ; Irrigation supply from private and Co-oprative pumping plants. (ii) Yes : proper drainage system exists.

*D. Soil type and Soil analysis :*

(i) Broad type—B type soils ; Depth—More than 122 cm. ; Colour—Medium black with redish type ; Structure—Alluvial soils. (ii) Chemical analysis : Total N=0.06 to 1% ; Organic matter—0.6 to 0.8 ; Av. P<sub>2</sub>O<sub>5</sub>—0.005 to 0.010% ; Av. K<sub>2</sub>O—0.009 to 0.012 ; Ex. Mg.—11.50 to 14.33 ; Ca=21.52 to 24.5 ; T.S.S.—26 to 36 ; pH.—7.4 to 7.9. (iii) Mechanical analysis : Sand—6 to 8% ; Silt—20 to 25% ; Clay—50 to 60% ; Free lime—1 to 2% ; Moisture—30%.

*E. No. of Experiments :*

Sugarcane—30, Total=30.

**32. Agricultural Research Station, Kopargaon.***A. General Information :*

(i) In Kopargaon taluka of Ahmednagar district 15 Km. from Kopargaon Rly. Stn. with Lat.—19.5° N. Long.—74.3° E. Alt.—546 m. The experimental area in blocks I and II are fairly levelled with slope of 0.1° to 0.2°. The soils are fertile and suitable for experiments on important crops under irrigated condition. The area in block No. III is rather slopy with about 2.5 to 5.0 acres is of 'Chopan' type and is unsuitable for cultivators. Attempts to improve its condition by taking green manuring Crops like Dhencha are being made. (ii) Deccan canal tract. (iii) Established in 1915. (iv) (1) Cotton—wheat—Cotton ; (2) Sugarcane—Wheat—Cotton ; (3) Groundnut—Rabi Jowar—Sugarcane. (v) At present agronomic work is being carried out on Cotton, Wheat, Gram, Jowar, Tur, Mug, Udid, Sesamum and Sugarcane. Breeding work only on Cotton. Similarly multiplication of Seed of Cotton, Groundnut, Moong, Udid, Niger, Sesamum, Paddy, Tur etc. is also undertaken.

*B. Normal Rainfall in cm :*

Jan.		Feb.		March		April		May		June		
1	2	1	2	1	2	1	2	1	2	1	2	
—	—	—	—	—	0.1	2.3	—	0.2	2.0	1.8	3.7	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
5.8	4.9	2.3	0.5	3.2	1.8	5.1	3.0	1.5	0.2	0.8	0.1	39.9

(Av. fortnightly rainfall in cm. based on the data for the period 1961-64).

*C. Irrigation and Drainage Facilities :*

(i) (a) and (b) The cultivated land of the farm is under canal irrigation of Godavari Right Bank since 1926. However due to longer break in two irrigation rotations it is proposed to construct two wells at Agri. Res. Stn., Kopargaon. (ii) To drain off excess water from Sugarcane plots, surface drains have been opened.

*D. Soil type and Soil analysis :*

(i) Broad soil type—The soils of this station have been classified into A, C, G, H and U types. The most of the soils are of A and H types. Depth—30 cm. to 122 cm. ; Colour—Medium black ; Structure—Medium black reddish clay loam to shallow light types. (ii) Chemical analysis : CaCO<sub>3</sub>—1 to 20% ; P<sub>2</sub>O<sub>5</sub> (available)—0.005 to 0.01% ; K<sub>2</sub>O (available)—0.02 to 0.06 ; M.H.P%—20 to 40% ; pH—7 to 9. (iii) Mechanical analysis : N.A.

*E. No. of Experiments :*

Wheat—2, *Jowar*—2, Gram—1, Sugarcane—10, Cotton—14, Groundnut—1, Total—30.

**33 Agricultural Research Station (M.A.E Centre) Lakhmapur.***A. General Information :*

(i) In Baglan taluka of Nasik district, Lat.—20°5' N, Long.—74°5' E. and Alt.—509m. The farm is situated on the high land shallow type of soil. (ii) High level shallow type of Deccan canal soil. (iii) Established in 1940. (iv) Sugarcane—*Bajra*—*Tur*, Groundnut—Wheat and Gram etc. (v) To verify the results of agronomic experiments on Sugarcane at main sugarcane research station padegaon in the soils and climate of this tract.

*B. Normal Rainfall in cm :*

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
0.5	—	0.3	1.7	5.0	10.2	5.8	16.2	12.0	9.4	6.3	0.1	67.5

(Av. rainfall data in cm., is based on the period 1954—58).

*C. Irrigation and Drainage Facilities :*

(i) (a) and (b) : Girna canal irrigation since 1940. (ii) Natural drainage.

*D. Soil type and Soil analysis :*

(i) Brownish type of soils 8 to 24 cm. deep with granular and loose structure. (ii) Chemical analysis : Free lime—1.5% ; pH.—8 to 9 ; Available  $P_2O_5$ —0.005 to 0.01% ; Available  $K_2O$ —0.02 to 0.06% ; Total salts—0.05%. (iii) Mechanical analysis : Soil texture—Sandy loam, Moisture holding capacity 20 to 30%.

*E. No. of Experiments :*

Sugarcane—13. Total=13.

**34. Agricultural Research station, (Oilseeds Research Station) Latur,***A. General Information :*

(i) In Latur taluka of Osmanabad district 4 Km. from Latur Rly. Stn. with Lat.—18°5' N, Long.—76°5' E, Alt.—638 m. Almost levelled plots. (ii) Medium to heavy soils of Osmanabad and Sholapur dists. (iii) Established in 1963. (iv) (a) *Moong*, *Jowar* or Wheat ; (b) *Udid*—*Jowar* or Wheat ; (c) Cotton Groundnut, *Kharif Jowar* ; (d) *Kharif Jowar*—Groundnut ; (e) *Kharif Jowar*—Sugarcane. (v) To evolve early maturing spreading variety of Groundnut with the high yielding, higher shelling percentage and higher Oils contents,

*B. Normal Rainfall in cm :*

Jan		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	—	—	—	—	0.1	0.6	0.2	1.5	5.4	9.1	9.2	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
2.6	9.2	10.6	9.3	—	—	—	—	—	—	0.4	—	90.6

(Av. fortnightly rainfall in cm. based on the data for the period 1960-64).

**C. Irrigation and Drainage Facilities :**

(i) (a) and (b) No ; (ii) Not necessary, since soils are well drained.

**D. Soil type and Soil analysis :**

(i) Broad soil types—Black cotton soils ; Colour—Light Black ; Depth—Ranging from 30 cm. to 2 m. ; Structure—Clayey. (ii) Chemical analysis : 1. Total Nitrogen—0.05 to 0.08%. 2. Available Phosphate—10 to 20 mg. 3. Available Potash—20.0 to 60.0%. 4. Soil Reaction (pH)—(i) 7.0 to 7.5%. (ii) 7.5 to 8.0%. 5. Calcium Carbonate—5 to 10%. 6. Total soluble salts—0.5%. 7. Soil Texture—Clay loam. (iii) Mechanical analysis : N.A.

**E. No. of experiments :**

Groundnut—5, Cotton—1, Total=6.

**35. Agricultural Research Station, Mohol.****A. General Information in cm :**

(i) In Mohol taluka of Sholapur district, Lat.—17.75° N ; Long—75.5° E Alt.—457 m ; Fairly levelled land. The general slope of the fields is more or less in one direction. (ii) Represent the scarcity zone of Bombay Daccan. (iii) Established in 1918. (iv) *Jowar*—Gram—Wheat—In *Rabi* and Groundnut—*Tur* in *Kharif*. (v) To evolve improved strains of crops like *Jowar*, Gram, Linseed etc. and develop suitable agronomic practices for higher yields.

**B. Normal Rainfall :**

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	—	—	—	—	0.8	2.0	0.3	0.6	3.2	5.6	3.5	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
2.5	7.5	6.6	2.4	12.1	9.4	4.6	1.5	2.5	—	0.3	—	65.4

(Av. fortnightly rainfall in cm. based on the data for the period 1960-64).

**C. Irrigation and Drainage Facilities :**

(i) (a) and (b) Irrigated from well since 1950. (ii) Hume pipes have been fitted at suitable places to clear of the water of the excessive rainfall.

**D. Soil type and Soil analysis :**

(i) Soil varies from heavy to light, 15 to 3.05 m. deep ; Black to reddish brown in colour and fine to coarse in structure. (ii) Chemical analysis : pH—6.1 to 8.5, available  $P_2O_5$ —10.8 to 155.9 Kg/ha. ; available N—3.9 to 9.3 Kg/ha. and available  $K_2O$ —347 or 963.9 Kg/ha. (iii) Mechanical analysis : N.A.

**E. No. of Experiments :**

*Jowar*—18, Groundnut—1, Mixed crops—3, Rotational—6, Total=28.

**36. Agricultural College Farm, (Agricultural Research Station), Nagpur.****A. General Information :**

(i) In Nagpur district, Lat.—21° N, Long.—79.5° E, Alt.—312 m. Fairly levelled and undulated land in some blocks. (ii) Cotton tract. (iii) Established in 1871. (iv) Cotton—

*Jowar—Jowar Fodder, Tur—Paddy, Groundnut and other Kharif crops. Sunnhemp, Wheat—Gram—Linseed and other Rabi crops. (v) To conduct agronomical experiments on different crops. Botany, Entomology sections carry out the research work on various crops pertaining to their sections.*

*B. Normal Rainfall in cm :*

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
1.3	0.7	0.7	2.2	1.3	0.6	0.9	0.8	0.4	1.8	6.9	6.3	
July		Aug.		Sept.		Oct.		Nov.		Dec.		
1	2	1	2	1	2	1	2	1	2	1	2	
9.6	11.1	17.7	11.3	13.2	8.1	6.0	9.9	15.8	0.5	2.1	—	132.2

(Av. fortnightly rainfall in cm. based on the data for the period 1960-64).

*C. Irrigation and Drainage Facilities*

(i) (a) and (b) Irrigation facilities exist since 1953. (ii) Drainage facilities exist.

*D. Soil type and Soil analysis :*

(i) Morand No. 1 (clay loam) and Morand No. 2. The soil contains good percentage of limestone and pebbles. (ii) Chemical analysis :

CaCO <sub>3</sub>	P <sub>2</sub> O <sub>5</sub>	N
6.73%	0.045%	0.051%
7.61%	0.045%	0.046%

(iii) Mechanical analysis :

Coarse sand	Fine sand	Silt	Clay
2.69%	9.73%	21.70%	54.96%
3.22%	9.02%	22.40%	54.59%

*E. No. of Experiments :*

Paddy—1, Wheat—25, *Jowar*—11, Maize—1, Gram—5, Sugarcane—1, Cotton—13, Groundnut—1, Linseed—7, *Bhindi*—1, Chillies—2, Mixed crops—15, Rotational—3, Total=86.

**37. Cotton Research Station, Nanded**

*A. General Information :*

(i) Nanded taluka of Nanded district 1 Km. from Nanded Rly. Stn. with Lat.—18.4° N, Long.—77.1° E, Alt.—569 m. Experimental area is fairly developed. (ii) Deep black cotton soil tract. (iii) Established in 1941. (iv) Cotton—*Jowar*—Groundnut. (v) Breeding Agronomic and Technological Research work.

*B. Normal Rainfall in cm :*

Jan.		Feb.		March		April		May		June		Total
2	1	1	2	1	2	1	2	1	2	1	2	
—	0.1	—	2.0	1.9	1.8	4.2	0.4	0.5	1.9	7.6	10.0	
July		Aug.		Sept.		Oct.		Nov.		Dec.		
1	2	1	2	1	2	1	2	1	2	1	2	
6.9	17.6	13.0	21.6	10.2	8.5	10.1	3.6	3.1	—	11.8	—	136.8

(Av. fortnightly rainfall in cm. based on the data for the period 1960—64).



*C. Irrigation and Drainage Facilities :*

(i) (a) and (b) Yes, by well water. (ii) Yes : there is a proper drainage system, 2—3 plots are water logged.

*D. Soil type and Soil analysis :*

(i) Broad soil types—Fairly uniform heavy black cotton soils ; Depth—16 to 17 m. ; Colour—Black. (ii) Chemical analysis : pH.—7.75, Soluble Salts—0.175% ; Organic carbon—0.42% ; Available N 178.8 Kg/ha. ; Available  $P_2O_5$ —7.2 Kg/ha. (iii) Mechanical analysis : Clay—55.60% ; Silt—24.61% ; Sand—15.43% ; Others—4.36%.

*E. No. of Experiments :*

Cotton—18, Mixed crop—1 ; Total=19.

**38. Agricultural Research Station, Niphad.***A. General Information :*

(i) In Niphad taluka of Nasik district about 1/3 Km. from Niphad Rly. Stn. (C.R.) with Lat.—20.1° N, Long.—74.1° E, Alt.—550 m. (ii) Deccan tract. (iii) Established in 1931. (iv) Wheat, Gram, Bajra, Tur, Onion. (v) Research and breeding on Wheat, Bajra, Gram, Tur and Onion.

*B. Normal Rainfall in cm :*

Jan.		Feb.		March		April		May		June		
1	2	1	2	1	2	1	2	1	2	1	2	
—	—	—	—	—	0.8	0.2	—	0.2	3.1	4.3	4.3	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
2.5	3.6	6.2	2.0	3.8	4.7	6.7	0.8	1.2	0.6	0.4	0.1	45.5

(Av. fortnightly rainfall in cm. based on the data for the period 1960-64).

*C. Irrigation and Drainage Facilities :*

(i) (a) and (b) For 45 acres the lift irrigation is given. (ii) Nil.

*D. Soil type and Soil analysis :*

(i) Black and medium type of soil ; Depth—91 cm. to 152 cm. ; Colour—Black ; Structure—Silt loam to clay loam. (ii) Chemical analysis : Total Nitrogen—0.06% ;  $P_2O_5$  0.004% ;  $K_2O$ —0.01% ; Moisture—8.16% ; Total soluble salt—0.102% ;  $CaCO_3$ —8.064%. (iii) Mechanical analysis : Coarse sand—6.07% ; Fine sand—43.86% ; Clay and Silt—50.07%.

*E. No. of Experiments :*

Wheat—11, Bajra—7, Safflower—1, Onion—10, Mixed crops—5, Total=34.

**39. Agricultural Research Station, Padegaon.***A. General Information :*

(i) In Phaltan taluka of Satara district 3.2 Km. from Nira Rly. Stn. with Lat.—18.2° N, Long.—74.2° E, Alt.—556 m. (ii) Deccan canal tract of Maharashtra State. (iii) Established

in 1932. (iv) Adsali cane—*Jowar* fodder—Gram, *Adsali* cane—*Jowar Rabi*, plant cane—*Jowar Rabi*—Sannhemp or Cotton or Groundnut. (v) The main work consists of testing different varieties for better cane and Sugar yields and conducting cultural and manurial experiments on Sugarcane.

**B. Normal Rainfall in cm ;**

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	—	—	—	0.1	1.6	0.2	0.3	1.7	4.1	2.8	4.8	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
5.1	4.3	3.8	1.2	6.5	7.8	3.7	4.6	2.8	—	0.7	—	56.1

(Av. fortnightly rainfall in cm. based on the data for the period 1960-64).

**C. Irrigation and Drainage Facilities :**

(i) (a) and (b) Canal irrigation, Nira Right Bank Canals. (ii) Drainage capacity fairly good.

**D. Soil type and soil analysis :**

(i) 'B' type : Deep black soil, over 122 cm. deep and greyish brown in colour on the surface and reddish brown in colour in sub soil, 'F' type : High level, low lime, brown loamy soil. Shallow ; 30 to 45 cm., light brown to brown, loose granular in structure. (ii) Chemical analysis : 'B' type : pH.—8.5 to 8.8 ; Total salts—0.3 to 2.0% ; Humus—1% ; Total  $P_2O_5$ —0.4% ; Total  $K_2O$ —0.3 to 0.4% ; Total N—0.05% ; Exchangeable Ca—26 to 45 me% ; Ca saturation—50 to 70%. 'F' type ; Free lime—5% ; Humus—0.59% ; Exchangeable Ca—45 me% ; pH.—8.1 ; Ca/Mg—10 ; Total N—0.058% ; total  $K_2O$ —0.187% ; Available  $K_2O$ —0.021% ; Total  $P_2O_5$ —0.360% ; Available  $P_2O_5$ —0.01%. (iii) Mechanical analysis : 'B' type : Clay—56 to 62% ; Silt—10 to 20% ; Sand—6 to 10% ; Free calcium carbonate—8 to 15% ; 'F' type : Clay—46 to 56% and Silt—15 to 20%.

**E. No. of Experiments :**

Sugarcane—58, Cotton—5, Total—63.

**40. Khar Land Research Station, Panvel.**

**A. General Information :**

(i) In Panvel taluka of Kolaba district 8 Km. from Panvel C. Rly. Stn. with Lat.—19° N, Long.—73.1° E, Alt. 10 m. The soils of the experimental area is almost flat having a slope of 0.1° to 0.2° only. Prior to the formation of this experimental farm—the land was sub-merged under creek water. Soil depth varies from 1½ to 5 feet as one goes towards the creek side. The salt percentage is till higer, no exposed locks on the surface area seen. (ii) Represents to the coastal Khar Land in Konkan districts of Thana, Kolaba, Ratnagiri. (iii) Established in 1959. (iv) Paddy after Paddy in *Kharif* season only. (v) Field experiments to find out suitable methods for reclamation of Khar Lands, optimum fertilizer shedule and study of salt resistance varieties.

**B. Normal Rainfall in cm :**

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	—	—	—	4	—	—	—	1	2	19	41	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
71	49	56	28	23	23	23	16	1	1	2	—	362

(Av. fortnightly rainfall in cm. based on the data for the period 1960-64).

*C. Irrigation and Drainage Facilities :*

(i) No. irrigation facilities are available as the under ground water is salty. (ii) There are three main drains laid of 100,200,400 m. respectively. All three drains meet a side drain which opens in to the creek. The average cross section of the drain is top 2.4 m. bottom 30 to 45 cm. having slope 1 : 2.

*D. Soil type and Soil analysis :*

(i) Broad soils—Clay loam to clay ; Depth—23 to 45 cm ; Colour—Greyish black (eye observation) ; Structure—Clody, hard, breaking in to irregular pieces.

(ii) Chemical analysis :	Analysed in May, 1967.	Analysed in Nov., 1967
pH.	7.8	7.9
E.C.	13.63	8.89
Nacl.	2.57	1.48
T.S.S.	3.78	2.60

(iii) Mechanical analysis : (for the year 1960 May). Coarse sand—3.13% ; Fine sand—43.51% ; Silt—21.69% ; Clay—31.67%.

*E. No. of Experiments :*

Paddy—23, Total=23.

**41. Agricultural College Farm, Parbhani.***A. General Information :*

(i) In Parbhani, Parbani district 1/4 Km. away from Parbhani Rly. Stn. (S.C. Rly.) with Lat.—19°16' N, Long.—76°47' E, Alt.—409 m. Moderately levelled. (ii) Moderate to high rainfall zone. (iii) Established in 1928. (iv) Research on all crops in relation to various aspects such as Agronomy, Horticulture, Botany, Plant Pathology, Entomology. (v) *Kharif* season :—Cotton, *Moong*, *Jowar* ; Groundnut ; *Rabi* season—*Rabi Jowar*, Wheat, Gram, Safflower, Linseed.

*B. Normal Rainfall in cm. :*

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
0.1	—	—	0.1	0.9	1.5	1.7	1.9	0.2	2.1	6.5	7.2	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
6.0	18.5	13.3	16.9	14.5	9.6	9.9	1.2	1.0	—	1.0	—	114.1

(Av. fortnightly rainfall in cm. based on the data for the period 1960-64).

*C. Irrigation and Drainage Facilities :*

(i) (a) and (b) Yes ; Sufficient to command an area of 16 ha. (ii) No.

*D. Soil type and Soil analysis :*

(i) Broad soil types—Medium black ; (Shallow and deep) ; Depth—91 cm. to 121 cm. Colour—Black ; Structure—Blacky. (ii) Chemical analysis ; (1967).

	Deep	Shallow
Nitrogen %	0.06	0.045
Free CaCO <sub>3</sub> %	4.00	3.89
pH.	8.3	8.1
P <sub>2</sub> O <sub>5</sub> %	0.09	0.06

## (iii) Mechanical analysis :

Clay	60.0	39.8
Silt	20.0	40.1
Fine sand	8.0	8.5
Coarse sand	5.0	5.6

## E. No. of Experiments :

Wheat—7, Jowar—16, Groundnut—4, Linseed—3, Mixed Crops—8, Total=38.

**42. Agricultural Research Station and Main Millet Research Station, Parbhani.**

## A. General Information :

(i) and (ii) Same as Agri. College Farm, Parbhani. (iii) Established in 1928. (iv) Jowar, Cotton, Groundnut, Wheat and Pulses are the crops normally grown in the tract. (v) Mainly agronomic experiments are conducted. Breeding work on Cotton and millets is also done.

## B. Normal Rainfall :

Same as Agriculture College Farm, Parbhani.

## C. Irrigation and Drainage Facilities :

(i) (a) Irrigational facilities are there since 1929. (b) Irrigated from wells. (ii) No. proper drainage system exists.

## D. Soil type and Soil analysis :

(i) Medium black cotton soil, 91 cm. to 122 cm ; deep ; Black coarse crump and plasty. (ii) Chemical analysis : N—0.05 to 0.03% ; Available  $P_2O_5$ —6.40 to 8.00 ; Lime reserve—2.24 to 5.08 ; T.S.S.—0.10 to 0.2 ; pH—8.1 to 8.2. (iii) Mechanical analysis : Coarse sand—2.19% to 6.60% ; Fine sand—20.71% to 41.50% and silt and clay—56.60% to 81.60%.

## E. No. of Experiments :

Jowar—6, Chinamung—5, Cotton—6, Groundnut—5, Total=22.

**43. Trial-cum-Demonstration Farm, Pokhari.**

## A. General Information .

(i) In Aurangabad district near Latur Rly. Stn. on Manmad—Kachiguda Railway Line. No experiment is conducted from last two years. But Plots, except few are levelled. (ii) Scarcity tract. (iii) Established in 1963—64. (iv) Bajra, Cotton, Soyabean in *Kharif* and Wheat in *Rabi*. (v) Breeding and Agronomical experiments.

## B. Normal Rainfall in cm. :

Jan.		Feb.		March		April		May		June	
1	2	1	2	1	2	1	2	1	2	1	2
—	0.7	—	0.6	5.7	1.1	0.5	2.5	2.1	1.5	—	—
July		Aug.		Sept.		Oct.		Nov.		Dec.	
1	2	1	2	1	2	1	2	1	2	1	2
—	—	—	—	—	—	—	—	—	0.4	—	—
											15.1

(Av. fortnightly rainfall in cm. based on the data for the period 1971-72).

*C. Irrigation and Drainage Facilities :*

(i) (a) Irrigation facility (Canal irrigated) is available from 1963. (b) One direct outlet is provided for the farm and one outlet at Chai No. 4 is provided for the irrigation. One well is also dug for this purpose. (ii) N.A.

*D. Soil type and Soil analysis :*

(i) Broad soil type—Medium ; Depth—30 to 91 cm. ; Colour—Black ; Structure—Clayey. (ii) Chemical analysis : (a) Calcium carbonate—5 to 15% ; (b) Total soluble salt—Less than 5% ; (c) Available Phosphate—5 to 10 mg. % ; (d) Available Potash—20 mgm. % ; (e) Total Nitrogen—0.02 to .08% ; (f) pH—7.5 to 9.0. (iii) Mechanical analysis : N.A.

*E. No. of Experiments :*

Wheat—2, Total=2.

**44. Agricultural College Farm, Poona.***A. General Information :*

(i) In Haveli taluka of Poona district, Lat.—18.5° N, Long—73.8° E and Alt.—553 m. Mostly levelled with slightly natural slope facilitating the drainage system. (ii) Deccan tract. (iii) Established in 1906. (iv) Cereals : *Jowar, Bajra, Maize, Wheat, Paddy*. Pulses : *Gram, Tur, Kulthi, Udid, Mug*. (v) As directed by Agricultural Research workers Committee.

*B. Normal Information in cm. :*

Jan.		Feb.		March		April		May		June		
1	2	1	2	1	2	1	2	1	2	1	2	
--	--	--	--	--	0.8	0.7	0.4	1.6	4.4	4.1	9.3	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
15.1	6.1	5.6	1.7	2.6	7.0	4.5	3.1	1.0	0.3	0.5	—	68.8

(Av. fortnightly rainfall in cm. based on the data for the period 1960-64).

*C. Irrigation and Drainage Facilities :*

(i) (a) Wells and Mutha left bank canal. (b) Since 1906. (ii) No proper drainage system exists.

*D. Soil type and Soil analysis :*

(i) Medium black soil, 91 to 122 cm. Deep. (ii) Chemical analysis : Loss on ignition - 10.17% ; Silica and insoluble silicates - 66.07% ; Lime - 3.74% ; Potash - 0.14% ; P<sub>2</sub>O<sub>5</sub> - 0.18% ; N - 0.07%. (iii) Mechanical analysis : Coarse sand - 6.96% ; Fine sand - 25.9% ; Coarse silt - 25.39% ; Medium silt-7.90% ; Fine silt-8.11% ; and clay and fine silt-25.73%.

*E. No. of Experiments :*

Wheat - 1, *Jowar*—12, Potato—1, Groundnut—4, Mixed crops—2, Total=20.

**45. Government Fruit Experimental Station, Poona.***A. General Information :*

(i) and (ii) Same as Agricultural College Farm, Poona. (iii) Established in 1921. (iv) Perennial Fruit crops, Intercrops like Groundnut, green manuring crops are taken in the

season. (v)(a) Evolution of new varieties of Grapes by hybridisation and selection. (b) Manurial experiments on fruit crops. (c) Rootstock of different fruit crops. (d) Citrus-root stock experiment. (e) Papaya breeding work.

*A. Normal Rainfall :*

Same as Agriculture College Farm, Poona.

*C. Irrigation and Drainage Facilities :*

(i) (a) and (b) : Yes, since 1927. (ii) Drainage system is provided.

*D. Soil type and Soil analysis :*

(i) Broad soil types - Medium black and Alluvial ; Depth - 61 cm. to 183 cm ; Colour - Black and Redish ; (ii) Chemical analysis : pH. value - 7.9 ; T. S. m. E. C. - 0.30 ; Available C% - 0.42 ; Av. P<sub>2</sub>O<sub>5</sub> - 2.4 ; Av. K<sub>2</sub>O - 120. (iii) Mechanical analysis : Moisture - 8.30% ; Calcium carbonate (CaCO<sub>3</sub>) - 8.00% ; Organic matter - 0.80% ; Silt - 21.75% ; Clay - 43.75% ; Coarse sand - 3.40% ; Fine sand (by difference) - 14.50%.

*E. No. of Experiments :*

Mosambi - 3, Total=3.

**46. Taluka Seed Multiplication Farm, Radhanagari.**

*A. General Information :*

(i) In Kolhapur district. (ii) It represents Konkan tract. (iii) Established in 1954. (iv) Paddy under transplanted condition. (v) The object of the farm is to effect the botanical improvement of the local heterogenous Paddy varieties grown by the cultivators of the district and to evolve varieties resistant to pests and diseases.

*B. Normal Rainfall :*

Information : N.A.

*C. Irrigation and Drainage Facilities :*

Information : N.A.

*D. Soil type and Soil analysis :*

Information : N.A.

*E. No. of Experiments :*

Paddy - 5, Total=5.

**47. Agricultural Research Station, Ratnagiri.**

*A. General Information :*

(i) In Ratnagiri district, Lat. - 17.5° N, Long. - 73° E, and Alt. - 9m. levelled land. (ii) Konkan tract. (iii) Established in 1913. (iv) Main crop is only Paddy. (v) Breeding and Agronomy work is done on paddy crop.

*B. Normal Rainfall :*

Information : N.A.

*C. Irrigation and Drainage Facilities :*

(i) (a) Irrigation facilities available since May, 1957. (b) Source of irrigation : N.A. (ii) No drainage facilities are available.

*D. Soil type and Soil analysis :*

(i) Brown soil. (ii) Chemical analysis : pH - 5.0. (iii) Mechanical analysis : N.A.

*E. No. of Experiments :*

Paddy - 10, Total = 10.

**48. Agriculture Research Station, Sakoli.***A. General Information :*

(i) In Sakoli taluka of Bhandara district 10 Km. away from Sakoli Rly. Stn. Lat.—21.1° N, Long.—80° E, and Alt.—253 m. Plain topography. (ii) High rainfall tract. Soils mixed from parent rocks. (iii) Established in 1964. (iv) Rice-Rabi pulses-Rice ; Rice-Rabi oilseeds-(Linseed) ; Rice-Rice. (v) Breeding and Agronomical experiments on Rice.

*B. Normal Rainfall in cm. :*

Jan.	Feb.	March	April	May	June	
2.1	0.6	0.8	1.4	0.2	15.5	
July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
36.4	52.2	29.1	4.5	—	1.5	144.3

(Av. monthly rainfall in cm. based on the data for the period 1960-65).

*C. Irrigation and Drainage Facilities :*

(i) (a) and (b) Only one well constructed in the year 1966 is available which irrigates only 2 ha. area in *Kharif* and 0.5 ha. in *Rabi*. (ii) No ; proper drainage system.

*D. Soil type and Soil analysis :*

(i) Depth—1.83 m ; Colour—Light brown ; Structure—Clay loam. (ii) Chemical analysis : pH - 7.1 ; E.C. - 0.19 ; C % - 0.49 ; P<sub>2</sub>O<sub>5</sub> - 14.9 (Kg/ha.) ; K<sub>2</sub>O - 466(Kg/ha.). (iii) Mechanical analysis : N.A.

*E. No. of Experiments :*

Paddy-4, Total—4.

**49. Banana Research Station, Savda.***A. General Information :*

(i) In Raver taluka of Jalgaon district 6.4 Km. from Savda Rly. Stn. The area of the farm is plain and is suitable for irrigation and at the North side there is Nala. (ii) Tapittract soil slightly acidic, suitable for *Jowar*, Cotton, Banana. (iii) Established in 1961-62. (iv) Cotton-*Jowar*. (v) Due to non availability of water Research work is not done. *Kharif* crops are taken for 2 years.

*B. Normal Rainfall :*

Information : N.A.

*C. Irrigation and Drainage Facilities :*

(i) (a) and (b) : From 1966 irrigation facilities are not available. (ii) Soil is well drained and bunding is done.

*D. Soil type and Soil analysis :*

(i) Broad soil types - Medium ; Depth - 45 to 91 cm. ; Colour - Black ; Structure—granular. (ii) and (iii) N.A.

*E. No. of Experiments :*

Banana - 5, Total=5.

**50. Agriculture Research Station (Govt. Expt. Farm), Sindewahi.***A. General Information :*

(i) In Brahmapuri taluka of Chanda district. Alt. - 220 m. Levelled land. (ii) Paddy tract. (iii) Established in 1912. (iv) Paddy in *Kharif*. (v) To conduct Agronomic research on Paddy.

*B. Normal Rainfall :*

Jan.	Feb.	March	April	May	June	
0.7	1.1	2.6	2.4	1.5	17.4	
July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
43.7	46.6	33.6	5.4	1.0	0.8	156.8

(Av. monthly rainfall in cm. based on the data for the period 59 to 66).

*C. Irrigation and Drainage Facilities :*

(i) (a) Irrigation facilities are available since 1912. (b) Irrigated through well. (ii) No proper drainage system exists.

*D. Soil type and Soil analysis :*

(i) Sandy loam, 15 to 61 cm ; Deep ; Brown to black in Colour. (ii) Chemical analysis : The soil of this farm is mostly of acidic nature having pH. - 5.4 to 7 in case of Field No. 51 to 20, about 25 ha. of area and alkaline having pH. upto 9.6 in case of 16 ha. (iii) Mechanical analysis : N.A.

*E. No. of Experiments :*

Paddy - 44, Wheat - 1, Total=45.

**51. Agricultural Research Station, Sholapur.***A. General Information :*

(i) In North Sholapur taluka of Sholapur district 8 Km. from Sholapur Rly. Stn. (S. C. Rly.) with Lat. - 17.04° N, Alt. - 476.5 m. General percentage of slope 1.5, uneven depth of soil ranging from 15 to 61 cm. (ii) Unassured rainfall tract. (iii) Established in 1933. (iv) *Kharif* - Bajri, Groundnut, Tur and other pulses ; *Rabi* - *Rabi Jowar* and Gram. (v) Research on Dry farming practices for scanty rainfall areas and other Agronomic practices.

*B. Normal Rainfall in cm. :*

Jan.		Feb.		March		April		May		June		
1	2	1	2	1	2	1	2	1	2	1	2	
--	--	--	0.4	--	0.9	1.3	0.4	1.1	3.6	5.1	5.7	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
3.3	9.5	4.6	4.3	8.9	8.3	4.8	2.2	2.4	--	0.5	0.1	67.4

(Av. fortnightly rainfall in cm. based on the data for the period 1960-64).



**C. Irrigation and Drainage Facilities :**

(i) and (ii) : No irrigation and drainage facilities available.

**D. Soil type and Soil analysis :**

(i) Broad soil type N.A. : Depth - Uneven depth ranging from 15 cm. to 61 cm. ; Colour - Black ; Structure - Granular structure. (ii) Chemical analysis : pH. - 8.16 to 8.86 ; Total soluble salt. 0.26 to 0.61% ; N - 0.031 to 0.067% ; P<sub>2</sub>O<sub>5</sub> - 7.62 to 32.89%. (iii) Mechanical analysis : Course sand - 0.22 to 13.72 % ; Fine sand - 0.52 to 40.05 % ; Clay - 24.0 to 66.50 % ; Silt - 9.0 to 23.25 %.

**E. No. of Experiments :**

*Jowar*—32, *Bajra*—9, Groundnut—7, Mixed crops—17, Total=64.

**52. Turmeric Research Station, Tasgaon.****A. General Information :**

(i) In Tasgaon taluka of Sangli district 9.6 Km. from Bhilwadi Rly. Stn, with Lat—17° N, Long.—176° E, Alt.—570 m. Generally land is in level. (ii) Krishana valley tract. (iii) Established in 1963. (iv) Turmeric—*Jowar* ; Turmeric—Chillies. (v) Agronomical experiments on Turmeric is the main purpose of Research.

**B. Normal Rainfall in cm. :**

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	—	—	0.4	0.1	0.8	1.2	0.7	2.4	6.8	1.0	7.0	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
9.8	12.3	12.4	5.5	7.2	7.7	6.1	4.7	1.8	0.2	0.6	0.5	88.9

(Av. fortnightly rainfall in cm. based on the data for the period 1960 - 64).

**C. Irrigation and Drainage Facilities :**

(i) (a) and (b) Yes, since the beginning. (ii) Fairly available.

**D. Soil type and Soil analysis :**

(i) Broad soil types-Medium black ; Depth - 45 cm. to 91 cm. ; Colour-Black ; Structure Blacky. (ii) Chemical analysis : pH - 7.5 to 8.1, Av. C - 0.61 to 0.82 %, Av. P<sub>2</sub>O<sub>5</sub>—21.7 Kg/ha. ; Av. K<sub>2</sub>O - 224 Kg/ha. (iii) Mechanical analysis - N.A.

**E. No. of Experiments :**

Turmeric - 8, Rotational - 2, Total=10.

**53. Agricultural Research Station and Government Experimental Farm, Tharsa.****A. General Information :**

(i) In Ramtek taluka of Nagpur district 1.6 Km. from Tharsa Rly. Stn. with Lat. - 10° 3' N, Long. - 21° 2' E. In general the soils of this farm are classed as Morand II which are water logging and ill drained. This is mostly due to the presence of clay and silt in the soil in heavy proportion. The sub soil impact and improvious with very poor drainage. (ii) Paddy, Wheat tract. (iii) Established in 1910-11. (iv) *Kharif* : Paddy, Soyabean, *Tur*, *Mung* ; *Rabi* : Wheat, *Jowar*, Gram, Linseed, *Til*. (v) Research work on]Wheat, Paddy and *Jowar*.

**B. Normal Rainfall in cm. :**

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
4.6	2.1	5.8	2.8	1.6	15.8	35.0	38.9	25.2	6.3	0.8	4.5	143.4

(Av. monthly rainfall in cm. based on the data of the period 1960-64).

**C. Irrigation and Drainage Facilities :**

(i) (a) Available since 1910 ; (b) N.A. (iii) Yes ; proper drainage system exists.

**D. Soil type and Soil analysis :**

(i) Broad soil types - Morand II ; Depth - 2.13 m. ; Colour - Black ; Structure - Gramular. (ii) Chemical analysis and (iii) Mechanical analysis : N.A.

**E. No. of Experiments :**

Paddy - 11, Wheat - 32, Jowar - 5, Gram - 2, Total=50.

**54. Agricultural Research Station, Vadgaon.****A. General Information :**

(i) In Poona district, Soil is laterite type of soil, having the slope from South to the North direction, farm is having 19 ha. of land out of which only 6 ha. is under Paddy cultivation and 4.5 to 6.5 ha. is under other crops. i.e. Nigar, Maldandi 35-1 etc. There is hill on the Southern side of the farm, and the railway line (Poona-Bombay) and heavy national way (State transport) passing through the research station area. Nearest railway station is Vadgaon (Maval). There are some trees of babhul on the bunds of the plots. Soil is alterite type, having the good natural system. There are natural *nallas* passing through the field. One is on the Eastern side and other on the Western side. The water from both the *nallas* is passing through the natural channal. Av. rainfall is 127 - 140 cm. only, received mainly in the monsoon season. (ii) This tract is maval tract and having the hilly region (iii) Established in 1940. (iv) (a) Nucleus seed production ; (b) Crossing ; (c) Foundation seed production ; (d) Najjar ; (e) Maldandi 35-1 ; (f) Trials etc. (v) Crossing Programme and Agronomic experiments.

**B. Normal Rainfall in cm. :**

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
-	-	-	-	-	0.2	0.8	-	2.2	3.9	2.3	17.1	
July		Sept.		Aug.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
39.8	18.4	24.0	8.8	6.5	9.4	6.7	1.7	2.4	0.4	1.1	-	145.7

(Av. fortnightly rainfall in cm. based on the data for the period 1960-64).

**C. Irrigation and Drainage Facilities :**

(i) (a) and (b) Irrigation facilities available since the starting of the farm but due to shortage of water in the well it is very limited and not for the summer season. (ii) Land is slopy and due to this there is natural drainage water is drained out of the field, hence there is no requirement of the drainage system.

**D. Soil type and Soil analysis :**

(i) Depth : - It varies from plot to plot and on an average soil depth varies from plot to plot Colour - Red to medium black ; Structure - medium. (ii) Chemical analysis : and (iii) Mechanical analysis : N.A.

*E. No. of Experiments :*

Paddy - 15, Wal - 3, Total = 18.

**55. Bajra Research Station, Vaijapur.***A. General Information :*

(i) In Vaijapur taluka of Aurangabad district  $1\frac{1}{2}$  Km. from Rotegaon Rly. Stn. with Alt. - 542.25 m. Experimental area is in general levelled. (ii) This area represents the dry land area with 38 cm. of average annual rainfall. (iii) Established in 1961-62. (iv) *Kharif* : Bajra, Moong and Groundnut ; *Rabi* : Jowar. (v) Plant Pathological, Botanical and Agronomic experiments on Bajra is the main research work.

*B. Normal Rainfall in cm. :*

Jan.		Feb.		March		April		May		June		Total
1	2	1	2	1	2	1	2	1	2	1	2	
—	—	—	—	—	—	—	—	0.6	—	4.8	3.3	
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
10.1	7.4	2.2	10.9	3.9	2.2	0.6	3.5	0.3	0.6	1.1	—	51.5

(Av. fortnightly rainfall in cm. based on the data for the period 1963-65).

*C. Irrigation and Drainage Facilities :*

(i) Not available. (ii) Soils are well drained.

*D. Soil type and Soil analysis :*

(i) Depth - 10-90 cm ; Colour - Medium black ; Structure - Blacky. Soil texture - Clay to sandy loam. (ii) Chemical analysis : Property of soil - Calcium carbonate - 5 to 15% ; Soil reaction (pH) - 8 to 8.5 ; Total soluble salts - Less than 0.5% ; Total Nitrogen - 0.02 to 0.08% ; Available Phosphate - 5.0 to 20.0 gm. per 100 gm. of soil ; Available Potash - 20 mg. per 100 gm. of soil. (iii) Mechanical analysis : N.A.

*E. No. of Experiments :*

Bajra - 6, Mixed crops - 11, Total = 17.

**56. Regional Fruit Research Sub-Station, Vengurla.***A. General Information :*

(i) In Vengurla taluka of Ratnagiri district with Lat. - 15.9° N, Long. - 73.6° E and Alt. 8 m. above sea level. The Farm is located at the base of the hill and the land is slopping towards N-W side. (ii) West coast Kokan Region Lateritic soil. (iii) Established in 1959. (iv) Mango and other fruit crops. (v) Root stock trials and other research experiments.

*B. Normal Rainfall in cm. :*

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
—	—	—	0.1	22.8	84.3	98.3	75.3	34.2	11.7	2.5	5.1	334.3

(The average rainfall data in cm. is based on the period 1960-64).

*C. Irrigation and Drainage Facilities :*

(i) and (ii) No.

**D. Soil type and Soil analysis :**

(i) Soil types N.A., Depth - 90 cm. to 250 cm. Colour - Redish brown lateritic soil. Structure medium. (ii) Chemical analysis - pH. 4 to 5.5. (iii) Mechanical analysis - N.A.

**E. No. of Experiments :**

Mango - 10, Total=10.

**57. Regional Cashewnut Research Station, Vengurla.**

(A) to (D) Same as in Fruit Res. Stn. Vengurla.

**E. No. of Experiments :**

Cashewnut - 10, Total - 10.

**58. Agricultural Research Station (Wheat Res. Stn.), Washim.****A. General Information :**

(i) In Akola district near Washim Rly. Stn. The site of the Farm is situated on main road of Washim - Akola at distance of 4.8 Km. away from Washim with Lat. - 20° N, Long. - 76° E, Alt. - 432.8 m. The experimental area is Levelled. (ii) Central zone tract. (iii) Established in 1918. (iv) *Kharif Jowar*, Groundnut, *Mung Udid*, Cotton, *Tur*, Wheat, Gram and Safflower. (v) Breeding and Agronomical trials mainly on Wheat and Cotton and All India Co-ordinated project.

**B. Normal Rainfall in cm. :**

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
0.6	0.3	1.0	0.5	1.2	13.2	20.2	24.1	13.3	1.5	1.3	3.3	80.5

(Av. monthly rainfall in cm. based on the data for the period 1965-72).

**C. Irrigation and Drainage Facilities :**

(i) and (ii) No.

**D. Soil type and Soil analysis :**

(i) Broad soil type with depth - Depth - 23 to 30 cm. ; Colour - Black ; (ii) Chemical analysis :

Sample No.	pH.	Electrical conductivity mmol/cum.	Organic matter %	Total N %	Available P <sub>2</sub> O <sub>5</sub> Kg/ha.	Available K <sub>2</sub> O Kg/ha.
I 10 to 15 cm.	6.9	1.68	1.025	0.0532	28.2	750
II 15-30 cm.	7.4	1.74	0.925	0.0445	25.2	770
III 30-60 cm.	7.8	1.94	0.723	0.0321	20.3	730

(iii) Mechanical analysis : N.A.

**E. No. of Experiments :**

Wheat - 8, Cotton - 7, Groundnut - 3, Mixed crops -9, Total=27.

**59. Agricultural Research Station, Yeotmal.****A. General Information :**

(i) In Yeotmal taluka of Yeotmal district, 1 Km. away from Yeotmal Rly. Stn. with Lat. - 20°4' N, Long. - 78°1' E and Alt. - 451·4 m above sea level. The fields of the farm are levelled and  $\frac{1}{2}$  area is used for research work. (ii) Berar tract of Yeotmal district. (iii) Established in 1920. (iv) Cotton-Jowar-Groundnut. (v) Research experimentations as per the instructions of the Research committee.

**B. Normal Rainfall in cm :**

Jan.		Feb.		March		April		May		June			
1	2	1	2	1	2	1	2	1	2	1	2		
1·1	0·1	—	0·3	0·5	1·3	1·4	0·2	1·4	1·8	8·7	7·0		
July		Aug.		Sept.		Oct.		Nov.		Dec.		Total	
1	2	1	2	1	2	1	2	1	2	1	2		
15·0	20·4	8·9	10·1	9·3	7·1	4·5	2·8	2·7	—	1·3	0·8	116·0	

Av. fortnightly rainfall in cm.

**C. Irrigation and Drainage Facilities :**

(i) (a) and (b) Irrigation from well. (ii) Bunding Nalas of soil conservations.

**D. Soil type and Soil analysis :**

(i) Soil type - Medium black to black. Depth - 22 cm. to 60 cm. Structure - Granular crumb. (ii) Chemical analysis : pH - 7·7, Organic - 0·45. Av. N<sub>2</sub>—210·7 Kg/ha., Av. P<sub>2</sub>O<sub>5</sub>- 20·0 Kg/ha., Av K<sub>2</sub>O - High, Soluble Salt - Normal. (iii) Mechanical analysis - N.A.

**E. No. of Experiments :**

Jowar - 3, Cotton - 9, Mixed crops - 12, Total=24.

## **EXPERIMENTAL DATA**

Crop :- Paddy (Kharif).

Ref :- Mh. 61(110), 62(97), 63(139)

Site :- Seed Multiplication Farm,  
Dongargaon.

Type 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) Medium soil. (iii) 2.8 61 ; 10.8.62 ; 8.8.63.  
(iv) (a) 2 to 3 ploughings, puddling, harrowing. (b) Japanese method of planting. (c) N.A. for 61 ;  
45 Kg/ha. for others. (d) 23 cm. × 23 cm. for 61 and 63 ; 23 cm. × 15 cm. for 62 (e) 2 to 3 for 61 and 63  
4—5 for 62 (v) 22.4 Kg/ha. of  $P_2O_5$ . (vi) Chinoor. (vii) Irrigated. (viii) 2 interculturings. (ix) 72 cm.  
for 62 ; N.A. for others. (x) 10.12.61 ; 8.12.62 ; 2.12.63.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N:  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.  
(2) 3 levels of lime:  $L_0=0$ ,  $L_1=12.5$  and  $L_2=25.1$  Q/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 6'40 m. × 6'40 m. (b) 4'57 m. × 4'57 m.  
(v) 91 cm. × 91 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil for 61 and 62 ; 5% B.H.C. dusted in 63 (iii) Yield of grain. (iv) (a) 1961-63.  
(b) Yes. (c) Results for combined analysis as well as individual analysis are presented under 5. Results.  
(v) Karanja, Radhanagari. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years  
interaction is present.

5. RESULTS :

Pooled results

(i) 2897 Kg/ha. (ii) 589.1 Kg/ha. (based on 16 d.f. made up of Treatments × years interaction). (iii) Main  
effect of N and N × L interaction is significant. (iv) Av. yield of grain in Kg/ha.

	$L_0$	$L_1$	$L_2$	Mean
$N_0$	2518	2759	2659	2645
$N_1$	2742	3098	2896	2912
$N_2$	3658	2826	2914	3133
Mean	2973	2894	2823	2897

C.D. for N marginal means = 294.4 Kg/ha.

C.D. for body of table = 509.8 Kg/ha.

Individual results

Treatments	$L_0$	$L_1$	$L_2$	Sig.	$N_0$	$N_1$	$N_2$	Sig.	G.M.	S.E./plot
Years										
1961	2615	2406	2356	**	2419	2374	2583	**	2459	29.1
1962	3832	3843	3508	**	3505	3783	3895	**	3728	382.7
1963	2472	2434	2605	N.S.	2011	2580	2920	**	2504	325.8
Pooled	2973	2894	2823	N.S.	2645	2912	3133	*	2897	589.1

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 61(11).**

**Site :- Agri. Res. Stn., Igatpuri.**

**Type :- 'M'.**

**Object :-** To study the effect of different types of G.M. on Paddy.

**1. BASAL CONDITIONS :**

(i) (a) Pulses—Paddy. (b) Pulses. (c) Nil. (ii) Medium black to dark Grey—Loamy. (iii) 11.6.61/6, 7.8.61. (iv) (a) 1 Ploughing. (b) Transplanting. (c) 34 Kg/ha. (d) 30 cm. × 15 cm. (e) 4 seedlings/bunch. (v) Nil. (vi) *Kolpi*—248 (late). (vii) Unirrigated. (viii) N.A. (ix) 432 cm. (x) 18.11.61.

**2. TREATMENTS :**

6 G.M. crops:  $G_0$ =Control,  $G_1$ =*Sannhemp*,  $G_2$ =*Takle*,  $G_3$ =*Phangla*,  $G_4$ =*Karanj* and  $G_5$ =*Dhaincha*.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 10.05 m. × 8.30 m. (b) 8.84 m. × 7.62 m. (v) 61 cm. × 30 cm. (vi) Yes.

**4. GENERAL :**

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

**5. RESULTS :**

(i) 1442 Kg/ha. (ii) 97.1 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$G_0$	$G_1$	$G_2$	$G_3$	$G_4$	$G_5$
Av. yield.	1045	1580	1471	1602	1509	1446

C.D. = 146 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 62(169), 63(219).**

**Site : Agri. Res. Stn., Igatpuri.**

**Type : 'M'.**

**Object :-** To study the efficacy of Nitrophosphate Complex by ODDA and PEC process on the yield of Paddy.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) Coarse to medium black. (iii) 16.6.62/12 to 16.8.62 ; 13.6.63/5 to 8.8.63. (iv) (a) Ploughing and puddling. (b) Transplanting. (c) 45 Kg/ha. (d) 25 cm. × 25 cm. (e) 4. (v) Nil. (vi) LK 248. (vii) Unirrigated. (viii) Interculturings. (iv) 86 cm. ; 175 cm. (x) 22.11.62 to 25.11.62 ; 26.11.63 to 29.11.63.

**2. TREATMENTS :**

All combination of (1), (2) and (3)+5 additional treatments in each block

(1) 3 types of fertilizers:  $P_1$ = $P_2O_5$ +A/S,  $P_2$ =ODDA and  $P_3$ =PEC.

(2) 3 levels of fertilizers:  $L_1$ =13.4 Kg/ha. of N+11.8 Kg/ha. of  $P_2O_5$ ,  $L_2$ =26.9 Kg/ha. of N+23.5 Kg/ha. of  $P_2O_5$  and  $L_3$ =53.8 Kg/ha. of N+47.1 Kg/ha. of  $P_2O_5$ .

(3) 3 methods of application:  $M_1$ =Broadcast,  $M_2$ =6.3 cm. below seed and  $M_3$ =Band placement.

5 additional treatments:  $N_0$ =0,  $N_1$ =13.4,  $N_2$ =26.9,  $N_3$ =40.3 and  $N_4$ =53.8 Kg/ha. of N.

**3. DESIGN :**

(i) 3<sup>3</sup> confd.+5 additional treatments in each block. (ii) (a) 14 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 13.72 m. × 4.57 m. (b) 13.21 m. × 4.06 m. (v) 25 cm. × 25 cm. (vi) Yes.



## 4. GENERAL

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961-63 (failed in 1961), (b) No. (c) Results of combined analysis as well as individual analysis are presented under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous. Treatments  $\times$  years interaction is absent.

## 5. RESULTS:

Pooled results,

(i) 1312 Kg/ha. (ii) 308.1 Kg/ha. [based on 94 d.f. made up of pooled error]. (iii) Main effect of M is highly significant. Extra treatments among themselves are highly significant. Main effects of P and L are significant. (iv) Av. yield of grain in Kg/ha.

$N_0=1098$ ,  $N_1=1016$ ,  $N_2=1310$ ,  $N_3=1490$  and  $N_4=1494$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
P <sub>1</sub>	1275	1246	1646	1320	1628	1219	1389
P <sub>2</sub>	1262	1174	1342	1314	1262	1202	1259
P <sub>3</sub>	1152	1229	1199	1153	1373	1054	1193
Mean	1230	1216	1396	1262	1421	1158	1281
M <sub>1</sub>	1243	1188	1357				
M <sub>2</sub>	1372	1319	1572				
M <sup>*</sup>	1074	1142	1260				

C.D. for extra treatment means = 250.3 Kg/ha.

C.D. for M, P and L marginal means = 144.5 Kg/ha.

## Individual results

Treatments	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Sig.	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Sig.	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	Sig.
Years												
1962	1256	1332	1526	*	1444	1468	1202	*	1494	1363	1257	*
1963	1204	1100	1266	N.S.	1081	1374	1115	*	1284	1156	1130	N.S.
Pooled	1230	1216	1396	N.S.	1262	1421	1158	*	1389	1259	1193	N.S.

N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	Sig.	G.M.	S.E./plot
1182	1158	1328	1629	1559	*	1372	288.8
1015	870	1290	1351	1428	N.S.	1190	362.2
1098	1096	1310	1490	1449	**	1281	308.1

Crop :- Paddy (Kharif).

Ref :- Mh. 61(86), 62(72), 63(103).

Site :- Taluka Seed Multiplication Farm,  
Karanja.

Type :- 'M'.

Object: — To study the effect of lime in combination with N on the yield of Paddy.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 3 C.L./ha. of F.Y.M.+22.4 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$  for 61; As per treatments for others. (ii) Sandy loam. (iii) 23.8.61; 30.7.62; 26.8.63. (iv) (a) 2 ploughings and 1 harrowing. (b) Japanese method of transplanting. (c) N.A. (d) 23 cm. x 23 cm. (e) 2 to 3. (v) 22.4 Kg/ha. of  $P_2O_5$ . (vi) Red 8 Luchai (late). (vii) Irrigated. (viii) 1 to 2 interculturings. (ix) N.A. (x) 29.11.61; 25 to 28.12.62; 10, 11.12.63 respectively.

## 2. TREATMENTS:

All combinations of (1) and (2)

(1) 3 levels of N :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(2) 3 levels of Lime :  $L_0=0$ ,  $L_1=12.5$  and  $L_2=25.0$  Q/ha.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 6.40 m. x 6.40 m. (b) 4.57 m. x 4.57 m. (v) 91 cm. x 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. Endrin sprayed for rice case worm for 63. (iii) Yield of grain. (iv) (a) 1961—63. (b) Yes. (c) Results of combined analysis as well as individual analysis are presented under 5. Results. (v) Radhanagari. (vi) Sudden heavy rainfall in Dec. 1962. (vii) Error variances are homogeneous. Treatments x years interaction is absent.

## 5. RESULTS:

## Pooled results

(i) 3292 Kg/ha. (ii) 398.8 Kg/ha. [based on 88 d.f. made up of pooled error of three years and interaction of Treatments x years]. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$N_2$	Mean
$L_0$	2868	3447	3434	3249
$L_1$	3056	3500	3608	3388
$L_2$	2920	3153	3642	3238
Mean	2948	3367	3561	3292

C.D. for N marginal means = 184.3 Kg/ha.

## Individual results

Mean	$N_0$	$N_1$	$N_2$	Sig.	$L_1$	$L_2$	$L_3$	Sig.
Year								
1961	2129	2415	2345	N.S.	2247	2456	2186	N.S.
1962	3553	4238	4547	**	4082	4215	4041	N.S.
1963	3162	3446	3791	**	3419	3492	3488	N.S.
Pooled	3249	3388	3238	**	2948	3367	3561	N.S.

G.M.	S.E/plot
2296	334.2
4113	461.6
3466	349.2
3292	398.8

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 60(11).**

**Site :- Agri. Res. Stn., Karjat.**

**Type :- 'M'.**

**Object :-** To study the effect of G.M. on the yield of Paddy crop.

**1. BASAL CONDITIONS :**

(i) (a) Paddy—Paddy. (b) Paddy. (c) Nil. (ii) Sandy loam to clay loam. (b) N.A. (iii) 4.6.60/13.7.60.  
(iv) (a) N.A. (b) Transplanting. (c) 27 Kg/ha. (d) 30 cm. × 15 cm. (e) 4 seedlings/bunch. (v) Nil.  
(vi) Kolamba -42. (vii) Un-irrigated. (viii) 2 interculturings. (ix) 380 cm. (x) 3.11.60.

**2. TREATMENTS :**

7 G.M. crops :  $G_0$ =Control,  $G_1$ =*Sanuhemp*,  $G_2$ =*Sesbania Sp.*,  $G_3$ =*Takala*,  $G_4$ =*Cilyricida Maculata*,  
 $G_5$ =*Karanj* and  $G_6$ =*Dhaincha*.  
3360 Kg/ha. of green matter (not in situ).

**3. DESIGN :**

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) 9.14 m. × 6.10 m. (b) 7.92 m. × 4.88 m. (v) 61 cm. × 61 cm.  
(vi) Yes.

**4. GENERAL :**

(i) Normal, lodging occurred. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960 only. (b) and (c) Nil.  
(v) N.A. (vi) and (vii) Nil.

**2. RESULTS :**

(i) 2684 Kg/ha. (ii) 425.5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$G_0$	$G_1$	$G_2$	$G_3$	$G_4$	$G_5$	$G_6$
Av. yield	2635	2690	2728	2519	2907	2822	2489

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 60(16), 61(160), 62(151)**

**Site :- Agri. Res. Stn., Karjat.**

**Type :- 'M'.**

**Object :-** To study the effect of fish manure on the yield of Paddy.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) Sandy loam to clay loam. (iii) 14.6.60/15.7.60 ; 8.6.61/3.7.61 ;  
12.6.62/12.7.62. (iv) (a) ploughing and puddling. (b) Transplanting. (c) 27 Kg/ha. for 60 and 37 Kg/ha.  
for others. (d) 30 cm. × 15 cm. (e) 4. (v) Nil. (vi) K 42 (late). (vii) Unirrigated. (viii) 2 interculturings  
and 2 weedings. (ix) 380 cm. ; 399 cm. ; 337 cm. (x) 3.11.60 ; 11.11.61 ; 6.11.62.

**2. TREATMENTS :**

3 manurial treatments :  $M_0$ =Control,  $M_1$ =44.8 Kg/ha. of N as A/S+22.4 Kg/ha. of  $P_2O_5$  as Super and  
 $M_2$ =44.8 Kg/ha. of N as fish manure.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4 for 60 and 61 ; 6 for 62. (iv) (a) 9.75 m. × 4.88 m. (b) 8.53 m. × 3.66 m.  
(v) 61 cm. × 61 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960—62. (b) No. (c) Results of combined  
analysis as well as individual analysis are presented under 5 Results. (v) N.A. (vi) Nil. (vii) Error vari-  
ances are homogeneous. Treatments × years interaction is absent.

## 5. RESULTS:

## Pooled results

(i) 2628 Kg/ha. (b) 313.3 Kg/ha. (based on 26 d.f. made up of pool error and Treatment  $\times$  years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>
Av. yield	1950	3031	2904

C.D.=243.5 Kg/ha.

## Individual results

Mean	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	Sig.	G.M.	S.E/plot
Year						
1960	1979	3201	2736	**	2638	347.7
1961	2065	3284	3262	**	2870	247.3
1962	1805	2607	2713	**	2375	305.3
Pooled	1950	3031	2904	**	2628	313.3

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 61(90), 62(73), 63(112).**

**site :- Agri. Res. Stn., Karjat.**

**Type :- 'M'.**

**Object :-** To study the relative merits of C/A/N with A/S and Urea in the presence and absence of F. Y. M. on the yield of Paddy.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) N.A. (iii) 11 to 13.7.61 ; 15 to 17.7.62 ; 8 to 10.7.63. (iv) (a) Ploughing. (b) Transplanting. (c) N.A. (d) 25 cm.  $\times$  25 cm. (e) 4. (v) Nil. (vi) Z-149. (vii) Unirrigated. (viii) Weedings and interculturings. (ix) N.A. (x) 19 to 21.11.61 ; 7.11.62 ; 29, 30.10.63.

## 2. TREATMENTS :

## Main-plot treatments :

All combinations (1) and (2)

(1) 3 levels of N : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 3 sources of N : S<sub>1</sub>=A/S, S<sub>2</sub>=C/A/N, and S<sub>3</sub>=Urea.

## Sub-plot treatments :

2 levels of F. Y. M. : F<sub>0</sub>=0 and F<sub>1</sub>=56 Q/ha.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  6.40 m. (b) 9.14 m.  $\times$  4.57 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Bacterial Blight sprayed insecticides in 61 ; Nil for other years. (iii) Yield of grain. (iv) (a) 1961-63. (b) Yes. (c) Nil. (v) Shindewahi. (vi) Nil. (vii) Error variances for main-plot treatments are heterogeneous. Similarly error variances for sub-plot treatments are heterogeneous, hence results of individual years are presented under 5. Results.

## 5. RESULTS :

## 61(90)

(i) 2058 Kg/ha. (ii) (a) 297.1 Kg/ha. (b) 312.6 Kg/ha. (iii) Main effect of Nitrogen vs. no Nitrogen and S effects are highly significant. Main effect of N is significant. (iv) Av. yield of grain in Kg/ha.

$N_0F_0=1588$  and  $N_0F_1=1842$  Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	2474	1873	2063	2141	2132	2137
N <sub>2</sub>	2755	2008	2203	2340	2304	2322
Mean	2614	1940	2133	2240	2218	2229
F <sub>0</sub>	2639	1924	2158			
F <sub>1</sub>	2590	1957	2108			

C.D. for N marginal means=231 Kg/ha.

C.D. for S marginal means=277 Kg/ha.

62(73)

(i) 1968 Kg/ha. (ii) (a) 160.3 Kg/ha. (b) 135.6 Kg/ha. (iii) Main effects of F, S and nitrogen vs. no nitrogen are highly significant. (iv) Av. yield of grain in Kg/ha.

$N_0F_0=1649$ ,  $N_0F_1=1803$  Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	2416	1830	2025	1952	2228	2090
N <sub>2</sub>	2361	1872	2035	1991	2188	2089
Mean	2388	1851	2030	1972	2208	2090
F <sub>0</sub>	2221	1779	1915			
F <sub>1</sub>	2556	1923	2145			

C.D. for S marginal means=152 Kg/ha.

C.D. for F marginal means=233 Kg/ha.

63(112)

(i) 2001 Kg/ha. (ii) (a) 113.4 Kg/ha. (b) 90.4 Kg/ha. (iii) Main effects of N, S and F interaction S×N, N×F and No nitrogen vs. nitrogen are highly significant. (iv) Av. yield of grain in Kg/ha.

$N_0F_0=1645$  and  $N_0F_1=1835$  Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	2293	2066	1816	1875	2242	2058
N <sub>2</sub>	2389	2099	2126	2100	2310	2205
Mean	2341	2083	1971	1988	2276	2132
F <sub>0</sub>	2170	1936	1855			
F <sub>1</sub>	2512	2229	2087			

C.D. for N marginal means=88 Kg/ha.

C.D. for S marginal means=108 Kg/ha.

C.D. for F marginal means=67 Kg/h.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 61(158).**

**Site :- Agri. Res. Stn., Karjat.**

**Type :- 'M'.**

Object —To study the effect of 'Paddy Guard' on the yield.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) 44.8 Kg/ha. of N as A/S+22.4 Kg/ha. of  $P_2O_5$  as Super. (ii) Loam. (iii) 17.7.61/9.8.61. (iv) (a) Ploughing and puddling. (b) Transplanting. (c) 37 Kg/ha. (d) 23 cm. × 23 cm. (e) 4. (v) As per treatments. (vi) 2—63 (medium). (vii) Unirrigated. (viii) 2 interculturings and weeding. (ix) 399 cm. (x) 24.10.61.

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 2 levels of Paddy Guard :  $G_0=0$  and  $G_1$ =Paddy Guard.

(2) 2 levels of manures :  $M_0=0$  and  $M_1=44.8$  Kg/ha. of N as A/S+22.4 Kg/ha. of  $P_2O_5$  as Super.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 6.71 m. × 7.92 m. (b) 5.49 m. × 6.71 m. (v) 61 cm. × 61 cm. (vi) Yes.

**4. GENERAL :**

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

**5. RESULTS :**

(i) 3004 Kg/ha. (ii) 279.4 Kg/ha. (iii) Main effect of G is significant. (iv) Av. yield of grain in Kg/ha.

	$G_0$	$G_1$	Mean
$M_0$	3075	2755	2915
$M_1$	3219	2966	3091
Mean	3147	2861	3004

C.D. for G marginal means=243.0 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 61(159).**

**Site :- Agri. Res. Stn., Karjat.**

**Type :- 'M'.**

Object : —To study the effect of Cotton seed cake and g.n.c. with A/S on the yield of Paddy.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) 44.8 Kg/ha. of N. (ii) Loam. (iii) 8.6.61/8.7.61. (iv) (a) Ploughing and puddling. (b) Transplanting. (c) 37 Kg/ha. (d) 23 cm. × 23 cm. (e) 4. (v) Nil. (vi) K 42. (vii) Irrigated. (viii) 2 interculturings. (ix) 399 cm. (x) 15.11.61.

**2. TREATMENTS :**

6 manurial treatments:  $T_0$ =Control,  $T_1=44.8$  Kg/ha. of N as A/S+22.4 Kg/ha. of  $P_2O_5$  as Super,  $T_2=44.8$  Kg/ha. of N as G.N.C.,  $T_3=44.8$  Kg/ha. of N as G.N.C.+suppliment Super to make a total of 22.4 Kg/ha. of  $P_2O_5$  including phosphate supplied by G.N.C.,  $T_4=44.8$  Kg/ha. of N as Cotton seed cake and  $T_5=44.8$  Kg/ha. of N as Cotton seed cake+suppliment Super to make a total of 22.4 Kg/ha. of  $P_2O_5$  including phosphate supplied by Cotton seed cake.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 19.20 m. × 21.94 m. (iii) 4. (iv) (a) 6.40 m. × 10.97 m. (b) 4.57 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Gram hoppers. (iii) Yield of grain. (iv) (a) 1961 only. (b) No. (c) Nil. (v) to (vii) Nil.

## 5. RESULTS :

(i) 2332 Kg/ha. (ii) 179.2 Kg/ha. (iii) Treatment effect is highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>
Av. yield	1580	2677	2512	2640	2237	2347

C.D. = 270 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 61(228), 62(225).**

**Site :- Agri. Res. Stn., Karjat.**

**Type :- 'M'.**

Object :- To see the possibilities of raising G.M. plants in Konkan area.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) wal. (c) Nil. (ii) Clay loam. (iii) 8.6.61/10.7.61 ; 12.6.62/13.7.62. (iv) (a) 3 ploughings. (b) Raised on seed beds and transplanted in *situ*. (c) 22 Kg/ha. (d) 30 cm. × 15 cm. (e) 4. (v) Nil. (vi) K-42 late (vii) Unirrigated. (viii) 1-2 hand weedings ; 2-3 interculturings. (ix) 468 cm. ; 374 cm. (x) 11.11.61 ; 17.11.62.

## 2. TREATMENTS :

4 G.M. crops : G<sub>0</sub> = Control, G<sub>1</sub> = *Sesbania*, G<sub>2</sub> = *Dhaincha* and G<sub>3</sub> = *Sannhemp*.

G.M. crops broadcasted on the field on 7.6.61 and 8.6.62 and burried on 9.7.61 and 12.7.62 respectively just before transplanting Paddy.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 9.14 m. × 6.10 m. (b) 7.92 m. × 4.88 m. (v) 61 cm. × 61 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Wt. of green material buried and yield of grain. (iv) (a) 1960-62. (modified in 1961). (b) No. (c) Results of combined analysis as well as individual analysis are presented under 5.—Results. (v) Khopoli. (vi) Nil. (vii) Error variances are homogeneous. Treatment × years interaction is absent.

## 5. RESULTS :

**Pooled results**

(i) 2644 Kg/ha. (ii) 237.7 Kg/ha. (based on 33 d.f. made up of pooled error and Treatment × years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	G <sub>0</sub>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>
Av. yield	2532	2525	2893	2626

C.D. = 198.6 Kg/ha.

## Individual results

Treatment	G <sup>0</sup>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	Sig.	G.M.	S.E/plot
Year							
1961	2798	2736	3095	2861	*	2873	254.6
1962	2267	2315	2691	2390	*	2416	240.0
Pooled	2532	2525	2893	2626	**	2644	237.7

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 63(148), 64(118), 65(16).**

**Crop :- Agri. Res. Stn., Karjat.**

**Type :- 'M'.**

**Object :-** To study the relative merits of different N-carriers on the yield of Paddy.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 44.8 Kg/ha. of N+22.4 Kg/ha. of P (63), N-fertilizer as per treatment in 64 and 65. (ii) Sandy loam. (iii) 9.6.63/20.7.63 ; 9.6.64/18.7.64 ; 9.6.65/21.7.65. (iv) (a) Ploughing. (b) Transplanting. (c) N.A. (d) 30 cm.×15 cm. (e) 4. (v) Nil. (vi) K-42. (viii) Unirrigated. (viii) Interculturing and weeding. (ix) N.A. ; N.A. ; 316 cm. (x) 8.11.63 ; 12.11.64 ; 10.11.65.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 5 sources of N : S<sub>1</sub>=A/S, S<sub>2</sub>=A/Cl., S<sub>3</sub>=A/S/N, S<sub>4</sub>=C/A/N and S<sub>5</sub>=Urea.

## 3. DESIGN :

(i) Factorial in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 8.22 m.×5.48 m. (b) 6.40 m.×3.66 m. (v) 91 cm.×91 cm. (v) Yes.

## 4. GENERAL :

(i) Satisfactory ; normal ; normal. (ii) Attack of Blight in 1963, Nil in 1964 and 65. (iii) Yield of grain. (iv) (a) 1963-65. (b) Yes. (c) Results of pooled analysis as well as individual years are presented under 5. Results, (v) Shindewahi. (vi) No. (vii) Error variances are heterogeneous and Treatments×years interaction is present.

## 5. RESULTS :

## Pooled results

(i) 1816 Kg/ha. (ii) 390.4 Kg/ha. (based on 22 d.f. made up of Treatments×years interaction). (iii) Control vs. others effect is highly significant and the main effect of N is significant. (iv) Av. yield of grain in Kg/ha.

Control (No)=1488 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	Mean
N <sub>1</sub>	1903	1652	1945	1737	1999	1847
N <sub>2</sub>	2309	2024	2117	2087	2027	2113
Mean	2106	1838	2031	1912	2013	1980

C.D. for N marginal means=256 Kg/ha.



## Individual results

Treatments	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	Sig.	N <sub>1</sub>	N <sub>2</sub>
Years								
1963	1330	1338	1257	1163	1408	N.S.	1190	1409
1964	2932	2221	2600	2370	2651	*	2428	2681
1965	2101	1955	2237	2205	1979	N.S.	1942	2249
Pooled	2106	1838	2031	1912	2013	N.S.	1847	2113

Sig.	N <sub>0</sub>	Sig.	G.M.	S.E./plot
*	984	**	1194	135.4
N.S.	1941	**	2350	443.4
*	1540	**	1910	246.5
*	1488	**	1816	390.4

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 64(165).**

**Site :- Agri. Res. Stn., Karjat.**

**Type :- 'M'.**

**Object :-** To study the effect of azotobacter inoculation with and without the combination of N, P, Mo and F.Y.M. on the yield of transplanted Paddy.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) 44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) N.A. (iii) 15.7.64. (iv) (a) Ploughing. (b) Transplanting. (c) 25 Kg/ha. (d) 30 cm. × 15 cm. (e) 3-4. (v) Nil. (vi) Z-149. (vii) Un-irrigated. (viii) Interculturing and weeding. (ix) N.A. (x) 15.11.64.

**2. TREATMENTS :**

All the 32 combinations of the following 5 factor each at 2 levels.

1. F.Y.M. : a<sub>0</sub>=0, a<sub>1</sub>=5600 Kg/ha.
2. N as A/S : b<sub>0</sub>=0, b<sub>1</sub>=44.8 Kg/ha.
3. P as S/P : c<sub>0</sub>=0, c<sub>1</sub>=22.4 Kg/ha.
4. Treatment of seedling d<sub>0</sub>=No inoculation d<sub>1</sub>=Innoculated with azotobacter.
5. M<sub>0</sub> : e<sub>0</sub>=0, e<sub>1</sub>=210 gm/ha. of Sod. molybdate.

Manuring at the time of transplanting.

**3. DESIGN :**

(i) 2<sup>5</sup> fact. confd. ACE, BCD, ABDE in Rep. I, ACD, BDE, ABCE in Rep. II confounded. (ii) (a) 8. (b) N.A. (iii) 2. (iv) (a) 11.96 m. × 6.39 m. (b) 9.14 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964—only. (b) No. (c) Nil. (v) to (vii) Nil.

**5. RESULTS :**

(i) 2690 Kg/ha. (ii) 481.9 Kg/ha. (iii) Main effect of B and interaction A × B × C × D are highly significant. (iv) Table of mean and differential responses in Kg/ha.

Treatment	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	80	-	-	123	37	149	11	97	63	76	84
B	774	817	731	-	-	982	566	725	823	973	575
C	78	147	9	286	-130	-	-	-35	191	-94	250
D	113	130	96	64	162	0	226	-	-	-36	262
E	-76	-80	-72	123	-275	-248	96	-225	73	-	-

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 60(112).**

**Site :- Agri. Res. Stn., Khopoli.**

**Type :- 'M'.**

**Object:—**To study the residual effect of G.M. of karanj leaves of hot weather crop to succeeding *kharif* Paddy.

**1. BASAL CONDITIONS :**

- (i) (a) No. (b) Paddy. (c) As per treatments. (ii) Medium black. (iii) 7.6.60/6.7.60. (iv) (a) N.A.  
 (b) Transplanting. (c) 17 Kg/ha. (d) 30 cm. × 15 cm. (e) 6 seedlings/bunch. (v) Nil. (vi) Kolpi - 70  
 (early). (vii) Unirrigated. (viii) N.A. (ix) 367 cm. (x) 7.10.60.

**2. TREATMENTS :**

4 manurial treatments:  $M_0$ =Control,  $M_1$ =22.4 Q/ha. of *karanj* leaves,  $M_2$ =44.8 Q/ha. of *karanj* leaves  
 and  $M_3$ =89.7 Q/ha. of *karanj* leaves.

Treatments given to previous paddy crop.

**3. DESIGN :**

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 5.49 m. × 5.49 m. (b) 4.88 m. × 5.18 m. (v) 30 cm. × 15 cm.  
 (vi) Yes.

**4. GENERAL :**

- (i) Lodging occurred due to heavy wind blow on 18.9.60 in the evening. (ii) Nil. (iii) Yield of grain.  
 (iv) (a) and (b) No. (c) Nil. (v) N.A. (vi) Heavy wind blow on 18.9.60 caused lodging. (vii) Nil.

**5. RESULTS :**

- (i) 2434 Kg/ha. (ii) 215.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain  
 in Kg/ha.

Treatment	$M_0$	$M_1$	$M_2$	$M_3$
Av. yield	2292	2405	2409	2630

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 60(114).**

**Site :- Agri. Res. Stn., Khopoli.**

**Type :- 'M'.**

**Object:—**To find out the residual effect of N, and  $P_2O_5$  combinations applied to hot weather Paddy on *Kharif* Paddy.

## 1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) As per treatments. (ii) Medium Black. (iii) 7.6.60/6.7.60. (iv) (a) N.A. (b) Transplanting. (c) 17 Kg/ha. (d) 30 cm × 15 cm, (e) 6 seedling/bunch. (v) Nil. (vi) Kolpi—70 (early) (vii) Unirrigated. (viii) N.A. (ix) 367 cm. (x) 7.10.60.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as A/S :  $N_0=0$ ,  $N_1=22.4$ ,  $N_2=33.6$  and  $N_3=44.8$  Kg/ha.

(2) 2 levels of  $P_2O_5$  as Super :  $P_0=0$  and  $P_1=22.4$  Kg/ha.

fertilizers applied to previous Paddy crop.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 6.10 m. × 3.05 m. (b) 5.49 m. × 2.74 m. (v) 30 cm × 15 cm. (vi) Yes.

## 4. GENERAL :

(i) Lodged completely on 18.9.60 due to heavy wind blow in the evening. (ii) Nil. (iii) Yield of grain. (iv) (a) and (b) No. (c) Nil. (v) N.A. (vi) Lodging occurred due to heavy wind blow on 18.9.60. (vii) Nil.

## 5. RESULTS :

(i) 2045 Kg/ha. (ii) 169.4 Kg/ha. (iii) None of the effects are significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$N_2$	$N_3$	Mean
$P_0$	2052	1949	2232	2052	2071
$P_1$	1968	1996	2039	2071	2019
Mean	2010	1973	2135	2062	2045

**Crop :-Paddy (Kharif).**

**Ref :- Mh. 60(115).**

**Site :- Agri. Res. Stn., Khopoli.**

**Type :- 'M'.**

**Object :-**To study the effect of the various fertilizer combination and of single elements such as N, P, K on the severity of the bacterial blight on Paddy.

## 1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) Medium black. (iii) 9.6.60. (iv) (a) N.A. (b) Transplanting (c) 17 Kg/ha. (d) 20 cm. × 20 cm. (e) 4 seedlings/bunch. (v) Nil. (vi) Kolpi 70 (early). (vii) Unirrigated. (viii) N.A. (ix) 367 cm. (x) 10.10.60.

## 2. TREATMENTS :

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

(1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=44.8$  and  $N_2=89.6$  Kg/ha.

(2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

(3) 3 levels of  $K_2O$  as Pot. Sul. :  $K_0=0$ ,  $K_1=22.4$  and  $K_2=44.8$  Kg/ha.

A/S to be applied in two equal doses, one just before transplanting and 2nd just before flowering. While rest of the fertilizers to be applied just before transplanting.

## 3. DESIGN :

(i) 3<sup>3</sup> confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) 10.97 m. × 18.29 m. (iii) 2. (iv) (a) 3.66 m. × 6.10 m. (b) 2.44 m × 4.88 m. (v) 61 cm. × 61 cm. (vi) Yes.

## 4. GENERAL :

(i) Lodged completely on 18.9.60 due to heavy wind blow in the evening. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960 only. (b) No. (c) Nil. (v) N.A. (vi) Heavy wind blow on 18.9.60 caused lodging. (vii) Nil.

## 5. RESULTS :

(i) 3587 Kg/ha. (ii) 498.6 Kg/ha. (iii) None of the effects are significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
N <sub>0</sub>	3326	3661	3971	3423	3685	3849	3653
N <sub>1</sub>	3457	3669	3579	3971	3440	3293	3568
N <sub>2</sub>	3480	3726	3415	3701	3661	3261	3540
Mean	3421	3685	3655	3698	3595	3468	3587
K <sub>0</sub>	3587	3562	3947				
K <sub>1</sub>	3219	4175	3391				
K <sub>2</sub>	3457	3318	3628				

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 60(105), 61(200).**

**Site :- Agri. Res. Stn., Khopli.**

**Type :- 'M'.**

**Object :-** To study the effect of G.M. on yield of Paddy crop with different types of G.M. plants.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) G.M. crop ; N.A. (c) Nil. (ii) Medium black. (iii) 9.6.60 to 10.7.60 ; 12.7.61. (iv) (a) Ploughing. (b) Transplanting. (c) 17 Kg/ha. ; 24.7 Kg/ha. (d) 25 cm. x 25 cm. ; 30 cm. x 20 cm. (e) 3 to 4. (v) Nil. (vi) E.K. 70. (vii) Unirrigated. (viii) 2 interculturing ; weeding. (ix) 367 cm. ; 409 cm. (x) 8.10.60 ; 28.10.61.

## 2. TREATMENTS :

7 G.M. crops : G<sub>0</sub>=Control, G<sub>1</sub>=Sannhemp, G<sub>2</sub>=Sesbania, G<sub>3</sub>=Bhend Leaves, G<sub>4</sub>=Glyricidia, G<sub>5</sub>=Karanj, G<sub>6</sub>=Dhaincha.  
3360 Kg/ha. of G.M. material was buried.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 7'92 m. x 4'88 m. (v) N.A. (vi) Yes.

## 4. GENERAL :

(i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960-61. (b) and (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments x years interaction is absent, hence results of individual years are presented under 5. Results.

## 5. RESULTS :

60(105)

(i) 2237 Kg/ha. (ii) 267.7 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	G <sub>0</sub>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	G <sub>4</sub>	G <sub>5</sub>	G <sub>6</sub>
Av. yield	1801	2306	2391	2215	2336	2282	2327

C.D. = 349.4 Kg/ha.

61(200)

(i) 1261 Kg/ha. (ii) 164.5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	G <sub>0</sub>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	G <sub>4</sub>	G <sub>5</sub>	G <sub>6</sub>
Av. yield	1043	1333	1228	1348	1234	1305	1338

**Crop :- Paddy (Kharif).**

**Ref Mh. 60(104), 61(199), 63(293).**

**Site :- Agri. Res. Stn., Khopoli.**

**Type :- 'M'.**

**Object :-** To study the possibilities of raising G.M. plants in Konkan area and effect of G.M. on Paddy.

**1. BASAL CONDITONS :**

(i) (a) Nil. (b) G.M. crops ; N.A. ; Paddy. (c) N.A. (ii) Medium black. (iii) 9.6.60 ; 27.7.61 ; 20.7.63. (iv) (a) Ploughing. (b) Transplanting. (c) 17 Kg/ha., 24 Kg/ha., 11 Kg/ha. (d) 25 cm. x 25 cm ; 30 cm. x 20 cm. ; 30 cm. x 15 cm (e) 3 to 4. (v) Nil. (vi) BK -70. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 367 cm. ; 226 cm. ; 396 cm. (x) 15.10.60 ; 21, 23.10.61 ; 15.10.63.

**2. TREATMENTS :**

4 G.M. crops : G<sub>0</sub>=Control, G<sub>1</sub>=Sannhemp, G<sub>2</sub>=Dhaincha and G<sub>3</sub>=Sesbania.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 15.24 m. x 4.57 m. (b) 12.19 m. x 3.35 m. for 60 ; 14.02 m. x 3.35 m. for others. (v) 152 cm. x 61 cm. for 60 ; 61 cm. x 61 cm. for others. (vi) Yes.

**4. GENERAL :**

(i) Normal, severe lodging due to heavy wind blow on 18.9.60. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960-63 (Not conducted in 1962). (b) No. (c) Results of pooled analysis as well as individual analysis are presented under 5. Results. (v) Karjat. (vi) Nil. (vii) Error variances are heterogeneous. Treatments x years interaction is present.

**5. RESULTS :**

**Pooled results :**

(i) 1577 Kg/ha. (ii) 524.8 Kg/ha. (based on 6 d.f. made up of Treatments x years of interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	G <sub>0</sub>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>
Av. yield	1289	1600	1783	1634

**Individual results**

Treatment	G <sub>0</sub>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	Sig.	G.M.	S.E./plot
Year							
1960	1710	1745	2057	2081	**	1898	190.0
1961	774	1186	824	899	*	921	214.2
1963	1923	2106	1998	2067	*	2024	109.1
Pooled	1289	1600	1783	1634	N.S.	1577	524.8

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 61(201).**

**Site :- Agri. Res. Stn., Khopoli.**

**Type :- 'M'.**

Object :- To see the possibilities of raising G.M. crops in Konkan during *kharif*.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black. (iii) 15.7.61. (iv) (a) Ploughing. (b) Transplanting. (c) 25 Kg/ha. (d) 30 cm. × 22.5 cm. (e) 3-4. (v) Nil. (vi) EK-70. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) N.A. (x) 23.10.61.

2. **TREATMENTS :**

4 treatments of G.M. :  $T_1$ =Control,  $T_2$ =sesbania,  $T_3$ =*Dhaincha* and  $T_4$ =*Sannhemp*.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 7.92 m. × 4.87 m. (v) N.A. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield data. (iv) (a) to (e) No. (v) to (vii) Nil.

5. **RESULTS :**

(i) 1415 Kh/ga. (ii) 138.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$
Av. yield	1383	1370	1515	1392

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 63(294), 64(255), 65(223).**

**Site :- Agri. Res. Stn., Khopoli.**

**Type :- 'M'.**

Object :- To study the effect of manuring with *Dhaincha* and N, P on the yield of Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Paddy-Paddy. (b) Paddy. (c) N.A. (ii) N.A. (iii) 8.6.63/17.7.63 ; 11.6.64/30.6.64 ; 7.6.65/6.7.65. (iv) (a) Puddling. (b) Transplanting. (c) N.A. (d) 30 cm. × 15 cm. (e) 6. (v) As per treatments. (vi) EK-70. (vii) Unirrigated. (viii) Interculturing and weeding. (ix) 396 cm. ; N.A. : 357 cm. (x) 14.10.63 ; 4.10.64 ; 6.10.65.

2. **TREATMENTS :**

3 manurial treatments :  $M_0=0$ ,  $M_1$ =*Dhaincha* at 1235.5 Kg/ha. buried in the site at the time of planting and  $M_2=44.8$  Kg/ha. of N as A/S+22.4 Kg/ha. of  $P_2O_5$  as Super.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) 19.20 m. × 32.92 m. (iii) 6 ; 6 ; 4. (iv) (a) 6.40 m. × 29.26 m. (b) 4.57 m. × 27.43 m. (v) 91 cm. × 91 cm. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-65. (b) No. (c) Results of pooled analysis as well as individual analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous. Treatments × years interaction is absent.

## 5. RESULTS :

## Pooled results

(i) 1524 Kg/ha. (ii) 217.7 Kg/ha. (based on 26 d.f. made up of pooled error and Treatments  $\times$  years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>
Av. yield	1303	1564	1705.

C.D. = 158.1 Kg/ha.

## Individual results

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	Sig.	G.M.	S.E/p'o
Year						
1963	1368	1968	1822	**	1619	153.5
1964	1568	1674	1099	*	1714	195.9
1965	107	1244	1240	N.S.	1097	325.7
Pooled	1303	1564	1705	**	1524	217.7

Crop :- Paddy (*Kharif*).

Ref :- Mb. 60(187).

Site :- Agri. College Farm, Nagpur.

Type :- 'M'.

Object :- To study the effect of different methods and time of application of fertilizer on the yield of Paddy.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Black cotton soil. (iii) 26.6 60. (iv) (a) 2 ploughings and 3 harrowings. (b) Drilled. (c) 50 Kg/ha. (d) 23 cm. (e) 3-4. (v) Nil. (vi) Nasik 27. (vii) Unirrigated. (viii) 3 weedings and 3 hoeings. (ix) 101 cm. (x) 26.10.60.

## 2. TREATMENTS :

7 times of application of fertilizers : T<sub>0</sub>=Control, T<sub>1</sub>=Full dose broadcast at sowing, T<sub>2</sub>=Full dose drilled with the seed, T<sub>3</sub>=Full dose drilled in between rows 1½ months after sowing, T<sub>4</sub>=½ dose broadcast at sowing+½ dose broadcast 6 weeks later, T<sub>5</sub>=½ dose drilled with seed+½ dose broadcast 6 weeks later and T<sub>6</sub>=½ dose drilled between rows at sowing+½ dose drilled 6 weeks later.  
Full dose of fertilizers—22.4 Kg/ha of N as A/S+17.6 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) 10.66 m.  $\times$  5.79 m. (b) 10.06 m.  $\times$  5.18 m. (v) 30 cm.  $\times$  30 cm. (vi) Yes.

## 4. GENERAL :

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

## 5. RESULTS :

(i) 944 Kg/ha. (ii) 220.1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>
Av. yield	952	871	783	1044	979	975	1005

**Crop :- Paddy (Kharif).****Ref :- Mh. 60(107).****Site :- Khar Land Res. Stn., Panvel.****Type :- 'M'.**

Object :- To find out the possibilities of correcting saline soils by addition of organic green, artificial manures and by cultural practices for Paddy.

**1. BASAL CONDITIONS :**

(i) (a) Paddy—Fallow—Paddy. (b) Paddy. (c) As per treatments. (ii) Saline soils. (iii) 16.6.60/19.8.60. (iv) (a) 1 ploughing. (b) Transplanting. (c) 17 to 22 Kg/ha. (d) 30 cm. x 30 cm. (e) N.A. (v) Nil. (vi) Kala Rata 2—18. (vii) Unirrigated. (viii) N.A. (ix) 316 cm. (x) 7.11.60.

**2. TREATMENTS:**

6 manurial treatments:  $M_0$ =Control,  $M_1$ =Turning of clods,  $M_2$ =*Dhaincha* as G.M.,  $M_3$ =50.2 Q/ha. of lime,  $M_4$ =25.1 Q/ha. of Sulphur and  $M_5$ =50.2 Q/ha. of Gypsum.

**3. DESIGN:**

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) 6.10 m. x 4.57 m. (b) 5.49 m. x 3.96 m (v) 30 cm. x 30 cm (vi) Yes.

**4. GENERAL:**

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

**5. RESULTS :**

(i) 1449 Kg/ha. (ii) 265.6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$M_0$	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$
Av. yield	1409	1422	1529	1395	1449	1490

**Crop :- Paddy (Kharif).****Ref :- Mh. 61(218), 62(212), 63(273), 64(231), 65(169).****Site :- Khar Land Res. Stn., Panvel.****Type :- 'M'.**

Object :- To study the effect of frequency of Gypsum application at different levels, in the presence of F.Y.M., as a suitable method for reclaiming intensive areas of saline soils (100 meter drain distance).

**1. BASAL CONDITIONS:**

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per-treatments (ii) Highly saline soils. (iii) 7.7.61 ; 10.7.62 ; 9.7.63 ; 10.7.64 ; 10.7.65. (iv) (a) No. (b) Transplanting. (c) to (e) N.A. (v) Nil. (vi) Rata (medium) in the years 61, 62 and 63. M.K. 47-22 (medium) in the years 64 and 65. (vii) Unirrigated. (viii) Nil in 61. Gap Filling and two weedings in 62 and 63. One weeding in 64 and 65. (ix) 412 cm. ; 298 cm. ; 325 cm. ; 239 cm. ; 290 cm. (x) 26, 31.10 61 ; 18.10.62 ; 18.10.63 ; 20.10.64 ; 24.10.65.

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) F.Y.M. applied at two levels.  $F_0=0$  and  $F_1=11.2$  C.L./ha.

(2) Gypsum to supply following doses in M. Ton/ha. for the years as indicated.

$G_1$ =Control (No Gypsum).  $G_2=2,500$  M. Ton/ha. of Gypsum every year.  $G_3=5,000$  M. Ton/ha. of Gypsum every alt. year, starting from 1st year.  $G_4=5,000$  M. Ton/ha. of Gypsum every alt. year, starting from 2nd year.  $G_5=10,000$  M. Ton/ha. of Gypsum during 1st year of expt. only.  $G_6=10,000$  M. Ton/ha. of Gypsum during 2nd year of expt. only.  $G_7=10,000$  M. Ton/ha. of Gypsum during 3rd year of expt. only.  $G_8=10,000$  M. Ton/ha. of Gypsum during 4th year of expt. only.



## 3. DESIGN:

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 6.86 m. × 11.88 m. (b) 5.04 m. × 10.06 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL:

(i) Poor every year. (ii) Nil. (iii) Grain yield. (iv) (a) 1961-65. (b) Yes (c) Nil. (v) and (vi) No. (vi) In 61(218), treatments  $G_1, G_4, G_6, G_7$  and  $G_8$  are similar, hence these are treated as dummy treatments of  $G_1$ . In 62(212), treatments  $G_1, G_7$  and  $G_8$  are similar and treated as dummy treatment of  $G_1$ . In 63(273), treatments  $G_1$  and  $G_8$  are similar and treated as dummy treatment of  $G_1$ . The expt. 65(169) is a study of residual effect of continuous application of treatments to expts. 61(218), 62(212), 63(273) and 64(231). The results of all the experiments are presented under 5. Results.

## 5. RESULTS

Individual results

## 61(218)

(i) 694 Kg/ha. (ii) 562.1 Kg/ha. (iii) None of the effects is significant. (iv) Av. grain yield in Kg/ha.

	$G_1$	$G_2$	$G_3$	$G_6$	Mean
$F_0$	603	993	811	1035	731
$F_1$	625	1013	395	721	656
Mean	614	1003	603	878	694

## 62(212)

(i) 302 Kg/ha. (ii) 355.0 Kg/ha. (iii) Main effect of F is significant. (iv) Av. grain yield in Kg/ha.

	$G_1$	$G_2$	$G_3$	$G_4$	$G_5$	$G_6$	Mean
$F_0$	187	230	75	215	323	134	192
$F_1$	254	929	347	633	321	304	412
Mean	220	577	211	424	322	219	302

C.D. for F marginal means = 181 Kg/ha.

## 63(273)

(i) 524 Kg/ha. (ii) 331.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. grain yield in Kg/ha.

	$G_1$	$G_2$	$G_3$	$G_4$	$G_5$	$G_6$	$G_7$	Mean
$F_0$	390	547	500	362	551	327	552	452
$F_1$	426	973	425	1057	672	422	353	597
Mean	438	760	463	709	611	385	453	524

## 64(231)

(i) 1076 Kg/ha. (ii) 569.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. grain yield in Kg/ha.

	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	G <sub>4</sub>	G <sub>5</sub>	G <sub>6</sub>	G <sub>7</sub>	G <sub>8</sub>	Mean
F <sub>0</sub>	1072	1243	1549	945	546	680	1208	964	1026
F <sub>1</sub>	796	1506	1295	2009	981	719	848	850	1125
Mean	934	1375	1422	1477	764	699	1028	907	1076

65(169)

(i) 1143 Kg/ha. (ii) 696.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. grain yield in Kg/ha.

	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	G <sub>4</sub>	G <sub>5</sub>	G <sub>6</sub>	G <sub>7</sub>	G <sub>8</sub>	Mean
F <sub>0</sub>	1000	1038	1631	783	1640	610	1418	1369	1186
F <sub>1</sub>	729	1611	944	1955	899	1040	796	830	1100
Mean	865	1324	1287	1369	1270	825	1107	1100	1143

**Crop :- Paddy (Kharif).****Ref :- Mh. 61(220), 62(214), 63(273),  
64(233), 65(171).****Site :- Khar Land Res. Stn., Panvel.****Type :- 'M'.**

Object:—To study the effect of frequency of Gypsum application at different levels, in the presence of F.Y.M., as a suitable measure of reclaiming saline soils (200 meter drain distance).

**1. BASAL CONDITIONS:**

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Highly saline soils. (iii) 7.7.61 ; 10.7.62 ; 6.7.63 ; 10.7.64 ; 11.7.65. (iv) (a) No. (b) Transplanting. (c) to (e) N.A. (v) Nil. (vi) Rata (medium) in 61, 62 and 63. M.K. 47-22 (medium) in 64 and 65. (vii) Unirrigated. (viii) Weeding and gap-filling. (ix) 412 cm. ; 299 cm. ; 325 cm. ; 239 cm. ; 290 cm. (x) 31.10.61 ; 18.10.62 ; 18.10.63 ; 20.10.64 ; 25.10.65.

**2. TREATMENTS:**

Same as for experiments No. 61(218), 62(212), 63(273) etc. conducted on Paddy and presented on page No. 18.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 6.86 m. × 11.88 m. (b) 5.04 m. × 10.06 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**(i) Poor germination every year. (ii) Nil. (iii) Grain yield. (iv) (a) 1961-65. (b) Yes. (c) No. (v) and (vi) No. (vii) In 61(220), treatments G<sub>1</sub>, G<sub>4</sub>, G<sub>6</sub>, G<sub>7</sub>, G<sub>8</sub> are similar, hence these are treated as dummy treatments of G<sub>1</sub>. In 62(214), treatments G<sub>1</sub>, G<sub>7</sub>, G<sub>8</sub> are similar and are treated as dummy of treatment G<sub>1</sub>. In 63(275), treatments G<sub>1</sub> and G<sub>8</sub> are treated as dummy of G<sub>1</sub>. In 65(171) the residual effect of continuous application of treatments to experiments 61(220), 62(214), 63(275) and 64(233) is studied.**5. RESULTS :**

Individual results

**61(220)**

(i) 125 Kg/ha. (ii) 167.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. grain yield in Kg/ha.

	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	G <sub>5</sub>	Mean
F <sub>0</sub>	64	35	62	339	94
F <sub>1</sub>	151	252	141	91	155
Mean	107	143	102	215	125

62(214)

(i) 487 Kg/ha. (ii) 392.4 Kg/ha. (iii) Main effect of F is significant. (iv) Av. grain yield in Kg/ha.

	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	G <sub>4</sub>	G <sub>5</sub>	G <sub>6</sub>	Mean
F <sub>0</sub>	353	401	287	257	620	375	357
F <sub>1</sub>	620	675	662	489	727	371	598
Mean	487	538	474	373	673	373	487

C.D. for F marginal means = 141 Kg/ha.

63(273)

(i) 491 Kg/ha. (ii) 310.1 Kg/ha. (iii) None of the effects is significant. (iv) Av. grain yield in Kg/ha.

	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	G <sub>4</sub>	G <sub>5</sub>	G <sub>6</sub>	G <sub>7</sub>	Mean
F <sub>0</sub>	389	664	445	393	390	498	413	448
F <sub>1</sub>	595	501	534	546	691	391	427	535
Mean	492	533	489	462	541	445	420	491

64(233)

(i) 1151.9 Kg/ha. (ii) 616.3 Kg/ha. (iii) Main effect of F is significant. (iv) Av. grain yield in Kg/ha.

	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	G <sub>4</sub>	G <sub>5</sub>	G <sub>6</sub>	G <sub>7</sub>	G <sub>8</sub>	Mean
F <sub>0</sub>	1038	1056	1123	919	979	808	529	756	906
F <sub>1</sub>	1278	1559	1352	1562	1213	1320	1154	1747	1398
Mean	1158	1327	1238	1240	1096	1064	841	1252	1152

C.D. for F marginal means = 310 Kg/ha.

65(171)

(i) 1405 Kg/ha. (ii) 762.5 Kg/ha. (iii) Main effect of F is significant. (iv) Av. grain yield in Kg/ha.

	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	G <sub>4</sub>	G <sub>5</sub>	G <sub>6</sub>	G <sub>7</sub>	G <sub>8</sub>	Mean
F <sub>0</sub>	877	1455	1463	1191	1369	941	654	1270	1158
F <sub>1</sub>	1352	1799	1950	1661	1463	1952	1206	1841	1653
Mean	1114	1627	1706	1426	1416	1447	950	1556	1405

C.D. for F marginal means = 384 Kg/ha.

Crop :- Paddy (*Kharif*).Ref :- Mh. 62(211), 63(272), 64(230),  
65(168).

Site :- Khar Land Res. Stn., Panvel.

Type :- 'M'.

Object :- To study the effect of F.Y.M. and Gypsum on reclaiming extensive areas of Khar Land (100 meter drain distance).

## 1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) As per treatments. (ii) Highly saline soil. (iii) 9.7.62 ; 5.6.63/6.7.63 ; 11.6.64/10.7.64 ; 9.6.65/5.7.65. (iv) (a) Nil. (b) *Rahu* method for 62(211). Seeds broadcasted on raised seed-beds for others. (c) 49 Kg/ha. for 62(211) and 25 Kg/ha. for others. (d) and (e) N.A. (v) Nil. (vi) *Kala Rata* 1-24 (medium) for 62, M.K. 47-22 (medium) for others. (vii) Unirrigated. (viii) Gap-filling and 1 to 2 weedings. (ix) 299 cms. ; 325 cms. ; 239 cms. ; 114 cms. (x) 18.10.62 ; 28.10.63 ; 27.10.64 ; 25.10.65.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of F.Y.M. :  $F_0=0$ ,  $F_1=12.35$ ,  $F_2=24.70$  and  $F_3=37.04$  C.L./ha.(2) 4 levels of Gypsum :  $G_0=0$ ,  $G_1=25.1$ ,  $G_2=50.2$  and  $G_3=75.3$  Q/ha.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 11.89 m.  $\times$  6.86 m. (b) 10.06 m.  $\times$  5.03 m. (v) 91 cm  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Tip burning was observed in early stages in 62 Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960-65 (failed in 60 and 61). (b) Yes. (c) No. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments  $\times$  years interaction is absent. Hence results for individual years are presented under 5. Results.

## 5. RESULTS :

## 62(211)

(i) 428 Kg/ha. (ii) 338.6 Kg/ha. (iii) Main effect of F is highly significant. (iv) Av. yield of grain in Kg/ha.

	$G_0$	$G_1$	$G_2$	$G_3$	Mean
$F_0$	98	232	119	184	158
$F_1$	231	257	566	301	339
$F_2$	514	645	796	269	556
$F_3$	603	1023	395	613	658
Mean	362	539	469	342	428

C.D. for F marginal means = 241.3 Kg/ha.

## 63(272)

(i) 580 Kg/ha. (ii) 327.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	$G_0$	$G_1$	$G_2$	$G_3$	Mean
$F_0$	310	489	234	688	430
$F_1$	362	746	630	344	520
$F_2$	890	774	829	458	732
$F_3$	427	993	521	578	630
Mean	497	750	554	517	580

64(230)

(i) 1103 Kg/ha. (ii) 482.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	G <sub>0</sub>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	Mean
F <sub>0</sub>	470	1107	1329	1020	990
F <sub>1</sub>	1035	1218	573	1495	1180
F <sub>2</sub>	1121	556	1394	1159	1225
F <sub>3</sub>	937	1418	687	985	1003
Mean	909	1175	1146	1182	1103

65(168)

(i) 1190 Kg/ha. (ii) 677.9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	G <sub>0</sub>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	Mean
F <sub>0</sub>	845	1067	1352	1007	1090
F <sub>1</sub>	820	1221	996	1599	1159
F <sub>2</sub>	1003	1621	1700	1348	1427
F <sub>3</sub>	1196	1428	709	1008	1085
Mean	966	1334	1192	1270	1190

**Crop :- Paddy (Kharif).****Ref :- Mh. 62(213), 63(274), 64(232), 65(170).****Site :- Khar Land Res. Stn., Panvel.****Type :- 'M'.**

Object: -To study the effect of F.Y.M. and Gypsum on reclaiming extensive areas of Khar land (200 meter drain distance).

**1. BASAL CONDITIONS :**

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Highly saline soil. (iii) N.A./9.7.62 ; 5.6.63/6.7.64 ; 11.6.64./10.7.64 ; 9.6.65/11.7.65. (iv) (a) N.A. (b) Seeds were broadcasted on raised seed bed. (c) 50 Kg/ha. for 62 ; 25 Kg/ha. for others. (d) and (e) N.A. (v) Nil. (vi) Kala Rata 1—24 (medium). (vii) Unirrigated. (viii) Weeding. (ix) 299 cm. ; 325 cm. ; 239 cm. ; 114 cm. (x) 18.10.62 ; 28.10.63 ; 27.10.64 ; 25.10.65.

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 4 levels of F.Y.M. : F<sub>0</sub>=0, F<sub>1</sub>=12.35, F<sub>2</sub>=24.70 and F<sub>3</sub>=37.07 C.L./ha.

(2) 4 levels of Gypsum : G<sub>0</sub>=0, G<sub>1</sub>=25.1, G<sub>2</sub>=50.2 and G<sub>3</sub>=75.3 Q/ha.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 11.89 m. × 6.86 m. (b) 10.06 m. × 5.03 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Tip burning was observed at an early stage in 62. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960—65 [failed in 60 and 61]. (b) Yes. (c) No. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent. Hence results for individual years are presented under 5.—Results.

## 5. RESULTS:

62(213)

(i) 313 Kg/ha. (ii) 244.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	G <sub>0</sub>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	Mean
F <sub>0</sub>	316	284	434	133	292
F <sub>1</sub>	425	383	230	114	288
F <sub>2</sub>	220	368	306	563	364
F <sub>3</sub>	437	198	235	368	310
Mean	350	308	301	294	313

63(274)

(i) 390 Kg/ha. (ii) 137.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	G <sub>0</sub>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	Mean
F <sub>0</sub>	414	410	437	334	399
F <sub>1</sub>	383	356	358	344	360
F <sub>2</sub>	366	407	376	570	430
F <sub>3</sub>	349	388	330	419	372
Mean	378	390	375	417	390

64(232)

(i) 922 Kg/ha. (ii) 487.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	G <sub>0</sub>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	Mean
F <sub>0</sub>	857	946	1171	338	830
F <sub>1</sub>	1060	1117	1070	602	977
F <sub>2</sub>	815	998	531	1512	964
F <sub>3</sub>	1030	1013	872	761	919
Mean	943	1018	911	818	922

65(170)

(i) 1030 Kg/ha. (ii) 716.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	G <sub>0</sub>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	Mean
F <sub>0</sub>	959	983	1359	697	1000
F <sub>1</sub>	1095	1364	1023	756	1060
F <sub>2</sub>	850	1025	524	1913	1078
F <sub>3</sub>	1077	1285	791	781	983
Mean	925	1164	924	1037	1030

Crop :- Paddy (*Karaj*).

Ref :- Mh. 61(32), 62(14), 63(13).

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

Type :- 'M'.

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

## 1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) N.A. (ii) Laterite soil. (iii) 23.7.61; 20, 21, 30.7.62 and 1.8.62; 28, 29.7.63. (iv) (a) 1 to 4 ploughings. (b) Transplanting. (c) N.A. (d) 23 cm. x 23 cm. (e) 3 to 4. (v) 12.4 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of  $P_2O_5$  applied at the time of puddling. (vi) D 6-22. (vii) Unirrigated. (viii) 2 interculturings. (ix) 425 cm.; 129 cm.; 144 cm. (x) 4.11.61; 22.10.62; and 6.11.62; N.A. for 63.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.(2) 3 levels of lime :  $L_0=0$ ,  $L_1=12.5$  and  $L_2=25.1$  Kg/ha.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 6.10 m. x 6.10 m. (b) 4.57 m. x 4.57 m. (v) 76 cm. x 76 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Gamaxene sprayed for Army worm in 61; 10% B.H.C. was dusted to control Army worm in 62 and 63. (iii) Yield of grain. (iv) (a) 1961-63. (b) No. (c) Results of combined analysis as well as individual analysis are presented under 5. Results. (v) Karanja. (vi) Due to heavy rains growth was stunted in 61. (vii) Error variances are homogeneous and Treatments x years interaction is absent.

## 5. RESULTS :

Pooled results

(i) 1308 Kg/ha. (ii) 109.6 Kg/ha. (based on 88 d.f. made up of pooled error and Treatments x years interaction). (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

	$L_0$	$L_1$	$L_2$	Mean
$N_0$	850	987	947	928
$N_1$	1479	1343	1310	1377
$N_2$	1694	1670	1494	1619
Mean	1341	1333	1250	1308

C.D. for N marginal means = 51.4 Kg/ha.

Individual results.

Treatment	$N_0$	$N_1$	$N_2$	Sig.	$L_0$	$L_1$	$L_2$	Sig.
Year 1961	1334	1739	1916	**	1681	1678	1630	N.S.
1962	734	1449	1820	**	1477	1390	1136	N.S.
1963	716	945	1122	**	865	932	986	N.S.
Pooled	928	1377	1619	**	1341	1333	1250	N.S.

Treatment	G.M.	S.E/plot
Year		
1961	1663	290.8
1962	1334	406.6
1963	928	277.5
Pooled	1308	109.6

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 61(87).**

**Site :- Agri. Res. Stn., Radhanagari.**

**Type :- 'M'.**

**Object :-** To study the effect of different carriers of P on the yield of Paddy.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) N.A. (iii) 5.6.61. (iv) (a) Ploughing. (b) Transplanting. (c) N.A. (d) 23 cm. x 23 cm. (e) 3-4. (v) 22.4 Kg/ha. of N. (vi) D-6-2-2. (vii) Unirrigated. (viii) 2 inter-culturing. (ix) and (x) N.A.

**2. TREATMENTS :**

3 sources of  $P_2O_5$  at 44.8 Kg/ha. :  $S_0$ =Control,  $S_1$ =Bone meal and  $S_2$ =Super.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 6.40 m. x 6.40 m. (b) 4.57 m. x 4.57 m. (v) 91 cm. x 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Growth was stunted. (ii) 50 % Gammaxene sprayed. (iii) Yield of grain. (iv) (a) to (c) No. (v) No. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 741 Kg/ha. (ii) 113.0 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$S_0$	$S_1$	$S_2$
Av. yield	597	922	705

C.D.=144 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 63(104).**

**Site :- Agri. Res. Stn., Radhanagari.**

**Type :- 'M'.**

**Object :-** To study the effect of different carriers of P on the yield of Paddy.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) N.A. (iii) 29, 30.7.63. (iv) (a) Ploughing. (b) Transplanting. (c) N.A. (d) 25 cm. x 25 cm. (e) 3 to 4. (v) 7 C.L./ha. of F.Y.M. (vi) D-6-2-2. (vii) Unirrigated. (viii) Inter-culturing. (ix) 144 cm. (x) N.A.



## 2. TREATMENTS :

4 sources of  $P_2O_5$  :  $S_0$ —Control,  $S_1$ —Dicalcium Phosphate,  $S_2$ —Bone meal and  $S_3$ —Super.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 6'40 m. × 6'40 m. (b) 4'57 m. × 4'57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

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

## 5. RESULTS :

(i) 1020 Kg/ha. (ii) 148.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$S_0$	$S_1$	$S_2$	$S_3$
Av. yield	963	1038	1063	1047

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 62(74), 63(114), 64(100).**

**Site :- Agri. Res. Stn., Ratnagiri.**

**Type :- 'M'.**

**Object:—**To study the relative merits of Nitro-phosphate by ODDA and PEC process on the yield of Paddy.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wal. (c) Nil. (ii) Laterite. (iii) 18.7.62 ; 18.7.63 ; 23.7.64. (iv) (a) 4 ploughings. (b) Transplanting. (c) 13 to 17 Kg/ha. (d) 25 cm. × 25 cm. (e) N.A. (v) 12.4 C.L./ha. of F.Y.M. (vi) Panvel 61 (mid-late). (vii) Unirrigated. (viii) Interculturing and weeding. (ix) N.A. (x) 22, 23.10.62 ; 12, 14.10.63 ; 30, 31.10.64.

## 2. TREATMENTS :

All combinations of (1), (2) and (3)+5 additional treatments

(1) 3 types of fertilizers :  $P_1$ — $P_2O_5$ +A/S,  $P_2$ —ODDA and  $P_3$ —PEC.

(2) 3 levels of fertilizers :  $L_1$ —13.4 Kg/ha. of N+11.8 Kg/ha. of  $P_2O_5$ ,  $L_2$ —26.9 Kg/ha. of N+23.5 Kg/ha. of  $P_2O_5$  and  $L_3$ —53.8 Kg/ha. of N+47.1 Kg/ha. of  $P_2O_5$ .

(3) 3 methods of application :  $M_1$ —Broadcast,  $M_2$ —6.3 cm. below seed and  $M_3$ —Band placement.

5 additional treatments :  $N_0$ —0,  $N_1$ —13.4,  $N_2$ —26.9,  $N_3$ —40.3 and  $N_4$ —53.8 Kg/ha. of N.

## 3. DESIGN :

(i) 3<sup>3</sup> confd.+5 additional treatments in each block. (ii) (a) 14 plots/block, 3 blocks/replication. (b) 44.81 m. × 21.94 m. (iii) 2. (iv) (a) 10.97 m. × 6.40 m. (b) 9.14 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL ;

(i) Satisfactory. (ii) Minor attack of blue beetle in 62. (iii) Yield of grain. (iv) (a) 1962—64. (b) and (c) No. (v) N.A. (vi) Lack of rains in earlier stages affected the crop in 62. (vii) Error variances are heterogeneous and Treatments × years interaction is absent. Hence results for individual years are presented under 5—Results.

## 5. RESULTS :

62(74)

(i) 2225 Kg/ha. (ii) 612.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Extra treatments :  $N_0=1995$ ,  $N_1=1935$ ,  $N_2=1955$ ,  $N_3=2354$  and  $N_4=2513$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
P <sub>1</sub>	2070	2457	2813	2358	2334	2649	2447
P <sub>2</sub>	2154	2154	2094	2214	2134	2054	2134
P <sub>3</sub>	2114	2015	2533	2194	2374	2094	2221
Mean	2113	2209	2480	2255	2281	2266	2267
M <sub>1</sub>	1995	2238	2533				
M <sub>2</sub>	2274	2174	2394				
M <sub>3</sub>	2070	2214	2513				

63(114)

(i) 3062 Kg/ha. (ii) 542.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Extra treatments :  $N_0=2493$ ,  $N_1=3012$ ,  $N_2=3351$ ,  $N_3=3531$  and  $N_4=2853$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
P <sub>1</sub>	2892	3770	3172	3172	3191	3371	3278
P <sub>2</sub>	2972	2633	3112	2972	2992	2753	2906
P <sub>3</sub>	3092	2952	3036	2916	2853	3311	3027
Mean	2985	3118	3106	3020	3045	3145	3070
M <sub>1</sub>	2152	3072	2836				
M <sub>2</sub>	2813	3052	3271				
M <sub>3</sub>	2992	3231	3212				

64(100)

(i) 2557 Kg/ha. (ii) 423.9 Kg/ha. (iii) Main effect of L is significant. (iv) Av. yield of grain in Kg/ha.

Extra treatments :  $N_0=2306$ ,  $N_1=2227$ ,  $N_2=2633$ ,  $N_3=2865$  and  $N_4=2818$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
P <sub>1</sub>	2573	2677	2748	2487	2854	2658	2666
P <sub>2</sub>	2352	2343	2625	2439	2561	2320	2440
P <sub>3</sub>	2232	2428	2974	2440	2680	2514	2542
Mean	2386	2483	2783	2456	2698	2497	2550
M <sub>1</sub>	2317	2288	2761				
M <sub>2</sub>	2588	2712	2795				
M <sub>3</sub>	2252	2448	2791				

C.D. for L marginal means = 284 Kg/ha.

Crop :- Paddy (Kharif).

Ref :- Mh. 60(92), 61(119), 62(108), 63(146).

Site :- Agri. Res. Stn., Shindewahi. Type :- 'M'.

Object :—To study the effect of G.M. alone and in combination with N and P on the yield of Paddy.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 22.4 Kg/ha. of N as A/S+22.4 Kg/ha. of  $P_2O_5$  as Super. (ii) Sandy loam. (iii) 7.7.60/16.8.60 ; N.A./29.8.61 ; N.A./6.8.62 ; N.A./6.8.63. (iv) (a) 3 ploughings. (b) Transplanting. (c) N.A. (d) 23 cm. x 23 cm. for 60. 23 cm. x 15 cm. for others. (e) 3 to 4. (v) Nil. (vi) EB -17. (vii) Unirrigated. (viii) Interculturing, weeding and hoeing. (ix) 174 cm. ; 39 cm. ; 54 cm. ; 74 cm. (x) 20.11.60 ; 7.11.61 ; 9.11.62 ; 19.10.63.

## 2. TREATMENTS :

7 manurial treatments:  $M_0$  = Control,  $M_1$  = Sann G.M.,  $M_2$  = Sann G.M.+22.4 Kg/ha. of  $P_2O_5$  to Sann,  $M_3$  = Sann G.M.+11.2 Kg/ha. of N as A/S+11.2 Kg/ha. of  $P_2O_5$  as Super. to Sann,  $M_4$  = Sann G.M.+5.6 Kg/ha. of N as A/S+11.2 Kg/ha. of  $P_2O_5$  as Super. to Sann +5.6 Kg/ha. of N as A/S to Paddy at puddling,  $M_5$  = Sann G.M.+5.6 Kg/ha. of N as A/S+22.4 Kg/ha. of  $P_2O_5$  as Super. to Sann+16.8 Kg/ha. of N as A/S to Paddy at puddling and  $M_6$  = Paddy crop without G.M.+22.4 Kg/ha. of N as A/S+22.4 Kg/ha. of  $P_2O_5$  as Super. to Paddy.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 10.97 m. x 6.40 m. (b) 9.14 m. x 4.57 m. (v) 91 cm. x 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. in 60 and 62 ; 5 % B.H.C. and Endrin for control of case worm in 61 and 63. (iii) Yield of grain. (iv) (a) 1960—63. (b) Yes. (c) Results of combined analysis as well as individual analysis are presented under 5. Results. (v) Tharsa. (vi) Crop suffered due to drought in August and Sept., 60. (vii) Error variances are heterogeneous and Treatments x years interaction is present.

## 5. RESULTS :

Pooled results :

(i) 966 Kg/ha. (ii) 330.4 Kg/ha. (based on 18 d.f. made up of Treatments x years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$M_0$	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$	$M_6$
Av. yield	783	857	952	933	1074	1130	971

Individual results

Treatment	$M_0$	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$	$M_6$	Sig.	G.M.	S.E./plot
Year										
1960	208	136	152	193	178	224	183	N.S.	182	102.3
1961	194	378	291	262	358	310	446	N.S.	320	105.1
1962	1076	1145	1495	1482	1837	1696	1162	**	1413	193.1
1963	1674	1768	1871	2016	1922	2289	2093	N.S.	1948	410.1
Pooled	788	857	952	988	1074	1130	971	N.S.	966	330.4

Crop :- Paddy (Kharif).

Ref :- Mh. 60(204), 61(211).

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

Type :- 'M'.

Object :—To study the effect of continuous manuring on Paddy with and without N.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) Sandy loam. (iii) N.A./25.7.60 ; 16.6.61/31.7.61. (iv) (a) Ploughing and levelling by *patta*. (b) Transplanting. (c) 49 Kg/ha. (d) 23 cm. × 15 cm. (e) 3—4. (v) Nil. (vi) Red *Luchai*. (vii) Irrigated. (viii) 2 interculturings. (ix) 143 cm. ; 182 cm. (x) 2.11.60 ; 1.12.61.

## 2. TREATMENTS :

## Main-plot treatments :

4 manurial treatments :  $M_0$  = Control,  $M_1$  = 22.4 Kg/ha. of  $P_2O_5$ ,  $M_2$  = 24.7 C.L./ha. of F.Y.M. and  $M_3$  =  $M_1 + M_2$ .

## Sub-plot treatments :

4 levels of N :  $N_0$  = 0,  $N_1$  = 22.4,  $N_2$  = 44.8 and  $N_3$  = 67.2 Kg/ha.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6.40 m. × 10.67 m. (b) 4.57 m. × 8.80 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958—61. (b) and (c) No. (v) N.A. (vi) Heavy rains during both the years. (vii) Error variances for main-plot treatments as well as Sub-plot treatments are heterogeneous. Hence results of individual years are presented under 5. Results.

## 5. RESULTS:

## 60(204)

(i) 1949 Kg/ha. (ii) (a) 599.1 Kg/ha. (b) 258.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$N_2$	$N_3$	Mean
$M_0$	1515	1726	1754	1796	1993
$M_1$	1655	2006	1754	1768	1756
$M_2$	1908	1936	2119	2062	2006
$M_3$	2147	2315	2159	2125	2294
Mean	1806	1916	1954	2038	1994

## 61(211)

(i) 3604 Kg/ha. (ii) (a) 418.2 Kg/ha. (b) 450.5 Kg/ha. (iii) Main effect of N and interaction  $M \times N$  are highly significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$N_2$	$N_3$	Mean
$M_0$	3155	3671	4093	3862	3695
$M_1$	2713	3344	3907	3863	3557
$M_2$	4570	3538	3567	3877	3888
$M_3$	3611	3140	3213	3140	3276
Mean	3512	3523	3695	3685	3604

C.D. for N marginal means = 509.2 Kg/ha.  
 C.D. for N means at the same level of M = 198.6 Kg/ha.  
 C.D. for M means at the same level of N = 679.9 Kg/ha.

Crop :- Paddy (Kharif).

Ref :- Mh. 61(20), 62(3), 63(3).

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

Type :- 'M'.

Crop :- To study the effect of combination of graded doses of N and lime on the yield of Paddy in the soil of high pH. value.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) 22.4 Kg/ha. of N as A/S+22.4 Kg/ha. of  $P_2O_5$  as Super. (ii) Clay loam. (iii) 15.6.61/28.8.61 ; 18.6.62/9.8.62 ; N.A./6.8.63. (iv) (a) 3 ploughings. (b) Transplanting. (c) N.A. (d) 23 cm.  $\times$  15 cm. (e) 3-4. (v) 22.4 Kg/ha. of  $P_2O_5$  as Super. (vi) R-8-Luchai. (vii) N.A. (viii) 2 interculturings. (ix) 182 cm. ; 109 cm. ; N.A. (x) 29.11.61 ; 30.11.62 ; 29.11.63.

## 2. TREATMENTS:

All combinations of (1) and (2)

(1) 3 levels of N :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(2) 3 levels of lime :  $L_0=0$ ,  $L_1=12.5$  and  $L_2=25.1$  Q/ha.

## 3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 10.06 m.  $\times$  5.18 m. (b) 8.23 m.  $\times$  3.35 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL:

(i) Normal. (ii) Case worm attack ; Endrex sprayed twice. (iii) Yield of grain. (iv) (a) 1961-63. (b) and (c) No. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction absent. Hence results of individual years are presented under 5. Results.

## 5. RESULTS:

## 61(20)

(i) 1622 Kg/ha. (ii) 411.0 Kg/ha. (iii) Main effect of L is significant. (iv) Av. yield of grain in Kg/ha.

	$L_0$	$L_1$	$L_2$	Mean
$N_0$	1325	1593	1253	1390
$N_1$	1469	1931	1829	1743
$N_2$	1490	2127	1582	1733
Mean	1428	1884	1555	1622

C.D. for L marginal means = 244 Kg/ha.

## 62(3)

(i) 3639 Kg/ha. (ii) 1036.0 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

	$L_0$	$L_1$	$L_2$	Mean
$N_0$	2775	2910	2523	2736
$N_1$	3319	4425	4338	4027
$N_2$	3891	3586	4987	4155
Mean	3328	3640	3949	3639

C.D. for N marginal means = 616 Kg/ha.

## 63(3)

(i) 2217 Kg/ha. (ii) 815.0 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

	L <sub>0</sub>	L <sub>1</sub>	L <sub>2</sub>	Mean
N <sub>0</sub>	1176	1535	1730	1480
N <sub>1</sub>	2830	3149	2372	2784
N <sub>2</sub>	2432	2213	2512	2386
Mean	2146	2299	2205	2217

C.D. for N marginal means = 489 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 61(21), 62(4), 63(4).**

**Site :- Agri. Res. Stn., Shindewahi.**

**Type :- 'M'.**

**Object :-** To study the effect of combination of graded doses of lime and N on the yield of Paddy in the soils of low pH. value.

**1. BASAL CONDITIONS:**

(i) (a) Nil. (b) Paddy. (c) 22.4 Kg/ha. of N as A/S + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. (ii) Sandy. (iii) 15.6.61/20.8.61; 18.6.62/10.8.62; N.A./4.8.63. (iv) (a) 3 ploughings. (b) Transplanting. (c) N.A. (d) 23 cm. × 15 cm. (e) 3 to 4. (v) 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. (vi) R-8-Luchai. (vii) N.A. (viii) 2 interculturings and weeding. (ix) 182 cm. 109 cm.; N.A. (x) 26.11.61; 28.11.62; 29.11.63.

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 3 levels of N as A/S: N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 3 levels of lime: L<sub>0</sub>=0, L<sub>1</sub>=12.5 and L<sub>2</sub>=25.1 Q/ha.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 10.06 m. × 5.18 m. (b) 8.23 m. × 3.35 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Attack of Case-worm. Endrex sprayed. (iii) Yield of grain. (iv) (a) 1961-1963. (b) and (c) No. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent. Hence results for individual years are presented under 5. Results.

**5. RESULTS :**

**61(21)**

(i) 2886 Kg/ha. (ii) 222.0 Kg/ha. (iii) Main effect of N is significant and interaction N × L is highly significant. (iv) Av. yield of grain in Kg/ha.

	L <sub>0</sub>	L <sub>1</sub>	L <sub>2</sub>	Mean
N <sub>0</sub>	2712	2774	3113	2866
N <sub>1</sub>	3072	2486	2682	2747
N <sub>2</sub>	2980	3288	2867	3045
Mean	2921	2849	2887	2886

C.D. for N marginal means = 187 Kg/ha.

C.D. for body of table = 324 Kg/ha.

62(4)

(i) 3133 Kg/ha. (ii) 590 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	L <sub>0</sub>	L <sub>1</sub>	L <sub>2</sub>	Mean
N <sub>0</sub>	2950	3518	3428	3299
N <sub>1</sub>	2910	3139	2930	2993
N <sub>2</sub>	3608	2412	3299	3106
Mean	3156	3023	3219	3133

63(4)

(i) 5344 Kg/ha. (ii) 1092 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	L <sub>0</sub>	L <sub>1</sub>	L <sub>2</sub>	Mean
N <sub>0</sub>	4684	5422	5382	5163
N <sub>1</sub>	5023	5143	5920	5362
N <sub>2</sub>	6020	4923	5581	5508
Mean	5242	5163	5628	5344

**Crop :- Paddy (Kharif).****Ref :- Mh. 61(23), 62(6), 63(6).****Site :- Agri. Res. Stn., Shindewahi.****Type :- 'M'.**

Object:—To study the relative merits of C/A/N with A/S and Urea in the presence and absence of F.Y.M. on the yield of Paddy.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) As per treatments (ii) Sandy loam. (iii) 15.6.61/3.8.61, 18.6.62/20.8.62, N.A./28.7.63. (iv) (a) Ploughings. (b) Transplanting. (c) N.A. (d) 23 cm. × 15 cm. (e) 3—4. (v) Nil. (vi) Buddia Bakox Luchai. (vii) N.A. (viii) Hoeing and weeding. (ix) 132 cm., 60 cm., N.A. (x) 17.11.61, 2.12.62, 17.11.63.

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

All combinations of (1) and (2)

(1) 3 levels of N : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.(2) 3 sources of N : S<sub>1</sub>=A/S, S<sub>2</sub>=C/A/N, S<sub>3</sub>=Urea.**Sub-plot treatments :**2 levels of F.Y.M. : F<sub>0</sub>=0 and F<sub>1</sub>=56 Q/ha.**3. DESIGN :**

(i) Split-plot. (ii) (a) 9 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7.32 m. × 4.11 m. (b) 5.49 m. × 2.29 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Attack of Gallfly. Endrin Sprayed. (iii) Yield of gram. (iv) (a) 1961—63. (b) Yes. (c) No. (v) Karjat. (vi) Nil. (vii) Error variances for main-plot treatments as well as for sub-plot treatments are heterogeneous and Treatments × years interaction is absent. Hence results for individual years are presented under 5. Results.

## 5. RESULTS:

61(23)

(i) 2364 Kg/ha. (ii) (a) 685.3 Kg/ha. (b) 415.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$N_0F_0=2263$  and  $N_0F_1=2253$  Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	2181	2396	2441	2253	2426	2339
N <sub>2</sub>	2339	2633	2509	2464	2524	2494
Mean	2260	2515	2475	2358	2475	2417
F <sub>0</sub>	2136	2453	2486			
F <sub>1</sub>	2385	2577	2464			

62(6)

(i) 2135 Kg/ha. (ii) (a) 716.0 Kg/ha. (b) 561.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$N_0F_0=2043$  and  $N_0F_1=2824$  Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	1869	2254	1973	2034	2030	2032
N <sub>2</sub>	2342	2444	1782	2124	2254	2189
Mean	2105	2349	1877	2079	2142	2110
F <sub>0</sub>	1945	2409	1883			
F <sub>1</sub>	2265	2289	1872			

63(6)

(i) 4112 Kg/ha. (ii) (a) 1243.1 Kg/ha. (b) 818.1 Kg/ha. (iii) Main effect of S alone is significant. (iv) Av. yield of grain in Kg/ha.

$N_0F_0=4206$  and  $N_0F_1=4359$  Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	3159	4734	3867	3880	3980	3920
N <sub>2</sub>	3608	4884	3907	3980	4286	4133
Mean	3384	4809	3887	3930	4123	4027
F <sub>0</sub>	3428	4734	3628			
F <sub>1</sub>	3339	4884	4146			

C.D. for S marginal means=904 Kg/ha.



**Crop :- Paddy (Kharif).**

**Ref :- Mh. 61(129), 62(120), 63(242).**

**Site :- Agri. Res. Stn., Shindewahi.**

**Type :- 'M'.**

**Object :-** To study the relative merits of Nitro-phosphate Complex by ODDA and PEC process.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Sandy soil. (iii) 15.6.61/6.8.61 ; N.A./26.8.62 ; 4th week of July 63. (iv) (a) Ploughings. (b) Transplanting. (c) 45 Kg/ha. (d) 23 cm. x 15 cm. (e) 3. (v) Nil. (vi) R. 8 Luchai (late). (vii) Irrigated. (viii) Weeding and hoeings. (ix) 132 cm., 29 cm., 157 cm. (x) 4.12.61, 3.12.62, 23.11.63.

**2. TREATMENTS :**

All combinations of (1), (2) and (3)+5 additional treatments in each block

(1) 3 types of fertilizers :  $P_1=P_2O_5+A/S$ ,  $P_2=ODDA$  and  $P_3=PEC$ .

(2) 3 levels of fertilizers :  $L_1=13.4$  Kg/ha. of N+11.8 Kg/ha. of  $P_2O_5$ ,  $L_2=26.9$  Kg/ha. of N+23.5 Kg/ha. of  $P_2O_5$  and  $L_3=53.8$  Kg/ha. of N+47.1 Kg/ha. of  $P_2O_5$ .

(3) 3 methods of application :  $M_1=Broadcast$ ,  $M_2=6.3$  cm. below seed and  $M_3=Band$  placement.

5 additional treatments are :  $N_0=0$ ,  $N_1=13.4$ ,  $N_2=26.9$ ,  $N_3=40.3$  and  $N_4=53.8$  Kg/ha. of N.

**3. DESIGN :**

(i) 3<sup>rd</sup> confd. + 5 additional treatments in each block. (ii) (a) 14 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 5.49 m. x 9.14 m. (b) 3.66 m. x 7.32 m. (v) 91 cm. x 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Attack of Gall-fly and Paddy case worm. Endrin sprayed. (iii) Yield of grain. (iv) (a) 1961-63. (b) No. (c) Results of combined analysis and individual years are presented under 5. Results. (v) N.A. (vi) Distribution of rainfall was unfavourable with long intermittent draughts in 62(120). (vii) Error variances are homogenous. (Treatments x years) interaction is absent.

**5. RESULTS :**

**Pooled results**

(i) 1654 Kg/ha. (ii) 410.5 Kg/ha. (based on 143 d.f. made up of pooled error). (iii) Main effect of M is highly significant. Interaction  $P \times L$  is significant. (iv) Av. yield of grain in Kg/ha.

$N_0=1476$ ,  $N_1=1617$ ,  $N_2=1714$ ,  $N_3=1660$  and  $N_4=1879$  Kg/ha.

	$L_1$	$L_2$	$L_3$	$M_1$	$M_2$	$M_3$	Mean
$P_1$	1608	1672	1612	1478	1823	1591	1631
$P_2$	1463	1792	1769	1617	1820	1586	1674
$P_3$	1729	1454	1718	1447	1746	1708	1634
Mean	1600	1639	1699	1514	1796	1628	1646
$M_1$	1485	1540	1518				
$M_2$	1684	1751	1954				
$M_3$	1631	1628	1626				

C.D. for M marginal means=158.6 Kg/ha.

C.D. for body of  $P \times L$  table=274.7 Kg/ha.

## Individual results

Treatment	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Sig.	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Sig.	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>
Year											
1961	2213	2189	2422	N.S.	2050	2535	2239	*	2274	2253	2298
1962	1203	1419	1451	N.S.	1195	1544	1334	N.S.	1299	1518	1257
1963	1386	1312	1226	N.S.	1299	1311	1315	N.S.	1321	1254	1348
Pooled	1600	1639	1699	N.S.	1514	1796	1628	**	1631	1674	1634

Sig.	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	Sig.	G.M.	S.E./plot
N.S.	2394	1970	2239	2196	2267	N.S.	2253	404.1
N.S.	884	1484	1615	1585	1629	N.S.	1387	450.3
N.S.	1150	1395	1288	1201	1740	N.S.	1325	406.2
N.S.	1476	1617	1714	1660	1879	N.S.	1657	420.5

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 62(109), 63(147), 64(117).**

**Site :- Agri. Res. Stn., Shindewahi.**

**Type :- 'M'.**

**Object :-** To study the residual effect of Nitro-phosphate Complex by ODDA and PEC process on the yield of Paddy.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) Sandy loam. (iii) 6.8.62 ; 17.7.63 ; 16.7.64.  
 (iv) (a) 2-3 ploughings, 2 harrowings. (b) Transplanting. (c) N.A. (d) 23 cm. x 15 cm. (e) 3. (v) Nil  
 (vi) R 8 Luchai. (vii) Unirrigated. (viii) 2 Hoeings and weedings. (ix) 59 cm. ; 124 cm. ; 80 cm.  
 (x) 26.11.62 ; 24.11.63 ; 1.12.64.

**2. TREATMENTS :**

All combination of (1), (2) and (3)+5 additional treatments in each block

(1) 3 types of fertilizers : P<sub>1</sub>=P<sub>2</sub>O<sub>5</sub>+A/S, P<sub>2</sub>=ODDA and P<sub>3</sub>=PEC.

(2) 3 levels of fertilizers : L<sub>1</sub>=13.4 Kg/ha. of N+11.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, L<sub>2</sub>=26.9 Kg/ha. of N+23.5 Kg/ha. of P<sub>2</sub>O<sub>5</sub> and L<sub>3</sub>=53.8 Kg/ha. of N+47.1 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

(3) 3 methods of application : M<sub>1</sub>=Broadcast, M<sub>2</sub>=6.3 cm. below seed and M<sub>3</sub>=Band placement.

5 additional treatments are : N<sub>0</sub>=0, N<sub>1</sub>=13.4, N<sub>2</sub>=26.9, N<sub>3</sub>=40.3 and N<sub>4</sub>=53.8 Kg/ha. of N.

**3. DESIGN :**

(i) 3<sup>8</sup> confd. +5 additional treatments in each block. (ii) (a) 14 plots/block ; 3 blocks/replication. (b) N.A.  
 (iii) 2. (iv) 9.14 m. x 5.49 m. (b) 7.32 m. x 3.66 m. (v) 91 cm. x 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962-64. (b) Yes. (c) No. (v) N.A. (vi) Monsoon started very late in 63(147). (viii) Error variances are heterogeneous. Treatments x years interaction is absent. Hence results of individual years are presented under 5. Results.

**5. RESULTS :**

**62(109)**

(i) 1660 Kg/ha. (ii) 512.6 Kg/ha. (iii) Component PL<sup>2</sup>M is significant. (iv) Av. yield of Paddy in Kg/ha.

Extra treatments :  $N_0=1660$  ;  $N_1=1663$  ;  $N_2=1684$  ;  $N_3=1945$  and  $N_4=1610$  Kg/ha

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
P <sub>1</sub>	1598	1498	1491	1595	1340	1652	1529
P <sub>2</sub>	1705	1664	1701	1763	2037	1270	1690
P <sub>3</sub>	1920	1488	1608	1562	1915	1539	1672
Mean	1741	1550	1600	1640	1764	1487	1630
M <sub>1</sub>	1948	1438	1534				
M <sub>2</sub>	1842	1836	1614				
M <sub>3</sub>	1433	1377	1652				

63(147)

(i) 2822 Kg/ha. (ii) 756.0 Kg/ha. (iii) W component of P, L and M is significant. (iv) Av. yield of Paddy in Kg/ha.

Extra treatments :  $N_0=2809$ ,  $N_1=3065$ ,  $N_2=2878$ ,  $N_3=3009$  and  $N_4=3002$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
P <sub>1</sub>	2585	2840	2361	2579	3090	2117	2595
P <sub>2</sub>	2442	3139	3096	2666	3021	2990	2892
P <sub>3</sub>	3015	2573	2697	2834	2865	2585	2761
Mean	2680	2851	2718	2693	2992	2564	2750
M <sub>1</sub>	2772	2616	2691				
M <sub>2</sub>	2672	3152	3152				
M <sub>3</sub>	2597	2784	2311				

64(117)

(i) 3621 Kg/ha. (ii) 1693.9 Kg/ha. (iii) None of the effects is Significant. (iv) Av. yield of Paddy in Kg/ha.

Extra treatments  $N_0=3121$ ,  $N_1=3532$ ,  $N_2=4173$ ,  $N_3=3519$  and  $N_4=2460$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
P <sub>1</sub>	3376	2859	4260	2877	3519	4098	3498
P <sub>2</sub>	3444	3587	5263	4435	4129	3731	4098
P <sub>3</sub>	3955	3743	3401	3637	3469	3992	3700
Mean	3592	3396	4311	3650	3706	3940	3766
M <sub>1</sub>	3320	3239	4391				
M <sub>2</sub>	4005	3313	3799				
M <sub>3</sub>	3450	3637	4734				

**Crop :- Paddy (Kharif).****Ref :- Mh. 63(131).****Site :- Agri. Res. Stn., Shindewahi.****Type :- 'M'.**

Object :—To study the relative merits of different N carriers on the yield of Paddy.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 1.8.63. (iv) (a) 3 ploughings and 3 harrowings. (b) Transplanting by Japanese method. (c) N.A. (d) 23 cm.×15 cm. (e) 2–3. (v) Nil. (vi) R–8 Luchai. (vii) Unirrigated. (viii) 3 harrowings and 2 interculturings. (ix) N.A. (x) 30.11.63.

**2. TREATMENTS.**

All combinations of (1) and (2)

(1) 3 levels of N :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.(2) 5 sources of N :  $S_1=A/S$ ,  $S_2=A/C$ ,  $S_3=A/S/N$ ,  $S_4=C/A/N$  and  $S_5=Urea$ .**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 9.45 m.×5.49 m. (b) 7.62 m.×3.66 m. (v) 91 cm.×91 cm. (vi) Yes,

**4. GENERAL :**

(i) Normal. (ii) Paddy case worm BHC 5 % and Endrin applied. (iii) Yield of grain. (iv) (a) 1963–64 (Modified in 1964). (b) No. (c) Nil. (v) Not known (vi) and (vii) Nil.

**5. RESULTS :**

(i) 4107 Kg/ha. (ii) 796.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control (No)=4024 Kg/ha.

	$S_1$	$S_2$	$S_3$	$S_4$	$S_5$	Mean
$N_1$	4278	3929	3830	4171	4180	4078
$N_2$	4413	4575	3992	3910	4207	4219
Mean	4345	4252	3911	4041	4194	4149

**Crop :- Paddy (Kharif).****Ref :- Mh. 63(244).****Site :- Agri. Res. Stn., Shindewahi.****Type :- 'M'.**

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

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 31.7.63 and 1.8.63. (iv) (a) Ploughing. (b) Transplanting. (c) 22.4 Kg/ha. (d) 23 cm.×15 cm. (e) 3. (v) Nil. (vi) R–8 Luchai (late) (vii) Irrigated. (viii) Hoeing and weeding. (ix) 1513.3 cm. (x) N.A.

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 3 doses of lime,  $L_1=56$ ,  $L_2=112$  and  $L_3=560$  Kg/ha.

(2) 5 levels of (NP) doses :  $(NP)_0=Control$ ,  $(NP)_1=22.4$  Kg/ha. of N as A/S+22.4 Kg/ha. of  $P_2O_5$  as S.P.  $(NP)_2=22.4$  Kg/ha. of N as A/S+44.8 Kg/ha. of  $P_2O_5$  as S.P.,  $(NP)_3=44.8$  Kg/ha. of N as A/S+22.4 Kg/ha. of  $P_2O_5$  as S.P.  $(NP)_4=44.8$  Kg/ha. of N as A/S+44.8 Kg/ha. of  $P_2O_5$  as S.P.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) and (b) 10 m. × 10 m. ; 9.14 m × 9.14 m. (v) Nil. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Mild attack of case worm. Endrin sprayed. (iii) Yield of grain. (iv) (a) 1963-only (b) No. (c) Nil. (v) to (vii) No.

## 5. RESULTS :

(i) 4123 Kg/ha. (ii) 793.0 Kg/ha. (iii) Main effects of (NP) is significant. (iv) Av. yield of grain in Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Mean
(NP) <sub>0</sub>	3740	3041	2960	3247
(NP) <sub>1</sub>	3983	3956	3794	3911
(NP) <sub>2</sub>	4090	4359	4279	4243
(NP) <sub>3</sub>	4736	4548	4440	4575
(NP) <sub>4</sub>	4817	4655	4440	4637
Mean	4273	4112	3983	4123

C.D. for N P marginal means=653.1 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 64(109).**

**Site :- Agri. Res. Stn., Shindewahi.**

**Type :- 'M'.**

Object :—To study the relative merits of different N carriers on the yield of Paddy.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Sandy loam. (iii) 13.8.64. (iv) (a) 3 ploughings. (b) Transplanting by Japanese method. (c) N.A. (d) 23 cm. × 15 cm. (e) 2—3. (v) Nil. (vi) R—8 luchi. (vii) Irrigated. (viii) 3 hoeings and 2 interculturings. (ix) N.A. (x) 1.12.64.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 4 sources of N : S<sub>1</sub>=A/S, S<sub>2</sub>=A/N, S<sub>3</sub>=C/A/N and S<sub>4</sub>=Urea.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 9.49 m. × 5.49 m. (b) 7.62 m. × 3.66 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) B.H.C. 5% and Endrin applied. (iii) Yield of grain. (iv) (a) 1963—64 (modified in 1964). (b) No. (c) Nil. (v) Not known. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 3157 Kg/ha. (ii) 911.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control (N<sub>0</sub>)=3056 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	Mean
N <sub>1</sub>	2969	3283	3130	3624	3252
N <sub>2</sub>	2924	3624	2996	3113	3164
Mean	2946	3454	3062	3368	3208

**Crop :- Paddy (Kharif).****Ref :- Mh. 64(198).****Site :- Agri Res. Stn., Shindewahi.****Type :- 'M'.**

Object :—To study the effect of liming with and without Azotobacter on the yield of Paddy.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Clay loam. (iii) 10, 11.8-64. (iv) (a) Ploughing. (b) Transplanting. (c) 20 Kg/ha. (d) 22.5 cm. × 15 cm. (e) 2—3. (v) Nil. (vi) R 8 Luchai (late). (vii) Irrigated once in a week. (viii) Weeding, Hoeing and Interculturing. (ix) 131 cm. (x) 1.12 64.

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

(Lime requirement 56 Kg/ha.)

M<sub>1</sub>=Control (No lime), M<sub>2</sub>=Application of lime,  $\frac{1}{2}$  lime required, M<sub>3</sub>=Application of lime, Full lime required, M<sub>4</sub>=Application of lime,  $1\frac{1}{2}$  lime required, M<sub>5</sub>=Application of lime, 2 times lime required.

**Sub-plot treatments :**S<sub>1</sub>=No Azotobacter. S<sub>2</sub>=With Azotobacter inoculated.**3. DESIGN :**

(i) Split-plot. (ii) (a) 5 main-plots/replications ; 2 sub-plots/main-plots. (b) N.A. (iii) 4. (iv) (a) 5.40 m × 9.30 m. (b) 3.60 m. × 7.50 m. (v) 90 cm. × 90 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964-only. (b) No. (c) Nil. (v) No. (vi) and (vii) Nil.

**5. RESULTS :**

(1) 3189 Kg/ha. (ii) (a) 946.1 Kg/ha. (b) 1071.9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	Mean
S <sub>1</sub>	3247	2834	2368	4027	3633	3222
S <sub>2</sub>	2861	2574	3696	4099	2547	3155
Mean	3054	2704	3032	4063	3090	3189

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 64(216).**

**Site :- Agri. Res. Stn., Shindewahi.**

**Type :- 'M'.**

**Object:—To find out the suitable phosphate carrier for manuring of Paddy in laterite soil.**

**1. BASAL CONDITIONS :**

(i) (a) Paddy—Paddy. (b) Paddy. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of P. (ii) Sandy loam. (iii) 26.6.64/27.7.64. (iv) (a) 3 puddling, levelling with *patta*. (b) Transplanting. (c) 22.4 Kg/ha. (d) 23 cm. x 15 cm. (e) 2—3. (v) As per treatments. (vi) R—8 Luchai (late). (vii) Irrigated. (viii) 3 interculturings. (ix) 127 cm. (x) 1.12.64.

**2. TREATMENTS :**

All combinations of (1) and (2)+5 extra treatments

(1) 2 levels of manures :  $L_1=22.4$  Kg/ha. of P+22.4 Kg/ha. of N and  $L_2=44.8$  Kg/ha. of P+44.8 Kg/ha. of N.

(2) N—supplied through A/S and 'P' through following 6 sources :  $S_1$ =Super phosphate,  $S_2$ =Rock phosphate,  $S_3$ =Bone meal,  $S_4$ =Stera meal,  $S_5$ =Nitrophosphate (ODDA),  $S_6$ =Di-Calcium phosphate.

5 extra treatments :  $C_0$ =Control,  $C_1=22.4$  Kg/ha. of N as A/S,  $C_2=44.8$  Kg/ha. of N as A/S,  $C_3=22.4$  Kg/ha. as Super phosphate,  $C_4=44.8$  Kg/ha. as Super phosphate.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 17. (b) N.A. (iii) 4. (iv) (a) 9.57 m. x 5.54 m. (b) 7.75 m. x 3.72 m. (v) 91 cm. x 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) 2 sprayings of Endrine. (iii) Yield of grain. (iv) (a) 1964-only. (b) No. (c) Nil. (v) No. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 2592 Kg/ha. (ii) 896.3 Kg/ha. (iii) Main effect of S is significant. (iv) Av. grain yield in Kg/ha.

$C_0=2251, C_1=2189, C_2=2162, C_3=2503, C_4=2449.$

	$S_1$	$S_2$	$S_3$	$S_4$	$S_5$	$S_6$	Mean
$L_1$	2753	2359	2458	2081	2448	2681	2463
$L_2$	3364	2503	3928	2978	2807	2143	2954
Mean	3059	2431	3193	2529	2627	2412	2709

C.D. for S marginal means=901.6 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 60(71), 61(33),62(15),  
63(12).**

**Site :- Agri. Res. Stn., Tharsa.**

**Type :- 'M'.**

**Object:—To study the effect of G.M. alone and in combination with N, P on the yield of Paddy.**

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) G.M. + 22.4 Kg/ha. of  $P_2O_5$  + 22.4 Kg/ha. of N for 60; As per treatments for other years. (ii) Black soil for 60; Morand soil No. 2 for other years. (iii) 29.7.60; 20.7.61; 22.7.62; 22.7.63. (iv) (a) 1 to 2 ploughings and *bakherings*. (b) Japanese method of transplanting. (c) 17 to 22 Kg/ha. (d) 23 cm. x 23 cm. (e) 2 to 3. (v) Nil. (vi) Red *Luchai*. (vii) Irrigated. (viii) Interculturing and weeding. (ix) N.A. for 60 and 61, 93 cm. for 62 and 118 cm. for 63, (x) 19.11.60; 29.11.61; 22.11.62; 30.11.63.

## 2. TREATMENTS:

7 manurial treatments:  $M_0$ =Control,  $M_1$ =Sann G.M.,  $M_2$ =Sann G.M. + 22.4 Kg/ha. of  $P_2O_5$  to Sann,  $M_3$ =Sann G.M. + 11.2 Kg/ha. of N as A/S + 11.2 Kg/ha. of  $P_2O_5$  as Super to Sann,  $M_4$ =Sann G.M. + 5.6 Kg/ha. of N as A/S + 11.2 Kg/ha. of  $P_2O_5$  as Super to Sann + 5.6 Kg/ha. of N as A/S to paddy at puddling,  $M_5$ =Sann G.M. + 5.6 Kg/ha. of N as A/S + 22.4 Kg/ha. of  $P_2O_5$  as Super to Sann + 16.8 Kg/ha. of N as A/S to paddy at puddling and  $M_6$ =Paddy crop without G.M. + 22.4 Kg/ha. of N as A/S + 22.4 Kg/ha. of  $P_2O_5$  as Super to Paddy.

## 3. DESIGN:

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 10.97 m. x 6.40 m. (b) 9.14 m. x 4.57 m. (v) 91 cm. x 91 cm (vi) Yes.

## 4. GENERAL:

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960-63. (b) No. (c) Results for combined analysis and individual analysis are presented under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments x years interaction is present.

## 5. RESULTS:

## Pooled results

(i) 3171 Kg/ha. (ii) 723.3 Kg/ha. (based on 18 d.f. made up of interaction Treatments x years). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$M_0$	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$	$M_6$
Av. yield	2790	2950	3170	3492	3193	3435	3170

## Individual results

Treatment	$M_0$	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$	$M_6$	Sig.
Year								
1960	2957	3689	3593	4204	3404	3771	2550	**
1961	3445	3133	3309	3526	3499	3513	4164	N.S.
1962	2422	2631	2721	3259	2840	3409	2930	N.S.
1963	2338	2348	3056	2978	3029	3047	3038	*
Pooled	2790	2950	3170	3492	3193	3435	3170	N.S.

G.M.	S.E./plot
3453	175.9
3513	466.5
2887	942.4
2833	358.8
3171	723.3



Crop :- Paddy (Kharif).

Ref :- Mh. 60(72), 61(18), 62(1),  
63(1), 64(1), 65(1).

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

Type :- 'M'.

Object :--To study the effect of G.M. alone and in combination with N and P on the yield of Paddy.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) G.M. + 33.6 Kg/ha. of  $P_2O_5$  in 61 and 63. 22.4 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$  in other years. (ii) Medium black soil. (iii) 21.7.60 ; 13.7.61 ; 18.7.62 ; 10.7.63 ; 11.8.64 ; 14.8.65. (iv) (a) 2 ploughings and 2 *bakherings*. (b) Transplanting. (c) 17 to 22 Kg/ha. (d) 23 cm. x 23 cm. (e) 2 to 3. (v) Nil. (vi) Red *Luchai*. (vii) Unirrigated. (viii) Interculturing and weeding. (ix) N.A. ; N.A. ; 90 cm. ; 118 cm. ; 102 cm. ; 36 cm. (x) 20.11.60 ; 20.11.61 ; 20.10.62 ; 21.10.63 ; 31.10.64 ; 2.11.65.

## 2. TREATMENTS :

7 manurial treatments :  $M_0$  = Control,  $M_1$  = Sann G.M.,  $M_2$  = Sann G.M. + 22.4 Kg/ha. of  $P_2O_5$  to Sann,  $M_3$  = Sann G.M. + 11.2 Kg/ha. of N as A/S + 11.2 Kg/ha. of  $P_2O_5$  as super to Sann,  $M_4$  = Sann G.M. + 5.6 Kg/ha. of N as A/S + 11.2 Kg/ha. of  $P_2O_5$  as Super to Sann + 5.6 Kg/ha. of N as A/S to Paddy at puddling.  $M_5$  = Sann G.M. + 5.6 Kg/ha. of N as A/S + 22.4 Kg/ha. of  $P_2O_5$  as Super to Sann + 16.8 Kg/ha. of N as A/S to Paddy at puddling and  $M_6$  = Paddy crop without G.M. + 22.4 Kg/ha. of N as A/S + 22.4 Kg/ha. of  $P_2O_5$  as Super to Paddy.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 10.97 m. x 6.40 m. (b) 9.14 m. x 4.57 m. (v) 91 cm. x 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960-65. (b) No. (c) Nil. (v) Shindewahi. (vi) Nil. (vii) Since the error variances are heterogeneous and Treatment x years interaction is absent, individual results are given under 5. Results.

## 5. RESULTS :

## 60(72)

(i) 1829 Kg/ha. (ii) 1139.2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$M_0$	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$	$M_6$
Av. yield	1668	1668	2414	2482	1654	1261	1654

## 61(18)

(i) 4319 Kg/ha. (ii) 1010.0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$M_0$	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$	$M_6$
Av. yield	3865	4638	4408	3635	4204	4679	4801

## 62(1)

(i) 752 Kg/ha. (ii) 419.0 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$M_0$	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$	$M_6$
Av. yield	329	538	568	598	658	897	1674

C.D. = 440 Kg/ha.

63(1)

(i) 1956 Kg/ha. (ii) 359.0 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>
Av. yield	1341	1752	1861	1668	2272	2278	2518

C.D. = 377 Kg/ha.

64(1)

(i) 929 Kg/ha. (ii) 272.0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>
Av. yield	658	706	855	921	1052	891	1417

C.D. = 286 Kg/ha.

65(1)

(i) 957 Kg/ha. (ii) 275 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>
Av. yield	646	765	676	1064	975	1495	1076

C.D. = 290 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 62(140).**

**Site :- Agri. Res. Stn., Tharsa.**

**Type :- 'M'.**

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

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Black soil. (iii) 23.7.62. (iv) (a) Ploughing. (b) Transplanting. (c) 22 Kg/ha. (d) 23 cm. × 23 cm. (e) 3—4. (v) Nil. (vi) Red *Luchal*. (vii) Irrigated. (viii) Weeding and interculturing. (ix) 62 cm. (x) N.A.

#### 2. TREATMENTS :

5 manrial treatments : M<sub>0</sub> = Control, M<sub>1</sub> = 22.4 Kg/ha. each of N and P<sub>2</sub>O<sub>5</sub>, M<sub>2</sub> = 22.4 Kg/ha. each of N and K<sub>2</sub>O, M<sub>3</sub> = 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> + 44.8 Kg/ha. of N, M<sub>4</sub> = 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> + 44.8 Kg/ha. of N + 22.4 Kg/ha. K<sub>2</sub>O.

#### 3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 3. (iv) (a) 6.40 m. × 10.97 m. (b) 4.57 m. × 9.14 m. (x) 91 cm. × 91 cm. (vi) Yes.

#### 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962 only. (b) No. (c) Nil. (v) to (vii) Nil.

#### 5. RESULTS :

(i) 2320 Kg/ha. (ii) 720.0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>
Av. yield	1754	2432	1834	2551	5030

Crop :- Paddy (*Kharif*).

Ref :- Mh. 60(149), 62(110),

Site :- Agri. Res. Stn, Vadgaon.

Type :- 'M'.

Object :—To study the effect of different G.M. crops and their suitability for G.M. purpose under normal tract for Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Medium black. (iii) 21.6 60/22.7.60; 17.6 62/6.8.62. (iv) (a) Ploughing (b) Transplanting. (c) N.A. (d) 23 cm. × 15 cm. (e) 3–4. (v) Nil. (vi) Ambemohar 157 (late). (vii) Unirrigated. (viii) 2 interculturings and 1 to 2 weedings. (ix) 48 cm. ; 59 cm. (x) 5.12.60 ; 28.11.62.

2. TREATMENTS :

8 G.M. crops : G<sub>0</sub> = Control, G<sub>1</sub> = *Chavali*, G<sub>2</sub> = *Dhaincha*, G<sub>3</sub> = *Seshania*, G<sub>4</sub> = *Sunn hemp*, G<sub>5</sub> = *Glyricidia*, G<sub>6</sub> = *Karanj* and G<sub>7</sub> = *Mogali Erand*.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 6.32 m. × 1.75 m. (b) 6.10 m. × 1.52 m. (v) 11 cm. × 11 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958–62 (Not conducted in 1961). (b) No. (c) Results of combined analysis and for individual years are presented under 5. Results. (v) N.A. (vi) Nil. (vii) Expt. for 1959 is N.A. Expt. no 58(40) is also taken into account while giving the pooled analysis under results. Error variances are heterogeneous. Treatments × years interaction is present.

5. RESULTS :

Pooled results

(i) 2036 Kg/ha. (ii) 409.2 Kg/ha. (based on 14 d.f. made up of Treatments × years interaction). (iii) Treatment differences are highly significant (iv) Av. yield of grain in Kg/ha.

Treatment	G <sub>0</sub>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	G <sub>4</sub>	G <sub>5</sub>	G <sub>6</sub>	G <sub>7</sub>
Av. yield	1559	1924	2046	2092	1913	2433	2292	2028

C.D. = 358.3 Kg/ha.

Individual results.

Treatment	G <sub>0</sub>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	G <sub>4</sub>	G <sub>5</sub>	G <sub>6</sub>	G <sub>7</sub>	Sig.	G.M.	S.E. /plot
Year											
1960	1984	2172	2622	2655	2464	3119	3241	2448	**	2588	288.1
1962	770	1067	1213	1180	1254	1503	1241	1210	**	1180	153.6
Pooled	1559	1924	2046	2092	1913	2433	2292	2028	**	2036	409.2

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 60(150).**

**Site :- Agri. Res. Stn., Vedgaon.**

**Type :- 'M'.**

**Object :-** To find out the economic doses of N and P requirements for getting the highest yield of Paddy under Maval condition.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) N.A. (c) N.A. (ii) Medium black. (iii) 21.6.60/4.8.60. (iv) (a) Ploughings. (b) Transplanting. (c) N.A. (d) 23 cm. x 23 cm. (e) N.A. (v) Nil. (vi) Ambemohar 157 (late). (vii) Unirrigated. (viii) 2 interculturings and one weeding. (ix) 48 cm. (x) 5.12.60

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 4 levels of N :  $N_0=0$ ,  $N_1=22.4$ ,  $N_2=44.8$  and  $N_3=89.6$  Kg/ha. of N.

(2) 2 levels of  $P_2O_5$ :  $P_0=0$  and  $P_1=22.4$  Kg/ha. of  $P_2O_5$

Fertilizers were applied in 2 doses on 4.8.60 and 27.9.60.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 9.14 m. x 4.57 m. (b) 7.32 m. x 2.74 m. (v) 91 cm x 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958-60. (b) N.A. (c) Nil. (v) to (vii) Nil.

**5. RESULTS :**

(i) 3055 Kg/ha. (ii) 183.4 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$N_2$	$N_3$	Mean
$P_0$	2708	2914	3151	3466	3060
$P_1$	2349	3126	3192	3611	3069
Mean	2528	3020	3172	3539	3065

C.D. for N marginal means = 161 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 61(85), 62(71), 63(102).**

**Site :- Agri. Res. Stn., Vadgaon.**

**Type :- 'M'.**

**Object :-** To study the effect of treated and untreated leather waste on the yield of Paddy.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) N.A. for 61, 44.8 Kg/ha. of N as A/S+22.4 Kg/ha. of  $P_2O_5$  as Super+12.4 C.L./ha. of compost for 62 and 63. (ii) N.A. (iii) 30.7.61; 9.8.62; 18.8.63. (iv) (a) Ploughing and harrowings. (b) Transplanting. (c) N.A. (d) 23 cm. x 23 cm. (e) 4. (v) Nil. (vi) Ambemohar 157. (vii) Unirrigated. (viii) 2 interculturings. (ix) 48 cm.; 59 cm.; 51 cm. (x) 27.11.61; 15.12.62; 7.12.63.

**2. TREATMENTS :**

10 manurial treatments :  $M_0$ =Control,  $M_1$ =Raw vegetable tanned leather waste,  $M_2$ =Raw chrome leather waste,  $M_3$ =Acid treated vegetable leather waste,  $M_4$ =Acid treated chrome leather waste,  $M_5$ =Alkali treated vegetable leather waste,  $M_6$ =Alkali treated chrome leather waste,  $M_7$ =Steamed vegetable leather waste,  $M_8$ =Steamed chrome leather waste and  $M_9$ =A/S.

Each of the above quantities to supply 44.8 Kg/ha. of N.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 9.14 m. × 4.57 m. (b) 7.32 m. × 2.74 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Attack of crabs and leaf rollers 5 % B.H.C. dusted laying of endrin baits twice. (iii) Yield of grain. (iv) (a) 1961—63, (b) No. (c) Nil. (v) N.A. (vi) Due to continuous heavy showers immediately after transplanting, the growth was stunted with proper tillering in 62. (vii) Error variances are heterogeneous and interaction between Treatments × years is absent. So individual results are presented under 5. Results.

## 5. RESULTS :

## 61(85)

(i) 2073 Kg/ha. (ii) 248.6 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yielded of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>
Av. yield	2129	2330	1794	1773	2108	1988	1932	1066	2362	2250

C.D. = 254 Kg/ha.

## 62(71)

(i) 2589 Kg/ha. (ii) 433.6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>
Av. yield	2423	2700	2230	2199	2574	2897	2534	2571	2626	3139

## 63(102)

(i) 2918 Kg/ha. (ii) 536.2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>
Av. yield	2479	2801	2554	2725	2834	2985	3427	2874	3040	3461

**Crop :- Paddy (Rabi).**

**Ref :- Mh. 64, 65(M.A.E.)**

**Site :- M.A.E. Centre, Lakhmapur.**

**Type :- 'M'.**

Object :- Type XI : To determine the effect of micrountrients on Paddy.

## 1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Medium black. (iii) to (x) N.A.

## 2. TREATMENTS :

Same as in expt. no. 63 to 65(M.A.E.) conducted at Karjat and presented on page 55.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

## 4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1964—66 (b) N.A. (c) Nil. (v) Nil. (vi) N.A. (vii) Nil.

## 5. RESULTS:

64(M.A.E.)

(i) 1276 Kg/ha. (ii) 448.2 Kg/ha. (iii) N.A. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>
Av. yield	914	1222	1358	1214	1066	1295	1067	1134
	T <sub>8</sub>	T <sub>9</sub>	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	
	1663	1215	1516	1294	1362	1447	1367.	

65(M.A.E.)

(i) 1824 Kg/ha. (ii) 226.2 Kg/ha. (iii) N.A. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>
Av. yield	1303	1667	2097	2163	1916	1894	1891	2073
	T <sub>8</sub>	T <sub>9</sub>	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	
	1774	1816	1860	1709	1823	1818	1549	

Crop :- Paddy (*Kharif*).

Ref :- Mh. 60 to 64(M.A.E.).

Site :- M.A.E. Centre, Karjat.

Type :- 'M'.

Object:—Type II: To study the long term effect of fertilizers and organic manures on continuous cropping.

## 1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Paddy. (c) N.A. (ii) Sandy and clay loam. (iii) 13.6.60/6.7.60, N.A./5.7.61; N.A./21.7.62; N.A./11.7.63; N.A./15.7.64. (iv) (a) 2 Ploughing and 1 puddling. (b) Transplanting. (c) 17 to 22 Kg/ha. (d) 20 cm. × 20 cm. (e) 4 Seedlings/hole. (v) Nil. (vi) KLMB-42 (150 days). (vii) Unirrigated. (viii) Weeding. (xi) 384 cm., 459 cm., N.A. for 62 and 63. (x) 3.11.60, 12.11.61, 5.11.62, 6.11.63, 15.11.64.

## 2. TREATMENTS :

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

- (1) 3 levels of N as A/S: N<sub>0</sub>=0, N<sub>1</sub>=33.6 and N<sub>2</sub>=67.2 Kg/ha. of N.
- (2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=33.6 and P<sub>2</sub>=67.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>
- (3) 3 levels of K<sub>2</sub>O as Pot. Sulph. : K<sub>0</sub>=0, K<sub>1</sub>=33.6 and K<sub>2</sub>=67.2 Kg/ha of K<sub>2</sub>O.
- (4) 2 levels of F.Y.M. : F<sub>0</sub>=0 and F<sub>1</sub>=5600 Kg/ha. of F.Y.M.

## 3. DESIGN :

(i) 3<sup>3</sup> × 2 Fact. Conf. (ii) (a) 9 plots/block, 6 blocks/replication. (b) 32.46 m. × 14.46 m. (iii) 1. (iv) (a) 10.82 m. × 4.82 m. (b) 9.00 m. × 3.00 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain and straw. (iv) (a) 1957-64. (b) Yes. (c) Nil. (v) to (vii) Nil

## 5. RESULTS :

60(M.A.E.)

(i) 3611 Kg/ha. (ii) 301.6 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
F <sub>0</sub>	2739	3579	4198	3532	3431	3654	3625	3403	3589	3539
F <sub>1</sub>	2785	3947	4316	3680	3689	3680	3671	3588	3790	3683
Mean	2762	3763	4307	3606	3560	3667	3648	3495	3689	3611
K <sub>0</sub>	2730	3883	4331	3772	3505	3667				
K <sub>1</sub>	2675	3606	4204	3486	3532	3467				
K <sub>2</sub>	2881	3800	4386	3560	3643	3867				
P <sub>0</sub>	2712	3708	4398							
P <sub>1</sub>	2776	3661	4243							
P <sub>2</sub>	2798	3921	4281							

C.D. for N marginal means = 207 Kg./ha.

61(M.A.E.)

(i) 2801 Kg/ha. (ii) 169.1 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
F <sub>0</sub>	2287	2659	3173	2693	2628	2795	2684	2665	2766	2705
F <sub>1</sub>	2349	2952	3387	2909	2894	2886	2880	2819	2989	2896
Mean	2318	2804	3280	2801	2761	2841	2782	2792	2878	2801
K <sub>0</sub>	2232	2868	3246	2739	2656	2951				
K <sub>1</sub>	2287	2739	3200	2805	2665	2712				
K <sub>2</sub>	2435	2805	3395	2814	2961	2859				
P <sub>0</sub>	2352	2758	3293							
P <sub>1</sub>	2195	2766	3320							
P <sub>2</sub>	2407	2887	3228							

C.D. for N marginal means = 117 Kg./ha.

62(M.A.E.)

(i) 2698 Kg/ha. (ii) 260.2 Kg/ha. (iii) Main effect of N is highly significant. Interaction N × P is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
F <sub>0</sub>	2211	2666	3013	2583	2534	2773	2621	2600	2669	2630
F <sub>1</sub>	2435	2948	2917	2728	2803	2770	2588	2910	2803	2767
Mean	2323	2807	2965	2656	2668	2771	2604	2755	2736	2698
K <sub>0</sub>	2183	2781	2849	2532	2607	2674				
K <sub>1</sub>	2410	2850	3006	2750	2672	2844				
K <sub>2</sub>	2376	2791	3041	2685	2728	2796				
P <sub>0</sub>	2304	2594	3069							
P <sub>1</sub>	2231	2775	3000							
P <sub>2</sub>	2434	3053	2827							

C.D. for N marginal means = 179 Kg./ha.

C.D. for body of N × P table = 310 Kg./ha.

63(M.A.E.)

(i) 2909 Kg/ha. (ii) 250.8 Kg/ha. (iii) Main effect of N is highly significant. Interaction F×N is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
F <sub>0</sub>	2281	3056	3099	2750	2820	2867	2824	2728	2885	2812
F <sub>1</sub>	2640	3392	2988	3033	3020	2967	2977	2927	3116	3007
Mean	2461	3224	3044	2891	2920	2917	2900	2827	3001	2909
K <sub>0</sub>	2436	3155	3110	2878	2865	2958				
K <sub>1</sub>	2409	3164	2908	2875	2845	2762				
K <sub>2</sub>	2537	3352	3113	2921	3050	3032				
P <sub>0</sub>	2441	3149	3084							
P <sub>1</sub>	2426	3237	3097							
P <sub>2</sub>	2516	3285	2951							

C.D. for N marginal means = 173 Kg./ha.

C.D. for body of N×F table = 244 Kg./ha.

64(M.A.E.)

(i) 2942 Kg/ha. (ii) 277.6 Kg/ha. (iii) Main effect of N is highly significant and main effect of K is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
F <sub>0</sub>	2358	2907	3138	2775	2736	2892	2969	2543	2191	2801
F <sub>1</sub>	2803	3199	3248	3087	3116	3047	3142	3028	3081	3084
Mean	2580	3053	3193	2931	2926	2970	3056	2785	2986	2942
K <sub>0</sub>	2641	3179	3347	2985	3096	3087				
K <sub>1</sub>	2515	2876	2964	2776	2728	2851				
K <sub>2</sub>	2584	3105	3268	3032	2954	2972				
P <sub>0</sub>	2491	3038	3264							
P <sub>1</sub>	2609	2908	3261							
P <sub>2</sub>	2641	3214	3054							

C.D. for N marginal means = 191 Kg/ha.

Crop :- Paddy.

Ref :- Mh. 60 to 62 (M.A.E.).

Site :- M.A.E. Centre, Karjat.

Type :- 'M'.

Object :- Type IV : To study the effect of phosphatic manures on legumes and their residual effect on succeeding Paddy crop manured with N.



## 1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Medium black. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

## 2. TREATMENTS :

## Main-plot treatments :

All Combinations of (1) and (2)+a control ( $L_0P_0$ )(1) 2 previous legumes :  $L_1$ =Gram and  $L_2$ =Wal.(2) 3 levels of  $P_2 @ 6$  as Super :  $P_0=0$ ,  $P_1=44.8$  and  $P_2=89.7$  Kg/ha.

## Sub-plot treatments :

3 levels of N as A/S applied to Paddy :  $N_0=0$ ,  $N_1=16.8$  and  $N_2=33.6$  Kg/ha.

## 3. DESIGN :

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

## 4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1959-62. (b) N.A. (c) Pooled results presented under 5. Results. (v) and (vi) Nil. (vii) Expt. of 1959 also taken into account for pooling.

## 5. RESULTS

## Pooled results

(i) 2901 Kg/ha. (ii) (a) N.A. (b) N.A. (iii) Main effects of LP and N are significant. (iv) Av. yield of grain in Kg/ha.

	$L_0P_0$	$L_1P_0$	$L_1P_1$	$L_1P_2$	$L_2P_0$	$L_2P_1$	$L_2P_2$	Mean
$N_0$	1543	1336	2485	2680	2739	2582	2699	2581
$N_1$	2963	2778	2852	2676	2957	2924	3078	2875
$N_2$	3294	3080	3292	3193	3301	3228	3332	3240
Mean	2933	2731	2876	2850	2999	2876	3036	2901

C.D. for L P marginal means=300 Kg/ha.

C.D. for N marginal means =141 Kg/ha.

## Individual results

## 60(M.A.E.)

(i) 2974 Kg/ha. (ii) (a) and (b) N.A. (iii) Main effect of N is significant. (iv) Av. yield of grain in Kg/ha.

	$L_0P_0$	$L_1P_0$	$L_1P_1$	$L_1P_2$	$L_2P_0$	$L_2P_1$	$L_2P_2$	Mean
$N_0$	2560	2160	2650	2270	2910	2240	2310	2443
$N_1$	2980	2970	3170	2310	3520	2860	3080	2984
$N_2$	3700	3060	3620	3260	4010	3320	3500	3496
Mean	3080	2730	3147	2613	3480	2807	2963	2974

C.D. for N marginal means=285 Kg/ha.

## 61(M.A.E.)

(i) 2157 Kg/ha. (ii) (a) and (b) N.A. (iii) Main effect of N is significant. (iv) Av. yield of grain in Kg/ha.

	L <sub>0</sub> P <sub>0</sub>	L <sub>1</sub> P <sub>0</sub>	L <sub>1</sub> P <sub>1</sub>	L <sub>1</sub> P <sub>2</sub>	L <sub>2</sub> P <sub>0</sub>	L <sub>2</sub> P <sub>1</sub>	L <sub>2</sub> P <sub>2</sub>	Mean
N <sub>0</sub>	1780	1920	1930	2070	1790	1700	1990	1883
N <sub>1</sub>	1960	2290	2060	2140	2160	2110	2280	2143
N <sub>2</sub>	2230	2670	2520	2510	2460	2290	2430	2444
Mean	1990	2293	2170	2240	2137	2033	2233	2157

C.D. for N marginal means=154 Kg/ha.

62(M.A.E.)

(i) 3006 Kg/ha. (ii) (a) and (b) N.A. (iii) Main effects of L P and N are significant. (iv) Av. yield of grain in Kg/ha.

	L <sub>0</sub> P <sub>0</sub>	L <sub>1</sub> P <sub>0</sub>	L <sub>1</sub> P <sub>1</sub>	L <sub>1</sub> P <sub>2</sub>	L <sub>2</sub> P <sub>0</sub>	L <sub>2</sub> P <sub>1</sub>	L <sub>2</sub> P <sub>2</sub>	Mean
N <sub>0</sub>	2800	2490	2640	2710	2910	2680	2880	2730
N <sub>1</sub>	3050	2900	3050	2970	3270	2980	3170	3056
N <sub>2</sub>	3500	3260	3200	3250	3210	3080	3130	3233
Mean	3117	2883	2963	2977	3130	2913	3060	3006

C.D. for L P marginal means=191 Kg/ha.

C.D. for N marginal means =332 Kg/ha.

**Crop :- Paddy.**

**Ref :- Mh. 62 to 65(M.A.E.).**

**Site :- M.A.E. Centre, Karjat.**

**Type :- 'M'.**

**Object :- Type V(a): To compare the utility of different methods of placement of different doses of N for Paddy.**

**1. BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) Medium black. (iii) and (iv) N.A. (v) 33.6 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. (vi) to (x) N.A.

**2. TREATMENTS :**

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

(1) 3 levels of N : N<sub>1</sub>=33.6, N<sub>2</sub>=50.4 and N<sub>3</sub>=67.2 Kg/ha.

(2) 4 methods of placement: M<sub>1</sub>=Broadcast just before last puddling and incorporated in the soil (sub-surface application), M<sub>2</sub>=Broadcast at planting, M<sub>3</sub>=Broadcast- $\frac{1}{2}$  at planting and  $\frac{1}{2}$  about a month after planting and M<sub>4</sub>=Application in the form of pellets about 3 weeks after planting.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

**4. GENERAL :**

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1962-66. (b) N.A. (c) Nil. (v) No. (vi) N.A. (vii) Nil.

## 5. RESULTS:

Treatment	Av. yield of plots without Nitrogen	Av. response of grain in Kg/ha.				C.D
		M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	
Year						
1962	2660	717	535	711	243	228
1963	2003	565	608	783	526	206
1964	2700	75	357	205	-582	198
1965	2025	93	-227	-163	-467	253

N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	C.D.
525	741	N.A.	N.A.
604	669	390	363
185	28	590	198
-565	-601	-171	224

Crop :- Paddy (Kharif).

Ref :- Mh. 61 to 63 (M.A.E.).

Site :- M.A.E. Centre, Karjat.

Type :- 'M'.

Object :- Type IX : To study the effect of 'Nitro-phosphate' on the yield of Paddy.

## 1. BASAL CONDITIONS:

(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) Dark grey. (iii) N.A./7.8.7.61 ; N.A./8 to 19.7.62 ; N.A./10.7.63. (iv) (a) 2 ploughings and puddling. (b) Transplanting. (c) 20 Kg/ha. (d) 20 cm. × 20 cm. (e) Nil. (v) Nil. (vi) Kolamba—42 (145 to 150 days). (vii) Unirrigated. (viii) 2 weedings. (ix) 459 cm., N.A. for 62 and 63, (x) 15.11.61 ; 5 to 7.11.62 ; 12.11.63.

## 2. TREATMENTS:

All combinations of (1), (2) and (3)+4 extra treatments

(1) 3 types of Nitro-phosphatic manures : P<sub>1</sub>=Single Super+A/S, P<sub>2</sub>=ODDA (20-20-0) and P<sub>3</sub>=PEC (16-14-0).

(2) 3 levels of fertilizers : L<sub>1</sub>=13.4 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, L<sub>2</sub>=2 times of L<sub>1</sub> and L<sub>3</sub>=4 times of L<sub>1</sub>.

(3) 3 methods of application : M<sub>1</sub>=Broadcasting at puddling time, M<sub>2</sub>=Dipping the seedlings in mud-slush mixed with fertilizers. M<sub>3</sub>=Fertilizers in the form of packets to be placed near the root.

4 extra treatments : N<sub>0</sub>=0, N<sub>1</sub>=13.4, N<sub>2</sub>=26.8 and N<sub>3</sub>=53.6 Kg/ha. of N as A/S.

## 3. DESIGN:

(i) 3<sup>3</sup> confd. +4 extra treatments in each block. (ii) (a) 13 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 9.0 m. × 3.60 m. (b) 7.80 m. × 2.40 m. (v) 60 cm. × 60 cm. (vi) Yes.

## 4. GENERAL:

(i) Normal. (ii) N.A. (iii) Yield of grain and straw. (iv) (a) 1961—63. (b) Yes. (c) No. (v) to(vii) Nil.

## 5. RESULTS:

61(M.A.E.)

(i) 2603 Kg/ha. (ii) 269.8 Kg/ha. (iii) Main effects of P, L and M and "N vs. others" are highly significant. (iv) Av. yield of grain in Kg/ha.

$N_0=2029$ ,  $N_1=2278$ ,  $N_2=2509$  and  $N_3=3034$  Kg/ha.

	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Mean
M <sub>1</sub>	2813	2693	2241	2380	2536	2831	2582
M <sub>2</sub>	2997	2461	2222	2370	2601	2710	2560
M <sub>3</sub>	3238	2869	2454	2582	2786	3193	2854
Mean	3016	2674	2306	2444	2641	2911	2665
L <sub>1</sub>	2665	2509	2158				
L <sub>2</sub>	3044	2610	2269				
L <sub>3</sub>	3339	2904	2490				

C.D. for marginal means=186 Kg /ha.

62(M.A.E.)

(i) 2382 Kg/ha. (ii) 282.7 Kg/ha. (iii) Main effects of P, L and M and "N vs others" are highly significant.  
(iv) Av. yield of grain in Kg/ha.

$N_0=1995$ ,  $N_1=1987$ ,  $N_2=2427$  and  $N_3=2953$  Kg/ha.

	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Mean
M <sub>1</sub>	2743	2285	2078	2072	2165	2870	2369
M <sub>2</sub>	2410	2218	2083	1875	2145	2692	2237
M <sub>3</sub>	2723	2627	2435	2300	2505	2988	2598
Mean	2628	2377	2199	2082	2272	2850	2401
L <sub>1</sub>	2172	2178	1897				
L <sub>2</sub>	2648	2085	2082				
L <sub>3</sub>	3065	2867	2618				

C.D. for marginal means=194 Kg./ha.

63(M.A.E.)

(i) 2226 Kg/ha. (ii) 149.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$N_0=2248$ ,  $N_1=2078$ ,  $N_2=2269$  and  $N_3=2270$  Kg/ha.

	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Mean
M <sub>1</sub>	2341	2216	2142	2280	2220	2200	2233
M <sub>2</sub>	2181	2195	2214	2106	2193	2291	2197
M <sub>3</sub>	2221	2335	2233	2293	2331	2165	2263
Mean	2248	2249	2196	2226	2248	2219	2230
L <sub>1</sub>	2245	2270	2163				
L <sub>2</sub>	2331	2248	2164				
L <sub>3</sub>	2167	2228	2261				

**Crop :- Paddy.**  
**Site :- M.A.E. Centre, Karjat.**

**Ref :- Mh. 62 to 64(M.A.E.).**  
**Type :- 'M'.**

Object :- Type X : To study the effect of various levels of N, P and G.M. on the yield of Paddy.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) Medium black. (iii) to (x) N.A.

2. TREATMENTS

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

(1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=16.8$  and  $N_2=33.6$  Kg/ha.

(2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=33.6$  and  $P_2=67.2$  Kg/ha.

(3) 3 G.M. treatments :  $G_0=0$ ,  $G_1=G.M.$  raised in *situ*. without  $P_2O_5$  and  $G_2=G.M.$  raised in *situ*. with 33.6 Kg/ha. of  $P_2O_5$ .

Extra treatment : T=N, P and K fertilisers equivalent to those present in G.M.

3. DESIGN :

(i) 3<sup>3</sup> confd. + one extra treatment in each block. (ii) (a) 10 plots/block : 3 blocks/replication. (b) N.A. (iii) 2 (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1962-64. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

Treatment Year	Av. yield difference (G-NPK)	Av. yield of plots without G.M.	Response to G.M.		C.D.
			raised without phosphores	with 33.6 Kg/ha. of $P_2O_5$	
1962	-510	1921	521	480	131
1963	345	2267	293	334	279
1964	-195	2387	949	1107	127

Treatment Year	Av. yield of plots without Nitrogen	Response to Nitrogen applied at		C.D.
		16.8 Kg/ha. of N	33.6 Kg/ha. of N	
1962	1921	473	752	72
1963	2267	333	589	278
1964	2387	958	995	127

Treatment Year	Av yield of plots without phosphorus	Response to Phosphorus applied at		C.D.
		33.6 Kg/ha. of $P_2O_5$	67.2 Kg/ha. of $P_2O_5$	
1962	2556	-100	-29	72
1963	3438	-23	-37	278
1964	2552	52	-75	127

**Crop :- Paddy (Kharif).**  
**Site :- M.A.E. Centre, Karjat.**

**Ref :- Mh. 63 to 65(M.A.E.)**  
**Type :- 'M'.**

Object :- Type XI: To determine the effect of micro-nutrients on Paddy.

## 1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) Medium black. (iii) to (x) N.A.

## 2. TREATMENTS:

15 micro-nutrient treatments:  $T_0$ =Control (No fertilizer),  $T_1$ =35 Kg/ha. of N+35 Kg/ha. of  $P_2O_5$ +35 Kg/ha. of  $K_2O$  applied to soil only,  $T_2$ = $T_1$ +spartan at 395 Kg/ha.,  $T_3$ = $T_1$ +Manganese as Manganese Sulphate at 60 Kg/ha.,  $T_4$ = $T_1$ +Zn as Zinc Sulphate at 30 Kg/ha.,  $T_5$ = $T_1$ +Cu as Copper Sulphate at 30 Kg/ha.,  $T_6$ = $T_1$ +Boron as Borox at 17.5 Kg/ha.,  $T_7$ = $T_1$ +Molybdenum as Sodium Molybedate at 1.25 Kg/ha.,  $T_8$ = $T_1$ +Mn+Zn+Cu+B× $M_0$ ,  $T_9$ = $T_1$ +Manganese Sulphate at 17.5 Kg/ha.,  $T_{10}$ = $T_1$ +Zn as Zinc Sulphate at 12.5 Kg/ha.,  $T_{11}$ = $T_1$ +Cu as Copper Sulphate at 12.5 Kg/ha.,  $T_{12}$ = $T_1$ +Boron as Borox at 6.2 Kg/ha.,  $T_{13}$ = $T_1$ +Molybdenum as Sodium Molybedate at 0.62 Kg/ha. and  $T_{14}$ = $T_1$ +Mn+Zn+Cu+B+ $M_0$ .

Treatments  $T_2$  to  $T_9$  by soil application and  $T_9$  to  $T_{14}$  by foliar spray.

## 3. DESIGN:

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

## 4. GENERAL:

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1962-66. (b) N.A. (c) Nil. (v) Nil. (vi) N.A. (vii) Nil.

## 5. RESULTS:

## 63(M.A.E.)

(i) 2602 Kg/ha. (ii) 216.9 Kg/ha. (iii) N.A. (iv) Av. yield of grain in Kg/ha.

Treatment	$T_0$	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$
Mean yield	2087	2757	2465	2809	2607	2525	2662	2632
	$T_8$	$T_9$	$T_{10}$	$T_{11}$	$T_{12}$	$T_{13}$	$T_{14}$	
	2862	2600	2610	2767	2500	2605	2542	

C.D.=306 Kg/ha.

## 64(M.A.E.)

(i) 2759 Kg/ha. (ii) 223.4 Kg/ha. (iii) N.A. (iv) Av. yield of grain in Kg/ha.

Treatment	$T_0$	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$
Mean yield	2126	2956	2858	2862	2999	2971	2627	2729
	$T_8$	$T_9$	$T_{10}$	$T_{11}$	$T_{12}$	$T_{13}$	$T_{14}$	
	2808	2825	2721	2861	2659	2834	2543	

C.D.=316 Kg/ha.

## 65(M.A.E.)

(i) 2637 Kg/ha. (ii) 325.2 Kg/ha. (iii) N.A. (iv) Av. yield of grain in Kg/ha.

Treatment	$T_0$	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$
Mean yield	2993	2758	2977	2674	2573	2842	2858	2607
	$T_8$	$T_9$	$T_{10}$	$T_{11}$	$T_{12}$	$T_{13}$	$T_{14}$	
	2506	2372	2254	2254	2661	2698	2725	

C.D.=460 Kg/ha.

Crop :- Paddy (*Kharif*).

Ref :- Mh. 63(115), 64(98).

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

Type :- 'MV'.

Object :—To find out the response of different Indian late varieties of Paddy to Nitrogen.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) N.A. (iii) 5.6.63/1.8.63 ; 10.6.64/18, 19.7.64. (iv) (a) 3 ploughings. (b) Transplanting. (c) N.A. (d) 30 cm. × 30 cm. (e) N.A. (v) 22.4 Kg/ha. of  $P_2O_5$  for  $N_1$  and  $N_2$  treatments. (vi) As per treatments. (vii) Unirrigated. (viii) Interculturings. (ix) N.A. ; 239 cm. (x) 16.11.63 ; 7.11.64.

## 2. TREATMENTS :

## Main-plot treatments :

11 Varieties :  $V_1=K-42$ ,  $V_2=Ambe\ mohar\ 157$ ,  $V_3=LK-248$ ,  $V_4=Varangal\ 487$ ,  $V_5=Chimansol-39$ ,  $V_6=Z-14$ ,  $V_7=Bholagira$ ,  $V_8=L-8$ . Luchai,  $V_9=Burma\ triple\ cross$ ,  $V_{10}=RBK-842$  and  $V_{11}=21-3-1$ .

## Sub-plot treatments :

3 levels of N as A/S :  $N_0=0$ ,  $N_1=44.8$  and  $N_2=89.6$  Kg/ha.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 11 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7.62 m. × 3.05 m. (b) 6.40 m. × 1.83 m. (v) 61 cm. × 61 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Tiller counts, height and yield of grain. (iv) (a) 1963—65 (65—N.A) (b) and (c) No. (v) and (vi) Nil; (vii) Error variances for main-plots as well as for sub-plots are heterogeneous. Hence results for individual years are presented under 5. Results.

## 5. RESULTS :

## 63(115)

(i) 2578 Kg/ha. (ii) (a) 511.7 Kg/ha. (b) 559.6 Kg/ha. (iii) Main effect of N is highly significant and that of V is significant. (iv) Av. yield of grain in Kg/ha.

	$V_1$	$V_2$	$V_3$	$V_4$	$V_5$	$V_6$	$V_7$	$V_8$	$V_9$	$V_{10}$	$V_{11}$	Mean
$N_0$	1110	1153	1196	1506	1698	1228	865	1570	997	1602	908	1258
$N_1$	2435	2541	2926	2744	2264	2466	2905	3238	3182	3485	2616	2799
$N_2$	3898	2904	4250	3535	3502	3204	3344	3588	4079	3940	4207	3677
Mean	2481	2199	2791	2595	2488	2296	2371	2799	2753	3009	2577	2578

C.D. for V marginal means=426.6 Kg/ha.

C.D. for N marginal means=238.4 Kg/ha.

## 64(98)

(i) 2155 Kg/ha. (ii) (a) 748.5 Kg/ha. (b) 372.5 Kg/ha. (iii) Main effects of N and V are highly significant. Interaction  $N \times V$  is significant. (iv) Av. yield of grain in Kg/ha.

	$V_1$	$V_2$	$V_3$	$V_4$	$V_5$	$V_6$	$V_7$	$V_8$	$V_9$	$V_{10}$	$V_{11}$	Mean
$N_0$	1025	1367	950	1452	1271	1292	1281	1762	1644	1110	1217	1306
$N_1$	1725	2477	1671	2435	2109	1698	2541	2787	2872	1954	1805	2189
$N_2$	2520	3118	2317	3161	2872	2178	3716	4165	3908	2509	2210	2970
Mean	1757	2321	1646	2349	2084	1723	2513	2905	2808	1858	1744	2155

C.D. for V marginal means = 623.8 Kg/ha.  
 C.D. for N marginal means = 158.6 Kg/ha.  
 C.D. for N means at the same level of V = 526.3 Kg/ha.  
 C.D. for V means at the same level of N = 757.3 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 63(220), 64(175), 65(61),**

**Site :- Agri. Res. Stn., Igatpuri.**

**Type :- 'MV'.**

Object :—To study the responses of different mid-late varieties to N levels.

### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Coarse to medium. (iii) 9.6 63/3.8.63 ; 10.6.64/17 ; 18.7.64 ; 11.6.65/26.7.65. (iv) (a) 2 to 3 ploughings. (b) Transplanting. (c) 45 Kg/ha. (d) 30 cm. x 30 cm. (e) 4. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Interculturings. (ix) 175 cm. ; 170 cm. ; 267 cm. (x) 15.11.63 ; 28, 29.10.64 ; 3.11.65.

### 2. TREATMENTS :

#### Main-plot treatments :

6 varieties :  $V_1$ =Bhadas 1303,  $V_2$ =Panvel 61,  $V_3$ =Z-63,  $V_4$ =Varangal-9,  $V_5$ =26-2 and  $V_6$ =A-67.

#### Sub-plot treatments :

3 levels of manures :  $M_0$ =0,  $M_1$ =44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$  and  $M_2$ =89.6 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ .

N applied in two equal doses, half at transplanting and other half one month after planting. P applied at transplanting.

### 3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7.32 m. x 3.05 m. (b) 6.40 m. x 1.83 m. (v) 61 cm. x 61 cm. (vi) Yes.

### 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-65. (b) and (c) No. (v) Vadgaon. (vi) Nil (vii) In 1965 design was changed i.e. manures were applied as main-plot treatments and varieties as sub-plot treatments. In the case of expts. for 63 and 64 error variances for main-plots are homogeneous while those for sub-plots are heterogeneous. Hence results for individual years are presented under 5. Results.

### 5. RESULTS :

#### 63(220)

(i) 1632 Kg/ha. (ii) (a) 414.3 Kg/ha. (b) 323.8 Kg/ha. (iii) Main effects of V and M are highly significant. Interaction V x M is significant. (iv) Av. yield of grain in Kg/ha.

	$V_1$	$V_2$	$V_3$	$V_4$	$V_5$	$V_6$	Mean
$M_0$	1232	897	790	688	1111	1217	989
$M_1$	2008	1292	1281	1980	2043	2050	1776
$M_2$	2334	1965	1324	2531	2232	2043	2131
Mean	1858	1385	1132	1733	1795	1890	1632

C.D. for V marginal means = 360.4 Kg/ha.  
 C.D. for M marginal means = 190.8 Kg/ha.  
 C.D. for M means at the same level of V = 464.8 Kg/ha.  
 C.D. for V means at the same level of M = 537.2 Kg/ha.



64(175)

(i) 1563 Kg/ha. (ii) (a) 651.8 Kg/ha. (b) 242.6 Kg/ha. (iii) Main effect of V is significant. M effect is highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	Mean
M <sub>0</sub>	1100	825	897	1431	844	1378	1079
M <sub>1</sub>	1559	1185	1378	1965	1239	2200	1588
M <sub>2</sub>	2050	1602	1869	2371	1506	2733	2022
Mean	1570	1204	1381	1922	1196	2104	1563

C.D. for V marginal means=568.0 Kg/ha.

C.D. for M marginal means=142.2 Kg/ha.

65(61)

(i) 1843 Kg/ha. (ii) (a) 515.1 Kg/ha. (b) 699.5 Kg/ha. (iii) Main effect of V is highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	Mean
M <sub>0</sub>	1709	880	1854	1713	1916	1640	1619
M <sub>1</sub>	1986	765	2315	2685	1877	1852	1913
M <sub>2</sub>	2366	1252	1437	2358	2315	2245	1996
Mean	2020	966	1869	2252	2036	1912	1843

C.D. for V marginal means=575.7 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 63(221), 64(176), 65(62).**

**Site :- Agri. Res. Stn., Igatpuri.**

**Type :- 'MV'.**

Object :- To study the responses of early varieties to N levels.

### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Coarse to medium black. (iii) 7.6.63/26.7.63 ; 10.6.64/17.7.64 ; 11.6.65/25.7.65. (iv) (a) 2 to 3 ploughings. (b) Transplanting. (c) 45 Kg/ha. (d) 30 cm. x 30 cm. (e) 4. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Inter-culturings. (ix) 172 cm ; 170 cm. ; 267 cm. (x) 24.10.63 ; 25.10.64 ; 20.10.65.

### 2. TREATMENTS :

#### Main-plot treatments :

5 varieties : V<sub>1</sub>=EK-70, V<sub>2</sub>=Patni-6, V<sub>3</sub>=D-6-2-2, V<sub>4</sub>=Kada 68-1 and V<sub>5</sub>=EB-17.

#### Sub-plot treatments :

3 manurial treatments : M<sub>0</sub>=0, M<sub>1</sub>=44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> and M<sub>2</sub>=89.6 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

N applied in two equal doses at planting and one month after planting.

### 3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7.62 x 3.05 m. (b) 6.40 m. x 1.83 m. (v) 61 cm. x 61 cm. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963—65. (b) and (c) No. (v) Vadgaon. (vi) Nil. (vii) Design changed in 1965 i. e. Manures applied in main-plots and varieties in sub-plots. In the case of expts for 1963 and 1964 error variances for main-plots as well as for sub-plots are heterogeneous. Hence results for individual years are presented under 5. Results.

## 5. RESULTS:

63(221)

(i) 1184 Kg/ha. (ii) (a) 340.9 Kg/ha. (b) 170.8 Kg/ha. (iii) Main effects of V and M and interaction  $V \times M$  are all highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	Mean
M <sub>0</sub>	542	493	965	645	756	680
M <sub>1</sub>	1200	1471	1674	884	1563	1358
M <sub>2</sub>	1151	1450	2091	1775	1691	1512
Mean	964	1138	1577	901	1337	1184

C.D. for V marginal means = 303.3 Kg/ha.

C.D. for M marginal means = 109.1 Kg/ha.

C.D. for M means at the same level of V = 224.1 Kg/ha.

C.D. for V means at the same level of M = 331.6 Kg/ha.

64(176)

(i) 1638 Kg/ha. (ii) (a) 474.1 Kg/ha. (b) 267.4 Kg/ha. (iii) Main effects of V and M are highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	Mean
M <sub>0</sub>	1096	438	1516	1068	1207	1065
M <sub>1</sub>	1410	1036	2200	1591	1719	1591
M <sub>2</sub>	1837	1559	3022	2178	2691	2257
Mean	1448	1011	2246	1612	1872	1638

C.D. for V marginal means = 422.5 Kg/ha.

C.D. for M marginal means = 170.9 Kg/ha.

65(62)

(i) 1806 Kg/ha. (ii) (a) 420.1 Kg/ha. (b) 379.9 Kg/ha. (iii) Main effects of M and V are highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	Mean
M <sub>0</sub>	1459	1017	1986	1339	1324	1425
M <sub>1</sub>	1976	1313	2802	1768	1766	1925
M <sub>2</sub>	2242	1249	2652	2225	1971	2068
Mean	1892	1193	2480	1777	1687	1806

C.D. for M marginal means = 325.0 Kg/ha.

C.D. V marginal means = 314.8 Kg/ha.

Crop :- Paddy (Kharif).

Ref :- Mh. 63(109), 64(95), 65(20).

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

Type :- 'MV'.

Object :—To study the responses of improved early strains of Paddy to Nitrogen.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Medium black soil. (iii) 15.7.63 ; 10.7.64 ; 11.6.65/5.7.65. (iv) (a) Ploughing. (b) Transplanting. (c) 25 Kg/ha. (d) 30 cm.×15 cm ; 23 cm.×10 cm ; 30 cm.×15 cm. (e) 4. (v) 22.4 Kg/ha. of  $P_2O_5$ . (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) N A. for 63 and 64 ; 316 cm. for 65. (x) 4.6.63 ; 6.10.64 ; 11.10.65.

## 2. TREATMENTS :

## Main-plot treatments :

3 levels of N :  $N_0=0$ ,  $N_1=44.8$  and  $N_2=89.6$  Kg/ha.

## Sub-plot treatments :

5 varieties :  $V_1=EK-70$  ;  $V_2=Patni 6$ ,  $V_3=D-6-2-2$ ,  $V_4=Kada 68-1$  and  $V_5=EB-17$ .

## 3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 5 sub-plots/main-plot. (b) 21.95 m.×13.72 m. (iii) 4. (iv) (a) 7.32 m.×2.74 m. (b) 6.10 m.×1.52 m. (v) 61 cm.×61 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Bacterial Blight in  $V_4$  in 63. Nil. (iii) Yield of grain. (iv) (a) 1963—65. (b) Yes. (c) Results for combined analysis are presented under 5. Results. (v) Vadgaon. (vi) Heavy rains in Aug., 63. (vii) Error variances for main-plot treatments are homogeneous. Error variances for sub-plots treatments are homogeneous.

## 5. RESULTS :

## Pooled results :

(i) 2219 Kg/ha. (ii) (a) 281.3 Kg/ha. (based on 18 d.f. made up of pooled error). (b) 317.5 Kg/ha. (based on 103 d.f. made up of pooled error). (iii) Main effects of N and V are highly significant. (iv) Av. yield of grain in Kg/ha.

	$V_1$	$V_2$	$V_3$	$V_4$	$V_5$	Mean
$N_0$	1624	1252	1777	1579	1750	1596
$N_1$	2544	1752	2378	2452	2493	2324
$N_2$	2969	2197	2939	2775	2800	2736
Mean	2379	1734	2365	2269	2348	2219

C.D. for N marginal means=107.9 Kg/ha.

C.D. for V marginal means=146.7 Kg/ha.

## Individual results :

Treatment	$N_0$	$N_1$	$N_2$	Sig.	$V_1$	$V_2$	$V_3$	$V_4$	$V_5$	Sig.
Year										
1963	1351	1851	2250	**	2120	1501	1793	1824	1849	**
1964	1368	2180	2639	**	2368	1292	2361	2053	2238	**
1965	2070	2940	3320	**	2649	2409	2940	2929	2956	*
Pooled	1596	2324	2736	**	2379	1734	2365	2269	2348	**

Treatment	G.M.	S.E./plot	
		Main	Sub
Year 1963	1817	179.8	319.7
1964	2062	321.8	307.9
1965	2777	318.9	324.6
Pooled	2219	281.3	317.5

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 63(113), 64(99), 65(18).**

**Site :- Agri Res. Stn, Karjat.**

**Type :- 'MV'.**

**Object :-** To study the responses of improved mid-late strains of Paddy to Nitrogen.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) 44.8 kg/ha of N+22.4 kg/ha of  $P_2O_5$ . (ii) Medium black. (iii) 17.7.63; 14.7.64; 11-6-65/27, 28-7-65. (iv) (a) Ploughing. (b) Transplanting. (c) N.A. (d) 30 cm. x 15 cm.; 23 cm. x 15 cm.; 30 cm. x 15 cm. (e) 4. (v) 22.4 Kg/ha. of  $P_2O_5$ . (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and interculturing (ix) N.A. for 63 and 64; 316 cm. for 65 (x) 24.10.63; 26.10.64 and 9.11.64; 27.10.65.

**2. TREATMENTS :**

**Main-plot treatments**

3 levels of N:  $N_0=0$ ,  $N_1=44.8$  and  $N_2=89.6$  Kg/ha.

**Sub-plot treatments :**

6 varieties :  $V_1$ =Bhadas 1303,  $V_2$ =Panvel 61,  $V_3$ =Zinia-63,  $V_4$ =Varangal 1-9,  $V_5$ =26-2 and  $V_6$ =Antarsal-67.

**3. DESIGN**

(i) Split-plot. (ii) (a) 3 main-plots/replication; 6 sub-plots/main-plot. (b) N.A (iii) 4. (iv) (a) 7.62 m x 3.05 m. (b) 6.40 m x 1.83 m. (v) 61 cm. x 61 cm. (vi) Yes.

**4. GENERAL**

(i) Satisfactory (ii) Bacterial blight in Sept., 63. (iii) Yield of grain. (iv) (a) 1963-65. (b) Yes. (c) Results of combined analysis are presented under 5. Results. (v) Vadgaon and Igatpuri. (vi) Heavy rains in Aug., 63. (vii) Error variances for main-plots are heterogeneous and main-treatments x years interaction is present. Error variances for sub-plots are homogeneous and sub plots treatments x years interaction is absent.

**5. RESULTS :**

**Pooled results**

(i) 2066 Kg/ha. (ii) (a) 666.8 Kg/ha. (based on 4 d.f. made up of treatments x years interaction). (b) 239.1 Kg/ha. (based on 135 d.f. made up of pooled error). (iii) Main effects of N and V are highly significant. Interaction N x V is highly significant (iv) Av. yield of grain in Kg/ha.

	$V_1$	$V_2$	$V_3$	$V_4$	$V_5$	$V_6$	Mean
$N_0$	1816	1230	1441	1472	1648	1524	1520
$N_1$	2771	1956	2009	2158	2309	1858	2177
$N_2$	3145	2112	2457	2480	2669	2145	2501
Mean	2557	1766	1969	2037	2205	1842	2066

C.D. for N marginal means = 308.5 Kg/ha.  
 C.D. for V marginal means = 110.4 Kg/ha.  
 C.D. for V means at the same level of N = 191.3 Kg/ha.  
 C.D. for N means at the same level of V = 349.9 Kg/ha.

## Individual results

Treatment	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Sig.	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	Sig.
Years											
1963	1287	1914	2114	**	2431	1328	1486	1611	1895	1882	**
1964	1828	2712	3074	**	3096	2430	2616	2334	2583	2169	**
1965	1446	1904	2314	**	2205	1540	1805	2166	2139	1475	**
Pooled	1520	2177	2501	**	2577	1766	1969	2037	2205	1842	**

G.M.	S.E./plot	
	Main	Sub
1772	451.9	208.4
2538	115.3	229.0
1888	294.4	276.2
2066	666.8	239.1

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 63 (239), 64 (167), 65 (19).**

**Site :- Agri. Res. Stn., Karjat**

**Type :- 'MV'.**

**Object :-** To study the effect of improved late strains of Paddy to Nitrogen.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black soil (iii) 12.6.63/17.7.63; 13.6.64/N.A.; 11.6.65/28.7.65. (iv) (a) 2 ploughings. (b) Transplanting. (c) N.A.; 37 Kg/ha.; 25 Kg/ha. (d) 30 cm. x 15 cm. (e) 4. (v) 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) As per treatments (vii) Unirrigated. (viii) Interculturing and weeding. (ix) N.A.; 290 cm.; 316 cm. (x) 15, 20.11.63; 9 and 23.11.64; 12 and 22.11.65.

## 2. TREATMENTS :

## Main-plot treatments :

3 levels of N : N<sub>0</sub>=0, N<sub>1</sub>=44.8 and N<sub>2</sub>=89.6 Kg/ha.

## Sub-plot treatments :

11 varieties : V<sub>1</sub>=K-42, V<sub>2</sub>=Ambe mohor, V<sub>3</sub>=L.K.-248, V<sub>4</sub>=Varangal-487, V<sub>5</sub>=Chimansal-39, V<sub>6</sub>=Zunia-14, V<sub>7</sub>=Bhotagira, V<sub>8</sub>=R-8-luchai, V<sub>9</sub>=Burma triple cross, V<sub>10</sub>=R.E.K.-8-42 and V<sub>11</sub>=K 21-3-1.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication; 11 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) 7.62 m x 3.05 m. (v) 6.40 m x 1.83 m. (vi) 61 cm. x 61 cm. (vii) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-65. (b) Yes. (c) No. (v) Vadgaon. (vi) Nil. (vii) Error variances for main-plots are homogeneous and error variances for sub-plots are heterogeneous. Hence results for individual years are given under 5. Results.

## 5. RESULTS :

63(239)

- (i) 1848 Kg/ha. (ii) (a) 294.2 Kg/ha. (b) 259.6 Kg/ha. (iii) Main effects of N and V are highly significant  
(iv) Av.-yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	V <sub>11</sub>	Mean
N <sub>0</sub>	1378	1387	1293	1669	530	1113	1703	1948	2170	1139	1478	1437
N <sub>1</sub>	1797	1774	1794	2033	914	1538	2064	2586	2793	1589	1859	1886
N <sub>2</sub>	1939	2087	2039	2429	1133	1714	2537	3110	3215	1951	2272	2220
Mean	1705	1749	1709	2044	859	1455	2101	2548	2726	1560	1870	1848

C.D. for N marginal means=201.1 Kg/ha.

C.D. for V marginal means=244.7 Kg/ha.

64(167)

- (i) 2541 Kg/ha. (ii) (a) 198.7 Kg/ha. (b) 250.6 Kg/ha. (iii) Main effects of N and V are highly significant.  
(iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	V <sub>11</sub>	Mean
N <sub>0</sub>	2129	1503	1914	2092	1988	2014	1895	2064	2176	2051	2126	1996
N <sub>1</sub>	2884	1958	2462	2604	2492	2640	2251	2660	2496	2931	2850	2566
N <sub>2</sub>	3281	2706	3158	2967	2936	2964	2932	2909	3484	3178	3175	3063
Mean	2765	2056	2511	2554	2462	2539	2359	2544	2719	2720	2717	2541

C.D. for N marginal means=135.7 Kg/ha.

C.D. for V marginal means=236.2 Kg/ha.

65(19).

- (i) 1401 Kg/ha. (ii) (a) 341.2 Kg/ha. (b) 405.2 Kg/ha. (iii) Main effects of N and V are highly significant.  
(iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	V <sub>11</sub>	Mean
N <sub>0</sub>	1390	142	1168	1905	1130	1438	51	34	629	957	1615	951
N <sub>1</sub>	1686	820	1688	2309	1680	1919	290	77	1298	1321	1908	1363
N <sub>2</sub>	2215	1410	2605	2597	2082	2301	888	632	1674	1942	2440	1890
Mean	1764	791	1820	2270	1631	1886	410	248	1200	1407	1988	1401

C.D. for N marginal means=233.2 Kg/ha.

C.D. for V marginal means=382.0 Kg/ha.

**Crop :- Paddy (Kharif).****Ref :- Mb. 65(172).****Site :- Khar Land Res. Stn., Panvel.****Type :- 'MV'**

Object:- To find out the effect of different forms of Nitrogen on different varieties. (drain distance 200 meters).

**1. BASAL CONDITIONS :**

(i) (a) Paddy—Paddy. (b) Paddy. (c) N.A. (ii) Highly saline soil. (iii) 8.6.65/8.7.65. (iv) (a) N.A. (b) Seeds were broadcasted on raised seed beds. (c) 24.7 Kg/ha. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding. (ix) 11.4 cm. (x) October, 65.

**2. TREATMENTS:**

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

(1) 4 Sources of N:  $S_1=A/S$ ,  $S_2=Urea$ ,  $S_3=C/A/N$  and  $S_4=A/S/N$ .

(2) 2 Levels of N:  $L_1=22.4$  and  $L_2=44.8$  Kg/ha.

(3) 2 Varieties of Paddy:  $V_1=K-42$  and  $V_2=47-22$ .

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 11.88 m. x 6.85 m. (b) 10.06 m. x 5.03 m. (v) 91 cm. x 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Germination satisfactory. Crop stand good. (ii) Nil. (iii) Yield of grain. (iv) to (vii) No.

**5. RESULTS :**

(i) 1651 Kg/ha. (ii) 313.7 Kg/ha. (iii) Main effect of S is significant. (iv) Av. yield of grain in Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>	Mean
S <sub>1</sub>	1326	1473	1487	1311	1399
S <sub>2</sub>	1656	1987	1799	1843	1821
S <sub>3</sub>	1925	1621	1843	1703	1773
S <sub>4</sub>	1735	1490	1715	1510	1612
Mean	1660	1643	1711	1592	1651
V <sub>1</sub>	1715	1707			
V <sub>2</sub>	1605	1578			

C.D. for S marginal means=233.1 Kg/ha.

**Crop :- Paddy (Kharif).****Ref :- Mb 65(173).****Site :- Khar Land Res. Stn., Panvel.****Type 'MV'.**

Object: - To find out suitable Paddy varieties with Nitrogen requirements in Khar land. (drain distance 200 meters).

**1. BASAL CONDITIONS:**

(i) Paddy—Paddy. (b) Paddy. (c) Nil. (ii) Highly saline soil. (iii) 8.6.65/8.7.65. (iv) (a) N.A. (b) Seeds broadcasted on raised seed beds. (c) 24.7 Kg/ha. (d) and (e) N.A. (v) Nil. (vi) As per treatments (vii) Unirrigated. (viii) Weeding. (ix) 11.4 cm. (x) October, 65.

## 2. TREATMENTS:

All combination of (1) and (2)

(1) 3 levels of N :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(2) 4 Varieties :  $V_1=K-42$ ,  $V_2=Bhadas$ ,  $V_3=E.K. 70$ ,  $V_4=47-22$ .

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) 11.88 m.  $\times$  6.85 m. (b) 10.06 m.  $\times$  5.03 m.  
(v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Germination good. Crop stand satisfactory. (ii) Nil. (iii) Yield of grain. (iv) to (vii) No.

## 5. RESULTS :

(i) 2086 Kg/ha. (ii) 293.2 Kg/ha. (iii) Main effect of V is significant. (iv) Av. yield of grain in Kg/ha.

	$V_1$	$V_2$	$V_3$	$V_4$	Mean
$N_0$	1252	2036	3262	1417	1992
$N_1$	1463	2570	2637	1239	2227
$N_2$	1278	2102	3262	1509	2038
Mean	1331	2236	3387	1388	2086

C.D. for V marginal means = 286.7 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 65(174).**

**Site :- Khar Land Res. Stn., Panvel.**

**Type :- 'MV'.**

**Object :-** To find out the effect of different forms of Nitrogen on different varieties. (Drain distance 400 meters).

## 1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) N.A. (ii) Highly saline soil. (iii) 8.6.65/10.7.65. (iv) (a) N.A.  
(b) Seeds were broadcasted on raised seed beds. (c) 24.7 Kg/ha. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding. (ix) 11.4 cm. (x) October, 65.

## 2. TREATMENTS :

Same as in Expt. No. 65(172) on page No. 65.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 11.88 m.  $\times$  6.85 m. (b) 10.06 m.  $\times$  5.03 m.  
(v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Germination good. Crop stand satisfactory. (ii) Nil. (iii) Yield of grain. (iv) to (vii) No.

## 5. RESULTS :

(i) 1288 Kg/ha. (ii) 308.3 Kg/ha. (iii) Main effect of S is significant. (iv) Av. yield of grain in Kg/ha.



	L <sub>1</sub>	L <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>	Mean
S <sub>1</sub>	969	1021	991	939	965
S <sub>2</sub>	1201	1601	1347	1455	1401
S <sub>3</sub>	1584	1431	1542	1473	1507
S <sub>4</sub>	1164	1196	1211	1242	1280
Mean	1265	1312	1274	1302	1288
V <sub>1</sub>	1233	1316			
V <sub>2</sub>	1296	1308			

C.D. for S marginal means=219.3 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 64(188), 65(23).**

**Site :- Agri. Res. Str., Ratna jiri.**

**Type :- 'MV'.**

**Object :-** To study the responses of improved strains of Paddy to fertilizers.

**1. BASAL CONDITIONS:**

(i) (a) Not fixed. (b) Paddy; *Kulthi*. (c) N.A. (ii) N.A. (iii) 15.6.64/7 to 9.7.64; 12.6.65/25.7.65. (iv) (a) 4 ploughings. (b) Transplanting on raised bed. (c) 13 Kg/ha. (d) 23 cm. x 15 cm. (e) 2. (v) Nil. 12.4 C.L./ha. of Compost and 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. broadcasted at planting. (vi) As per treatments. (vii) Unirrigated. (viii) 3 interculturings and 1 weeding. (ix) N.A.; 204 cm. (x) 4.11.64; 30.10.65.

**2. TREATMENTS:**

**Main-plot treatments:**

3 levels of fertilizers: M<sub>0</sub>=Control (no manure), M<sub>1</sub>=44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> and M<sub>2</sub>=89.6 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

**Sub-plot treatments:**

4 varieties: V<sub>1</sub>=Panvel-61, V<sub>2</sub>=Warangal-9, V<sub>3</sub>=26-2 and V<sub>4</sub>=A-67.

N as A/S and P<sub>2</sub>O<sub>5</sub> as Super. broadcasted at planting.

**3. DESIGN:**

(i) Split-plot. (ii) (a) 4 sub-plots/main-plot.; 3 main-plots/replication. (b) 16.47 m. x 10.92 m. (iii) 4. (iv) (a) 5.49 m. x 2.73 m. (b) 4.57 m. x 2.13 m. (v) 46 cm. x 30 cm. (vi) Yes.

**4. GENERAL:**

(i) Satisfactory. (ii) Dusting of BHC 5% for the control of blue beetle. (iii) Yield of grain. (iv) (a) 1964-66. (b) No. (c) Nil. (v) to (vii) Nil.

**5. RESULTS:**

**64(188)**

(i) 2992 Kg/ha. (ii) (a) 666.4 Kg/ha. (b) 419.0 Kg/ha. (iii) Main effect of M is highly significant. (iv) Av. yield of grain in Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	Mean
V <sub>1</sub>	2430	3042	3511	2994
V <sub>2</sub>	2442	3342	3693	3159
V <sub>3</sub>	2150	2791	3596	2846
V <sub>4</sub>	2407	3034	3471	2970
Mean	2357	3052	3567	2992

C.D. for M marginal means=577 Kg/ha

65(23)

(i) 2644 Kg/ha. (ii) (a) 983.1 Kg/ha. (b) 530.1 Kg/ha. (iii) Main effect of M is significant. (iv) Av. yield of grain in Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	Mean
V <sub>1</sub>	2145	2483	3103	2577
V <sub>2</sub>	1781	2391	2588	2253
V <sub>3</sub>	1827	2839	3698	2788
V <sub>4</sub>	2476	2811	3588	2958
Mean	2057	2631	3244	2644

C.D. for M marginal means=851 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 64(189), 65(24).**

**Site :- Agri. Res. Stn., Ratnagiri.**

**Type :- 'MV'.**

Object.—To study the effect of improved late strains of Paddy to Nitrogen.

**1. BASAL CONDITIONS:**

(i) (a) Nil. (b) *Kulthi*. (c) N.A. (ii) N.A. (iii) 16.6.64/17.7.64 ; 12.6.65/16.7.65. (iv) (a) 4 ploughings. (b) Transplanting. (c) 13.4 Kg/ha. (d) 30 cm. × 15 cm. (e) 4. (v) Nil ; 12.35 C.L./ha. of Compost and 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) As per treatments. (vii) Unirrigated. (viii) 3 interculturing and 1 weeding. (ix) N.A. ; 20.38 cm. (x) 15, 16.11.64 ; 9.11.65.

**2. TREATMENTS:**

**Main-plot treatments:**

3 levels of manures : M<sub>0</sub>=0, M<sub>1</sub>=44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> and M<sub>2</sub>=89.6 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

**Sub-plot treatments :**

7 varieties : V<sub>1</sub>=K-42, V<sub>2</sub>=Ambemohor 157, V<sub>3</sub>=L.K.-248, V<sub>4</sub>=Warangal-487, V<sub>5</sub>=Chimansal-39, V<sub>6</sub>=Ziniya-14, V<sub>7</sub>=Bholagira.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 7 sub-plots/main-plot. (b) N.A. (iv) (a) 5.47 m. × 2.73 m. (b) 4.87 m. × 2.13 m. (v) 30 cm. × 30 cm. (v) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) BHC 5% dusted for blue beetle. (iii) Yield of grain. (iv) (a) 1964-66. (b) No. (c) Nil. (v) to (vii) Nil.

**5. RESULTS :**

64(189)

(i) 2717 Kg/ha. (ii) (a) 1151.3 Kg/ha. (b) 460.8 Kg/ha. (iii) Main effect of V is significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	Mean
M <sub>0</sub>	1730	1747	2124	2715	2383	2667	2093	2208
M <sub>1</sub>	3003	2297	3352	3395	3152	2914	2508	2946
M <sub>2</sub>	2943	2770	3270	3847	2655	3198	2299	2997
Mean	2559	2271	2915	3319	2730	2926	2300	2717

C.D. for V marginal means=414 Kg/ha.

65(24)

(i) 1993 Kg/ha. (ii) (a) 1272.1 Kg/ha. (b) 460.2 Kg/ha. (iii) Main effect of V's significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	Mean
M <sub>0</sub>	1740	1557	1530	2207	1860	1720	1891	1801
M <sub>1</sub>	2153	1329	1629	2689	2220	1886	2098	2000
M <sub>2</sub>	1927	1915	1985	2869	2655	1949	1958	2180
Mean	1940	1600	1715	2621	2245	1852	1982	1993

C.D. for V marginal means = 413 Kg/ha.

Crop :- Paddy (*Kharif*).

Ref :- Mh. 64(190), 65(25).

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

Type :- 'MV'.

Object :- To find out the response of various early varieties to different doses of fertilisers.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy; *Kulhi*. (c) N.A. (ii) N.A. (iii) 15.6.64/11.7.64; 12.6.65/4.7.65. (iv) (a) 4 ploughings. (b) Transplanting. (c) 13 Kg/ha. (d) 23 cm. x 10 cm. (e) 4. (v) 12.4 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. broadcasted at planting. (vi) As per treatments. (vii) Unirrigated. (viii) 1 weeding. (ix) N.A.; 20 cm. (x) 6.10.64; 30.1.65.

2. TREATMENTS:

Main-plot treatments:

3 levels of fertilisers: M<sub>0</sub>=C, M<sub>1</sub>=44.8 Kg/ha. of N as A/S+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. and M<sub>2</sub>=2 x M<sub>1</sub>.

Sub-plot treatments:

4 varieties: V<sub>1</sub>=E.K.-70, V<sub>2</sub>=Patni-6, V<sub>3</sub>=D-622 and V<sub>4</sub>=Kada 68-1.

Manures applied by broadcast at planting.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/replication; 4 sub-plots/main-plot. (b) 16.46 m. x 10.37 m. (iii) 4. (iv) (a) 5.49 m. x 2.74 m. (b) 4.67 m. x 2.29 m. (v) 41 cm. x 23 cm. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Crop dusted with 5% B.H.C. powder for blue beetles. (iii) Yield of grain. (iv) (a) 1964-65. (b) No. (c) Presented under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances for main-plots are homogeneous and main plot Treatments x years interaction is present. Error variances for sub-plots are homogeneous and sub-treatments x years interactions is present.

5. RESULTS:

Pooled results

(i) 3032 Kg/ha. (ii) (a) 1664.8 Kg/ha. (based on 2 d.f. made up of main-treatments x years interaction). (b) 589.0 Kg/ha. (based on 9 d.f. made up of interaction of V and V x M with years). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	Mean
V <sub>1</sub>	2630	3439	3403	3157
V <sub>2</sub>	2199	3334	3005	2846
V <sub>3</sub>	2388	3382	3760	3177
V <sub>4</sub>	2268	3260	3318	2949
Mean	2371	3354	3372	3032

## Individual results

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	Sig.	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	Sig.
Year 1964	2410	3126	2823	*	3022	2397	3046	2679	**
1965	2332	3582	3921	**	3293	3295	3307	3218	N.S.
Pooled	2371	3354	3372	N.S.	3157	2846	3177	2949	N.S.

G.M.	S.E./plot	
	Main	Sub
2786	580.6	319.4
3278	433.8	336.5
3032	1664.8	589.0

Crop :- Paddy (Kharif).

Ref :- Mh. 63(281), 64(239), 65(175),

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

Type :- 'MV'.

Object :- To study the responses of improved strains of Paddy to Nitrogen.

## 1. BASAL CONDITIONS:

(i) (a) Paddy—Paddy. (b) Paddy. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Sandy loam. (iii) 20.6.63/5.7.63; 27.6.64/19.7.64; 20.6.65/2.9.65. (iv) (a) 3 ploughings and puddling. (b) Transplanting. (c) N.A. (d) 23 cm. × 10 cm. (e) 4. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 weedings and hoeings. (ix) 174 cm.; 127 cm.; N.A. (x) 29.10.63; 1st week of October, 64; 2nd week of November, 65.

## 2. TREATMENTS:

## Main-plot treatments:

3 manurial treatments: M<sub>0</sub>=0, M<sub>1</sub>=44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> and M<sub>2</sub>=89.7 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

## Sub-plot treatments:

5 varieties: V<sub>1</sub>=E.K.-70, V<sub>2</sub>=Patni-6, V<sub>3</sub>=D-622, V<sub>4</sub>=Kada 68-1 and V<sub>5</sub>=E.B.-17. N Applied as A/S, half at planting and half one month after planting; P<sub>2</sub>O<sub>5</sub> as Super.

## 3. DESIGN:

(i) Split-plot. (ii) (a) 3 main plots/replication, 5 sub-plots/main-plot. (b) N.A. (iii) 4 (effective 3 for 63; 3 for 64; 4 for 65. (iv) (a) N.A.; 7.62 m. × 3.05 m.; 5.49 m. × 1.83 m. (b) 5.49 m. × 2.13 m.; 6.40 m. × 1.83 m.; 4.88 m. × 1.52 m. (v) N.A.; 61 cm. × 61 cm.; 30 cm. × 15 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory except some lodging in 64. (ii) Dusting and spraying of BHC and Endrine. (iii) Yield of grain. (iv) (a) 1963-65. (b) No. (c) Nil. (v) N.A. (vi) Abnormal rains and late transplanting in 65. (vii) In one replication variety D-622 failed so it is not taken for analysis in 63. Error variances for main-plots and sub-plots are heterogeneous. Hence results for individual years are presented under 5. Results.

## 5. RESULTS :

## 63(281)

(i) 3387 Kg/ha. (ii) (a) 1169.4 Kg/ha. (b) 772.2 Kg/ha. (iii) Main effect of V is highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	Mean
M <sub>0</sub>	3380	3132	4291	3502	4929	3707
M <sub>1</sub>	3508	2144	4089	2697	4639	3415
M <sub>2</sub>	2426	1777	4229	2708	4061	3040
Mean	3105	2351	4203	2969	4309	3387

C.D. for V marginal means=751.3 Kg/ha.

## 64(239)

(i) 2312 Kg/ha. (ii) (a) 404.9 Kg/ha. (b) 456.7 Kg/ha. (iii) Main effect of M is significant. Main effect of V is highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	Mean
M <sub>0</sub>	1344	1509	2193	1896	2355	1859
M <sub>1</sub>	2440	1936	2548	2711	3161	2559
M <sub>2</sub>	2050	1885	2933	2768	2947	2517
Mean	1945	1777	2558	2458	2821	2312

C.D. for M marginal means=410.4 Kg/ha.

C.D. for V marginal means=444.3 Kg/ha.

## 65(195)

(i) 662 Kg/ha. (ii) (a) 141.2 Kg/ha. (b) 97.2 Kg/ha. (iii) Main effect of M is significant. Main effect of V is highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	Mean
M <sub>0</sub>	314	474	700	832	542	572
M <sub>1</sub>	469	494	900	1026	759	730
M <sub>2</sub>	394	558	925	886	658	648
Mean	302	509	842	915	653	662

C.D. for M marginal means=109.2 Kg/ha.

C.D. for V marginal means=80.6 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 63(282), 64(240), 65(176).**

**Site :- Agri Res. Stn., Shindewahi.**

**Type :- 'MV'.**

**Object :-** To study the responses of improved strains of Paddy to Nitrogen.

**1. BASAL CONDITIONS:**

(i) (a) Paddy—Paddy. (b) Paddy. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Sandy loam. (iii) 20.6.63/7.8.63; 28.6.64/26.7.64; 21.6.65/8.9.65. (iv) (a) Ploughing and puddling. (b) Transplanting. (c) N.A. (d) 23 cm. x 15 cm. (e) 4. (v) FYM at 12.35 C.L./ha. (vi) As per treatments. (vii) Irrigated. (viii) Interculturing and hand weeding. (ix) 174 cm.; 127 cm.; N.A. (x) 10.11.63; 28.10.64; 29.11.65 and 4.12.65.

**2. TREATMENTS:**

**Main-plot treatments:**

3 manurial treatments:  $M_0=0$ ,  $M_1=44.8$  Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$  and  $M_2=89.6$  Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ .

**Sub-plot treatments:**

6 varieties:  $V_1$ =Bhadas-1303,  $V_2$ =Panvel-61,  $V_3$ =Z-63,  $V_4$ =W-1-9,  $V_5$ =26-2 and  $V_6$ =A-67.

**3. DESIGN:**

(i) Split-plot. (ii) (a) 3 main-plots/replication, 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7.62 m. x 3.05 m. (b) 5.49 m. x 2.13 m. (v) 106 cm. x 46 cm. (vi) Yes.

**4. GENERAL:**

(i) Satisfactory. (ii) Mild attack of Paddy case-worm; dusting and spraying of BHC and Endrine. (iii) Yield of grain. (iv) (a) 1955-65. (b) No. (c) No. (v) N.A. (vi) Nil. (vii) Error variances for main-plots are heterogeneous. Error variances for sub-plot are also heterogeneous. Hence results for individual years are presented under 5. **Result:**

**5. RESULTS:**

**63(282)**

(i) 3290 Kg/ha. (ii) (a) 1172.4 Kg/ha. (b) 679.2 Kg/ha. (iii) Main effect of V is highly significant. (iv) Av. yield of grain in Kg/ha.

	$V_1$	$V_2$	$V_3$	$V_4$	$V_5$	$V_6$	Mean
$M_0$	3652	4920	1538	2259	2881	3853	3184
$M_1$	3951	5003	1815	2116	3755	4165	3517
$M_2$	3780	5341	1448	1864	3133	3445	3163
Mean	3794	5188	1600	2080	3256	3821	3290

C.D. for V marginal means = 559.0 Kg/ha.

**64(240)**

(i) 3564 Kg/ha. (ii) (a) 336.5 Kg/ha. (b) 454.5 Kg/ha. (iii) Main effects of N and V are highly significant. Interaction  $M \times V$  is significant. (iv) Av. yield of grain in Kg/ha.

	$V_1$	$V_2$	$V_3$	$V_4$	$V_5$	$V_6$	Mean
$M_0$	3567	3994	2178	3214	3139	3812	3317
$M_1$	4741	4314	2648	3107	3684	5072	3928
$M_2$	4111	4709	2189	3022	3289	3355	3446
Mean	4140	4339	2338	3114	3371	4080	3564

C.D. for M marginal means = 237.7 Kg/ha.  
 C.D. for V marginal means = 374.1 Kg/ha.  
 C.D. for V means at the same level of M = 647.9 Kg/ha.  
 C.D. for M means at the same level of V = 309.2 Kg/ha.

65(176)

(i) 1350 Kg/ha. (ii) (a) 204.5 Kg/ha. (b) 139.1 Kg/ha. (iii) Main effects of M and V are highly significant, (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	Mean
N <sub>0</sub>	1335	769	572	1121	1132	1655	1097
M <sub>1</sub>	1623	1335	844	1709	1506	2275	1549
M <sub>2</sub>	1463	1196	886	1559	1420	1901	1404
Mean	1474	1100	767	1463	1353	1944	1350

C.D. for M marginal means = 144.4 Kg/ha.  
 C.D. for V marginal means = 114.5 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 63(283), 64(241), 65(177).**

**Site :- Agri. Res. Stn., Shindewahi.**

**Type :- 'MV'.**

**Object :-** To study the effect of improved strains of Paddy to Nitrogen.

#### 1. BASAL CONDITIONS:

(i) (a) Paddy—Paddy. (b) Paddy. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Sandy loam. (iii) 21.63/11.8.63 ; 27.6.64/23.7.64 ; 22.6.65/2.9.65. (iv) (a) 3 ploughings and puddling. (b) Transplanting. (c) N.A. (d) 30 cm. × 15 cm. (e) 4. (v) 12.4 C.L./ha. of F.Y.M. (vi) As per treatments. (vii) irrigated. (viii) 3 weedings and 2 hoeings. (ix) 174 cm. ; 127 cm. : N.A. (x) 21.11.63 ; 15.11.64 ; 7.12.65.

#### 2. TREATMENTS:

**Main-plot treatments:**

3 manurial treatments : M<sub>0</sub>=Control, M<sub>1</sub>=44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> and M<sub>2</sub>=89.6 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

**Sub-plot treatments:**

11 varieties : V<sub>1</sub>=K-42, V<sub>2</sub>=Ambe mohar-157, V<sub>3</sub>=L-K-248, V<sub>4</sub>=Warangal-487, V<sub>5</sub>=Chimansal-39, V<sub>6</sub>=Z-14, V<sub>7</sub>=Bholagira, V<sub>8</sub>=R-8—Luchai, V<sub>9</sub>=Burma triple cross, V<sub>10</sub>=21-3-1 and V<sub>11</sub>=R.E.K-8-42.

#### 3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 11 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. ; 7.62 m. × 3.05 m. ; 5.49 m. × 1.83 m. (b) 5.49 m. × 2.13 m. ; 6.40 m. × 1.83 m. ; 4.88 m. × 1.52 m. (v) N.A. ; 61 cm. × 61 cm. ; 30 cm. × 15 cm. (vi) Yes.

#### 4. GENERAL :

(i) Satisfactory. (ii) Mild attack of paddy case-worm ; spraying with B.H.C. and Endrine. (iii) Yield of grain. (iv) (a) 1963—65. (b) and (c) No. (v) N.A. (vi) Abnormal rains and late planting in 65. (vii) Error variances for main-plots and sub-plots are heterogeneous. Hence results for individual years are given under 5. Results :

#### 5. RESULTS:

63(283)

(i) 3171 Kg/ha. (ii) (a) 799.1 Kg/ha. (b) 561.1 Kg/ha. (iii) Main effect of V is highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	V <sub>11</sub>	Mean
M <sub>0</sub>	2423	1669	1543	2896	2959	2904	3352	3918	5220	1788	3041	2883
M <sub>1</sub>	3520	3169	1808	2463	2634	2759	4004	4157	6416	3232	3018	3380
M <sub>2</sub>	2924	2990	2030	2705	2973	3236	4046	4152	4249	3158	3189	3249
Mean	2956	2609	1794	2688	2855	2996	3801	4076	5295	2726	3083	3171

C.D. for V marginal means=529.0 Kg/ha.

64(241)

- (i) 3102 Kg/ha. (ii) (a) 1043.6 Kg/ha. (b) 630.8 Kg/ha. (iii) Main effect of V is highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	V <sub>11</sub>	Mean
M <sub>0</sub>	3175	2642	2178	1794	2762	2848	3075	4072	3844	3047	2022	2862
M <sub>1</sub>	2961	2492	2805	2648	3018	3759	3303	4570	4157	3275	3346	3303
M <sub>2</sub>	3631	3061	2791	3004	2534	3004	3260	3773	3873	3018	2591	3140
Mean	3256	2738	2591	2482	2771	3204	3213	4138	3958	3113	2653	3102

C.D. for V marginal means=594.6 Kg/ha.

65(177)

- (i) 1134 Kg/ha. (ii) (a) 176.7 Kg/ha. (b) 111.7 Kg/ha. (iii) Main effects of M and V and interaction M × V are highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	V <sub>11</sub>	Mean
M <sub>0</sub>	718	1009	796	706	975	1345	1110	1446	946	908	740	973
M <sub>1</sub>	897	1805	1345	946	857	998	1525	1502	1772	1009	1009	1242
M <sub>2</sub>	1155	1727	1076	1155	410	978	1715	1245	1738	1005	852	1187
Mean	923	1514	1072	936	747	1107	1450	1398	1485	974	867	1134

C.D. for M marginal means =120.7 Kg/ha.

C.D. for V marginal means =105.2 Kg/ha.

C.D. for M means at the same level of V=97.2 Kg/ha.

C.D. for V means at the same level of M=91.1 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 63(108), 64(94), 65(87).**

**Site :- Agri. Res. Stn., Vadgaon.**

**Type :- 'MV.'**

**Object :-** To study the responses of improved early strains of Paddy to different levels of N.

#### 1. BASAL CONDITIONS:

- (i) (a) Nil. (b) Paddy. (c) 12.4 C.L./ha. of F.Y.M. +44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) N.A. (iii) N.A./16.8.63; N.A./16.7.64; 3.6.65/19.7.65. (iv) (a) Ploughings and harrowing. (b) Transplanting. (c) N.A. (d) 23 cm. × 10 cm. for 63 and 64; 30 cm. × 15 cm. for 65. (e) 3-4. (v) 12 C.L./ha. of F.Y.M. +22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) As per treatments. (vii) Unirrigated. (viii) Interculturings. (ix) 25 cm.; 74 cm.; 92 cm. (x) 23.11.63; 13.10.64; 12.10.65.



## 2. TREATMENTS :

## Main-plot treatments :

3 levels of N :  $N_0=0$ ,  $N_1=44.8$  and  $N_2=89.6$  Kg/ha.

## Sub-plot treatments :

5 varieties :  $V_1=E.K. 70$ ,  $V_2=Patni-6$ ,  $V_3=D-6-2-2$ ,  $V_4=Kada 68-1$  and  $V_5=EB-17$ .

N applied in 2 equal doses, at transplanting and one month after planting.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 5 sub-plots/main-plot. (b) N.A. (iii) 4.  
(iv) (a) 6.10 m.  $\times$  3.05 m. (b) 4.88 m.  $\times$  1.83 m. (v) 61 cm.  $\times$  61 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Laying of Endrin baits twice. (iii) Yield of grain. (iv) (a) 1963-65. (b) and (c) No.  
(v) Karjat. (vi) Nil. (vii) Main-plot error variances and Sub-plot error variances are heterogeneous.  
Hence results for individual years are presented under 5. Results

## 5. RESULTS :

## 63(108)

(i) 2373 Kg/ha. (ii) (a) 846.5 Kg/ha. (b) 365.5 Kg/ha. (iii) Main effects of N and V are highly significant.  
(iv) Av. yield of grain in Kg/ha.

	$V_1$	$V_2$	$V_3$	$V_4$	$V_5$	Mean
$N_0$	1528	1525	1732	1962	1758	1701
$N_1$	2181	1348	2649	2430	2427	2327
$N_2$	2741	2918	3560	3025	3215	3092
Mean	2150	2133	2647	2472	2467	2373

C.D. for N marginal means = 655.0 Kg/ha.

C.D. for V marginal means = 302.9 Kg/ha.

## 64(74)

(i) 2999 Kg/ha. (ii) (a) 448.5 Kg/ha. (b) 416.0 Kg/ha. (iii) Main effects of N and V are highly significant.  
(iv) Av. yield of grain in Kg/ha.

	$V_1$	$V_2$	$V_3$	$V_4$	$V_5$	Mean
$N_0$	2772	1592	2621	3103	2349	2488
$N_1$	3355	1856	3417	3655	3097	3020
$N_2$	3742	2329	3714	4112	3549	3489
Mean	3190	1926	3258	3623	2998	2999

C.D. for N marginal means = 347.0 Kg/ha.

C.D. for V marginal means = 344.7 Kg/ha.

## 65(87)

(i) 2889 Kg/ha. (ii) (a) 199.7 Kg/ha. (b) 272.9 Kg/ha. (iii) Main effects of N and V are highly significant.  
(iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	Mean
N <sub>0</sub>	3125	2685	3350	3106	2663	2986
N <sub>1</sub>	2360	1917	2285	2439	2416	2283
N <sub>2</sub>	3728	3176	3638	3462	2988	3398
Mean	3071	2593	3091	3002	2689	2889

C.D. for N marginal means=142.8 Kg/ha.

C.D. for V marginal means=226.1 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 63(110), 64(96), 65(88).**

**Site :- Agri. Res. Stn., Vadgaon.**

**Type :- 'MV'.**

**Object :-**To study the response of improved mid-late strains of Paddy to different levels of N.

### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> in 63 and as per treatments in 64 and 65. (ii) N.A. (iii) 29.8.63; 4.8.64; 4.6.65/21.7.65. (iv) (a) Ploughings and harrowings. (b) Transplanting. (c) N.A. (d) 30 cm × 23 cm for 63; 30 cm. × 15 cm. for others. (e) 4. (v) 12.4 C.L./ha. of F.Y.M.+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> for 63; 22.4 Kg/ha. P<sub>2</sub>O<sub>5</sub> for others. (vi) As per treatments. (vii) Irrigated. (viii) 2 interculturings. (ix) 25 cm.; 69 cm.; 97 cm. (x) 15.12.63; 21.1.64; 4.11.65.

### 2. TREATMENTS :

**Main-plot treatments :**

3 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=44.8 and N<sub>2</sub>=89.6 Kg/ha.

**Sub-plot treatments :**

6 varieties : V<sub>1</sub>=Bhadra 1303, V<sub>2</sub>=Panvel 61, V<sub>3</sub>=Zinia-63, V<sub>4</sub>=Varangal-9, V<sub>5</sub>=26-2 and V<sub>6</sub>=A-67. N applied in two equal doses ; at transplanting and one month after transplanting.

### 3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7.62 m. × 3.05 m. (b) 6.4 m. × 1.83 m. (v) 61 cm. × 61 cm. (vi) Yes.

### 4. GENERAL :

(i) Normal. (ii) Attack of crabs ; laying of Endrin baits twice. (iii) Yield of grain. (iv) (a) 1963-65. (b) Yes. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Main plot error variances are homogeneous. Sub-plot error variances are also homogeneous. Main-plot Treatments × years interaction is absent. Sub-plot Treatments × years interaction is present.

### 5. RESULTS:

#### Pooled results

(i) 2612 Kg/ha. (ii) (a) 811.3 Kg/ha. (based on 22 d.f. made up of pooled error and Treatments × years interaction). (b) 676.6 Kg/ha. (based on 50 d.f. made up of interactions of V and V × N with years). (iii) Main effects of N and V are highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	Mean
N <sub>0</sub>	2268	1523	1390	2182	2446	2215	2004
N <sub>1</sub>	2930	2195	1829	2876	3205	2894	2655
N <sub>2</sub>	3613	2996	2278	3305	3670	3203	3177
Mean	2937	2238	1832	2788	3107	2770	2612

C.D. for N marginal means=280.4 Kg/ha.

C.D. for V marginal means=325.6 Kg/ha.

## Individual results :

Treatment	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Sig.	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	Sig.
Year											
1963	1879	2282	2709	**	2277	2395	1428	2227	2915	2499	**
1964	2030	2743	3515	**	3142	2313	2015	3033	3250	2823	**
1965	2103	2938	3308	**	3391	2006	2053	3102	3156	2989	**
Pooled	2004	2655	3177	**	2937	2238	1832	2788	3107	2770	**

G.M.	S.E./plot	
	Main	Sub
2290	574.1	533.1
2763	92.8	444.2
2783	826.8	424.3
2612	811.3	676.6

Crop :- Paddy (*Kharif*).

Ref :- Mb. 63(111), 64(97), 65(89).

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

Type :- 'MV'.

Object: -- To study the responses of improved late strains of Paddy to different levels of N.

## 1. BASAL CONDITIONS;

(i) (a) Nil. (b) Paddy. (c) 12 C.L./ha. of compost + 44.3 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> for 63; 44.8 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> for 64; N.A. for 65. (iii) 30.8.63; 26.7.64; 3.6.65/22.7.65. (iv) (a) Ploughing and harrowing. (b) Transplanting. (c) N.A. (d) 30 cm. x 15 cm. (e) 3-4. (v) 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) As per treatments. (vii) Unirrigated. (viii) 2 interculturings. (ix) 25 cm.; 69 cm.; 97 cm. (x) 18.12.63; 18.11.64; 19.11.65.

## 2. TREATMENTS :

**Main-plot treatments :**3 levels of N as A/S: N<sub>0</sub>=0, N<sub>1</sub>=44.8 and N<sub>2</sub>=89.6 Kg/ha.**Sub-plot treatments :**10 varieties: V<sub>1</sub>=K-42, V<sub>2</sub>=L-K-248, V<sub>3</sub>=Ambemohar-157, V<sub>4</sub>=Varangal-487, V<sub>5</sub>=Chimansal-39, V<sub>6</sub>=Z-14, V<sub>7</sub>=Bholagira, V<sub>8</sub>=R-8-Luchai, V<sub>9</sub>=Pure Japonica and V<sub>10</sub>=Pure hybrid.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication; 10 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 7.62 m. x 3.05 m. (b) 6.40 m. x 1.83 m. (v) 61 cm. x 61 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Attack of aphids. Laying of Endrin baits twice. (iii) Yield of grain. (iv) (a) 1963-65. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Main-plot error variances are heterogeneous and main-plot Treatments x years interaction could not be tested. Hence results for individual years are presented under 5. Results.

## 3. RESULTS:

63(111)

(i) 2578 Kg/ha. (ii) (a) 2104.1 Kg/ha. (b) 403.2 Kg/ha. (iii) Main effect of V is significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	Mean
N <sub>0</sub>	2021	2207	2708	2580	1703	2002	2047	2232	2289	2033	2182
N <sub>1</sub>	3084	2996	2702	2685	2176	2836	2033	2759	2705	2737	2671
N <sub>2</sub>	2836	3144	2850	2494	2959	2973	2312	3078	3104	3070	2882
Mean	2647	2782	2753	2586	2271	2601	2131	2690	2699	2613	2578

C.D. for V marginal means=381.3 Kg/ha.

64(97)

(i) 3231 Kg/ha. (ii) (a) 671.5 Kg/ha. (b) 294.7 Kg/ha. (iii) Main effects of N and V are highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	Mean
N <sub>0</sub>	2625	2859	2457	2742	2603	2500	3286	2623	2415	2551	2666
N <sub>1</sub>	3161	3118	3101	3619	2796	2933	3776	3337	3303	3243	3239
N <sub>2</sub>	3799	3206	4032	4041	3460	3571	4340	3616	3861	3967	3789
Mean	3195	3061	3197	3467	2953	3001	3801	3192	3193	3254	3231

C.D. for N marginal means=481.1 Kg/ha.

C.D. for V marginal means=278.6 Kg/ha.

65(89)

(i) 2805 Kg/ha. (ii) (a) 498.2 Kg/ha. (b) 325.3 Kg/ha. (iii) Main effect of V is highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	Mean
N <sub>0</sub>	3007	2549	2250	2505	2375	2432	2230	2449	2815	2979	2569
N <sub>1</sub>	3209	2853	2816	2873	2457	2751	2344	2979	3161	3349	2879
N <sub>2</sub>	3038	3027	2665	3092	2657	3053	2623	3224	3306	2990	2968
Mean	3085	2810	2577	2857	2496	2745	2399	2884	3094	3106	2805

C.D. for V marginal means=311.4 Kg/ha.

Crop :- Paddy (Kharif).

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

Ref :- Mh. 60(110).

Type :- 'C'.

Object :- To study the effect of previous crop on the yield of Paddy.

## 1. BASAL CONDITIONS :

(i) (a) Pulses—Paddy. (b) Pulses. (c) Nil. (ii) N.A. (iii) 20.6.60/18.7.60. (iv) (a) 1 ploughing. (b) Transplanting. (c) 33.6 Kg/ha. (d) 25 cm. × 25 cm. (e) 4 seedlings/bunch. (v) Nil. (vi) Kolpi 248 (late). (vii) Unirrigated. (viii) N.A. (ix) 274.0 cm. (x) 5.11.60.

## 2. TREATMENTS :

4 previous crops : C<sub>1</sub>=Gram, C<sub>2</sub>=Wal, C<sub>3</sub>=Peas and C<sub>4</sub>=Lentil.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) and (b) 10.06 m. × 10.06 m. (v) Nil. (vi) Yes.

## 4. GENERAL :

(i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—60. (b) Yes. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 1362 Kg/ha. (ii) 156.6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatments	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>
Av. yield	1620	1205	1323	1300

**Crop :- Paddy (Kharif).**

**Res :- Mh. 60(9).**

**Site :- Agri. Res. Stn., Karjat.**

**Type :- 'C'.**

Object :—To study the possibilities of drilling, dibbling and transplanting in Paddy crop.

## 1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) Nil. (ii) Sandy loam. (iii) 5.6.60/24.7.60. (iv) (a) Nil. (b) As per treatments. (c) 29 Kg/ha. (d) 23 cm. × 15 cm. (e) 7 to 8 seeds/dibble, 4 seedlings/buch. (v) Nil. (vi) EK 70. (vii) Unirrigated. (viii) 2 weedings. (ix) 380 cm. (x) 11, 12.10.60.

## 2. TREATMENTS :

4 cultural treatments: C<sub>1</sub>=Drilling at 23 cm. (seedrate @ 30 Kg/ha. with 46 cm. wheel and thinning at 15 cm.) in the line, C<sub>2</sub>=Dibbling 23 cm. × 15 cm. (7 to 8 seeds/dibble and thinning to 4 plants after germination), C<sub>3</sub>=Transplanting—23 cm. × 15 cm. (4 seedlings per hill) and C<sub>4</sub>=Drilling without thinning.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 13.72 m. × 4.57 m. (b) 12.80 m. × 3.66 m. (v) 46 cm. × 46 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960—only. (b) and (c) Nil. (v) to (vii) Nil.

## 5. RESULTS :

(i) 1701 Kg/ha. (ii) 238.3 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>
Av. yield	1529	1450	2466	1358

C.D. = 207 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 60(10).**

**Crop :- Agri. Res. Stn., Karjat.**

**Type :- 'C'.**

**Object :-** To study the possibility of drilling, dibbling and transplanting in Paddy crop.

**1. BASAL CONDITIONS :**

(i) (a) Paddy-Paddy. (b) Paddy. (c) Nil. (ii) N.A. (iii) 6.6.60/23.6.60. (iv) (a) Nil. (b) As per treatments. (c) 27 Kg/ha. (d) 30 cm. x 15 cm. (e) 7 to 8 seeds/dibble, 4 seedlings/bunch. (v) Nil. (vi) Paddy Z--14. (vii) Unirrigated. (viii) 2 interculturing. (ix) 380 cm. (x) 11.11.60.

**2. TREATMENTS :**

4 cultural treatments: C<sub>1</sub>=Drilling at 30 cm. (seedrate @ 29 Kg/ha. with 38 cm. wheel and thinned to 15 cm. in the line), C<sub>2</sub>=Dibbling—30 cm. x 15 cm., C<sub>3</sub>=Transplanting—30 cm. x 15 cm. and C<sub>4</sub>=Drilling at 30 cm. (without thinning).

**3. DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 13.72 m. x 6.10 m. (b) 12.50 m. x 4.88 m. (v) 61 cm. x 61 cm. (vi) Yes.

**4. GENERAL :**

(i) Lodging occurred. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960—only. (b) No. (c) Nil. (v) to (vii) Nil.

**5. RESULTS :**

(i) 2589 Kg/ha. (ii) 486.0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>
Av. yield	2525	2331	2943	2558

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 60(14).**

**Site :- Agri. Res. Stn., Karjat.**

**Type :- 'C'.**

**Object :-** To study the effect of tillered seedlings on the yield of paddy.

**1. BASAL CONDITIONS :**

(i) (a) Paddy in Kharif—Wal. in Rabi. (b) Wal. (c) Nil. (ii) Sandy loam. (iii) 17.6.60/30.7.60. (iv) (a) N.A. (b) Transplanting. (c) 27 Kg/ha. (d) 25 cm. x 25 cm. (e) 4 seedlings/bunch. (v) 67.2 Kg/ha. of N as A/S and 33.6 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. (vi) K—42. (vii) Unirrigated. (viii) 1 weeding. (ix) 380 cm. (x) 10.11.60.

**2. TREATMENTS :**

4 cultural treatments: C<sub>1</sub>=Four tillered seedlings (four seedlings/hill), C<sub>2</sub>=Three tillered seedlings (four seedlings/hill), C<sub>3</sub>=Two tillered seedlings (four seedlings/hill) and C<sub>4</sub>=Seedlings without tillers (four seedlings/hill).

**3. DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 3.05 m. x 0.76 m. (v) N.A. (vi) Yes.

**4. GENERAL :**

(i) Lodging occurred. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961—only. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 3361 Kg/ha. (ii) 302.7 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>
Av. yield	3720	3237	3803	2686

C.D. for treatment means=342 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 60(15).**

**Site :- Agri. Res. Stn., Karjat.**

**Type :- 'C'.**

Object:—To study the effect of tillered seedlings on the yield of Paddy.

## 1. BASAL CONDITIONS :

(i) (a) Wal—Paddy. (b) Wal. (c) Nil. (ii) Sandy loam to clayey loam. (iii) 17.6.60. (iv) (a) N.A. (b) Transplanting. (c) 27 Kg/ha. (d) 25 cm. × 25 cm. (e) 2 to 3 seedlings/bunch. (v) 67.2 Kg/ha. of N as A/S+33.6 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super on 4.8.60. (vi) K—42. (vii) Unirrigated. (viii) 1 weeding. (ix) 380 cm. (x) N.A.

## 2. TREATMENTS :

5 cultural treatments : C<sub>1</sub>= 4 tillered seedlings (1 seedling per hill), C<sub>2</sub>=3 tillered seedlings (1 seedling per hill), C<sub>3</sub>=2 tillered seedlings (1 seedling per hill), C<sub>4</sub>=1 tillered seedling (1 seedling per hill) and C<sub>5</sub>=Seedling without tillers (1 seedling per hill).

## 3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 3.05 m. × 0.76 m. (v) N.A. (vi) Yes.

## 4. GENERAL :

(i) Lodging occurred. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961-only (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 3216 Kg/ha. (ii) 470.6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	C <sub>5</sub>
Av. yield	3818	3612	3219	2770	2660

C.D. for treatment mean=419 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 62(162), 63(24).**

**Site :- Agri. Res. Stn., Karjat.**

**Type :- 'C'.**

Object:—To test the interculturing equipments on the yield of Paddy.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) Clay loam. (iii) 12.6.62/29.7.62 ; N.A. (iv) (a) Ploughing and puddling. (b) Transplanting. (c) 37 Kg/ha. (d) 30 cm. × 15 cm. (e) 4. (v) 44.8 Kg./ha. of N as A/S+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. (vi) EK 70. (vii) Unirrigated. (viii) 3 interculturings. (ix) N.A. (x) 24.10.62 ; 3.10.63.

## 2. TREATMENTS :

5 interculturing equipments :  $T_0$ =Interculturing,  $T_1$ =Akshat,  $T_2$ =Rotary,  $T_3$ =Karjat and  $T_4$ =Japanese.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 15.24 m.  $\times$  3.05 m. (b) 14.63m.  $\times$  2.44 m. (v) 30 cm.  $\times$  30 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962-63. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments  $\times$  years interaction is present.

## 5. RESULTS :

## Pooled results

(i) 2019 Kg/ha. (ii) 272.7 Kg/ha. (based on 4 d.f. made up of Treatments  $\times$  years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$T_0$	$T_1$	$T_2$	$T_3$	$T_4$
Av. yield	1884	2155	1965	1970	2120

## Individual results

Treatment	$T_0$	$T_1$	$T_2$	$T_3$	$T_4$	Sig.	G.M.	S.E./plot
Year								
1962	2331	2499	2313	2313	2289	N.S.	2329	218.3
1963	1537	1811	1617	1627	1950	**	1708	113.6
Pooled	1884	2155	1965	1970	2120	N.S.	2019	272.7

**Crop :- Paddy (Khari).**

**Ref :- Mh. 63(60), 64(51), 65(17).**

**Site :- Agri. Res. Stn., Karjat.**

**Type :- 'C'.**

Object :—To compare the methods of Paddy cultivation.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Medium black soil. (iii) 6.6.63/16.7.63; 12.6.64/12.7.64; 11.6.65/11.7.65. (iv) (a) Ploughings. (b) to (d) As per treatments. (e) 4. (v) 44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ +12 C.L./ha. of Compost. (vi) Z-14. (vii) Unirrigated. (viii) Interculturings and weeding. (ix) N.A. for 63 and 64; 316 cm. (x) 3.11.63; 10.11.64; 4.11.65.

## 2. TREATMENTS :

7 methods of Paddy cultivation :  $C_1$ =Drilling at 30 cm. (seed rate 27 Kg/ha. and thinned to 15 cm. in the line),  $C_2$ =Dibbling at 30 cm.  $\times$  15 cm. (dibbling 7-8 seeds/hill and thinned to 4 seedlings),  $C_3$ =Transplanting 30 cm.  $\times$  15 cm. 4 seedlings per hill,  $C_4$ =Drilling at 30 cm. without thinning and seed rate 27 Kg/ha.,  $C_5$ =Broadcasting sprouted seed (*Rahu* method) at the time of transplanting with seed rate 45 Kg/ha.,  $C_6$ =*Blyasi* method of sowing i.e. dry broadcasting at 45 Kg/ha. seed rate and thinning by cross-ploughing 5-6 weeks after germination and  $C_7$ =Dry broadcasting seed rate at 45 Kg/ha.



## 3. DESIGN :

(i) R.B.D. (ii) 7. (b) 27.74 m. × 12.19 m. (iii) 4. (iv) (a) 12.19 m. × 3.96 m. (b) 10.97 m × 2.74 m. (v) 61 cm. × 61 cm. (vi) Yes.

## 4. GENERAL :

(i) Growth was severely affected due to heavy infestation of weeds which could not be controlled by manual labour in 63. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-65. (b) No. (c) Results for combined analysis are presented under 5. Results. (v) N.A. (vi) Heavy rains in Aug., 63. (vii) Error variances are heterogeneous. Treatments × years interaction is present.

## 5. RESULTS :

## Pooled results

(i) 2504 Kg/ha. (ii) 751.6 Kg/ha. (based on 12 d.f. made up of interaction Treatments × years). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	C <sub>5</sub>	C <sub>6</sub>	C <sub>7</sub>
Av yield	2164	2566	3107	2401	2057	2693	2543

## Individual results

Treatment	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	C <sub>5</sub>	C <sub>6</sub>	C <sub>7</sub>	Sig.	G.M.	S.E./plot
Year										
1963	1570	1694	3303	1526	1288	2013	1943	**	1905	96.3
1964	2419	2432	2902	2697	2471	2739	2633	N.S.	2613	322.3
1965	2503	2980	3570	3117	2412	3327	3054	*	2995	183.9
Pooled	2164	2566	3107	2401	2057	2693	2543	N.S.	2504	751.6

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 60(116), 61(84), 62(70).**

**Site :- Agri. Res. Stn., Khopoli.**

**Type :- 'C'.**

**Object :-** To find out the most suitable time of sowing and spacings for hot weather Paddy.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) N.A. (iii) As per treatments. (iv) (a) Ploughing. (b) Transplanting. (c) 17 Kg/ha. (d) As per treatments. (e) N.A. (v) 44.8 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) EK-70. (vii) Irrigated. (viii) 2 interculturings. (ix) N.A. (x) 3rd week of April, 61 ; 15.3.62 ; 9.4.63.

## 2. TREATMENTS :

## Main-plot treatments :

4 dates of sowing : D<sub>1</sub>=1st Dec., D<sub>2</sub>=11th Dec., D<sub>3</sub>=21st Dec. and D<sub>4</sub>=31st Dec.

## Sub-plot treatments :

3 spacings : S<sub>1</sub>=23 cm. × 10 cm., S<sub>2</sub>=23 cm. × 15 cm. and S<sub>3</sub>=23 cm. × 23 cm.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication, 3 sub-plots/main-plot- (b) N.A. (iii) 5. (iv) (a) 9.14 m. × 7.32m. (b) 7.32 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Bacterial blight. Blitox sprayed in 62. (iii) yield of grain. (iv) (a) 1960-62. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Main-plot variances are heterogeneous. Sub-plot variances are homogeneous. Main treatments × years interaction is absent. Hence results for individual years are presented under 5. Results.

## 5. RESULTS:

60(116)

- (i) 3128 Kg/ha. (ii) (a) 316.9 Kg/ha. (b) 410.7 Kg/ha. (iii) Main effects of D and S are highly significant.  
 (iv) Av. yield of grain in Kg/ha.

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	Mean
S <sub>1</sub>	3443	2914	3787	3316	3365
S <sub>2</sub>	2971	2745	3626	3321	3166
S <sub>3</sub>	2526	2807	2997	3080	2853
Mean	2980	2822	3470	3239	3128

C.D. for D marginal means=252.1 Kg/ha.

C.D. for S marginal means=264.7 Kg/ha.

61 (84)

- (i) 2788 Kg/ha. (ii) (a) 603.7 Kg/ha. (b) 392.9 Kg/ha. (iii) Main effects of D and S are significant.  
 (iv) Av. yield of grain in Kg/ha.

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	Mean
S <sub>1</sub>	2809	2644	3157	3118	2932
S <sub>2</sub>	2621	2390	3219	3070	2825
S <sub>3</sub>	2361	2261	2890	2918	2607
Mean	2597	2432	3089	3035	2788

C.D. for D marginal means=480.2 Kg/ha.

C.D. for S marginal means=253.1 Kg/ha.

62(70)

- (i) 1808 Kg/ha. (ii) (a) 335.9 Kg/hn. (b) 289.4 Kg/ha. (iii) Main effects of D and S are highly significant.  
 (iv) Av. yield of grain in Kg/ha.

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	Mean
S <sub>1</sub>	1562	1719	2253	2387	1980
S <sub>2</sub>	1273	1811	2242	2079	1851
S <sub>3</sub>	1229	1636	1821	1689	1594
Mean	1355	1722	2105	2052	1808

C.D. for D marginal means=267.1 Kg/ha.

C.D. for S marginal means=186.5 Kg/ha.

Crop :- Paddy (Kharif).

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

Ref :- Mh. 60(17).

Type :-C<sup>2</sup>.

Object :-To study the effect of various previous crops on the yield of Paddy.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) As per treatments. (c) Nil. (ii) Laterite soil. (iii) 5.6 60. (iv) (a) 2 ploughings. (b) Broadcasting. (c) 22.4 Kg/ha. (d) and (e) N.A. (v) 71.7 Kg/ha. of N as A/S in two doses,  $\frac{1}{2}$  on 13.7.60 and  $\frac{1}{2}$  on 16.8.60 and 71.7 Kg/ha. of  $P_2O_5$  as B.M. applied in equal doses on 13.7.60 and 16.8.60. (vi) Panvel—61 (mid-late). (vii) Unirrigated. (viii) 1 interculturing. (ix) 290 cm. (x) 23.10.60.

## 2. TREATMENTS :

4 previous crops :  $C_0$ =Fallow,  $C_1$ =*Kulthi*,  $C_2$ =*Udid* and  $C_3$ =Wal.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 40.24 m.  $\times$  10.06 m. (iii) 4. (iv) (a) and (b) 10.06 m.  $\times$  10.06 m. (v) Nil. (vi) Yes.

## 4. GENERAL :

(i) Growth was normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—60. (b) Yes. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 2308 Kg/ha. (ii) 321.8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$C_0$	$C_1$	$C_2$	$C_3$
Av. yield	2432	2306	2225	2271

**Crop :- Paddy (*Kharif*).**

**Ref :- Mh. 65(187).**

**Site :- Agri. Res. Stn., Sakoli.**

**Type :- 'C'.**

Object :—To find out suitable sowing methods of Paddy for better yield.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 25 C.L./ha. of Compost+44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Medium. (iii) 2.7.65. (iv) (a) 2 ploughings. (b) to (e) As per treatments. (v) 25 C.L./ha. of Compost+44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (vi) W.L. 112 (medium). (vii) 2 irrigations at one month interval. (viii) 2 weedings, and one hoeing. (ix) 111 cm. (x) 23.11.65.

## 2. TREATMENTS :

6 cultural treatments :  $T_1$ =Drilling at 30 cm. spacing,  $T_2$ = $T_1$  with thinning at 15 cm.,  $T_3$ =Drilling at 23 cm.,  $T_4$ = $T_3$  with thinning at 15 cm.,  $T_5$ =Dibbling at 30 cm.  $\times$  15 cm. at 4 seeds/hill and  $T_6$ =Dibbling 23 cm.  $\times$  15 cm. at 4 seeds/hill.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 10.02 m.  $\times$  5.46 m. (b) 8.22 m.  $\times$  3.66 m. (v) 90 cm.  $\times$  90 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Attack of Blast. (iii) Height, length of panicles and Yield of grain. (iv) (a) 1965—67. (b) No, (c) Nil. (v) to (vii) Nil.

## 5. RESULTS :

(i) 2601 Kg/ha. (ii) 660.2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$
Av. yield	2458	2618	2805	2727	2521	2477

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 65(188).**

**Site :- Agri. Res. Stn., Sakoli.**

**Type :- 'C'.**

**Object :-** To assess the suitable planting dates for Paddy.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) 44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Medium. (iii) 15.6.65. (iv) (a) 3 ploughings and puddlings. (b) Transplanting. (c) 44.8 Kg/ha. (d) 30 cm. x 15 cm. (e) 4. (v) 22.4 Kg/ha. of  $P_2O_5$ . (vi) White Luchai local (medium). (vii) 2 irrigations at 33 days interval. (viii) One weeding and 2 hoeings. (ix) 111 cm. (x) 20.11.65.

**2. TREATMENTS :**

3 dates of transplanting :  $D_1=24.7.65$ ,  $D_2=31.7.65$  and  $D_3=15.8.65$ .

**3. DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 6'00 m. x 3'00 m. (b) 5'40 m. x 2'40 m. (v) 30 cm. x 30 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Slight attack of Paddy gall-fly. (iii) Height, length of panicles and yield of grain. (iv) (a) 1965-67. (b) No. (c) Nil. (v) to (vii) Nil.

**5. RESULTS :**

(i) 2696 Kg/ha. (ii) 520.6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$D_1$	$D_2$	$D_3$
Av. yield	3521	2446	2121

C.D. for treatment means = 638 Kg/ha.

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 65(189).**

**Site :- Agri. Res. Stn., Sakoli.**

**Type :- 'C'.**

**Object :-** To find out optimum seedrate for Paddy.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) 12.35 C.L./ha. of F.Y.M. + 44.8 Kg/ha. N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Light soil. (iii) 19.6.65. (iv) (a) 2 ploughings. (b) Drilling. (c) As per treatments. (d) 22 cm. (e) As per treatments. (v) 12 C.L. compost + 44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . N applied in 2 doses. (vi) EB-17. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 110.5 cm. (x) 7.10.65.

**2. TREATMENTS :**

5 seed rate treatments :  $T_1=40$ ,  $T_2=50$ ,  $T_3=60$ ,  $T_4=70$  and  $T_5=80$  Kg/ha.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 11.98 m. x 2.69 m. (b) 11.01 m. x 2.25 m. (v) 44 cm. x 22 cm (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Attack of blast. sprayed Endrin and Copper Oxchloride. (iii) Height, length of panicle and yield of grain. (iv) (a) 1965-67. (b) No. (c) Nil. (v) Nil. (vi) Heavy rain. (vii) Nil.

## 5. RESULTS :

(i) 1809 Kg/ha. (ii) 611.2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>
Av. yield	1486	1877	1756	1728	2200

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 65(190).**

**Site :- Agri. Res. Stn., Sakoli.**

**Type :- 'C'.**

Object: --To study the relative merits of different methods of sowing and to explore possibility of replacing Transplanting by other methods of Paddy cultivation.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) black soil. (iii) 22.6.65/3 8.65. (iv) (a) 3 plughings and puddings. (b) to (e) As per treatments. (v) 12.35 C.L./ha. of F.Y.M.+44.8 Kg/ha. of N+22.4 Kg./ha of P<sub>2</sub>O<sub>5</sub>. (vi) E.B. 17. (vii) Unirrigated. (viii) 2 weedings and 1 hoeing. (ix) 110 cm. (x) 22.10.65.

## 2. TREATMENTS :

10 cultural treatments : T<sub>1</sub>=Drilling at 30 cm. spacing, seedrate 44.8 Kg/ha., T<sub>2</sub>=T<sub>1</sub> with thinning at 15 cm., T<sub>3</sub>=Drilling at 22 cm. spacing and seed rate at 44.8 Kg/ha., T<sub>4</sub>=T<sub>3</sub> with thinning at 15 cm., T<sub>5</sub>=Dibbling at 30 cm. x 15 cm. with 4 seeds/hill, T<sub>6</sub>=Dibbling at 22 cm. x 15 cm. with 4 seeds/hill, T<sub>7</sub>=Transplanting at 30 cm. x 15 cm. with 4 seedlings/hill, T<sub>8</sub>=Transplanting at 22 cm. x 15 cm. with 4 seedlings/hill, T<sub>9</sub>=Broadcasting at 44.8 Kg/ha. and T<sub>10</sub>=Biyani method with 112 Kg/ha. seed rate.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 7.50 m. x 3.60 m. (b) 6.30 m. x 2.70 m. (v) 60 cm. x 45 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Army Worms. (iii) Height, penicle length, No. of grains/Penicle and yield of grain. (iv) (a) 1965-68. (b) No. (c) Nil. (v) to (vii) Nil.

## 5. RESULTS :

(i) 2650 Kg/ha. (ii) 495.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>	T <sub>10</sub>
Av. yield	2616	3227	2297	2933	2847	3227	2591	2128	1917	2713

**Crop :- Paddy (Rabi).**

**Ref :- Mh. 63(243).**

**Site :- Agri. Res. Stn., Shindewahi.**

**Type :- 'GV'.**

Object: --To find out the suitable sowing time for different varieties of Paddy during second crop season.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) Sandy loam. (iii) As per treatments. (iv) Ploughing. (b) Drillings. (c) 22.4 Kg/ha. (d) 22.5 cm. (e) --. (v) 22 Kg/ha. of N+22 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) As per treatments. (vii) Irrigated. (viii) Weeding and interculturing. (ix) and (x) N.A.

## 2. TREATMENTS:

All combinations of (1) and (2)

(1) 2 varieties of Paddy:  $V_1 = E-B-17$  and  $V_2 = EK-70$ .

(2) 4 dates of sowing:  $D_1 = 15.11.63$ ,  $D_2 = 30.11.63$ ,  $D_3 = 15.12.63$  and  $D_4 = 30.12.63$ .

## 3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 2. (iv) (a) 13.50 m.  $\times$  7.20 m. (b) 11.70 m.  $\times$  5.40 m. (v) 90 cm.  $\times$  90 cm. (vi) Yes.

## 4. GENERAL:

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

## 5. RESULTS:

(i) 105 Kg/ha. (ii) 31:7 Kg/ha. (iii) None of the effects is significant. (iv) (a) Av. yield of grain in Kg/ha.

	$D_1$	$D_2$	$D_3$	$D_4$	Mean
$V_1$	107	77	100	92	94
$V_2$	169	115	123	61	117
Mean	138	96	111	77	105

**Crop :- Paddy (Kharif)**

**Ref :- Mh. 63(192), 64(159).**

**Site :- Taluka Seed Farm, Amgaon.**

**Type :- 'CM'.**

**Object :-** To find the effect of liming and Azotobactor inoculation in acid soils on the yield of Paddy crop.

## 1. BASAL CONDITIONS:

(i) (a) Paddy-Paddy. (b) Paddy. (c) N.A. (ii) Morand. (iii) N.A./10.8.63. N.A./21.8.64. (iv) (a) 2 ploughings. (b) Japanese methods of transplanting. (c) N.A. (d) 23 cm.  $\times$  23 cm. (e) 2-3. (v) Nil. (vi) Luchai 12. (vii) Irrigated. (viii) Interculturing. (ix) N.A. (x) 1st week of Dec., 63; 11.12.64.

## 2. TREATMENTS:

**Main-plot treatments:**

5 levels of lime:  $L_0 = 0$ ,  $L_1 = 2100$ ,  $L_2 = 4200$ ,  $L_3 = 6300$  and  $L_4 = 8400$  Kg/ha.

**Sub-plot treatments:**

2 inoculation treatments;  $T_1 =$  Without Azotobactor inoculation and  $T_2 =$  With Azotobactor inoculation.

Lime applied before transplanting.

## 3. DESIGN:

(i) Split-plot. (ii) (a) 5 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 9.44m.  $\times$  5.48 m. (b) 7.62 m.  $\times$  3.66 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL:

(i) Normal; Satisfactory. (ii) *Berdi* disease, Nil. (iii) Yield of grain. (iv) (a) 1963-64. (b) No. (c) Nil (v) and (vi) Nil. (vii) Sub-plot error variances are heterogeneous. Hence individual years results are presented under 5. Results.

## 5. RESULTS:

**63(192)**

(i) 2386 Kg/ha. (ii) (a) 835.6 Kg/ha. (b) 727.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	L <sub>0</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	Mean
T <sub>1</sub>	2153	2287	2063	2870	2691	2413
T <sub>2</sub>	2153	2601	2242	2512	2287	2359
Mean	2153	2444	2152	2691	2489	2386

64(159)

(i) 1045 Kg/ha. (ii) (a) 304.3 Kg/ha. (b) 235.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	L <sub>0</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	Mean
T <sub>1</sub>	721	1156	977	1142	1250	1049
T <sub>2</sub>	926	1086	1062	918	1209	1040
Mean	824	1121	1020	1030	1230	1045

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 60(91), 61(57), 62(44).**

**Site :- Agri. Res. Stn., Shindewahi.**

**Type :- 'CM'.**

**Object :-** To study the effect of graded doses of N and P on the yield of Paddy at different dates of transplanting on *seher* (low fertility) soil.

#### 1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 22.4 Kg/ha. of N as A/S + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. (ii) Sandy loam. (iii) As per treatments. (iv) (a) 3 ploughings. (b) Transplanting. (c) N.A. (d) 25 cm. × 23 cm. (e) 3—4. (v) Nil. (vi) R—8 Luchai. (vii) Irrigated. (viii) 2 interculturings. (ix) 174 cm. ; 132 cm. ; 79 cm. (x) 26.11.60 ; 16.11.61 ; 18.11.62.

#### 2. TREATMENTS :

##### Main-plot treatments :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=16.8, N<sub>2</sub>=33.6 and N<sub>3</sub>=67.2 Kg/ha.

(2) 2 dates of transplanting : D<sub>1</sub>=15th July and D<sub>2</sub>=7th August.

##### Sub-plot treatments :

4 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=16.8, P<sub>2</sub>=33.6 and P<sub>3</sub>=67.2 Kg/ha.

#### 3. DESIGN :

(i) Split-plot (ii) (a) 8 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.06m. × 5.03m. (b) 8.23 m. × 3.20 m. (v) 91 cm. × 91 cm. (vi) Yes.

#### 4. GENERAL :

(i) Satisfactory. (ii) Damage due to gal-fly. Endrine sprayed. (iii) Yield of grain. (iv) (a) 1960-62. (b) No. (c) Results for combined analysis are presented under 5. Results. (v) N.A. (vi) Nil. (vii) Main-plot variances are heterogeneous. Main treatments × years interaction is present. Sub-plot variances are homogeneous. Sub treatments × years interaction is absent.

#### 5. RESULTS :

##### Pooled results

(i) 2620 Kg/ha. (ii) (a) 2787.1 Kg/ha. (based on 14 d.f. made up of interaction treatments × years). (b) 533.4 Kg/ha. (based on 216 d.f. made up of pooled error). (iii) Main effects of D and P are highly significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	Mean
D <sub>1</sub>	2860	2812	3213	3587	2821	3076	3120	3395	3118
D <sub>2</sub>	1954	2124	2125	2287	1975	1962	2147	2406	2122
Mean	2407	2468	2669	2937	2398	2519	2663	2901	2620
P <sub>0</sub>	2319	2243	2384	2646					
P <sub>1</sub>	2406	2354	2506	2812					
P <sub>2</sub>	2406	2523	2721	3003					
P <sub>3</sub>	2497	2753	3065	3289					

C.D. for D marginal means=610.2 Kg/ha.

C.D. for P marginal means=150.9 Kg/ha.

#### Individual results

Treatment	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	Sig.	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	Sig.
Year										
1960	1243	1407	1416	1776	*	1329	1494	1496	1523	N.S.
1961	4157	4110	4428	4751	*	4026	4184	4431	4805	**
1962	1821	1887	2163	2285	**	1839	1880	2063	2374	**
Pooled	2407	2468	2669	2937	N.S.	2398	2519	2663	2901	**

D <sub>1</sub>	D <sub>2</sub>	Sig.	G.M.	S.E./plot (a) (b)	
1655	1266	*	1460	544.5	484.2
5578	3145	**	4361	906.0	585.2
2121	1957	N.S.	2039	566.1	526.2
3118	2122	**	2620	2787.1	533.4

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 60(93), 61(22), 62(5),  
63(5), 64(4).**

**Site :- Agti. Res. Stn., Shindewahi.**

**Type :- 'CM'.**

**Object :-** To study the effect of graded doses of N and P on the yield of Paddy at different dates of transplanting on fertile soil.

#### 1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Sandy loam. (iii) As per treatments.  
(iv) (a) 3 ploughings. (b) Transplanting. (c) 22 Kg/ha. (d) 23 cm. × 23 cm. (e) 3—4. (v) Nil. (vi) Red Luchai—8. (vii) Irrigated. (viii) 2 interculturings. (iv) 174 cm. ; 132 cm. ; 79 cm. ; N.A. for 63 and 64.  
(x) 19.11.60 ; 3.11.61 ; 18.11.62 ; 20.11.63 ; 20.11.64.

#### 2. TREATMENTS :

##### Main-plot treatments :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=16.8, N<sub>2</sub>=33.6 and N<sub>3</sub>=67.2 Kg/ha.

(2) 2 dates of transplanting : D<sub>1</sub>=15th July and D<sub>2</sub>=7th August.

##### Sub-plot treatments :

4 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=16.8, P<sub>2</sub>=33.6 and P<sub>3</sub>=67.2 Kg/ha.



## 3. DESIGN:

(i) Split-plot. (ii) (a) 8 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.06m. × 5.03m. (b) 8.23 m. × 3.20 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory. (ii) 25% damage due to gall-fly in 60. Endrine sprayed. (iii) Yield of grain. (iv) (a) 1960-64. (b) Yes. (c) Nil. (v) N.A. (vi) Crop suffered due to draught in Aug. and Sept., 60. (vii) Main-plot variances are homogeneous. Sub-plot variances are heterogeneous. Hence results for individual years are presented under 5. Results.

## 5. RESULTS:

60(93)

(i) 2299 Kg/ha. (ii) (a) 539.2 Kg/ha. (b) 289.0 Kg/ha. (iii) Main effect of D is highly significant. N and P effects are significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	Mean
D <sub>1</sub>	2777	2885	2906	3277	2916	2874	3138	2916	2961
D <sub>2</sub>	1571	1814	1383	1781	1760	1458	1641	1690	1637
Mean	2174	2349	2144	2529	2338	2166	2389	2303	2299
P <sub>0</sub>	2099	2432	2238	2584					
P <sub>1</sub>	2163	2325	1894	2282					
P <sub>2</sub>	2185	2443	2303	2626					
P <sub>3</sub>	2250	2196	2142	2626					

C.D. for N marginal means = 280.4 Kg/ha.

C.D. for D marginal means = 198.2 Kg/ha.

C.D. for P marginal means = 144.0 Kg/ha.

61(22)

(i) 3503 Kg/ha. (ii) (a) 654.3 Kg/ha. (b) 426.2 Kg/ha. (iii) Main effect of D is highly significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	Mean
D <sub>1</sub>	4069	4007	4052	3956	4133	4036	4061	3853	4021
D <sub>2</sub>	3057	2890	2949	3046	2938	2901	3027	3054	2986
Mean	3563	3448	3500	3501	3536	3468	3544	3454	3503
P <sub>0</sub>	3633	3380	3525	3606					
P <sub>1</sub>	3428	3541	3552	3353					
P <sub>2</sub>	3713	3450	3439	3574					
P <sub>3</sub>	3477	3421	3487	3471					

C.D. for D marginal means = 244.4 Kg/ha.

62(5)

(i) 3108 Kg/ha. (ii) (a) 730.1 Kg/ha. (b) 497.0 Kg/ha. (iii) Main effect of N is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	Mean
D <sub>1</sub>	3003	3147	3054	3679	3258	3112	3229	3287	3221
D <sub>2</sub>	2853	2795	2974	3357	2919	2846	3102	3111	2995
Mean	2928	2971	3014	3518	3089	2979	3165	3199	3108
P <sub>0</sub>	3109	2784	2952	3510					
P <sub>1</sub>	2689	2876	2920	3431					
P <sub>2</sub>	2964	3186	2878	3628					
P <sub>3</sub>	2950	3037	3306	3503					

C.D. for N marginal means = 379.6 Kg/ha.

63(5)

- (i) 2961 Kg/ha. (ii) (a) 771.5 Kg/ha. (b) 623.4 Kg/ha. (iii) Main effect of D is highly significant.  
 (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	Mean
D <sub>1</sub>	3147	3332	3298	3529	3163	3222	3678	3241	3326
D <sub>2</sub>	2795	2553	2575	2463	2615	2425	2674	2672	2597
Mean	2971	2942	2936	2996	2889	2824	3176	2957	2961
P <sub>0</sub>	2995	2947	2620	2995					
P <sub>1</sub>	3004	2838	2762	2691					
P <sub>2</sub>	3241	2999	3151	3313					
P <sub>3</sub>	2644	2985	3213	2985					

C.D. for D marginal means = 283.7 Kg/ha.

64(4)

- (i) 2839 Kg/ha. (ii) (a) 890.4 Kg/ha. (b) 758.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	Mean
D <sub>1</sub>	2259	2916	2674	3189	2466	2729	2836	3009	2760
D <sub>2</sub>	2852	2698	2938	3187	2902	2651	2855	3268	2919
Mean	2556	2807	2806	3188	2684	2690	2846	3138	2839
P <sub>0</sub>	2112	2585	2938	3104					
P <sub>1</sub>	3446	3759	3360	3042					
P <sub>2</sub>	2696	2753	2886	3047					
P <sub>3</sub>	2919	3085	2990	3559					

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 60(108).**

**Site :- Agri. Res. Stn., Panvel.**

**Type :- 'I'.**

**Object :-** To study the effect of flooding of fields with creek water once in about 3 years on the yield of Paddy.

**1. BASAL CONDITIONS :**

(i) (a) No. (b) and (c) N.A. (ii) Saline Soil. (iii) 15.6.60/9.8.70. (iv) (a) 1 ploughing. (b) Transplanting (c) 17 to 22 Kg/ha. (d) 30 cm. x 30 cm. (e) —. (v) Nil. (vi) K.R. 1-27. (vii) Unirrigated. (viii) N.A. (ix) 316 cm. (x) 9.11.60.

**2. TREATMENTS :**

4 irrigational treatment :  $I_0$  = Control,  $I_1$  = Creek water every 2 years,  $I_2$  = Creek water every 3 years and  $I_3$  = Sweet water every 3 years.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 1.83 m. x 8.53 m. (b) 1.22 m. x 7.92 m. (v) 30 cm. x 30 m. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Light attack of leaf hoppers. (iii) Yield of grain. (iv) (a) 1954-60 (failed in 54 and 59). (b) No. (c) Nil, (v) N.A. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 1554 Kg/ha. (ii) 336.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$I_0$	$I_1$	$I_2$	$I_3$
Av. yield	1357	1765	1389	1705

**Crop :- Paddy (Kharif).**

**Ref :- Mh. 60(113), 61(202).**

**Site :- Agri. Res. Stn., Khopoli.**

**Type :- 'D'.**

**Object :-** To find out the suitable control against bacterial blight of Paddy.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black. (iii) 9.6.60/16.7.60 ; 14.6.61/22.7.61. (iv) Ploughing. (b) Transplanting. (c) 17 Kg/ha. ; 25 Kg/ha. (d) 30 cm. x 25 cm. ; 30 cm. x 20 cm. (e) 3 to 4. (v) Nil, (vi) BK-70. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 367 cm. ; 409 cm. (x) Oct., 60 ; 18.10.61.

**2. TREATMENTS :**

6 fungicidal treatments :  $F_0$  = Control,  $F_1$  = G.M. 3 : 3 : 50, 788 litres/ha.,  $F_2$  = Copper fungicide (Blitox),  $F_3$  = Copper dust 4% (dusting at 22.4 Kg/ha.),  $F_4$  = Mercurial fungicide (Agrosan or Cereson) + lime 1 : 8 at 22.4 Kg/ha. and  $F_5$  = Sulphur dusting at 22.4 Kg/ha. Fungicides applied after transplanting, 20 days after transplanting and 20 days after second application.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4, (iv) (a) 15.24 m. x 3.35 m. (b) 13.41 m. x 2.13 m. (v) 91 cm. x 61 cm. (vi) Yes.

## 4. GENERAL :

(i) Lodged completely on 18.9.60 due to heavy wind blow in the evening in 60. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960-61. (b) No. (c) Results for combined analysis are presented under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous. Treatments  $\times$  years interaction is absent.

## 5. RESULTS :

## Pooled results

(i) 9.8 Kg/ha. (ii) 133.7 Kg/ha. (based on 30 d.f. made up of pooled error). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	F <sub>5</sub>
Av. yield	867	931	995	924	920	868

## Individual results

Treatment	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	F <sub>5</sub>	Sig.	G.M.	S.E./plot
Year 1960	856	922	968	917	891	845	N.S.	900	154.3
1961	877	939	1022	931	950	890	N.S.	935	54.6
Pooled	867	931	995	924	920	868	N.S.	918	133.7

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 60(182).**

**Site :- Agri. College Farm, Akola.**

**Type :- 'M'.**

**Object :-** To find out the effective method of application of Super in association with organic manure on the yield of Wheat.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) 12.35 C.L./ha. of F.Y.M. (ii) Medium black. (iii) 28.10.60. (iv) (a) 1 ploughing, 3 harrowings. (b) Drilling. (c) 45 Kg/ha. (d) 30 cm.  $\times$  5 to 8 cm. (e) 3-4. (v) 22.4 Kg/ha. of N as A/S. (vi) HY-65. (vii) Irrigated. (viii) 2 interculturings. (ix) N.A. (x) 9.3.61.

## 2. TREATMENTS :

8 manurial treatments: T<sub>0</sub>=No Super and no Compost, T<sub>1</sub>=Compost only, T<sub>2</sub>=44.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super, T<sub>3</sub>=44.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub> through digested Compost, T<sub>4</sub>=44.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super and Compost mixed one week before application, T<sub>5</sub>=44.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super and Compost applied separately, T<sub>6</sub>=44.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super+1112 Kg/ha. of Compost mixed one week prior to application the mixture was drilled at the time of sowing and T<sub>7</sub>=Absolute control.

Manuring was done on 28.9.60.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 15.54 m  $\times$  8.23 m. (b) 13.72 m.  $\times$  6.40 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960-62. (b) No. (c) Nil. (v) Nagpur. (vi) Nil. (vii) Treatments changed every year.

## 5. RESULTS:

(i) 668 Kg/ha. (ii) 161.7 Kg/ha. (iii) Treatments differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatments	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>
Av. yield	536	649	558	746	737	664	693	763

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 61(125).**

**Site :- Agri. College Farm, Akola.**

**Type :- 'M'.**

Object :—To find out the effective method of application of super phosphate in association with organic manure.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) Medium black soil. (iii) 3.11.61. (iv) (a) 1 ploughing and 1 harrowing. (b) Drilling. (c) 44.8 Kg/ha. (d) 30 cm. × 5 to 8 cm. (e) 3 to 4. (v) 22.4 Kg/ha. of N as A/S. (vi) HY—65. (vii) Unirrigated. (viii) Nil. (ix) 2 cm. (x) 28.2.62.

## 2. TREATMENTS:

7 manurial treatments: T<sub>0</sub>=No Super, No compost, T<sub>1</sub>=Compost only, T<sub>2</sub>=22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super, T<sub>3</sub>=22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super through digested compost, T<sub>4</sub>=22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super and compost mixed one week before application. T<sub>5</sub>=22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super and compost applied separately and T<sub>6</sub>=Absolute control.

Manuring on 22.10.61.

## 3. DESIGN:

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3. (iv) (a) 15.54 m. × 8.23 m. (b) 13.72 m. × 6.40 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960-62. (b) No. (c) Nil. (v) Nagpur. (vi) Nil. (vii) Treatments changed every year.

## 5. RESULTS:

(i) 557 Kg/ha. (ii) 87.71 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>
Av. yield	514	586	581	594	551	536	533

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 62(117).**

**Site :- Agri. College Farm, Akola.**

**Type :- 'M'.**

Object :—To find out the method of application of super phosphate in association with organic manure.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) *Wheat*. (c) Nil. (ii) Medium black soil. (iii) 12.11.62. (iv) (a) 1 ploughing and 7 harrowings. (b) Drilling. (c) 44.8 Kg/ha. (d) 30 cm. × 5 to 8 cm. (e) 3—4. (v) Nil. (vi) N—59. (vii) Unirrigated. (viii) Weeding once. (ix) 19 cm. (x) 4.3.63.

## 2. TREATMENTS :

7 manurial treatments:  $T_0$ =Compost only,  $T_1$ =Compost+22.4 Kg/ha. of  $P_2O_5$  as Super applied separately,  $T_2$ =Compost+22.4 Kg/ha. of  $P_2O_5$  as Super mixed and kept for a week and then applied,  $T_3$ =22.4 Kg/ha. of  $P_2O_5$  applied through digested compost,  $T_4$ =22.4 Kg/ha. of N as A/5+22.4 Kg/ha. of  $P_2O_5$  as Super,  $T_5$ =22.4 Kg/ha. of  $P_2O_5$  as Super and  $T_6$ =Absolute control.

## 3. DESIGN and 4. GENERAL :

Same as in expt. No. 61(125) on page No. 95.

## 5. RESULTS :

(i) 467 Kg/ha. (ii) 115.50 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$T_0$	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$
Av. yield	458	427	542	480	596	417	352

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 60(181), 61(122), 62(115).**

**Site :- Agri. Res. Stn., Badnapur.**

**Type :- 'M'.**

**Object :-** To find out the effect of micronutrients on the yield of Wheat.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram ; Cotton in 61 and 62. (c) Nil ; 22.4 Kg/ha. of N ; Nil. (ii) Medium black ; black Cotton soil in 61 and 62. (iii) 24, 25.10.60 ; 21, 22.10.61 ; 15.10.62. (iv) (a) Once ploughing ; 1 ploughing and 3 harrows in 61 and 62. (b) Drilling. (c) 45 Kg/ha. (d) 23 cm. (e) —. (v) 44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (vi) K-28. (vii) Unirrigated. (viii) Nil. (ix) N.A. ; 28 cm. ; N.A. (x) 2, 10.3.61 ; 17to 28.3.62 ; 9.4.63.

## 2. TREATMENTS :

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

- (1) 2 levels of Zn :  $A_0=0$  and  $A_1=22.4$  Kg/ha.
- (2) 2 levels of  $MnSO_4$  :  $B_0=0$  and  $B_1=22.4$  Kg/ha.
- (3) 2 levels of  $CuSO_4$  :  $C_0=0$  and  $C_1=22.4$  Kg/ha.
- (4) 2 levels of Boron :  $D_0=0$  and  $D_1=22.4$  Kg/ha.
- (5) 2 levels of Sod. Moly :  $E_0=0$  and  $E_1=175$  gm./ha.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 32. (b) N.A. (iii) 4. (iv) (a) 5.49 m. × 9.14 m. (b) 3.66 m. × 7.31 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959-62. (b) No. (c) Nil. (v) No. (vi) Nil. (vii) As the error variances are heterogeneous and Treatments × years interaction is absent therefore individual results are presented under 5. Results.

## 5. RESULTS :

60(181)

(i) 453 Kg/ha. (ii) 208.9 Kg/ha. (iii) Interaction  $D \times E$  alone is highly significant. (iv) Table of mean and differential response in Kg/ha.

Treatment	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	12.1	-	-	36.9	-12.7	8.1	16.1	73.4	49.2	60.2	-36.0
B	-23.1	1.7	-47.9	-	-	-6.2	-40.0	-72.9	26.7	14.6	-60.8
C	48.8	40.8	56.8	65.7	31.9	-	-	5.6	92.0	64.6	33.0
D	25.3	86.6	-36.0	-24.5	75.1	-17.9	68.5	-	-	130.2	-79.6
E	32.4	80.5	-15.7	70.1	-5.3	48.2	16.6	137.3	-72.5	-	-

C.D. for differential response=103.9 Kg/ha.

61(122)

396 Kg/ha. (ii) 323.7 Kg/ha. (iii) None of the effects is significant. (iv) Mean and differential response in Kg/ha.

Treatments	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	-10.1	-	-	-9.0	-11.2	0.5	-20.7	-18.9	-1.3	-6.7	-13.5
B	-24.5	-23.4	-25.6	-	-	-30.2	-18.8	-77.1	28.1	-22.3	-26.7
C	37.6	48.2	27.0	31.9	43.3	-	-	9.9	65.3	25.2	50.0
D	-1.5	-10.3	7.3	-54.1	51.1	-29.2	26.2	-	-	2.2	-5.2
E	42.6	46.0	39.2	44.2	40.4	30.2	55.0	46.3	38.9	-	-

62(115).

(i) 994 Kg/ha. (ii) 189.9 Kg/ha. (iii) None of the effects is significant. (iv) Mean and differential response in Kg/ha.

Treatments	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	60.4	-	-	101.7	19.1	72.1	48.7	51.1	69.7	53.3	67.5
B	49.1	90.4	7.8	-	-	77.3	20.9	77.1	21.1	72.1	26.1
C	6.7	18.4	-5.0	34.9	-21.5	-	-	-3.7	17.1	-16.0	29.4
D	5.5	-3.8	14.8	33.5	-22.5	-4.9	15.9	-	-	-9.7	20.7
E	-60.0	-67.1	-52.9	-37.0	-83.0	-82.7	-37.3	-75.2	-44.8	-	-

Crop :- Wheat (Rabi).

Ref :- Mh. 61(121).

Site :- Agri. Res. Stn Badnapur.

Type :- 'M'.

Object: —To study the relative merits of Nitro-phosphate complex by ODDA and PEC processes.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Safflower. (c) Nil. (ii) Black cotton soil. (iii) 24.10.61. (iv) (a) Harrowing. (b) Drilling. (c) N.A. (d) 30 cm. x 8 to 10 cm. (e) —. (v) Nil. (vi) PW—3. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 28 cm. (x) 28.3.62.

**2. TREATMENTS :**

All combinations of (1), (2) and (3)+5 extra treatments per block

(1) 3 sources of N and P :  $P_1$ =Single Super and A/S,  $P_2$ =ODDA and  $P_3$ =PEC.

(2) 3 levels of N and P :  $L_1$ =13.4 Kg/ha. of N+11.8 Kg/ha. of  $P_2O_5$ ,  $L_2$ =26.9 Kg/ha. of N+23.5 Kg/ha. of  $P_2O_5$  and  $L_3$ =53.8 Kg/ha. of N+47 Kg/ha. of  $P_2O_5$ .

(3) 3 methods of application :  $M_1$ =Broadcasting,  $M_2$ =6.4 cm. below seed and  $M_3$ =Band placement. 5 extra treatments/block are  $N_0=0$ ,  $N_1=13.4$ ,  $N_2=26.9$ ,  $N_3=40.3$  and  $N_4=53.8$  Kg/ha. of N as A/S.

**3. DESIGN :**

(i)  $3^3$  Fact. Confd.+5 extra treatments. (ii) (a) 14 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 6.40 m. x 10.97 m. (b) 4.57 m. x 9.14 m. (v) 91 cm. x 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 to 64. (b) No. (c) Nil. (v) (a) Not known. (b) Nil. (vi) Nil. (vii) Experiments conducted during the years 1962, 63 and 64 vitiated.

**5. RESULTS :**

(i) 513 Kg/ha. (ii) 115.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$N_0=468$ ,  $N_1=468$ ,  $N_2=539$ ,  $N_3=528$  and  $N_4=522$ .

	$L_1$	$L_2$	$L_3$	$M_1$	$M_2$	$M_3$	Mean
$P_1$	572	547	500	503	529	588	540
$P_2$	471	508	496	496	520	460	492
$P_3$	595	486	478	490	535	534	520
Mean	546	514	491	496	528	527	517
$M_1$	521	500	467				
$M_2$	567	497	520				
$M_3$	550	544	487				

**Crop :-** Wheat (*Rabi*).

**Ref :-** Mh, 61(124), 62(114), 63(163), 64(145).

**Site :-** Agri. Res. Stn., Badnapur.

**Type :-** ,M<sup>2</sup>.

**Object :-** To study the effect of different levels and sources of N with and without F.Y.M. on the yield of Wheat.

**1. BASBL CONDITIONS :**

(i) (a) Nil. (b) Safflower ; Wheat ; *Jowar* ; Wheat. (c) Nil in 1961 to 63. G.M. in 1964. (c) Black cotton soil. (iii) 25.10.61 ; 13.10.62 ; 10.10.63 ; 4, 5.10.64. (iv) (a) 4 harrowings ; 1 ploughing and 5 harrowings ; 4 harrowings ; 5 harrowings. (b) Drilling. (c) 20 Kg/ha. (d) 30 cm. x 8 to 10 cm. (e) —. (v) Nil. (vi) PW—3 (Medium). (vii) Unirrigated. (viii) 1 hoeing and 1 weeding in 61 and 62 ; 4 hoeings and 2 weedings in 63. (ix) 28 cm ; N.A. ; N.A. ; 1 cm. (x) 30.3.62 ; 21.3.63 ; 17.2.64 ; 2, 3.2.65.

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

All combinations of (1) and (2)

(1) 3 levels of N :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(2) 3 sources of N :  $S_1$ =A/S,  $S_2$ =C/A/N and  $S_3$ =Urea.

**Sub-plot treatments :**

2 levels of F.Y.M. :  $F_0=0$  and  $F_1=56$  Q/ha.



**3. DESIGN:**

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (v) (a) 10.97 m. x 6.40 m. (b) 9.14 m. x 4.57 m. (v) 91 cm. x 91 cm. (vi) Yes.

**4. GENERAL:**

(i) Normal, satisfactory. (ii) Stem-rot attack, Sulphur dusted (in 1961 ; other years Nil. (iii) Yield of grain. (iv) (a) 1961 to 64. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Sub-plot variances are homogeneous. Main-plot variances are heterogeneous. Main Treatments x years interaction is absent. Hence results for individual years are presented under 5. Results.

**5. RESULTS:**

61(124)

(i) 414 Kg/ha. (ii) (a) 123.1 Kg/ha. (b) 110.2 Kg/ha. (iii) Interaction  $N \times F$  is highly significant. and main effect of S is significant. (iv) Av. yield of grain in Kg/ha.

$$N_0F_0 = 427, N_0F_1 = 392 \text{ Kg/ha.}$$

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	401	451	406	439	400	419
N <sub>2</sub>	439	465	338	342	486	414
Mean	420	458	372	390	443	417
F <sub>0</sub>	412	405	354			
F <sub>1</sub>	428	511	390			

C.D. for S marginal means = 89.8 Kg/ha.

C.D. for F means at the same level of N = 92.8 Kg/ha.

C.D. for N means at the same level of F = 98.5 Kg/ha.

62(114)

(i) 931 Kg/ha. (ii) (a) 324.7 Kg/ha. (b) 102.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$$N_0F_0 = 934, N_0F_1 = 872 \text{ Kg/ha.}$$

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	892	955	998	963	933	948
N <sub>2</sub>	932	1052	842	936	949	942
Mean	912	1003	920	950	941	945
F <sub>0</sub>	913	997	939			
F <sub>1</sub>	911	1010	902			

63(163)

(i) 224 Kg/ha. (ii) (a) 88.6 Kg/ha. (b) 65.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$N_0F_0=232$  and  $N_0F_1=267$  Kg/ha

	$S_1$	$S_2$	$S_3$	$F_0$	$F_1$	Mean
$N_1$	238	212	192	207	221	214
$N_2$	158	228	235	211	204	207
Mean	198	220	214	209	212	211
$F_0$	197	235	195			
$F_1$	199	205	232			

64(114)

(i) 416 Kg/ha. (ii) (a) 127.7 Kg/ha. (b) 101.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$N_0F_0=474$  and  $N_0F_1=388$  Kg/ha.

	$S_1$	$S_2$	$S_3$	$F_0$	$F_1$	Mean
$N_1$	374	347	475	398	400	399
$N_2$	419	395	437	402	432	417
Mean	396	371	456	400	416	408
$F_0$	402	313	486			
$F_1$	391	430	427			

**Crop :-** Wheat (*Rabi*).

**Ref :-** Mh. 64(132).

**Site :-** Agri. Res. Stn., Badnapur.

**Type :-** 'M'.

**Object :-** To study the effect of Spartin on the yield of Wheat.

### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Medium black soil. (iii) 5,6,10,64. (iv) (a) Ploughing and 5 harrowings. (b) Drilling. (c) 49 Kg/ha. (d) 30 cm. (e) —. (v) Nil. (vi) N—59. (vii) Unirrigated. (viii) 1 hoeing and 2 weedings. (ix) 0.4 cm. (x) 12.2.65.

### 2. TREATMENTS :

**Main-plot treatments :**

2 levels of F.Y.M. :  $F_0=0$  and  $F_1=5604$  Kg/ha.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 2 levels of spartin :  $S_0=0$  and  $S_1=371$  Kg/ha.

(2) 2 levels of manure :  $M_0=0$  and  $M_1=22.4$  Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ .

### 3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.97 m. x 6.40 m. (b) 9.14 m. x 5.48 m. (v) 91 cm. x 91 cm. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964-66 (not conducted in 65). (b) No. (c) Nil. (v) (a) Washim, Niphad, Nagpur and Tharsa. (b) No. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 338 Kg/ha. (ii) (a) 87.4 Kg/ha. (b) 81.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of Wheat in Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	S <sub>0</sub>	S <sub>1</sub>	Mean
F <sub>0</sub>	285	370	298	356	327
F <sub>1</sub>	351	349	362	338	350
Mean	318	359	330	347	338
S <sub>0</sub>	315	344			
S <sub>1</sub>	320	374			

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 60(89).**

**Site :- Agri. Res. Stn., Kashti.**

**Type :- 'M'.**

**Object :-** To study the effect of N and P alone and in combination on the yield of irrigated Wheat.

## 1. BASAL CONDITIONS :

(i) (a) N.A. (b) Jowar for fodder. (c) 25 C.L./ha. of F.Y.M. (ii) Medium black and Chopen soil. (iii) 28 to 31.10.60. (iv) (a) 1 ploughing and one harrowing. (b) Drilling. (c) 45 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) N—345. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 6.3.61.

## 2. TREATMENTS :

**Main-plot treatments:**

All combinations of (1) and (2)

(1) 4 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=22.4, N<sub>2</sub>=33.6 and N<sub>3</sub>=67.2 Kg/ha.

(2) 4 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=22.4, P<sub>2</sub>=33.6 and P<sub>3</sub>=67.2 Kg/ha.

**Sub-plot treatments:**

2 levels of F.Y.M : F<sub>0</sub>=0 and F<sub>1</sub>=56 Q/ha.

F.Y.M. drilled on 28.10.60.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 16 main-plots/replication ; 2 sub plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6.40 m. × 10.97 m. (b) 4.57 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960—only. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil

## 5. RESULTS :

(i) 1228 Kg/ha. (ii) (a) 482.3 Kg/ha. (b) 260.4 Kg/ha. (iii) Main effect of N is highly significant and interaction F × N is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
P <sub>0</sub>	807	1146	976	1633	1174	1107	1140
P <sub>1</sub>	1097	1306	1406	1468	1283	1355	1319
P <sub>2</sub>	810	1152	1472	1288	1098	1263	1180
P <sub>3</sub>	1010	1180	1580	1323	1246	1300	1273
Mean	931	1196	1359	1428	1200	1256	1228
F <sub>0</sub>	836	1261	1389	1316			
F <sub>1</sub>	1027	1131	1328	1539			

C.D. for N marginal means = 243.1 Kg/ha.

C.D. for F means at the same level of N = 185.3 Kg/ha.

C.D. for N means at the same level of F = 276.2 Kg/ha.

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 60(67), 61(126).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'M'.**

**Object :—**To find out the effective method of application of Super in association with organic manure on the yield of Wheat.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*; Wheat. (c) Nil. (ii) Black cotton soil. (iii) 1.11.60; 13.11.61. (iv) (a) Nil.; 3 harrowings. (b) By tiffan, drilling. (c) 67 Kg/ha. (d) 30 cm. × 5 to 7 cm. (e) 1 to 2. (v) Nil. (vi) Hy-65. (vii) Unirrigated. (viii) 1 weeding, 2 weedings. (ix) N.A.; 4 cm. (x) 4 and 5.3.61; 2, 3.3.62.

#### 2. TREATMENTS :

7 manurial treatments: M<sub>0</sub> = Control (no manure), M<sub>1</sub> = 22.4 Kg/ha. of N as A/S, M<sub>2</sub> = M<sub>1</sub> + compost, M<sub>3</sub> = M<sub>1</sub> + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super, M<sub>4</sub> = M<sub>1</sub> + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as digest compost, M<sub>5</sub> = M<sub>1</sub> + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super + compost mixed and M<sub>6</sub> = M<sub>1</sub> + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super and compost applied separately.

#### 3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 15.54 m. × 8.23 m. (b) 13.72 m. × 6.40 m. (v) 91 cm. × 91 cm. (vi) Yes.

#### 4. GENERAL :

(i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960 to 63 (Treatments changed for 62). (b) No. (c) Results for combined analysis are presented under 5. Results. (v) and (vi) Nil. (v) Error variances are homogeneous. Treatments × years interaction is absent.

#### 5. RESULTS :

Pooled results

(i) 1054 Kg/ha. (ii) 125.8 K3/ha. (based on 36 d.f. made up of pooled error). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>
Av. yield	1067	1042	1106	963	1008	1101	1092

## Individual results

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	Sig.	G.M.	S.E./plot
Year 1960	1079	1017	1446	1077	1141	1097	1208	N.S.	1109	109.3
1961	1055	1066	1065	849	874	1105	975	N.S.	998	140.3
Pooled	1067	1042	1106	963	1008	1101	1092	N.S.	1054	125.8

Crop :- Wheat (Rabi).

Ref :- Mh. 60(100), 61(132).

Site :- Agri. College Farm, Nagpur.

Type :- 'M'.

Object :- To study the effect of foliar application of Urea and Super applied alone and in combination on unirrigated Wheat.

## 1. BASAL CONDITIONS:

(i) (a) Wheat; Wheat. (b) Wheat. (c) As per treatments. (ii) Black cotton soil. (iii) Nov. 1960; 27.10.61. (iv) (a) 2 ploughings and 3 harrowings; 3 harrowings. (b) Drilling. (c) 56 to 67 Kg/ha.; 67 Kg/ha. (d) 25 cm.; 30 cm. between rows. (e) —. (v) Nil. (vi) HY—65. (vii) Unirrigated. (viii) 1 weeding. (ix) 1 cm.; 17 cm. (x) March 1961; 6.3.62.

## 2. TREATMENTS:

Main-plot treatments:

5 manurial treatments: M<sub>0</sub>=Control, M<sub>1</sub>=Water spraying, M<sub>2</sub>=3 % Urea spraying, M<sub>3</sub>=8 % Super phos spraying and M<sub>4</sub>=3 % Urea+8 % Super phos spraying.

Sub-plot treatments:

3 times of application: T<sub>1</sub>=1½ months after sowing, T<sub>2</sub>=2½ months after sowing and T<sub>3</sub>=1½ months after sowing+2½ months after sowing.

## 3. DESIGN:

(i) Split-plot. (ii) (a) 5 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7.70 m. × 5.61 m. (b) 6.88 m. × 4.88 m. (v) 41 cm. × 36 cm. (vi) Yes.

## 4. GENERAL:

(i) Normal. (ii) Whiteants attack in 1960; Nil in 1961. (iii) Population, height measurement, tiller counts and yield of grain. (iv) (a) 1958 to 61 (1958 N.A.). (b) Yes. (c) No. (v) and (vi) Nil. (vii) Error variances for sub-plot are heterogeneous and Treatments × years interaction is absent, hence results for individual years are presented under 5. Results.

## 5. RESULTS:

60(100)

(i) 938 Kg/ha. (ii) (a) 252.4 Kg/ha. (b) 199.9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	Mean
T <sub>1</sub>	899	981	1007	788	840	919
T <sub>2</sub>	818	803	951	855	1025	890
T <sub>3</sub>	885	929	1087	988	1139	1006
Mean	867	904	1042	877	1101	938

61(132)

(i) 1365 Kg/ha. (ii) (a) 220.4 Kg/ha. (b) 134.0 Kg/ha. (iii) Main effect of M is significant. (iv) Av. yield of grain in Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	Mean
T <sub>1</sub>	1169	1381	1560	1221	1471	1360
T <sub>2</sub>	1288	1162	1449	1292	1527	1344
T <sub>3</sub>	1333	1303	1508	1285	1519	1390
Mean	1263	1282	1505	1266	1506	1365

C.D. of M marginal means=196.0 Kg/ha.

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 60(119), 61(138).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'M'.**

**Object :-** To compare the effect of soil and foliar application of Urea on irrigated Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Wheat ; Wheat. (b) Wheat. (c) As per treatments. (ii) Black cotton soil. (iii) 28.10.60 ; 11.11.61. (iv) (a) N.A. ; Harrowing. (b) By tiffan ; drilling. (c) 67 Kg/ha. (d) 23 cm. x 5 cm to 8 cm. ; 23 cm. between rows. (e) —. (v) Nil. (vi) HY—65. (vii) Irrigated. (viii) 1 weeding. (ix) 1 cm. ; 4 cm. (x) 11, 12.3.61 ; 23.3.62.

**2. TREATMENTS :**

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

(1) 4 levels of N as Urea : N<sub>0</sub>=0, N<sub>1</sub>=22.4, N<sub>2</sub>=44.8 and N<sub>3</sub>=89.6 Kg/ha.

(2) 2 methods of application : T<sub>1</sub>=Soil application and T<sub>2</sub>=Foliar application.

(3) 2 times of application : M<sub>1</sub>=In one dose and M<sub>2</sub>=In two split doses.

First spraying on 24 to 26.11.60 and 6.12.61 second in 27.12.60 and 18.1.62 and soil application by broadcasting at sowing on 27.12.60 and 17.1.62.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 6.40 m. x 10.97 m. (b) 5.49 m. x 10.06 m. (v) 46 cm. x 46 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959 to 61. (b) Yes. (c) Nil. (v) N.A. (vi) No. (vii) Since the dummy treatments are not separated while analysing the data, the pooling is not carried out and hence the results for individual years are presented under 5. Results.

**5. RESULTS :**

**1960**

(i) 1378 Kg/ha. (ii) 127.9 Kg/ha. (iii) Main effect of N, T and interaction N x T are highly significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	Mean
T <sub>1</sub>	1095	1415	1590	1729	1419	1496	1457
T <sub>2</sub>	1064	1391	1496	1249	1306	1293	1300
Mean	1080	1403	1543	1489	1362	1395	1378
M <sub>1</sub>		1410	1549	1441			
M <sub>2</sub>		1396	1537	1537			

C.D. for N Marginal means =91.2 Kg/ha.  
 C.D. for T marginal means =64.5 Kg/ha.  
 C.D. for the body of N×T table =129.0 Kg/ha.

1961

(i) 1423 Kg/ha. (ii) 269.4 Kg/ha. (iii) Main effects of N, T and interaction N×T are highly significant.  
 (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	Mean
T <sub>1</sub>	909	1561	1815	2003	1615	1529	1572
T <sub>2</sub>	1041	1321	1713	1021	1331	1217	1274
Mean	975	1441	1764	1512	1473	1373	1423
M <sub>1</sub>		1593	1794	1487			
M <sub>2</sub>		1289	1734	1537			

C.D. for N marginal means =191.9 Kg/ha.  
 C.D. for T marginal means =135.7 Kg/ha.  
 C.D. for the body of N×T table =271.5 Kg/ha.

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 60(186), 61(135).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'M'.**

Object:—To study the effect of micronutrients on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) Black cotton soil. (iii) 29.10.60; 5.11.61. (iv) (a) Harrowings. (b) Drilling. (c) N.A. (d) 23 cm. (e) 1 to 2. (v) 44.8 Kg/ha. of N as A/S+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. (vi) HY-65. (vii) Unirrigated. (viii) 2 weedings. (ix) 1 cm. ; 4 cm. (x) 6, 7.3.61; 8.3.62.

2. TREATMENTS:

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

- (1) 2 levels of Zn as ZnSO<sub>4</sub>: A<sub>0</sub>=0 and A<sub>1</sub>=Zn application.
- (2) 2 levels of Mn as Mn SO<sub>4</sub>: B<sub>0</sub>=0 and B<sub>1</sub>=Mn application.
- (3) 2 levels of Cu as CuSO<sub>4</sub>: C<sub>0</sub>=0 and C<sub>1</sub>=Cu application.
- (4) 2 levels of Mo as Sodium molybdate: D<sub>0</sub>=0 and D<sub>1</sub>=Mo application.
- (5) 2 levels of B as Borax: E<sub>0</sub>=0 and E<sub>1</sub>=B application.

3. DESIGN :

(i) 2<sup>5</sup> Fact. in R.B.D. (ii) (a) 32. (b) N.A. (iii) 4. (iv) (a) 4.88 m×4.88 m. (b) 3.66m,×3.66 m. (v) 61 cm. ×61 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959 to 61. (b) No. (c) Nil. (v) and (vi) N.A. (vii) As the error variances are heterogeneous and Treatments×years interaction is absent, therefore individual years results are presented under 5. Results.

5. RESULTS:

60(186)

(i) 776 Kg/ha. (ii) 116.6 Kg/ha. (iii) Effect of B is highly significant and that of interaction B×D and A×E are significant. (iv) Table of mean and differential responses in Kg/ha.

Treatment	Mean response	Differential responses									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	-40.2	-	-	-65.0	-15.4	-40.0	-40.4	-43.7	-36.7	2.3	-82.7
B	-68.7	-93.5	-43.9	-	-	-41.4	-96.0	-27.4	-100.0	-43.5	-93.9
C	48.8	-49.9	48.6	76.1	21.5	-	-	38.5	59.1	18.2	79.4
D	16.6	13.1	20.1	57.9	-24.7	6.3	26.9	-	-	4.7	28.5
E	19.2	61.7	-23.3	44.4	-6.0	-11.4	49.8	7.3	31.1	-	-

C.D. for mean response = 41.0 Kg/ha.

C.D. for differential response = 58.1 Kg/ha.

61(135)

(i) 1383 Kg/ha. (ii) 293.0 Kg/ha. (iii) Interaction ADE is highly significant. (iv) Mean and differential response table in Kg/ha.

Treatment	Mean response	Differential responses									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	33.9	-	-	112.1	-44.3	12.9	54.9	-25.7	93.5	36.2	31.6
B	-72.4	5.8	-150.6	-	-	-157.7	12.9	-151.8	7.0	29.2	-174.0
C	-22.2	-43.2	-1.2	-107.5	63.1	-	-	-53.7	9.3	-52.6	8.2
D	2.3	-57.3	61.9	-77.1	81.7	-29.2	33.8	-	-	17.5	-12.9
E	36.2	38.5	33.9	137.8	-65.4	5.8	66.6	51.4	21.0	-	-

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 60(188), 61(138).**

**Site :- Agri. College Farm, Nagpur.**

**Type 'M'.**

Object :- To compare the effect of soil and foliar application of N.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) Black cotton soil. (iii) 28.10.60; 11.11.61. (iv) (a) Harrowing. (b) Drilling. (c) 67.2 Kg/ha. (d) 23 cm. (e) 1 to 2. (v) Nil. (vi) Hy 65. (vii) Irrigated. (viii) Weeding. (ix) 1 cm. ; 4 cm. (x) 11, 12, 3.61 ; 23.3.62.

**2. TREATMENTS:**

All combinations of 1, 2 and 3.

(1) 4 levels of N as Urea :  $N_0=0$ ,  $N_1=22.4$ ,  $N_2=44.8$ ,  $N_3=89.6$  Kg/ha.

(2) 2 Types of application :  $T_1$ =Soil application and  $T_2$ =Foliar application.

(3) 2 methods of application :  $M_1$ =In one dose and  $M_2$ =In two split doses.

Foliar application at tillering stage and ear emergence stage and soil application at broadcasting

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (ii) 4. (iv) (a) 6.40 m.  $\times$  10.97 m. (b) 5.49 m.  $\times$  10.06 m. (v) 46 cm.  $\times$  46 cm. (vi) Yes.

**4. GENERAL INFORMATION :**

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1959-61. (b) Yes. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous, and Treatments  $\times$  years interaction is present.



## 5. RESULTS :

Pooled results :

(i) 1450 Kg/ha. (ii) 209.8 Kg/ha. (based on 135 d.f. made up of pooled error). (iii) Main effects of T, M and interaction M x T are highly significant. (iv) Av. yield of grain in Kg/ha.

Control=1356 Kg/ha.

	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	Mean
T <sub>1</sub>	1447	1718	1670	1438	1785	1612
T <sub>2</sub>	1377	1380	1302	1340	1366	1353
Mean	1412	1549	1486	1389	1576	1482
M <sub>1</sub>	1224	1548	1395			
M <sub>2</sub>	1600	1550	1577			

Individual results :

Treatments	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	Sig.	M <sub>1</sub>	M <sub>2</sub>	Sig.	T <sub>1</sub>	T <sub>2</sub>	Si.
Years										
1960	1325	1477	1568	N.S.	621	759	N.S.	1459	1301	N.S.
1961	1333	1540	1413	**	1208	1638	**	1572	1274	**
Pooled	1412	1549	1486	N.S.	1389	1576	**	1612	1353	**

Control	Sig.	G.M.	S.E./plot
1301	*	1392	205.8
1333	*	1437	267.3
1356	*	1450	209.8

Crop :- Wheat (*Rabi*).

Ref :- Mh- 62(118), 63(166)

Site :- Agri. College Farm, Nagpur.

Type :- 'M'.

Object :- To find out the effective method of application of Super in association with organic manures on the yield.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) wheat. (c) N.A. (ii) Black cotton soil. (iii) 23.10.62 ; 3.11.63. (iv) (a) 3 harrowings ; 4 harrowings. (b) Drilling. (c) N.A. (d) 30 cm. x 5 to 8 cm. (e) 1 to 2. (v) Nil. (vi) Hy.—65. (vii) Unirrigated. (viii) 1 weeding. (ix) 17 cm. ; N.A. (x) 12.3.63 ; 25, 26.2.64.

## 2. TREATMENTS :

7 manurial treatments : M<sub>0</sub>=Control, M<sub>1</sub>=Compost only, M<sub>2</sub>=M<sub>1</sub>+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. applied separately, M<sub>3</sub>=M<sub>1</sub>+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. mixed and kept for a week and then applied, M<sub>4</sub>=22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> applied through digested Compost, M<sub>5</sub>=22.4 Kg/ha. of N as A/S+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super and M<sub>6</sub>=22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 7 (b) N.A. (iii) 4. (iv) (a) 15.54 m. x 8.23 m. (b) 13.72 m. x 6.40 m. (v) 91 cm. x 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) No. of tillers, plant population and yield of grain. (iv) (a) 1960-63 (treatments changed from 62). (b) No. (c) Nil. (v) Akola. (vi) Nil. (vii) Error variances are heterogeneous. Treatments x years interaction is absent. Hence individual year results are given under 5. Results.

## 5. RESULTS:

62(118)

(i) 1116 Kg/ha. (ii) 150.9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>
Av. yield	1099	1071	1139	1185	1152	1125	1044

63(166)

(i) 818 Kg/ha. (ii) 91.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>
Av. yield	824	803	752	847	732	930	839

Crop :- Wheat (*Rabi*).

Ref :- Mh. 63(159), 64(130), 65(72)

Site :- Agri. College Farm, Nagpur.

Type :- 'M'.

Object :- To study the effect of Spartin on the yield of Wheat.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Linseed and Wheat ; Wheat ; Wheat. (c) Nil in 63 ; As per treatments in 64 and 65. (ii) Morand No. 2. (iii) 4.11.63 ; 22.10.64 ; 13.10.65. (iv) (a) 1 tractor ploughing ; 1 ploughing and 3 harrowings ; 1 to 2 harrowings. (b) Drilling. (c) 45 Kg/ha. (d) 30 cm. (e) —. (v) Nil. (vi) Hy.—65. (vii) Unirrigated. (viii) 1 weeding ; interculturing ; Nil. (ix) N.A., 0.5 cm. ; Nil. (x) 6.3.64 ; 16.2.65 ; 10.2.66.

## 2. TREATMENTS :

Main-plot Treatments :

2 levels of F.Y.M. : F<sub>0</sub>=0 and F<sub>1</sub>=5600 Kg/ha.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of manure : M<sub>0</sub>=0 (control) and M<sub>1</sub>=22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.(2) 2 levels of Spartin : S<sub>0</sub>=0 and S<sub>1</sub>=168 Kg/ha. of Spartin.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) Nil. (v) 91 cm. x 91 cm. (v) Yes.

## 4. DENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-65. (b) Yes. (c) Nil. (v) Badnapur, Niphad, Tharsa and Washim. (vi) Nil. (vii) Main-plot variances are homogeneous, sub-plot variances are heterogeneous. Hence individual year results are given under 5. Results.

## 5. RESULTS :

63(159)

(i) 1202 Kg/ha. (ii) (a) 402.0 Kg/ha. (b) 491.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	S <sub>0</sub>	S <sub>1</sub>	Mean
F <sub>0</sub>	986	1307	1135	1158	1146
F <sub>1</sub>	1595	921	1245	1271	1258
Mean	1290	1114	1190	1214	1202
S <sub>0</sub>	1240	1140			
S <sub>1</sub>	1341	1088			

65(130)

(i) 386 Kg/ha. (ii) (a) 128.6 Kg/ha. (b) 109.6 Kg/ha. (iii) Main effect of M alone is significant. (iv) Av. yield of grain in Kg/ha.

	M <sub>1</sub>	M <sub>2</sub>	S <sub>0</sub>	S <sub>1</sub>	Mean
F <sub>0</sub>	351	399	349	401	375
F <sub>1</sub>	326	467	455	339	397
Mean	339	433	402	370	386
S <sub>0</sub>	335	468			
S <sub>1</sub>	343	397			

C.D. for M marginal means=87.5 Kg/ha.

65(72)

(i) 664 Kg/ha. (ii) (a) 476.8 Kg/ha. (b) 216.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	S <sub>0</sub>	S <sub>1</sub>	Mean
F <sub>0</sub>	663	648	642	705	674
F <sub>1</sub>	705	605	671	639	655
Mean	684	644	655	672	664
S <sub>0</sub>	720	593			
S <sub>1</sub>	648	696			

**Crop :- Wheat (Rabi).**

**Site :- Agri. Res. Stn., Niphad.**

**Ref :- Mh. 63(155), 64(125).**

**Type :- 'M'.**

Object :- To study the effect of Spartina on Wheat yield (unirrigated).

### 1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A.; Gram. (c) N.A. (ii) N.A. (iii) 25.10.63 ; 17.10.64. (iv) (a) 3 to 4 harrowings (b) Drilling. (c) 45 Kg/ha. (d) 30 cm. (e) —. (v) Nil. (vi) N-59. (vii) Unirrigated. (viii) 2 weedings and 2 hoeing; 3 interculturations. (ix) N.A. (x) 18.2.64 ; 20.2.65.

### 2. TREATMENTS:

**Main-plot treatments :**

2 levels of F.Y.M. : F<sub>0</sub>=0 and F<sub>1</sub>=5600 Kg/ha.

**Sub-plot treatments :**

All combinations of (1) and (2).

(2) levels of spartina : S<sub>0</sub>=0 and S<sub>1</sub>=168 Kg/ha.

(2) 2 levels of manure : M<sub>0</sub>=0 and M<sub>1</sub>=22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

### 3. DESIGN:

(i) Split-plot. (ii) (a) 2 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 6.40 m. (b) 9.14 m. × 5.48 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-64. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Parbhani. (vi) Nil. (vii) Main-plot error variances and sub-plot error variances are homogenous. Treatments  $\times$  years interactions are absent.

## 5. RESULTS

## Pooled Results

(i) 514 Kg/ha. (ii) (a) 81.2 Kg/ha. (with 6 d.f. made up of Pooled error). (b) 69.0 Kg/ha. (with 36 d.f. is made up of Pooled error). (iii) M effect alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	S <sub>0</sub>	S <sub>1</sub>	Mean
F <sub>0</sub>	498	551	513	537	525
F <sub>1</sub>	469	536	499	507	503
Mean	484	544	506	522	514
S <sub>0</sub>	477	534			
S <sub>1</sub>	490	553			

C.D. for M marginal mean = 35.1 Kg/ha.

## Individual results

Treatment	M <sub>0</sub>	M <sub>1</sub>	Sig.	S <sub>0</sub>	S <sub>1</sub>	Sig.
Year						
1963	694	743	N.S.	701	736	N.S.
1964	273	344	**	310	307	N.S.
Pooled	484	544	**	506	522	N.S.

F <sub>0</sub>	F <sub>1</sub>	Sig.	G.M.	S.E./plot	
				(a)	(b)
708	730	N.S.	719	88.6	67.8
341	275	N.S.	308	73.8	70.2
525	503	N.S.	514	81.2	69.0

Crop :- Wheat (*Rabi*).

Ref : Mh. 63(158), 64(129).

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

Type :- 'M'.

Object :- To study the effect of Spartina on the yield of Wheat (irrigated).

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A.; *Sannhamp*. (c) N.A.; Nil. (ii) N.A. (iii) 5.11.63; 24.10.64. (iv) (a) N.A.; 2 ploughings and 3 harrowings. (b) Drilling. (c) 45 Kg/ha. (d) 30 cm. (e) —. (v) Nil. (vi) N.I.—146. (vii) Irrigated. (viii) 1 weeding and 2 hoeings; 3 interculturings. (ix) N.A. (x) 12.3.64.; 8.3.65.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. No. 63(155), 64(125) conducted at Agri. Res. Stn., Niphad and presented at page 109.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-64. (b) No. (c) Presented under 5. Results. (v) Bednapur, Nagpur, Washim and Tharsa. (vi) No. (vii) Main-plot variances and sub-plot variances are homogeneous. Treatments  $\times$  years interaction is absent.

## 5. RESULTS:

(i) 1347 Kg/ha. (ii) (a) 207.2 Kg/ha. (with 6 d.f. made up of pooled error). (b) 205.8 Kg/ha. (with 36 d.f. made up of pooled error). (iii) Main effect of M and interaction M×F are highly significant. (vi) Av. yield of grain in Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	S <sub>0</sub>	S <sub>1</sub>	Mean
F <sub>0</sub>	1193	1501	1331	1363	1347
F <sub>1</sub>	1305	1344	1363	1287	1325
Mean	1249	1423	1347	1325	1336
S <sub>0</sub>	1222	1472			
S <sub>1</sub>	1276	1374			

C.D. for M marginal means = 104.1 Kg/ha.

C.D. for M means at the same level of F = 148.1 Kg/ha.

.. F .. .. M = 148.6 Kg/ha.

## Individual results

Treatment	M <sub>0</sub>	M <sub>1</sub>	Sig.	S <sub>0</sub>	S <sub>1</sub>	Sig.
Year						
1963	1221	1509	**	1400	1330	N.S.
1964	1277	1336	N.S.	1294	1319	N.S.
Pooled	1249	1423	**	1347	1325	N.S.

F <sub>0</sub>	F <sub>1</sub>	Sig.	G.M.	S.E./plot	
				(a)	(b)
1336	1394	N.S.	1365	242.4	188.9
1357	1255	N.S.	1306	164.6	221.3
1347	1325	N.S.	1336	207.2	205.8

Crop :- Wheat (*Rabi*).

Ref. :- Mh. 64(53), 65(101).

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

Type :- 'M'.

Object :- To study the effect of N, P and K on the yield of Wheat.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Nil; *Tur.* (c) Nil. (ii) Medium black. (iii) 22.10.64.; 27.10.65. (iv) (a) 2 ploughings and 3 to 4 harrowings. (b) Drilling. (c) 49 Kg/ha. (d) 30 cm. (e) —. (v) Nil. (vi) N-59. (vii) Unirrigated. (viii) 3 interculturings; weeding. (ix) N.A.; 29 cm. (x) 13.2.65.; 23.2.66.

## 2. TREATMENTS:

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

(1) 3 levels of N as A/S: N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super: P<sub>0</sub>=0, P<sub>1</sub>=22.4 and P<sub>2</sub>=44.8 Kg/ha.

(3) 3 levels of K<sub>2</sub>O as Mur. of pot: K<sub>0</sub>=0, K<sub>1</sub>=22.4 and K<sub>2</sub>=44.8 Kg/ha.

## 3. DESIGN:

(i) 3<sup>3</sup> confd. NPK<sup>2</sup> and NP<sup>2</sup>K effects partially confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 10.97 m. × 5.79 m. (b) 9.14 m. × 4.57 m. (v) 91 cm. × 61 cm. (vi) Yes.

## 4. GENERAL:

(i) Normal in 64 ; Plots with treatments 102, 020, 121, 120, 202, 101, 021, 220, 010 irrigated as they were not germinated for want of moisture. (ii) White ants—BHC 50% sprayed in 64 ; Nil in 65. (iii) Yield of grain. (iv) (a) 1964-67. (b) No. (c) Nil. (v) Washim. (vi) and (vii) Nil.

## 5. RESULTS:

64(53)

(i) 458 Kg/ha. (ii) 63.2 Kg/ha. (iii) Main effect of P and N are highly significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
N <sub>0</sub>	320	397	417	407	378	349	378
N <sub>1</sub>	419	510	509	483	495	490	489
N <sub>2</sub>	477	506	542	518	529	478	508
Mean	415	471	489	469	467	439	458
K <sub>0</sub>	454	509	445				
K <sub>1</sub>	420	463	519				
K <sub>2</sub>	372	441	504				

C.D. for N or P marginal means = 43.7 Kg/ha.

65(101)

(i) 549 Kg/ha. (ii) 133.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
N <sub>0</sub>	478	504	527	432	520	557	503
N <sub>1</sub>	591	582	531	508	557	639	568
N <sub>2</sub>	553	596	582	614	540	577	577
Mean	541	561	546	518	539	591	549
K <sub>0</sub>	544	506	504				
K <sub>1</sub>	534	498	585				
K <sub>2</sub>	544	678	551				

Crop :- Wheat (*Rabi*).

Ref :- Mh. 60(122), 62(95), 63(138), 65(74).

Site :- Agri. College Farm,  
Parbhani.

Type :- 'M'.

Object :- To study the effect of phosphate manuring with and without F.Y.M. on the yield of *chinamung* and on the yield of succeeding Wheat crop.

## 1. BASAL CONDITIONS :

(i) (a) Not fixed. (b) *Chinamung* (c) As per treatments. (ii) Medium black soil. (iii) 27.10.60 ; 13.10.62 ; 11.10.63 ; 13.10.65. (iv) (a) 1 ploughing and 2 harrowings ; harrowing ; 3 harrowings ; 2 harrowing. (b) Drilling. (c) 56 Kg/ha. ; 44.8 Kg/ha. in 62, 63 and 65. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) HY 65-4. (vii) Unirrigated. (viii) 2 weedings and 2 hoeings for 60 and 63 ; weedings and hoeing once for other years. (ix) 5 cm. ; 10 cm. : 8 cm. ; 4 cm. (x) 6 to 9.3.61 ; 8, 9 4.63 ; 10, 11.2 64 and 15, 16.2.66.

## 2. TREATMENTS :

All combinations of (1) and (2)+extra treatment

(1) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

(2) 2 levels of F.Y.M. :  $F_0=0$  and  $F_1=12$  C.L./ha.

Extra treatments (E) Fallow in *Kharif*.

Manure applied to previous *chinamug* crop. F Y.M. broadcast and  $P_2O_5$  as Super drilled.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 6.40 m.  $\times$  10.97 m. (b) 4.57 m.  $\times$  14. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960 to 65. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is absent. Hence individual years results are given. Experiments conducted during 1961 and 64 are not available.

## 5. RESULTS :

60(227)

(i) 1415 Kg/ha. (ii) 251.0 Kg/ha. (iii) Main effect of P alone is significant. (iv) Av. yield of grain in Kg/ha.

E=1361 Kg/ha.

	$P_0$	$P_1$	$P_2$	Mean
$F_0$	1539	1743	1135	1472
$F_1$	1388	1422	1316	1375
Mean	1464	1582	1226	1424

C.D. for P marginal means=267.4 Kg/ha.

62(95)

(i) 961 Kg/ha. (ii) 186.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

E=896 Kg/ha.

	$P_0$	$P_1$	$P_2$	Mean
$F_0$	829	966	930	908
$F_1$	990	1181	935	1035
Mean	910	1074	932	972

63(138)

(i) 1108 Kg/ha. (ii) 131.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

E=1064 Kg/ha.

	$P_0$	$P_1$	$P_2$	Mean
$F_0$	1017	1112	1188	1106
$F_1$	1093	1035	1247	1125
Mean	1055	1074	1218	1116

65(74)

(i) 554 Kg/ha. (ii) 57.9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

E= 524 Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
F <sub>0</sub>	531	530	559	540
F <sub>1</sub>	560	592	583	578
Mean	546	561	571	559

**Crop :- Wheat (Rabi).****Ref :- Mh. 63(156), 64(129), 65(175)****Site :- Agri. College Farm, Parbhani.****Type :- 'M'.**

Object :- To study the effect of spartin on the yield of Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*. (c) N.A. ; 12.5 C.L./ha. of F.Y.M. ; Nil. (ii) Medium black soil. (iii) 28.10.63 ; 21.10.64 ; 14.10.65. (iv) (a) 5 harrowings in 63 and 65 ; 3 ploughings and 2 harrowings in 64. (b) Drilling. (c) 45 Kg/ha. (d) 30 cm. (e) N.A. (v) Nil (vi) HY-65-4. (vii) Unirrigated. (viii) 2 hoeings and 1 weeding. (ix) Nil. ; 0.2 cm. ; 3 cm. (x) 25 to 27.2.64 ; 4, 5.3.65 ; 17 to 19.2.66.

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

Same in expt no. 63(155), 64(125) conducted at Agri. Res. Stn , Niphed on page 109.

**4. GENERAL :**

(i) Satisfactory ; Normal ; Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-65. (b) ... (c) Results of combined analysis are presented under 5 Results (v) Niphed. (vi) Nil. (vii) Both the error variances are homogeneous. Treatments × years interactions are absent.

**5. RESULTS :**

Pooled results :

(i) 733 Kg/ha. (ii) (a) 116.7 Kg/ha. with 9 d.f. made up of pooled error. (b) 67.9 Kg/ha. with 54 d.f. made up of pooled error. (iii) Main effect of M is only significant. (iv) Av. yield of grain in Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	S <sub>0</sub>	S <sub>1</sub>	Mean
F <sub>0</sub>	678	780	700	757	729
F <sub>1</sub>	704	770	742	733	737
Mean	691	775	721	745	733
S <sub>0</sub>	667	775			
S <sub>1</sub>	715	775			

C.D. for M marginal means=28.2 Kg/ha.

Individual results :

Treatment	M <sub>0</sub>	* M <sub>1</sub>	Sig.	S <sub>0</sub>	S <sub>1</sub>	Sig.
Year 1963	850	914	**	854	910	*
1964	528	699	**	613	614	N.S.
1965	696	713	N.S.	698	711	N.S.
Pooled	691	775	**	721	745	N.S.



Treatment	F <sub>0</sub>	F <sub>1</sub>	Sig.	G.M.	S.E./plot	
					(a)	(b)
Year						
1963	874	890	N.S.	882	116.7	62.6
1964	613	614	N.S.	613	117.8	83.7
1965	723	686	N.S.	704	115.6	53.9
Pooled	729	737	N.S.	733	116.7	67.9

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 63(67).**

**Site :- Agri. College Farm, Poona.**

**Type :- 'M'.**

Object :- To study the effect of spartan on the yield of Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Chilies. (c) 25 C.L./ha. of F.Y.M. (ii) Medium black. (iii) 25.9.63. (iv) (a) Harrowing. (b) Dibbling. (c) 45 Kg/ha. (d) 30 cm. (e) 2. (v) Nil. (vi) N-59. (vii) Unirrigated. (viii) Weeding. (ix) 10 cm. (x) 10.2.64.

**2. TREATMENTS :**

**Main-plot treatments :**

2 levels of F.Y.M. : F<sub>0</sub>=0 and F<sub>1</sub>=56 Q/ha.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 2 levels of spartan : S<sub>0</sub>=0 and S<sub>1</sub>=2.2 Kg/plot.

(2) 2 levels of manurial combinations : M<sub>0</sub>=0 and M<sub>1</sub>=0.67 Kg. of A/S+0.75 Kg. of single Super per plot.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 2 main-plots/replication, 4 sub-plots/main-plot. (b) 16.46 m. × 29.28 m. (iii) 4. (iv) (a) 8.23 m. × 7.32 m. (b) 6.40 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963 only. (b) —. (c) No. (v) to (vii) Nil.

**5. RESULTS :**

(i) 775 Kg/ha. (ii) (a) 104.7 Kg/ha. (b) 145.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	S <sub>0</sub>	S <sub>1</sub>	M <sub>0</sub>	M <sub>1</sub>	Mean
F <sub>0</sub>	762	772	755	779	767
F <sub>1</sub>	818	748	837	729	783
Mean	790	760	796	754	775
M <sub>0</sub>	794	798			
M <sub>1</sub>	786	722			

**Crop :- Wheat (Rabi).****Ref :- Mh. 60(170).****Site :- Agri. Res. Stn., Tharsa.****Type :- 'M'.**

Object :—To compare the effect of soil and foliar application of Urea on irrigated Wheat.

**1. BASAL CONDITIONS :**(i) (a) Wheat—Wheat. (b) Wheat. (c) As per treatments. (ii) Morand no. 2. (iii) 1.11.60. (iv) (a) 2 ploughings and 2 *bakherings*. (b) Sowing by tiffan. (c) 67 Kg/ha. (d) 30 cm. × 8 cm. (e) N.A. (v) Nil. (vi) HY—65. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 21.3.61.**2. TREATMENTS :**

Same as in Experiment No. 61(145), 62(130) on page No. 122.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 6.40 m. × 10.97 m. (b) 4.57 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Late rains during the month of February, March 61 damaged the crop to some extent. (ii) Nil. (iii) Yield of grain (iv) (a) 1959-60. (b) Yes. (c) Nil. (v) Nagpur and Achalpur. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 1988 Kg/ha. (ii) 694.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	Mean
T <sub>1</sub>	—	2207	1916	1862	2051	2049	2050
T <sub>2</sub>	—	2113	1780	2115	2042	1810	1926
Mean	1958	2160	1848	1888	2047	1929	1988
M <sub>1</sub>	—	2461	1909	1882			
M <sub>2</sub>	—	1858	1787	2095			

**Crop :- Wheat (Rabi).****Ref :- Mh. 60(158), 61(54).****Site :- Agri. Res. Stn., Tharsa.****Type :- 'M'.**

Object :—To study the relative merits of Nitrophosphate complex by ODDA and PEC process on the yield of irrigated Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Nil. ; N.A. (b) Gram ; N.A. (c) N.A. (ii) Medium black. (iii) 12.11.60 ; 18.11.61. (iv) (a) 2 ploughings and 2 harrowings. (b) Sowing by tiffan. (c) 90 Kg/ha (d) 30 cm. × 5 cm. (e) —. (v) Nil. (vi) HY—65 (vii) Irrigated. (viii) Nil. ; 3 weedings. (ix) N.A. (x) 22.3.61 ; 3.4.62.

**2. TREATMENTS :**

All combinations of (1), (2) and (3)+5 extra treatments/block.

(1) 3 sources of P<sub>2</sub>O<sub>5</sub> and N : S<sub>1</sub>=A/S+Super, S<sub>2</sub>=ODDA and S<sub>3</sub>=PEC.(2) 3 levels of N and P<sub>2</sub>O<sub>5</sub> : L<sub>1</sub>=13.5 Kg/ha. of N+11.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, L<sub>2</sub>=2 L<sub>1</sub> and L<sub>3</sub>=4 L<sub>1</sub>.(3) 3 methods of application : M<sub>1</sub>=Broadcast, M<sub>2</sub>=6 cm. below seed and M<sub>3</sub>=Band placement.5 extra treatments per block : N<sub>0</sub>=0, N<sub>1</sub>=13.5, N<sub>2</sub>=27.0, N<sub>3</sub>=46.5 and N<sub>4</sub>=54.0 Kg/ha. of N.

## 3. DESIGN :

(i) 3<sup>3</sup> confd. + 5 extra treatment in each block. (ii) (a) 14 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 6.40 m. × 10.97 m. (b) 4.57 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain (iv) (a) 1960-62. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) No. (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interactions are absent. Experiment for the year 62 is not available.

## 5. RESULTS :

Pooled results

(i) 1606 Kg/ha. (ii) 416.3 Kg/ha. (based on 98 d.f. made up of pooled error). (iii) Main effect of S is highly significant. (iv) Av. yield of grain in Kg/ha.

$N_0=1462$ ,  $N_1=1434$ ,  $N_2=1565$ ,  $N_3=1752$  and  $N_4=1730$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
S <sub>1</sub>	1678	1456	1877	1542	1694	1775	1670
S <sub>2</sub>	1664	1583	1870	1656	1724	1738	1706
S <sub>3</sub>	1444	1576	1392	1417	1503	1492	1470
Mean	1595	1538	1713	1538	1640	1668	1615
M <sub>1</sub>	1551	1588	1475				
M <sub>2</sub>	1664	1518	1738				
M <sub>3</sub>	1570	1508	1962				

C.D. for S marginal means = 195.6 Kg/ha.

Individual results :

Treatment	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Sig.	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Sig.	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Sig.
Year												
1960	2088	2060	2350	*	2080	2151	2267	*	2238	2368	1892	*
1961	1102	1016	1076	N.S.	996	1129	1069	N.S.	1102	1043	1049	N.S.
Pooled	1595	1538	1713	N.S.	1538	1640	1668	N.S.	1670	1706	1470	**

N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	Sig.	G.M.	S.E/plot
1728	1953	2054	2467	2224	N.S.	2166	474.12
1196	916	1076	1036	1235	N.S.	1074	349.0
1462	1434	1565	1752	1730	N.S.	1606	416.3

Crop :- Wheat (Rabi).

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

Ref :- Mh. 60(164), 61(103).

Type :- 'M'.

Object :- To study the effect of micronutrients on irrigated Wheat.

## 1. BASAL CONDITIONS :

(i) (a) Not fixed. (b) Wheat. (c) N A. ; Nil. (ii) Morand no. 2 ; Medium black. (iii) 27.10.60 ; 6.11.61. (iv) (a) 2 ploughings and 2 harrowings ; (b) By tiffan ; Drilling. (c) 67 Kg/ha. (d) 30 cm. x 8 cm, (e) —. (v) Nil. ; 22.4 Kg/ha. of N. (vi) HY—65. (vii) Irrigated. (viii) Nil. ; weeding. (ix) N.A. (x) 8.3.61 ; 19.3.62.

## 2. TREATMENTS :

Same as in experiment 60(186), 61(135) on Wheat presented at page No. 105.

## 3. DESIGN :

(i) 2<sup>5</sup> Fact. (ii) (a) 32. (b) N.A. (iii) 4. (iv) (a) 5.49 m. x 9.14 m. (b) 3.66 m. x 7.32 m. (v) 91 cm. x 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Late rains in the months of Feb. to April damage the crop to some extent in 60 ; poor germination in 61. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959 to 61. (b) No. (c) Results of combined analysis are given under 5, Results. (v) and (vi) N.A. (vii) Error variances for the years 1959 to 61 are heterogeneous and Treatments x years interactions are present. Experiment for the year 59 has also been taken for pooled analysis into consideration.

## 5. RESULTS :

## Pooled results

(i) 1284 Kg/ha. (ii) 304.6 Kg/ha. (based on 279 d.f. made up of pooled error). (iii) Main effects of B and E are highly significant and that of interaction C x D is significant. (iv) Table of mean and differential response in Kg/ha.

	Mean response	A		B		C		D		E	
		—	+	—	+	—	+	—	+	—	+
A	34.1	0	0	35.8	32.5	25.2	43.1	52.7	15.6	91.6	-23.2
B	74.8	76.3	73.3	0	0	81.3	68.4	52.0	97.4	78.3	71.7
C	65.3	56.4	74.3	71.9	59.1	0	0	8.4	122.5	96.8	34.1
D	18.7	37.3	0.2	-4.1	41.4	-38.0	75.6	0	0	36.3	-18.7
E	91.7	149.3	34.0	94.0	88.2	123.0	52.9	129.1	53.9	0	0

C.D. for mean response = 31.1 Kg/ha.

C.D. for differential response = 43.9 Kg/ha.

## Individual results :

Year	Mean response					G.M.	S.E./plot
	A	B	C	D	E		
1960	-68	116	-58	22	113	1724	383.3
1961	58	76	70	-12	12	695	168.3
Pooled	34.1	74.8	65.3	18.7	91.7	1284	304.6

Crop :- Wheat (Rabi).

Ref :- Mh. 60(81), 61(34), 62(16).

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

Type :- 'M'.

Object :- To study the effect of N in combination with P on the yield of unirrigated Wheat.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) *Jowar*. (c) 11.2 Kg/ha. of N in 60, 61 and N.A. in 62. (ii) Morand no 2. (iii) 2.11.60 ; 5.11.61 ; 16.11.62. (iv) (a) 2 ploughings and 2 *bakherings*. (b) Sowing by tiffan. (c) 67 Kg/ha. (d) 30 cm × 8 cm. (e) N.A. (v) Nil. (vi) HY—65. (vii) Unirrigated. (viii) Nil. ; 2 weedings ; 2 weedings. (ix) N.A. ; N.A. ; 24 cm. (x) 4.3.61 ; 21.3.62 ; 5.3.63.

## 2. TREATMENTS:

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

(1) 3 levels of N :  $N_0=0$ ,  $N_1=11.2$  and  $N_2=22.4$  Kg/ha.

(2) 3 sources of N :  $S_1=A/S$ ,  $S_2=A/N/S$  and  $S_3=Urea$ .

(3) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=11.2$  and  $P_2=22.4$  Kg/ha.

Manures broadcast at the time of sowing.

## 3. DESIGN:

(i)  $3^3$  fact. confd. (ii) (a) 3 blocks/replication; 9 plots/block. (b) N.A. (iii) 1. (iv) (a) 6.40 m. × 10.97 m. (b) 4.57 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL:

(i) Due to late rains in Feb. and March 60, the crop was damaged to some extent ; satisfactory in 61 and 62. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959 to 62. (b) and (c) No. (v) and (vi) No. (vii) Error variances for the years 1959 to 62 are heterogeneous and Treatments × years interaction is absent. Hence results of individual years are presented under 5. Results.

## 5. RESULTS:

## 60(81)

(i) 1001 Kg/ha. (ii) 92.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$N_2$	$S_1$	$S_2$	$S_3$	Mean
$P_0$	976	1049	985	921	1058	1031	1004
$P_1$	1022	1121	983	1022	1049	1057	1043
$P_2$	860	994	1013	1022	814	1031	956
Mean	958	1055	994	989	974	1040	1001
$S_0$	—	1040	994				
$S_1$	—	985	1022				
$S_2$	—	1139	967				

## 61(34)

(i) 691 Kg/ha. (ii) 191.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$N_2$	$S_1$	$S_2$	$S_3$	Mean
$P_0$	518	757	758	797	678	558	678
$P_1$	757	797	678	718	797	718	744
$P_2$	598	598	731	678	518	757	651
Mean	624	717	731	731	664	678	691
$S_1$		797	718				
$S_2$		598	797				
$S_3$		757	678				

62(16)

(i) 810 Kg/ha. (ii) 222.9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
P <sub>0</sub>	598	957	797	678	837	837	784
P <sub>1</sub>	837	837	877	797	837	917	850
P <sub>2</sub>	757	877	757	797	997	598	797
Mean	731	890	810	757	890	784	810
S <sub>1</sub>	—	997	678				
S <sub>2</sub>	—	957	877				
S <sub>3</sub>	—	718	877				

**Crop :-** Wheat (*Rabi*).

**Ref :-** Mh. 60(82), 61(144), 62(129).

**Site :-** Agri. Res. Stn., Tharsa.

**Type :-** 'M'.

**Object :-** To study the effect of N manures in combination with P on irrigated Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Wheat—Wheat. (b) Wheat. (c) As per treatments. (ii) Black cotton soil. (iii) 6.11.60 ; 9.11.61 ; 16.11.62. (iv) (a) 2 ploughings and 3 harrowings. (b) Tiffan for 60 and drilling for others. (c) 67 Kg/ha. for 60 and 49 Kg/ha. for others. (d) 30 cm.×8 cm. for 60 and 30 cm. between rows for others. (e) N.A. (v) Nil. (vi) HY—65. (vii) Irrigated. (viii) Nil. ; 1 weeding ; 1 weeding. (ix) N.A. ; 3 cm. ; 24 cm. (x) 4.3.61 ; 20.3.62 ; 23.3.63.

**2. TREATMENTS :**

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

(1) 3 levels of N: N<sub>0</sub>=0, N<sub>1</sub>=44.8 and N<sub>2</sub>=89.6 Kg/ha.

(2) 3 sources of N: S<sub>1</sub>=A/S, S<sub>2</sub>=A/N and S<sub>3</sub>=Urea.

(3) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super: P<sub>0</sub>=0, P<sub>1</sub>=22.4 and P<sub>2</sub>=44.8 Kg/ha.

Manures applied at the time of planting.

**3. DESIGN :**

(i) 3<sup>3</sup> fact. confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 6.40 m.×10.97 m. (b) 4.57 m.×9.14 m. (v) 91 cm.×91 cm. (vi) Yes.

**4. GENERAL :**

(iv) Crop suffered to some extent due to late rains in Feb. and March ; good ; good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959 to 62. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Since the dummy treatments are not separated while analysing the data, the pooling is not carried out and hence individual results are presented under 5. Results.

**5. RESULTS :**

60(82)

(i) 2441 Kg/ha. (ii) 673.8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
P <sub>0</sub>	1799	2496	2550	2659	1845	2341	2282
P <sub>1</sub>	2450	2234	2730	2749	2775	1890	2471
P <sub>2</sub>	2171	2567	2976	2677	2785	2252	2571
Mean	2140	2432	2752	2695	2468	2161	2441
S <sub>1</sub>	—	2839	2930				
S <sub>2</sub>	—	2261	2776				
S <sub>3</sub>	—	2197	2550				

61(144)

(i) 1245 Kg/ha. (ii) 203.3 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
P <sub>0</sub>	797	1395	1236	1196	1036	1196	1143
P <sub>1</sub>	1156	1196	1435	1395	1315	1076	1262
P <sub>2</sub>	1037	1356	1594	1555	1156	1276	1329
Mean	996	1315	1422	1382	1169	1183	1245
S <sub>1</sub>	—	1595	1554				
S <sub>2</sub>	—	1076	1316				
S <sub>3</sub>	—	1276	1395				

C.D. for N marginal means = 234.6 Kg/ha.

62(129)

(i) 1103 Kg/ha. (ii) 204.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
P <sub>0</sub>	957	1076	1196	957	1196	1076	1076
P <sub>1</sub>	1116	957	1036	918	957	1236	1036
P <sub>2</sub>	1156	1395	1036	1315	1355	917	1196
Mean	1076	1143	1090	1063	1169	1076	1103
S <sub>1</sub>	—	997	1076				
S <sub>2</sub>	—	1315	1076				
S <sub>3</sub>	—	1116	1116				

**Crop. :- Wheat (Rabi).**

**Ref. :- Mh. 61(145), 62(130).**

**Site. :- Agri. Res. Stn., Tharsa,**

**Type. :- 'M.'**

Objekt :- To compare soil and foliar application for N.

**1. BASAL CONDITIONS :**

(i) (a) Wheat-Wheat. (b) Wheat. (c) As per treatments. (ii) Morand No. 2. (iii) 10.11.61. ; 2.11.62.  
(iv) (a) 2 ploughings and 2 *bakharings*. (b) Sowing by Tiffan. (c) 67 Kg/ha. (d) 30 cm. x 8 cm. (e) N.A.  
(v) Nil. (vi) Hy.-65. (vii) Irrigated. (viii) 1 weeding. (ix) 3.3 cm. ; 24.4 cm. (x) N.A. ; 10.3 63.

**2. TREATMENTS :**

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

(1) 4 levels of N. as Urea :  $N_0=20$ ,  $N_1=11.2$ ,  $N_2=22.4$  and  $N_3=44.8$  Kg/ha.

(2) 2 types of application of N:  $T_1$ =Soil application and  $T_2$ =Foliar application.

(3) 2 methods of application :  $M_1$ =In one dose and  $M_2$ =In two doses.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 6.40 m. x 10.97 m. (b) 4.57 m. x 9.14 m.  
(v) 91 cm. x 91 cm. (iv) Yes.

**4. GENERAL :**

(i) Normal. (ii) Slight attack of blight and sunt. (iii) Yield of grain. (iv) (a) 1961-62. (b) No. (c) Nil.  
(v) Nil. (vi) Nil. (vii) Error variancces hetrogeneous and Treatmentsxyears interaction is absent, therefore individual results are presented under 5.Results.

**5. RESULTS :**

**61(45)**

(i) 1458 Kg/ha. (ii) 417.16 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=1360 Kg/ha.

	$T_1$	$T_2$	$M_1$	$M_2$	Mean
$N_1$	1525	1465	1644	1345	1495
$N_2$	1465	1345	1420	1390	1405
$N_3$	1644	1395	1435	1704	1570
Mean	1545	1435	1500	1480	1490
$M_1$	1535	1465			
$M_2$	1555	1405			

**62(130)**

(i) 1023 Kg/ha. (ii) 195.66 Kg/ha. (iii) N effect is only significant. (iv) Av. yield of grain in Kg/ha.

Control=921 Kg/ha.

	$T_1$	$T_2$	$M_1$	$M_2$	Mean
$N_1$	1091	1121	1046	1166	1106
$N_2$	1085	975	1049	1011	1030
$N_3$	1112	957	1088	981	1034
Mean	1096	1018	1062	1052	
$M_1$	1108	1015			
$M_2$	1084	1021			

C.D. of N marginal means=139.4 Kg/ha.



**Crop :- Wheat (Rabi).**

**Ref :- Mh. 63(162), 64(131).**

**Site :- Agri. Res. Stn., Tharsa.**

**Type :- 'M'.**

**Object :-** To study the effect of spartin on the yield of Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Gram. (c) Nil. (ii) Morand No. 2. (iii) 26.11.63 ; 30.10.64. (iv) (a) 3 harrowings. (b) Drilling. (c) N.A. (d) 30 cm. x 8 cm. (e) —. (v) Nil. (vi) Hy-65. (vii) Irrigated. (viii) 2 weedings. (ix) 2 cm. ; 6 cm. (x) 6.4.64 ; 5.3.65.

**2. TREATMENTS :**

**Main-plot treatments :**

2 levels of F.Y.M. :  $F_0=0$  and  $F_1=5604$  Kg/ha.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 2 levels of spartin :  $S_0=0$  and  $S_1=371$  Kg/ha.

(2) 2 levels of manures :  $M_0=0$  and  $M_1=44.8$  Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$ .

**3. DESIGN :**

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.97 m. x 6.40 m (b) 9.14 m. x 5.48 m. (v) 91 cm. x 91 cm. (v) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-64 (b) No. (c) Results of combined analysis are presented under 5-Results. (v) Niphad, Washim, Badnapur and Nagpur. (vi) Nil. (vii) Both the error variances are homogenous, interaction years x main-plot treatments and years x sub-plot treatments are absent.

**5. RESULTS :**

**Pooled result**

(i) 1130 Kg/ha. (ii) (a) 217.2 Kg/ha. (based on 6 d.f. made up of pooled error (a). (b) 145.4 Kg/ha. (based on 36 d.f. made up of pooled error (b). (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in Kg/ha

	$M_0$	$M_1$	$S_0$	$S_1$	Mean
$F_0$	1010	1232	1126	1116	1121
$F_1$	986	1294	1150	1130	1140
Mean	998	1263	1138	1123	1130
$S_0$	986	1290			
$S_1$	1010	1236			

C.D. for M marginal means = 73.8 Kg/ha.

**Individual results**

Treatment	$M_0$	$M_1$	Sig.	$S_0$	$S_1$	Sig.
Year						
1963	842	1149	**	1010	980	N.S.
1964	1153	1378	**	1266	1266	N.S.
Pooled	998	1263	**	1138	1123	N.S.

Treatment	F <sub>0</sub>	F <sub>1</sub>	Sig.	C.M.	S.E./plot (a) (b)	
Year						
1963	1012	980	N.S.	995	276.2	109.4
1964	1230	1301	N.S.	1266	140.9	169.7
Pooled	1121	1140	M.S.	1130	217.2	145.4

**Crop :- Wheat (Rabi)**

**Ref :- Mh. 60(174), 61(105) 62(91).**

**Site :- Agri. Res. Stn., Washim.**

**Type :- 'M'.**

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

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) N.A. ; N.A. ; Wheat. (c) N.A. (ii) Black cotton soil. (iii) 28.10.60 ; 15.11.61 ; 27.10.62. (iv) (a) N.A. ; 4 harrowings ; 1 ploughing and 2 harrowings. (b) Drilling ; (c) N.A. (d) 30 cm. (e) —. (v) N.A. (vi) Hy-65. (vii) Unirrigated. (viii) N.A. ; one hoeing, 2 interculturing. (ix) N.A. (x) N.A. ; 23.3.62 ; 7.3. 63.

**2. TREATMENTS :**

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

(1) 3 sources of N : S<sub>1</sub>=A/S, S<sub>2</sub>=A/N and S<sub>3</sub>=Urea.

(2) 3 levels of N : N<sub>0</sub>=0, N<sub>1</sub>=11.2, and N<sub>2</sub>=22.4-Kg/ha.

(3) 3 levels of P<sub>2</sub>O<sub>5</sub> : P<sub>0</sub>=0, P<sub>1</sub>=11.2, and P<sub>2</sub>=22.4 Kg/ha.

**3. DESIGN :**

(i) 3<sup>3</sup> Fact. confd. (ii) (a) 3 blocks/replication, 9 plots/block ; (b) . (iii) 1. (iv) 10.97 m.×6.40 m. (v) 9.14 m.×4.57 m. (vi) 91 cm.×91 cm.

**4. GENERAL :**

(i) Normal ; Satisfactory, Normal. (ii) Nil ; B.H.C. 10% and sulphur dusted ; Nil. (iii) Yield of grain. (iv) (a) 1959-62. (b) No. (v) and (vi) No. (vii) Error variances for the years are homogenous. Interaction treatments×years is present

**5. RESULTS :**

Pooled results

(i) 693 Kg/ha. (ii) 141.9 Kg/ha. (based on 54 d.f. made up of Treatment×years interaction). (iii) Only N effect is highly significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
S <sub>1</sub>	597	752	762	684	726	701	704
S <sub>2</sub>	621	711	728	664	744	652	687
S <sub>3</sub>	579	723	762	671	684	710	688
Mean	599	729	751	673	718	688	693
P <sub>0</sub>	582	690	747				
P <sub>1</sub>	607	782	765				
P <sub>2</sub>	608	715	741				

C.D. for N marginal means=66.6 Kg/ha.

## Individual results

Treatment	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Sig.	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Sig.
Year								
1960	521	510	515	N.S.	492	539	515	N.S.
1961	366	873	922	N.S.	759	808	794	**
1962	835	1044	1076	*	953	1037	966	**
Pooled	599	729	751	**	673	618	688	N.S.

S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Sig.	G.M.	S.E/plot
518	509	519	*	515	29.6
771	782	807	*	787	40.0
1080	952	922	*	985	98.4
704	687	688	N.S.	693	141.9

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 63(157).**

**Site :- Agri. Res. Stn., Washim.**

**Type :- 'M'.**

Object :- To study the effect of spartin on the yield of Wheat.

## 1. BASAL CONDITIONS :

(i) (a), Nil. (b), and (c) Nil. (ii) (a) Medium black. (b) Nil. (iii) 4.11.63. (iv) (a) 1 ploughing and 3 harrowing. (b) Drilling. (c) 62 Kg/ha. (d) 30 cm. (e) —. (v) Nil. (vi) N—59. (vii) Unirrigated. (viii) 3 hoeings. (ix) Nil. (x) 12.3.64.

## 2. TREATMENTS :

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

(1) 2 levels of spartin : S<sub>0</sub>=0, S<sub>1</sub>=336.3 Kg/ha.

(2) 2 levels of R.T.M. : F<sub>0</sub>=0 and F<sub>1</sub>=5604 Kg/ha.

(3) 2 levels of Manures ; M<sub>0</sub>=3, M<sub>1</sub>=22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) 29.26 m. × 21.95 m. (iii) 4. (iv) (a) 10.97 m. × 6.40 m. (b) 9.14 m. × 5.48 m. (v) 91cm × 91cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-64. (b) No. (c) Nil. (v) (a) Nagpur and Badnapur. (b) No. (vi) —. (vii) Experiment vitiated in 1965.

## 5. RESULTS :

(i) 1093 Kg/ha. (ii) 114.6 Kg/ha. (iii) Main effect of M is highly significant. (iv) Av. yield of grain in Kg/ha.

	S <sub>0</sub>	S <sub>1</sub>	M <sub>0</sub>	M <sub>1</sub>	Mean
F <sub>0</sub>	1087	1087	1011	1163	1087
F <sub>1</sub>	1111	1088	1020	1179	1100
Mean	1099	1088	1016	1171	1093
M <sub>0</sub>	1024	1007			
M <sub>1</sub>	1174	1168			

C.D. for M marginal means = 59 Kg/ha.

**Crop :-** Wheat (*Rabi*).

**Ref :-** Mh. 64(128).

**Site :-** Agri. Res. Stn., Washim.

**Type :-** 'M'.

Object :—To study the effect of spartan on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black. (iii) 27.10.64. (iv) (a) 1 Ploughing and 2 harrowings. (b) Drilling. (c) 74 Kg/ha. (d) 30 cm. (e) —. (v) Nil. (vi) N-59. (vii) Unirrigated. (viii) 3 Hoeings. (ix) 0.1 cm. (x) 2.2.65.

2. TREATMENTS :

**Main plot treatments :**

2 levels of F.Y.M. : F<sub>0</sub>=0, F<sub>1</sub>=5604 Kg/ha.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 2 levels of spartan : S<sub>0</sub>=0, S<sub>1</sub>=336.4 Kg/ha.

(2) 2 levels of manures : M<sub>0</sub>=0, M<sub>1</sub>=22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 Main-plot/replication; 4 sub-plot/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.97m. × 6.40m. (b) 9.14 m. × 5.48 m. (v) 91 cm. × 91 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (i) Yield of grain. (ii) (a) 1963-65 (Design changed in 63). (b) No. (c) Nil. (v) (a) Nagpur, Badnapur. (b) Nil. (vi) —. (vii) Experiment viriated in 1965.

5. RESULTS :

(i) 1042 Kg/ha. (ii) (a) 117.8 Kg/ha. (b) 106.5 Kg/ha. (iii) Main effect of M is highly significant. (iv) Av. yield of grain in Kg/ha.

	S <sub>0</sub>	S <sub>1</sub>	M <sub>0</sub>	M <sub>1</sub>	Mean
F <sub>0</sub>	988	1072	905	1155	1030
F <sub>1</sub>	1028	1079	951	1156	1054
Mean	1008	1076	928	1155	1042
M <sub>0</sub>	873	983			
M <sub>1</sub>	1142	1168			

C.S. for M. marginal means = 87 Kg/ha.

**Crop :- Wheat (Rabi).****Ref :- Mh. 64(191).****Site :- Wheat Res. Sub-stn., Washim.****Type :- 'M'.**

Object :—To study the response of wheat to different conditions of N, P, and K under rain-fed conditions.

**1. BASAL CONDITIONS:**

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) N.A. (iii) 4.11.64. (iv) (a) 3 harrowings. (b) Drilling. (c) 62 Kg/ha. (d) 30 cm. (e) —. (v) G.M. (Sann) on 24.8.64. (vi) N—59. (vii) Unirrigated. (viii) 1 hoeing and 2 weedings. (ix) 2 cm. (x) 5.3.65.

**2. TREATMENTS :**

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

(1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.(2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.(3) levels of  $K_2O$  as Pot Sulph. :  $K_0=0$ ,  $K_1=22.4$  and  $K_2=44.8$  Kg/ha.

Fertilizers drilled at the time of sowing.

**3. DESIGN :**(i)  $3^3$  Fact. partially confd. (ii) (a) 9 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) 10.97 m.  $\times$  5.79 m. (b) 9.14 m.  $\times$  4.57 m. (v) 91 cm.  $\times$  61 cm. (vi) Yes.**4. GENERAL :**

(i) Germination satisfactory. Due to dry spell, growth was founded to be attacked. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964-67. Experiment conducted in 65. vitiated due to dry spell in Oct. 65. (b) and (c) No. (v) (a) Not known. (b) No. (vi) and (vii) Nil.

**5. RESULTS :**(i) 671 Kg/ha. (ii) 118.2 Kg/ha. (iii) Interaction  $NP^3K$  alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	Mean
$N_0$	732	584	702	668	698	652	672
$N_1$	666	630	672	686	626	656	656
$N_2$	688	698	668	753	578	722	684
Mean	695	637	681	702	634	677	671
$K_0$	787	636	684				
$K_1$	576	662	664				
$K_2$	722	614	694				

**Crop :- Wheat.****Ref :- Mh. 61-63(M.A.E.)****Site :- M.A.E. Centre ; Lakhmapur.****Type :- 'M'.**

Object :—Type IV: To study the effect of phosphatic manures on legumes and their residual effect on succeeding Wheat manured with N.

**1. BASAL CONDITIONS:**

(i) (a) to (c) N.A. (ii) Medium black. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

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

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

(1) 2 previous legumes :  $L_1$ =Groundnut and  $L_2$ =Mung.(2) 3 levels of  $P_2O_5=0$ ,  $P_1=44.8$  and  $P_2=89.6$  Kg/ha.**Sub-plot treatments :**3 levels of N as A/S :  $N_0=0$ ,  $N_1=16.8$  and  $N_2=33.6$  Kg/ha.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/replication ; 3 sub-plots/ main field. (b) N.A. (iii) 3. (iv) and (v) N.A. (vi) Yes.

## 4 GENERAL:

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1957-63 (N.A. for 59 and 60). (b) N.A. (c) Pooled results given under 5. Results. (v) and (vi) Nil. (vii) Expts. of 57 and 58 are also taken while pooling.

## 5. RESULTS :

## Pooled Result

(i) 1081 Kg/ha. (ii) (a) and (b) N.A. (iii) Main effects of L P and N are significant. (iv) Av. yield of grain in Kg/ha.

	L <sub>0</sub> P <sub>0</sub>	L <sub>1</sub> P <sub>0</sub>	L <sub>1</sub> P <sub>1</sub>	L <sub>1</sub> P <sub>2</sub>	L <sub>2</sub> P <sub>0</sub>	L <sub>2</sub> P <sub>1</sub>	L <sub>2</sub> P <sub>2</sub>	Mean
N <sub>0</sub>	960	757	849	845	1095	944	1077	932
N <sub>1</sub>	1069	870	1045	1056	1167	1087	1362	1094
N <sub>2</sub>	1234	1026	1160	1254	1254	1203	1377	1215
Mean	1088	884	1018	1052	1172	1078	1272	1081

C.D. for LP marginal means = 133 Kg/ha.

C.D. for N marginal means = 48 Kg/ha.

## Individual Results

## 1961

(i) 664 Kg/ha. (ii) (a) and (b) N.A. (iii) Main effects of L P and N are significant. (iv) Av. yield of grain in Kg/ha.

	L <sub>0</sub> P <sub>0</sub>	L <sub>1</sub> P <sub>0</sub>	L <sub>1</sub> P <sub>1</sub>	L <sub>1</sub> P <sub>2</sub>	L <sub>2</sub> P <sub>0</sub>	L <sub>2</sub> P <sub>1</sub>	L <sub>2</sub> P <sub>2</sub>	Mean
N <sub>0</sub>	330	460	610	600	550	640	850	577
N <sub>1</sub>	490	360	760	780	710	650	950	671
N <sub>2</sub>	530	520	890	980	570	730	990	744
Mean	450	447	753	787	610	673	930	664

C.D. for LP marginal means = 392 Kg/ha.

C.D. for N marginal means = 88 Kg/ha.

## 1962

(i) 591 Kg/ha. (ii) (a) and (b) N.A. (iii) Main effects of L P and N are significant. (iv) Av. yield of grain in Kg/ha.

	L <sub>0</sub> P <sub>0</sub>	L <sub>1</sub> P <sub>0</sub>	L <sub>1</sub> P <sub>1</sub>	L <sub>1</sub> P <sub>2</sub>	L <sub>2</sub> P <sub>0</sub>	L <sub>2</sub> P <sub>1</sub>	L <sub>2</sub> P <sub>2</sub>	Mean
N <sub>0</sub>	610	450	590	580	630	430	590	554
N <sub>1</sub>	493	420	570	680	660	450	780	579
N <sub>2</sub>	570	540	680	780	680	470	770	641
Mean	557	470	613	680	657	450	713	591

C.D. for LP marginal means = 187 Kg/ha.

C.D. for N marginal means = 68 Kg/ha.

## 1963

(i) 1274 Kg/ha. (ii) (a) and (b) N.A. (iii) Main effects of LP and N are significant. (iv) Av. yield of grain in Kg/ha.

	L <sub>0</sub> P <sub>0</sub>	L <sub>1</sub> P <sub>0</sub>	L <sub>1</sub> P <sub>1</sub>	L <sub>1</sub> P <sub>2</sub>	L <sub>2</sub> P <sub>0</sub>	L <sub>2</sub> P <sub>1</sub>	L <sub>2</sub> P <sub>2</sub>	Mean
N <sub>0</sub>	1528	857	977	1043	1235	1343	1216	1171
N <sub>1</sub>	1477	1016	991	1301	1258	1467	1414	1275
N <sub>2</sub>	1705	1030	1112	1421	1496	1451	1419	1376
Mean	1570	968	1027	1255	1330	1420	1350	1274

C.D. for LP marginal means=398 Kg/ha.

C.D. for N marginal means =166 Kg/ha.

**Crop. :- Wheat (Rabi).**

**Ref. :- Mh. 60 and 61(M.A.E).**

**Site. :- M.A.E. Centre, Lakhmapur.**

**Type. :- 'M'.**

Object :—Type V : To study the effect of different times of application of N on the yield of Wheat.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) Medium black. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. **TREATMENTS :**

All combinations of (1), (2) and (3)+a control in each block

(1) 3 sources of N : S<sub>1</sub>=A/S, S<sub>2</sub>=A/N and S<sub>3</sub>=Urea.

(2) 2 levels of N : N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(3) 3 times of application : T<sub>1</sub>=At sowing, T<sub>2</sub>=At first irrigation and T<sub>3</sub>= $\frac{1}{2}$  at sowing+ $\frac{1}{2}$  at first irrigation.

3. **DESIGN :**

(i) Fact. confd. (ii) (a) 7 plots/block, 3 blocks/replication. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

4. **GENERAL :**

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1956-61 (N.A. for 59). (b) N.A. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

Av. response of grain in Kg/ha.

Treatment	Av. of plots without Nitrogen	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	C.D.	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	C.D.	N <sub>1</sub>	N <sub>2</sub>	C.D.
Year												
1960	959	847	927	904	172	917	861	901	172	910	876	140
1961	1170	90	220	180	136	140	170	200	136	130	140	156

**Crop. :- Wheat (Rabi).**

**Ref. :- Mh. 62 to 65(M.A.E.).**

**Site. :- M.A.E. Centre, Lakhmapur.**

**Type. :- 'M'.**

Object :—Type V (a). To study the effect of nitrogenous fertilizers and method placement on the yield of Wheat.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) Medium black. (iii) and (iv) N.A. (v) 33.6 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as super. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

## 2. TREATMENTS :

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

(1) 3 levels of N as A/S :  $N_1=33.6$ ,  $N_2=50.4$  and  $N_3=67.2$  Kg/ha.

(2) 3 methods of application of N :  $M_1$ =Broadcast at sowing,  $M_2$ =Drilled 6 cm. below the seed and  $M_3$ =Side band placement at about 5 cm. to 7.6 cm. on either side.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

## 4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1962-66. (b) N.A. (c) —. (v) Nil. (vi) and (vii) Nil.

## 5. RESULTS :

62(M.A.E.)

Treatment	Control=950 Kg/ha.					
	$M_1$	$M_2$	$M_3$	$N_1$	$N_2$	$N_3$
Av. response of grain in Kg/ha.	187	165	191	159	122	263
	C.D.=324 Kg/ha.			C.D.=324 Kg/ha.		

63(M.A.E.)

Treatment	Control=523 Kg/ha.					
	$M_1$	$M_2$	$M_3$	$N_1$	$N_2$	$N_3$
Av. response of grain in Kg/ha.	324	232	256	105	418	289
	C.D.=178 Kg/ha.					

64(M.A.E.)

Treatment	Control=1171 Kg/ha.					
	$M_1$	$M_2$	$M_3$	$N_1$	$N_2$	$N_3$
Av. response of grain in Kg/ha.	-112	176	77	55	91	-5
	C.D.=404 Kg/ha.			C.D.=404 Kg/ha.		

65(M.A.E.)

Treatment	Control=753 Kg/ha.					
	$M_1$	$M_2$	$M_3$	$N_1$	$N_2$	$N_3$
Av. response of grain in Kg/ha.	605	368	457	487	360	584
	C.D.=217 Kg/ha.			C.D.=217 Kg/ha.		

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 60(M.A.E.)**

**Site :- M.A.E. Centre, Lakhmapur.**

**Type :- 'M'.**

Object :—Type VI. To determine the method of placement of fertilizer for Wheat.

## 1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Medium black. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

## 2. TREATMENTS :

All combinations of (1), (2) and (3)+a control

(1) 2 sources of  $P_2O_5$  :  $S_1$ =Ammono. phos. and  $S_2$ =Super.

(2) 2 levels of  $P_2O_5$  :  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

(3) 3 methods of application :  $M_1$ =Broadcast before sowing,  $M_2$ =placement about 6 cm. below the seed and  $M_3$ =Band placement.



## 3. DESIGN :

(i) R B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

## 4. GENERAL ;

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1956-60. (b) N.A. (c) Nil. (v) to (vii) Nil.

## 5. RESULTS :

Treatment	Yield without phosphate	Response of Wheat in Kg/ha.								
		M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	S <sub>1</sub>	S <sub>2</sub>	C.D.	P <sub>1</sub>	P <sub>2</sub>	C.D.
1960	1061	-169	-77	-243	736	-160	165	-188	-137	165

**Crop :- Wheat.****Ref :- Mh. 62 to 65(M.A.E.)****Site :- M.A.E. Centre, Lakhmapur.****Type :- 'M'.**

Object:—Type X. To study the effect of various levels of N, P and G.M. on the yield of Wheat.

## 1. BASAL CONDITIONS :

(i) (a) to (b) N.A. (ii) Medium black. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

## 2. TREATMENTS :

All combinations of (1), (2) and (3)+an additional treatment in each block

(1) 3 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=16.8 and N<sub>2</sub>=33.6 Kg/ha.(2) 3 levels of P<sub>2</sub>O<sub>5</sub> as super : P<sub>0</sub>=0, P<sub>1</sub>=33.6 and P<sub>2</sub>=67.2 Kg/ha.(3) 3 G.M. treatments : G<sub>0</sub>=No G.M., G<sub>1</sub>=G.M. raised *in situ* without P<sub>2</sub>O<sub>5</sub> and G<sub>2</sub>=G.M. raised *in situ* with 33.6 Kg/ha of P<sub>2</sub>O<sub>5</sub>.

Extra treatment : T=N, P and K fertilizers equivalent to those present in G.M.

## 3. DESIGN :

(i) 3<sup>3</sup> confd. (ii) (a) 10 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) N.A. (v) N.A. (vi) Yes.

## 4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1962-66. (b) N.A. (c) Nil. (v) to (vii) Nil.

## 5. RESULTS :

Treatment Year	Av. yield difference (G-NPK)	Av. yield of plots without G.M.	Response to G.M		C.D.
			raised without phosphores	with 33.6 Kg/ ha. of P <sub>2</sub> O <sub>5</sub>	
1962	270	840	179	595	154
1963	698	625	255	203	199
1964	-763	1161	154	153	207
1965	-198	1903	397	412	174

Treatment Year	Av. yield of plots without Nitrogen	Response to Nitrogen applied at		C.D.
		16.8 Kg/ha. of N	33.6 Kg/ha. of N	
1962	1096	50	-44	154
1963	656	47	318	199
1964	1231	-13	112	207
1965	1964	309	318	174

Treatment Year	Av. yield of plots without phosphorus	Response to Phosphorus applied at		C.D.
		33.6 Kg/ha. of P <sub>2</sub> O <sub>5</sub>	67.2 Kg/ha. of P <sub>2</sub> O <sub>5</sub>	
1962	1118	-49	-11	154
1963	752	40	37	199
1964	1245	-15	73	207
1965	2140	-5	104	174

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 61(137)**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'MV'.**

**Object :-** To study the manurial response of different varieties of Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) Black cotton soil. (iii) 2.11.61. (iv) (a) Harrowing. (b) Drilling. (c) 67 Kg/ha. (d) 30 cm. (e) 1-2. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings. (ix) 4 cm. (x) 9.3 62.

**2. TREATMENTS :**

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

- (1) 2 levels of N as A/S : N<sub>0</sub>=0 and N<sub>1</sub>=22.4 Kg/ha.  
 (2) 2 levels of P<sub>2</sub>O<sub>5</sub> as super : P<sub>0</sub>=0 and P<sub>1</sub>=22.4 Kg/ha.  
 (3) 8 varieties : V<sub>1</sub>=Hy.-11, V<sub>2</sub>=N-271, V<sub>3</sub>=N-974, V<sub>4</sub>=Hy.-32, V<sub>5</sub>=N-59, V<sub>6</sub>=N-1200, V<sub>7</sub>=Vijay and V<sub>8</sub>=Hawara.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 32. (b) N.A. (iii) 6. (iv) (a) 8.23m. × 2.44m. (b) 7.62m. × 1.83m. (v) 30 cm. × 30 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) white ants, 10% B.H.C. dusted. (iii) Yield of grain. (iv) (a) 1961-63. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Treatments changed from 62.

**5. RESULTS :**

(i) 824 Kg/ha. (ii) 132.8 Kg/ha. (iii) Main effect of V is highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	V <sub>8</sub>	P <sub>0</sub>	P <sub>1</sub>	Mean
N <sub>0</sub>	715	906	825	765	873	723	918	822	826	811	818
N <sub>1</sub>	694	810	899	750	916	709	918	939	859	800	830
Mean	704	858	862	757	894	716	918	880	842	806	824
P <sub>0</sub>	747	849	917	783	933	742	897	870			
P <sub>1</sub>	661	867	807	732	856	691	939	891			

C.D. for V marginal means=75.1 Kg/ha.

**Crop :- Wheat (Rabi).****Ref :- Mh. 62(125), 63(170).****Site :- Agri. College Farm, Nagpur.****Type :- 'MV'.**

Object :- To study the manurial response of different varieties of Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) N.A. ; Wheat. (c) N A. (ii) Black cotton soil. (iii) 26, 27.10.62 ; 5.11.63. (iv) (a) Harrowings. (b) Drilling. (c) 67 Kg/ha. (d) 30 cm. (e) 1 to 2. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 3 weedings ; 1 weeding. (ix) 17 cm. : 1 cm. (x) 11, 12.3.63 ; 3 to 7.3.64.

**2. TREATMENTS :**

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

(1) 2 levels of N as A/S :  $N_0=0$  and  $N_1=22.4$  Kg/ha.(2) 2 levels of  $P_2O_5$  as Super :  $P_0=0$  and  $P_1=22.4$  Kg/ha.(3) 8 varieties :  $V_1=N-59$ ,  $V_2=N-271$ ,  $V_3=N-1200$ ,  $V_4=HY-11$ ,  $V_5=HY-3-4-2-2$ ,  $V_6=HY-3-4-2-4$ ,  $V_7=Vijay$  and  $V_8=Hawara$ .**3. DESIGN :**(i) Fact. in R.B.D. (ii) (a) 32. (b) N.A. (iii) 3. (iv) (a)  $10.67$  m.  $\times$   $5.79$  m. (b)  $9.14$  m.  $\times$   $4.57$  m. (v)  $76$  cm.  $\times$   $61$  cm. (vi) Yes.**4. GENERAL :**(i) Satisfactory. (ii) White ants, 10 % B.H.C. dusted. (iii) Yield of grain. (iv) (a) 1961-63. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments  $\times$  years interactions are absent. Hence results for individual years are given under 5. Results.**5. RESULTS :****62(125)**(i) 1447 Kg/ha. (ii) 303.8 Kg/ha. (iii) Main effect of N is highly significant. V effect and N  $\times$  P interaction are significant. (iv) Av. yield of grain in Kg/ha.

	$V_1$	$V_2$	$V_3$	$V_4$	$V_5$	$V_6$	$V_7$	$V_8$	$P_0$	$P_1$	Mean
$N_0$	1421	1505	1324	1300	1152	1257	1495	1393	1253	1458	1356
$N_1$	1663	1718	1620	1490	1296	1339	1541	1634	1562	1513	1538
Mean	1542	1612	1472	1395	1224	1298	1518	1514	1408	1486	1447
$P_0$	1513	1474	1432	1393	1142	1336	1426	1549			
$P_1$	1571	1750	1513	1397	1306	1260	1610	1480			

C.D. for V marginal means = 243.1 Kg/ha.

C.D. for N marginal means = 121.5 Kg/ha.

C.D. for means in N  $\times$  P table = 171.9 Kg/ha.**63(170)**

(i) 749 Kg/ha. (ii) 118.2 Kg/ha (iii) Main effect of N and V are highly significant. (v) Av. yield of grain in Kg/ha.

	$V_1$	$V_2$	$V_3$	$V_4$	$V_5$	$V_6$	$V_7$	$V_8$	$P_0$	$P_1$	Mean
$N_0$	724	703	542	654	660	566	775	640	642	673	658
$N_1$	941	797	739	814	839	797	941	845	815	864	839
Mean	832	750	740	734	750	682	858	743	728	769	749
$P_0$	821	799	643	694	702	586	857	726			
$P_1$	844	701	638	774	797	778	859	760			

C.D. for V marginal means = 94.5 Kg/ha.

C.D. for N marginal means = 47.3 Kg/ha.

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 64(187)**

**Site :- Agri. Res. Stn., Niphad.**

**Type :- 'MV'.**

Object :—To study the response of different varieties of Wheat to different levels of N, P and K under dry condition.

**1. BASAL CONDITIONS :**

(i) (a) Not fixed. (b) Gram. (c) Nil. (ii) Medium black. (iii) 19.10.64. (iv) (a) 4 harrowings. (b) Drilling. (c) 99 Kg/ha. (d) 30 cm. (e) N.A. (v) As per treatments. (NPK applied at the time of sowing. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 94.2 cm. (x) 20.2.65.

**2. TREATMENTS :**

**Main-plot treatments :**

5 varieties:  $V_1=N-59$ ,  $V_2=N-271$ ,  $V_3=N-1200$ ,  $V_4=H-2-7-53$  and  $V_5=Vijay$ .

**Sub-plot treatments :**

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

(1) 2 levels of N as A/S :  $N_0=0$  and  $N_1=44.8$  Kg/ha.

(2) 2 levels of  $P_2O_5$  as Super :  $P_0=0$  and  $P_1=44.8$  Kg/ha.

(3) 2 levels of  $K_2O$  as Mur. Pot. :  $K_0=0$  and  $K_1=44.8$  Kg/ha.

**4. DESIGN :**

(i) Split-plot confd. (NPK confd). (ii) (a) 4 sub-plots/block. 2 blocks/main-plot, 5 main plots/replication. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  5.79 m. (b) 9.14 m.  $\times$  4.57 m. (v) 91 cm.  $\times$  61 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) White ant attack, population affected. (iii) Yield of grain. (iv) (a) 1964—68, (1965 expt. vitiated) (b) and (c) No. (v) Washim. (vi) and (vii) Nil.

**5. RESULTS:**

(i) 332 Kg/ha. (ii) (a) 69.5 Kg/ha. (b) 86.7 Kg/ha. (iii) Main effects of V, N and P are highly significant and that of interaction  $N \times P$  is significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$P_0$	$P_1$	$K_0$	$K_1$	Mean
$V_1$	300	390	303	387	359	331	345
$V_2$	319	392	320	391	371	340	355
$V_3$	275	324	245	354	295	304	300
$V_4$	310	285	261	334	292	303	298
$V_5$	358	363	355	366	371	350	360
Mean	312	351	297	366	338	326	332
$K_0$	319	356	296	379			
$K_1$	306	345	298	353			
$P_0$	294	299					
$P_1$	331	402					

C.D. for V marginal means=35.7 Kg/ha.

C.D. for N or P marginal means=27.3 Kg/ha.

C.D. for the body of  $N \times P$  table=38.6 Kg/ha.

**Crop :- Wheat (Rabi).****Ref :- Mh. 61(149).****Site :- Agri. Res. Stn., Tharsa.****Type :- 'MV'.**

Object :- To study the effect of application of fertilizers on the yield of different varieties of Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) Black soil. (iii) 14.11.61. (iv) (a) Harrowing. (b) Drillings. (c) 45 Kg/ha. (d) 46 cm. (e) —. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding. (ix) 7 cm. (x) Last week of March 62.

**2. TREATMENTS :****Main-plot treatments :**4 varieties :  $V_1=N-135 E$ ,  $V_2=HY-65$ ,  $V_3=HY-3-4-2-2$  and  $V_4=Hawara$ .**Sub-plot treatments :**

All combinations (1) and (2)

(1) 3 levels of N :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.(2) 3 levels of  $P_2O_5$  :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.**3. DESIGN :**(i) Split-plot. (ii) (a) 4 main-plots/replication, 9 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 7.32 m.  $\times$  10.97 m. (b) 5.49 m.  $\times$  9.14 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 only. (b) No. (c) Nil. (v) to (vii) Nil.

**5. RESULTS :**

(i) 756 Kg/ha. (ii) (a) 83.3 Kg/ha. (b) 161.9 Kg/ha. (iii) Main effect of V alone is significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	Mean
$V_1$	731	797	764	764	731	797	764
$V_2$	709	819	875	775	731	897	801
$V_3$	649	656	771	766	671	638	692
$V_4$	797	698	808	786	808	709	768
Mean	722	742	804	773	735	760	756
$P_0$	723	749	847				
$P_1$	736	656	814				
$P_2$	706	822	752				

C.D. for V marginal means=55 Kg/ha.

**Crop :- Wheat (Rabi).****Ref :- Mh. 63(183).****Site Agri. Res. Stn., Tharsa.****Type :- 'MV'.**

Object :- To study the effect of application of fertilizers on the yield of different varieties of Wheat.

**1. BASAL CONDITIONS :**(i) (a) Nil. (b) and (c) N.A. (ii) Black soil. (iii) 6.11.63. (iv) (a) Harrowing. (b) Drilling. (c) 45 Kg/ha. (d) 23 cm.  $\times$  8 cm. (e) —. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and harrowing. (ix) 2 cm. (x) 26.3.64.

## 2. TREATMENTS:

## Main-plot treatments:

6 varieties :  $V_1=NI-146$ ,  $V_2=NI-973$ ,  $V_3=N-135-E$ ,  $V_4=HY-65$ ,  $V_5=HY-3-4-2-2$  and  $V_6=Hawara$ .

## Sub-plot treatments:

All combinations of (1) and (2)

(1) 3 levels of N :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(2) 3 levels of  $P_2O_5$  :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

## 3. DESIGN:

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a)  $9.76$  m.  $\times$   $6.10$  m. (b)  $9.14$  m.  $\times$   $5.49$  m. (v)  $30$  cm.  $\times$   $30$  cm. (vi) Yes.

## 4. GENERAL:

(i) Not satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

## 5. RESULTS:

(i) 199 Kg/ha. (ii) (a) 244.6 Kg/ha. (b) 71.8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	$V_1$	$V_2$	$V_3$	$V_4$	$V_5$	$V_6$	$P_0$	$P_1$	$P_2$	Mean
$N_0$	203	166	194	218	191	233	199	201	202	201
$N_1$	189	158	199	224	140	234	188	189	195	191
$N_2$	201	168	199	238	186	239	199	194	223	205
Mean	198	164	198	227	172	235	195	195	207	199
$P_0$	196	161	204	213	148	249				
$P_1$	194	164	186	243	178	204				
$P_2$	203	166	203	224	191	252				

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 63(172), 64(142).**

**Site :- Agri. Res. Stn., Tharsa.**

**Type :- 'MV'.**

Object :—To study the effect of different levels of N and P on the yield of different varieties of Wheat.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) 44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Morand No II. (iii) 4.11.63 ; 29.10.64. (iv) (a) 3 harrowings. (b) Drilling. (c) —. (d) 23 cm.  $\times$  8 cm. (e) 1 to 2. (v) Nil. (vi) As per treatments. (vii) Irrigated, (viii) 2 weedings. (ix) 1 cm. ; 8 cm. (x) 16.3.64 ; 15.3.65.

## 2. TREATMENTS:

## Main-plot treatments:

6 varieties :  $V_1=NI-146$ ,  $V_2=NI-973$ ,  $V_3=N-135-E$ ,  $V_4=HY-65$ ,  $V_5=HY-3-4-2-2$ ,  $V_6=Hawara$  (Local).

## Sub-plot treatments:

All combinations of (1) and (2)

(1) 3 levels of N as A/S:  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

## 3. DESIGN:

(i) Split-plot. (ii) (a) 6 main-plots/replication, 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a)  $7.32$  m.  $\times$   $10.97$  m. (b)  $5.48$  m.  $\times$   $9.14$  m. (v)  $91$  cm.  $\times$   $91$  cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963 to 64. (b) No. (c) Presented under 5. Results. (v) N.A. (vi) Nil. (vii) Both the error variances are homogeneous and main treatments  $\times$  years interaction is absent.

## 5. RESULTS :

## Pooled results

(i) 395 Kg/ha. (ii) (a) 188.3 Kg/ha. (based on 30 d.f. made up of pooled error.) (b) 111.0 Kg/ha. (based on 288 d.f. made up of pooled error). (iii) Main effect of N, P and interaction  $N \times P$  are highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
N <sub>0</sub>	355	295	301	299	268	304	319	296	296	304
N <sub>1</sub>	443	432	371	439	384	425	360	427	460	416
N <sub>2</sub>	425	478	466	564	392	464	369	508	518	465
Mean	408	402	379	434	348	398	349	410	425	395
P <sub>0</sub>	393	327	312	371	302	391				
P <sub>1</sub>	421	420	422	432	348	417				
P <sub>2</sub>	409	459	403	500	394	385				

C.D. for N or P marginal means = 25.6 Kg/ha.

C.D. for body of  $N \times P$  table = 44.4 Kg/ha.

## Individual results

Treatment	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	Sig.	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Sig.
Year											
1963	363	387	337	340	318	392	N.S.	352	347	368	N.S.
1964	453	417	422	529	379	404	N.S.	346	473	481	**
Pooled	408	402	379	434	348	398	N.S.	349	410	425	**

N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Sig.	G.M.	S.E./plot	
					(a)	(b)
307	368	392	**	356	189.8	110.4
300	463	538	N.S.	434	186.8	111.6
304	416	465	**	395	188.3	111.0

**Crop :-** Wheat (*Rabi*).

**Ref :-** Mh. 64(192), 65(26).

**Site :-** Wheat Res. Sub-Stn., Washim.

**Type :-** 'MV'.

**Object :-** To study the response of different varieties of Wheat to the different levels of N, P and K under dry conditions.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sann* (G.M.) (c) Nil. (ii) Medium black. (iii) 3.11.64 ; 18.10.65. (iv) (a) 3 to 7 harrowings. (b) Drilling. (c) 49 Kg/ha. (d) 30 cm. (e) Nil! (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 3 hoeings. (ix) 2.3 cm. ; 2.5 cm. (x) 3.3.65 ; 15.2.66.

## 2 TREATMENTS:

## Main-plot treatments:

5 varieties :  $V_1=N-59$ ,  $V_2=N-1200$ ,  $V_3=N-271$ ,  $V_4=HY-32$  and  $V_5=Hawara$  (local)

## Sub-plot treatments:

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

(1) 2 levels of N as A/S :  $N_0=0$  and  $N_1=44.8$  Kg/ha.

(2) 2 levels of  $P_2O_5$  as Super :  $P_0=0$  and  $P_1=44.8$  Kg/ha

(3) 2 levels of  $K_2O$  as Mur. of Pot. :  $K_0=0$  and  $K_1=44.8$  Kg/ha.

## 3. DESIGN:

(i) Split-plot confd. (ii) (a) 4 plots/sub-blocks, 2 sub-blocks/main-Plot, 5 main-plots/replication. (b) N.A.  
(iii) 3 ; 4. (iv) (a) 9.14 m.  $\times$  4.57 m. (b) 7.92 m.  $\times$  3.35 m. (v) 61 cm.  $\times$  61 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964-67 (b) No. (c) Nil. (v) Niphad. (vi) Nil.  
(vii) As the experiment is continued beyond 65, hence individual year results are presented under 5 Results.

## 5. RESULTS:

64(192)

(i) 694 Kg/ha. (ii) (a) 152.0 Kg/ha. (b) 65.9 Kg/ha. (iii) Main effect of P is highly significant and effect of interactions  $N \times K$  and  $V \times P$  are significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$P_0$	$P_1$	$K_0$	$K_1$	Mean
$V_1$	726	702	663	765	717	711	714
$V_2$	666	633	608	690	630	668	649
$V_3$	690	638	629	698	658	670	664
$V_4$	717	742	706	753	744	715	730
$V_5$	717	705	727	695	722	700	711
Mean	703	684	667	720	694	693	694
$K_0$	717	671	673	716			
$K_1$	689	696	661	725			
$P_0$	680	654					
$P_1$	726	714					

C.D. for P marginal means = 24.1 Kg/ha.

C.D. for P means at the same level of V = 53.8 Kg/ha.

C.D. for V means at the same level of P = 99.7 Kg/ha.

C.D. for the body of  $N \times K$  table = 34.0 Kg/ha.

65(26)

(i) 433 Kg/ha. (ii) (a) 148.4 Kg/ha. (b) 61.3 Kg/ha. (iii) Interactions  $N \times K$  and  $V \times K$  are highly significant and interactions  $P \times K$ ,  $V \times N$  and  $V \times P$  are significant. (iv) Av. yield of grain in Kg/ha.



	N <sub>0</sub>	N <sub>1</sub>	P <sub>0</sub>	P <sub>1</sub>	K <sub>0</sub>	K <sub>1</sub>	Mean
V <sub>1</sub>	400	407	416	391	412	395	403
V <sub>2</sub>	472	392	395	469	472	392	432
V <sub>3</sub>	435	471	455	451	422	484	453
V <sub>4</sub>	454	464	442	476	445	472	458
V <sub>5</sub>	422	415	421	416	400	437	418
Mean	437	430	426	441	430	436	433
K <sub>0</sub>	418	442	435	426			
K <sub>1</sub>	455	417	487	455			
P <sub>0</sub>	430	422					
P <sub>1</sub>	444	437					

C.D. for the body of N×K or P×K table = 27.3 Kg/ha.  
 C.D. for N, P or K means at the same level of V = 43.2 Kg/ha.  
 C.D. for V means at the same level of N, P or K = 82.0 Kg/ha.

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 63(86), 64(80), 65(196)**

**Site :- Trial-Cum-Demons. Farm, Bendsura-Bhir. Type :- 'C'.**

**Object :-** To study the residual effect of different crops sown in the previous season on the yield of Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) As per treatments. (ii) Deep black soil. (iii) 15.10.63 and 1.11.63 ; 21.10.64 ; 4.10.65. (iv) (a) Harrowing. (b) Drilling. (c) 49 Kg/ha. (d) 30 cm. (e) N.A. (v) 33.6 Kg/ha. of N+33.6 Kg/ha. of P<sub>2</sub>O<sub>5</sub> for 63 and 64 and 44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> for 65. (vi) HY 65 for 63 and 64 ; N-I-146 for 65. (vii) Irrigated. (viii) 2 to 4 interculturings. (ix) Nil. ; 1 cm. ; 3.9 cm. (x) 8 to 10.2.64 ; 2. 3.3.65 ; 24 to 26.2.66.

**2. TREATMENTS :**

10 crops sown in the previous season : M<sub>0</sub>=Usual cultural operation without manure, M<sub>1</sub>=Sannhemp, M<sub>2</sub>=Groundnut, M<sub>3</sub>=Chinamug, M<sub>4</sub>=Udid, M<sub>5</sub>=Proper cultural operation, M<sub>6</sub>=Sann with 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, M<sub>7</sub>=Groundnut with 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, M<sub>8</sub>=Chinamug with 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> and M<sub>9</sub>=Udid with 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 10.97 m.×7.32 m. (b) 9.14 m.×5.49 m. (v) 91 cm.×91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963—contd. (b) Yes. (c) Nil. (v) Golegaon, Khasapur. (vi) Nil. (vii) Since the experiment is continued beyond 65 therefore individual results are given under 5. Results.

**5. RESULTS :**

**63(86)**

(i) 518 Kg/ha. (ii) 106.8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>
Av. yield	566	738	127	600	633	481	720	132	613	573

C.D.=155.0 Kg/ha.

64(80)

(i) 787 Kg/ha. (ii) 83.7 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>
Av. yield	942	937	498	658	583	733	1321	628	832	738

C.D. = 121.5 Kg/ha.

(16)

(i) 799 Kg/ha. (ii) 63.7 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>
Av. yield	479	1063	540	761	683	959	1134	650	879	843

C.D. = 92.3 Kg/ha.

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 64(243), 65(185).**

**Site :- Trial-Cum.-Demos. Farm, Dheku Project. Typy :- 'C'.**

Object :- To find out a suitable double crop under irrigation.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) As per treatments. (ii) Medium black. (iii) 21.10.64 ; 30.10.65. (iv) (a) 2 to 3 harrowings. (b) Drilling. (c) 49 Kg/ha. (d) 30 cm. (e) —. (v) 44.8 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) NI—146. (vii) irrigated. (viii) 2 weedings and 1 to 2 hoeings. (ix) N.A. (x) 12, 13.3.65 ; 24.3.66.

#### 2. TREATMENTS :

10 previous crop and manuring : T<sub>1</sub>=Sannhemp, T<sub>2</sub>=Groundnut, T<sub>3</sub>=Moong, T<sub>4</sub>=Udid, T<sub>5</sub>=Fallow, T<sub>6</sub>=Sannhemp + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, T<sub>7</sub>=Groundnut with 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, T<sub>8</sub>=Moog with 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, T<sub>9</sub>=Udid with 22.4 Kg/ha of P<sub>2</sub>O<sub>5</sub> and T<sub>10</sub>=Fallow no manuring.

In 65, T<sub>6</sub> and T<sub>10</sub> are proper cultural operation for preparing good seed bed.

#### 3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 7.33 m. × 10.97 m. (b) 5.49 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

#### 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964—67. (b) No. (c) Nil. (v) Golegaon, Bendsura. (vi) and (vii) Nil.

#### 5. RESULTS :

64(243)

(i) 659 Kg/ha. (ii) 231.6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>	T <sub>10</sub>
Av. yield	584	160	686	630	794	821	407	894	757	861

C.D. = 336.1 Kg/ha.

65(185)

(i) 1170 Kg/ha. (ii) 201.3 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>	T <sub>10</sub>
Av. yield	1310	1140	1078	1385	999	1120	1147	1382	1228	915

C.D.=292.1 Kg/ha.

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 62(65), 63(84), 64(76), 65(210).**

**Site :- Trial-Cum-Demons. Farm,**

**Type :- 'C'.**

**Khasapur.**

Object :—To find out suitable double crop under irrigation in Kharif followed by Wheat in Rabi.

### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) As per treatments. (ii) Black clayey in 62 and 63 ; medium black in 64 and medium deep black in 65. (iii) 19.10.62 and 16.11.62 ; 6.10.63 ; 17.10.64 ; 31.10.65. (iv) (a) 2 harrowings. (b) Drilling (c) 56 Kg/ha. in 62 to 64 and 74 Kg/ha. in 65. (d) 30 cm. (e)—for 62 to 64 and 1 to 2 in 65. (v) Nil for 62 to 64 and 44.8 Kg/ha. of N for 65. (vi) HY 65—4 (late). (vii) Irrigated. (viii) 2 weedings and one hoeing ; weeding. (ix) N.A. for 62 to 64 and 54 cm. in 65. (x) 23.2.63 and 10.15.3.63 ; 23.2.64 ; 20.3.65 ; 26.2.66 to 3.66.

### 2. TREATMENTS :

11 previous crops treatments : M<sub>0</sub>=Proper cultural operations without manuring, M<sub>1</sub>=*Sannhemp*, M<sub>2</sub>=Groundnut, M<sub>3</sub>=Chinamug, M<sub>4</sub>=*Udid*, M<sub>5</sub>=Paddy with 44.8 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, M<sub>6</sub>=Proper cultural operation with manuring, M<sub>7</sub>=*Sannhemp* with 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, M<sub>8</sub>=Groundnut with 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, M<sub>9</sub>=Chinamug with 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> and M<sub>10</sub>=*Udid* with 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

### 3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

### 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962—66. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vi) As the experiment is continued beyond 65, therefore individual year results are presented under 5. Results.

### 5. RESULTS :

#### 62(65)

(i) 655 Kg/ha. (ii) 271.1 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>	M <sub>10</sub>
Av. yield	728	663	279	882	782	294	790	695	429	972	693

C.D.=391.3 Kg/ha.

#### 63(84)

(i) 1236 Kg/ha. (ii) 47.8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>	M <sub>10</sub>
Av. yield	1071	1510	1281	1268	1196	439	822	1572	1500	1046	1894

C.D.=69.1 Kg/ha.

64(76)

(i) 1936 Kg/ha. (ii) 87.7 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>	M <sub>10</sub>
Av. yield	2347	2123	1630	1869	1943	977	1983	2412	1809	2023	2198

C.D.=126.6 Kg/ha.

65(20)

(i) 1999 Kg/ha. (ii) 96.6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>	M <sub>10</sub>
Av. yield	1879	2274	1769	1914	2021	942	2181	2575	2007	2226	2207

C.D.=139.5 Kg/ha.

**Crop :- Wheat(Rabi).****Ref :- Mh. 64(246), 65(197).****Site :- Trial-Cum-Demons. Farm, Golegaon.****Type :- 'C'.**

Object: - To find out suitable double crop that can be grown under irrigation.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) As per treatments. (ii) Black soil. (iii) 24.10.64 and 25.11.64 (for Groundnut plots) ; 27.11.65. (iv) (a) Harrowing. (b) Drilling. (c) 49 Kg/ha. (d) 30 cm. (e) —. (v) Nil. ; 44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) NI 146. (vii) Irrigated. (viii) 3 weedings and 1 hoeing ; weeding and hoeing. (ix) Nil. ; N.A. (x) 10 to 12.3.65 ; 17.3.66.

**2. TREATMENTS :**

Same as in expt. No. 63(86), 64(80), 65(196) conducted at trial-cum-Demons. Farm, Bendsura Bhir at page No. 139.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Dusted sulphur. (iii) Yield of grain. (iv) (a) 1964-65. (b) No. (c) Results for combined analysis are presented under 5. Results. (v) Bendsura and Khasapur. (vi) Nil. (vii) Error variances are homogeneous. Treatments × years interaction is absent.

**5. RESULTS :**

Pooled results

(i) 1103 Kg/ha. (ii) 301.0 Kg/ha. (based on 63 d.f. made up of pooled error and Treatments × years interaction). (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>
Av. yield	1320	774	1105	1046	1186	1248	887	1165	1150	1147

C.D.=300.8 Kg/ha.

## Individual results

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>	Sig.	G.M.	S.E./plot
Year													
1964	919	704	802	753	883	1145	659	1086	985	791	N.S.	873	281.9
1965	1720	844	1408	1340	1491	1352	1114	1243	1314	1503	N.S.	1333	306.3
Pooled	1320	774	1105	1046	1186	1248	887	1165	1150	1147	*	1103	301.0

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 60(171).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'C'.**

**Object :—**To study the effect of method of spacing and direction of sowing with different seed rate on the yield of Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) (a) Black cotton soil. (b) Refer soil analysis, Nagpur. (iii) 12.11.60. (iv) (a) N.A. (b) to (d) As per treatments. (e) N.A. (iv) 22.4 Kg/ha of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) Hy-65. (vii) Irrigated. (viii) Interculturing. (xi) 1 cm. (x) 20.3.61.

**2. TREATMENTS :**

**Main-plot treatments :**

5 methods of sowing. M<sub>1</sub>=Broadcast. M<sub>2</sub>=Drilling in rows 23 cm. apart in one direction. M<sub>3</sub>=Drilling in rows 23 cm. apart length wise and cross wise. M<sub>4</sub>=Drilling in rows 11 cm. apart in one direction and M<sub>5</sub>=Drilling in rows 11 cm. apart length wise and cross wise.

**Sub-plot treatments :**

3 seed rates : S<sub>1</sub>=67.2, S<sub>2</sub>=100.8 and S<sub>3</sub>=134.5 Kg/ha.

**3. DESIGN :**

(i) Split plot. (ii) (a) 5 main-plots/replication, 3 Sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7.32m. × 7.32m. (b) 6.40m. × 6.40m. (v) 46 cm. × 46 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958-60. (b) Yes. (c) No. (v) (a) No. (b) Nil. (vi) Nil.

**5. RESULTS :**

(i) 1752 Kg/ha. (ii) (a) 190.1 Kg/ha. (b) 192.6 Kg/ha. (iii) Main effect of M is highly significant. (iv) Av. yield of grain in Kg/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	Mean
S <sub>1</sub>	1678	1629	1757	1892	1568	1705
S <sub>2</sub>	1779	1440	1879	1867	1843	1762
S <sub>3</sub>	1824	1507	1886	1989	1742	1790
Mean	1760	1525	1841	1916	1718	1752

C.D. for M marginal means=169 Kg/ha.

**Crop :- Wheat (Rabi).****Ref :- Mh. 60(106).****Site :- Agri. Res. Stn., Niphad.****Type :- 'C'.**

Object :—To find out the suitable method of preparatory tillage for dry crop of Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Not fixed. (b) and (c) N.A. (ii) Medium black. (iii) 2nd week of Oct. 60. (iv) (a) As per treatments. (b) Drilling. (c) 45 Kg/ha. (d) 25 cm. between rows. (e) —. (v) 12 C.L./ha. of F.Y.M. before harrowing after ploughing. (vi) N—59. (vii) Unirrigated. (viii) N.A. (ix) 13 cm. (x) 24.2.61.

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) No. of ploughings:  $P_1=1$  iron ploughing on 3.9.60 and  $P_2=2$  wooden ploughings on 3.9.60 and 4.10.60.(2) No. of harrowings:  $H_1=2$ ,  $H_2=3$  and  $H_3=4$  harrowings.

Dates of harrowings are 5.9.60, 1.10.60, 26.10.60 and 30.10.60.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 6. (b) 18.29 m. × 27.43 m. (iii) 6. (iv) (a) 6.10 m. × 13.72 m. (b) 4.57 m. × 12.19 m. (v) 76 cm. × 76 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958—60. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 417 Kg/ha. (ii) 49.0 Kg/ha. (iii) Main effects of P and H are significant. (iv) Av. yield of grain in Kg/ha.

	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	Mean
P <sub>1</sub>	454	429	323	392
P <sub>2</sub>	429	491	406	442
Mean	441	460	365	417

C.D. for P marginal means=31 Kg/ha.

C.D. for H marginal means=40 Kg/ha.

**Crop :- Wheat (Rabi).****Ref :- Mh. 65(215).****Site :- Agri. Res. Stn., Kopergaon.****Type :- 'CV'.**

Object :—To find out the suitable date of sowing for the new varieties of Wheat.

**1. BASAL CONDITIONS :**(i) (a) Nil. (b) Sugarcane. (c) 504 Kg/ha. of N as A/S, 112 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) 'A' type. (iii) As per treatments. (iv) (a) 2 ploughings by tractor and 2 harrowings. (b) Drilling. (c) 20 Kg/ha. (d) 25 cm. between rows. (e) N.A. (v) 12.35 C.L./ha. of F.Y.M. + 44.8 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) As per treatments. (vii) Irrigated. (viii) 3 weedings. (ix) N.A. (x) 24.2.66.**2. TREATMENTS :****Main-plot treatments :**3 sowing dates:  $D_1=8.10.65$ ,  $D_2=23.10.65$  and  $D_3=7.11.65$ .**Sub-plot treatments :**4 varieties:  $V_1=N-1200$ ,  $V_2=N-271$ ,  $V_3=N-59$  and  $V_4=Vijay$ .

## 3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (v) (a) 6.40 m. × 10.97 m  
(b) 5.18 m. × 9.75 m. (v) 61 cm. × 61 cm. (vi) Yes.

## 4. GENERAL :

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

## 5. RESULTS :

(i) 1334 Kg/ha. (ii) (a) 644.8 Kg/ha. (b) 374.1 Kg/ha. (iii) Main effect of V and interaction D × V are highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	Mean
D <sub>1</sub>	705	1703	1398	1278	1272
D <sub>2</sub>	733	2184	2102	1443	1617
D <sub>3</sub>	1237	1568	1056	715	1144
Mean	892	1820	1519	1547	1344

C.D. for V marginal means = 313.3 Kg/ha.  
C.D. for comparison of V means at the same level of D = 543.0 Kg/ha.  
C.D. for comparison of D means at the same level of V = 726.9 Kg/ha.

**Crop :- Wheat (Rabi).**

**Site :- Agri. College Farm, Nagpur.**

**Ref :- Mh. 60(101).**

**Type :- 'CV'.**

Object : To study the suitable sowing date for different varieties of Wheat.

## 1. BASAL CONDITIONS :

(i) (a) Wheat—Wheat. (b) Wheat. (c) As per treatments. (ii) Black cotton soil. (iii) As per treatments.  
(iv) (a) 2 ploughings and 3 harrowings. (b) Argada sowing. (c) 56 to 67 Kg/ha. (d) 25 cm. between rows.  
(e) N.A. (v) Nil. (vi) As per treatments. (vii) Un-irrigated. (viii) 1 weeding. (ix) 1 cm. (x) 20.2.61 ;  
1.3.61 and 5.3.61.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 dates of sowing : D<sub>1</sub> = 23.10.60, D<sub>2</sub> = 30.10.60, D<sub>3</sub> = 7.11.60 and D<sub>4</sub> = 14.11.60.

(2) 2 varieties : V<sub>1</sub> = Hawara (local) and V<sub>2</sub> = HY—65.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 10.97 m. × 6.70 m. (b) 9.14 m. × 6.10 m.  
(v) 91 cm. × 30 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Germination, height, tiller counts and yield of grain. (iv) (a) 1959—60. (b) Yes.  
(c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 1369 Kg/ha. (ii) 314.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	Mean
V <sub>1</sub>	1297	1134	1527	1238	1299
V <sub>2</sub>	1327	1579	1510	1344	1440
Mean	1312	1356	1519	1291	1369

**Crop :- Wheat (Rabi).****Ref :- Mh. 61(136).****Site :- Agri. College Farm, Nagpur.****Type :- 'CV'.**

Object :- To study the suitable sowing date for different varieties of Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) Black cotton soil. (iii) As per treatments. (iv) (a) Harrowing. (b) Drilling. (c) 67 Kg/ha. (d) 30 cm. (e) 1-2. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 weedings. (ix) 4 cm. (x) 12.3.62 and 5.4.62.

**2. TREATMENTS:****Main-plot treatments:**5 date of sowing:  $D_1=30.10.61$ ,  $D_2=15.11.61$ ,  $D_3=30.11.61$ ,  $D_4=15.12.61$  and  $D_5=30.11.61$ .**Sub-plot treatments:**2 varieties:  $V_1=Harwara$  (local) and  $V_2=HY-65$ .**3. DESIGN :**(i) Split-plot. (ii) (a) 5 main-plots/replications; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 4.57 m.  $\times$  10.97 m. (b) 3.96 m.  $\times$  10.97 m. (v) 30 cm.  $\times$  30 cm. (vi) Yes.**4. GENERAL:**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959-61 (Treatments modified). (b) No. (c) Nil. (v) (a) (b) Nil. N.A. (vi) and (vii) Nil.

**5. RESULTS:**(i) 755 Kg/ha. (ii) (a) 110.4 Kg/ha. (b) 72.4 Kg/ha. (iii) Main effect of D, V and interaction  $D \times V$  are significant. (iv) Av. yield of grain in Kg/ha.

	$D_1$	$D_2$	$D_3$	$D_4$	$D_5$	Mean
$V_1$	897	747	603	279	167	539
$V_2$	1172	1090	980	937	676	971
	1034	918	792	608	421	755

C.D. for D marginal means = 122 Kg/ha.

C.D. for V marginal means = 49 Kg/ha.

C.D. for V means at the same level of D = 110 Kg/ha.

C.D. for D means at the same level of V = 146 Kg/ha.

**Crop :- Wheat (Rabi).****Ref :- Mh. 60(68).****Site :- Agri. Res. Stn., Tharsa.****Type :- 'CV'.**

Object :- To study the suitable sowing date for different varieties of Wheat.

**1. BASAL CONDITIONS :**(i) (a) N.A. (b) Wheat. (c) N.A. (ii) Morand No. 2. (iii) As per treatments. (iv) (a) 2 ploughings and 2 bakherings. (b) Sowing by 'Tiffan' plough. (c) 67 Kg/ha. (d) 30 cm.  $\times$  8 cm. (e) N.A. (v) Green manuring. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 4th week of March, 61.**2. TREATMENTS:****Main-plot treatments:**4 date of sowing:  $D_1=18.10.60$ ,  $D_2=23.10.60$ ,  $D_3=7.11.60$  and  $D_4=15.11.60$ .**Sub-plot treatments:**2 varieties:  $V_1=HY-65$  and  $V_2=Hawara$  (local).



## 3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 6.40 m. × 10.97 m. (b) 4.57 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain, tiller counts and plant height. (iv) (a) 1960-61 (modified in 1961). (b) No. (c) Nil. (v) N.A. (vi) Crop was damaged due to late rains in Feb. and March. (vii) Nil.

## 5. RESULTS :

(i) 7.5 Kg/ha. (ii) (a) 184.7 Kg/ha. (b) 240.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	Mean
V <sub>1</sub>	705	850	805	887	812
V <sub>2</sub>	696	760	751	669	719
Mean	700	805	778	778	765

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 61(35), 62(17).**

**Site :- Agri. Res. Stn., Tharsa.**

**Type :- 'CV'.**

Object :—To study the suitable sowing dates for different varieties of Wheat.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A.; *Tur.* (c) N.A.; 22.4 Kg/ha. of N. (ii) Medium black. (iii) As per treatments. (iv) (a) 2 ploughings and 2 bakherings; 4 bakherings. (b) *Tiffan* sowing. (c) 56 Kg/ha. (d) 33 cm. × 8 cm. (e) —. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A.; 25 cm. (x) 9.3.62 to 1.4.62; 11, 23.3.63.

## 2. TREATMENTS :

## Main-plot treatments

4 dates of sowing: D<sub>1</sub>=30th October, D<sub>2</sub>=7th Nov., D<sub>3</sub>=15th Nov. and D<sub>4</sub>=23rd Nov.

## Sub-plot treatments :

2 varieties: V<sub>1</sub>=Hy-65 and V<sub>2</sub>=Haware (local).

## 3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 6.40 m. × 10.90 m. (b) 4.57 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory; Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960 to 62 (modified in 1961). (b) No. (c) Results for combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Both error variances are homogeneous, main-plot Treatments × years interaction is absent.

## 5. RESULTS :

## Pooled results

(i) 490 Kg/ha. (ii) (a) 141.42 Kg/ha. (based on 30 d.f. made up of pooled error). (b) 178.8 Kg/ha. (based on 40 d.f. made up of pooled error). (iii) Only D effect is significant. (iv) Av. yield of grain in Kg/ha.

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	Mean
V <sub>1</sub>	524	564	526	429	511
V <sub>2</sub>	408	524	510	431	468
Mean	466	544	518	430	490

C.D. for D marginal means = 83.36 Kg/ha.

## Individual results

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	Sig.	V <sub>1</sub>	V <sub>2</sub>	Sig.	G.M.	S.E./plot	
										(a)	(b)
Year 1961	538	558	548	448	N.S.	523	523	N.S.	523	105.48	140.85
1962	394	530	488	411	N.S.	498	414	*	456	169.9	116.0
Pooled	466	544	518	430	*	511	468	N.S.	490	141.4	118.8

Crop :- Wheat (*Rabi*).

Ref :- Mh. 60(88).

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

Type :- 'CM'.

Object:—To find out the optimum spacing, seed rate and N,P, K requirement for irrigated Wheat.

## 1. BASAL CONDITIONS:

(i) (a) N.A. (b) Groundnut. (c) Nil. (ii) 'A' type soil. (iii) 17.12.60. (iv) (a) 4 harrowings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Kenphad—25. (vii) Irrigated. (viii) 5 weedings. (ix) 22 cm. (x) 11 to 14.4.61.

## 2. TREATMENTS:

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

- (1) 2 levels of N as A/S: N<sub>0</sub>=0 and N<sub>1</sub>=67.2 Kg/ha
- (2) 2 levels of P<sub>2</sub>O<sub>5</sub> as Super: P<sub>0</sub>=0 and P<sub>1</sub>=67.2 Kg/ha.
- (3) 2 levels of K<sub>2</sub>O as sulphos: K<sub>0</sub>=0 and K<sub>1</sub>=67.2 Kg/ha.
- (4) 2 spacing between rows: S<sub>0</sub>=15 cm. and S<sub>1</sub>=30 cm.
- (5) 2 seed rates: R<sub>0</sub>=34 and R<sub>1</sub>=67 Kg/ha.
- (6) 2 levels of compost: F<sub>0</sub>=0 and F<sub>1</sub>=12.5 C L./ha.

## 3. DESIGN:

(i) 2<sup>6</sup> fact. confd. (ii) (a) 8 plots/block; 8 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 10.36 m. × 4.88 m. (b) 9.14 m. × 3.66 m. (v) 61 cm. × 61 cm. (vi) Yes.

## 4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960—only. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Nil.

## 5. RESULTS:

(i) 751 Kg/ha. (ii) 174.0 Kg/ha. (iii) Main effect of N is highly significant and N × P interaction is significant. (iv) Table of mean and differential response in Kg/ha.

	Mean response	Differential responses											
		N		P		K		S		R		F	
		—	+	—	+	—	+	—	+	—	+	—	+
N	142	—	—	236	48	155	130	137	148	114	170	151	133
P	19	113	—75	—	—	—62	100	—18	56	74	—36	86	—48
K	—81	—68	—94	—162	0	—	—	0	—162	—57	—104	—27	—134
S	—25	—30	—19	—62	12	56	—105	—	—	20	—69	—35	—15
R	—16	—44	12	39	—71	8	—39	29	—61	—	—	0	—31
F	—87	—78	—96	—20	—155	—34	—141	—98	—77	—72	—103	—	—

C.D. for mean response=88.3 Kg/ha.

C.D. for differential response=124.9 Kg/ha.

**Crop :- Wheat (Rabi).****Ref :- Mh. 61(128).****Site :- Agri. Res. Stn., Shindewahi.****Type :- 'CM'.**

Object:—To study the effect of spacing, seed rate and different levels of N on the yield of Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) Sandy loam. (iii) 1, 2.12.61. (iv) (a) 3 ploughings and 2 harrowings. (b) Dilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) HY-3-4-2-2. (vii) Irrigated. (viii) and (ix) Nil. (x) 18, 19.3.62.

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

All combination of (1) and (2)

(1) 3 spacings :  $S_1=23$ ,  $S_2=30$  and  $S_3=37$  cm.(2) 3 seed rates :  $R_1=33.6$ ,  $R_2=50.4$  and  $R_3=67.2$  Kg/ha.**Sub-plot treatments :**4 levels of N as A/S :  $N_0=0$ ,  $N_1=22.4$ ,  $N_2=44.8$  and  $N_3=67.2$  Kg/ha.**3. DESIGN :**(i) Split-plot. (ii) (a) 9 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 6'40 m.  $\times$  10'97 m. (b) 4'57 m.  $\times$  9'14 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.**4. GENERAL :**

(i) Germination was not proper. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961—only. (b) —. (c) Nil. (v) (a) Tharsa. (b) Nil. (vi) and (vii) Nil.

**5. RESULTS :**(i) 561 Kg/ha. (ii) (a) 267.9 Kg/ha. (b) 257.4 Kg/ha. (iii) Main effect of S and N are highly significant while the S  $\times$  R interaction is significant. (iv) (a) Av. yield of grain in Kg/ha.

	$S_1$	$S_2$	$S_3$	$N_0$	$N_1$	$N_2$	$N_3$	Mean
$R_1$	756	377	357	325	441	560	662	497
$R_2$	542	817	484	572	567	565	755	615
$R_3$	655	685	371	308	624	633	716	570
Mean	651	626	404	402	544	586	711	561
$N_0$	422	478	305					
$N_1$	709	553	371					
$N_2$	617	685	453					
$N_3$	858	787	487					

C.D. for S marginal means=134 Kg/ha.

C.D. for N marginal means=140 Kg/ha.

C.D. for two means in the body of S  $\times$  R table=164 Kg/ha.**Crop :- Wheat (Rabi)****Ref :- Mh. 61(127), 62(119), 63(167).****Site :- Agri. Res. Stn., Tharsa.****Type :- 'CM'.**

Object:—To study the effect of spacing, seed rate and N on the yield of Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) N.A.; Wheat in 62 and 63. (c) N.A.; as per treatments in 62 and 63. (ii) Morand No. II. (iii) 25.11.61; 15.11.62; 16.11.63. (iv) (a) 2 ploughings and 2 harrowings; 3 harrowings in 62, 63. (b) Dilling. (c) and (d) As per treatments. (e) 3 to 4. (v) Nil. (vi) HY-65. (vii) Irrigated. (viii) 2 weedings. (ix) 4 cm.; 24 cm.; 2 cm. (x) 6.3.62; 13.3.63; 27.3.64.

## 2. TREATMENTS :

## Main-plot treatments :

All combinations of (1) and (2)

(1) 3 seed rates :  $R_1=33.6$ ,  $R_2=50.0$  and  $R_3=67.2$  Kg/ha.(2) 3 spacings :  $S_1=23$ ,  $S_2=30$  and  $S_3=38$  cm.

## Sub-plot treatments :

4 levels of N as :  $N_0=0$ ,  $N_1=22.4$ ,  $N_2=44.8$  and  $N_3=67.2$  Kg/ha.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 7.32 m.  $\times$  10.97 m. (b) 5.49 m.  $\times$  9.14 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961-63. (b) No. (c) Nil. (v) Shindewahi. (vi) Nil. (vii) Sub-plot error variances are heterogeneous, hence results for individual years are presented under 5. Results.

## 5. RESULTS :

61(127)

(i) 960 Kg/ha. (ii) (a) 294.2 Kg/ha. (b) 170.8 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$N_2$	$N_3$	$S_1$	$S_2$	$S_3$	Mean
$R_1$	919	1019	997	997	980	1005	963	983
$R_2$	819	1019	986	997	939	972	955	955
$R_3$	808	1019	997	941	806	930	1088	941
Mean	849	1019	993	978	908	969	1002	960
$S_1$	731	975	952	974				
$S_2$	908	986	1008	975				
$S_3$	908	1096	1019	986				

C.D. for N marginal means=93.2 Kg/ha.

62(119)

(i) 1133 Kg/ha. (ii) (a) 191.4 Kg/ha. (b) 137.5 Kg/ha. (iii) Main effect of N and interaction of  $N \times R$  are highly significant. S effect is significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$N_2$	$N_3$	$S_1$	$S_2$	$S_3$	Mean
$R_1$	1008	1063	1152	1251	1229	1088	1038	1118
$R_2$	1052	1185	1174	1141	1188	1121	1105	1138
$R_3$	986	1196	1196	1196	1238	1138	1055	1144
Mean	1015	1148	1174	1196	1218	1116	1066	1133
$S_1$	1041	1240	1296	1296				
$S_2$	1052	1152	1141	1118				
$S_3$	952	1052	1085	1174				

C.D. for N marginal means =75.2 Kg/ha.

C.D. for two N means at the same level of R=130.0 Kg/ha.

C.D. for two R means at the same level of N =147.6 Kg/ha.

63(167)

(i) 1035 Kg/ha. (ii) (a) 205.1 Kg/ha. (b) 212.7 Kg/ha. (iii) Main effect of N is highly significant. S effect and interaction  $S \times R$  is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
R <sub>1</sub>	859	893	1121	1063	1148	935	869	984
R <sub>2</sub>	899	1017	1076	1110	1093	925	1058	1025
R <sub>3</sub>	908	1200	999	1280	1103	1224	963	1097
Mean	889	1037	1065	1151	1115	1028	963	1035
S <sub>1</sub>	890	1176	1158	1234				
S <sub>2</sub>	844	1068	1099	1103				
S <sub>3</sub>	932	866	939	1116				

C.D. for N marginal means = 116.0 Kg/ha.

C.D. for S marginal means = 103.1 Kg/ha.

C.D. for body of the  $S \times R$  table = 59.5 Kg/ha.

**Crop :-** Wheat (Rabi).

**Ref :-** Mh. 60(99), 61(143), 62(128).

**Site :-** Agri. Res. Stn., Tharsa.

**Type :-** 'CMV'.

**Object :-** To study the effect of sowing dates on different varieties of irrigated Wheat.

#### 1. BASAL CONDITIONS :

(i) (a) to (c) As per treatments. (ii) Medium black. (iii) As per treatments. (iv) (a) 2 ploughings and 2 *bakhe rings*; harrowings in 1961 and 62. (b) Sown by tiffan; dirlling in 61 and 62. (c) 67 Kg/ha.; 99 Kg/ha. (d) 30 cm.  $\times$  8 cm.; 30 cm.  $\times$  11 cm.; 30 cm.  $\times$  11 cm. (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Weeding. (ix) N.A.; 3 cm.; 24 cm. (x) 24.3, 61; 13.3, 62; 10.3, 63.

#### 2. TREATMENTS :

**Main-plot treatments :**

5 sowing dates: D<sub>1</sub>=30th Oct., D<sub>2</sub>=15th Nov., D<sub>3</sub>=30th Nov., D<sub>4</sub>=15th Dec. and D<sub>5</sub>=30th Dec.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 3 levels of N as A/S: N<sub>0</sub>=0, N<sub>1</sub>=44.8 and N<sub>2</sub>=89.6 Kg/ha.

(2) 2 varieties: V<sub>1</sub>=Hawara (local) and V<sub>2</sub>=HY-65.

N broadcast at the time of sowing.

#### 3. DESIGN:

(i) Split-plot. (ii) (a) 5 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6.40 m.  $\times$  10.97. (b) 4.57 m.  $\times$  9.14 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

#### 4. GENERAL :

(i) Due to lack of rains during the month of Feb.—March 1961, the crop was damaged to some extent. (ii) Nil. (iii) Plant height, tiller counts and yield of grain. (iv) (a) 1959 to 62, (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) As the sub-plot error variances are heterogeneous, results of individual years are given under 5. Results.

#### 5. RESULTS :

60(99)

(i) 710 Kg/ha. (ii) (a) 550.1 Kg/ha. (b) 182.0 Kg/ha. (iii) Main effects of D, N and V are highly significant. Effect of interactions  $D \times N$  and  $D \times V$  are significant. (iv) Av. yield of grain in Kg/ha.

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	V <sub>1</sub>	V <sub>2</sub>	Mean
N <sub>0</sub>	749	885	837	451	281	624	658	641
N <sub>1</sub>	884	1030	963	400	248	620	790	705
N <sub>2</sub>	929	1291	919	461	318	698	870	784
Mean	854	1069	906	437	282	647	773	710
V <sub>1</sub>	838	870	891	384	253			
V <sub>2</sub>	870	1268	922	491	312			

C.D. for D marginal means = 346.0 Kg/ha.  
 C.D. for N marginal means = 81.2 Kg/ha.  
 C.D. for V marginal means = 65.6 Kg/ha.  
 C.D. for D means at the same level of N = 382.2 Kg/ha.  
 C.D. for N means at the same level of D = 179.5 Kg/ha.  
 C.D. for D means at the same level of V = 364.3 Kg/ha.  
 C.D. for V means at the same level of D = 146.6 Kg/ha.

61(143)

(i) 405 Kg/ha. (ii) (a) 160.3 Kg/ha. (b) 161.7 Kg/ha. (iii) Main effect of D is highly significant and effect of interaction D × V is significant. (iv) Av. yield of grain in Kg/ha.

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	V <sub>1</sub>	V <sub>2</sub>	Mean
N <sub>0</sub>	478	568	419	329	164	413	371	392
N <sub>1</sub>	448	553	419	344	194	419	365	392
N <sub>2</sub>	478	673	493	299	209	443	419	431
Mean	468	598	444	324	189	42	385	405
V <sub>1</sub>	578	638	389	299	219			
V <sub>2</sub>	359	558	498	349	159			

C.D. for D marginal means = 100.7 Kg/ha.  
 C.D. for D means at the same level of V = 143.4 Kg/ha.  
 C.D. for V means at the same level of D = 131.7 Kg/ha.

62(128)

(i) 820 Kg/ha. (ii) (a) 257.9 Kg/ha. (b) 216.5 Kg/ha. (iii) Main effects of D and N are highly significant and effects of V and interaction D × N are significant. (iv) Av. yield of grain in Kg/ha.

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	V <sub>1</sub>	V <sub>2</sub>	Mean
N <sub>0</sub>	777	897	733	643	272	647	682	664
N <sub>1</sub>	1032	1121	957	957	248	801	924	862
N <sub>2</sub>	987	1405	1091	942	236	891	374	932
Mean	932	1141	927	847	252	780	860	820
V <sub>1</sub>	807	1116	947	807	221			
V	1056	1166	907	887	283			

C.D. for D marginal means = 162.1 Kg/ha.  
 C.D. for N marginal means = 96.4 Kg/ha.  
 C.D. for V marginal means = 78.8 Kg/ha.  
 C.D. for D means at the same level of N = 251.2 Kg/ha.  
 C.D. for N means at the same level of D = 215.7 Kg/ha.

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 61(143), 62(128).**

**Site :- Agri. Res. Stn., Tharsa.**

**Type :- 'CMV'.**

**Object :-**To study the effect of different dates of sowing with different levels of N on different varieties of Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black. (iii) As per treatments. (iv) (a) Harrowings. (b) Drilling. (c) 45 Kg/ha. (d) 30 cm. × 10 cm. (e) 1. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Weeding. (ix) 3 cm. ; 24 cm. (v) 13.3.62 ; 10.3.63.

**2. TREATMENTS :**

**Main-plot treatments :**

5 dates of sowing :  $D_1=30\text{th Oct.}$ ,  $D_2=15\text{th Nov.}$ ,  $D_3=30\text{th Nov.}$ ,  $D_4=15\text{th Dec.}$  and  $D_5=30\text{th Dec.}$

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 3 levels of N :  $N_0=0$ ,  $N_1=44.8$  and  $N_2=89.6$  Kg/ha.

(2) 2 varieties :  $V_1=Hawara$ , and  $V_2=HY-65$ .

**3. DESIGN :**

(i) Split-plot. (ii) (a) 5 main-plots/replication ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6.40 m. × 10.97 m. (b) 4.57 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961-62. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances for sub-plots are heterogeneous, hence results for individual years are presented under 5. Results.

**5. RESULTS :**

**61(143)**

(i) 405 Kg/ha. (ii) (a) 160.3 Kg/ha. (b) 161.7 Kg/ha. (iii) Main effect of D is highly significant, and interaction  $D \times V$  is significant. (iv) Av. yield of grain in Kg/ha.

	$D_1$	$D_2$	$D_3$	$D_4$	$D_5$	$N_0$	$N_1$	$N_2$	Mean
$V_1$	578	638	389	299	219	413	419	443	425
$V_2$	359	558	498	349	159	371	365	419	485
Mean	468	598	443	324	189	392	392	431	405
$N_0$	478	568	419	329	164				
$N_1$	448	553	419	344	194				
$N_2$	478	673	493	299	209				

C.D. for D marginal means = 100.9 Kg/ha.

C.D. for V means at the same level of D = 131.7 Kg/ha.

C.D. for D means at the same level of V = 133.0 Kg/ha.

**62(128)**

(i) 820 Kg/ha. (ii) (a) 257.9 Kg/ha. (b) 216.5 Kg/ha. (iii) Main effect of D and N are highly significant. (iv) Av. yield of grain in Kg/ha.

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Mean
V <sub>1</sub>	807	1116	947	807	221	647	801	891	780
V <sub>2</sub>	1056	1166	907	887	283	682	924	974	860
Mean	932	1141	927	847	252	664	863	932	820
N <sub>0</sub>	777	897	733	643	272				
N <sub>1</sub>	1032	1121	957	957	248				
N <sub>2</sub>	987	1405	1091	942	236				

C.D. for D marginal means=162.1 Kg/ha.

C.D. for N marginal means=96.4 Kg/ha.

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 60(117), 62(113), 63(174), 64(138).**

**Site :- Agri. Res. Stn., Badnapur. Type :- 'I'.**

Object :—To study the requirement of irrigation to Wheat crop.

**1. BASAL CONDITIONS :**

(i) (a) Wheat –Wheat. (b) Wheat. (c) 112 Kg/ha. of N as A/s, 140 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as super. (ii) Black cotton soil. (iii) 14.10.60. (iv) (a) 4 harrowings. (b) Drilling. (c) 67 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) HY 65–4. (vii) As per treatments. (viii) 1 weeding. (ix) 9 cm. ; N.A. for years 62, 63 and 64. (x) 4.4.61.

**2. TREATMENTS :**

5 irrigational treatments : I<sub>0</sub>=No irrigation, I<sub>1</sub>=2 irrigations—one after 25 days and 2nd after 50 days of sowing, I<sub>2</sub>=2 irrigations—one after 25 days and 2nd after 70 days of sowing, I<sub>3</sub>=3 irrigations—one after 25 days, 2nd after 50 days and 3rd after 70 days of sowing and I<sub>4</sub>=4 irrigations—one after 25 days, 2nd after 50 days, 3rd after 70 days and 4th after 90 days of sowing.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960 to 64. (b) No. (c) Nil. (v) and (vi) No. (vii) Error variances are homogeneous. Treatments × years interaction is present. Experiment not conducted in 61.

**5. RESULTS :**

Pooled results

(i) 1144 Kg/ha. (ii) 258.3 Kg/ha. (with 12 d.f. based on Treatments × years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	I <sub>0</sub>	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>
Av. yield	500	872	841	1099	1266

C.D. for I marginal means=162 Kg/ha.



## Individual results

Treatment	I <sub>0</sub>	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	Sig.	G.M.	S.E./plot
1960	558	1074	948	1171	1369	**	1024	110.8
1962	493	660	630	813	848	**	689	87.7
1963	557	891	1174	1346	1428	**	1079	127.0
1964	390	862	612	1066	1261	**	838	191.4
Pooled	500	872	841	1099	1266	**	1144	258.3

Crop :- Wheat (*Rabi*).

Ref :- Mh. 62(131), 63(173), 64(144).

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

Type :- 'I'.

Object :- To study the effect of interval of irrigation on the yield of Wheat.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Cotton in 62, wheat in 63 and 64. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> in 62 and 63 ; G.M.+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> in 64. (ii) Black cotton soil. (iii) 12.10.62 ; 9.10.63 ; 13.10.64. (iv) (a) Ploughing and 3 harrowings ; 3 harrowings ; harrowing. (b) Drilling. (c) 22.4 Kg/ha. (d) 30 cm. (e) —. (v) 12.5 C.L./ha. of F.Y.M. (vi) N -59 (late). (vii) As per treatments. (viii) Weeding and hoeing. (ix) 26 cm. ; 2 cm. ; 1 cm. (x) 11.4.63 ; 3.3.64 ; 25.2.65.

## 2. TREATMENTS:

7 irrigation treatments : I<sub>0</sub>=No irrigation, I<sub>1</sub>=One irrigation after 25 days of sowing, I<sub>2</sub>=One irrigation after 50 days of sowing, I<sub>3</sub>=2 irrigations after 25 and 50 days of sowing, I<sub>4</sub>=2 irrigations after 25 and 70 days of sowing, I<sub>5</sub>=2 irrigations after 50 and 70 days of sowing and I<sub>6</sub>=3 irrigations after 25, 50 and 70 days of sowing.

## 3. DESIGN :

(i) R.B.D. (ii) (a) C. (b) N.A. (iii) 4. (iv) (a) 7.32 m. × 4.57 m. (b) 6.09 m. × 2.74 m. (v) 62 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962—66. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. was not conducted in 65.

## 5. RESULTS :

## 62(131)

(i) 1534 Kg/ha. (ii) 112.4 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	I <sub>0</sub>	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>	I <sub>6</sub>
Av. yield	1106	1420	1577	1589	1652	1644	1749

C.D. for I marginal means=168 Kg/ha.

## 63(173)

(i) 1497 Kg/ha. (ii) 170.4 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	I <sub>0</sub>	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>	I <sub>6</sub>
Av. yield	834	1458	1477	1474	1580	1743	1911

C.D. for I marginal means=255 Kg/ha.

64(144)

(i) 742 Kg/ha. (ii) 178.2 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	I <sub>0</sub>	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>	I <sub>6</sub>
Av. yield	414	758	721	928	739	727	900

C.D. for I marginal means = 267 Kg/ha.

**Crop :- Wheat. (Rabi).**

**Ref :- Mh. 62(132), 63(175).**

**Site :- Agri. College Farm, Nagpur.**

**type :- 'P'.**

Object :- To study the optimum interval and quantity of irrigation for Wheat crop.

### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. ; 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Black cotton soil. (iii) 6.11.62 ; 6.11.63. (iv) (a) Harrowing. (b) Drilling. (c) 50 Kg/ha. (d) 30 cm. (e) 1 to 2. (v) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> at sowing. (vi) HY-65. (vii) As per treatments. (viii) Weeding. (ix) 17 cm ; 1 cm. (x) 18.3.63 ; 12 to 16.3.64.

### 2. TREATMENTS :

#### Main-plot treatments :

8 intervals of irrigation : F<sub>1</sub>=30, F<sub>2</sub>=60, F<sub>3</sub>=90, F<sub>4</sub>=30 and 60, F<sub>5</sub>=30 and 90, F<sub>6</sub>=60 and 90, F<sub>7</sub>=30 and 60 and 90 days after sowing and F<sub>8</sub>=As and when required.

#### Sub-plot treatments :

4 varieties of irrigations : I<sub>0</sub>=0, I<sub>1</sub>=1 ac inch, I<sub>2</sub>=2 ac inch and I<sub>3</sub>=3 ac. inch.

### 3. DESIGN :

(i) Split-plot. (ii) (a) 8 main-plots/replication ; 4 Sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 8.23 m. × 11.28 m. (b) 4.57 m. × 7.62 m. (v) 1.83 m. × 1.83 m. (vi) Yes.

### 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962-63. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) As error variances for sub-plots are heterogeneous and hence results for individual years are presented under 5. Results.

### 5. RESULTS :

62(132)

(i) 1268 Kg/ha. (ii) (a) 190.9 Kg/ha. (b) 112.5 Kg/ha. (iii) Main effects of F and I are highly significant interaction F×I is significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	F <sub>5</sub>	F <sub>6</sub>	F <sub>7</sub>	F <sub>8</sub>	Mean
I <sub>0</sub>	1220	1137	936	1034	1206	1149	1195	1080	1120
I <sub>1</sub>	1215		1071	1321	1220	1186	1350	1424	1251
I <sub>2</sub>	1186	1321	1128	1493	1123	1335	1488	1416	1311
I <sub>3</sub>	1295	1358	1034	1617	1321	1358	1597	1551	1391
Mean	1229	1259	1042	1366	1217	1257	1408	1368	1268

C.D. for F marginal means = 167.1 Kg/ha.

C.D. for I marginal means = 65.4 Kg/ha.

C.D. for I means at the same level of F = 185.0 Kg/ha.

C.D. for F means at the same level of I = 231.5 Kg/ha.

63(175)

(i) 1170 Kg/ha. (ii) (a) 161.9 Kg/ha. (b) 152.0 Kg/ha. (iii) Main effects of F and I are highly significant. Interaction F×I is significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	F <sub>5</sub>	F <sub>6</sub>	F <sub>7</sub>	F <sub>8</sub>	Mean
I <sub>0</sub>	675	807	755	784	721	790	864	848	781
I <sub>1</sub>	1080	1048	741	1387	962	905	1307	1674	1138
I <sub>2</sub>	1014	1077	770	1354	1378	1065	1597	2191	1307
I <sub>3</sub>	1321	1281	727	1867	1062	1192	1826	2372	1456
Mean	1023	1053	748	1351	1031	988	1398	1771	1170

C.D. for F marginal means = 141.8 Kg/ha.

C.D. for I marginal means = 88.2 Kg/ha.

C.D. for I means at the same level of F = 249.8 Kg/ha.

C.D. for F means at the same level of I = 253.6 Kg/ha.

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 64(235).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'I'.**

Object :- To study the effect of irrigation on yield of Wheat.

#### 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Clayey loam. (iii) 2.11.64. (iv) (a) Harrowing and ploughing. (b) Drilling. (c) 89.6 Kg/ha. (d) 30 cm. (e) —. (v) 22.4 Kg/ha. of N as A/S+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super at sowing. (vi) HY-65. (vii) As per treatments. (viii) 2 weedings. (ix) 4 cm. (x) 22 to 23.3.65.

#### 2. TREATMENTS:

##### Main-plot treatments :

8 irrigation: I<sub>1</sub>=One irrigation 30 days after sowing, I<sub>2</sub>=One irrigation 60 days after sowing, I<sub>3</sub>=One irrigation 90 days after sowing, I<sub>4</sub>=Two irrigations 30 and 60 days after sowing, I<sub>5</sub>=Two irrigations 30 and 90 days after sowings, I<sub>6</sub>=Two irrigations 60 and 90 days after sowing, I<sub>7</sub>=3 irrigations 30, 60 and 90 days after sowing and I<sub>8</sub>=At a regular interval of 10 days.

##### Sub-plot treatments :

4 levels of irrigation : L<sub>0</sub>=0, L<sub>1</sub>=2.5, L<sub>2</sub>=5.0 and L<sub>3</sub>=7.0 cm/ha.

#### 3. DESIGN :

(i) Split-plot. (ii) (a) 8 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 8.23 m. × 11.28 m. (b) 4.57 m. × 7.62 m. (v) 183 cm. × 183 cm. (vi) Yes.

#### 4. GENERAL :

(i) Normal. (ii) Slight attack of Stem borer. (iii) Plant population, height, number of tillers and yield of grain. (iv) (a) 1962—contd treatments modified in 1964. (b) No. (c) Nil. (v) and (vi) Nil (vii) As treatment I<sub>8</sub> is different in 1962 and 63, further number of replications differ from year to year, the experiment is not pooled.

#### 5. RESULTS :

62(220)

(i) 1269 Kg/ha. (ii) (a) 190.8 Kg/ha. (b) 112.5 Kg/ha. (iii) Main effect of I is highly significant, while L effect is significant. (iv) Av. yield of grain in Kg/ha.

	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>	I <sub>6</sub>	I <sub>7</sub>	I <sub>8</sub>	Mean
L <sub>0</sub>	1220	1139	938	1033	1206	1448	1195	1081	1120
L <sub>1</sub>	1215	1220	1072	1320	1220	1187	1349	1426	1257
L <sub>2</sub>	1186	1320	1129	1493	1124	1335	1483	1416	1311
L <sub>3</sub>	1296	1359	1033	1617	1320	1359	1593	1550	1392
Mean	1229	1260	1043	1306	1218	1257	1408	1368	1269

C.D. for comparison of I marginal means = 65.4 Kg/ha.

C.D. for comparison of L marginal means = 167.1 Kg/ha.

63(175)

(ii) 1170 Kg/ha. (ii) (a) 161.9 Kg/ha. (b) 151.9 Kg/ha. (iii) Main effects of I and L are highly significant, interaction (I × L) is significant. (iv) Av. yield of grain in Kg/ha.

	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>	I <sub>6</sub>	I <sub>7</sub>	I <sub>8</sub>	Mean
L <sub>0</sub>	675	808	756	785	722	789	866	847	781
L <sub>1</sub>	1081	1048	741	1387	961	904	1306	1674	1138
L <sub>2</sub>	1014	1076	770	1363	1378	1067	1598	2191	1307
L <sub>3</sub>	1320	1282	727	1865	1062	1191	1827	2373	1456
Mean	1023	1053	749	1350	1031	988	1399	1771	1170

C.D. for I marginal means = 143 Kg/ha.

C.D. for L marginal means = 88 Kg/ha.

C.D. for L means at the same levels of I = 250 Kg/ha.

C.D. for I means at the same levels of L = 258 Kg/ha.

64(235)

(i) 1258 Kg/ha. (ii) (a) 152.3 Kg/ha. (b) 146.3 Kg/ha. (iii) Main effects of I and L are highly significant. Interaction (I × L) is significant. (iv) Av. yield of grain in Kg/ha.

	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>	I <sub>6</sub>	I <sub>7</sub>	I <sub>8</sub>	Mean
L <sub>0</sub>	775	868	574	646	962	581	825	732	745
L <sub>1</sub>	1249	1055	639	1177	1191	976	1593	1974	1232
L <sub>2</sub>	1227	1371	710	1464	1507	983	1859	2167	1411
L <sub>3</sub>	1493	1615	839	1636	1650	1392	1937	2590	1644
Mean	1186	1227	691	1231	1327	983	1554	1866	1258

C.D. for I marginal means = 167 Kg/ha.

C.D. for L marginal means = 104 Kg/ha.

C.D. for L means at same level of I = 300 Kg/ha.

C.D. for I means at same level of L = 216 Kg/ha.

Crop :- Wheat (Rabi).

Ref :- Mh. 63(169), 64(141).

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

Type :- 'P'.

Object :- To study the effect of irrigation on the yield and growth of Wheat.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. ; 33.6 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Morand II. (iii) 15.11.63 ; 30.10.64 (iv) (a) 4 harrowings. (b) Drilling. (c) N.A. (d) 30 cm.  $\times$  10 cm. (e) 3 to 4. (v) 33.6 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (vi) HY-65. (vii) As per treatments. (viii) Nil. ; 2 weedings. (ix) 2 cm. ; 7 cm. (x) 20.3.64 ; 4.3.65.

## 2. TREATMENTS :

## Main-plot treatments :

9 irrigational treatments:  $I_1=1$  irrigation at the 1st critical phase of crop i.e. 30 days after sowing,  $I_2=1$  irrigation at the 2nd critical phase of crop i.e. 60 days after sowing,  $I_3=1$  irrigation at the 3rd critical phase of crop i.e. 90 days after sowing,  $I_4=2$  irrigation at the 1st and 2nd critical phase,  $I_5=2$  irrigation at the 1st and 3rd critical phase,  $I_6=2$  irrigation at the 2nd and 3rd critical phase,  $I_7=3$  irrigation at the 1st, 2nd and 3rd critical phase,  $I_8=$  Irrigation as and when required,  $I_9=$  At regular interval of 10-15 days.

## Sub-plot treatments.

4 intensities of irrigation:  $T_0=0$ ,  $T_1=1$ ,  $T_2=2$  and  $T_3=3$  acre inches.

## 3. DESIGN:

(i) Split-plot. (ii) (a) 9 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 8.23 m.  $\times$  11.28 m. (b) 4.57 m.  $\times$  7.62 m. (v) 1.83 m.  $\times$  1.83 m. (vi) Yes.

## 4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (p) 1963 to 64. (b) No. (c) Nil. (v) No. (vi) Nil. (vii) Error variances for main plot are heterogeneous, interaction is absent. Hence the results of individual years are presented under 5. Results.

## 5. RESULTS:

## 63(169)

(i) 563 Kg/ha. (ii) (a) 98.7 Kg/ha. (b) 174.8 Kg/ha. (iii) Main effect of I is significant. (iv) Av. yield of grain in Kg/ha.

$T_0=531$  Kg/ha.

	$I_1$	$I_2$	$I_3$	$I_4$	$I_5$	$I_6$	$I_7$	$I_8$	$I_9$	Mean
$T_1$	622	354	565	631	431	469	517	584	588	530
$T_2$	765	488	555	545	612	593	641	715	651	618
$T_3$	670	574	517	679	498	565	566	541	563	575
Mean	686	475	546	618	514	542	574	613	601	574

C.D. for I marginal means=98.9 Kg/ha.

## 64(141)

(i) 653 Kg/ha. (ii) (a) 219.0 Kg/ha. (b) 180.8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$T_0=655$  Kg/ha.

	$I_1$	$I_2$	$I_3$	$I_4$	$I_5$	$I_6$	$I_7$	$I_8$	$I_9$	Mean
$T_1$	737	747	630	719	580	653	662	630	758	680
$T_2$	806	679	698	569	456	797	666	487	472	626
$T_3$	797	571	824	718	551	609	620	545	625	651
Mean	780	666	717	669	529	686	649	554	618	652

**Crop :-** Wheat (*Rabi*).

**Ref :-** Mh. 63(92), 64(72), 65(198).

**Site :-** Trial-Cum-Demons. Farm,  
Bendsura, Bhir.

**Type :-** 'IM'.

**Object :-** To study the optimum time of irrigation for Wheat.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar* ; Wheat ; *Moong*. (c) N.A. ; N.A., 24.7 Kg/ha. of N+49.4 Kg/ha. of  $P_2O_5$ .  
(ii) Heavy black soil. (iii) 11.11.63 ; 17, 26.10.64 ; 12, 15.10.65. (iv) (a) Ploughings and 4 harrowings :  
3 harrowings ; 3 harrowings. (b) Drilling. (c) 56 Kg/ha. ; 56 Kg/ha. ; 49 Kg/ha. (d) 30 cm.  $\times$  8 to 10 cm. ;  
30 cm.  $\times$  8 to 10 cm. ; 30 cm. (e) —. (v) Nil, Nil ; 98.8 Kg/ha. of N+49.4 Kg/ha. of  $P_2O_5$ . (vi) HY—65.  
(vii) As per treatments. (viii) 4 interculturings ; 1 interculturings ; 2 interculturings. (ix) Nil. (x) 10 to  
13.3.64 ; 20, 22.2.65 ; 21, 23.2.66.

**2. TREATMENTS:**

19 treatments :  $T_0$ =Control,  $T_1$ =49.4 Kg/ha. of N+24.7 Kg/ha. of  $P_2O_5$ ,  $T_2$ =Irrigation as a presoaking  
dose,  $T_3$ =Presoaking dose+49.4 Kg/ha. of N+24.7 Kg/ha. of  $P_2O_5$ ,  $T_4$ =Irrigation at  
advance tillering stage or grand growth period,  $T_5$ =Irrigation at flag leaf stage or boot  
stage,  $T_6$ =Irrigation at milk stage or peak flowering or fruiting period,  $T_7$ =Presoaking dose  
+  $T_4$ ,  $T_8$ =Presoaking dose +  $T_5$ ,  $T_9$ =Presoaking dose +  $T_6$ ,  $T_{10}$ =Presoaking dose +  $T_4$   
+  $T_5$ ,  $T_{11}$ =Presoaking dose +  $T_4$  +  $T_6$ ,  $T_{12}$ =Presoaking dose +  $T_5$  +  $T_6$ ,  $T_{13}$ = $T_4$  +  $T_5$ ,  $T_{14}$ =  
 $T_4$  +  $T_6$ ,  $T_{15}$ = $T_5$  +  $T_6$ ,  $T_{16}$ =Presoaking dose +  $T_4$  +  $T_5$  +  $T_6$ ,  $T_{17}$ =Irrigation at an interval of  
14 days and  $T_{18}$ =Irrigation at an interval of 21 days.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 19. (b) N.A. (iii) 3. (iv) (a) 12'80 m.  $\times$  9'14 m. (b) 9'14 m.  $\times$  5'49 m. (v) 1'83 m.  $\times$  1'83 m.  
(vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963—65. (b) No. (c) Results for combined analy-  
sis are presented under 5. Results. (v) Golegaon, Khasapur. (vi) Nil. (vii) Error variances are heterogene-  
ous and Treatments  $\times$  years interaction is present.

**5. RESULTS :**

Pooled results

(i) 562 Kg/ha. (ii) 210.2 Kg/ha. (with 36 d.f. based on Treatments  $\times$  years interaction). (iii) Treatments  
differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$T_0$	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$	$T_8$	T
Av. yield	195	299	324	383	476	493	414	618	540	439
Treatment	$T_{10}$	$T_{11}$	$T_{12}$	$T_{13}$	$T_{14}$	$T_{15}$	$T_{16}$	$T_{17}$	$T_{18}$	
Av. yield	690	645	649	622	582	589	821	1094	803	

C.D. = 202.8 Kg/ha.

Individual results

**63(92)**

(i) 472 Kg/ha. (ii) 150.7 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain  
in Kg/ha.

Treatment	$T_0$	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$	$T_8$	$T_9$
Av. yield	166	316	203	229	389	437	439	468	512	261
Treatment	$T_{10}$	$T_{11}$	$T_{12}$	$T_{13}$	$T_{14}$	$T_{15}$	$T_{16}$	$T_{17}$	$T_{18}$	
Av. yield	684	641	565	408	645	399	784	718	708	

**64(72)**

(i) 734 Kg/ha. (ii) 155.5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain  
in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. yield	292	379	472	485	605	625	478	870	605	578
Treatment	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>	T <sub>17</sub>	T <sub>18</sub>	
Av. yield	844	738	797	1003	631	924	1123	1482	1023	

65(198)

(i) 479 Kg/ha. (ii) 34.8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. yield	128	201	296	435	434	417	324	516	504	477
Treatment	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>	T <sub>17</sub>	T <sub>18</sub>	
Av. yield	542	557	585	454	470	443	557	1082	678	

Crop :- Wheat (*Rabi*).

Ref :- Mh. 63(89), 65(194).

Site :- Trial-Cum-Demons. Farm, Golegaon.

Type :- 'IM'.

Object :—To study the optimum time of irrigation for Wheat.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. ; *Jowar*. (c) N.A. ; Nil. (ii) Black cotton soil. (iii) 29.10.63 ; 22, 23.10.65. (iv) (a) 3 harrowings ; ploughings and harrowings. (b) Drilling. (c) 56 Kg/ha. (d) N.A. ; 30 cm. (e) —. (v) Nil ; 4.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) Nf—146. (vii) As per treatments. (viii) Weeding. (ix) Nil ; 11.8 cm. (x) 24 to 29 2.64 and 2.3.64 ; 26 to 28.2.66.

## 2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 63(92) on page No. 160,

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain (iv) (a) 1963—65. (b) No. (c) Nil. (v) Khasapur, Pokhri and Bhir. (vi) Nil. (vii) Crop failed in 64. Error variances are heterogeneous and hence results of individual years are presented under 5. Results.

## 5. RESULTS :

63(89)

(i) 1383 Kg/ha. (ii) 320.9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. yield	1001	977	903	1223	1248	1245	1469	1484	1174	1165
Treatment	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>	T <sub>17</sub>	T <sub>18</sub>	
Av. yield	1261	1203	1054	1376	1265	1777	1480	2723	2241	

C.D. for treatment means=455 Kg/ha.

65(194)

(i) 507 Kg/ha. (ii) 174.8 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. yield	335	401	473	355	371	534	444	537	430	342
Treatment	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>	T <sub>17</sub>	T <sub>18</sub>	
Av. yield	455	482	592	781	533	501	691	618	749	

C.D. for treatment means=248 Kg/ha.

**Crop :- Wheat.****Ref :- Mh. 61--65(M.A.E.).****Site :- M.A.E. Centre, Lakhmapur.****Type :- 'IM'.**

**Object :-** Type 1 : To study the effect of different levels of N, P intensities and frequencies of irrigation on the yield of Wheat.

**1. BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) Medium black. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

**2. TREATMENTS :**

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

(1) 3 frequencies of irrigations :  $F_1=3$ ,  $F_2=4$  and  $F_3=5$  irrigations.(2) 3 intensities of irrigation :  $I_1=5.0$ ,  $I_2=7.5$  and  $I_3=10.0$  cm/ha.(3) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=33.6$  and  $N_2=67.3$  Kg/ha.(4) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=33.6$  and  $P_2=67.2$  Kg/ha.**3. DESIGN :**(i)  $3^4$  fact. confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.**4. GENERAL :**

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—1965 (N.A. for 59, 60 and 63). (b) N.A. (c) Nil. (v) Nil. (vi) N.A. (vii) Nil.

**5. RESULTS:****61(M.A.E.)**

(i) 1162 Kg/ha. (ii) 231.2 Kg/ha. (iii) Main effect of N is significant. (iv) Av. yield of grain in Kg/ha.

	$F_1$	$F_2$	$F_3$	Mean
$I_1$	1070	1300	1218	1196
$I_2$	1005	1190	1264	1153
$I_3$	950	1236	1225	1137
Mean	1008	1242	1236	1162

Treatment	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$
Mean yield	1008	1144	1334	1027	1226	1233

C.D.=214 Kg/ha.

**62(M.A.E.)**

(i) 978 Kg/ha. (ii) 362.8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	$F_1$	$F_2$	$F_3$	Mean
$I_1$	959	994	957	970
$I_2$	959	1079	941	993
$I_3$	1064	889	958	970
Mean	994	987	958	978

Treatment	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$
Mean yield	976	996	962	907	962	1064

**64(M.A.E.)**

(i) 1433 Kg/ha. (ii) 237.6 Kg/ha. (iii) Main effect of N is significant. (iv) Av. yield of grain in Kg/ha.



	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	Mean
I <sub>1</sub>	1176	1262	1787	1411
I <sub>2</sub>	1375	1412	1728	1505
I <sub>3</sub>	1184	1378	1587	1383
Mean	1245	1353	1701	1433

Treatment	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>
Mean yield	1272	1489	1537	1363	1504	1431

C.D.=220 Kg/ha.

65(M.A.E.)

(i) 1186 Kg/ha. (ii) 231.2 Kg/ha. (iii) None of the effect is significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	Mean
I <sub>0</sub>	936	1049	1071	1019
I <sub>1</sub>	950	1321	1510	1260
I <sub>2</sub>	967	1297	1573	1279
Mean	951	1222	1385	1186

Treatment	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>
Mean yield	1158	1187	1211	1146	1177	1234

**Crop : Wheat (Rabi).****Ref :- Mh. 63(93), 64(73), 65(213).****Site :- Trial-Cum-Demons. Farm, Khasapur. Type :- 'IM'.**

Object :—To study the optimum time of irrigation for Wheat.

**1. BASAL CONDITIONS:**

(i) (a) Nil. (b) Groundnut ; Wheat ; Chinamug. (c) 11.2 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub> ; as per treatments ; 11.2 Kg/ha. of N+22.5 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black soil. (iii) 14.10.63 ; 26, 27.10.64 ; 7.10.65. (iv) (a) Harrowing ; 1 ploughing and 4 harrowings ; ploughings, harrowings. (b) Drilling. (c) 49 Kg/ha. ; 49 Kg/ha. ; 74 Kg/ha. (d) 30 cm.×10 cm. to 15 cm. (e) —. (v) Nil ; Nil ; 22.5 Kg/ha. of N+37 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) HY—65 ; HY—65 ; HY—65—4. (vii) As per treatments. (viii) Nil ; weeding and hoeing ; 2 weedings and 2 hoeings. (ix) N.A. ; N.A. ; 54 cm. (x) 19.1.64 to 22.1.1964 ; 10 to 25.3.65 ; 28.2.66 to 7.3.66.

**2. TREATMENTS :**

Refer to experiment No. 63(92), 64(72), 65(198) on wheat presented on Page No. 160

**3. DESIGN :**

(i) R.B.D. (ii) (a) 19. (b) N.A. (iii) 3 ; 4 and 4. (iv) (a) 12.80 m.×9.14 m. (b) 9.14 m.×5.49 m. (v) 1.83 m.×1.83 m. (vi) Yes.

**4. GENERAL :**

(i) Normal ; satisfactory ; Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963 to 67. (b) No. (c) Nil. (v) Golegaon, Pokhri Bendsura. (vi) Nil. (vii) Individual results are presented as No. of replications changed from year to year.

## 5. RESULTS :

63(93)

(i) 812 Kg/ha. (ii) 12.8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. yield	555	462	382	522	701	817	591	787	585	598
Treatment	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>	T <sub>17</sub>	T <sub>18</sub>	
Av. yield	1199	831	807	1183	1007	797	1435	1502	674	

C.D. for treatment=21Kg/ha.

64(73)

(i) 1054 Kg/ha. (ii) 81.8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. yield	289	493	429	648	917	1066	414	909	1211	1070
Treatment	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>	T <sub>17</sub>	T <sub>18</sub>	
Av. yield	1415	1480	1455	1101	1266	1096	1525	1640	1301	

C.D. for means=116 Kg/ha.

65(213)

(i) 895 Kg/ha. (ii) 222.3 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. yield	508	336	573	799	1193	862	344	972	924	681
Treatment	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>	T <sub>17</sub>	T <sub>18</sub>	
Av. yield	1316	1194	762	1221	976	527	1167	1490	1177	

C.D. for means=315 Kg/ha.

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 60(172).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'IM'.**

**Object :-** To determine the effect of various frequencies and intervals of irrigation on the yield of Wheat grown with and without N and P.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) Medium black. (iii) 4.11.60. (iv) (a) N.A. (b) Drilling. (c) N.A. (d) 23 cm. (e) —. (v) Nil. (vi) HY—65. (vii) As per treatments. (viii) Interculturing. (ix) 1 cm. (x) 23.3.61.

## 2. TREATMENTS :

**Main-plot treatments :**

9 irrigational treatments : I<sub>1</sub> = One irrigation after 30 days of sowing, I<sub>2</sub> = One irrigation after 50 days of sowing, I<sub>3</sub> = One irrigation 70 days of sowing, I<sub>4</sub> = Two irrigation after 30+50 days of sowing, I<sub>5</sub> = Two irrigation after 30+60 days of sowing, I<sub>6</sub> = Two irrigation after 30+70 days of sowing, I<sub>7</sub> = Three irrigation after 30+50+70 days of sowing, I<sub>8</sub> = Three irrigation after 30+60+80 days of sowing and I<sub>9</sub> = Three irrigation 30+50+80 days of sowing.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 3 levels of N: N<sub>0</sub>=0, N<sub>1</sub>=33.6 and N<sub>2</sub>=67.2 Kg/ha.

(2) 3 levels of P<sub>2</sub>O<sub>5</sub>: P<sub>0</sub>=0, P<sub>1</sub>=33.6 and P<sub>2</sub>=67.2 Kg/ha.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 8.23 m. x 5.49 m. (b) 6.78 m. x 3.96 m. (v) 72 cm. x 76 cm. (vi) Yes.

## 4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958-60. (b) Yes. (c) No. (v) to (vii) Nil.

## 5. RESULTS:

(i) 1576 Kg/ha. (ii) (a) 488.97 Kg/ha. (b) 204.99 Kg/ha. (iii) Main effect of I, N and P are highly significant, N x P, I x N interactions are significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
I <sub>1</sub>	1222	1864	1938	1578	1718	1727	1675
I <sub>2</sub>	878	1309	1371	1079	1178	1299	1186
I <sub>3</sub>	909	1088	1073	1005	927	1138	1023
I <sub>4</sub>	1209	1671	1783	1405	1504	1755	1555
I <sub>5</sub>	1200	1740	2072	1541	1690	1780	1670
I <sub>6</sub>	1126	1680	1824	1420	1585	1625	1543
I <sub>7</sub>	1448	2019	2264	1805	1898	2028	1910
I <sub>8</sub>	1315	1851	2096	1647	1774	1842	1754
I <sub>9</sub>	1501	1830	2279	1838	2016	1786	1870
Mean	1201	1672	1856	1477	1588	1664	1576
P <sub>0</sub>	1183	1510	1737				
P <sub>1</sub>	1186	1757	1820				
P <sub>2</sub>	1234	1750	2010				

C.D. for I marginal means = 368 Kg/ha.

C.D. for N or P marginal means = 78 Kg/ha.

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 63(238), 64(139), 65(22).**

**Site :- Agri. Res. Stn., Niphad.**

**Type :- 'IMV'.**

**Object:—**To find out suitable irrigational interval and appropriate dose of fertilizer to different varieties of Wheat.

## 1. BASAL CONDITIONS :

(i) (a) Not fixed. (b) N.A. : Bajra and Wheat in 64 and 65. (c) N.A. (ii) Medium black. (iii) 2.11.63 ; 27.10.64 ; 30.10.65. (iv) (a) 2 ploughings and 3 harrowings ; 1 ploughing and 3 harrowings ; 1 iron plough, 1 wooden plough and 1 harrowing. (b) Drilling. (c) 62 Kg/ha. ; 49 Kg/ha. ; 62 Kg/ha. (d) 30 cm. (e) —. (v) Nil. (vi) and (vii) As per treatments. (viii) 2 hoeings ; 2 interculturings ; Nil. (ix) 3 cm. ; 4 cm. ; 4 cm. (x) 26.3.64 ; 11.3.65 ; 17, 18.3.66.

## 2. TREATMENTS :

**Main-plot treatments :**

6 irrigations : I<sub>0</sub> = Control (no irrigation), I<sub>1</sub> = 2 irrigations on 25th and 50th day of sowing, I<sub>2</sub> = 2 irrigations on 25th and 75th day of sowing, I<sub>3</sub> = 2 irrigations on 50th and 75th day of sowing, I<sub>4</sub> = 3 irrigations on 25th, 50th and 75th day of sowing and I<sub>5</sub> = 4 irrigations on 25th, 50th, 75th and 100th day of sowing.

**Sub-plot treatments:**

All combinations of (1) and (2)

(1) 3 varieties : V<sub>1</sub> = N-59, V<sub>2</sub> = N<sub>1</sub>-146 and V<sub>3</sub> = B-218-18.

(2) 3 levels of N as A/S : N<sub>0</sub> = 0, N<sub>1</sub> = 33.6 and N<sub>2</sub> = 67.2 Kg/ha.

## 3. DESIGN:

(i) Split-plot. (ii) (a) 6 main-plots/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 6'10 m. × 6'10 m. (b) 4'88 m. × 4'57 m. (v) 61 cm. × 76 cm. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory ; Normal ; Satisfactory. (ii) Nil. ; stemborer and white ants, BHC 50 % sprayed ; attck of Stem borer and black Stem rust, hexathene applied against Stem rust. (iii) Yield of grain. (iv) (a) 1963 to 67. (b) and (c) No. (v) and (vi) No. (vii) As experiment is continued beyond 1965 results of individual years are presented under 5 Results.

## 5. RESULTS:

63(238)

(i) 908 Kg/ha. (ii) (a) 162.3 Kg/ha. (b) 177.9 Kg/ha. (iii) Main effects of I, N and V are highly significant. (iv) Av. yield of grain in Kg/ha.

	I <sub>0</sub>	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	Mean
N <sub>0</sub>	512	703	676	658	990	902	895	731	594	740
N <sub>1</sub>	669	843	902	1072	1271	1096	1135	982	810	976
N <sub>2</sub>	650	801	979	1099	1166	1350	1159	1029	834	1008
Mean	610	782	852	943	1142	1116	1063	914	746	908
V <sub>1</sub>	790	937	871	1116	1381	1282				
V <sub>2</sub>	519	831	827	1011	1150	1147				
V <sub>3</sub>	522	578	859	701	895	920				

C.D. for of I marginal means = 139 Kg/ha.

C.D. for of N or V marginal means = 84 Kg/ha.

64(139)

(i) 1209 Kg/ha. (ii) (a) 228.7 Kg/ha. (b) 180.8 Kg/ha. (iii) Main effect of I is highly significant. Interactions I × V and I × N are significant. (iv) Av. yield of grain in Kg/ha.

	I <sub>0</sub>	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	Mean
N <sub>0</sub>	706	1192	1208	1277	1464	1607	1208	1249	1270	1242
N <sub>1</sub>	658	1125	1149	1328	1374	1493	1220	1180	1164	1188
N <sub>2</sub>	753	1089	1257	1241	1329	1506	1221	1209	1157	1196
Mean	706	1135	1205	1282	1389	1535	1216	1213	1197	1209
V <sub>1</sub>	747	1165	1220	1255	1417	1493				
V <sub>2</sub>	614	1080	1212	1357	1390	1624				
V <sub>3</sub>	756	1160	1181	1234	1361	1490				

C.D. for of I marginal means = 196 Kg/ha.

65(22)

(i) 1774 Kg/ha. (ii) (a) 342.1 Kg/ha. (b) 179.0 Kg/ha. (iii) Main effects of I and V are highly significant, N effect is significant while other effects are not significant. (iv) Av. yield of grain in Kg/ha.

	I <sub>0</sub>	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	Mean
N <sub>0</sub>	1070	1875	1626	1887	2142	2268	1753	1954	1726	1811
N <sub>1</sub>	976	1927	1722	1902	2005	2266	1709	1892	1798	1800
N <sub>2</sub>	1021	1650	1786	1723	2026	2059	1619	1786	1727	1711
Mean	1022	1817	1711	1837	2058	2198	1694	1877	1750	1774
V <sub>1</sub>	997	1809	1644	1768	1926	2017				
V <sub>2</sub>	1087	1889	1756	2000	2222	2312				
V <sub>3</sub>	983	1754	1734	1743	2025	2264				

C.D. for I marginal means =293 Kg/ha.

C.D. for N or V marginal means=85 Kg/ha.

**Crop :- Wheat (Rabi).**

**Ref :- Mh. 63(91), 64(71).**

**Site :- Trial-Cum-Demons. Farm, Pokhari.**

**Type :- 'IM'.**

Object :- To study the optimum time of irrigation for Wheat.

**1. BASAL CONDITIONS:**

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black. (iii) 10.11.63 ; 24.10.64. (iv) (a) Harrowing ; 2 harrowings. (b) Drilling. (c) 28 Kg/ha. (c) 30 cm. (e) —. (v) Nil. (vi) NI—146. (vii) As per treatments. (viii) Weeding and hoeing. (ix) N.A. (x) 16 to 20.3.64 ; 18 to 21.3.65.

**2. TREATMENTS :**

Same as in expt. 63(92) on page No. 160

**3. DESIGN :**

(i) R.B.D. (ii) (a) 19. (b) N.A. (iii) 4. (iv) (a) 12'80 m. x 9'14 m. (b) 9'14 m. x 5'49 m. (v) 1'83 cm. x 1'83 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963—64. (b) Yes. (c) No. (v) (a) Golegaon, Khasapur and Bhir. (b) No. (vi) and (vii) Nil.

**5. RESULTS:**

**63(91)**

(i) 284 Kg/ha. (ii) 108.4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. yield	259	253	346	372	312	244	208	309	359	223

Treatment	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>	T <sub>17</sub>	T <sub>18</sub>
Av. yield	268	255	221	305	324	185	294	387	262

**64(71)**

(i) 637 Kg/ha. (ii) 111.0 Kg/ha. (iii) Treatment differences are highly significant. (iv) (a) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. yield	332	452	503	527	548	627	390	679	762	529

Treatment	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>	T <sub>17</sub>	T <sub>18</sub>
Av. yield	1043	604	718	845	543	754	1019	950	1231

C.D. for treatment means=157 Kg/ha.

**Crop :- Jowar (Kharif).****Ref :- Mh. 60(96).****Site :- Agri. Res. Stn., Achalpur.****Type :- 'M'.**Object :—To study the effect of N,P, and K with and without F.Y.M. on the yield of *Jowar*.**1. BASAL CONDITIONS :**

(i) (a) *Jowar*—Cotton. (b) Cotton. (c) N.A. (ii) Medium black. (iii) 24.7.60. (iv) (a) 5 *bakharings*. (b) Dibbling. (c) 9 Kg/ha. (d) 46 cm. × 23 cm. (e) —. (v) Nil. (vi) Improved saoner. (vii) Un-irrigated (viii) 1 weeding and 2 hoeings. (ix) 57 cm. (x) 10 12.60.

**2. TREATMENTS :**

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

(1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.(2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.(3) 3 levels of  $K_2O$  as Pot-Sulp :  $K_0=0$ ,  $K_1=44.8$  and  $K_2=89.2$  Kg/ha.(4) 2 levels of F.Y.M. :  $F_0=0$  and  $F_1=12.5$  Kg/ha. $P_2O_5$  and  $K_2O$  was applied at the time of sowing and Nitrogen was applied three weeks after sowing.**3. DESIGN :**

(i)  $3^3 \times 2$  confd. (ii) (a) 18 plots/block and 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 6.40 m. × 10.97 m. (b) 4.57 m × 9.14 m. (v) 91. cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Stem borer attack. Dusting of B.H.C. and D.D.T. 5 % against Stem borer on 28.8.60. (iii) Yield of grain. (iv) (a) 1960—63 (Design changed in 61). (b) Yes. (c) Nil. (v) N.A. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 1482 Kg/ha. (ii) 327.5 Kg/ha. (iii) Main effect of N is highly significant and F effect is significant. (iv) Av. yield of grain in Kg/ha.

	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	$F_0$	$F_1$	Mean
$N_0$	988	1312	1350	1215	1326	1109	1186	1248	1217
$N_1$	1446	1464	1584	1624	1490	1381	1360	1636	1498
$N_2$	1714	1664	1818	1753	1610	1833	1578	1886	1732
Mean	1383	1480	1584	1531	1475	1441	1375	1590	1482
$F_0$	1240	1309	1575	1404	1382	1338			
$F_1$	1526	1651	1593	1658	1568	1544			
$K_0$	1259	1629	1704						
$K_1$	1412	1566	1448						
$K_2$	1478	1245	1599						

C.D. for N marginal means=224.5 Kg/ha.

C.D. for F marginal means=184.4 Kg/ha.

**Crop :- Jowar (Kharif).****Ref :- Mh, 60(178), 61(111), 62(98).****Site :- Govt. Exptl. Farm, Achalpur.****Type :- 'M'.**Object :—To study the effect of micronutrients on the yield of *Jowar*.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A.; N.A.; Cotton. (c) N.A.; N.A.; 22.4 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Black cotton soil. (iii) 24.7.60; 27.7.61; 31.7.62. (iv) (a) N.A.; 4 harrowings in 61 and 62. (b) Dibbling. (c) N.A.; N.A.; 7 to 9 Kg/ha. (d) 46 cm. x 30 cm. (e) 2. (v) 22.4 Kg/ha. of N+17.6 Kg/ha. of  $P_2O_5$ . (vi) Improved saoner. (vii) Unirrigated. (viii) 1 to 2 weeding and 2 hoeings. (ix) 35 cm.; N.A. 48 cm. (x) 14.12.60; 15.12.61; 16.11.63.

## 2. TREATMENTS:

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

- (1) 2 levels of Zinc as  $Zn SO_4$ ;  $A_0=0$  and  $A_1=22.4$  Kg/ha.  
 (2) 2 levels of Manganese as  $Mn SO_4$ ;  $B_0=0$  and  $B_1=22.4$  Kg/ha.  
 (3) 2 levels of Copper as  $Cu SO_4$ ;  $C_0=0$  and  $C_1=22.4$  Kg/ha.  
 (4) 2 levels of Molybdenum as Sodium Molybdate;  $D_0=0$  and  $D_1=0.18$  Kg/ha.  
 (5) 2 levels of Boron;  $E_0=0$  and  $E_1=22.4$  Kg/ha.

## 3. DESIGN:

(i) 2<sup>5</sup> fact. in R.B.D. (ii) (a) 32. (b) N.A. (iii) 4. (iv) (a) 5.40 m. x 9.00 m. (b) 3.60 m. x 7.20 m. (v) 90 cm. x 90 cm. (vi) Yes.

## 4. GENERAL:

(i) Normal. (b) Stem borer, B.H.C. 5% and D.D.T. 5% dusted. (iii) Yield of grain. (iv) (a) 1960-62. (b) No. (c) Nil. (v) and (vi) No. (vii) As the error variances are heterogeneous and Treatments x years interactions are absent therefore individual results are presented under 5. Results.

## 5. RESULTS:

60(178)

(i) 1555 Kg/ha. (ii) 380.8 Kg/ha. (iii) None of the effects is significant. (iv) Mean and differential response table in Kg/ha.

Treatment	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	14	-	-	-6	34	-1	29	69	-41	68	-40
B	-36	-56	-16	-	-	-122	50	-131	59	-10	-62
C	-2	-13	17	88	84	-	-	-74	70	47	-51
D	74	129	19	-21	169	2	146	-	-	-52	200
E	26	80	-28	52	0	75	-23	100	152	-	-

61(111)

(i) 1710 Kg/ha. (ii) 540.4 Kg/ha. (iii) None of the effects is significant. (iv) Mean and differential response table in Kg/ha.

Treatment	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	113	-	-	193	33	194	32	111	115	133	93
B	154	234	74	-	-	29	297	226	82	204	104
C	-104	-25	185	-229	21	-	-	-92	-116	-8	-200
D	39	37	41	111	-33	51	28	-	-	-109	187
E	99	119	79	149	49	195	3	-49	247	-	-

62(98)

(i) 1790 Kg/ha. (ii) 376 0 Kg/ha. (iii) None of the effects is significant. (iv) Mean and differential response table in Kg/ha.

Treatment	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	-25	-	-	-81	41	64	-114	-49	-1	-92	42
B	-87	-153	-21	-	-	42	-216	-117	-57	-79	-95
C	53	142	36	182	-76	-	-	171	-65	35	71
D	7	-17	31	-23	37	125	-111	-	-	-87	101
E	-73	140	-6	-65	-81	91	-55	-167	21	-	-

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 61(43), 62(28), 63(43).**

**Site :- Agri. Res. Stn., Achalpur.**

**Type :- 'M'.**

**Object :-** To study the effect of N, P and K with and without F.Y.M. on the yield of *Jowar*.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) N.A. ; Cotton ; *Jowar*. (c) N.A. ; 22.4 Kg/ha. of N+11.2 Kg/ha. of  $P_2O_5$  ; 22.4 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Black soil. (iii) 27.7.61 ; 29.7.62 ; 26.7.63. (iv) (a) Heavy *bakhering* once and 3 to 5 light *bakherings*. (b) Hand dibbling. (c) 7 to 9 Kg/ha. (d) 46 cm. x 30 c.n. (e) 2. (v) Nil. (vi) Improved saoner. (vii) Unirrigated. (viii) 2 hoeings and 2 weedings. (ix) 132 cm. ; 48 cm ; 38 cm. (x) 14.12.61 ; 22.12.62 ; 17.12.63.

**2. TREATMENTS :**

**Main-plot treatments :**

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

- (1) 3 levels of N :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.  
 (2) 3 levels of  $P_2O_5$  :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.  
 (3) 3 levels of  $K_2O$  :  $K_0=0$ ,  $K_1=44.8$  and  $K_2=89.6$  Kg/ha.

**Sub-plot treatments :**

2 levels of F.Y.M. :  $F_0=0$  and  $F_1=12.5$  C.L./ha.

$P_2O_5$  and  $K_2O$  applied on one week before sowing and  $\frac{1}{2}$  N at sowing and  $\frac{1}{2}$  N at one month after sowing.

**3. DESIGN :**

(i) Split-plot confd. (ii) (a) 2 sub-plots/main-plot ; 9 main-plots/block and 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 10.97 m. x 6.40 m. (b) 9.14 m. x 4.57 m. (v) 91 cm. x 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Good. (ii) Dusted 5 % B.H.C. for Stem borer. (iii) Height measurements and yield of grain. (iv) (a) 1960-63 (modified in 61). (b) No. (c) Results for combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Both the error variances are homogeneous and Treatments x years interaction in all cases are absent.

**5. RESULTS :**

**Pooled results**

(i) 1545 Kg/ha. (ii) (a) 491.8 Kg/ha. (based on 54 d.f. made up of Pooled error and Treatments x years interaction). (b) 302.8 Kg/ha. (based on 74 d.f. made up of pooled error and Treatments x years interaction). (iii) Main effect of N is highly significant. Interaction  $K \times F$  is significant. (iv) Av. yield of grain in Kg/ha.



	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>0</sub>	1401	1295	1087	1311	1298	1174	1214	1308	1261
N <sub>1</sub>	1529	1610	1628	1498	1751	1517	1561	1617	1589
N <sub>2</sub>	1772	1812	1770	1965	1670	1720	1789	1781	1785
Mean	1567	1572	1495	1591	1573	1470	1521	1569	1545
F <sub>0</sub>	1564	1564	1436	1596	1466	1502			
F <sub>1</sub>	1571	1581	1554	1587	1680	1439			
K <sub>0</sub>	1450	1721	1602						
K <sub>1</sub>	1567	1644	1507						
K <sub>2</sub>	1685	1352	1375						

C.D. for N marginal means = 189.9 Kg/ha.

C.D. for F means at the same level of K = 164.4 Kg/ha.

C.D. for K means at the same level of F = 222.8 Kg/ha.

#### Individual results

Treatment	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Sig.	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Sig.
Year								
1961	1621	1934	2097	N.S.	1944	1807	1901	N.S.
1962	917	1295	1619	**	1321	1352	1158	N.S.
1963	1245	1538	1649	N.S.	1437	1559	1426	N.S.
Pooled	1261	1589	1785	**	1567	1572	1495	N.S.

Treatment	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Sig.	F <sub>0</sub>	F <sub>1</sub>	Sig.	G.M.	S.E./plot	
									Main	Sub
Year										
1961	2000	1984	1671	N.S.	1820	1948	N.S.	1884	731.9	351.6
1962	1236	1299	1296	N.S.	1252	1302	N.S.	1277	330.1	219.8
1963	1538	1439	1445	N.S.	1492	1456	N.S.	1474	556.1	293.6
Pooled	1591	1573	1470	N.S.	1521	1569	N.S.	1545	491.8	302.8

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 62(153), 63(198).**

**Site :- Agri. Res. Stn., Achalpur.**

**Type :- 'M'.**

**Object :-** To study the relative merits of different sources of N with and without F.Y.M.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black. (iii) 29.7.62 ; 5.7.63. (iv) (a) 2 to 3 harrowings. (b) Dibbling. (c) 7 to 9 Kg/ha. (d) 46 cm. × 46 cm. ; 46 cm. × 30 cm. (e) 2. (v) Nil. (vi) Improved saoner. (vii) Unirrigated. (viii) 2 weedings and 1 hoeing. (ix) 86 cm. ; 41 cm. (x) 22.12.62 ; 1.12.63.

#### 2. TREATMENTS :

##### Main-plot treatments :

All combinations of (1) and (2)

(1) 3 sources of N : S<sub>1</sub>=A/S, S<sub>2</sub>=C/A/N and S<sub>3</sub>=Urea.

(2) 3 levels on N : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

##### Sub-plot treatments :

2 levels of F.Y.M. : F<sub>0</sub>=0 and F=12.35 C.L./ha. of F.Y.M.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6'40 m. × 10'97 m. (b) 4'57 m. × 9'14 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) B.H.C. 5% dusted for Stem borer. (iii) Yield of grain. (iv) (a) 1961 to 63. (b) No. (c) Prested under 5. Results. (v) N.A. (vi) No. (vii) Experiment for the year 1961 N.A., both the error variances are homogeneous. Interaction main-plot treatments × years is present, inter action sub-plot treatments × years (4 d.f.) is absent.

## 5. RESULTS :

## Pooled results

(i) 1420 Kg/ha. (ii) (a) 727.6 Kg/ha. (based on 6 d.f. made up of interaction main-plot treatments × years). (b) 358.1 Kg/ha. (based on 58 d.f. made up of pooled error and interaction of Treatments × years. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$$N_0F_0=1218 \text{ Kg/ha. ; } N_0F_1=1258 \text{ Kg/ha.}$$

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	1544	1075	1508	1263	1489	1376
N <sub>2</sub>	1762	1397	1782	1625	1669	1647
Mean	1653	1236	1645	1444	1579	1511
F <sub>0</sub>	1519	1210	1602			
F <sub>1</sub>	1787	1262	1688			

## Individual results

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Sig.	F <sub>0</sub>	F <sub>1</sub>	Sig.
Year 1962	1733	997	1725	**	1411	1559	**
1963	1574	1475	1565	N.S.	1477	1599	N.S.
Pooled	1653	1236	1645	N.S.	1444	1579	N.S.

N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Sig.	G.M.	S.E./1 lot	
				(a)		(b)
1193	1307	1663	**	1388	436.9	373.2
1284	1445	1631	*	1453	424.7	362.7
1238	1376	1647	N.S.	1420	727.9	358.1

**Crop :- Jower (Kharif).**

**Ref :- Mh. 63(46), 64(39), 65(50).**

**Crop :- Agri. Res. Stn., Achalpur.**

**Type :- 'M'.**

Object :- To study the relative merits of various N carriers on the fertilizers of *Jowar*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*; Cotton; Cotton. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> in 63 and 64; 44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> in 65. (ii) Medium black in 63 and 64 Morand II in 65. (iii) 5.7.63; 22.7.64; 23.7.65. (iv) (a) Heavy and light *bakharings*. (b) Local method in 63 and 64; drilling in 65. (c) 7 Kg/ha.; 10 Kg/ha. in 64 and 65. (d) 46 cm. × 30 cm. (e) —. (v) Nil. (vi) NJ 164. (vii) Unirrigated. (viii) 2 weedings and 1 hoeing. (ix) 39 cm.; 56 cm.; 43 cm. (v) 2.12.63; 26.12.64; 25.11.65.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N :  $N_0=0$ ,  $N_1=22.4$ , and  $N_2=44.8$  Kg/ha.

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

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  7.32 m. (b) 9.14 m.  $\times$  5.49 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 63 to 65. (b) and (c) No. (v) and (vi) Nil. (vii) Error variances are heterogeneous. Treatments  $\times$  years interactions are absent. Hence results for individual years are given under 5. Results.

## 5. RESULTS :

## 63(46)

(i) 1572 Kg/ha. (ii) 403.6 Kg/ha. (iii) No effect is significant. (iv) Av. yield of grain in Kg/ha.

$N_0=1364$  Kg/ha.

	$S_1$	$S_2$	$S_3$	$S_4$	$S_5$	Mean
$N_1$	1435	1443	1635	1637	1687	1567
$N_2$	1700	1754	1652	1784	2033	1785
Mean	1568	1598	1644	1710	1860	1676

## 64(39)

(i) 1901 Kg/ha. (ii) 259.1 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

$N_0=1580$  Kg/ha.

	$S_1$	$S_2$	$S_3$	$S_4$	$S_5$	Mean
$N_1$	1615	1869	2013	2103	2056	1931
$N_2$	2218	1904	2307	2215	2315	2192
Mean	1917	1886	2160	2159	2185	2062

C.D. for N marginal means = 165 Kg/ha.

## 65(50)

(i) 1933 Kg/ha. (ii) 297.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$N_0=1031$  Kg/ha.

	$S_1$	$S_2$	$S_3$	$S_4$	$S_5$	Mean
$N_1$	1031	1296	1084	1185	1053	1130
$N_2$	1010	910	1109	1290	1127	1089
Mean	1020	1103	1096	1238	1090	1110



**Crop :- Jowar (Kharif).**

**Ref :- Mh. 61(93), 62(79), 63(120).**

**Site :- Govt. Exptl. Farm, Akola.**

**Type :- 'M'.**

**Object :-** To study the relative merits of C/A/N with A/S and Urea in the presence and absence of F.Y.M. on the yield of *Jowar*.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Groundnut; Cotton in 1962 and 63. (c) 11.2 Kg/ha. of N+11.2 Kg/ha. of  $P_2O_5$ ; N.A.; Nil. (ii) Black cotton soil. (iii) 19.7.61; 9.7.62; 28.7.63. (iv) (a) One ploughing, 4 harrowings; 4 harrowings; harrowing. (b) Drilling; dibbling in 1962 and 63. (c) N.A. (d) 46 cm. x 23 cm.; 46 cm. x 30 cm. in 1962 and 63. (e) N.A. (v) Nil. (vi) Improved saoner. (vii) Unirrigated. (viii) N.A.; 2 hoeings; one weeding add 2 hoeings. (ix) 63 cm.; 70 cm.; 32 cm. (x) 17.1.1962; N.A.; 25.12.1963.

**2. TREATMENTS :**

**Main-plot treatments :**

All combinations of (1) and (2)

(1) 3 levels of N :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(2) 3 sources of N :  $S_1=A/S$ ,  $S_2=C/A/N$  and  $S_3=Urea$ .

**Sub-plot treatments :**

2 levels of F.Y.M.,  $F_0=0$  and  $F_1=5600$  Kg/ha.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 9 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6.40 m. x 10.97 m. (b) 4.57 m. x 9.14 m. (v) 91 cm. x 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 to 63. (b) No. (c) Nil. (v) Digraj and Jalgaon. (vi) Nil. (vii) As sub-plot error variances are heterogeneous, hence results for individual years are given under 5. Results.

**5. RESULTS:**

**61(93)**

(i) 1984 Kg/ha. (ii) (a) 505.4 Kg/ha. (b) 124.2 Kg/ha. (iii) F and N effects are highly significant. (iv) Av. yield of grain in Kg/ha.

$N_0F_0=1393$ ,  $N_0F_1=1590$  Kg/ha.

	$S_1$	$S_2$	$S_3$	$F_0$	$F_1$	Mean
$N_1$	2044	2110	2017	1949	2165	2057
$N_2$	2424	2080	2740	2254	2574	2414
Mean	2234	2095	2370	2102	2369	2235
$F_0$	2094	1972	2239			
$F_1$	2374	2218	2369			

C.D. for N marginal means = 301.2 Kg/ha.

C.D. for F marginal means = 73.6 Kg/ha.

**62(79)**

(i) 1724 Kg/ha. (ii) (a) 256.9 Kg/ha. (b) 190.6 Kg/ha. (iii) N and F effects are highly significant. Interaction  $S \times N$  is significant. (iv) Av. yield of grain in Kg/ha.

$N_0F_0=1385$  and  $N_0F_1=1492$  Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	1550	1668	1872	1678	1715	1697
N <sub>2</sub>	2127	2042	1945	1906	2171	2038
Mean	1839	1855	1908	1792	1943	1867
F <sub>0</sub>	1803	1757	1816			
F <sub>1</sub>	1075	1954	2000			

C.D. for N marginal means=153.0 Kg/ha.

C.D. for F marginal means =112.9 Kg/ha.

C.D. for body of N×S table=265.0 Kg/ha.

63(120)

(i) 2649 Kg/ha. (ii) (a) 331.4 Kg/ha. (b) 290.0 Kg/ha. (iii) N effect is significant. N<sub>0</sub> vs. N<sub>1</sub>+N<sub>2</sub> effect is highly significant. (iv) Av. yield of grain in Kg/ha.

$N_0F_0=2259$  and  $N_0F_1=2373$  Kg/ha.

	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	2728	2812	2547	2582	2810	2696
N <sub>2</sub>	3105	2832	2863	2934	2932	2933
Mean	2917	2822	2705	2758	2871	2815
F <sub>0</sub>	2814	2687	2773			
F <sub>1</sub>	3020	2956	2637			

C.D. for N marginal means =197.5 Kg/ha.

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 62(190), 63(231), 64(184).**

**Site :- Agri. Kes. Stn., Akola.**

**Type :- 'M'.**

Object: --To study the residual effect of Nitrophoska on the yield of Jowar.

#### 1. BASAL CONDITIONS :

(i) (a) Cotton-Jowar. (b) Cotton. (c) N.A. (ii) Black cotton soil. (iii) 17.7.62 ; 19.7.63 ; 22.7.64.  
(iv) (a) 2 harrowings. (b) Hand dibbling. (c) 20 Kg/ha. (d) 46 cm. × 30 cm. (e) 2 to 3. (v) Nil.  
(vi) Saonar. (vii) Unirrigated. (viii) 2 hoeings and 2 weedings ; one hoeing and weeding ; 2 weedings and hoeing. (ix) 82 cm. ; 51 cm. : 78 cm. (x) 31.12.62, 21.12.63 ; 1.1.65.

#### 2. TREATMENTS :

All combinations of (1), (2) and (3)+5 extra treatments

(1) 3 sources of N and P<sub>2</sub>O<sub>5</sub> : S<sub>1</sub>=A/S+Super, S<sub>2</sub>=ODDA and S<sub>3</sub>=PEC.

(2) 3 levels of N and P<sub>2</sub>O<sub>5</sub> : L<sub>1</sub>=13.5 Kg/ha. of N+11.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, L<sub>2</sub>=2 L<sub>1</sub> and L<sub>3</sub>=4 L<sub>1</sub>.

(3) 3 methods of application : M<sub>1</sub>= Broadcast, M<sub>2</sub>=6 cm. below seed and M<sub>3</sub>=Band placement.

5 extra treatments per block : N<sub>0</sub>=0, N<sub>1</sub>=13.5, N<sub>2</sub>=27.0, N<sub>3</sub>=40.5 and N<sub>4</sub>=54.0 Kg/ha. of N.

b

## 3. DESIGN

(i) 3<sup>2</sup> Fact. confd. + 5 extra treatments in each block. (ii) (a) 3 blocks/replication, 14 plots/block. (b) 47.55 m. × 69.49 m. (iii) 2. (iv) (a) 6.40 m. × 10.97 m. (b) 4.57 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes

## 4. GENERAL:

(i) Good. (ii) Nil (iii) Yield of grain. (iv) (a) 1962 to 64. (b) and (c) No. (v) and (vi) No. (vii) Error variances are heterogeneous and Treatments × years interactions are absent, hence results for individual years are given under 5. Results.

## 5. RESULTS:

62(190)

(i) 1938 Kg/ha. (ii) 277.7 Kg/ha. (iii) Extra treatments among themselves and S effect are significant. (iv) Av. yield of grain in Kg/ha

$N_0 = 1818, N_1 = 1935, N_2 = 2041, N_3 = 1860$  and  $N_4 = 2272$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
S <sub>1</sub>	1757	1775	1889	1725	1883	1814	1807
S <sub>2</sub>	1729	2033	1844	1917	1929	1759	1869
S <sub>3</sub>	1907	1994	2272	2037	2087	2049	2058
Mean	1798	1934	2002	1893	1966	1874	1911
M <sub>1</sub>	1686	1905	2088				
M <sub>2</sub>	1860	1974	2055				
M <sub>3</sub>	1846	1923	1852				

C.D. for S marginal means = 186.5 Kg/ha.

C.D. for extra treatment means = 322.9 Kg/ha.

63(231)

(i) 1884 Kg/ha. (ii) 314.9 Kg/ha. (iii) Only extra treatments are significant among themselves. (iv) Av. yield of grain in Kg/ha.

$N_0 = 1173, N_1 = 1704, N_2 = 1622, N_3 = 1696$  and  $N_4 = 1822$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
S <sub>1</sub>	1631	1862	2027	1816	1948	1757	1840
S <sub>2</sub>	1767	1862	1790	1751	1954	1714	1806
S <sub>3</sub>	1781	1893	2000	1771	1994	1909	1892
Mean	1727	1873	1939	1779	1965	1793	1846
M <sub>1</sub>	1601	1779	1958				
M <sub>2</sub>	1844	1974	2077				
M <sub>3</sub>	1735	1864	1781				

C.D. for extra treatment means = 368.2 Kg/ha.

64(184)

(i) 1531 Kg/ha. (ii) 449.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$N_0=1173$ ,  $N_1=1704$ ,  $N_2=1622$ ,  $N_3=1696$  and  $N_4=1822$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
S <sub>1</sub>	1555	1676	1209	1616	1287	1536	1480
S <sub>2</sub>	1500	1394	1151	1293	1387	1363	1348
S <sub>3</sub>	1695	1678	1562	1726	1500	1709	1645
Mean	1583	1583	1307	1545	1391	1536	1491
M <sub>1</sub>	1814	1514	1309				
M <sub>2</sub>	1389	1553	1233				
M <sub>3</sub>	1547	1682	1380				

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 62(31), 63(45), 64(37).**

**Site :- Govt. Exptl. Farm, Amaravati.**

**Type :- 'M'.**

**Object :-** To study the residual effect of Nitrophosphate manures applied to the previous Cotton crop on Jowar.

**1. BASAL CONDITIONS:**

(i) Nil. (b) Cotton. (c) As per treatments. (ii) Medium black. (iii) 30.7.62; 12.7.63; 23.7.64. (iv) (a) 2 harrowings. (b) Hand dibbling. (c) 15 Kg/ha. (d) 46 cm. × 23 cm. (e) 2. (v) Nil (vi) N.J. 156. (vii) Unirrigated. (viii) 2 weedings and 2 hoeings. (ix) 75 cm.; 149 cm.; 35 cm. (x) 20.1.63; 1, 2.1.64; 17.12.64.

**2. TREATMENTS:**

All combinations of (1), (2) and (3) + 5 extra treatments in each block

(1) 3 sources of fertilizers: P<sub>1</sub> = A/S + single Super, P<sub>2</sub> = ODDA and P<sub>3</sub> = PEC.

(2) 3 levels of fertilizers: L<sub>1</sub> = 13.2 Kg/ha. of N + 11.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, L<sub>2</sub> = 2 L<sub>1</sub> and L<sub>3</sub> = 4 L<sub>1</sub>.

(3) 3 methods of application: M<sub>1</sub> = Broadcasting, M<sub>2</sub> = 6 cm. below seed and M<sub>3</sub> = Band placement.

5 extra treatments: N<sub>0</sub> = 0, N<sub>1</sub> = 13.2, N<sub>2</sub> = 26.4, N<sub>3</sub> = 39.6 and N<sub>4</sub> = 52.8 Kg/ha.

These manures were applied to the previous cotton crop.

**3. DESIGN:**

(i) 3<sup>3</sup> Fact. confd. + 5 Extra treatments in each block. (ii) (a) 14 plots/block; 3 blocks/replication. (b) 51.21 m. × 21.95 m. (iii) 2. (iv) (a) 10.97 m. × 6.40 m. for 62; 10.97 m. × 7.31 m. for other years. (b) 9.14 m. × 5.49 m. for 62; 9.14 m. × 5.49 m. for others. (v) 91 cm. × 91 cm.. (vi) Yes.

**4. GENERAL**

(i) Satisfactory. (ii) BHC 10% dusted for Sugary disease. (iii) Yield of grain. (iv) (a) 1962—64. (b) No. (c) Nil. (v) Nil. (vi) Heavy rains in Dec. damaged the quality of grain in 62 (vii) Error variances are heterogeneous and Treatments × years interactions are absent in three cases, hence results for individual years are given under 5. Results.

**5. RESULTS:**

62(31)

(i) 1429 Kg/ha. (ii) 345.0 Kg/ha. (iii) Main effects of L alone is significant. (iv) Av. yield of grain in Kg/ha



$N_0=1282$ ,  $N_1=1654$ ,  $N_2=1441$ ,  $N_3=1398$  and  $N_4=1405$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
P <sub>1</sub>	1100	1541	1445	1307	1581	1199	1362
P <sub>2</sub>	1190	1345	1518	1373	1235	1445	1351
P <sub>3</sub>	1463	1614	1604	1591	1465	1626	1560
Mean	1251	1500	1522	1424	1427	1423	1424
M <sub>1</sub>	1345	1315	1551				
M <sub>2</sub>	1398	1551	1322				
M <sub>3</sub>	1011	1364	1694				

C. D. for L marginal means = 231.6 Kg/ha.

63(45)

(i) 1543 Kg/ha. (ii) 222.7 Kg/ha. (iii) Interaction  $P \times L$  and  $MP^2L^2$  are highly significant and interaction  $M \times P$  is significant. (iv) Av. yield of grain in Kg/ha.

$N_0=1583$ ,  $N_1=1382$ ,  $N_2=1551$ ,  $N_3=1478$  and  $N_4=1435$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
P <sub>1</sub>	1456	1963	1554	1760	1458	1755	1658
P <sub>2</sub>	1614	1345	1591	1358	1790	1401	1517
P <sub>3</sub>	1445	1494	1707	1627	1591	1428	1549
Mean	1505	1601	1617	1582	1613	1528	1574
M <sub>1</sub>	1445	1641	1661				
M <sub>2</sub>	1518	1591	1730				
M <sub>3</sub>	1553	1571	1461				

C. D. for interaction  $P \times L$  or  $M \times P$  = 259.0 Kg/ha.

64(37)

(i) 1759 Kg/ha. (ii) 363.9 Kg/ha. (iii) Interaction  $P \times M$  alone is significant. (iv) Av. yield of grain in Kg/ha.

$N_0=1754$ ,  $N_1=1943$ ,  $N_2=1956$ ,  $N_3=1767$  and  $N_4=1787$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
P <sub>1</sub>	1767	1853	1631	1574	1810	1886	1750
P <sub>2</sub>	1575	1730	1896	1940	1737	1524	1734
P <sub>3</sub>	1674	1637	1657	1687	1292	1989	1655
Mean	1672	1740	1728	1734	1613	1793	1713
M <sub>1</sub>	1544	1790	1868				
M <sub>2</sub>	1734	1571	1534				
M <sub>3</sub>	1737	1860	1782				

C. D. for interaction  $P \times M$  means = 423.1 Kg/ha.

**Crop :- Jowar (Kharif).****Ref :- Mh. 61(96), 62(82), 63(123).****Site :- Central Res. Stn., Badnapur.****Type :- 'M'.**Object: — To study the effect of treated and untreated leather waste on *Jowar*.**1. BASAL CONDITIONS :**

(i) (a) Nil (b) Groundnut. (c) Nil. (ii) Medium black. (iii) 5.7.61 ; 12.7.62 3.7.63. (iv) (a) 2 harrowings ; 1 ploughing and 3 harrowings. ; 2 ploughings and 3 harrowings. (b) Drilling. (c) 9 Kg/ha. (d) 30 cm. (e) —. (v) Nil. (vi) PJ 16K. (vii) Unirrigated. (viii) Weeding and hoeing ; 3 weedings and 3 hoeings ; 1 weeding and 3 hoeings. (ix) 60 cm ; N.A ; N.A. (x) 3 to 5.1.62 ; 18, 19.12.62 ; 18, 19.12.63.

**2. TREATMENTS :**

10 Sources of N to give 44.8 Kg/ha of N : S<sub>0</sub> = Control (no manures) S<sub>1</sub> = Raw vegetable tanned leather waste, S<sub>2</sub> = Raw chrome tanned leather waste, S<sub>3</sub> = Acid treated vegetable leather waste, S<sub>4</sub> = Acid treated chrome leather waste, S<sub>5</sub> = Alkali treated vegetable leather waste, S<sub>6</sub> = Alkali treated chrome leather waste. S<sub>7</sub> = Steamed vegetable leather waste, S<sub>8</sub> = Steamed chrome leather waste, and S<sub>9</sub> = A/s.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 6.40 m, × 10.97 m. (b) 4.57 m × 9.14 m. (v) 91 cm. × 91 cms. (vi) Ycs.

**4. GENERAL :**

(i) Satisfactory. (ii) Stemborer, 5% Gammexene dusted. (iii) Yield of grain. (iv) (a) 1961 to 63. (b) No. (c) Nil. (v) Borgaon. (vi) Nil. (vii) Error variances are heterogeneous and (Treatments × years) interaction is absent, hence results for individual years are given under 5—Results.

**5. RESULTS :****61 (95)**

(i) 816 Kg/ha. (ii) 202.9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	S <sub>0</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>	S <sub>9</sub>
Av. yield	820	771	515	910	1017	832	815	817	705	959

**62(82)**

(i) 649 Kg/ha. (ii) 224.8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. Yield of grain in Kg/ha.

Treatment	S <sub>0</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>	S <sub>9</sub>
Av. yield	637	646	556	724	670	532	691	660	700	673

**63(123)**

(i) 295 Kg/ha. (ii) 574 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	S <sub>0</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>	S <sub>9</sub>
Av. yield.	281	258	290	278	272	251	332	278	344	365

**Crop :- Jowar (Kharif).****Ref :- Mh. 61(97)****Site :- Agri. School, Borgaon.****Type :- 'M'.**Object: — To study the effect of treated and untreated leather waste on the yield of *Jowar*.**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) N.A. (iii) 30.6.61. (iv) (a) 3 harrowings (b) Drilling. (c) 7 Kg. to 8 Kg/ha. (d) 46 cm. × 23 cm. to 30 cm. (e) — (v) Nil. (vi) Shenoli 4—5. (vii) Unirrigated (viii) One weeding and 2 hoeings. (ix) N.A. (x) 18.12.61.

## 2. TREATMENTS :

8 sources of N to supply 40 Kg/ha. of N: S<sub>0</sub>=Control, S<sub>1</sub>=Raw vegetable tanned leather waste, S<sub>2</sub>=Raw chrome S<sub>3</sub>=Alkali treated chrome, S<sub>4</sub>=Acid treated vegetable, S<sub>5</sub>=Acid treated chrome, S<sub>6</sub>=Stanned vegetable and S<sub>7</sub>=A/S.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) 6.40 m × 10.97 m. (b) 4.57 m × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) No. (iii) Yield of grain. (iv) (a) 1961 to 63. (b) No. (c) Nil (v) Badnapur. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 1761 Kg/ha. (ii) 636.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	S <sub>0</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>
Av. yield.	1674	1597	2141	1456	1875	2101	1420	1821

**Crop :- Jowar (Kharif).**

**Site :- Agri. School, Borgaon.**

**Ref :- Mh. 62(83), 63(124).**

**Type :- 'M'.**

Object :- To study the effect of treated and untreated leather waste on the yield of Jowar.

## 1. BASAL CONDITIONS :

(i) (a) Nil (b) Groundnut ; N.A. (c) Nil. (ii) Medium black. (iii) 13.7.62 ; 28.6.63. (iv) (a) 1 ploughing and 1 harrowing ; 2 harrowings. (b) Drilling. (c) 13 Kg/ha. (d) 46 cm. (e) —. (v) Nil. (vi) Shenoli 4. 5. (vii) Unirrigated. (viii) 2 hoeings and one weeding. (ix) 73 cm. ; 63 cm. (x) 3.1.63 ; 13.12.63.

## 2. TREATMENTS and 3. DESIGN :

Same as in expts no. 61(96), 62(82), 63(123) conducted at central Res. Stn., Badnapur on page no. 180.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 to 63. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Badnapur. (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent. Treatments modified in 62 years.

## 5. RESULTS :

Pooled results

(i) 1199 Kg/ha. (ii) 337.8 Kg/ha. (based on 51 d.f. made up of pooled error and Treatments × years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	S <sub>0</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>	S <sub>9</sub>
Av. yield	1240	1254	1254	1146	1270	1128	1045	1105	1361	1193

Individual results

Treatment	S <sub>0</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>	S <sub>9</sub>	Sig.
Year 1962	1041	819	1005	777	981	807	700	825	736	652	N.S.
1963	1438	1689	1502	1515	1560	1450	1390	1385	1986	1734	N.S.
Pooled	1240	1254	1254	1146	1270	1128	1045	1105	1361	1193	N.S.

G.M.	S.E./plot
834	342.1
1565	314.9
1199	337.8

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 60(86), 61(73).**

**Site :- Agri. Res. Stn., Chas.**

**Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of *Rabi Jowar*.

**1. BASAL CONDITIONS :**

(i) (a) Gram—*Jowar*. (b) Gram. (c) N.A. (ii) Medium black. (iii) 16.9.60 ; 10.7.61. (iv) (a) 4 harrowings. (b) Drilling. (c) 5 Kg/ha. (d) 46 cm. (e) N.A. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) 2 to 3 interculturings. (ix) 45 cm. ; 21 cm. (x) 19.1.61 ; 13.2.62.

**2. TREATMENTS :**

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

(1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

(3) 3 levels of  $K_2O$  as pot. Sul. :  $K_0=0$ ,  $K_1=22.4$  and  $K_2=44.8$  Kg/ha.

**3. DESIGN :**

(i)  $3^3$  fact. confd. (ii) (a) 3 blocks/replication, 9 plots/block. (b) N.A. (iii) 1. (iv) (a) 6.40 m.  $\times$  10.97 m. (b) 4.57 m.  $\times$  9.14 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

**4. GENERAL :**

(i) Growth not satisfactory due to ill distribution or rains in 60. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957 to 61. (b) No. (c) Results for combined analysis results are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances for the years 57 to 61 are homogeneous and Treatments  $\times$  years interaction is present.

**5. RESULTS :**

Pooled results

(i) 1574 Kg/ha. (ii) 493.1 Kg/ha. (based on 72 d.f. made up of Treatments  $\times$  years interaction), (iii) Main effect of N is highly significant. Interaction P  $\times$  N is significant. (iv) Av. yield of grain in Kg/ha.

	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	Mean
$N_0$	1273	1361	1103	1421	1082	1235	1246
$N_1$	1567	1575	1564	1490	1625	1591	1569
$N_2$	1927	1981	1812	1877	1965	1879	1907
Mean	1589	1639	1493	1596	1557	1568	1574
$K_0$	1630	1520	1637				
$K_1$	1769	1542	1360				
$K_2$	1368	1854	1483				

C.D. for N marginal means = 207.6 Kg/ha.

C.D. for body of P  $\times$  K table = 359.3 Kg/ha.

**Individual results**

Treatment	$P_0$	$P_1$	$P_2$	Sig.	$K_0$	$K_1$	$K_2$	Sig.
Year								
1960	1352	1426	1171	N.S.	1255	1381	1312	N.S.
1961	2553	2773	2584	N.S.	2816	2644	2450	N.S.
Pooled	1589	1639	1493	N.S.	1596	1557	1568	N.S.

$N_0$	$N_1$	$N_2$	Sig.	G.M.	S.E./plot
1048	1404	1497	**	1316	232.8
1901	2477	3532	**	2637	218.5
1246	1569	1907	**	1574	493.1

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 61(37), 62(22), 63(35), 64(30).**

**Site :- Agri. Res. Stn., Chas.**

**Type :- 'M'.**

**Object :—**To study the effect of placement of F.Y.M. on the yield of *Jowar*.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) Medium in 61; deep black soil for others. (iii) 16.10.1961; 13, 14.9.62; 2.9.63; 19.9.64 (iv) (a) 2 harrowings. (b) Drilling. (c) 6 Kg/ha.; 5 Kg/ha.; 4 kg/ha. in 63 and 64. (d) 46 cm. (e) —. (v) Nil. (vi) M. 35—1. (vii) Unirrigated. (viii) 3 interculturings; 2 interculturings and 2 weedings; 2 interculturings and 1 weedings; 2 interculturings. (ix) 21 cm.; 42 cm.; 13 cm. and 35 cm. (x) 18.2.62; 16.2.63; 10.1.64; 13.2.65.

**2. TREATMENTS :**

**Main-plot treatments :**

5 levels of F.Y.M. :  $F_0=0$ ,  $F_1=1120$ ,  $F_2=2240$ ,  $F_3=3360$  and  $F_4=5600$  Kg/ha.

**Sub-plot treatments :**

3 methods of application ;  $M_1$ =Broadcast,  $M_2$ =Band placement in between 2 rows and  $M_3$ =Drilling in the same row of seed.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 5 main-plots/replication ; sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  7.32 m. (b) 8.53 m.  $\times$  4.88 m. (v) 1.22 m.  $\times$  1.22 m. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 to 64. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Both the error variances are heterogeneous, hence results for individual years are given under 5. Results.

**5. RESULTS :**

**61(37)**

(i) 409 Kg/ha. (ii) (a) 200.1 Kg/ha. (b) 175.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	$F_0$	$F_1$	$F_2$	$F_3$	$F_4$	Mean
$M_1$	306	485	366	566	571	459
$M_2$	261	392	485	416	380	387
$M_3$	410	387	265	575	332	382
Mean	326	421	372	499	428	409

**62(22)**

(i) 612 Kg/ha. (ii) (a) 214.9 Kg/ha. (b) 198.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	407	447	667	567	706	559
M <sub>2</sub>	401	738	676	669	729	643
M <sub>3</sub>	552	564	655	638	757	643
Mean	453	583	666	625	731	612

63(35)

(i) 365 Kg/ha. (ii) (a) 97.7 Kg/ha. (b) 126.1 Kg/ha. (iii) Main effect of F is highly significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	259	324	347	255	534	344
M <sub>2</sub>	240	331	436	459	372	368
M <sub>3</sub>	300	345	448	395	431	384
Mean	266	333	4.0	370	4.6	365

C.D. for F marginal means=86.7 Kg/ha.

64(30)

(i) 1045 Kg/ha. (ii) (a) 283.2 Kg/ha. (b) 218.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	956	898	851	1079	1179	993
M <sub>2</sub>	916	881	1028	1133	1052	1002
M <sub>3</sub>	1005	1147	1175	1171	1201	1140
Mean	959	975	1018	1128	1144	1045

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 63(29), 64(23), 65(167).**

**Site :- Agri. College Farm, Dhulia.**

**Type :- 'M'.**

**Object :-** To study the relative merits of different N carriers for Jowar.

### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A.; cotton; cotton. (c) N.A.; 12.5 C.L./ha. of F.Y.M. + 11.2 Kg/ha. of N as A/S + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super; 12.5 C.L./ha. of F.Y.M. and 84 Kg/ha. of N. (ii) Medium black. (i) 17.7.63; 2.7.64; 1.8.65. (iv) (a) 5 harrowings; 4 harrowings; 1 tractor ploughing, 1 disting by tractor. (b) Drilling. (c) 9 Kg/ha. (d) 46 cm. (e) —. (v) Nil. (vi) Rankel; Khedi—2—2—10 in 1964 and 65. (vii) Unirrigated. (viii) Hoeing; one hoeing; 2 weedings and 2 hoeings; (ix) 30 cm.; 53 cm.; 40 cm. (x) 16.11.63; 10.11.64; 5.11.65.

### 2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 5 sources of N : S<sub>1</sub>=A/S, S<sub>2</sub>=A/C, S<sub>3</sub>=A/S/N, S<sub>4</sub>=C/A/N and S<sub>5</sub>=Urea.

### 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL:

(i) Good. (ii) B.H.C. and sulphur dusted ; B.H.C. dusted ; sulphur and Endrin sprayed. (iii) Yield of grain. (iv) (a) 1963 to 65. (b) No. (c) Results for combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is present.

## 5. RESULTS:

Pooled results

(i) 1303 Kg/ha. (ii) 267.6 Kg/ha. (28 d.f. made up of Treatments  $\times$  years interaction). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$N_0 = 1245$  Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	Mean
N <sub>1</sub>	1362	1205	1275	1304	1223	1274
N <sub>2</sub>	1363	1384	1382	1418	1409	1391
Mean	1363	1294	1328	1361	1316	1332

Individual results

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	Sig.	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Sig.
Year										
1963	764	879	879	776	836	N.S.	661	779	875	N.S.
1964	2802	2626	2696	2716	2593	N.S.	2602	2584	2789	*
1965	522	380	411	591	519	*	471	460	509	N.S.
Pooled	1363	1294	1328	1361	1316	N.S.	1245	1274	1391	N.S.

G.M.	S.E./plot
772	235.2
2658	269.1
480	116.2
1303	267.6

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 61 (94), 62 (80), 63 (121).**

**Site :- Agri. Res. Stn., Digraj.**

**Type :- 'M'.**

**Object :-** To study the relative merits of C/A/N with A/S and Urea in the presence and absence of F.Y.M. on the yield of Jowar.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut : N.A. ; Wheat. (c) 12 CL./ha. of F.Y.M. ; N.A. ; Super and G.M. (ii) —. (iii) 29, 30, 7.61 ; 9.7, 62 ; 29, 6, 63. (iv) (a) 5 harrowings ; 4 harrowings ; ploughing and 4 harrowings. (b) Drilling. (c) 11 Kg/ha. (d) 46 cms.  $\times$  8 cm. to 10 cm. (e) —. (v) Nil. (vi) Local *momdepuri*. (vii) Un-irrigated. (viii) 3 to 5 interculturations. (ix) 18 cm ; 48 cm ; 47 cm. (x) 17.12.61 ; 17.12.62 ; 13.12.63.

## 2. TREATMENTS :

## Main-plot treatments :

All combinations of (1) and (2).

(1) 3 levels of N :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(2) 3 sources of N :  $S_1=A/S$ ,  $S_2=C/A/N$ , and  $S_3=Urea$ .

## Sub-plot treatments :

2 levels of F.Y.M. :  $F_0=0$  and  $F_1=5600$  Kg/ha.

## 3. DESIGN :

(i) Split-plot. (ii) 9 main-plots/replication; 2 sub-plots/main-plot. (iii) 4. (iv) (a) 6.40 m.  $\times$  10.97 m.

(b) 4.57 m  $\times$  9.14 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Affected by stem-borer years. B.H.C. 50% was sprayed at 11.2 to 17 Kg/ha.

(iii) Yield of grain. (iv) 1961 to 1963. (b) No. (c) Nil. (v) Jalgaon and Akola. (vi) Nil. (vii)

Both the error variances are heterogeneous, hence results for individual years are given under 5. Results.

## 5. RESULTS :

## 61 (94)

(i) 1410 Kg/ha. (ii) (a) 256.9 Kg/ha. (b) 182.3 Kg/ha. (iii) N and F effects are highly significant, while other effects are not significant. (iv) Av. yield of grain in Kg/ha.

$N_0 F_0=989$ ;  $N_0 F_1=1084$  Kg/ha.

	$S_1$	$S_2$	$S_3$	$F_0$	$F_1$	Mean
$N_1$	1572	1330	1418	1345	1535	1440
$N_2$	1661	1799	1803	1694	1815	1754
Mean	1616	1565	1611	1520	1675	1597
$F_0$	1501	1519	1540			
$F_1$	1732	1611	1682			

C.D. for N marginal means=153.0 Kg./ha.

C.D. for F marginal means=108.0 Kg./ha.

## 62(80)

(i) 1312 Kg/ha. (ii) (a) 232.0 Kg./ha. (b) 132.6 Kg./ha. (iii) Only N and F effects are highly significant. (iv) Av. yield of grain in Kg/ha.

$N_0 F_0=1068$  and  $N_0 F_1=1186$  Kg/ha.

	$S_1$	$S_2$	$S_3$	$F_0$	$F_1$	Mean
$N_1$	1357	1271	1381	1294	1379	1336
$N_2$	1450	1408	1556	1385	1558	1471
Mean	1404	1340	1468	1339	1469	1404
$F_0$	1341	1284	1313			
$F_1$	1467	1395	1544			

C.D. for N marginal means=138.2 Kg./ha.

C.D. for F marginal means=78.5 Kg/ha.

## 63(121)

(i) 1529 Kg/ha. (ii) (a) 447.5 Kg/ha. (b) 314.9 Kg/ha. (iii) N effect is highly significant. (iv) Av. yield of grain in Kg/ha.

$N_0 F_0=1251$  and  $N_0 F_1=1407$  Kg/ha.



	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	1538	1607	1177	1350	1531	1441
N <sub>2</sub>	1591	2008	1849	1901	1731	1816
Mean	1565	1808	1513	1629	1631	1629
F <sub>0</sub>	1541	1908	1428			
F <sub>1</sub>	1588	1707	1598			

C.D. for N marginal means = 266.6 Kg./ha.

**Crop :- jowar (Kdarif).**

**Ref :- Mh. 60(66), 61(161).**

**Site :- Agri. Res. Stn ; Jalgaon.**

**Type :- 'M'.**

**Object :** To find out the requirements of N, P and K with and without F.Y.M.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Gram ; Mung. (c) Nil. (ii) Deep black cotton soil. (iii) 5.7.60 ; 5.7.61. (iv) (a) N.A. ; Harrowing. (b) Dibbling. (c) 6.7 Kg/ha. (d) 46 cm. × 30 cm. (e) N.A. ; 1-2. (v) Nil. (vi) B S-12-2-11. (vii) Unirrigated. (viii) Hoeings and weedings. (ix) 79 cm. ; 71 cm. (x) 25.11.60 ; 8.12.61.

**2. TREATMENTS :**

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

(1) 3 levels of N as A/S :- N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super :- P<sub>0</sub>=0, P<sub>1</sub>=22.4 and P<sub>2</sub>=44.8 Kg/ha.

(3) 3 levels of K<sub>2</sub>O as Pot. Sul. :- K<sub>0</sub>=0, K<sub>1</sub>=22.4 and K<sub>2</sub>=44.8 Kg/ha.

(4) 3 levels of F.Y. M. :- F<sub>0</sub>=0, F<sub>1</sub>=12.5 and F<sub>2</sub>=25.0 C.L./ha.

**3. DESIGN :**

(i) 3<sup>3</sup> c r d (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) 10.97 m. × 6.40 m. (v) 9.14 m. × 4.57 m. (vi) 91 cm. × 91 cm. (vii) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Slight attack of milli-peds. (iii) Yield of grain. (iv) (a) 1959-61. (b) No. (c) Results of combined analysis are given under 5. Results. (v) & (vi) Nil. (vii) Error variances are homogeneous and interaction of Treatments × years is present. Expt. for 59 is also included while combining the results.

**5. RESULTS :**

Pooled results.

(i) 1990 Kg/ha. (ii) 349.8 Kg/ha (based on 6 df made up of interaction of Treatments × years). (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	Mean
N <sub>0</sub>	1528	1477	1624	1559	1502	1567	1476	1538	1614	1543
N <sub>1</sub>	2012	2035	2013	2010	2383	1967	1940	2026	2093	2020
N <sub>2</sub>	2282	2449	2494	2374	2480	2372	2390	2408	2427	2408
Mean	1941	1987	2044	1981	2022	1969	1935	1991	2045	1990
F <sub>0</sub>	1838	1975	1994	1954	1957	1896				
F <sub>1</sub>	1921	2059	1993	1983	1978	2011				
F <sub>2</sub>	2064	1927	2144	2007	2130	1998				
K <sub>0</sub>	1985	1982	1977							
K <sub>1</sub>	1987	2019	2058							
K <sub>2</sub>	1849	1960	2097							

C.D for N marginal means = 134.5 Kg./ha.

## Individual results.

Treatment	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Sig.	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Sig.
Year 1960	2107	2736	3249	**	2636	2698	2758	N.S.
1961	1478	1853	1944	**	1725	1740	1810	N.S.
Pooled	1543	2020	2403	*	1941	1987	2044	N.S.

K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Sig.	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	Sig.	G.M.	S.E./plot
2708	2725	2659	N.S.	2697	2652	2743	N.S.	2697	169.2
1709	1750	1816	N.S.	1649	1777	1849	*	1758	266.3
1918	2022	1969	N.S.	1935	1991	2045	N.S.	1990	349.8

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 61(95), 62(81), 63(122).**

**Site :- Agri. Res. Stn., Jalgaon.**

**Type :- 'M'.**

**Object :-** To study the relative merits of C/A/N with A/S and Urea in the presence and absence of F.Y.M. on the yield of Jowar.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Gram. (c) Nil. (ii) Deep black cotton soil. (iii) 2.7.61 ; 9.7.62 ; 1.7.63 (iv) (a) N.A. (b) Dibbling (c) 9 Kg/ha. (d) 46 cm. × 30 cm. (e) 2 to 3 seeds dibbled and thinned to one. (v) Nil. (vi) B.S. 12—2—11. (vii) Unirrigated. (viii) 2 weedings and 2 hoeings ; 1 weeding and 3 hoeings in 62 and 63. (ix) N.A. ; 62 cm. (x) 8.12.61 ; 22.12.62 ; 20.12.63.

## 2. TREATMENTS:

## Main-plot treatments:

All combinations of (1) and (2)

(1) 3 levels of N: N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 3 sources of N: S<sub>1</sub>=A/S, S<sub>2</sub>=C/A/N and S<sub>3</sub>=Urea.

## Sub-plot treatments:

2 levels of F.Y.M. F<sub>0</sub>=0 and F<sub>1</sub>=5600 Kg/ha.

## 3. DESIGN:

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 6.40 m. (b) 9.14 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory. (ii) Slight attacked of Milliped and Army worms in 61 only. (iii) Yield of grain. (iv) (a) 1961 to 63. (b) No. (c) Results of combined analysis are given under 5. Results. (v) Akola, Digraj (vi) Nil. (vi) Both error variances are homogeneous and Treatments × years interaction is absent.

## 5. RESULTS:

## Pooled results

(i) 1951 Kg/ha. (ii) (a) 448.46 Kg/ha. (based on 72 d.f. made up of pooled error). (b) 304.0 Kg/ha. (based on 81 d.f. made up of pooled error). (iii) Both N and S effects are significant. (iv) Av. yield of grain in Kg/ha.

$N_0F_0=1492$ ,  $N_0F_1=1595$  Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	2017	9187	2221	2034	2116	2075
N <sub>2</sub>	2210	2112	2385	2219	2253	2236
Mean	2113	2050	2303	2126	2184	2155
F <sub>0</sub>	2067	2004	2308			
F <sub>1</sub>	2159	2095	2298			

C.D. for N marginal means=149.2 Kg/ha.

C.D. for S marginal means=135.2 Kg/ha.

#### Individual results

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Sig.	F <sub>0</sub>	F <sub>1</sub>	Sig.	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Sig.
Year											
1961	1648	1708	1693	N.S.	1632	1734	N.S.	914	1579	1787	N.S.
1962	3006	2745	3159	N.S.	2894	3046	N.S.	2322	2970	2970	N.S.
1963	1686	1696	2057	N.S.	1853	1773	N.S.	1393	1676	1950	N.S.
Pooled	2113	2050	2303	*	2126	2184	N.S.	1543	2075	2236	*

G.M.	S.E./p of	
	(a)	(b)
14.7	392.4	256.9
2754	493.8	381.1
1673	453.2	256.9
1951	448.5	304.0

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 60(30), 61(31).**

**Site :- Agri. Res. Stn., Jaur.**

**Type :- 'M'.**

Object: —To study the effect of different levels of N, P and K on the yield of *Jowar*.

#### 1. BASAL CONDITIONS:

(i) (a) *Jowar*—Gram; Nil. (b) Gram. (c) N.A. (ii) Medium deep. (iii) 16.9.60; 1.10.61. (iv) (a) 3 harrowings. (b) Drilling. (c) 5 Kg/ha. (d) 46 cm. × 10 to 15 cm. (e) N.A. (v) Nil. (vi) M 35—1. (vii) Un-irrigated. (viii) 2 interculturings. (ix) 24 cm.; 23 cm. (x) 9.2.61; 9.2.62.

#### 2. TREATMENTS:

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

(1) 3 levels of N as A/S: N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super: P<sub>0</sub>=0, P<sub>1</sub>=22.4 and P<sub>2</sub>=44.8 Kg/ha.

(3) 3 levels of K<sub>2</sub>O as Pot. Sul.: K<sub>0</sub>=0, K<sub>1</sub>=22.4 and K<sub>2</sub>=44.8 Kg/ha.

Time and method of application not available.

#### 3. DESIGN:

(i) 3<sup>3</sup> fact. confd. (ii) (a) 3 blocks/replication; 9 plots/block. (b) N.A. (iii) 1. (iv) (a) 6.40 m. × 10.97 m. (b) 4.57 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957 to 61. (b) and (c) No. (v) Sholapur. (vi) Nil. (vii) Error variances for the years 1957 to 61 are heterogeneous and Treatments  $\times$  years interaction are absent, hence results for individual years are given under 5. Results.

## 5. RESULTS:

## 60(30)

(i) 2088 Kg/ha. (ii) 60.1 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
N <sub>0</sub>	1746	1627	1771	1610	1496	2038	1715
N <sub>1</sub>	1953	2165	2201	2137	2192	1990	2106
N <sub>2</sub>	2219	2600	2513	2508	2242	2581	2444
Mean	1973	2131	2162	2085	1977	2203	2088
K <sub>0</sub>	2039	2124	2093				
F <sub>1</sub>	1790	2021	2120				
K <sub>2</sub>	2089	2247	2273				

C.D. for N marginal means = 69.2 Kg/ha.

## 61(31)

(i) 1574 Kg/ha. (ii) 378.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
N <sub>0</sub>	1433	1795	2329	1763	1849	1944	1852
N <sub>1</sub>	1243	1772	1636	1315	1379	1957	1550
N <sub>2</sub>	1284	1234	1446	1170	1578	1216	1321
Mean	1320	1600	1804	1416	1602	1705	1574
K <sub>0</sub>	1243	1609	1397				
K <sub>1</sub>	1293	1645	1867				
K <sub>2</sub>	1424	1546	2147				

**Crop :- Jowar (Rabi).**

**Ref :- 61(69), 62(63), 63(78), 64(70).**

**Site :- Agri. Res. stn., Jeur.**

**Type :- 'M'.**

**Object :-** TO study the effect of placement of F.Y.M. on the yield of Jowar.

## BASAL CONDITIONS :

(i) (a) Nil. (b) Jowar. (c) Nil. (ii) Medium deep. (iii) 19.10.61 ; 26.9.62 ; 14.9.63 ; 23.9.64. (iv) (a) One ploughing and 3 harrowings. (b) Drilling (c) 5 Kg/ha. (d) 46 cm.  $\times$  10 to 15 cm. (e) —. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) 2 interculturings ; 3 interculturings and 1 weeding ; 3 interculturings in 63 and 64. (ix) 15 cm. ; 11 cm. ; 6 cm. ; 7 cm. (x) 14.2.62 ; 17.2.63 ; 31.1.64 ; 23.2.65.

## 2. TREATMENTS :

## Main-plot treatments :

5 levels of F.Y.M. :  $F_0=0$ ,  $F_1=1120$ ,  $F_2=2240$ ,  $F_3=3360$  and  $F_4=5600$  Kg/ha.

## Sub-plot treatments :

3 methods of application :  $M_1$ =Broadcast,  $M_2$ =Band placement and  $M_3$ =Drilling.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7.32 m.  $\times$  10.97 m. (b) 5.49 m.  $\times$  9.14 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Plant counts, height measurements and yield of grain. (iv) (a) 1961 to 64 (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Chas and Sholapur. (vi) No. (vii) Both the error variances are homogeneous and Treatments  $\times$  years interaction are absent in both.

## 5. RESULTS :

## Pooled results

(i) 723 Kg/ha. (ii) (a) 340.8 Kg/ha. (based on 60 d.f. made up of pooled error and Treatments  $\times$  years interaction). (b) 165.9 Kg/ha. (based on 150 d.f. made up of pooled error and Treatments  $\times$  years interaction). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	$F_0$	$F_1$	$F_2$	$F_3$	$F_4$	Mean
$M_1$	655	638	629	782	831	707
$M_2$	799	608	553	925	846	746
$M_3$	709	640	571	766	897	717
Mean	721	629	584	824	858	723

## Individual results

Treatment	$M_1$	$M_2$	$M_3$	Sig.	$F_0$	$F_1$	$F_2$	$F_3$	$F_4$	Sig.
Year										
1961	516	537	541	N.S.	479	376	416	667	718	N.S.
1962	570	655	610	N.S.	602	478	431	759	789	N.S.
1963	964	957	921	N.S.	965	1032	940	918	881	N.S.
1964	777	835	796	N.S.	836	629	551	954	1043	N.S.
Mean	707	746	717	N.S.	721	629	584	824	858	N.S.

G.M.	S.E./plot (a) (t)	
53.1	424.4	176.1
612	323.4	134.4
947	296.8	205.8
803	410.1	201.7
723	340.8	165.9

**Crop :- Jowar (Rabi).**  
**Site :- Agri. Res. Stn., Mohol.**

**Ref :- Mh. 64(135), 65(119).**  
**Type :- 'M'.**

Object: —To study the effect of spartin on the yield of *Jowar*.

**1. BASAL CONDITIONS :**

(i) (a) Nil ; *Jowar*—Pulses. (b) Gram. (c) 12.5 C.L./ha of F.Y.M. (ii) Medium light. (iii) 26.9 64 ; 22.9.65. (iv) (a) 2 ploughings and 5 harrowings ; 3 harrowings. (b) Drilling. (c) N.A. ; 9.9 Kg/ha. (d) 46 cm. (e) N.A. (v) Nil ; As per treatments. (vi) M-35-1. (vii) Unrigged. (viii) 4 hoeings and weeding. (ix) 10 cm. ; 9.2 cm. (x) 19.2 65 ; 2.2.66.

**2 TREATMENTS:**

**Main-plot treatments :**

2 levels of F.Y.M.  $F_0=0$  and  $F_1=5600$  Kg/ha.

**Sub-plot treatments :**

All combinations of (1) and (2) ✓

(1) 2 levels of spartin :  $S_0=0$  and  $S_1=168$  Kg/ha.

(2) 2 levels of manuring :  $M_0=0$  and  $M_1=22.4$  Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$ .

**3 DESIGN:**

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  7.32 m. (b) 9.14 m.  $\times$  5.49 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

**4. GENERAL:**

(i) Satisfactory. (ii) 10 % B.H.C. dusted for sugary disease ; Nil. (iii) Yield of grain. (iv) (a) 1964—66. (b) No. (c) Nil. (v) Sholapur and Parbhani. (vi) Nil. (vii) Expt. is continued.

**5. RESULTS :**

64(35)

(i) 945 Kg/ha. (ii) (a) 99.8 Kg/ha. (b) 112.8 Kg/ha. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	$M_0$	$M_1$	$S_0$	$S_1$	Mean
$F_0$	664	1198	935	927	931
$F_1$	727	1193	965	955	960
Mean	696	1196	950	941	945
$S_0$	701	1199			
$S_1$	690	1192			

C.D. for M marginal means = 83.8 Kg/ha.

65(119)

(i) 436 Kg/ha. (ii) (a) 204.7 Kg/ha. (b) 240.8 Kg/ha. (iii) Interaction  $F \times M$  alone is significant. (iv) Av. yield of grain in Kg/ha.

	$M_1$	$M_2$	$S_1$	$S_2$	Mean
$F_0$	387	611	461	537	499
$F_1$	463	283	367	380	373
Mean	425	447	414	459	436
$S_1$	372	455			
$S_2$	478	439			

C.D. for M means at the same level of F = 252.9 Kg/ha.  
 C.D. for F means at the same level of M = 285.5 Kg/ha.

**Crop :- Jowar (Kharif).**  
**Site :- Agri. College Farm, Nagpur.**

**Ref :- Mh. 60(191), 62(139).**  
**Type :- 'M'.**

**Object :-** To study the effect of N, P and K with and without F.Y.M. on the yield of Jowar.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton. (c) 22.4 Kg/ha. of N. (ii) Black cotton soil. (iii) 7.9.60; 28.7.62. (iv) (a) 3 to 5 harrowings. (b) Argada. (c) N.A. (d) 46 cm. x 20 to 23 cm. (e) One. (v) Nil. (vi) Imp. Saoner. (vii) Unirrigated. (viii) 2 weedings and 3 hoeings. (ix) 17 cm ; 73 cm. (x) 20.1.61 ; 29.12.62.

2. **TREATMENTS :**

**Main-plot treatments**

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

- (1) 3 levels of N:  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.  
 (2) 3 levels of  $P_2 O_5$ :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.  
 (3) 3 levels of  $K_2 O$ :  $K_0=0$ ,  $K_1=22.4$  and  $K_2=44.8$  Kg/ha.

**Sub-plot treatments**

2 levels of F.Y.M :  $F_0=0$  and  $F_1=12.5$  C.L./ha.

F.Y.M. applied on 5.9.60,  $\frac{1}{2}$  N and full  $P_2 O_5$  on 7.6.60 and other half N on 26.10.60.

3. **DESIGN :**

(i) Split-plot. (ii) (a) 27 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 6.40 m. x 10.97 m. (b) 4.57 m. x 9.14 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960 to 62 (Not conducted in 61). (b) No. (c) No. (v) & (vi) No. (vii) Both the error variances are heterogeneous, hence results for individual years are given under 5-Results. Expt. not conducted during 61.

5. **RESULTS :**

**60(191)**

(i) 504 Kg/ha (ii) (a) 144.7 Kg/ha. (b) 146.2 Kg/ha. (iii) N one of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	$F_0$	$F_1$	Mean
$N_0$	474	537	543	503	538	513	504	532	518
$N_1$	484	460	499	507	411	525	461	501	481
$N_2$	522	530	490	488	480	574	502	526	514
Mean	493	509	511	499	476	537	489	520	504
$F_0$	494	506	468	487	463	518			
$F_1$	493	513	553	512	490	557			
$K_0$	532	538	428						
$K_1$	447	465	517						
$K_2$	501	524	587						

**62(139)**

(i) 1894 Kg/ha. (ii) (a) 511.9 Kg/ha. (b) 320.5 Kg/ha. (iii) Main effect of N is highly significant, interaction  $N \times K$  is significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>0</sub>	1541	1643	1737	1785	1762	1374	1588	1693	1640
N <sub>1</sub>	1654	1789	1849	1702	1689	1901	1814	1714	1764
N <sub>2</sub>	2444	2022	2366	2422	1920	2491	2179	2376	2422
Mean	1880	1818	1984	1970	1790	1922	1860	1928	1894
F <sub>0</sub>	1829	1839	1913	1932	1817	1832			
F <sub>1</sub>	1931	1797	2055	2008	1763	2012			
K <sub>0</sub>	1858	1868	2184						
K <sub>1</sub>	1983	1694	1693						
K <sub>2</sub>	1798	1893	2075						

C.D. for N marginal means = 248.3 Kg/ha.  
 C.D. for means in the body of N × K table = 430.1 Kg/ha.

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 63(149), 64(119), 65(70).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'M'.**

Object :- To study the relative merits of different N carriers on the yield of *Jowar*.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*. (c) N.A. (ii) Black cotton soil. (iii) 20, 21 7.63 ; 22.7.64 ; 20.7.65. (iv) (a) Ploughing by tractor and harrowing. (b) Drilling. (c) N.A. (d) 46 cm. × 23 cm (e) ---. (v) Compost applied in 63 ; Nil in 64 and 65. (vi) N.J. 156. (vii) Unirrigated. (viii) 2 weedings and 2 hoeings ; interculturing ; gap filling, 2 weedings and 2 hoeings. (ix) 83 cm ; 89 cm ; N.A. (x) 27 to 30.12.63 ; 21, 22.12.64 ; N.A.

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 3 levels of N : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 5 sources of N : S<sub>1</sub>=A/S, S<sub>2</sub>=A/C, S<sub>3</sub>=A/S/N, S<sub>4</sub>=C/A/N and S<sub>5</sub>=Urea.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) 10.97 m. × 7.23 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963 to 65. (b) No. (c) No. (v) Achalpur and Dhulia. (vi) Nil. (vii) Error variances are heterogeneous. Treatments X years interaction is absent, hence results for individual years are given under 5-Results.

**5. RESULTS :**

**63(149)**

(i) 2165 Kg/ha. (ii) 478.4 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

N<sub>0</sub>=1711 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	Mean
N <sub>1</sub>	1909	2100	2168	2270	2270	2143
N <sub>2</sub>	2761	2053	2676	3110	2604	2641
Mean	2335	2076	2422	2690	2437	2392

C.D. for N marginal means = 305.5 Kg/ha.



64(119)

(i) 1298 Kg/ha (ii) 512.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

 $N_0=1324$  Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	Mean
N <sub>1</sub>	1303	1109	1288	1779	1059	1308
N <sub>2</sub>	987	1301	937	1326	1764	1263
Mean	1145	1205	1112	1553	1412	1285

65(70)

(i) 1561 Kg/ha. (ii) 335.9 Kg/ha. (iii) Only N effect is highly significant. (iv) Av. yield of grain in Kg/ha.

 $N_0=1348$  Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	Mean
N <sub>1</sub>	1139	1814	1502	1565	1547	1513
N <sub>2</sub>	1697	1884	1841	1782	1899	1821
Mean	1418	1849	1672	1674	1723	1667

C:D. for N marginal means=214.5 Kg/ha.

**Crop :- Jowar (Kharif).****Ref :- Mh. 60(121), 63(19), 64(13).****Site :- Agri. College Farm, Parbhani.****Type :- 'M'.**

Object : To study the effect of different levels of N, P and K with and without F.Y.M. on the yield of Jowar.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton ; Jowar ; Jowar and Gram. (c) 37 C.L./ha. of F.Y.M. + 168 Kg/ha. of A/S + 168 Kg/ha. of Super in 60 ; N.A. for others. (ii) Medium black soil. (iii) 12.7.60 ; 8.7.63 ; 26.7.64. (iv) (a) 3 to 4 harrowings. (b) Drilling. (c) 9 Kg/ha. (d) 46 cm. between rows. (e) N.A. (v) Nil. (vi) PJ 4 K. (vii) Unirrigated. (viii) Weeding. (ix) 78 cm. ; 108 cm. ; 70 cm. (x) Dec., 60 ; 11.12.63 ; 22.12.64

## 2. TREATMENTS :

**Main-plot treatments :**

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

- (1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.  
 (2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.  
 (3) 3 levels of  $K_2O$  as Pot. Sul. :  $K_0=0$ ,  $K_1=44.8$  and  $K_2=89.6$  Kg/ha.

**Sub-plot treatments :**2 levels of F.Y.M. :  $F_0=0$  and  $F_1=12.4$  C.L./ha.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 3 blocks/replication ; 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 10.97 m.  $\times$  6.40 m. (b) 9.14 m.  $\times$  4.57 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Stem borer attack noticed in 60 ; Rat attack noticed in 63. Zinc Sulphate used for control measures. (iii) Yield of grain. (iv) (a) 1960—64 (expt. failed in 61 and 62). (b) and (c) No.

(v) and (vi) Nil. (vii) Error variances for sub-plot treatments are heterogeneous, hence results for individual years are given under 5. Results.

### 5. RESULTS:

60(121)

(i) 3233 Kg/ha. (ii) (a) 565.0 Kg/ha. (b) 426.9 Kg/ha. (iii) Main effect of N and interaction P×F are highly significant. Main effect of P and interaction P×K are significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>0</sub>	2759	2975	2296	2612	2796	2622	2647	2707	2677
N <sub>1</sub>	3759	3137	3268	3536	3404	3224	3489	3287	3388
N <sub>2</sub>	3964	3623	3316	3598	3536	3769	3487	3782	3634
Mean	3494	3245	2960	3249	3245	3205	3208	3259	3233
F <sub>0</sub>	3666	2943	3014	3189	3233	3201			
F <sub>1</sub>	3322	3547	2906	3309	3257	3209			
K <sub>0</sub>	3801	3328	2617						
K <sub>1</sub>	3289	3116	3331						
K <sub>2</sub>	3392	3291	2932						

C.D. for N or P marginal means = 460.8 Kg/ha.

C.D. for F means at the same levels of P = 419.7 Kg/ha.

C.D. for P means at the same levels of F = 540.7 Kg/ha.

C.D. for body of P×K table = 564.5 Kg/ha.

63(19)

(i) 1434 Kg/ha. (ii) (a) 362.4 Kg/ha. (b) 219.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>0</sub>	1399	1489	1225	1452	1240	1420	1397	1344	1371
N <sub>1</sub>	1555	1507	1488	1469	1686	1395	1448	1586	1517
N <sub>2</sub>	1608	1267	1369	1620	1207	1416	1387	1442	1415
Mean	1520	1421	1361	1514	1378	1411	1411	1457	1434
F <sub>0</sub>	1407	1467	1357	1512	1413	1308			
F <sub>1</sub>	1633	1374	1364	1515	1343	1514			
K <sub>0</sub>	1706	1366	1468						
K <sub>1</sub>	1424	1380	1329						
K <sub>2</sub>	1431	1516	1285						

64(31)

(i) 1425 Kg/ha. (ii) (a) 574.1 Kg/ha. (b) 272.5 Kg/ha. (iii) Main effect of F is highly significant and N effect is significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>0</sub>	1043	1050	986	725	1188	1166	968	1085	1026
N <sub>1</sub>	1362	1285	1887	1829	1209	1497	1433	1591	1511
N <sub>2</sub>	1455	2066	1687	1703	1732	1774	1485	1987	1736
Mean	1287	1467	1520	1419	1376	1479	1295	1554	1425
F <sub>0</sub>	1088	1304	1493	1324	1283	1278			
F <sub>1</sub>	1485	1630	1547	1514	1469	1680			
K <sub>0</sub>	987	1515	1755						
K <sub>1</sub>	1151	1603	1375						
K <sub>2</sub>	1723	1283	1430						

C.D. for F marginal means=154.7 Kg/ha.

C.D. for N marginal means=468.3 Kg/ha.

**Crop :- Jowar (Rabi).**

**Site :- Agri. College Farm, Parbhani.**

**Ref :- Mh. 61(114).**

**Type :- 'M'.**

Object:— To study the relative merits of C/A/N in the presence and absence of F.Y.M. for *Jowar* crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton and Wheat. (c) N.A. (ii) Medium black soil. (iii) 2.11.61. (iv) (a) 6 harrowings. (b) Drilling. (c) 10 Kg/ha. (d) 46 cm. (e) —. (v) Nil. (vi) PJ 4 R. (vii) Unirrigated. (viii) 2 hoeings and 1 weeding. (ix) Nil. (x) 24, 25.3.62.

2. **TREATMENTS :**

**Main-plot treatments :**

All combinations of (1) and (2)

(1) 3 sources of N : S<sub>1</sub>=A/S, S<sub>2</sub>=C/A/N and S<sub>3</sub>=Urea.

(2) 3 levels of N : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

**Sub-plot treatments :**

2 levels of F.Y.M. : F<sub>0</sub>=0 and F<sub>1</sub>=5600 Kg/ha.

3. **DESIGN :**

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6.40 m. × 10.97 m. (b) 4.57 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 only. (b) and (c) No. (v) to (vii) Nil.

5. **RESULTS :**

(i) 953 Kg/ha. (ii) (a) 435.8 Kg/ha. (b) 288.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha

N<sub>0</sub>F<sub>0</sub>=911 and N<sub>0</sub>F<sub>1</sub>=845 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	719	1121	981	1018	863	940
N <sub>2</sub>	1059	820	1239	1095	982	1039
Mean	889	970	1110	1057	923	990
F <sub>0</sub>	871	1037	1262			
F <sub>1</sub>	907	904	958			

**Crop :- Jowar (Rabi).**  
**Site :- Agri. College Farm, Parbhani.**

**Ref :- Mh. 62(105).**  
**Type :- 'M'.**

Object :—To find out the effective method of application of P in association with organic manure for *Jowar* crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fodder *Jowar*. (c) 25 C.L./ha. of F.Y.M. (ii) Medium black cotton soil. (iii) 21.10.62.  
 (iv) (a) 3 harrowings. (b) Drilling. (c) 9 Kg/ha. (d) 46 cm. (e) —. (v) Nil. (vi) PJ 4 R. (vii) Un-irrigated. (viii) 2 weedings and 2 hoeings. (ix) 10 cm. (x) 1, 2.4.63.

2. TREATMENTS :

7 manurial treatments:  $M_0$ =Control,  $M_1$ =Ordinary compost,  $M_2$ =Ordinary compost+ $P_2O_5$  drilled at the time of sowing,  $M_3$ =Ordinary compost+ $P_2O_5$  mixed (4.08 Kg/ha. of Super),  $M_4$ =Digested compost,  $M_5$ =N as A/S+ $P_2O_5$  as Super at the time of sowing and  $M_6$ = $P_2O_5$  as Super at the time of sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 15.54 m. × 8.23 m. (b) 13.72 m. × 6.40 m. (v) 91 cm. × 91 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil (iii) Yield of grain. (iv) (a) 1962 only. (b) and (c) No. (v) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 712 Kg/ha. (ii) 169.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$M_0$	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$	$M_6$
Av. yield	675	647	599	815	646	829	774

**Crop :- Jowar (Rabi).**  
**Site :- Agri. College Farm, Parbhani.**

**Ref :- Mb. 63(161), 64(134).**  
**Type :- 'M'.**

Object :—To study the effect of spartin on the yield of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*; Cotton (c) 12.4 C.L./ha. of F.Y.M.; N.A. (ii) Medium black soil. (iii) 28.10.63; 2.10.64. (iv) (a) 6-7 harrowings. (b) Drilling. (c) 9 Kg/ha. (d) 46 cm. between rows. (e) —. (v) Nil. (vi) PJ 4 R. (vii) Unirrigated. (viii) 2 hoeings and weedings. (ix) Nil. (x) 4, 5.3.64; 2, 3.3.65.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M. :  $F_0=0$  and  $F_1=56.4$  Kg/ha.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of spartin :  $S_0$ =No spartin and  $S_1=168$  Kg/ha. of spartin.

(2) 2 levels of manures :  $M_0=0$  and  $M_1=22.4$  Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ .

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication; 4 sub-plots/main plot. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (viii) Yield of grain. (iv) (a) 1963-64. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Mohal, Sholapur. (vi) Nil. (vii) Both the error variances are homogeneous and Treatments × years interaction are absent in both cases.

5. RESULTS :

Pooled Results

(i) 1046 Kg/ha. (ii) (a) 242.5 Kg/ha. (based on 7 d.f. made up of pooled error and Treatments × years interaction). (b) 152.0 Kg/ha. (based on 41 d.f. made of pooled error and Treatments × years interactions). (iii) Main effect of M is significant. (iv) Av. yield of grain in Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	S <sub>0</sub>	S <sub>1</sub>	Mean
F <sub>0</sub>	941	1012	958	995	976
F <sub>1</sub>	1011	1220	1149	1082	1116
Mean	976	1116	1054	1038	1046
S <sub>0</sub>	962	1145			
S <sub>1</sub>	990	1087			

C.D. for M marginal means = 76.8 Kg/ha.

#### Individual Results

Treatment	M <sub>0</sub>	M <sub>1</sub>	Sig.	S <sub>0</sub>	S <sub>1</sub>	Sig.
Year						
1963	709	630	N.S.	666	673	N.S.
1964	1243	1602	**	1441	1404	N.S.
Pooled	976	1116	*	1054	1038	N.S.

F <sub>0</sub>	F <sub>1</sub>	Sig.	G.M.	S.E./plot	
				(a)	(b)
676	663	N.S.	669	279.0	130.2
1277	1568	*	1422	169.1	155.4
976	1116	N.S.	1046	242.5	152.0

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 61(58), 62(43), 63(66).**

**Site :- Agri. College Farm, Poona.**

**Type :- 'M'.**

**Object :-** To find out the suitable time and method of application of A/S to *Jowar*.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Double bean ; Nilwa ; *Bajri* and Potato. (c) Nil ; Nil ; 37 C.L./ha. of F.Y.M. + 60 Kg/ha. of A/S + 40 Kg/ha. of super. (ii) Medium black soil. (iii) 14.10.61 ; 26.9.62 ; 4.10.63. (iv) (a) Harrowing ; ploughing and harrowing ; harrowing. (b) Drilling ; Dibbling in 62 and 63. (c) 11 Kg/ha ; N.A. ; N.A. (d) 46 cm ; 46 cm. x 46 cm. in 62 and 63. (v) Nil. (vi) M 35-1. (vii) Irrigated. (viii) 1 to 2 interculturings. (ix) N.A. ; N.A. ; 10 cm. (x) 5.3.62 ; 6.2.63 ; 6.2.64.

#### 2. TREATMENTS :

5 methods of application of N at 44.8 Kg/ha. : M<sub>1</sub> = Broadcast at sowing, M<sub>2</sub> =  $\frac{1}{2}$  dose broadcast at sowing +  $\frac{1}{2}$  broadcast one month after sowing, M<sub>3</sub> = Drilling at sowing, M<sub>4</sub> =  $\frac{1}{2}$  dose drilled at sowing +  $\frac{1}{2}$  dose drilled one month after sowing and M<sub>5</sub> = Broadcast 15 days before sowing.

#### 3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 11.89 m. x 6.40 m. (b) 10.6 m. x 4.57 m. (v) 91 cm. x 91 cm. (vi) Yes.

#### 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 to 63. (b) & (c) No. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments' X years interaction is absent, hence results for individual years are given under 5-Results.

## 5. RESULTS :

61(58)

(i) 2896 Kg/ha. (ii) 812.2 Kg/ha (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>
Av. yield	2541	2256	3207	3289	3187

62(43)

(i) 1008 Kg/ha. (ii) 295.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>
Av. yield	973	935	832	1413	886

63(66)

(i) 669 Kg/ha. (ii) 554.5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>
Av. yield	2351	2786	2745	2800	2664

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 60(38), 61(229).**

**Site :- Agri. Res. Stn., Sholapur.**

**Type :- 'M'.**

Object:—To study the effect of graded doses of N, P and K on the yield of *Jowar*.

## 1. BASAL CONDITIONS:

(i) (a) Not fixed; *Jowar*-Gram. (b) Gram. (c) Nil. (ii) Deep black soil. (iii) 5.10.60; 1.10.61. (iv) (a) 3 harrowings. (b) Drilling. (c) 5 Kg/ha. (d) 46 cm. × 15 cm. to 23 cm. (e) N.A. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) 3 interculturings; 2 weedings. (ix) 35 cm; N.A. (x) 11.2.61; 9.2.62

## 2. TREATMENTS:

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

(1) 3 levels of N as A/S: N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super: P<sub>0</sub>=0, P<sub>1</sub>=22.4 Kg/ha. and P<sub>2</sub>=44.8 Kg/ha.

(3) 3 levels of K<sub>2</sub>O as Pot. Sul: K<sub>0</sub>=0, K<sub>1</sub>=22.4 and K<sub>2</sub>=44.8 Kg/ha.

Time and method of application of fertilizers N.A.

## 3. DESIGN:

(i) 3<sup>3</sup> Fact. Confd. (ii) (a) 3 blocks/replication; 9 plots/block. (b) 19.20 m. × 32.92 m. (iii) 1. (iv) (a) 6.40 m. × 9.14 m. (b) 4.57 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1957-61. (b) Yes. (c) No. (v) Jeur and Chas. (vi) Nil. (viii) Error variances are heterogeneous and Treatments X years interaction is absent, hence results for individual years are given under 5-Results.

## 5. RESULTS:

60(38)

(i) 757 Kg/ha. (ii) 142.1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
N <sub>0</sub>	640	773	692	667	756	682	702
N <sub>1</sub>	904	741	719	788	786	791	788
N <sub>2</sub>	650	791	902	736	845	761	781
Mean	722	769	771	730	796	745	757
K <sub>0</sub>	722	766	704				
K <sub>1</sub>	751	843	793				
K <sub>2</sub>	722	697	815				

61(229)

(i) 3471 Kg/ha. (ii) 834.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
N <sub>0</sub>	3159	2740	2830	2740	2850	3139	2910
N <sub>1</sub>	3956	3906	2720	3547	3627	3408	3527
N <sub>2</sub>	5132	3608	3188	3079	4116	4734	3976
Mean	4082	3418	2913	3122	3513	3760	3471
K <sub>0</sub>	3886	2900	2580				
K <sub>1</sub>	4076	3039	3478				
K <sub>2</sub>	4285	4315	2680				

**Crop :- Jowar (Rabi).****Ref :- Mh. 61(61), 62(57).****Site :- Agri. Res. Stn. Sholapur.****Type :- 'M'.**

Object: — To study the relative merits of Nitrophosphate complex by ODDA and PEC processes.

**1. BASAL CONDITIONS :**(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) Medium deep. (iii) 14.10.61 ; 30.9.62. (iv) (a) 3 *harrowings*. (b) *Drilling*. (c) 5 Kg/ha. (d) 46 cm. × 15 to 23 cm. (e) —. (v) Nil. (vi) M 35-1. (vii) Unirrigated. (viii) 3 *interculturings* ; 1 *interculturing*. (ix) 3 cm ; 15 cm. (x) 23.2.62 ; 15.3.63.**2. TREATMENTS :**

All combinations of (1), (2) and (3) + 5 extra treatments/block.

(1) 3 sources of N and P<sub>2</sub>O<sub>5</sub> : S<sub>1</sub>=A/S+Super, S<sub>2</sub>=ODDA and S<sub>3</sub>=PEC.(2) 3 levels of N and P<sub>2</sub>O<sub>5</sub> : L<sub>1</sub>=13.5 Kg/ha. of N+11.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, L<sub>2</sub>=2L<sub>1</sub> and L<sub>3</sub>=4L<sub>1</sub>.(3) 3 methods of application : M<sub>1</sub>=Broadcast, M<sub>2</sub>=6 cm. below seed and M<sub>3</sub>=Band placement.5 Extra treatments are : N<sub>0</sub>=O, N<sub>1</sub>=13.5, N<sub>2</sub>=27.0, N<sub>3</sub>=40.5 and N<sub>4</sub>=54.0 Kg/ha. of N.**3. DESIGN:**(i) 3<sup>3</sup> Conf'd. + 5 extra treatments per block. (ii) (a) 14 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) 6.40 m. × 10.97 m. (b) 4.57 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 to 63. (b) N.A. (c) Results of combined analysis are presented under 5. Results. (v) Nil. (vi) Nil. (viii) Experiment for 63 N.A. Error variances are homogeneous. Treatments X years interaction is absent.

## 5. RESULTS:

Pooled results.

(i) 705 Kg/ha. (ii) 125.7 Kg/ha. (based on 102 d. f. made up of pooled error + Treatments X years interaction). (iii) L and M effects are highly significant. Extra treatments among themselves are also highly significant. (iv) Av. yield of grain in Kg/ha.

$N_0=549$ ,  $N_1=631$ ,  $N_2=731$ ,  $N_3=729$  and  $N_4=754$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
S <sub>1</sub>	618	696	778	596	746	749	697
S <sub>2</sub>	623	762	711	646	682	768	699
S <sub>3</sub>	671	760	856	680	837	770	762
Mean	637	739	782	641	755	762	719
M <sub>1</sub>	608	624	690				
M <sub>2</sub>	676	804	786				
M <sub>3</sub>	627	790	870				

C.D. for L or M marginal means=75.0 Kg/ha.

C.D. for extra treatment means=91.9 Kg/ha.

Individual results

Treatment	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Sig.	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Sig.	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Sig.
Year 1961	652	736	772	N.S.	681	742	737	N.S.	684	721	755	N.S.
1962	622	743	791	**	713	656	788	N.S.	598	789	769	**
Pooled	637	739	782	**	697	699	762	N.S.	641	755	762	**

N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	Sig.	G.M.	S.E/plot
596	690	725	748	681	N.S.	709	158.5
502	571	737	711	827	**	701	160.9
549	631	731	729	754	**	705	125.7

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 61(63), 62(55), 63(73).**

**Site :- Agri. Res. Stn., Sholapur.**

**Type :- 'M'.**

Object :- To study the relative merits of C/A/N with A/S and Urea in the presence and absence of F.Y.M. on the yield of Jowar.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Jowar ; Jowar ; Gram. (c) Nil. (ii) Deep black. (iii) 6.10.61 ; 30.9.62 ; 30.9.63. (iv) (a) 3 harrowings in 61 and 62 ; 1 ploughing and 1 harrowing. (b) Drilling. (c) 5 Kg/ha. (d) 46 cm. x 15 to 23 cm. (e) —. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) 3 interculturations ; 1 interculturing ; 1 interculturing and 1 weeding. (ix) 18 cm. ; 15 cm. ; 8 cm. ; (x) 8.2.62 ; 13.3.63 ; 19.2.64.

## 2. TREATMENTS :

**Main-plot treatments:**

All combinations of (1) and (2)

(1) 3 levels of N :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(2) 3 sources of N :  $S_1=A/S$ ,  $S_2=C/A/N$  and  $S_3=Urea$ .

**Sub-plot treatments :**

2 levels of F.Y.M. :  $F_0=0$  and  $F_1=5600$  Kg/ha.



## 3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) 6.40 m. × 10.97 m.  
(b) 4.57 m. × 9.14 m. (v) 91 m × 91 cm. (vi) Yes.

## 4. GENERAL:

(i) Normal. (ii) Nil. (iii) Germination counts, plant height and yield of grain. (l) 1961 to 63. (b) No. (c) No. (v) & (vi) No. (vii) Both the errors variances are heterogeneous, hence results for individual years are given under 5-Results.

## 5. RESULTS :

61(63)

(i) 758 Kg/ha. (ii) (a) 142.1 Kg/ha. (b) 99.4 Kg/ha. (iii) Main effect of N, F and control vs. N are highly significant. (iv) Av. yield of grain in Kg/ha.

Control=580 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	787	795	732	700	843	772
N <sub>2</sub>	877	1024	864	827	1017	922
Mean	832	909	798	764	930	847
F <sub>0</sub>	787	799	704			
F <sub>1</sub>	877	1020	892			

C.D. of N marginal means=83.9 Kg/ha.

C.D. of F marginal means=58.9 Kg/ha.

C.D. of control vs. N means=73.3 Kg/ha.

62(55)

(i) 542 Kg/ha. (ii) (a) 169.1 Kg/ha. (b) 132.6 Kg/ha. (iii) Control vs. N is highly significant. (iv) Av. yield of grain in Kg/ha.

Control=380 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	536	633	603	564	617	590
N <sub>2</sub>	547	669	751	610	700	655
Mean	541	651	677	587	658	623
F <sub>0</sub>	460	653	649			
F <sub>1</sub>	622	649	705			

C.D. of control vs. N means=87.3 Kg/ha.

63(73)

(i) 771 Kg/ha. (ii) (a) 311.2 Kg/ha. (b) 215.4 Kg/ha. (iii) None of the effects is significant. (iii) Av. yield of grain in Kg/ha.

Control=707 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	735	864	822	794	820	807
N <sub>2</sub>	752	884	762	868	731	800
Mean	744	874	792	831	776	803
F <sub>0</sub>	826	822	844			
F <sub>1</sub>	662	925	740			

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 61(65), 62(53), 63(77), 64(65).**

**Site :- Agri. Res. Stn., Sholapur.**

**Type :- 'M'.**

Object :- To study the effect of placement of F.Y.M. on the yield of *Jowar*.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) Medium black. (iii) 4.10.61 ; 28.9.62 ; 12.2.63 ; 12.10.64. (iv) (a) 3 harrowings in 61 and 62 ; 1 ploughing and 1 harrowing. ; 3 harrowings. (b) Drilling. (c) 5 Kg/ha. (d) 46 cm.  $\times$  15 to 23 cm. (e) —. (v) Nil (vi) M—3<sup>5</sup>—1. (vii) Unirrigated. (viii) 3 interculturings. (ix) 18 cm. ; 18 cm. ; 14 cm. ; 8 cm. (x) 22.2.62. ; 17.3.63 ; 21.2.64 ; 17.2.65.

**2. TREATMENTS :**

Same as in Expt. No. 61(37), 62(22), 63(35), 64(30) on page No. 183.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 5 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6.40 m.  $\times$  10.97 m. (b) 5.49 m.  $\times$  9.14 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil in 61 and 62. Endrin 20 % for sugary disease sprayed in 63 ; B.H.C. 10 % dusted for Stem borer and sugary disease in 64. (iii) Plant counts, height measurements and yield of grain. (iv) (a) 1961 to 64. (b) and (c) No. (v) Chas. (vi) N.A. (vii) Sub-plot error variances are homogeneous, main-plot error variances are heterogeneous and Treatments  $\times$  years interaction is absent, hence results for individual years are given under 5. Results.

**5. RESULTS :**

**61(65)**

(i) 612 Kg/ha. (ii) (a) 131.8 Kg/ha. (b) 126.1 Kg/ha. (iii) Main effect of F is significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	496	537	457	700	667	571
M <sub>2</sub>	396	657	584	653	698	618
M <sub>3</sub>	569	654	549	746	710	646
Mean	520	616	530	700	692	612

C.D. for F marginal means = 117.2 Kg/ha.

**62(53)**

(i) 540 Kg/ha. (ii) (a) 83.0 Kg/ha. (b) 94.6 Kg/ha. (iii) Main effect of F is highly significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	466	520	526	519	617	530
M <sub>2</sub>	449	551	590	590	646	565
M <sub>3</sub>	410	557	482	538	636	525
Mean	442	543	533	549	633	540

C.D. for F marginal means = 73.9 Kg/ha.

**63(77)**

(i) 491 Kg/ha. (ii) (a) 66.4 Kg/ha. (b) 100.9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	460	472	519	535	561	509
M <sub>2</sub>	424	487	515	469	477	474
M <sub>3</sub>	433	479	458	554	522	489
Mean	439	479	497	519	520	491

64(65)

(i) 515 Kg/ha. (ii) (a) 180.6 Kg/ha, (b) 102.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>0</sub>	632	545	587	571	424	552
M <sub>1</sub>	437	552	572	416	458	487
M <sub>2</sub>	488	493	533	500	500	507
Mean	579	530	571	496	461	515

**Crop :- Jowar (Rabi).**

**Site :- Agri. Res. Stn., Sholapur.**

**Ref :- Mh. 63(160), 64(133), 65(122).**

**Type :- 'M'.**

Object :—To study the effect of spartin on the yield of *Jowar*.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram ; *jowar* ; *jowar*. (c) Nil ; 22.4 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub> in 64 and 65. (ii) Deep black. (iii) 9.10.63 ; 17.10.64 ; 28.9.65. (iv) (a) Nil ; harrowing ; 3 harrowings. (b) Drilling. (c) 5 Kg/ha. (d) 46 cm. × 15 to 23 cm. (e) —. (v) Nil. (vi) M 35—1. (vii) Unirrigated. (viii) Nil ; 2 interculturings ; 2 hoeings. (ix) 20 cm. ; N.A. ; 15 cm. (x) 18.2.64 ; 18.2.65 ; 6.2.66.

#### 2. TREATMENTS :

##### Main-plot treatments :

2 levels of F.Y.M. : F<sub>0</sub>=0 and F<sub>1</sub>=5600 Kg/ha.

##### Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of spartin : S<sub>0</sub>=0 and S<sub>1</sub>=168 Kg/ha.

(2) 2 levels of N and P<sub>2</sub>O<sub>5</sub> : M<sub>0</sub>=0 and M<sub>1</sub>=22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

#### 3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6.40 m. × 10.97 m. (b) 4.57 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

#### 4. GENERAL :

(i) Normal. (ii) Sugary disease, 10% B.H.C. at 17 Kg/ha. dusted. (iii) Yield of grain. (iv) (a) 1963 to 65. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Mohol, Parbhani. (vi) Nil. (vii) Both the error variances are homogeneous and Treatments × years interaction is absent in main-plot treatments and present in sub-plot treatments.

#### 5. RESULTS :

##### Pooled results

(i) 866 Kg/ha. (ii) (a) 233.4 Kg/ha. (based on 11 d.f. made up of pooled error and Treatments × years interaction). (b) 246.4 Kg/ha. (based on 10 d.f. made up of Treatments × years interaction). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	S <sub>0</sub>	S <sub>1</sub>	Mean
F <sub>0</sub>	805	870	873	802	838
F <sub>1</sub>	835	952	822	906	894
Mean	820	911	878	854	866
S <sub>0</sub>	819	936			
S <sub>1</sub>	822	886			

## Individual results.

Treatment	M <sub>0</sub>	M <sub>1</sub>	Sig.	S <sub>0</sub>	S <sub>1</sub>	Sig.
Year						
1963	752	969	**	913	808	N.S.
1964	740	842	N.S.	779	803	N.S.
1965	969	922	N.S.	920	951	N.S.
Pooled	820	911	N.S.	878	854	N.S.

Treatment	F <sub>0</sub>	F <sub>1</sub>	Sig.	G.M.	S.E./plot	
					(a)	(b)
Year						
1963	851	870	N.S.	860	224.6	184.7
1964	763	819	N.S.	791	228.9	142.1
1965	894	992	N.S.	945	299.3	179.9
Pooled	838	894	N.S.	866	233.4	246.4

Crop :- Jowar (*Rabi*).

Ref :- Mh. 60(179), 62(99).

Site :- Govt. Exptl. Farm, Tharsa.

Type :- 'M'.

Object :- To study the effect of micronutrients on the yield of *Jowar*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*; N.A. (c) N.A. (ii) Medium black. (iii) 26.10.60; 25.10.62. (iv) (a) 2 ploughings and 2 harrowings; 4 harrowings. (b) Drilling. (c) 22 Kg/ha. (d) 46 cm. × 10 cm. (e) —. (v) Nil; 11 Kg/ha. of N + 11 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) Sholapur; M-35-1. (vii) Unirrigated; Irrigated. (viii) Nil. (ix) N.A. (x) 24.3.61; 16.4.63.

## 2. TREATMENTS :

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

- (1) 2 levels of Zn as ZnSO<sub>4</sub>: A<sub>0</sub>=0 and A<sub>1</sub>=22.4 Kg/ha.
- (2) 2 levels of Mn as MnSO<sub>4</sub>: B<sub>0</sub>=0 and B<sub>1</sub>=22.4 Kg/ha.
- (3) 2 levels of Cu as CuSO<sub>4</sub>: C<sub>0</sub>=0 and C<sub>1</sub>=22.4 Kg/ha.
- (4) 2 levels of Molybdenum as Sod. Molybdate: D<sub>0</sub>=0 and D<sub>1</sub>=0.18 Kg/ha.
- (5) 2 levels of Boron: E<sub>0</sub>=0 and E<sub>1</sub>=22.4 Kg/ha.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 32. (b) N.A. (iii) 4. (iv) (a) 5.49 m. × 5.49 m. (b) 3.66 m. × 3.66 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959-62. (b) No. (c) Nil. (v) Achalpur and Parbhani. (vi) Nil. (vii) As the error variances are heterogeneous and interaction is absent, therefore individual year results are given under 5. Results.

## 5. RESULTS :

60(179)

(i) 1944 Kg/ha. (ii) 564.9 Kg/ha. (iii) None of the effects is significant. (iv) Mean and differential response in Kg/ha.

Treatment	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	45	--	--	124	-34	16	74	106	-16	124	-34
B	98	177	19	--	--	217	-21	85	111	-19	215
C	-69	-98	-40	50	-188	--	--	-5	-133	-50	-88
D	-21	40	-82	-34	-8	-43	-85	--	--	119	-161
E	50	129	-29	-67	167	69	32	190	-90	--	--

61(99)

(i) 1147 Kg/ha. (ii) 484.4 Kg/ha. (iii) Main effect of B is highly significant. (iv) Mean and differential response table in Kg/ha.

Treatment	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	103	--	--	243	-37	119	87	224	-18	59	147
B	238	378	98	--	--	250	226	98	378	352	124
C	-72	-56	-88	-60	-84	--	--	5	-149	-58	-86
D	93	214	-28	-47	233	170	16	--	--	16	170
E	-54	-98	-10	60	-168	-40	-68	-131	23	--	--

C.D. for mean response=170.4 Kg/ha.

Crop :- Jowar (Rabi).

Ref :- Mh. 61(24), 62(7), 63(7).

Site :- Govt. Exptl. Farm, Tharsa.

Type :- 'M'.

Object :- To study the relative merits of C/A/N with A/S and Urea in the presence and absence of F.Y.M. on the yield of Jowar.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A.; Wheat; Jowar. (c) N.A. (ii) Medium black. (iii) 8.11.61; 24.10.63; 16.10.63. (iv) (a) 2 ploughings and 2 bakharings in 61 and 62 and 2 ploughings in 63. (b) Drilling. (c) N.A. (d) 46 cm. x 20 cm.; 46 cm. x 23 cm. in 62, 63. (e) N.A. (v) Nil. (vi) M.-35-1. (vii) Unirrigated. (viii) One weeding. (ix) N.A.; 25 cm.; 8 cm. (x) 26.3.62; 11.4.63; 7.4.64.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expts. No. 61(63), 62(55), 63(73) conducted at sholapur and presented on page no. 202.

## 4. GENERAL :

(i) Poor growth; lodging due to late rain; satisfactory. (ii) Nil; black sumt on cob; Nil. (iii) Yield of grain. (iv) (a) 1961 to 63. (b) and (c) No. (v) Sholapur. (vi) Nil. (vii) Sub-plot error variances are heterogeneous. hence results for individual years are given under 5. Results.

## 5. RESULTS :

61(24).

(i) 399 Kg/ha. (ii) (a) 101.5 Kg/ha. (b) 132.6 Kg/ha. (iii) Main effect of S and interaction S x N are significant and control vs. N is highly significant. (ix) Av. yield of grain in Kg/ha.

$N_0F_0=289$  and  $N_0F_1=284$  Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	426	516	478	493	453	473
N <sub>2</sub>	486	501	329	478	399	439
Mean	456	508	404	486	426	456
F <sub>0</sub>	523	523	411			
F <sub>1</sub>	389	493	396			

C.D. for S marginal means=74.1 Kg/ha.

C.D. for two means in the body of S × N table=104.7 Kg/ha.

C.D. of control vs. N marginal means=52.4 Kg/ha.

62(7)

(i) 1888 Kg/ha. (ii) (a) 675.99 Kg/ha. (b) 512.59 Kg/ha. (iii) No effect is significant. (iv) Av. yield of grain in Kg/ha.

 $N_0F_0=1479$  and  $N_0F_1=1938$  Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	2045	1704	1988	1880	1945	1912
N <sub>2</sub>	2120	2242	1764	1880	2205	2042
Mean	2082	1973	1876	1880	2075	1977
F <sub>0</sub>	1958	1803	1878			
F <sub>1</sub>	2207	2144	1875			

63(7)

(i) 909 Kg/ha. (ii) (a) 311.12 Kg/ha. (b) 214.77 Kg/ha. (iii) Control vs. N is highly significant. (iv) Av. yield of grain in Kg/ha.

 $N_0F_0=726$  and  $N_0F_1=777$  Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>1</sub>	924	888	942	917	919	918
N <sub>2</sub>	996	1055	1124	1048	1068	1058
Mean	960	972	1033	982	994	988
F <sub>0</sub>	936	954	1058			
F <sub>1</sub>	984	990	1008			

C.D. for control vs. N marginal means=160.5 Kg/ha.

**Crop :- Jowar (Kharif).**  
**Site :- Agri. Res. Stn., Yeotmal.**

**Ref :- Mh. 60(208), 61(216), 62 (209).**  
**Type :- 'M'.**

Object :- To study the effect of micronutrients on the yield of Jowar.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) cotton (c) N.A. (ii) Medium black. (iii) 4.7.60 ; 6.7.61 ; 6.7.62. (iv) (a) Ploughings and harrowings. (b) Dibbling. (c) 10 Kg/ha. for 60 and 61 ; 14.8 Kg/ha. for 62. (d) 46 cm. × 23 cm. (e) 1 to 2 (v) 112 Kg/ha. of N as A/S+112 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super applied at the time of sowing. (vi) N.J 156. (vii) Unirrigated. (viii) 1 to 2 weedings and 3 to 4 hoeings. (ix) 78 cm. ; 112 cm. ; 119 cm. (x) N.A. for 60 and 61 ; 18,19,12,62.

## 2. TREATMENTS :

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

- (1) 2 levels of Zn as Zn SO<sub>4</sub> : A<sub>0</sub>=0 and A<sub>1</sub>=22.4 Kg/ha.  
 (2) 2 levels of Mn as MnSO<sub>4</sub> : B<sub>0</sub>=0 and B<sub>1</sub>=22.4 Kg/ha.  
 (3) 2 levels of Cu as CuSO<sub>4</sub> : C<sub>0</sub>=0 and C<sub>1</sub>=22.4 Kg/ha.  
 (4) 2 levels of Molybdenum as Sod. Molybdate : D<sub>0</sub>=0 and D<sub>1</sub>=0.18 Kg/ha.  
 (5) 2 levels of Boron : E<sub>0</sub>=0 and E<sub>1</sub>=22.4 Kg/ha.

## 3. DESIGN :

(i) 2<sup>5</sup> fact. confd. (ii) (a) 8 plots/block ; 4 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 8.53 m. × 5.49 m. (b) 7.32 m. × 3.66 m. (v) 61 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Good. (ii) Stem borer attack. (iii) Yield of grain. (iv) (a) 1960-62. (b) and (c) Nil (v) and (vi) Nil. (viii) As the error variances are heterogeneous and interaction is absent, therefore individual year results are given under 5-Results.

## 5. RESULTS :

60(208)

(i) 1658 Kg/ha. (ii) 387.8 Kg/ha. (iii) None of the effects is significant. (iv) Mean and differential response table in Kg/ha.

Treatment	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	22.7	--	--	-58.9	13.4	13.4	-58.9	-58.3	12.8	-39.0	-6.4
B	72.9	36.7	109.1	--	--	130.0	15.7	-16.3	162.1	-61.2	207.9
C	22.7	58.9	-13.4	79.9	-34.4	--	--	43.1	2.3	-25.1	70.6
D	43.1	7.6	78.7	46.1	132.4	63.6	22.7	--	--	1.7	84.0
E	152.2	135.9	168.5	18.1	286.3	104.4	200.0	110.8	193.6	--	--

61(216)

(i) 586 Kg/ha. (ii) 108.6 Kg/ha. (iii) None of the effects is significant. (iv) Mean and differential response table in Kg/ha.

Treatment	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	46.0	--	--	74.9	17.1	38.2	53.8	58.4	33.6	47.0	45.0
B	11.1	40.0	-17.7	--	--	17.7	4.5	9.9	12.4	15.3	7.0
C	31.9	24.1	39.6	38.5	25.3	--	--	26.9	36.8	28.8	35.0
D	21.5	33.9	9.1	20.3	22.7	16.6	26.4	--	--	1.7	44.8
E	2.1	3.1	1.2	6.3	-2.0	-0.9	5.2	21.1	25.4	--	--

62(209)

(i) 760 Kg/ha. (ii) 229.5 Kg/ha. (iii) Only the effect of D is significant. (iv) Mean and differential response table in Kg/ha.

Treatment	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	-39.6	-	-	-14.1	-65.1	-54.6	-24.6	-105.6	26.4	-39.1	-40.1
B	-92.8	-67.3	-118.3	-	-	-57.1	-128.4	-91.6	-94.0	-76.2	-109.4
C	65.7	50.7	80.7	101.4	30.1	-	-	81.1	50.4	45.6	85.8
D	88.7	22.7	154.7	89.9	87.5	104.0	73.4	-	-	148.5	28.9
E	17.3	17.8	16.8	33.9	0.7	-2.8	37.4	77.1	-42.4	-	-

C.D. for mean response=81.1 Kg/ha.

**Crop :- Jowar (Kharif).**  
**Site :- M.A.E. Centre, Akola.**

**Ref :- Mh. 61,62(M.A.E.)**  
**Type :- 'M'**

**Object :-**Type IX : To study the effect of different methods of application of different phosphatic fertilizers on the yield of *Jowar*.

**1. BASAL CONDITIONS :**

- (i) (a) N.A. (b) N.A. (c) N.A. (ii) Medium black. (iii) 13.7.61 ; N.A. (iv) (a) 2 harrowings. (b) Drilling with the cultured magha attached with bowel (c) 4.5 Kg/ha. (d) 53 cm. x 15 to 23 cm. (e) -. (v) Nil. (vi) Local (160 days duration). (vii) N.A. (viii) 2 hoeings and 3 weedings. (ix) 76 cm. ; N.A. (x) 14.12.61 ; Z.A.

**2. TREATMENTS:**

All combinations of (1), (2) and (3)+4 extra treatments in each block.

(1) 3 types of phosphates :  $P_1$ =super,  $P_2$ =ODDA (20-20-0) and  $P_3$ =PEC (16-14-0)

(2) 3 levels of phosphates :  $L_1$ =13.5 Kg/ha. of N+11.8 Kg/ha. of  $P_2O_5$ ,  $L_2$ =2  $L_1$  and  $L_3$ =4 $L_1$ .

(3) 3 methods of application :  $M_1$ =Broadcast before final cultivation,  $M_2$ =6.3 cm. below seed and  $M_3$ =Band placement.

4 Extra treatments are :  $N_0$ =0,  $N_1$ =13.5,  $N_2$ =26.9 and  $N_3$ =53.8 Kg/ha. of N as A/S.

Fertilizers applied at sowing.

**3. DESIGN :**

- (i)  $3^3$  fact. + 4 extra in each block. (ii) (a) 13 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) 10.4 m x 4.9 m. (b) 9.8 m. x 4.3 m. (v) 30 cm. x 30 cm. (vi) Yes.

**4. GENERAL :**

- (i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961-62. (b) No. (c) Nil. (v) to (vii) Nil.

**5. RESULTS :**

**61(M.A.E.)**

- (i) 880 Kg/ha. (ii) 222.3 Kg/ha. (iii) Interactions  $P \times L$  and  $PL^2M$  are highly significant. Interaction  $PL^2M^2$  is significant. (iv) Av. yield of grain in Kg/ha.

$N_0$ =701,  $N_1$ =765,  $N_2$ =932 and  $N_3$ =941 Kg/ha.

	$L_1$	$L_2$	$L_3$	$M_1$	$M_2$	$M_3$	Mean
$P_1$	950	867	941	959	802	996	919
$P_2$	765	710	931	812	710	884	802
$P_3$	830	1356	747	1033	876	1025	978
Mean	848	978	873	935	796	968	900
$M_1$	802	1024	979				
$M_2$	710	839	839				
$M_3$	1032	1071	801				

C.D. of body of  $P \times L$  table=259.1 kg/ha.



62(M.A.E.)

(i) 561 Kg/ha. (ii) 99.5 Kg/ha. (iii) Main effect of M is significant, N effect is highly significant. (iv) Av. yield of grain in Kg/ha.

$N_0=521, N_1=492, N_2=702$  and  $N_3=487$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
P <sub>1</sub>	547	571	532	508	611	530	550
P <sub>2</sub>	572	542	566	650	538	491	560
P <sub>3</sub>	558	630	568	643	587	525	585
Mean	559	581	555	600	579	516	565
M <sub>1</sub>	609	628	564				
M <sub>2</sub>	589	597	550				
M <sub>3</sub>	479	513	552				

C.D for M marginal means = 67.1 Kg/ha.

C.D. for N marginal means = 116.0 Kg/ha.

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 64(116).**

**Site :- Agri. Res. Stn., Dhulia.**

**Type :- 'MV'.**

**Object :-** To study the effect of different levels of N on different varieties of Jowar.

#### 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Gram and Jowar. (c) N.A. (ii) Medium black. (iii) 15.7.64. (iv) (a) One ploughing and 2 harrowings (b) Drilling. (c) 4 Kg/ha. (d) 46 cm. × 15 to 23 cm. (e) —. (v) 12.5 C.L/ha of F.Y.M. (vi) As per treatments. (vii) Unirrigated. (viii) 2 interculturings and weeding. (ix) 58 cm. (x) 26.11.64.

#### 2. TREATMENTS:

**Main-plot treatments :**

5 levels of N as A/S :  $N_0=0, N_1=22.4, N_2=44.8, N_3=67.2$  and  $N_4=89.6$  Kg/ha.

**Sub-plot treatments :**

10 varieties :  $V_1=K-2-10, V_2=chopde 3-10, V_3=Nahalpur 5-3, V_4=PJ 8 K, V_5=1 Ramkel, V_6=D-18, V_7=H-4-1, V_8=H-1-4, V_9=H-1-5$  and  $V_{10}=H.S. 111 A-1-4-1$ .

Manure applied half at sowing + half at 1 month after sowing.

#### 3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication ; 10 sub-plots/main-plot. (b) 36.6 m. × 49.4 m, (iii) 4. (iv) 9.14 m. × 3.66 m. (b) 7.62 m. × 2.74 m. (v) 76 cm. × 46 cm. (vi) Yes.

#### 4. GENERAL :

(i) Normal. (ii) Stem borer attack ; 20% E.C. Endrin sprayed. (iii) Yield of grain. (iv) (a) 1964 only. (b) N.A. (c) Nil. (v) and (vi) Nil. (vii) The treatment of 44.8 Kg/ha. of N failed to produce the grain formation, hence while analysis of variance was done 1 main-plot was deleted viz  $N_2$ .

#### 5. RESULTS :

(1) 497 Kg/ha. (ii) (a) 368.0 Kg/ha. (b) 396.5 Kg/ha. (iii) Main effect of V is highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	Mean
N <sub>0</sub>	928	283	825	411	42	718	132	137	93	103	367
N <sub>1</sub>	1316	349	368	553	175	730	212	606	1304	135	575
N <sub>3</sub>	1459	624	463	490	172	1238	237	795	135	144	576
N <sub>4</sub>	1196	323	646	708	165	825	407	157	103	179	471
Mean	1225	395	576	540	138	878	247	424	409	140	497

C.D. for V marginal means=278.2 Kg/ha.

**Crop :- Jowar (Rabi.)**

**Ref :- Mh. 62(205).**

**Site :- Agri. Res. Stn., Mohol.**

**Type :- 'MV'.**

Object :- To study the manurial effect on different varieties of Jowar.

**1. BASAL CONDITIONS :**

(i) (a) Jowar-Pulses. (b) Moong. (c) Nil. (ii) Medium light. (iii) 15,16,10,1962. (iv) (a) 2 harrowings. (b) Drilling. (c) 7 kg/ha. (d) 46 cm. (e) —. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 hoeings and 2 weedings. (ix) 6 cm. (x) 28.2.63.

**2. TREATMENTS :**

**Main-plot treatments :**

3 manurial treatments : M<sub>1</sub>=12.4 C.L./ha. of F.Y.M. before sowing, M<sub>2</sub>=12.4 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> at sowing and M<sub>3</sub>=12.4 C.L./ha. of F.Y.M. + 44.8 Kg/ha. of N+44.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub> in split doses at sowing and 3 weeks after sowing.

N as A/S and P<sub>2</sub>O<sub>5</sub> as super.

**Sub-plot treatments :**

V<sub>1</sub>=PJ-1R, V<sub>2</sub>=PJ-3R, V<sub>3</sub>=PJ-7R, V<sub>4</sub>=PJ-4R, V<sub>5</sub>=PJ-14R, V<sub>6</sub>=PJ-15R, V<sub>7</sub>=PJ-5R, V<sub>8</sub>=PJ-17R, V<sub>9</sub>=PJ-18R, V<sub>10</sub>=PJ-19R, V<sub>11</sub>=PJ-16R, V<sub>12</sub>=H-35-1, V<sub>13</sub>=H-47-3, V<sub>14</sub>=D-22-15, V<sub>15</sub>=240 11-5-7 and V<sub>16</sub>=19-2-17-3-22.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 3 main plots/replication, 16 sub-plots/main-plot. (b) N.A. (iii) 4 (iv) 7.02 m. × 1.82 m. (b) 6.10 m. × 0.91 m. (v) 46 cm. × 46 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962 only. (b) No. (c) Nil. (v) N.A. (vi) No. (vii) No.

**5. RESULTS :**

(i) 857 Kg/ha. (ii) (a) 549.0 Kg/ha. (b) 321.9 Kg/ha. (iii) Only V effect is highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	V <sub>11</sub>	V <sub>12</sub>	V <sub>13</sub>	V <sub>14</sub>	V <sub>15</sub>	V <sub>16</sub>	Mean
M <sub>1</sub>	685	722	816	521	640	744	787	780	922	588	612	915	1023	909	838	856	772
M <sub>2</sub>	785	820	714	426	522	1014	785	1250	564	780	1063	466	959	795	820	926	793
M <sub>3</sub>	933	928	880	586	916	1079	782	1120	928	971	1048	1338	1338	1024	1089	1137	1006
Mean	801	823	803	511	693	946	785	1050	805	780	908	906	1107	909	916	973	857

C.D. for V marginal means=260.2 kg/ha.

**Crop :- Jowar (Kharif).****Ref :- Mh. 64(150).****Site :- Main Millet Res. Stn., Parbhani.****Type :- 'MV'.**Object :—To study the effect of application of N at different phases of growth of *Jowar*.**1. BASAL CONDITIONS :**

(i) (a) Nil (b) and (c) N.A. (ii) Medium black. (iii) 16, 17.7.64. (iv) (a) 4 harrowings. (b) Dibbling. (c) 10 Kg/ha. (d) 46 cm. × 30 cm. (e) 1. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 75 cm. (x) 8.12.64.

**2. TREATMENTS :****Main-plot treatments :** $V_1 = \text{PJ}-4 \text{ K}$ ,  $V_2 = \text{PJ}-16 \text{ K}$ ,  $V_3 = \text{BS}-12-2-11$  and  $V_4 = 9 \text{ Imp. saoner}$ .**Sub-plot treatments :**Same as in expt. no. 64(152) on *Jowar* crop conducted at Parbhani and presented on page No. 214.**3. DESIGN :**

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 9 14 m. × 3.66 m. (b) 7.62 m. × 2.73 m. (v) 76 cm. × 46 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Height, no. of leaves and yield of grain. (iv) (a) 1964 only. (b) and (c) Nil. (v) to (vii) Nil.

**5. RESULTS :**

(i) 1198 Kg/ha. (ii) (a) 1202.7 Kg/ha. (b) 488.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	$M_0$	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$	$M_6$	$M_7$	$M_8$	Mean
$V_1$	1153	1289	759	1033	1291	1133	1330	993	1228	1134
$V_2$	926	1568	1237	1951	1259	1655	1782	1020	1143	1393
$V_3$	1237	905	1457	927	1050	1231	872	1325	1067	1119
$V_4$	758	1158	1035	1188	1061	1384	1313	1213	1186	1144
Mean	1018	1230	1122	1275	1165	1351	1324	1138	1156	1198

**Crop :- Jowar (Rabi).****Ref :- Mh. 64(151).****Site :- Main Millet Res. Stn., Parbhani.****Type :- 'MV'.**Object :—To study the effect of application of N fertilizers on different varieties of *Jowar*.**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black. (iii) 5, 7.10.64. (iv) (a) Harrowing. (b) Dibbling. (c) 10 Kg/ha. (d) 46 cm. × 30 cm. (e) 1. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 25 cm. (x) 21.2.65.

**2. TREATMENTS :****Main-plot treatments :**5 manurial treatments:  $M_0 = 0$ ,  $M_1 = 22.4 \text{ Kg/ha. of } P_2O_5 \text{ as Super}$ ,  $M_2 = 22.4 \text{ Kg/ha. of N as A/S} + 22.4 \text{ Kg/ha. of } P_2O_5 \text{ as Super}$ ,  $M_3 = 44.8 \text{ Kg/ha. of N as A/S} + 22.4 \text{ Kg/ha. of } P_2O_5 \text{ as Super}$  and  $M_4 = 67.2 \text{ Kg/ha. of N as A/S} + 22.4 \text{ Kg/ha. of } P_2O_5 \text{ as Super}$ .**Sub-plot treatments :**10 varieties:  $V_1 = \text{PJ}-7 \text{ R}$ ,  $V_2 = \text{PJ}-14 \text{ R}$ ,  $V_3 = \text{PJ}-16 \text{ R}$ ,  $V_4 = \text{PJ}-17 \text{ R}$ ,  $V_5 = \text{PJ}-18 \text{ R}$ ,  $V_6 = \text{PJ}-19 \text{ R}$ ,  $V_7 = 550-1-11-29$ ,  $V_8 = \text{Barti } 3-8-2$ ,  $V_9 = 240-1-11-5-7$  and  $V_{10} = \text{M}-35-1$ .

## 3. DESIGN :

(i) Split-plot. (ii) 5 main-plots/replication ; 10 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 9.14 m. × 3.66 m. (b) 7.32 m. × 2.73 m. (v) 91 cm. × 46 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964 only. (b) and (c) No. (v) to (vii) Nil.

## 5. RESULTS :

(i) 956 Kg/ha. (ii) (a) 322.4 Kg/ha. (b) 240.2 Kg/ha. (iii) Main effect of M is highly significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	Mean
M <sub>0</sub>	502	743	775	759	791	527	713	861	637	734	704
M <sub>1</sub>	787	799	799	885	750	882	795	760	918	704	808
M <sub>2</sub>	851	701	774	826	730	921	791	1024	1048	992	866
M <sub>3</sub>	1152	1024	1284	1216	985	1403	1149	1170	984	1331	1170
M <sub>4</sub>	1206	1578	1157	1105	1177	1245	1192	1302	1094	1261	1232
Mean	900	969	958	958	887	996	928	1023	936	1004	956

C.D. for M marginal means = 157.1 Kg/ha.

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 64 (152).**

**Site :- Main Millet Res. Stn., Parbhani.**

**Type :- 'MV'.**

Object :- To study the effect of application of N at different phases of growth of different varieties of jowar.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black. (iii) 22.10.64. (iv) (a) Harrowing. (b) Dibbling. (c) 4.5 Kg/ha. (d) 46 cm. × 30 cm. (e) —. (v) and (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 25 cm. (x) 12.3.65.

## 2. TREATMENTS :

## Main-plot treatments :

8 varieties : V<sub>1</sub>=PJ-5 R, V<sub>2</sub>=PJ-7 R, V<sub>3</sub>=PJ-14 R, V<sub>4</sub>=PJ-16 R, V<sub>5</sub>=PJ-17 R, V<sub>6</sub>=PJ-18 R, V<sub>7</sub>=M 35-1, V<sub>8</sub>=M 47-3.

## Sub-plot treatments :

9 time of application of 67.2 Kg/ha. of N as A/S: M<sub>0</sub>=Control (no application), M<sub>1</sub>=Whole as basal dose at sowing, M<sub>2</sub>= $\frac{1}{2}$  at sowing +  $\frac{1}{2}$  at the time of panicle initiation, M<sub>3</sub>= $\frac{1}{2}$  at sowing +  $\frac{1}{2}$  at the time of reduction division, M<sub>4</sub>= $\frac{1}{2}$  at sowing +  $\frac{1}{2}$  at full heading, M<sub>5</sub>= $\frac{1}{2}$  at sowing +  $\frac{1}{4}$  at panicle initiation +  $\frac{1}{4}$  at reduction division, M<sub>6</sub>= $\frac{1}{2}$  at sowing +  $\frac{1}{4}$  at panicle initiation +  $\frac{1}{4}$  at full heading, M<sub>7</sub>= $\frac{1}{2}$  at sowing +  $\frac{1}{4}$  at reduction division +  $\frac{1}{4}$  at full heading and M<sub>8</sub>= $\frac{1}{2}$  at sowing +  $\frac{1}{8}$  at panicle initiation +  $\frac{1}{8}$  at reduction division +  $\frac{1}{8}$  at full heading.

12.35 C.L./ha. of F.Y.M. applied as basal dose to all the sub-plots.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 8 main-plots/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7.32 m. × 3.66 m. (b) 6.40 m. × 2.73 m. (v) 46 cm. × 46 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964 only. (b) No. (c) Nil. (v) to (vii) Nil.

## 5. RESULTS :

(i) 1467 Kg/ha. (ii) (a) 797.3 Kg/ha. (b) 309.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	V <sub>8</sub>	Mean
M <sub>0</sub>	1345	1489	1169	1875	1538	1304	1317	1654	1461
M <sub>1</sub>	1149	1232	1119	1775	1439	1588	1296	1788	1423
M <sub>2</sub>	1566	1592	1348	1916	1468	1331	1291	1459	1496
M <sub>3</sub>	1326	1650	1301	1911	1781	1667	1371	1751	1595
M <sub>4</sub>	1243	1646	1253	1740	1467	1239	1234	1738	1445
M <sub>5</sub>	1116	1727	1283	1827	1452	1357	1660	1502	1490
M <sub>6</sub>	1230	1266	1227	1837	1283	1216	1099	1771	1366
M <sub>7</sub>	1411	1562	1304	1737	1385	1505	1331	1573	1476
M <sub>8</sub>	1682	1296	1239	1585	1328	1249	1420	1794	1449
Mean	1341	1496	1249	1800	1460	1384	1335	1670	1467

**Crop :- Jowar (*Kharif*).**

**Ref :- Mb. 60(43), 61(195), 62(194), 63(233).**

**Site :- Agri. Res. Stn., Akola.**

**Type :- 'C'.**

Object :—To find out the best treatment which will give highest economic return per hectare.

## 1. BASAL CONDITIONS :

(i) (a) Not fixed. (b) N.A. : Cotton in other years. (c) N.A. : 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> in other years. (ii) Black-cotton. (iii) 23.7.60 ; 24.7.61 ; 9.7.62 ; 10.7.63. (iv) (a) 3 harrowings ; 3 harrowings and *bakharing* in other years. (b) Drilling. (c) 7 to 9 Kg/ha. (d) 30 cm. between rows. (e) 1 to 2. (v) 108 Kg/ha. of G.M. buried on 24.8.60 ; 12.4 C.L./ha. of F.Y.M. broadcast before *bakharing* in 61 to 63 and 11.2 Kg/ha. of N+162.1 Kg/ha. of P<sub>2</sub>O<sub>5</sub> one month after sowing in 63. (vi) Improved saoner. (vii) Un-irrigated. (viii) N.A. ; 2 hoeings and 2 weedings in other years. (ix) N.A. (x) 6.1.61 ; 16. 17.1.62 ; 2nd week of Dec., 62 ; 23.12.63.

## 2. TREATMENTS :

5 cultural treatments: C<sub>0</sub>=46 cm.×23 cm. spacing (control), C<sub>1</sub>=*Jowar* and *Moong* alternate lines, C<sub>2</sub>=*Jowar* and *Udid* alternate lines, C<sub>3</sub>=*Jowar* and *Sannhemp* alternate line and C<sub>4</sub>=*Jowar* and Groundnut alternate line *Sam* being G.M.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 10.06 m.×10.06 m. (v) N.A. (vi) Yes.

## 4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain (*jowar*). (iv) (a) 1960 to 64. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) N.A. (vii) Experiment in 64 vitiated, error variances are homogeneous and Treatments×years interaction is absent.

## 5. RESULTS :

Pooled results

(i) 1827 Kg/ha. (ii) 238.5 Kg/ha. (based on 76 d.f. made up of pooled error and Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	C <sub>0</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>
Av. yield	1810	1800	1781	1957	1788

## Individual results

Treatment	C <sub>0</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	Sig.	G.M.	S.E./plot
Year								
1960	1737	1705	1678	1745	1759	N.S.	698	236.2
1961	1692	1554	1569	1537	1661	N.S.	1603	73.5
1962	1831	2173	2093	2471	2056	*	2125	114.9
1963	1978	1768	1784	2076	1677	*	1857	89.5
Pooled	1810	1800	1781	1957	1788	N.S.	1827	238.5

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 60(42).**

**Site :- Agri. Res. Stn., Akola.**

**Type :- 'C'.**

Object :--To study the suitable method of sowing and spacing for *jowar*.

## 1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Black cotton. (iii) 22.7.60. (iv) (a) 2 *bakharings*. (b) As per treatments. (c) N.A. (d) and (e) As per treatments. (v) 8.6 C.L./ha. of F.Y.M. applied before sowing. (vi) Improved saoner. (vii) Unirrigated. (viii) 2 weedings and 3 hoeings. (ix) 62 cm. (x) 5.1.61.

## 2. TREATMENTS :

5 methods of cultivation : M<sub>1</sub>=46 cm. × 23 cm. spacing, Argade sowing, M<sub>2</sub>=46 cm. × 46 cm. spacing, *chaufuli* sowing, 2 plants per hole, M<sub>3</sub>=61 cm. × 61 cm. spacing, *chaufuli* sowing, 2 plants per hole, M<sub>4</sub>=46 cm. × 46 cm. spacing, *chaufuli* sowing, poona method. and M<sub>5</sub>=61 cm. × 61 cm. spacing, *chaufuli* sowing, poona method.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 10.06 m. × 10.06 m. (v) N.A. (vi) Yes.

## 4. GENERAL :

(i) N.A. (ii) Mild attack of Stem borer. (iii) Yield of grain and fodder. (iv) (a) 1960 only. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 2814 Kg/ha. (ii) 209.5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>
Av. yield	2666	2763	2244	2740	2429

C.D. = 280.9 Kg/ha.

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 61(191), 62(192), 63(232).**

**Site :- Agri. Res. Stn., Akola.**

**Type :- 'C'.**

Object :--To find the best method for sowing of *jowar*.

## 1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) Cotton. (c) 10 C.L./ha. of F.Y.M. ; 22.4 Kg/ha. of N ; 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Black cotton. (iii) 22.7.61 ; 15.7.62 ; 13.7.63. (iv) (a) 4 harrowings and *bakharings*. (b) As per treatments. (c) 9 Kg/ha. (d) and (e) As per treatments. (v) 12.4 C.L./ha. of F.Y.M. broadcast during summer and 11.2 Kg/ha. of N as A/S + 11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. (vi) Improved saoner. (vii) Unirrigated. (viii) 3 hoeings and 2 weedings. (ix) 73 cm. ; 78 cm. ; 51 cm. (x) 15.1.62 ; 4.1.63. ; 23.12.63.

## 2. TREATMENTS :

5 sowing methods :  $T_1$ =Argada sowing (control) with 46 cm. × 23 cm. spacings,  $T_2$ =*Chaufuli* sowing with 46 cm. × 46 cm. spacings and 2 plants/hole,  $T_3$ =*Chaufuli* sowing with 61 cm. × 61 cm. spacings and 2 plants/hole,  $T_4$ =Poona method of sowing with 46 cm. × 46 cm. spacings and 3 plants/hole and  $T_5$ =Poona method of sowing with 61 cm. × 61 cm. spacings and 3 plants/hole.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 10'06 m. × 10'06 m. (b) 1/108'7 ha. for  $T_1$  (control) and 1/112'4 ha. for others. (v) Yes ; exact dimensions N.A. (vi) Yes.

## 4. GENERAL :

(i) Normal ; Satisfactory. (ii) Red leaf. (iii) Yield of grain. (iv) (a) 1961 to 64. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) No. (vii) Error variances are heterogeneous and Treatments × years interaction is present. Expt. in 64 vitiated.

## 5. RESULTS :

Pooled results

(i) 2079 Kg/ha. (ii) 511'6 Kg/ha. (based on 8 d.f. made up of Treatments × years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$
Av. yield	2067	2335	1967	1955	2072

Individual results

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	Sig.	G.M.	S.E./plot
Year								
1961	1639	1940	1882	1565	1898	**	1785	119.8
1962	2439	3096	2316	2282	2289	**	2484	329.4
1963	2122	1970	1702	2019	2028	N.S.	1968	343.5
Pooled	2067	2335	1967	1955	2072	N.S.	2079	511.6

**Crop :- Jowar (Kharif). Ref :- Mh. 61(148), 62(135), 63(179), 64(147), 65(29).**

**Site :- Govt. Exptl. Farm, Type :- 'C'.  
Akola.**

Object :- To find out optimum time of sowing for *Jowar*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 12.5 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$  for 61 and 62 ; 22.4 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$  for 63 and 65 ; N.A. for 64. (ii) Black cotton soil. (iii) As per treatments. (iv) (a) Ploughing and 1 to 4 harrowings. (b) Drilled. (c) 9 Kg/ha. (d) 46 cm. × 30 cm. for 61 to 64 ; 46 cm. × 23 cm. for 65. (e) 3 to 4. (v) Nil for 64 ; 12.5 C.L./ha. of F.Y.M. broadcast for others. (vi) Improved saoner. (vii) Unirrigated. (viii) 1 to 4 hoeings and 1 to 2 weedings. (ix) 73 cm. ; 82 cm. ; 51 cm. ; 54 cm. ; N.A. (x) 14 to 23.12.61 ; N.A. ; 21.12.63 ; 27.12.64 ; 21.11.65 to 8.12.65.

## 2. TREATMENTS :

6 dates of sowing :  $D_1$ =23rd June,  $D_2$ =30th June,  $D_3$ =8th July,  $D_4$ =15th July,  $D_5$ =23rd July, and  $D_6$ =31st July.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (ii) 4. (iv) (a) 6'40 m. × 10'97 m. (6) 4'57 m. × 9'14 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal for all years but lodging occurred in late sowing in 63. (ii) Incidence of leaf rust in Sept. for 61 ; B.H.C. 10 % sprayed for Stem borer in 63 ; Nil for others. (iii) Population count and yield of grain. (iv) (a) 1961-67. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Expt. is continued and hence individual years results presented under 5 Results.

## 5. RESULTS :

## 61(148)

(i) 1386 Kg/ha. (ii) 296.8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	1679	1290	1489	1258	1196	1401

## 62(135)

(i) 1277 Kg/ha. (ii) 282.5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	1507	936	1259	1489	1351	1118

## 63(179)

(i) 1498 Kg/ha. (ii) 188.0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	1405	1507	1644	1764	1471	1196

C.D. = 283.2 Kg/ha.

## 64(147)

(i) 1363 Kg/ha. (ii) 256.2 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	1252	1311	1366	1805	1552	893

C.D. = 386.1 Kg/ha.

## 65(29)

(i) 1366 Kg/ha. (ii) 263.0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	1164	1782	1633	1591	1290	754

C.D. = 396.2 Kg/ha.

**Crop :- Jowar (Kharif).**  
**Site :- Regl. Res. Stn., Amaravati.**

**Ref :- Mb. 60(198).**  
**Type :- 'C'.**

Object :- To study the effect of different spacings and seed rate on the yield of *Jowar*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) Medium black. (iii) 16, 17.7.60. (iv) (a) Harrowing. (b) As per treatments. (c) 9 Kg/ha. (d) and (e) As per treatments. (v) Nil. (vi) Saoner. (vii) Unirrigated. (viii) Weeding and 4 hocings. (ix) 51 cm. (x) 16.1.61.



## 2. TREATMENTS :

All combinations of (1) and (2) + one extra treatment ( $T_1$ )

(1) 3 spacings:  $S_1=46 \text{ cm.} \times 46 \text{ cm.}$ ,  $S_2=61 \text{ cm.} \times 61 \text{ cm.}$  and  $S_3=91 \text{ cm.} \times 91 \text{ cm.}$

(2) 4 no. of plants/hill:  $P_1=1$ ,  $P_2=2$ ,  $P_3=3$  and  $P_4=4$ .

$T_1$ =Hand sowing with 46 cm. spacing.

In all other treatments method of sowing is dibbling.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 9'14 m.  $\times$  9 14 m. (v) N.A. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956-60. (b) No. (c) Nil. (v) to (vii) Nil.

## 5. RESULTS :

(i) 2392 Kg/ha. (ii) 430.2 Kg/ha. (iii) S effect alone is significant. (iv) Av. yield of grain in Kg/ha.

$T_1=2712 \text{ Kg/ha.}$

	$P_1$	$P_2$	$P_3$	$P_4$	Mean
$S_1$	2441	2848	2278	2509	2519
$S_2$	2265	2685	2265	2550	2441
$S_3$	1817	2061	2251	2414	2136
Mean	2174	2531	2265	2491	2365

C.D. for S marginal means = 308.8 Kg/ha.

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 63(88), 65(195).**

**Site :- Trial-Cum-Demons. Farm, Bendsura.**

**Type :- 'C'.**

Object :- To find out a suitable double crop.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) As per treatments. (ii) Black soil. (iii) 4.10.63 and 31.10.63 ; 3.10.65. (iv) (a) 2 to 3 harrowings. (b) Drilling. (c) N.A. ; 14.8 Kg/ha. (d) 46 cm. (e) Nil. (v) Nil ; 44.8 Kg/ha. of N and 44.8 Kg/ha. of P. (vi) M-35-1. (vii) Irrigated. (viii) 2 interculturations. (ix) Nil ; 3.9 cm. (x) 11.2.64 and 22.2.64 ; 1.3.66.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 5 previous crops:  $T_1$ =Sannhamp,  $T_2$ =Groundnut,  $T_3$ =China mung,  $T_4$ =Udid and  $T_5$ =Fallow.

(2) 2 levels of  $P_2O_5$ :  $P_0=0$  and  $P_1=22.4 \text{ Kg/ha.}$

## 63. DESIGN :

(i) Fact. in R.B.D. (ii) 10. (b) N.A. (iii) 4. (iv) (a) 10'97 m.  $\times$  7'32 m. (b) 9'14 m.  $\times$  5'49 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Sugary disease ; Nil. (iii) Yield of grain. (iv) (a) 63-contd. (vitiating in 64). (b) Yes. (c) No. (v) Golegaon. (vi) Nil. (vii) Error variances are heterogeneous, hence results of individual years are presented under 5. Results

## 5. RESULTS :

63(88)

(i) 598 Kg/ha. (ii) 134.6 Kg/ha. (iii) Main effects of P and T are highly significant. (iv) (a) Av. yield of grain in Kg/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	Mean
P <sub>0</sub>	899	244	655	653	840	658
P <sub>1</sub>	628	157	573	598	733	538
Mean	763	200	614	626	786	598

C.D. for P marginal means=87.4 Kg/ha.

C.D. for T marginal means=138.1 Kg/ha.

65(195)

- (i) 474 Kg/ha. (ii) 52.8 Kg/ha. (iii) Main effect of T and interaction P×T are highly significant.  
 (iv) Av. yield of grain in Kg/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	Mean
P <sub>0</sub>	560	131	500	550	625	491
P <sub>1</sub>	844	93	550	594	205	457
Mean	702	112	570	572	415	474

C.D. for T marginal means=54.2 Kg/ha.

C.D. for body of P×T table=76.5 Kg/ha.

**Crop :- Jowar (Rabi).**

**Site :- Agri. Res. Stn., Chas.**

**Ref :- Mh. 60(65).**

**Type :- 'C'.**

Object :—To study the effect of different spacings and seed rates on *Jowar*.

1. BASAL CONDITIONS:

- (i) (a) Nil. (b) Gram. (c) N.A. (ii) Medium black. (iii) 17.9.60. (iv) (a) 1 ploughing and 3 harrowings.  
 (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) M—35—1. (vii) Unirrigated. (viii) 2 inter-culturing. (ix) 20 cm. (x) 3.2.61.

2. TREATMENTS:

Main-plot treatments:

3 spacings: S<sub>1</sub>=30 cm., S<sub>2</sub>=46 cm. and S<sub>3</sub>=61 cm.

Sub-plot treatments:

3 seed rates: R<sub>1</sub>=5, R<sub>2</sub>=7 and R<sub>3</sub>=9 Kg/ha.

3. DESIGN:

- (i) Split-plot. (ii) (a) 3 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 5.49 m. × 10.97 m. (b) 3.66 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

4. GENERAL:

- (i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—61. Design changed in 61 (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Design changed in 61.

5. RESULTS:

- (i) 563 Kg/ha. (ii) (a) 161.4 Kg/ha. (b) 241.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	Mean
S <sub>1</sub>	409	586	586	527
S <sub>2</sub>	681	536	592	603
S <sub>3</sub>	605	584	491	560
Mean	565	569	556	563

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 60(87), 61(76).**

**Site :- Agri. Res. Stn., Chas.**

**Type :- 'C'.**

**Object:—**To study the effect of weeding and interculturing on removal of weeds as well as reducing evaporation loss for *Jowar*.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) Medium black. (iii) 29.9.60 ; 17.10.61. (iv) (a) 1 ploughing, 3 harrowings ; 3 harrowings, (b) Drilling. (c) 5 Kg/ha. (d) 46 cm. (e) —. (v) Nil. (vi) M 35-1 (vii) Unirrigated. (viii) As per treatments. (ix) 45 cm. ; 81 cm. (x) 13.2.61 ; 26.2.62.

**2. TREATMENTS :**

All combinations of (1) and (2) + 2 extra treatments.

(1) 4 time of cultural operation: T<sub>0</sub>=Nil, T<sub>1</sub>=1 operation during 3rd week, T<sub>2</sub>=2 operations during 3rd and 5th week T<sub>3</sub>=3 operations during 3rd, 5th and 8th week of growth.

(2) 3 cultural operations: C<sub>1</sub>=Interculturing, C<sub>2</sub>=weeding and C<sub>3</sub>=weeding followed by interculturing.

2 Extra treatments: E<sub>1</sub>=Weeding as and when required, E<sub>2</sub>=Interculturing as and when required.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) 4.57m × 12.19 m. (b) 3.66 m. × 10.97 m. (v) 46 cm. × 46 cm. (vi) Yes.

**4. GENERAL :**

(i) Growth not satisfactory: Normal (ii) Nil. (iii) Yield of grain. (iv) (a) 1958 to 61. (b) Yes. (c) Nil. (v) Jeur. (vi) No. (vii) Error variances for years 1958 to 61 are heterogeneous and interaction is absent. hence results for individual years are given under 5-Results.

**5. RESULTS**

**60(87)**

(i) 403 Kg/ha. (ii) 217.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

T<sub>0</sub>=360, E<sub>1</sub>=350 and E<sub>2</sub>=500 Kg/ha.

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	Mean
T <sub>1</sub>	369	340	466	392
T <sub>2</sub>	315	415	473	401
T <sub>3</sub>	555	306	477	446
Mean	413	354	472	413

**61(76)**

(i) 220 Kg/ha. (ii) 138.4 Kg/ha. (iii) Main effect of C alone is significant. (iv) Av. yield of grain in Kg/ha.

To=235.  $E_1=160$  and  $E_2=274$  Kg/ha.

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	Mean
T <sub>1</sub>	178	196	303	226
T <sub>2</sub>	146	240	272	219
T <sub>3</sub>	154	73	378	202
Mean	159	170	318	216

C.D. for C marginal means=114.2 Kg/ha.

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 61(74)**

**Site :- Agri. Res. Stn., Chas.**

**Type :- 'C'.**

Object :—To study the effect of different spacing and seed rates on *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) Medium black. (iii) 1.10.61. (iv) (a) 4 harrowings. (b) Drilling. (c) and (d) As per treatments. (e) —. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) 2 interculturings (ix) 21 cm. (x) 16.2.62.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 spacings :  $S_1=30$  cm.,  $S_2=46$  cm. and  $S_3=61$  cm.

(2) 3 seed rates :  $R_1=5$ ,  $R_2=7$  and  $R_3=9$  Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 6.10 m. × 10.97 m. (b) 3.66 m. × 9.14 m. (v) 122 cm. × 91 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957-67 (Design changed in 61). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 425 Kg/ha. (ii) 146.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	Mean
S <sub>1</sub>	370	441	429	413
S <sub>2</sub>	539	417	412	456
S <sub>3</sub>	516	360	343	406
Mean	475	406	395	425

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 62(12), 63(11), 64(6), 65(60).**

**Site :- Agri. Res. Stn., Dhulia.**

**Type :- 'C'.**

Object :—To find out the optimum time of sowing for *Jowar* crop.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar* for 65 and *Groundnut* for others. (c) 5 C.L./ha. of F.Y.M. (ii) Medium black. (iii) As per treatments. (iv) (a) One ploughing and one harrowing. (b) Dibbling. (c) 10 Kg/ha. (d) 46 cm. x 30 cm. (e) —. (v) 12 C.L./ha. of F.Y.M. (vi) K-2-2-10. (vii) Unirrigated. (viii) Interculturing and weeding. (ix) 33 cm.; 47 cm.; 59 cm.; 37 cm. (x) 2nd week of Oct., 62; 2nd week of Nov., 63; 10.11 64; 2nd week of Nov., 65.

## 2. TREATMENTS :

7 dates of sowing :  $D_1$ =2nd week of June,  $D_2$ =3rd week of June,  $D_3$ =4th week of June,  $D_4$ =1st week of July,  $D_5$ =2nd week of July,  $D_6$ =3rd week of July and  $D_7$ =4th week of July.

## 3. DESIGN :

(i) R.B.D. (ii) 7. (b) N.A. (iii) 4. (iv) (a) 10.97 m. x 6.40 m. (b) 10.14 m. x 5.49 m. for 62 and 9.14 m. x 4.57 m. for others (v) 91 cm. x 46 cm. for 62 and 91 cm. x 91 cm. for others. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil for 65; attack of stem-borer for others. Endrin sprayed. (iii) Yield of grain. (iv) (a) 1962-69. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Only first five treatments were taken into account for the analysis, as the last two treatments were failed from 1962 to 64. As the experiment is continued beyond 65, results of individual analysis are presented under 5-Results.

## 5. RESULTS :

## 62(12)

(i) 1093 Kg/ha. (ii) 127.6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$D_1$	$D_2$	$D_3$	$D_4$	$D_5$
Av. yield	1066	1146	1101	1196	957

## 63(11)

(i) 1212 Kg/ha. (ii) 334.9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$D_1$	$D_2$	$D_3$	$D_4$	$D_5$
Av. yield	1423	1256	1501	1543	335

C.D. = 515.8 Kg/ha.

## 64(6)

(i) 1298 Kg/ha. (ii) 433.0 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$D_1$	$D_2$	$D_3$	$D_4$	$D_5$
Av. yield	1941	1825	1076	989	658

C.D. = 667.1 Kg/ha.

## 65(60)

(i) 742 Kg/ha. (ii) 361.8 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$D_1$	$D_2$	$D_3$	$D_4$	$D_5$	$D_6$	$D_7$
Av. yield	918	553	993	1029	804	777	120

C.D. = 537.4 Kg/ha.

**Crop :- Jowar.**

**Ref :- Mh. 61 (47), 62(33), 63(54), 65(36).**

**Site :- Agri. Res. Stn., Digraj.**

**Type :- 'C'.**

**Object :- To find out the optimum date of sowing for Jowar.**

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut in 61, and 62 ; N.A ; Wheat. (c) 12.5 C.L./ha. of F.Y.M. in 61 and 62 ; N A ; 22.4 Kg./ha. of N and 22.4 Kg/ha. of  $P_2O_5$ . (ii) N.A. (iii) As per treatments. (iv) (a) 5 to 6 harrowings ; 3 to 4 harrowings ; Tractor ploughing and 3 to 4 harrowings ; (b) Drilling. (c) 11 Kg/ha. (d) 46 cm.  $\times$  8 to 10 cm. (e) —. (v) 12.5 C.L./ha. of F.Y.M. (vi) Local Manidapur in 61 and 62 ; Shenoli 4-2 in 63 and 65. (vii) Unirrigated. (viii) 2 interculturings. (ix) 53 cm. ; 48 cm. ; 55 cm. ; 45 cm. (x) 30.12.61 ; N.A ; 14.12.63 ; 8.12.65.

## 2. TREATMENTS :

7 sowing dates :  $D_1=15$ th June,  $D_2=23$ rd June,  $D_3=30$ th June,  $D_4=7$ th July,  $D_5=15$ th July,  $D_6=23$ rd July and  $D_7=31$ st July.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) 44.87 m.  $\times$  10.9 m. (iii) 4. (iv) (a) 10.97 m.  $\times$  6.40 m. (b) 9.14 m.  $\times$  4.57 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory ; Normal in 62 and 63 ; Good. (ii) Stem borer attack in 61 and 62. B.H.C. 50% sprayed at the rate of 11 to 17 Kg/ha. in 61 ; Nil in 63 and 65. (iii) Yield of grain. (iv) (a) 1961 to 65. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Nil. (vi) Nil. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is present. Experiment in 64 not conducted.

## 5. RESULTS :

## Pooled results

(i) 1078 Kg/ha. (ii) 647.8 Kg/ha (based on 18 d.f. made up of Treatments  $\times$  years interaction.) (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$D_1$	$D_2$	$D_3$	$D_4$	$D_5$	$D_6$	$D_7$
Av. yield	1168	1232	1157	1223	1073	1044	646

## Individual results

Treatment	$D_1$	$D_2$	$D_3$	$D_4$	$D_5$	$D_6$	$D_7$	Sig.	G.M.	S.E./plot
Year										
1961	1151	1092	877	1099	1100	583	504	N.S.	915	428.2
1962	1357	1656	1985	1746	1178	2123	837	**	1555	440.1
1963	1175	1453	1256	1205	1495	631	419	**	1091	263.1
1965	987	727	510	842	518	837	824	N.S.	749	335.2
Pooled	1168	1232	1157	1223	1073	1044	646	N.S.	1078	647.8

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 64(161), 65(214).**

**Site :- Agri. Res. Stn., Gadhinglaj.**

**Type :- 'C'.**

**Object :-** To determine the suitable sowing date for Jowar.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Groundnut : Jowar. (c) 11.2 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$  ; 12.35 C.L./ha. of F.Y.M. (ii) Medium black soil. (iii) As per treatments. (iv) (a) ploughing and harrowing. (b) Drilling. (c) 6 to 7 Kg/ha. (d) 46 cm.  $\times$  30 cm. (e) 1. (v) 12.35 C.L./ha. of F.Y.M. + 44.8 Kg/ha. of N as A/S + 22.4 Kg/ha. of  $P_2O_5$  as super. (vi) Local. (vii) Unirrigated. (viii) Hoeing and weeding. (ix) 113 cm. ; 87 cm. (x) 1st week of Dec. 64 ; last week of Dec. 65.

## 2. TREATMENTS :

8 dates of sowing :  $D_1=9$ th June,  $D_2=23$ rd June,  $D_3=30$ th June,  $D_4=7$ th July,  $D_5=14$ th July,  $D_6=21$ st July and  $D_7=28$ th July.

## 5. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 7.32 m. × 5.49 m. ; 9.14 m. × 5.49 m. ; (b) 6.71 m. × 4.57 m. ; 8.53 m. × 4.57 m. (v) 30 cm. × 46 cm. (vi) Yes.

## 4. GENERAL :

(i) Good. (ii) Nil. (iii) Height of plant, length of earhead and yield of grain. (iv) (a) 1964-65. (b) No. (c) Results of combined analysis are presented under 5-Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

## 5. RESULTS:

## Pooled results:

(i) 1808 Kg/ha. (ii) 476.3 Kg/ha. (based on 42 d.f. made up of pooled error and Treatments × years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	D <sub>7</sub>	D <sub>8</sub>
Av. yield	2578	2802	2431	2137	1528	1886	577	513

C.D. = 480.7 Kg/ha.

## Individual results :

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	D <sub>7</sub>	D <sub>8</sub>	Sig.	G.M.	S.E., plot
Year											
1964	3084	3036	2397	2458	1661	1961	581	479	**	1957	382.3
1965	2913	2567	2465	1835	1394	1811	573	547	**	1659	334.8
Pooled	2578	2802	2431	2147	1528	1886	577	513	**	1808	464.8

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 64(244).**

**Site :- Trial-Cum-Demons. Farm, Dheku Project.**

**Type :- 'C'.**

Object : To find out a suitable double crop under irrigation.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) As per treatments. (ii) Black soil. (iii) 6.10.64. (iv) (a) 2 harrowings. (b) Drilling. (c) 20 Kg/ha. (d) 46 cm. (e) —. (v) 44.8 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) M 35—1. (vii) Irrigated. (viii) 2 weedings and 1 hoeing. (ix) N.A. (x) 3.4.65.

## 2. TREATMENTS and 3. DESIGN :

Same as in Experiment No. 64(32) conducted at T.C.D.F, Golegaon and presented on page No. 226.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964 to 67. (b) and (c) No. (v) Golegaon. (vi) Nil. (vii) As the Groundnut crop in *Kharif* season failed, the yield of treatments C<sub>2</sub>M<sub>2</sub> and C<sub>3</sub>M<sub>1</sub> were not considered for analysis. Experiment was vitiated in 65.

## 5. RESULTS :

(i) 451 Kg/ha. (ii) 182.1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	C <sub>0</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	Mean
M <sub>0</sub>	380	289	491	595	439
M <sub>1</sub>	307	454	548	548	464
Mean	343	371	520	571	451

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 64(82).**

**Site :- Trial-Cum-Demons. Farm, Golegaon.**

**Type :- 'C'.**

Object :—To find out a suitable double crop for irrigated *Jowar*.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) As per treatments. (ii) Black cotton soil. (iii) 24, 25.10.64. (iv) (a) Harrowing. (b) Drilling. (c) 15 Kg/ha. (d) 45 cm. (e) —. (v) Nil. (vi) M 35—1. (vii) Irrigated. (viii) 3 weedings and 1 hoeing. (ix) Nil. (x) 10.3.65 to 12.3.65.

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) *Kharif* crops used as double crops : C<sub>0</sub>=Fallow, C<sub>1</sub>=*Sannhemp*, C<sub>2</sub>=Groundnut, C<sub>3</sub>=*Chinamung* and C<sub>4</sub>=*Udid*.

(2) 2 manurial doses : M<sub>0</sub>=Control and M<sub>1</sub>=22.4 Kg/ha of P<sub>2</sub>O<sub>5</sub> as Super.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4 (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964 only. (b) No. (c) Nil. (v) Bendsura, Khasapur. (vi) Nil. (vii) Nil.

**5. RESULTS :**

(i) 873 Kg/ha. (ii) 279.1 Kg/ha. (iii) Main effect of C alone is significant. (iv) Av. yield of grain in Kg/ha.

	C <sub>0</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	Mean
M <sub>0</sub>	919	704	811	753	882	814
M <sub>1</sub>	1142	659	1086	985	790	932
Mean	1030	682	948	869	836	873

C.D. for C marginal means=286.0 Kg/ha.

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 61(157), 62(222), 63(196), 64(166), 65(162).**

**Site :- Agri. Res. Stn., Jalgaon. Type :- 'C'.**

Object :—To find out the optimum sowing time for *Jowar*.



## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut ; *Moong* and Groundnut ; Groundnut and linseed ; *jowar* ; *jowar and Udid*. (c) 12.35 C.L./ha. of F.Y.M. for 61 and 65 ; Nil for 62, 63 and 64. (ii) Deep black cotton soil. (iii) As per treatments. (iv) (a) Harrowing. (b) Drilling. (c) 7 Kg/ha. (d) 46 cm. (e) 1 to 2. (v) 12.35 C.L./ha. of F.Y.M. (vi) Aishari BS-12-2-11. (vii) Unirrigated. (viii) 3 weedings and hoeings. (ix) 84 cm. ; 74 cm. ; 57 cm. ; 84 cm. ; 52 cm. (x) 8.12.61 and 6.1.62 ; 28.12.62 ; 28.12.63 ; 9.12.64 ; 17.12.65.

## 2. TREATMENTS :

7 dates of sowings:  $D_1=15\text{th June}$ ,  $D_2=23\text{rd June}$ ,  $D_3=30\text{th June}$ ,  $D_4=8\text{th July}$ ,  $D_5=15\text{th July}$ ,  $D_6=23\text{rd July}$  and  $D_7=30\text{th July}$ .

## 3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 6.40 m.  $\times$  10.97 m, (b) 4.57 m.  $\times$  9.14 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Lodging in Oct. 61. (ii) Attack of Millipedes in 61. (iii) Yield of grain and final plant count. (iv) (a) 1961 to 65. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is present.

## 5. RESULTS :

Pooled results

(i) 1228 Kg/ha. (ii) 971.5 Kg/ha. (based on 24 d.f. made up of Treatments  $\times$  years interaction). (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$D_1$	$D_2$	$D_3$	$D_4$	$D_5$	$D_6$	$D_7$
Av. yield	1071	1326	1393	1762	1433	973	638

C.D.=634.0 Kg/ha.

Individual results

Treatment	$D_1$	$D_2$	$D_3$	$D_4$	$D_5$	$D_6$	$D_7$	Sig.	G.M.	S.E./plot
Year										
1961	1710	1648	1540	1909	1716	1782	1115	* *	1631	180.0
1962	653	1306	1042	2743	2485	1822	1101	* *	1593	536.0
1963	1427	1981	1994	2027	1737	64	79	* *	1330	208.2
1964	673	652	999	981	451	435	433	* *	661	217.5
1965	893	1043	1391	1151	778	763	461	* *	925	57.3
Mean	1071	1326	1393	1762	1433	973	638	*	1228	971.5

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 60(29).**

**Site :- Agri. Res. Sta. Jeur.**

**Type 'C'.**

**Object :-** To study the different methods of sowing of *Jowar* in comparison with Poona method of drilling in dry tracts.

## 1. BASAL CONDITIONS :

(i) (a) *Jowar*-Gram. (b) Gram. (c) Nil. (ii) Medium deep. (iii) 15.9.60. (iv) (a) 3 harrowings. (b) to (e) As per treatments. (v) 12.5 C.L./ha. of F.Y.M. on 2.7.60. (vi) M 35-1. (vii) Unirrigated. (viii) Nil. (ix) 49 cm. (x) 8.2.61.

## 2. TREATMENTS :

4 methods of sowing:  $M_1=30\text{ cm. between rows}$ , 7 Kg/ha. of seed and drilling,  $M_2=46\text{ cm. between rows}$ , 4 Kg/ha. of seed and drilling,  $M_3=46\text{ cm. between rows}$ , 4 Kg/ha. of seed and drilling with 2 thinnings after germination 4 to 7 days, spacing between plants 10 cm. to 15 cm. and 3rd to 4th weeks spacing between plants 23cm. to 30 cm.  $M_4=46\text{ cm.} \times 46\text{ cm.}$ , 10 to 12 seeds/dibble by hand dibbling, 1st thinning between 4 to 7 days of germination and 2nd thinning 3rd to 4th week after germination keeping 2 to 8 plants hill.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 10.06 m. × 10.06 m. (b) 9.14 m. × 9.14 m. (v) 46 cm. × 46 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Severe attack of Chikta in winter season. (iii) Germination counts, height measurements and yield of grain. (iv) (a) 1958—60. (b) Yes. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 510 Kg/ha. (ii) 120.4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>
Av. yield	507	512	497	523

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 60(1), 61(77).**

**Site :- Agri. Res. Stn., Jeur.**

**Type :- 'C'.**

Object :—To study the suitability of interculturings-cum-weeding on *Jowar* crop.

## 1. BASAL CONDITIONS:

(i) (a) *Jowar*—Cram. (b) Gram. (c) Nil. (ii) Medium deep. (iii) 16.9.60 ; 1.10.61. (iv) (a) 3 harrowings. (b) Drilling. (c) 4.5 Kg/ha. (d) 46 cm. × 10 to 15 cm. (e) N.A. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) As per treatments. (ix) 50 cm ; 23 cm. (x) 9.2.61 ; 9.2.62.

## 2. TREATMENTS :

Same as in Expt. No 60(87), 61(176) conducted at Chas on *Jowar* crop and presented on page No. 221.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) 4.57 m. × 12.19 m. (b) 3.66 m. × 10.97 m. (v) 46 cm. × 61 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (vi) (a) 1960—61. (b) and (c) No. (v) Chas and sholapur (vi) No. (vii) Error variances are heterogeneous and Treatments × years interaction is absent, hence results for individual years are given under 5-Results.

## 5. RESULTS :

60(1)

(i) 952 Kg/ha. (ii) 243.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$T_0=1022, E_1=893$  and  $E_2=1013$  Kg/ha.

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	Mean
	883	647	829	786
T <sub>2</sub>	1158	829	982	990
T <sub>3</sub>	1063	854	1114	1010
Mean	1035	777	975	929

61(77)

(i) 1766 Kg/ha (ii) 792.3 Kg/ha. (iii) Only C effect is significant. (iv) Av. yield of grain in Kg/ha.

$T_0=1131$ ,  $E_1=2063$  and  $E_2=2073$  Kg/ha.

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	Mean
T <sub>1</sub>	1385	1954	1744	1694
T <sub>2</sub>	1938	2600	1860	2133
T <sub>3</sub>	1829	2460	1424	1904
Mean	1717	2338	1676	1910

C.D. for C marginal means=553.4 Kg/ha.

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 65(138).**

**Site :- Agri. Res. Stn., Jeur.**

**Type :- 'C'.**

Object :- To study the effect of different types of hoes on the soil moisture and the yield of *Jowar*.

**1. BASAL CONDITIONS :**

(i) (a) Nil (b) Gram. (c) Nil. (ii) N.A. (iii) 3.9.65. (iv) (a) 2 ploughings and 1 harrowing. (b) Drilling. (c) 5 Kg/ha. (d) 46 cm. (e) N.A. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) As per treatments. (ix) 16 cm. (x) 12.1.65.

**2. TREATMENTS :**

15 treatments of hoeing :

	I hoeing on 8.10.65	II hoeing on 14.11.65	III hoeing on 23.11.65.		I hoeing on 8.10.65	II hoeing on 14.11.65	III hoeing on 23.11.65
T <sub>1</sub>	BH	--	--	T <sub>9</sub>	AH	AH	AH
T <sub>2</sub>	BH	BH	BH	T <sub>10</sub>	BH	TH	LP
T <sub>3</sub>	BH	BH	TH	T <sub>11</sub>	BH	BH	LP
T <sub>4</sub>	BH	TH	TH	T <sub>12</sub>	BH	AH	LP
T <sub>5</sub>	TH	TH	TH	T <sub>13</sub>	BH	AH	TH
T <sub>6</sub>	BH	BH	AH	T <sub>14</sub>	BH	LP	LP
T <sub>7</sub>	BH	TH	AH	T <sub>15</sub>	LP	LP	LP
T <sub>8</sub>	BH	AH	AH				

BH=Hoeing done by blade hoe, TH=Hoeing done by five tooth hoe, AH=Hoeing done by Akola hoe, LP=Hoeing done by light plough.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 14.63 m.×7.32 m. (b) 13.72 m.×6.40 m. (v) 46 cm. ×46 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1965 only (b) to (c) No. (v) Sholapur. (vi) and (vii) Nil.

**5. RESULTS**

(i) 619 Kg/ha. (ii) 242.8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. yield	832	569	713	641	433	502	649	548
	T <sub>9</sub>	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	
	635	893	558	697	426	582	610	

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 63(101), 64(78), 65(211).**

**Site :- Trial-Cum-Demons. Farm, Khasapur. Type :- 'C'.**

**Object :-**To find out a suitable double crop under irrigated conditions.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) As per treatments. (ii) Medium black. (iii) 3.10.63 and 29.11.63 ; 6 and 15.10.64 ; 2 and 31.10.65. (iv) (a) 2 harrowings ; harrowing ; ploughing and harrowing. (b) Drilling. (c) N.A. ; 56 Kg/ha. ; 12.4 Kg/ha. (d) 30 cm ; N.A. ; 46 cm. (e) N.A. (v) Nil in 63 and 64, 44.8 Kg/ha. of N in 65. (vi) M-35-1. (vii) Irrigated. (viii) 2 weedings and 2 hoeings ; 1 hoeing ; 2 weedings. (ix) N.A. in 63 and 64 ; 53.9 cm. in 65. (x) 2.2.64 ; 6.3.65 ; 15.2.66 to 1.3.66.

**2. TREATMENTS:**

All combinations of (1) and (2) + one extra treatment.

(1) Five previous crops :  $C_0$ =Proper cultural operation without previous crop,  $C_1$ =*Sannhem*,  $C_2$ =Groundnut,  $C_3$ =*Chinamung* and  $C_4$ =*Udid*.

(2) 2 levels of manure :  $M_0$ =0 and  $M_1$ =22.4 Kg/ha. of  $P_2O_5$ . Applied to previous crops.

Extra treatment: Paddy as previous crop with 44.8 Kg/ha. of N and 22.4 Kg/ha. of  $P_2O_5$ .

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 7.31 m. x 10.97 m. (b) 5.49 m. x 9.14 m. (v) 91 cm. x 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal ; satisfactory ; satisfactory. (ii) Nil ; B.H.C. 10 % for chitka ; Nil. (iii) Yield of grain. (iv) (a) 1963-66. (b) Yes. (c) No. (v) and (vi) Nil. (vii) Extra treatment was dropped from the analysis as yield was nil in 63 and 65.

**5. RESULTS:**

63(101)

(i) 2264 Kg/ha. (ii) 21.6 Kg/ha. (iii) All the effects are highly significant. (iv) Av. yield of grain in Kg/ha.

	$C_0$	$C_1$	$C_2$	$C_3$	$C_4$	Mean
$M_0$	2123	2462	1600	2123	2207	2103
$M_1$	1226	3614	2014	2451	2426	2426
Mean	1674	3038	1807	2287	2516	2264

C.D. for C marginal means = 14.0 Kg/ha.

C.D. for M marginal means = 22.2 Kg/ha.

C.D. for the body of (C x M) table = 31.4 Kg/ha.

64(78)

(i) 2286 Kg/ha. (ii) 126.8 Kg/ha. (iii) All the effects are highly significant. (iv) Av. yield of grain in Kg/ha.

Extra treatment = 199 Kg/ha.

	$C_0$	$C_1$	$C_2$	$C_3$	$C_4$	Mean
$M_0$	2407	2796	1683	2422	2377	2337
$M_1$	1769	3958	1977	2622	2939	2653
Mean	2088	3377	1830	2522	2659	2495

C.D. for C marginal means = 129.5 Kg/ha.

C.D. for M marginal means = 81.9 Kg/ha.

C.D. for the body of (C x M) table = 183.1 Kg/ha.

C.D. for 'Extra vs. others' = 135.8 Kg/ha.

65(211)

(i) 3196 Kg/ha. (ii) 260.6 Kg/ha. (iii) C effect is highly significant. (iv) Av. yield of grain in Kg/ha.

	C <sub>0</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	Mean
M <sub>0</sub>	2929	4020	1832	3240	3067	3017
M <sub>1</sub>	2564	4684	2384	3583	3658	3374
Mean	2744	4352	2108	3411	3363	3196

C.D. for C marginal means=188.0 Kg/ha.

**Crop :- Jowar (Rabi).****Ref :- Mh. 60(33).****Site :- Agri. Res. Stn., Kopergaon.****Type :- 'C'.**Object:—To compare merits of different methods of *Jowar* cultivation under dry as well as irrigated condition.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) N.A. (ii) N.A. (iii) 16.10.60. (iv) (a) 1 ploughing and 2 harrowings. (b) to (e) As per treatments. (v) Nil. (vi) M—35. (vii) Irrigated (viii) 2 hoeings and 2 weedings. (ix) 22 cm. (x) 25.2.61.

## 2. TREATMENTS :

6 methods of cultivations :

	Method of sowing	Spacing	Seed rate
C <sub>1</sub>	Dibbling	61 cm. × 61 cm.	11 to 13 Kg/ha.
C <sub>2</sub>	Dibbling	46 cm. × 46 cm.	11 to 13 Kg/ha.
C <sub>3</sub>	Drilling	61 cm. × 61 cm.	11 to 13 Kg/ha.
C <sub>4</sub>	Drilling	46 cm. × 46 cm.	11 to 13 Kg/ha.
C <sub>5</sub>	Drilling	30 cm. × 30 cm.	9 to 11 Kg/ha.
C <sub>6</sub>	Drilling	46 cm. × 46 cm.	4 Kg/ha. (dry farming method).

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) 8.23 m. × 24.4 m. (b) 7.01 m. × 23.2 m. (v) 61 cm. × 61 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal growth, crop failed in some plots due to back of moisture. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960 only. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 888 Kg/ha. (ii) 558.8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	C <sub>5</sub>	C <sub>6</sub>
Av. yield	971	798	623	900	1292	744

**Crop :- Jowar (Rabi).****Ref :- Mh. 60(160).****Site :- Agri. Res. Stn., Mohol.****Type :- 'C'.**Object:—To study the effect of different dates of sowing on the yield of *Jowar*.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Gram. (c) Nil. (ii) N.A. (iii) As per treatments. (iv) (a) 5 harrowings. (b) Drilling. (c) 4 Kg/ha. (d) 46 cm. × 23 cm. (e) —. (v) Nil. (vi) M 35—1. (vii) Unirrigated. (viii) 5 interculturations. (ix) 5 cm. (x) 14 2.6t.

## 2. TREATMENTS :

3 dates of sowing :  $D_1=30.9.60$ ,  $D_2=7.10.60$  and  $D_3=14.10.60$ .

## 3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 20·12 m. × 6·40 m. (b) 18·29 m. × 4·57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Aphids and Jassids attack, no control measures taken (iii) Yield of grain. (iv) (a) 1960—64 (treatments modified every year) (b) No. (c) Nil. (v) No. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 419 Kg/ha. (ii) 160·6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$D_1$	$D_2$	$D_3$
Av. yield	373	428	456

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 61(56).**

**Site :- Agri. Res. Stn., Mohol.**

**Type :- 'C'.**

Object:—To study the effect of different dates of sowing on yield of *Jowar*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) N.A. (iii) As per treatments. (iv) (a) Harrowing. (b) Drilling. (c) 4 Kg/ha. (d) 46 cm. × 23 cm. (e) N.A. (v) Nil. (vi) M 35—1. (vii) Unirrigated. (viii) 2 interculturations. (ix) 17 cm. (x) 23,2.6t.

## 2. TREATMENTS:

3 dates of sowing :  $D_1=24.9.61$ ,  $D_2=1.10.61$  and  $D_3=8.10.61$ .

## 3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 20·12 m. × 6·40 m. (b) 18·29 m. × 4·57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Aphids and Jassid attack, Endrex and 20 EC sprayed. (iii) Yield of grain. (iv) (a) 1960—64 (treatments modified every year) (b) No. (c) Nil. (v) No. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 434 Kg/ha. (ii) 109·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$D_1$	$D_2$	$D_3$
Av. yield	469	474	358

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 62(47).**

**Site :- Agri. Res. Stn., Mohol.**

**Type :- 'C'.**

Object:—To study the effect of different dates of sowing on the yield of *Jowar*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) N.A. (iii) As per treatments. (iv) (a) 2 horrowings. (b) Drilling. (c) 4 Kg/ha. (d) 46 cm. x 23 cm. (e) N.A. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) 2 interculturings. (ix) 36 cm. (x) 13.2.63.

## 2. TREATMENTS :

5 dates of sowing :  $D_1=24.9.62$ ,  $D_2=1.10.62$ ,  $D_3=8.10.62$ ,  $D_4=15.10.62$  and  $D_5=22.10.62$ .

## 3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) 20.12 m. x 6.40 m. (b) 18.29 m. x 4.57 m. (v) 91 cm. x 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Fajr. (ii) B.H.C. sprayed. (iii) Yield of grain. (iv) (a) 1960-64 (treatment modified every year). (b) No. (c) Nil. (v) Nil. (vi) Nil. (vii) Irregular distribution of rain and cloudy weather during grain formation.

## 5. RESULTS :

(i) 188 Kg/ha. (ii) 68.2 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$D_1$	$D_2$	$D_3$	$D_4$	$D_5$
Av. yield	292	271	201	123	46

C.D. = 82.2 Kg/hg.

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 62(207), 63(258), 64(213).**

**Site Agri. Res. Stn., Mohol.**

**Type :- 'C'.**

Object :- To study the effect of spacing and different seed rates on the yield of Jowar.

## 1. BASAL CONDITIONS :

(i) (a) Jowar - Pulses. (b) Gram : Tur. for 63 and 64 (c) Nil. (ii) Medium light. (iii) 16.10.62 ; 21.9.63 ; 28.9.64 (a) Ploughing (iv) and harrowing. (b) Drilling. (c) to (e) As per treatments. (v) 12.5 C.L/ha. of F.V.M. and 22.4 Kg/ha. of N + 11.2 Kg/ha. of  $P_2O_5$  to all plots except  $R_6S_3$ . (vi) M-35-1. (vii) Unirrigated. (viii) Hoeing and 2 weedings for all years, thinning in 64. (ix) 6 cm. (x) 27, 28.2.63 ; 10.2.64 ; 2nd week of Feb., 65.

## 2. TREATMENTS :

All combination of (1) and (2)

(1) 6 seedrates :  $R_1=3.3$ ,  $R_2=4.4$ ,  $R_3=5.5$ ,  $R_4=6.6$ ,  $R_5=8.8$  and  $R_6=11.0$  Kg/ha.

(2) 3 spacings between rows :  $S_1=30$ ,  $S_2=46$  and  $S_3=61$  cm.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4 (iv) (a) and (b) 9.14 m. x 4.57 m. (v) Nil. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962 to 64. (b) and (c) Nil. (v) and (vi) N.A. (vii) Error variances are heterogeneous and Treatments x years interaction is absent, hence results for individual years are given under 5 Results.

## 5. RESULTS :

62(207)

(i) 538 Kg/ha. (ii) 166.1 Kg/ha. (iii) Main effect of R is significant. (iv) Av. yield of grain in Kg/ha.

	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	R <sub>6</sub>	Mean
S <sub>1</sub>	451	794	416	555	596	545	559
S <sub>2</sub>	408	632	456	573	670	584	554
S <sub>3</sub>	565	577	446	476	461	473	500
Mean	475	668	439	535	576	534	538

C.D. for R marginal means=136.3 Kg/ha.

63(258)

(i) 1165 Kg/ha. (ii) 296.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/

	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	R <sub>6</sub>	Mean
S <sub>1</sub>	1234	1227	1181	1167	1127	1150	1181
S <sub>2</sub>	1152	1147	1112	1042	1088	1344	1148
S <sub>3</sub>	1302	1295	1354	841	1158	1055	1168
Mean	1229	1223	1216	1017	1124	1183	1165

64(213)

(i) 1124 Kg/ha. (ii) 339.6 Kg/ha. (iii) Interaction R×S is significant. (iv) Av. yield of grain in Kg/ha.

	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	R <sub>6</sub>	Mean
S <sub>1</sub>	1020	1175	1120	1112	1132	1281	1140
S <sub>2</sub>	1245	1070	812	966	1381	1254	1138
S <sub>3</sub>	1179	1211	1380	1202	1090	507	1095
Mean	1148	1152	1137	1093	1201	1014	1124

C.D. for body of table=482.6 Kg/ha.

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 63(69).**

**Site :- Agri. Res. Stn., Mohol.**

**Type :- 'C'.**

**Object :-** To study the effect of different dates of sowing on the yield of Jowar.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Gram. (c) Nil. (ii) N.A. (iii) As per treatments. (iv) (a) 5 harrowings. (b) Drilling. (c) 4 Kg/ha. (d) 46 cm. × 23 cm. (e) —. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) 2 hoeings. (ix) 11 cm. (x) 3, 13, 21.2.64

**2. TREATMENTS :**

6 dates of sowing : D<sub>1</sub>=17.9.63, D<sub>2</sub>=24.9.63, D<sub>3</sub>=1.10.63, D<sub>4</sub>=8.10.63, D<sub>5</sub>=15.10.63 and D<sub>6</sub>=22.10.63.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 20.12 m. × 6.40 m. (b) 18.29 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) B.H.C. sprayed. (iii) Yield of grain. (iv) (a) 1960 —64 (treatments modified every year) (b) No. (c) Nil. (v) Nil. (vi) and (vii) Nil.



## 5. RESULTS :

(i) 785 Kg/ha. (ii) 172.2 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	895	876	1115	780	732	311

C.D.—204.8 Kg/ha.

**Crop :- Jowar (Rabi).**

**Ref :- Mb. 64(60).**

**Site :- Agri. Res. Stn., Mohol.**

**Type :- 'C'.**

Object:—To study the effect of different dates of sowing on the yield of *Jowar*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) 12.5 C.L./ha. of F.Y.M. (ii) N.A. (iii) As per treatments. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 4 Kg/ha. (d) 46 cm. × 23 cm. (e) —. (v) 12.5 C.L./ha. of F.Y.M. (vi) M—35—1. (vii) Unirrigated. (viii) 3 hoeings. (ix) 43 cm. (x) 7.3.65.

## 2. TREATMENTS :

6 dates of sowing: D<sub>1</sub>=19.9.64, D<sub>2</sub>=25.9.64, D<sub>3</sub>=5.10.64, D<sub>4</sub>=12.10.64, D<sub>5</sub>=20.10.64 and D<sub>6</sub>=25.10.64.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 20.12 m. × 6.40 m. (b) 18.29 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Aphids and Jassids attack, B.H.C. sprayed. (iii) Yield of grain. (iv) (a) 1960—64 (treatments modified every year). (b) No. (c) Nil. (v) No. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 481 Kg/ha. (ii) 151.9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/h.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	534	409	558	545	423	417

**Crop :- Jowar (Kharif).**

**Ref :- Mb. 63(273).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'C'.**

Object:—To find out the optimum time of sowing for *Jowar*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Black cotton soil. (iii) As per treatments. (iv) (a) 5 harrowings. (b) Dibbling. (c) N.A. (d) 46 cm. × 23 cm. (e) 8 to 10. (v) 22.4 Kg/ha. of N as A/S at the time of sowing. (vi) N.J. 156] (vii) Unirrigated. (viii) 3 weedings and 3 hoeings. (ix) 182.2 cm. (x) 27.11.63, 2, 13, 20, 30.12.63 and 3.1.64.

## 2. TREATMENTS :

11 Dates of sowing: X=On the set of monsoon, D<sub>1</sub>=26.6.63, D<sub>2</sub>=5.7.63, D<sub>3</sub>=13.7.63, D<sub>4</sub>=21.7.63, D<sub>5</sub>=24.7.63, D<sub>6</sub>=1.8.63, D<sub>7</sub>=7.8.63, D<sub>8</sub>=18.8.63, D<sub>9</sub>=25.8.63 and D<sub>10</sub>=30.8.63.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 6.40 m. (b) 9.14 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963—67 (treatments modified every year). (b) and (c) No. (v) No. (vi) Nil. (vii) As monsoon started on 26.6.63, Treatment X is not there hence only 10 treatments.

## 5. RESULTS:

(i) 1678 Kg/ha. (ii) 431.7 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	D <sub>7</sub>	D <sub>8</sub>	D <sub>9</sub>	D <sub>10</sub>
Av. yield	539	751	1547	2780	2600	2508	2179	1673	1786	416

C.D.=623.2 Kg/ha.

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 64(186).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'C'.**

Object:—To find out the optimum time of sowing for *Jowar*.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Linseed. (c) Nil. (ii) Black cotton soil. (iii) As per treatments. (iv) (a) 5 harrowings. (b) Dibbling. (c) N.A. (d) 46 cm. × 23 cm. (e) 8 to 10. (v) 22.4 Kg/ha. of N as A/S applied in harrows at the time of sowing. (vi) N.J.—156. (vii) Unirrigated. (viii) 4 weedings and 4 hoeings. (ix) 106.9 cm. (x) 3.11.64, 8.9, 19 and 20.65.

## 2. TREATMENTS:

11 dates of sowing : D<sub>1</sub>=23.6.64, D<sub>2</sub>=26.6.64, D<sub>3</sub>=4.7.64, D<sub>4</sub>=13.7.64, D<sub>5</sub>=20.7.64, D<sub>6</sub>=27.7.64, D<sub>7</sub>=2.8.64, D<sub>8</sub>=11.8.64, D<sub>9</sub>=19.8.64, D<sub>10</sub>=26.8.64 and D<sub>11</sub>=28.8.64.

## 3. DESIGN:

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 6.40 m. (b) 9.14 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963—67 (treatments modified every year). (b) and (c) No. (v) No. (vi) and (vii) Nil.

## 5. RESULTS:

(i) 560 Kg/ha. (ii) 402.9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	D <sub>7</sub>	D <sub>8</sub>	D <sub>9</sub>	D <sub>10</sub>	D <sub>11</sub>
Av. yield	601	883	898	1610	1858	1218	1089	778	1092	299	233

C.D.=581.6 Kg/ha.

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 65(21).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'C'.**

Object:—To find out the optimum time of sowing for *Jowar*.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) Black cotton soil. (iii) As per treatments. (iv) (a) 3 ploughings and harrowing. (b) Dibbling. (c) N.A. (d) 46 cm. × 23 cm. (e) 8. (v) 22.4 Kg/ha. of N as A/S applied in harrows at the time of sowing. (vi) N.J.—156. (vii) Unirrigated. (viii) 2 weedings and 3 hoeings. (ix) 79.7 cm. (x) 31.12.65 to 7.1.66.

## 2. TREATMENTS :

11 dates of sowing :  $D_1=26.6.65$ ,  $D_2=28.6.65$ ,  $D_3=8.7.65$ ,  $D_4=12.7.65$ ,  $D_5=22.7.65$ ,  $D_6=28.7.65$ ,  
 $D_7=5.8.65$ ,  $D_8=11.8.65$ ,  $D_9=16.8.65$ ,  $D_{10}=25.8.65$  and  $D_{11}=31.8.65$ .

## 3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  6.40 m. (b) 9.14 m.  $\times$  4.57 m. (v) 91 cm.  $\times$  91 cm.  
 (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963—67 (treatments modified every year). (b) and  
 (c) No. (v) No. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 1427 Kg/ha. (ii) 385.9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain  
 in Kg/ha.

Treatment	$D_1$	$D_2$	$D_3$	$D_4$	$D_5$	$D_6$	$D_7$	$D_8$	$D_9$	$D_{10}$	$D_{11}$
Av. yield	1287	1116	1879	2041	1894	2490	1556	1403	1053	563	413

C.D. = 557.3 Kg/ha.

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 61(117), 62(104), 63(143), 64(115).**

**Site :- Agri. College Farm,  
 Parbhani.**

**Type :- 'C'.**

**Object :-** To study the optimum time of weeding and interculturing for Jowar.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Chillies ; Fallow ; Jowar and Wheat ; Wheat. (c) N, P, K and F.Y.M. applied—details  
 N A. ; Nil ; N.A. ; N.A. (ii) Medium black soil. (iii) 29.10.61 ; 23.10.62 ; 5.10.63 ; 8.10.64. (iv) (a) 5 har-  
 rowings ; ploughing and harrowing ; 4 harrowings ; 5 harrowings. (b) Drilling. (c) 9 Kg/ha. (d) 46 cm.  
 (e) —. (v) Nil. ; 12.5 C.L./ha. of F.Y.M. spread on 17.10.62 and 7.10.64 ; 25 C.L./ha. of F.Y.M. broadcast  
 on 30.9.63. (vi) PJ—4 R. (vii) Unirrigated. (viii) As per treatments. (ix) Nil ; 10 cm. ; 8 cm. ; Nil.  
 (x) 14, 15. 3.62 ; 11, 12.4.63 ; 20, 21.2.64 ; 17 to 19.2.65.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expts. No. 60(87), 61(76) conducted at chas on Jowar crop on page No. 221.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961—64. (b) No. (c) Nil. (v) Chas. (vi) Nil.  
 (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is absent, hence results for indi-  
 vidual years are presented under 5. Results.

## 5. RESULTS :

61(117)

(i) 1436 Kg/ha. (ii) 295.1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$T_0=1428$ ,  $E_1=1268$  and  $E_2=1648$  Kg/ha.

	$C_1$	$C_2$	$C_3$	Mean
$T_1$	1525	1397	1555	1492
$T_2$	1358	1643	1431	1477
$T_3$	1515	1261	1219	1332
Mean	1466	1434	1402	1434

62(204)

(i) 1777 Kg/ha. (ii) 366.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

 $T_0=1762, E_1=2021$  and  $E_2=1806$  Kg/ha.

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	Mean
T <sub>1</sub>	1818	1624	1546	1663
T <sub>2</sub>	1603	2039	1567	1736
T <sub>3</sub>	1854	1716	1991	1854
Mean	1758	1793	1701	1751

63(143)

(i) 1026 Kg/ha. (ii) 279.9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

 $T_0=1014, E_1=965$  and  $E_2=962$  Kg/ha.

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	Mean
T <sub>1</sub>	839	976	974	930
T <sub>2</sub>	904	1042	1129	1025
T <sub>3</sub>	1204	1124	1203	1177
Mean	982	1047	1102	1044

64(115)

(i) 1159 Kg/ha. (ii) 168.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

 $T_0=995, E_1=1287$  and  $E_2=1182$  Kg/ha.

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	Mean
T <sub>1</sub>	1271	1170	1131	1191
T <sub>2</sub>	1145	1076	1222	1148
T <sub>3</sub>	1284	1225	1301	1270
Mean	1283	1157	1218	1203

**Crop :- Jowar (Kharif).****Ref :- Mh. 62(18), 63(15), 64(9), 65(43).****Site :- Agri. College Farm, Parbhani. Type :- 'C'.****Object :-** To find out the best date of sowing of Jowar.**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Jowar for 62 ; Cotton for others. (c) N.A. for 62 and 64 ; 12.5 C.L./ha. of F.Y.M. + 112 Kg/ha. of N for 63 ; Nil for 65. (ii) Light medium black. (iii) As per treatments. (iv) (a) 3 harrowings and tractor ploughing. (b) Dibbling. (c) 7 to 12 Kg/ha. (d) 46 cm. x 23 cm. (e) 2 to 4. (v) Nil for 62, 63 and 64 ; 12.4 C.L./ha. of F.Y.M. for 65. (vi) P.J. - 4 K. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) N.A. ; 133 cm. ; 75 cm. ; 77 cm. (x) 12.1.62 ; 14.12.63 ; 21.12.64 ; 16.12.65.

**2. TREATMENTS :**

7 dates of sowing : D<sub>1</sub>=15th June, D<sub>2</sub>=23rd June, D<sub>3</sub>=30th June, D<sub>4</sub>=8th July, D<sub>5</sub>=15th July, D<sub>6</sub>=23rd July and D<sub>7</sub>=31st July.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 6.40 m. (b) 9.14 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal in 62 and 63 ; satisfactory in others. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962 to 66. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Expt. is contd. D<sub>7</sub> treatment—excluded from analysis in 62 and 65 because of poor germination.

## 5. RESULTS :

## 62(18)

(i) 853 Kg/ha. (ii) 363.6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	740	1014	1154	522	956	733

## 63(15)

(i) 731 Kg/ha. (ii) 227.2 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	D <sub>7</sub>
Av. yield	1047	1258	1240	909	137	298	225

C.D. = 337.4 Kg/ha.

## 64(9)

(i) 1243 Kg/ha. (ii) 442.5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	D <sub>7</sub>
Av. yield	1365	1209	1182	1245	1292	1072	1338

## 65(43)

(i) 1176 Kg/ha. (ii) 316.0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	1200	1357	1429	1097	1064	912

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 60(156), 61(50), 62(39), 63(62).**

**Site :- Agri. College Farm, Poona.**

**Type :- 'C'.**

**Object :-** To study the effect of different methods of planting, spacings and top dressing on the yield of Jowar.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotto; N.A. in 61 to 63. (c) Nil; N.A. in 61 to 63. (ii) N.A. (iii) 5.10.60 ; 29.9.61 ; 29.9.62 ; 20.9.63. (iv) (a) One ploughing and three harrowings. (b) to (c) As per treatments. (v) Nil. (vi) M-35-1 and local. (vii) Unirrigated. (viii) 2 interculturings and weeding in 60 and 62 ; 2 interculturings in 61 and 2 weedings in 63. (ix) N.A. ; N.A. ; N.A. ; 14 cm. (x) 20.2.61 ; 28.2.62 ; 5.2.63 ; 29.1.64

## 2. TREATMENTS:

Treatments	Methods of planting	Spacing	Seedrate	Type of Seed	Top dressing	2 thinngs 30 cm. bet- ween plants	No. of seedlings finally kcpt.
T <sub>1</sub>	Local poona drilled	30 cm.	91 Kg/ha.	Local	Nil	Nil	—
T <sub>2</sub>	Local poona drilled	30 cm.	9 Kg/ha.	Improved	Nil	Nil	—
T <sub>3</sub>	Local poona drilled	30 cm.	9 Kg/ha.	Improved	Yes	Nil	—
T <sub>4</sub>	Local poona drilled	30 cm.	9 Kg/ha.	Improved	Yes	Yes	—
T <sub>5</sub>	Local poona drilled	30 cm.	9 Kg/ha.	Improved	Nil	Yes	—
T <sub>6</sub>	Local poona drilled	30 cm.	11 Kg/ha.	Improved	Yes	Yes	—
T <sub>7</sub>	Local poona drilled	46 cm.	11 Kg/ha.	Improved	Yes	Yes	—
T <sub>8</sub>	Dibbling	46 cm. × 46 cm.	2 seeds/hil.	Improved	Yes	—	2
T <sub>9</sub>	Dibbling	46 cm. × 46 cm.	10 seeds/hil.	Improved	Yes	—	2**
T <sub>10</sub>	Dibbling	61 cm. × 46 cm.	10 seeds/hil.	Improved	Yes	—	2**
T <sub>11</sub>	Dibbling	46 cm. × 46 cm.	10 seeds/hil.	Improved	Nil	—	2**
T <sub>12</sub>	Dibbling	46 cm. × 46 cm.	10 seeds/hil.	Improved	Yes	—	2**

X top dressing of 22.4 Kg/ha. of N as A/S ; \*\* Thinnings will be done as per instruction.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) 9'14 m. × 5'49 m. (b) 7'32 m. × 3'66 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960 to 63. (b) and (c) No. (v) Nil. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent, hence results for individual years are given under 5. Results.

## 5. RESULTS:

63(150)

(i) 3133 Kg/ha. (ii) 576.4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>
Av. yield	2119	3645	3136	2924	3221	3263	3433	3518	3009	3094	3094	3136

61(50)

(i) 2858 Kg/ha. (ii) 880.2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>
Av. yield	2738	2887	2934	3033	1993	3532	2734	2747	2598	2850	3093	3046

62(39)

(i) 1071 Kg/ha. (ii) 287.8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>
Av. yield	747	1075	1121	1121	1402	1121	972	1093	1271	981	934	1018

63(62)

(i) 1590 Kg/ha. (ii) 278.8 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>
Av. yield.	1196	1439	1831	1458	1327	1822	1345	1626	1925	1710	1757	1644

C.D. = 401.4 Kg/ha.

**Crop :- Jowar (Rabi.)****Ref :- Mh. 60(157), 61(51), 62(40), 63(63).****Site :- Agri. College Farm, Poona. Type :- 'C'.**Object :- To study the effect of different methods of planting, spacing, top dressing etc. on *Jowar* yield.**1. BASAL CONDITIONS:**

(i) (a) Nil. (b) N.A. except in 62; Brinjal in 62. (c) N.A. (ii) N.A. (iii) 8.10.60; 29.9.61; 14.9.62; 16.9.63. (iv) (a) Harrowing. (b) to (e) As per treatments. (v) Nil. (vi) M-35-1 and local. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. except in 63; 14 cm. in 63. (x) 18.2.61; 13.2.62; 15.1.63; 1.2.64.

**2. TREATMENTS:**

Same as in Expts No. 60(156), 61(50), 62(30), 63(62) on *Jowar* crop conducted at Poona presented on page No. 239.

**3. DESIGN:**

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 9.14 m. x 5.49 m. (b) 8.23 m. x 4.57 m. (v) 46 cm. x 46 cm. (vi) Yes.

**4. GENERAL:**

(i) Normal. (ii) Nil. (iii) field of grain. (iv) (a) 1960 to 63. (b) No. (c) Results of combined analysis are presented under 5-Result. (v) Poona (vi) Nil. (vii) Error variances are homogeneous and Treatments x years interaction is present.

**5. RESULTS:**

Pooled results

(i) 2224 Kg/ha. (ii) 769.5 Kg/ha. (based on 33 d.f. made up of interaction of Treatments x years.) (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>
Av. yield	1965	2113	2155	1990	1948	2216	2321	1916	2522	2369	2556	2623

Individual Result

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>
Year 1960	1706	1676	1759	1789	2019	1435	2253	1718	1409	1910	1624	1544
1961	2950	2810	3029	3202	2546	2957	2874	2652	3485	3243	3590	4114
1962	1924	2555	2234	1799	1742	2698	1988	2081	3626	2773	2953	3116
1963	1280	1411	1598	1168	1486	1775	2168	1215	1570	1551	2056	1719
Pooled	1965	2113	2155	1990	1948	2216	2321	1916	2522	2369	2556	2623

Sig.	G.M.	S.E./Plot
N.S.	1737	559.4
**	3121	409.9
**	2457	606.0
N.S.	1583	515.8
N.S.	2224	769.5

**Crop :- Jowar (Rabi).****Ref :- Mh. 60(36).****Site :- Agri. Res. Stn., Sholapur.****Type :- 'C'.**Object :- To study the effect of planting of *Rabi Jowar* under different methods on its yield.

## 1. BASAL CONDITIONS:

(i) (a) Not fixed. (b) and (c) N.A. (ii) Deep black soil. (iii) 7.10.60. (iv) (a) 3 harrowings. (b) to (d) As per treatments. (e) N.A. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) As per treatments. (ix) 35 cm. (x) 12.2.61.

## 2. TREATMENTS:

T<sub>1</sub>=Dry farm method i.e. seedrate 5 Kg/ha., spacing 45 cm. drilling, no thinning, 3 interculturings. T<sub>2</sub>=Spacing 45 cm.×45 cm., dibbling, thinning. 2 plants hill, T<sub>3</sub>=Spacing 45 cm. drilling @ 10-12 Kg/ha. seedrate, thinning, T<sub>4</sub>=Local method : spacing 30 cm. drilling, seedrate 7 Kg/ha. no thinning, no interculturing, T<sub>5</sub>=T<sub>4</sub> without interculturing. T<sub>6</sub>=Local method with spacing 35 cm., drilling, seedrate 10 Kg/ha. no thinning and one interculturing and T<sub>7</sub>=T<sub>6</sub> without interculturing.

## 3. DESIGN:

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 10.36 m × 7.32 m. (b) 8.53 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL:

(i) Normal. (ii) Nil. (iii) Germination counts, height and yield of grain. (iv) (a) 1958-60. (b) no. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS:

(i) 457 Kg/ha. (ii) 85.5 Kg/ha. (iii) Treatment differences are not significant. (iv) (a) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>
Av. yield	509	432	430	432	398	390	509

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 60(37), 61(60).**

**Site :- Agri. Res. Stn., Sholapur.**

**Type :- 'C'.**

Object :- To study the effect of weeding and interculturing on *jowar* yield.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Gram. (c) Nil. (ii) Deep black soil. (iii) 6.10.60; 6.10.61. (iv) (a) 3 harrowings. (b) drilling. (c) 4.5 Kg/ha. (d) 46 cm. between rows and 15 cm. to 23 cm. between plants. (e) N.A. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) As per treatments. (ix) 35 cm.; 18 cm. (x) 13.2.61; 26.2.62.

## 2. TREATMENTS:

Same as in expts no. 60(87), 61(76) conducted at Chas on *jowar* crop and presented on page No. 221.

T<sub>3</sub> here is 3 operations during 3rd, 6th and 8th week of growth.

## 3. DESIGN:

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) 4.57 m. × 12.29 m. (b) 3.66 m. × 10.97 m. (v) 46 cm. × 61 cm. (vi) Yes.

## 4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958 to 61. (b) and (c) No. (v) Chas and Jeur (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent, hence results for individual years are presented under 5. Results.

## 5. RESULTS:

60(37)

(i) 309 Kg/ha. (ii) 99.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.



$T_0=296$ ,  $E_1=325$  and  $E_2=331$  Kg/ha.

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	Mean
T <sub>1</sub>	308	312	282	301
T <sub>2</sub>	347	300	309	319
T <sub>3</sub>	326	279	313	306
Mean	327	297	302	309

61:60)

(i) 447 kg/ha. (ii) 128 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$T_0=337$ ,  $E_1=486$  and  $E_2=451$  Kg/ha.

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	Mean
T <sub>1</sub>	554	458	417	480
T <sub>2</sub>	480	604	406	497
T <sub>3</sub>	408	405	415	409
Mean	481	489	416	462

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 65(139).**

**Site :- Agri. Res. Stn., Sholapur.**

**Type :- 'C'.**

**Object :-** To study the effect of different types of hoes on the soil moisture, structure and yield of *jowar*.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*. (c) 22.4 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black. (iii) 30.9.65. (iv) (a) 3 harrowings. (b) Drilling. (c) 5 Kg/ha. (d) 46 cm. between rows. (e) —. (v) 11.2 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as A.S and Super respectively at drilling. (vi) M-35-1. (vii) Unirrigated. (viii) 3 hoeings as per treatments. (ix) 4 cm. (x) 29.1.66.

**2. TREATMENTS to 4 GENERAL :**

Same as in expt. no. 65(138) conducted at Jeur and presented on page No. 229.

The treatments were applied on 20.10.65, 12.11.65 and 3.12.65.

**5. RESULTS :**

(i) 668 Kg/ha. (ii) 142.1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. yield	571	7	602	711	596	727	682	766
	T <sub>9</sub>	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	
	655	638	620	809	618	678	651	

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 63(236), 64(185), 65(7).**

**Site :- Agri. College Farm, Dhulia.**

**Type :- 'CV'.**

**Object :-** To find out the optimum date of sowing for *Jowar*.

## 1. BASAL CONDITIONS:

(i) (a) Cotton—*Jowar*. (b) Cotton. (c) 24.7 C.L./ha. of F.Y.M. ; 24.7 C.L./ha. of F.Y.M.+ 224.2 Kg/ha. of Super ; 67.8 Kg/ha. of N as Urea . (ii) Medium black. (iii) As per treatments. (iv) (a) 3 harrowings for 63, 4 harrowings and discing for others. (b) Dibbling. (c) 9.9 Kg/ha. (d) 61 cm.  $\times$  61 cm. (e) N.A. (v) 12.4 C.L./ha. of F.Y.M. at sowing and 22.4 Kg/ha. of N as A/S 3 weeks after sowing. (vi) As per treatments. (vii) Unirrigated. (viii) 3 hoeings ; 1 hoeing ; 3 weedings. (ix) 29.8 cm. ; 53.5 cm. ; 41.4 cm. (x) 8 to 20.11.63 ; 16.11.64 to 7.12.64 ; 6.11.65.

## 2. TREATMENTS:

## Main-plot treatments:

4 dates of sowing :  $D_1=1$ st July,  $D_2=8$ th July,  $D_3=15$ th July and  $D_4=21$ st July.

## Sub-plot treatments:

3 varieties :  $V_1=$ Satpani,  $V_2=$ Ramkel and  $V_3=K-2-210$ .

## 3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) 9.75 m.  $\times$  6.70 m. (b) 7.92 m.  $\times$  4.88 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory. (ii) Mild attack of Stem borer for 63 ; Nil for others. (iii) Yield of grain. (iv) (a) 1963-67. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Expt. is continued. Hence results for individual years are given under 5. Results.

## 5. RESULTS:

63(236)

(i) 894 Kg/ha. (ii) (a) 128.7 Kg/ha. (b) 116.3 Kg/ha. (iii) Main effects of V, D and interaction  $V \times D$  are highly significant. (iv) Av. yield of grain in Kg/ha.

	$D_1$	$D_2$	$D_3$	$D_4$	Mean
$V_1$	1037	797	586	302	680
$V_2$	1282	1232	989	148	913
$V_3$	1537	1405	1068	352	1090
Mean	1235	1145	881	267	894

C.D. for D marginal means = 102.4 Kg/ha.

C.D. for V marginal means = 75.1 Kg/ha.

C.D. for V means at the same level of D = 150.1 Kg/ha.

C.D. for D means at the same level of V = 203.5 Kg/ha.

64(185)

(i) 1145 Kg/ha. (ii) (a) 323.6 Kg/ha. (b) 171.3 Kg/ha. (iii) Main effects of V, D and interaction  $V \times D$  are highly significant. (iv) Av. yield of grain in Kg/ha.

	$D_1$	$D_2$	$D_3$	$D_4$	Mean
$V_1$	2054	2124	424	463	1266
$V_2$	1329	1108	181	219	709
$V_3$	2272	2360	667	543	1461
Mean	1885	1864	424	408	1145

C.D. for D marginal means = 257.5 Kg/ha.

C.D. for V marginal means = 110.4 Kg/ha.

C.D. for V means at the same level of D = 220.9 Kg/ha.

C.D. for D means at the same level of V = 366.2 Kg/ha.

65(7)

(i) 717 Kg/ha. (ii) (a) 98.4 Kg/ha. (b) 85.2 Kg/ha. (iii) Main effects of V, D and interaction V×D are highly significant. (iv) Av. yield of grain in Kg/ha.

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	Mean
V <sub>1</sub>	801	776	668	721	741
V <sub>2</sub>	402	375	237	149	291
V <sub>3</sub>	1234	1332	1131	784	1120
Mean	812	828	679	551	717

C.D. for D marginal means = 78.2 Kg/ha.  
 C.D. for V marginal means = 54.8 Kg/ha.  
 C.D. for V means at the same level of D = 109.8 Kg/ha.  
 C.D. for D means at the same level of V = 150.3 Kg/ha.

**Crop :- Jowar (Rabi.)**

**Ref :- Mh. 60(64), 61(72), 62(59).**

**Site :- Agri. Res. Stn., Chas.**

**Type :- 'CM'.**

**Object :- To study the effect of spacing, F.Y.M. and method of sowing of Jowar.**

#### 1. BASAL CONDITIONS :

(i) (a) *Jowar-Jowar* (b) *Jowar* (c) As per treatments. (ii) Medium black. (iii) 2nd week of Sept., 60; 15.10.61; 12.9.62. (a) 3 harrowings for 60 and 61; 1 ploughing and 3 harrowings for 62. (b) As per treatments (c) 11 to 13 Kg/ha. (d) and (e) As per treatments. (v) Nil. (vi) M-35-L. (vii) Unirrigated. (viii) 2 interculturings. (ix) Nil; 21 cm; 29 cm. (x) N.A; 13.2.62; 9.2.63.

#### 2. TREATMENTS :

All combinations of (1), (2), (3) and (4)+3 extra treatments

(1) 3 methods of planting: S<sub>1</sub>=Dibbled keeping one plant finally, S<sub>2</sub>=Dibbled keeping two plants finally and S<sub>3</sub>=Dibbled and thinned.

(2) 3 manures: M<sub>0</sub>=0, M<sub>1</sub>=5600 Kg/ha. of F.Y.M. and M<sub>2</sub>=28 Kg/ha. of N as A.S.

(3) 2 row spacings: P<sub>1</sub>=46 cm. and P<sub>2</sub>=61 cm.

(4) 2 plant spacings: R<sub>1</sub>=46 cm. and R<sub>2</sub>=61 cm.

Extra treatments: A=Local method of cultivation, B=A+crop thinned to 1 plant at 15 cm. spacing in a row and C=A+crop thinned to 1 plant at 30 cm. spacing in a row.

#### 3. DESIGN :

(i) 3<sup>2</sup> × 2<sup>2</sup> confd. + 3 extra treatments (ii) (a) 21 plots/block; 2 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

#### 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958-62. (b) Yes. (c) No. (v) Sholapur. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent, hence results of individual years are presented under 5. Results.

#### 5. RESULTS :

10.64)

(i) 914 Kg/ha. (ii) 2143 Kg/ha. (iii) Main effect of M alone is significant. (iv) (a) Av. yield of grain in Kg/ha.

A=512, B=662 and C=625 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
P <sub>1</sub>	958	1009	916	786	1022	1075	964	958	961
P <sub>2</sub>	992	1025	904	868	890	1163	962	985	974
Mean	975	1017	910	827	956	1119	963	972	967
R <sub>1</sub>	978	1060	850	826	975	1087			
R <sub>2</sub>	972	974	970	828	937	1151			
M <sub>0</sub>	845	814	822						
M <sub>1</sub>	893	974	1001						
M <sub>2</sub>	1187	1263	907						

C.D. for M marginal means = 124.0 Kg/ha.

61(72)

(i) 554 Kg/ha. (ii) 78.8 Kg/ha. (iii) Main effects of S, M, extra treatment effects and extra vs. others are highly significant. (iv) Av. yield of grain in Kg/ha.

A=239, B=297 and C=543 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
P <sub>1</sub>	561	612	553	501	627	598	568	582	575
P <sub>2</sub>	567	661	566	569	597	628	576	600	598
Mean	564	636	559	535	612	613	582	591	586
R <sub>1</sub>	560	641	545	545	616	586			
R <sub>2</sub>	568	652	573	525	608	641			
M <sub>0</sub>	528	544	532						
M <sub>1</sub>	572	689	574						
M <sub>2</sub>	592	676	571						

C.D. for S or M marginal means = 45.5 Kg/ha.

C.D. for extra vs. others = 49.2 Kg/ha.

C.D. for extra treatment means = 111.6 Kg/ha.

62(59)

(i) 799 Kg/ha. (ii) 169.2 Kg/ha. (iii) Main effects of S and M are highly significant. Interaction S×P, M×R, extra treatment effect and extra vs. others are significant. (iv) Av. yield of grain in Kg/ha.

A=365, B=503 and C=704 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
P <sub>1</sub>	699	1036	728	655	986	822	821	820	821
P <sub>2</sub>	920	933	758	756	946	909	869	871	870
Mean	810	984	743	705	966	865	845	846	845
R <sub>1</sub>	836	921	779	696	1048	792			
R <sub>2</sub>	784	1048	706	715	883	939			
M <sub>0</sub>	749	746	651						
M <sub>1</sub>	865	1106	924						
M <sub>2</sub>	814	1099	680						

C.D. for S or M marginal means=97.7 Kg/ha.  
 C.D. for extra treatment mean=239.6 Kg/ha.  
 C.D. for extra vs. others =105.7 Kg/ha.  
 C.D. for body of S×P, or M×R table=138.3 Kg/ha.

Crop :- Jowar (*Rabi*).

Ref :- Mh. 60(47), 62(35), 64(58).

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

Type :- 'CM'.

Object : To evaluate separately and in combination, the effect of all factors of the Bombay Dry Farming methods toward increase in the yield of *Jowar*.

#### 1. BASAL CONDITIONS:

(i) (a) Nil. (b) *Jowar*. (c) As per treatments. (ii) Medium black and Deep black. (iii) 17.9.60; 14.9.62; 6.9.64. (iv) (a) As per treatments. (b) Drilling. (c) As per treatments. (d) 10 cm. to 23 cm between plants for 62 and 64 and N.A. for 60. (e) N.A. (v) As per treatments. (vi) M-35-1. (vii) Unirrigated. (viii) As per treatments. (ix) 45 cm.; 51 cm.; 35 cm. (x) 30.1.61; 10.2.63; 12, 13.2.65.

#### 2. TREATMENTS:

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

- (1) 2 ploughings : A<sub>0</sub>=No plough and A<sub>1</sub>=Ploughing once in 3 years.
- (2) 2 levels of F.Y.M. : B<sub>0</sub>=0 and B<sub>1</sub>=5600 Kg/ha. of F.Y.M. once in 3 years.
- (3) 2 harrowings : C<sub>1</sub>=2 and C<sub>2</sub>=3 harrowings.
- (4) 2 row spacings : D<sub>1</sub>=30 and D<sub>2</sub>=46 cm.
- (5) 2 seed rates : E<sub>1</sub>=4.4 and E<sub>2</sub>=6.7 Kg/ha.
- (6) 2 interculturings : F<sub>1</sub>=1 and F<sub>2</sub>=3 interculturing.

#### 3. DESIGN:

(i) 2<sup>6</sup> confd. (ii) (a) 8 plots/block, 8 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 5.48 m.×16.46 m. (b) 3.66 m.×14.63 m. (v) 91 cm.×91 cm. (vi) Yes.

#### 4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—contd. (Expt. failed in 61 and 63). (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) As the experiment is continued beyond 65, results of individual years are given under 5. Results.

#### 5. RESULT:

60(47)

(i) 1329 Kg/ha. (ii) 489.4 Kg/ha. (iii) None of the effects is significant. (iv) Mean and differential response table in Kg/ha.

Treatment	Mean response	Differential response											
		A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	133.9	—	—	149.9	118.0	219.0	48.8	140.3	127.5	32.6	300.5	63.2	204.7
B	144.4	160.3	128.4	—	—	105.8	183.0	304.4	15.6	148.1	140.7	193.1	95.7
C	128.3	213.4	43.2	94.6	166.9	—	—	143.1	113.4	201.4	55.1	218.0	38.5
D	11.4	25.8	13.0	179.4	140.6	34.3	4.6	—	—	10.1	28.7	11.9	27.0
E	-35.8	-202.4	130.7	-32.1	-39.5	37.3	-109.0	-4.1	-26.5	—	—	-43.3	-28.3
F	89.1	18.3	159.8	137.8	40.4	178.9	-0.7	82.6	96.6	-40.4	218.5	—	—

62(35)

(i) 466.1 Kg/ha. (ii) 159.8 Kg/ha. (iii) Only the main effect of F and interaction A×E are significant. (iv) Mean and differential response table in Kg/ha.

Treatment	Mean response	Differential response											
		A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	9.0	—	—	40.7	-22.6	3.8	14.2	-19.2	37.3	-57.8	75.9	-41.6	59.7
B	160.6	192.3	128.9	—	—	121.9	199.3	176.1	145.2	184.2	137.0	128.5	192.7
C	22.7	17.5	27.9	-16.0	61.5	—	—	33.4	12.1	26.6	18.9	69.9	-24.4
D	48.6	20.3	76.8	64.0	33.1	59.2	37.9	—	—	58.9	38.2	52.7	44.4
E	7.6	-59.3	74.5	31.1	-16.0	11.4	3.7	17.9	-2.7	—	—	-5.0	20.2
F	56.9	6.2	107.6	24.8	89.0	104.0	9.8	61.1	52.8	44.3	60.5	—	—

C.D. for mean response = 56.6 Kg/ha.

C.D. for differential response = 80.0 Kg/ha.

64(58)

- (i) 617.5 Kg/ha. (ii) 193.4 Kg/ha. (iii) Main effect of B is highly significant and that of F is significant.  
 (iv) Mean and differential response table in Kg/ha.

Treatment	Mean response	Differential response											
		A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	39.6	—	—	69.0	10.1	41.2	38.0	13.3	65.8	-11.8	91.0	8.9	70.2
B	101.4	130.9	72.0	—	—	50.8	152.0	148.0	54.9	131.7	71.3	86.9	115.9
C	-2.2	-0.6	-3.8	-52.8	48.4	—	—	-10.6	6.2	-30.3	25.9	31.1	-17.5
D	50.3	24.0	76.6	96.9	3.7	41.9	58.7	—	—	44.1	56.4	37.8	62.7
E	47.0	-4.4	98.4	77.1	16.8	18.9	75.0	40.3	53.1	—	—	47.5	46.4
F	88.3	57.6	118.9	73.8	102.8	103.6	73.0	75.8	100.7	88.8	87.7	—	—

C.D. for mean response = 68.4 Kg/ha.

C.D. for differential response = 96.7 Kg/ha.

**Crop :- Jowar (Kharif).****Ref :- Mh. 64(26), 65(58).****Site :- Agri. College Farm, Dhulia.****Type :- 'CM'.**

Object :- To study the effect of spacing, plant population and manuring on unirrigated jowar.

**1. BASAL CONDITIONS :**

- (i) (a) Nil. (b) Cotton. (c) 112 Kg/ha. of N as A/S + 224 Kg/ha. of  $P_2O_5$  as Super + 25 C.L./ha. of F.Y.M. ; Nil (b) Medium black. (iii) 8.7.64 ; 24.7.65. (iv) (a) Tractor ploughing ; 2 harrowings. (b) Dibbling. (c) N.A. ; 11.2 Kg/ha. (d) and (e) As per treatments. (v) As per treatments. (vi) Khedi 2-2-10. (vii) Unirrigated. (viii) Weeding and hoeing ; gap filling, thinning. (ix) 62 cm. ; 44 cm. (x) 20.11.64 ; 19.11.65.

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

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

- (1) 2 spacing between rows :  $A_1=46$  and  $A_2=61$  cm.  
 (2) 2 spacing between plants :  $B_1=23$  cm. and  $B_2=46$  cm.  
 (3) 2 plant populations :  $C_1=2$  and  $C_2=3$  plants/hill.  
 (4) 2 levels of F.Y.M. :  $D_0=0$  and  $D_1=5600$  Kg/ha.

**Sub-plot treatments :**3 levels of N as A/S :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

## 3. DESIGN :

(i) Split-plot confd. (ii) (a) 16 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 2.  
(iv) (a) 10.7m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Good. (ii) Endrin B.H.C. 10 % dusted to check pests and diseases. (iii) Yield of grain. (iv) (a) 1964—66. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. is contd. Hence results of individual years are presented under 5. Results

## 5. RESULTS :

64(26)

(i) 1552 Kg/ha. (ii) (a) 878.9 Kg/ha. (b) 462.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	A <sub>1</sub>	A <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>	C <sub>1</sub>	C <sub>2</sub>	D <sub>0</sub>	D <sub>1</sub>	Mean
N <sub>0</sub>	1495	1659	1535	1620	1516	1639	1721	1434	1577
N <sub>1</sub>	1362	1469	1433	1399	1497	1335	1368	1464	1416
N <sub>2</sub>	1718	1607	1422	1903	1570	1755	1656	1669	1662
Mea	1525	1575	1463	1461	1528	1576	1582	1522	1552
D <sub>0</sub>	1464	1700	1432	1732	1623	1541			
D <sub>1</sub>	1586	1458	1494	1550	1433	1611			
C <sub>1</sub>	1600	1456	1567	1489					
C <sub>2</sub>	1450	1703	1359	1793					
B <sub>1</sub>	1445	1482							
B <sub>2</sub>	1018	977							

65(58)

(i) 948 Kg/ha. (ii) (a) 243.1 Kg/ha. (b) 332.8 Kg/ha. (iii) Main effect of C is highly significant and the interaction C × D is significant. (iv) Av. yield of grain in Kg/ha.

	A <sub>1</sub>	A <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>	C <sub>1</sub>	C <sub>2</sub>	D <sub>0</sub>	D <sub>1</sub>	Mean
N <sub>0</sub>	850	1110	956	1004	1079	881	973	986	979
N <sub>1</sub>	866	897	809	954	965	798	857	906	882
N <sub>2</sub>	1035	935	935	1035	1091	879	983	879	985
	917	981	900	998	1045	853	937	959	948
D <sub>0</sub>	885	991	836	1040	966	910			
D <sub>1</sub>	948	971	963	956	1123	796			
C <sub>1</sub>	976	1113	1007	1083					
C <sub>2</sub>	857	848	793	913					
B <sub>1</sub>	816	984							
B <sub>2</sub>	1018	97							

C.D. for C marginal means = 106.4 Kg/ha.

C.D. for means in the body of C × D table = 212.8 Kg/ha.

**Crop :- Jowar (Rabi).****Ref :- Mh. 60(94).****Site :- Agri. Res. Stn., Digraj.****Type :- 'CM'.**Object :- To assess the effect of different cultivation methods on the yield of *Jowar*.**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) Cotton, (c) Nil. (ii) Black soil. (iii) 2.10.60 to 9.10.60. (iv) (a) 1 ploughing and 3 harrowings. (b) to (d) As per treatments. (e) N.A. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) 5 interculturations, 5 weedings and 7 thinnings. (ix) 12.7 cm. (x) 2nd week of Feb. 1961.

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

Same as in Expt. No. 60(64) presented on page No. 245.

**4. GENERAL :**

(i) Satisfactory. (ii) Stem borer attack ; Aldrex 30 B.C. applied on 13.11.60 and Endrin 20 B.C. applied on 27.11.60. (iii) Yield of grain. (iv) (a) 1959 to 60. (b) No. (c) Nil. (v) Sholapus, Jeur. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 904 Kg/ha. (ii) 155.1 Kg/ha. (iii) Main effect of S and interactions S×P and M×R are significant. (iv) Av. yield of grain in Kg/ha.

A=818, B<sub>2</sub>=783 and C=917 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
P <sub>1</sub>	1037	916	909	921	998	943	972	936	914
P <sub>2</sub>	905	1040	805	924	909	918	875	958	917
Mean	971	978	857	922	954	930	924	947	915
R <sub>1</sub>	943	957	871	947	865	958			
R <sub>2</sub>	999	999	843	898	1041	902			
M <sub>0</sub>	1021	910	836						
M <sub>1</sub>	961	986	913						
M <sub>2</sub>	931	1037	822						

C.D. for body of S×P or M×R table=126.8 Kg/ha.

C.D. for S marginal means=89.7 Kg/ha.

**Crop :- Jowar (Kharif).****Ref :- Mh. 60(85), 61(170).****Site :- Agri. Res. Stn., Digraj.****Type :- 'CM'.**Object :- To assess the effect of different cultivation methods on the yield of *Jowar*.**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) N.A. ; Groundnut. (c) N.A. ; 12.4 C.L./ha. of F.Y.M. (ii) Black soil ; Medium black clay loam. (iii) 7.7.60 to 10.7.60 ; 26.6.61. (iv) (a) 1 ploughing and 8 harrowings ; 5 to 6 harrowings. (b) Dibbling. (c) to (e) As per treatments. (v) As per treatments. (vi) Mandapuri. (vii) Unirrigated. (viii) 5 weedings ; weeding. (ix) 40.5 cm. ; 45.4 cm. (x) N.A. ; 26.12.61.

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

Same as in Expt. Nos. 60(64), 61(72) and 62(59) presented on page No. 245.



## 4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959-61. (b) and (c) No. (v) to (vi) Nil. (vii) Error variances are homogeneous and Treatments  $\times$  years interaction is absent.

## 5. RESULTS :

Pooled results

(i) 1592 Kg/ha. (ii) 265.8 Kg/ha. (based on 16 d.f. made up of pooled error). (iii) Only M effect is significant. (iv) Av. yield of grain in Kg/ha.

Extra treatments : A=1501, B=1507 and C=1192 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
P <sub>1</sub>	1780	1525	1536	1484	1647	1711	1571	1657	1614
P <sub>2</sub>	1555	1718	1628	1511	1668	1720	1564	1702	1633
Mean	1668	1622	1582	1498	1658	1715	1568	1680	1624
R <sub>1</sub>	1597	1559	1547	1403	1641	1658			
R <sub>2</sub>	1739	1685	1617	1592	1675	1773			
M <sub>0</sub>	1563	1346	1585						
M <sub>1</sub>	1597	1763	1614						
M <sub>2</sub>	1844	1756	1547						

C.D. for M marginal means=75 Kg/ha.

## Individual results

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Sig.	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	Sig.
1960	1914	1798	1861	N.S.	1748	2031	1793	N.S.
1961	1421	1445	1302	N.S.	1247	1284	1637	
Pooled	1668	1622	1582	N.S.	1498	1658	1715	•

  

R <sub>1</sub>	R <sub>2</sub>	Sig.	P <sub>1</sub>	P <sub>2</sub>	Sig.	A	B	C
1720	1994	N.S.	1843	1872	N.S.	1875	1987	1838
1414	1364	N.S.	1385	1394	N.S.	1126	1026	1045
1568	1680	N.S.	1614	1633	N.S.	1501	1507	1192

G.M.	S.E./plot
1840	295.2
1343	232.6
1592	263.9

**Crop :- Jowar (Kharif).****Ref :- Mh. 60(201), 61(169), 62(163).****Site :- Agri. Res. Stn., Digraj.****Type :- 'CM'.**Object:—To study the effect of different methods of cultivation on *Jowar*.**1. BASAL CONDITIONS :**

(i) (a) *Jowar (Kharif)*—Pulses—Groundnut. (b) Groundnut. (c) 12.5 C.L./ha. of F.Y.M. (ii) Medium black clay loam. (iii) 6.7.60; 28.6.61; 10.7.62. (iv) (a) One ploughing, 5 to 6 harrowings; 3 ploughings, 5 harrowings; 3 to 4 harrowings. (b) to (c) As per treatments. (v) As per treatments. (vi) Local mandapuri. (vii) Unirrigated. (viii) As per treatments. (ix) 49 cm.; 15 cm.; 48 cm. (x) 15.12.60; 26.12.61; 10.12.62.

**2. TREATMENTS :**3 methods of cultivations:  $T_1$ =Poona method,  $T_2$ =Karades method and  $T_3$ =Local method.

Poona method: 12.4 C.L./ha. of F.Y.M. mixed well with two—three harrowings, 61 cm. × 61 cm. spacings with 10–12 seeds dibbled in circular area with 15 cm. diameter; 1st thinning 15 days after sowing 6 to 7 seedlings/hill, 2nd thinning 21 days after sowing 4 to 5 seedlings/hill and third thinning one month after sowing—2 seedlings/hill; earthing up and interculturing by blade at 2nd and 3rd thinning.

Karades method: 21 days after sowing, one handful of F.Y.M. applied around plant and mixed; 46 cm. (N—S) × 23 cm. (E—W) spacings, 3 to 4 seeds dibbled at one place, thinning 12 days after sowing to 2 seedlings/hill, 5 interculturings at weekly interval from flowering stage to grain formation stage.

Local method: Manuring as in  $T_1$ , sowing by seed drill at 46 cm. apart at 11.2 Kg/ha. thinning 10 to 12 days after sowing leaving 1 seedling/hill in 8 cm. with a line, one interculture one month after sowing.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 10.36 m. × 12.19 m. for  $T_1$ , 10.67 m. × 12.19 m. for  $T_2$  and 10.06 m. × 12.19 m. for  $T_3$ . (b) 9.14 m. × 6.10 m. (v) and (vi) Yes.

**4. GENERAL :**

(i) Good. (ii) Nil in 1960 and 62; Stem borer attack in 61, B.H.C. 50% dusted. (iii) Yield of grain. (iv) (a) 1960 to 62. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) No. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

**5. RESULTS :**

## Pooled results

(i) 1365 Kg/ha. (ii) 1064.6 Kg/ha. (based on 4 d.f. made up of Treatments × years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$T_1$	$T_2$	$T_3$
Av. yield	1521	1234	1339

## Individual results

Treatment	$T_1$	$T_2$	$T_3$	Sig.	G.M.	S.E./plot
Year						
1960	1982	1109	1829	**	1640	313.9
1961	1449	950	805	**	1068	88.9
1962	1930	1643	1383	**	1652	214.6
pooled	1521	1234	1339	N.S.	1365	1064.6

**Crop :- Jowar (Kharif).**

**Ref :- 62(166), 63(217), 64(174).**

**Site :- Agri. Res. Stn., Digraj.**

**Type :- 'CM'.**

**Object :-** To study the effect of different factors in Ramban method of *Jowar* cultivation on its yield.

**1. EXPERIMENTAL CONDITIONS:**

(i) (a) Groundnut+*Jowar*. (b) Groundnut. (c) 12.34 C.L./ha. of F.Y.M. (ii) Medium black clay loam. (iii) 15.7.62; 14.7.63; 17.7.64. (iv) (a) 2 to 3 harrowings; one tractor ploughing; 3 to 4 harrowings. (b) Dibbling. (c) 9 Kg/ha. (d) and (e) As per treatments. (v) No. (vi) Shenoli. —4—2. (vii) Unirrigated. (viii) As per treatments. (ix) 48 cm.; 47 cm.; 64 cm. (x) 21.12.62; 14.12.63; 24.12.64.

**2. TREATMENTS:**

**Main-plot treatments:**

3 doses of F.Y.M. :  $M_0$ =No F.Y.M.,  $M_1$ =7.4 C.L./ha. of F.Y.M. and  $M_2$ =12.3 C.L./ha. of F.Y.M. +11.2 Kg/ha. of  $P_2O_5$  as Super+22.4 Kg/ha. of N as A/S.

**Sub-plot treatments:**

All combinations of (1) and (2)

(1) 2 methods of sowings :  $D_0$ =61 cm. × 61 cm., Square planting with 8 to 10 seeds at 2.5 to 5.0 cm. depth and 3 healthy seedlings/hill ultimately left and  $D_1$ =61 cm. × 46 cm. oblong planting with 4 seeds/hill and thinned to healthy seeds/hill.

(2) 2 cultural practices :  $I_0$ =Interculture with 30 cm. blade hoe in both directions before plants were two months old and  $I_1$ =No interculture in first 2½ to 3 months. After wards duck hoe in East West direction. Then with entire block hoe with manual labour.

**3. DESIGN:**

(i) Split-plot. (ii) (a) 3 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12.19 m. × 9.14 m. for  $D_0$  and 12.19 m. × 9.75 m. for  $D_1$ . (b) 9.14 m. × 6.10 m. (v) Nil. (vi) Yes.

**4. GENERAL:**

(i) Satisfactory: Good; Gappy germination due to rains. (ii) Attack of stem borer, Adrex sprayed. (All years). Sulphur dusted on 26.9.64. (iii) Yield of grain. (iv) (a) 1962 to 64. (b) and (c) No. (v) and (vi) No. (vii) Error variances for sub-plots are heterogeneous, hence results for individual years are presented under 5. Results.

**5. RESULTS:**

**62(166)**

(i) 1776 Kg/ha. (ii) (a) 396.2 Kg/ha. (b) 308.9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	$D_0$	$D_1$	Mean	$I_0$	$I_1$
$M_0$	1949	1866	1907	1859	1955
$M_1$	1698	1694	1696	1794	1598
$M_2$	1796	1652	1724	1704	1744
Mean	1814	1737	1776	1786	1766
$I_0$	1788	1784			
$I_1$	1840	1691			

**63(217)**

(i) 1724 Kg/ha. (ii) (a) 518.2 Kg/ha. (b) 367.7 Kg/ha. (iii) Main effects of M, D and interaction  $M \times D$  are significant. (iv) Av. yield of grain in Kg/ha.

	D <sub>0</sub>	D <sub>1</sub>	Mean	I <sub>0</sub>	I <sub>1</sub>
M <sub>0</sub>	1954	2328	2141	1999	2283
M <sub>1</sub>	1361	1601	1481	1442	1520
M <sub>2</sub>	1392	1708	1550	1458	1643
Mean	1569	1879	1724	1633	1815
I <sub>0</sub>	1398	1868			
I <sub>1</sub>	1741	1890			

C.D. for M marginal means=448.3 Kg/ha.  
C.D. for D marginal means=217.8 Kg/ha.

64(174)

(i) 1597 Kg/ha. (ii) (a) 592.2 Kg/ha. (b) 518.7 Kg/ha. (iii) Main effect of D is highly significant while that of I is significant. (iv) Av. yield of grain in Kg/ha.

	D <sub>0</sub>	D <sub>1</sub>	Mean	I <sub>0</sub>	I <sub>1</sub>
M <sub>0</sub>	2227	1321	1774	2038	1510
M <sub>1</sub>	1532	1181	1356	1490	1223
M <sub>2</sub>	1871	1450	1660	1765	1556
Mean	1877	1317	1597	1764	1430
I <sub>0</sub>	2115	1414			
I <sub>1</sub>	1639	1221			

C.D. for D or I marginal means=307.2 Kg/ha.

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 60(162), 61(78), 62(58).**

**Site :- Agri. Res. Stn., Jeur.**

**Type :- 'CM'.**

Object :- To study the effect of sowing, F.Y.M. and method of sowing on *Jowar*.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*. (c) As per treatments. (iii) N.A. (iii) 1.10.60 ; 5.10.61 ; 29.9.62. (iv) (a) 1 ploughing and 2 to 3 harrowings. (b) As per treatments. (c) N.A. (d) and (e) As per treatments. (vi) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) 2 interculturings. (ix) 13 cm. ; 14 cm. ; 11 cm. (x) 8.2.61 ; 10.2.62 ; 21.2.63.

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

Same as in Expt. No. 60(64), 61(72), 62(59) presented on page No. 245.

**4. GENERAL:**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959-62. (b) Yes. (c) No. (v) Parbhani, Sholapur. (vii) Error variances are heterogeneous and Treatments×years interaction is absent, hence results of individual years are presented under 5. Results.

## 5. RESULTS :

60(16)

(i) 857 Kg/ha. (ii) 394.5 Kg/ha. (iii) Main effect of M and 'extra vs. others' are highly significant. Interaction S x P is significant. (iv) Av. yield of grain in Kg/ha.

A=439, B=588, C=464 Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
S <sub>1</sub>	701	787	1199	1023	768	998	793	896
S <sub>2</sub>	568	1061	996	761	989	843	907	875
S <sub>3</sub>	727	772	1442	1123	837	1010	950	950
Mean	665	873	1212	969	864	950	883	917
R <sub>1</sub>	660	887	1303	1042	857			
R <sub>2</sub>	770	860	1121	895	871			
P <sub>1</sub>	680	887	1340					
P <sub>2</sub>	650	860	1084					

C.D. for M marginal means = 228.1 Kg/ha.

C.D. for 'extra vs. others' = 247.0 Kg/ha.

C.D. for body of S x P table = 322.4 Kg/ha.

61(78)

(i) 732 Kg/ha. (ii) 310.1 Kg/ha. (iii) 'Extra vs. others' alone is significant. (iv) Av. yield of grain in Kg/ha.

A=474 Kg/ha., B=617 Kg/ha., C=537 Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
S <sub>1</sub>	625	589	761	701	615	705	611	658
S <sub>2</sub>	653	963	767	796	792	805	783	794
S <sub>3</sub>	719	768	1027	927	749	889	786	838
Mean	666	773	852	808	719	800	727	763
R <sub>1</sub>	636	808	955	810	759			
R <sub>2</sub>	695	738	748	776	678			
P <sub>1</sub>	675	767	983					
P <sub>2</sub>	656	779	720					

C.D. for 'extra vs. others' = 193.6 Kg/ha.

62(58)

(i) 523 Kg/ha. (ii) 192.0 Kg/ha. (iii) Main effect of S and M are highly significant. (iv) Av. yield of grain in Kg/ha.

A=508, B=597 and C=356 Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
S <sub>1</sub>	438	352	620	517	419	500	436	470
S <sub>2</sub>	349	561	498	480	459	512	427	469
S <sub>3</sub>	485	640	819	657	639	706	589	648
Mean	422	518	646	551	506	573	484	529
R <sub>1</sub>	432	587	698	570	576			
R <sub>2</sub>	411	448	593	533	435			
P <sub>1</sub>	444	499	711					
P <sub>2</sub>	400	537	580					

C.D. for S or M marginal means=111.0 Kg/ha.

**Crop :- Jowar (Rabi).****Ref :- Mh. 60(50), 61(71), 62(60), 63(81),  
64(68), 65(137),****Site :- Agri. Res. Stn., Jeur.****Type :- 'CM'.**Object :- To evaluate separately and in combination, the effect of all factors of the Bombay Dry Farming methods toward increase in the yield of *Jowar*.**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) *Jowar*. (c) As per treatments. (ii) N.A. (iii) 17.9.60 and 20.10.60 ; 7.10.61 ; 27.9.62 ; 13.14.9.63 ; 9.10.9.64 ; 2.9.65. (iv) (a) As per treatments. (b) Drilling. (c) and (d) As per treatments. (e) —. (v) As per treatments. (vi) M-35-1. (vii) Unirrigated. (viii) As per treatments. (ix) 60 cm ; 15 cm. ; 11 cm ; 18 cm. ; 37 cm. ; 16 cm. (x) 7 to 9.2.61 ; 8 to 11.2.62 ; 17.2.63 ; 31.1.64 ; 17 and 19.2.65 ; 8, 11 and 15.1.66.

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

Same as in experiment 60(47), 62(35), 64(58) presented on page No. 247.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959 contd. (b) Yes. (c) Nil. (v) Chas. (vi) Nil. (vii) As the experiment is continued beyond 1965 therefore individual years results are presented under 5. Results.

**5. RESULTS :****60(50)**

(i) 1401 Kg/ha. (ii) 477.6 Kg/ha. (iii) None of the effects is significant. (iv) Mean and differential response table in Kg/ha.

Differential response

	Mean response	A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	24.0	-	-	86.7	-38.7	95.6	-47.6	90.4	-42.4	226.3	-178.3	-73.0	121.1
B	118.2	180.9	55.5	-	-	146.6	89.7	159.0	77.3	40.9	154.4	42.2	194.1
C	83.5	155.1	11.9	111.9	55.1	-	-	102.2	64.7	194.2	27.3	124.6	42.3
D	66.3	132.7	-0.1	107.1	25.5	85.1	47.5	-	-	84.6	48.0	-4.4	137.0
E	-57.6	144.7	-259.9	-134.9	19.6	53.1	-168.4	-39.3	-76.0	-	-	129.8	-245.0
F	79.7	-17.4	176.7	3.8	155.5	120.8	38.5	8.9	150.4	267.1	-107.7	-	-

61(71)

(i) 1345 Kg/ha. (ii) 611.8 Kg/ha. (iii) Main effect of C alone is significant. (iv) Mean and differential response table in Kg/ha.

Differential response

	Mean response	A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	-65.6	-	-	80.8	-212.1	-5.7	-125.6	-130.6	-0.6	-14.7	-116.6	-90.4	-40.8
B	-55.5	91.0	-201.9	-	-	-166.4	55.5	-82.3	-28.6	-112.4	1.4	-121.0	10.0
C	260.2	320.2	200.3	149.3	371.2	-	-	270.5	250.0	205.6	314.9	259.6	260.9
D	5.9	-59.1	70.0	-21.0	32.7	16.1	-4.4	-	-	-61.1	72.8	-23.4	35.0
E	0.8	51.8	-50.1	-56.1	57.8	-53.8	55.5	66.1	67.8	-	-	14.7	-13.1
F	-101.4	-126.2	-76.6	-166.9	-35.9	-102.1	-100.7	-130.5	-72.3	-87.5	-115.3	-	-

C.D. for mean response = 216.3 Kg/ha.

62(60)

(i) 1153 Kg/ha. (ii) 247.4 Kg/ha. (iii) Main effect of C and interaction B × C are highly significant and that of interaction C × D is significant. (iv) Mean and differential response table in Kg/ha.

Differential response

	Mean response	A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	63.7	-	-	150.1	22.7	48.8	78.5	-51.8	179.2	71.1	56.2	71.0	56.3
B	56.7	143.2	-29.7	-	-	-87.1	200.6	139.8	-26.3	37.2	76.3	73.1	40.3
C	256.8	241.9	271.7	113.0	400.7	-	-	351.9	161.7	263.0	250.7	252.3	261.2
D	10.1	-105.4	125.7	93.2	-72.9	105.3	-85.0	-	-	-74.5	94.8	84.9	-64.6
E	-32.1	-24.7	-39.6	-51.7	-12.6	-25.9	-38.3	-116.8	52.5	-	-	35.2	-99.5
F	-111.1	-103.7	-118.4	-94.7	-127.5	-115.4	-106.8	-36.3	-135.9	-43.7	-178.5	-	-

C.D. for mean response = 87.5 Kg/ha.

C.D. for differential response = 123.7 Kg/ha.

63(81)

(i) 1209 Kg/ha. (ii) 354.1 Kg/ha. (iii) None of the effects is significant. (iv) Mean and differential response table in Kg/ha.

	Mean response	Differential response											
		A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	-42.6	-	-	-92.7	7.5	-33.3	51.8	96.6	11.4	47.3	-132.5	16.6	-101.7
B	-4.7	-54.8	45.4	-	-	3.4	-12.9	14.8	-24.3	-34.2	24.7	7.6	-17.8
C	121.0	130.3	111.7	129.2	112.8	-	+	190.6	51.4	109.3	132.7	181.0	61.0
D	110.8	56.8	164.8	130.3	91.3	180.4	41.2	-	-	157.5	64.1	36.8	184.8
E	-41.0	48.9	-131.0	-70.5	-11.6	-52.8	-29.3	5.6	-87.7	-	-	86.5	-168.7
F	-78.8	-19.7	-138.0	-66.5	-91.1	-18.8	-138.9	-152.8	-4.9	48.7	-206.4	-	-

64(68)

(i) 612 Kg/ha. (ii) 145.0 Kg/ha. (iii) Main effects of D and F are significant. (iv) Mean and differential response in Kg/ha.

	Mean response	Differential response											
		A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	-
A	-13.8	-	-	-23.6	-3.9	-14.1	-13.4	5.9	-33.5	-49.4	21.9	-4.5	-23.0
B	37.8	28.0	47.7	-	-	9.8	65.9	27.9	47.8	-1.1	76.8	-0.6	76.3
C	19.2	18.9	19.6	-8.8	47.3	-	-	53.3	-57.1	-10.3	48.8	18.9	19.5
D	58.9	78.6	39.2	48.9	68.9	96.8	21.0	-	-	25.2	92.5	60.8	57.0
E	-46.6	-82.2	-11.0	-85.5	-7.6	-76.2	-17.0	-80.2	-12.9	-	-	-39.7	-53.5
F	-55.2	-46.0	-64.5	-93.7	-16.7	-55.5	-54.9	-53.3	-57.1	-48.3	62.1	-	-

C.D. for mean response = 25.6 Kg/ha.

65(137)

(i) 989 Kg/ha. (ii) 135.5 Kg/ha. (iii) Interaction B × C is highly significant and that of D and interaction A × C are significant. (iv) Mean and differential response table in Kg/ha.

	Mean response	Differential response											
		A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	12.2	-	-	4.2	28.6	65.5	41.0	-48.6	73.3	2.6	21.9	15.0	9.4
B	28.0	11.5	44.4	-	-	-28.9	84.8	45.8	10.1	50.8	5.1	56.0	-0.1
C	9.6	62.9	-43.7	-47.2	66.4	-	-	16.3	2.9	-0.1	19.3	-10.3	29.5
D	-26.7	-87.5	34.1	-8.9	-44.9	-20.0	-33.3	-	-	15.6	-69.0	-12.3	-41.0
E	-49.2	-58.9	-39.6	-26.4	-72.2	-59.0	-39.5	-6.0	-91.6	-	-	-28.5	-70.0
F	30.3	33.1	27.6	58.4	2.3	10.4	50.3	44.7	16.0	51.1	9.6	-	-

C.D. for mean response = 23.9 Kg/ha.

C.D. for differential response = 33.9 Kg/ha.



**Crop :- Jowar (Kharif).****Ref :- Mh. 60(83).****Site :- Agri. Res. Stn., Karad.****Type :- 'CM'.**Object :- To study the effect of manuring, spacings and methods of planting on *Jowar*.**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) Groundnut. (c) 12.5 C.L./ha. of F.Y.M. (ii) Medium black. (iii) 2nd week of July. (iv) (a) 1 ploughing and 1 harrowing. (b) As per treatments. (c) 5 Kg/ha. (d) As per treatments. (e) N.A. (v) Nil. (vi) Sheoli 4--3. (vii) Unirrigated. (viii) 3 interculturings, 2 thinning. (ix) 71.8 cm. (x) N.A.

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

Same as in Expt. Nos. 60(64), 61(72), 62(59) presented on page No. 245.

**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960 only. (b) No. (c) Nil. (v) Chas, Digraj and Sholapur. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 667 Kg/ha. (ii) 119.8 Kg/ha. (iii) Main effect of M and interaction S x M are highly significant. (iv) Av. yield of grain in Kg/ha.

A=675, B=682 and C=617 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
P <sub>1</sub>	676	591	708	587	619	768	663	653	658
P <sub>2</sub>	686	693	656	669	639	727	688	669	678
Mean	680	642	682	628	629	747	675	661	668
R <sub>1</sub>	666	602	758	641	654	731			
R <sub>2</sub>	695	681	606	614	603	764			
M <sub>0</sub>	592	141	650						
M <sub>1</sub>	662	593	631						
M <sub>2</sub>	787	691	764						

C.D. for M marginal means = 69.3 Kg/ha

C.D. for body of S x M table = 120.0 Kg/ha.

**Crop :- Jowar (Kharif).****Ref :- Mh. 60(200).****Site :- Agri. Res. Stn., Kopergaon.****Type :- 'CM'.**Object :- To assess the effect of different cultivation methods on the yield of *Jowar*.**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) 'A' type. (iii) 14.10.60. (iv) (a) 2 ploughings, 2 harrowings. (b) to (c) As per treatments. (v) As per treatments. (vi) M-35-1. (vii) Irrigated. (viii) 3 weedings. (ix) N.A. (x) 21.2.61.

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

Same as in Expt. No. 60(64), 61(72), 62(59) presented on page No. 245.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958-61. (b) and (c) No. (v) Digraj, Chas and Sholapur. (vi) and (vii) No.

## 5. RESULTS :

(i) 1060 Kg/ha. (ii) 526.1 Kg/ha. (iii) Main effect of S and interaction S×P are highly significant. Main effect of P and 'Extra vs. others' are significant. (iv) Av. yield of grain in Kg/ha.

A=1079, B=534 and C=705 Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
S <sub>1</sub>	676	747	1010	654	968	736	886	811
S <sub>2</sub>	1155	1044	1149	1246	985	907	1325	1116
S <sub>3</sub>	1350	1237	1603	1043	1752	1420	1374	1397
Mean	1060	1009	1254	981	1235	1021	1195	1108
R <sub>1</sub>	886	889	1289	859	1184			
R <sub>2</sub>	1236	1131	1219	1104	1286			
P <sub>1</sub>	993	865	1086					
P <sub>2</sub>	1128	1155	1422					

C.D. for S marginal means =304.0 Kg/ha.

C.D. for P<sub>i</sub> marginal means =248.4 Kg/ha.

C.D. for body of S×P table =430.0 Kg/ha.

C.D. for 'extra vs. others' =329.3 Kg/ha.

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 60(53).**

**Site :- Agri. Res. Stn., Mohol.**

**Type :- 'CM'.**

Object :- To study the effect of mulching and fertilizers on the yield of *Jowar*.

## 1. BASAL CONDITIONS :

(i) (a) *Jowar*-Gram. (b) Gram. (c) N.A. (ii) Medium black. (iii) 4.10.60. (iv) (a) 1 ploughing, 4 harrowings. (b) Drilling. (c) 5 Kg/ha. (d) 46 cm. between rows. (e) N.A. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) 5 interculturings. (ix) N.A. (x) 6.2.61.

## 2. TREATMENTS :

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

(1) 2 levels of N as A/S: N<sub>0</sub>=0 and N<sub>1</sub>=16.8 Kg/ha.

(2) 2 levels of P<sub>2</sub>O<sub>5</sub> as Super: P<sub>0</sub>=0 and P<sub>1</sub>=16.8 Kg/ha.

(3) 2 mulchings: M<sub>0</sub>=No mulching and M<sub>1</sub>=Mulching with *Jowar Kadbi* at 2273 Kg/ha.

Manures applied on 4.10.60.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) 8. (iii) N.A. (iv) (a) 5.49 m. × 9.14 m. (b) 3.66 m. × 6.71 m. (v) 91 cm. × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Good. (ii) Aphids and Jassids causing sugary disease. (iii) Yield of grain. (iv) (a) 1959-60. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 543 Kg/ha. (ii) 138.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	M <sub>0</sub>	M <sub>1</sub>	Mean
N <sub>0</sub>	537	563	543	558	550
N <sub>1</sub>	578	492	544	527	535
Mean	558	528	544	543	543
M <sub>0</sub>	542	545			
M <sub>1</sub>	574	511			

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 60(84).**

**Site :- Agri. Res. Stn., Mohol.**

**Type :- 'CM'.**

Object :- To ascertain optimum spacing, manurial requirements and the method of planting on *Jowar*.

## 1. BASAL CONDITIONS:

(i) (a) *Jowar*-Gram. (b) Gram. (c) Nil. (ii) Medium black. (iii) 2, 3, 10, 60. (iv) (a) 1 ploughing and 3 harrowings. (b) As per treatments (c) 5Kg/ha. (d) and (e) As per treatments. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) 2 thinnings and 3 interculturings (ix) 5.4 cm. (x) 5, 6, 2, 61.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. No. 60(64), 61(72), 62(59) presented on page No. 245.

## 4. GENERAL :

(i) Normal. (ii) Aphids and Jassids causing sugery disease control measures N.A. (iii) Yield of grain (iv) (a) 1958 to 60. (b) So. (c) Nil. (v) Sholapur, Chas and Parbhani. (vi) and (vii) No.

## 5. RESULTS :

(i) 443 Kg/ha. (ii) 137 Kg/ha. (iii) Interaction S x P is significant, extra treatments differ significantly. (iv) Av. yield of grain in Kg/ha.

A=238, B=389 and C=553 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
P <sub>1</sub>	497	367	499	461	401	500	469	439	454
P <sub>2</sub>	405	489	453	435	454	457	486	411	449
Mean	451	428	476	448	428	478	477	425	451
R <sub>1</sub>	475	427	530	508	414	510			
R <sub>2</sub>	427	428	421	388	442	446			
M <sub>0</sub>	452	378	513						
M <sub>1</sub>	419	467	398						
M <sub>2</sub>	482	438	517						

C.D for body of S x P table =120.0 Kg/ha.

C.D. for extra treatment means=207.7 Kg/ha.

**Crop :- Jowar (Rabi).****Ref :- Mh. 61(212).****Site :- Agri. Res. Stn., Mohol.****Type :- 'M'.**Object :—To study the effect of mulching with manuring on the yield of *Jowar*.**1. BASAL CONDITIONS :**(i) (a) *Jowar*-Pulses. (b) Gram. (c) Nil. (ii) Medium light. (iii) 18.10.61. (iv) (a) 3 harrowings. (b) Drilling. (c) 7 Kg/ha. (d) 45 cm. (e) N.A. (v) As per treatments. (vi) M-35-1. (vii) Unirrigated. (viii) Hoeing and weeding. (ix) 7.1 cm. (x) 28.2.62.**2. TREATMENTS :****Main-plot Treatments :**4 Manurial treatments :  $T_0$ =Control,  $T_1$ =16.8 Kg/ha. of N,  $T_2$ =16.8 Kg/ha. of  $P_2O_5$  as Super and  $T_3$ =( $T_1+T_2$ ).**Sub-plot treatments :**2 mulching treatments :  $M_0$ =No mulching and  $M_1$ =Mulching on 4.12.61.**3. DESIGN :**

(i) Split-plot. (ii) (a) 2 sub-plots/main-plot ; 4 main-plots/replication. (b) N.A. (iii) 4. (iv) (a) 9.14 m. × 5.48 m. (b) 6.70 m. × 3.66 m. (v) 122 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 only (b) No. (c) Nil. (v) N.A. (vi) and (vii) No.

**5. RESULTS :**

(i) 341 Kg/ha. (ii) (a) 322.2 Kg/ha. (b) 128.1 Kg/ha. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	$T_0$	$T_1$	$T_2$	$T_3$	Mean
$M_0$	287	272	293	226	269
$M_1$	565	351	425	306	412
Mean	426	311	359	266	341

C.D. for M marginal means=98.7 Kg/ha.

**Crop :- Jowar (Rabi).****Ref :- Mh. 61(210), 62(204).****Site :- Agri. Res. Stn., Mohol.****Type :- 'CM'.**Object :—To study the Poona method of cultivation with the local method on the yield of *jowar*. (unirrigated).**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) Medium light. (iii) 12.10.61 ; 28, 29.9.62. (iv) (a) Ploughing and 2 harrowings ; 2 harrowings. (b) to (e) As per treatments. (v) Nil. (vi) Maldandi (local). (vii) Unirrigated. (viii) Thinning. (ix) 7 cm. ; 6 cm. (x) 20.2.62 ; 23.2.63.

**2. TREATMENTS :**3 methods of cultivation :  $M_1$ =Drilling at 30 cm. with seed rate 4.4 Kg/ha. (local method),  $M_2$ =Drilling at 30 cm. with seed rate 11.2 Kg/ha. and thinning and  $M_3$ =Poona method of cultivation viz. drilling at 46 cm. × 46 cm. manuring with 24.7 C.L./ha. of F.Y. M. + 44.8 Kg/ha. of N as A/S + 22.4 Kg/ha. of  $P_2O_5$  as Super.**3. DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 16.46 m. × 5.49 m. (b) 14.63 m. × 3.66 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 to 62. (b) and (c) No. (v) No. (vi) No. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is absent, hence individual years results are given under 5. Results.

## 5. RESULTS:

## 61(210)

(i) 547 Kg/ha. (ii) 95.9 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>
Av. yield	627	552	463

C.D. = 102.8 Kg/ha.

## 62(204)

(i) 632 Kg/ha. (ii) 174.5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>
Av. yield	669	771	455

C.D. = 187.2 Kg/ha.

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 61(213), 62(206).**

**Site :- Agri. Res. Stn., Mohol.**

**Type :- 'CM'.**

**Object :-** To study the effect of Poona method of cultivation with local method on the yield of Jowar. (Irrigated).

## 1. BASAL CONDITIONS:

(i) (a) Jowar-Pulses. (b) Tur + Moong. (c) Nil. (ii) Medium light. (iii) 7.10.61; 10.10.62. (iv) (a) 2 harrowings; 3 harrowings. (b) to (c) As per treatments. (v) Nil. (vi) Maldaudi (late). (vii) Irrigated. (viii) 2 hoeings; weeding and thinning. (ix) 7 cm.; 6 cm. (x) 28.2.62; 23.2.63.

## 2. TREATMENTS and 3. DESIGN

Same as in Expts. No. 61(210), 62(204) presented at page No. 262.

## 4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 to 62. (b) No. (c) Results of combined analysis are presented under 5-Results. (v) and (vi) No. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is present.

## 5. RESULTS:

## Pooled results

(i) 1498 Kg/ha. (ii) 881.1 Kg/ha. (based on 2 d.f. made up of interaction of Treatments  $\times$  years). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>
Av. yield	1516	1651	1327

## Individual results

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Sig.	G.M.	S.E./plot
Year						
1961	1658	1569	962	**	1396	175.6
1962	1373	1732	1692	N.S.	1599	370.0
Pooled	1516	1651	1327	N.S.	1498	881.1

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 60(124), 61(113), 62(101).**

**Site :- Agri. Res. Stn., Parbhani.**

**Type :- 'CM'.**

Object: —To study the effect of manuring, spacings and methods of planting on *Jowar*.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton for 60 and 61 ; *Jowar* and *Groundnut* for 62. (c) 56.0 Kg/ha. of N as A/S for 60 ; N.A. for others. (ii) Medium black soil. (iii) 13,15,16.10.60 ; 23,24.10.61 ; 12.10.62. (iv) (a) 5 harrowings. (b) As per treatments. (c) 11.2 Kg./ha. (d) and (e) As per treatments. (v) Nil. (vi) PJ-412. (vii) Unirrigated (viii) 1 to 2 weedings and hoeings. (ix) 6 cm. ; 4 cm. ; 10 cm. (x) 1, 2.3.61 ; 3,5,6.3.62 ; 19.3.63.

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

Same as in Expts. No. 60(64)61(72), 62(59) presented on page. No. 245.

**4. GENERAL :**

(i) Normal for 60 and 62 ; Satisfactory for 61. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958-62. (b) No. (c) Nil. (v) Chas, Digraj and Sholapur (vi) Nil. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is absent, hence results of individual years are presented under 5-Results.

**5. RESULTS :**

**60(124)**

(i) N.A. (ii) 200.9 Kg/ha. (iii) Main effects of S and R and interaction  $S \times P$ ,  $S \times R$  are significant. (iv) Av. yield of grain in Kg/ha.

A=N.A., B=N.A., C=N.A.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>e</sub>	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
P <sub>1</sub>	958	782	731	835	863	773	742	906	824
P <sub>2</sub>	787	931	520	790	656	791	734	758	746
Mean	872	856	626	812	759	782	738	832	785
R <sub>1</sub>	905	1001	308	703	732	778			
R <sub>2</sub>	840	712	943	921	787	787			
M <sub>0</sub>	840	957	640						
M <sub>1</sub>	825	857	595						
M <sub>2</sub>	953	755	640						

C.D. for S marginal means=116.2 Kg/ha.

C.D. for R marginal means=94.9 Kg/ha.

C.D. for body of  $S \times P$  or  $S \times R$  table=164.2 Kg/ha.

**61(113)**

(i) 3958 Kg/ha. (ii) 978.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

A=3248, B=3322 and C=3929 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
P <sub>1</sub>	4491	4109	3819	3853	4493	4072	3935	4343	4139
P <sub>2</sub>	3596	3712	4483	3772	3928	4090	4026	3832	3930
Mean	4044	3910	4151	3812	4210	4080	3981	4088	4035
R <sub>1</sub>	4001	3962	3981	3685	4283	3975			
R <sub>2</sub>	4086	3859	4321	3940	4138	4188			
M <sub>0</sub>	3831	3794	3811						
M <sub>1</sub>	4378	3724	4527						
M <sub>2</sub>	3918	4211	4112						

62(101)

- (i) 994 Kg/ha. (ii) 130.7 Kg/ha. (iii) Main effects of S, P and interaction P×R are highly significant.  
 (iv) Av. yield of grain in Kg/ha.

A=1112, B=1083 and C=1144 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
P <sub>1</sub>	916	902	980	934	950	914	955	910	933
P <sub>2</sub>	914	999	1132	1001	1025	1018	985	1044	1015
Mean	915	950	1056	968	987	966	970	977	974
R <sub>1</sub>	872	971	1067	1015	976	914			
R <sub>2</sub>	957	930	1045	921	1025	1018			
M <sub>0</sub>	872	977	1055						
M <sub>1</sub>	895	950	1117						
M <sub>2</sub>	979	923	995						

C.D. for S marginal means=75.5 Kg/ha.

C.D. for P marginal means=61.7 Kg/ha.

C.D. for body of P×R table=87.3 Kg/ha.

**Crop :- Jowar (Rabi).****Ref :- Mh. 63(68).****Site :- Agri. College Farm, Poona.****Type :- 'CM'.**

Object :- To study the effect of different methods of Preparatory tillage with and without F.Y.M. on the yield of Jowar.

**1. BASAL CONDITIONS :**

- (i) (a) Nil. (b) Cotton. (c) Nil. (ii) N.A. (iii) 16.9.63. (iv) (a) As per treatments. (b) Drilling. (c) N.A. (d) 46 cm. (e) —. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) 2 hoeings. (ix) 14 cm. (x) 20-1-64.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 cultural treatments : C<sub>1</sub>=Harrowing & C<sub>2</sub>=Ploughings.

(2) 2 levels of F.Y.M. : F<sub>0</sub>=0 and F<sub>1</sub>=12.3 C.L./ha.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4, (b) N.A. (iii) 5, (iv) (a) 40.23 m. × 6.09 m. (b) 37.30 m. × 4.88 m. (v) 122 cm. × 61 cm. (vi) Yes.

## 4. GENERAL :

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

## 5. RESULTS :

(i) 3753 Kg/ha. (ii) 337.5 Kg/ha. (iii) Main effect of F alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	Mean
C <sub>1</sub>	3450	3944	3697
C <sub>2</sub>	3396	4221	3808
Mean	3423	4081	3753

C.D. for F marginal means=328.8 Kg/ha.

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 60(90), 61(62).**

**Site :- Agri. Res. Stn, Sholapur.**

**Type :- CM<sup>2</sup>**

Object :—To find out the effect of method of planting, manuring and spacing on the yield of Jowar.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Jowar. (c) Nil. (ii) Deep black. (iii) 3.10.60 ; 13.10.61. (iv) (a) 3 harrowings. (b) As per treatments. (c) N.A. (d) and (e) As per treatments. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) 3 interculturings. (ix) 35.1 cm ; 17.6 cm. (x) 18.2.61 ; 20.2.62.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. Nos. 60(64), 61(72), 62(59) presented on page No. 245.

## 4. GENERAL :

(i) Growth was normal in 60 but lodging was comparatively more in dibbled plots. (ii) Slight attack of sugary; Nil (iii) Yield of grain. (iv) 1959-61. (b) No. (c) Nil. (v) Chas, Digras and Parbhani. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent, hence results of individual years are presented under 5-Results.

## 5. RESULTS :

60(90)

(i) 558 Kg/ha. (ii) 93.4 Kg/ha. (iii) Main effects of S, M, and P are highly significant. (iv) Av. yield of grain in Kg/ha.



A=447, B=442 and C=361 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
P <sub>1</sub>	489	509	662	497	600	563	533	573	553
P <sub>2</sub>	573	581	672	544	650	633	603	615	609
Mean	531	545	667	520	625	598	568	584	581
R <sub>1</sub>	511	513	680	519	620	565			
R <sub>2</sub>	551	577	654	521	630	631			
M <sub>0</sub>	504	456	600						
M <sub>1</sub>	566	620	689						
M <sub>2</sub>	524	558	712						

C.D. for S or M marginal means=54.0 Kg/ha.

C.D. for P marginal means =44.1 Kg/ha.

61(62)

(i) 490 Kg/ha. (ii) 158.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

A=478, B=502 and C=445 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
P <sub>1</sub>	430	490	467	424	490	474	478	447	462
P <sub>2</sub>	483	453	627	521	550	492	523	518	521
Mean	457	471	547	472		482	501	483	492
R <sub>1</sub>	513	463	526	454	527	521			
R <sub>2</sub>	401	480	568	491	513	444			
M <sub>0</sub>	439	500	478						
M <sub>1</sub>	504	479	577						
M <sub>2</sub>	427	435	585						

**Crop :- Jowar (Rabi).****Ref :- Mh. 60(56), 61(64), 62(54), 63(76), 64(66), 65(140).****Site :- Agri. Res. Stn., Sholapur. Type :- 'CM'.**Object:—To evaluate separately and in combination the effect of all factors of Bombay Dry Farming method towards increase in the yield of *Jowar* (banded).**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*. (c) As per treatments. (ii) Deep black soil. (iii) 4.10.60 ; 14.10.61 ; 29.9.62 ; 27.9.63 ; 8.10.64 ; 28.9.65. (iv) (a) As per treatments. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil for 60 ; as per treatments for others. (vi) M-35-1. (vii) Unirrigated. (viii) As per treatments. (ix) 7 cm. ; 13 cm. ; 15 cm. ; 10 cm. ; 8 cm. ; 8 cm. (x) 15, 16.2.61 ; 11.2.62 ; 12.3.63 ; 12.2.64 ; 15.2.65 ; 3, 4.2.66.

## 2. TREATMENTS :

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

(1) 2 ploughings :  $A_0$ =No ploughing and  $A_1$ =Ploughing once in three years.

(2) 2 levels of F.Y.M. :  $B_0$ =No F.Y.M. and  $B_1$ =5600 Kg/ha. of F.Y.M. once in 3 years.

(3) 2 harrowings :  $C_1$ =2 and  $C_2$ =3 harrowings.

(4) 2 row spacings :  $D_1$ =30 cm. and  $D_2$ =46 cm.

(5) 2 seed rates :  $E_1$ =4.4 and  $E_2$ =6.7 Kg/ha.

(6) 2 interculturings :  $F_1$ =1 and  $F_2$ =3 interculturings.

## 3. DESIGN :

(i) 2<sup>6</sup> fact. confd. (ii) (a) 8 plots/block ; 8 blocks/replication. (b) 21.94 m. × 32.92 m. (iii) 2. (iv) (a) 5.49 m. × 16.47 m. (b) 3.66 m. × 14.63 cm. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Not satisfactory in 60 ; below normal in 61, and 62 ; fair in others. (ii) Nil but Endrin sprayed against sugary disease in 64. (iii) Yield of grain. (iv) (a) 1959—contd. (b) Yes. (c) Nil. (v) Chas and Jeur. (vi) Nil. (vii) Expt. being continued and hence individual year results presented below.

## 5. RESULTS :

60(56)

(i) 326 Kg/ha. (ii) 71.1 Kg/ha. (iii) Main effect of D, interaction C × F is highly significant while interaction A × D and D × F are significant. (iv) Table of mean and differential response in Kg/ha.

	Mean response	Differential response											
		A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	8.1	-	-	13.6	2.6	17.7	-1.6	33.7	-17.5	9.7	6.4	1.7	14.5
B	8.3	13.8	2.8	-	-	21.9	-5.2	2.6	14.0	9.7	6.9	6.7	10.0
C	4.6	14.3	-5.1	18.2	-9.0	-	-	12.2	-3.0	1.4	7.8	-33.5	42.7
D	33.9	59.5	8.3	28.2	39.6	41.5	26.3	-	-	18.7	49.1	8.0	59.8
E	14.1	15.7	12.5	15.5	12.7	10.9	17.3	-1.1	29.3	-	-	7.1	21.0
F	7.8	1.4	14.2	6.1	9.4	-30.3	45.9	-18.2	33.7	0.8	14.8	-	-

C.D. for means response = 25.1 Kg/ha.

C.D. for differential response = 35.4 Kg/ha.

61(64)

(i) 370 Kg/ha. (ii) 99.8 Kg/ha. (iii) Interaction B × C is highly significant. (iv) Table of mean and differential response in Kg/ha.

	Mean response	Differential response											
		A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	-11.5	-	-	1.9	-24.9	-13.1	-9.9	13.6	-36.6	-16.6	-6.4	16.9	-39.9
B	1.3	14.7	-12.1	-	-	-51.4	54.0	-2.6	5.2	12.9	-10.3	12.0	-9.4
C	9.3	-10.9	-7.7	-62.0	43.4	-	-	-33.9	15.4	-1.3	-17.3	12.3	-30.8
D	4.3	29.4	-20.8	0.4	8.2	-20.4	29.0	-	-	-19.0	27.6	-7.5	16.0
E	2.7	-2.4	7.8	14.3	-8.9	10.7	-5.3	-20.6	26.0	-	-	-2.4	7.8
F	-6.7	21.6	-35.1	3.9	-17.4	14.8	-28.3	-18.5	5.0	-11.8	-1.6	-	-

C.D. for mean response = 35.0 Kg/ha.

C.D. for differential response = 49.6 Kg/ha.

62(54)

(i) 552 Kg/ha. (ii) 150.5 Kg/ha. (iii) Main effect of B is highly significant while interaction  $A \times B \times C$ ,  $A \times B \times E$  and  $A \times C \times E$  are significant. (iv) Mean and differential response table in Kg/ha.

	Mean response	Differential response											
		A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	16.4	---	---	2.0	30.7	-1.2	34.0	29.3	3.4	10.8	21.9	-13.0	45.7
B	108.5	94.1	122.8	---	---	121.5	95.4	102.4	114.5	77.4	139.6	120.4	96.6
C	38.4	20.8	56.0	51.5	25.4	---	---	36.8	40.0	20.3	56.5	17.5	59.3
D	23.9	36.8	10.9	17.9	29.9	22.3	25.5	---	---	32.3	15.5	30.0	17.8
E	12.6	7.0	18.1	-18.5	43.7	-5.5	30.7	20.9	4.2	---	---	-19.8	44.9
F	-20.4	-49.8	8.9	-8.5	-32.4	-41.3	0.4	-14.3	-26.5	-52.8	11.9	---	---

C.D. for mean response = 52.9 Kg/ha.

C.D. for differential response = 74.8 Kg/ha.

63(76)

(i) 321.3 Kg/ha. (ii) 96.7 Kg/ha. (iii) Main effect of D and interaction  $E \times F$ ,  $B \times D \times E$  and  $ABCF$  are significant. (iv) Table of mean and differential response table in Kg/ha.

	Mean response	Differential response											
		A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	-1.7	---	---	19.4	-22.9	6.4	-9.9	11.4	-14.9	1.8	-5.3	12.9	-16.5
B	-13.4	7.7	-34.6	---	---	4.4	-31.3	-16.4	10.5	-14.2	-12.6	-32.3	5.4
C	-5.9	2.2	-14.0	11.9	-23.7	---	---	-13.8	2.1	13.3	-25.0	-23.5	11.8
D	35.8	49.0	22.6	32.8	38.8	27.9	43.8	---	---	56.5	15.1	33.3	38.3
E	-0.8	2.8	-4.3	-1.5	0.0	18.4	-19.9	19.8	-21.4	---	---	-34.8	33.3
F	-3.5	11.2	-18.2	-22.3	15.4	-21.1	14.2	-6.0	-0.9	-37.5	30.6	---	---

C.D. for mean response = 31.8 Kg/ha.

C.D. for differential response = 45.2 Kg/ha.

64(66)

(i) 385 Kg/ha. (ii) 101.6 Kg/ha. (iii) Main effect of D and interaction  $BCDF$  are highly significant. Interaction  $ABDE$  is significant. (iv) Mean and differential response table in Kg/ha.

	Mean response	Differential response											
		A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	-13.6	---	---	-1.4	-25.7	-15.9	-11.2	-2.4	-24.8	-5.2	-21.9	4.1	-31.2
B	17.2	29.3	5.0	---	---	39.4	-5.1	11.8	22.6	-6.3	40.7	6.8	27.6
C	2.4	28.6	-23.9	24.6	-19.9	---	---	-1.3	6.1	-25.3	30.1	-1.9	6.7
D	65.5	54.3	-76.7	-70.9	-60.1	-69.2	-61.8	---	---	-70.8	-60.3	-70.4	-60.7
E	-6.4	1.9	-14.8	-29.9	17.1	34.1	21.3	-11.7	-1.2	---	---	-10.1	-2.8
F	7.7	25.4	-10.0	-2.7	18.1	3.3	12.1	2.8	12.6	4.0	11.3	---	---

C.D. for mean response = 35.6 Kg/ha.

C.D. for differential response = 50.5 Kg/ha.

65(140)

(i) 519.1 Kg/ha. (ii) 119.1 Kg/ha. (iii) Main effect of A and interaction  $A \times D \times E$ ,  $D \times F$ ,  $ABEF$ , are highly significant. Interaction  $B \times C \times D$ ,  $A \times B \times E$ ,  $C \times F$ ,  $A \times C \times F$ ,  $A \times D \times F$ ,  $BCDF$ ,  $B \times E \times F$ ,  $CDEF$  are significant. (iv) Mean and differential response table in Kg/ha.

	Mean response	Differential response											
		A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	71.9	—	—	102.4	41.3	61.1	82.6	72.9	70.8	68.4	77.4	90.3	53.4
B	39.0	69.5	8.4	—	—	44.4	33.5	18.6	59.4	7.9	70.0	43.9	34.0
C	-32.2	-42.9	-21.4	-26.7	-37.5	—	—	-47.5	-16.8	-32.9	-31.4	-84.3	19.9
D	5.8	6.9	4.7	-14.6	26.2	-9.6	21.2	—	—	-24.1	36.7	-55.0	66.6
E	37.2	31.7	42.7	6.2	68.3	36.5	37.9	7.3	67.2	—	—	71.3	3.1
F	-6.9	11.5	-25.4	-2.0	-11.8	-59.0	45.2	-67.7	53.9	27.2	-40.1	—	—

C.D. for mean response = 41.8 Kg/ha.

C.D. for differential response = 59.3 Kg/ha.

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 60(205), 61(214), 62(208), 63(259),  
64(214), 65(120).**

**Site :- Agri. Res. Stn., Sholapur. Type :- 'CM'.**

**Object :-** To evaluate separately and in combination the effects of all the factors of Bombay Dry Farming method towards increase in yield of Rabi Jowar (unbunded).

**1. BASAL CONDITIONS :**

(i) (a) Jowar—Jowar. (b) Jowar. (c) As per treatments. (ii) Deep black. (iii) 6.10.60 ; 7.10.61 ; 29.9.62 ; 29.9.63 ; 8.10.64 ; 29.9.65. (iv) (a) As per treatments. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) As per treatments. (vi) M—35—1. (vii) Unirrigated. (viii) As per treatments. (ix) 5.4 cm. ; 11.1 cm. ; 15.1 cm. ; N.A. for 63 and 64 ; 8.6 cm. (x) 20.2.61 ; 28.2.62 ; 11.3.63 ; 19.2.64 ; 15. 17.2.65 ; 6.2.66.

**2. TREATMENTS :**

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

(1) 2 levels of ploughing :  $A_1$ =No ploughing and  $A_2$ =Once in 3 years. (In 60 and 63).

(2) 2 applications of 56 Q/ha. of F.Y.M. :  $B_1$ =No application and  $B_2$ =Once in 3 years. (In 60 and 63).

(3) 2 levels of harrowing :  $C_1$ =2 and  $C_2$ =3 harrowings.

(4) 2 spacings between rows :  $D_1$ =30 and  $D_2$ =45 cm.

(5) 2 seed rates :  $E_1$ =6.7 and  $E_2$ =4.5 Kg/ha.

(6) 2 levels of interculturings :  $F_1$ =1 and  $F_2$ =3 interculturings.

**3. DESIGN :**

(i) 2<sup>6</sup> fact. confd. (ii) (a) 8 blocks/replication., 8 plots/block. (b) 21.94 m. × 32.92 m. (iii) 2. (iv) (a) 5.49 m. × 16.46 m. (b) 3.66 m. × 14.63 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—contd. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) As the experiment is continued beyond 65, individual year results are presented under 5. Results.

**5. RESULTS :**

60(205)

(i) 493 Kg/ha. (ii) 121.1 Kg/ha. (iii) None of the effects is significant. (iv) Mean and differential response table in Kg/ha.

	Mean response	Differential response											
		A		B		C		D		E		F	
A	-10.3	—	—	7.4	-28.0	-8.5	-12.1	-13.2	-7.4	-2.5	-18.1	24.1	-44.7
B	33.9	51.6	16.2	—	—	42.5	25.3	6.4	61.5	31.5	36.3	34.7	33.1
C	-21.8	-20.0	-23.7	-13.3	-30.4	—	—	-7.3	-36.4	-19.7	-24.0	-30.1	-13.6
D	84.9	82.0	87.8	57.4	112.5	99.5	70.4	—	—	97.2	72.6	49.7	120.1
E	2.1	9.9	-5.7	-0.4	4.5	4.2	-0.1	14.4	-10.2	—	—	-3.7	7.8
F	-2.3	32.1	-36.7	-1.5	3.1	-10.5	5.9	-37.5	32.9	-8.0	3.4	—	—

61(214)

(i) 449 Kg/ha. (ii) 156.2 Kg/ha. (iii) Main effect of C and interaction B×D are significant. (iv) Mean and differential response table in Kg/ha.

	Mean response	Differential response											
		A		B		C		D		E		F	
A	-13.3	—	—	33.4	-60.0	-28.1	1.6	-17.4	-9.2	10.4	-16.1	10.8	-37.4
B	34.4	81.1	-12.2	—	—	26.4	42.4	98.3	-29.4	25.4	43.5	63.9	5.0
C	71.9	57.1	86.8	63.9	79.9	—	—	107.4	36.5	95.5	48.3	110.4	33.5
D	52.3	48.1	56.4	116.1	-11.6	87.7	16.8	—	—	73.9	30.6	14.1	90.4
E	13.4	15.3	10.6	4.4	22.5	37.0	-10.2	35.1	-8.2	—	—	10.9	15.9
F	10.2	34.3	-13.9	39.7	-19.3	48.7	28.3	-27.9	48.3	7.7	12.7	—	—

C.D. for mean response = 55.2 Kg/ha.

C.D. for differential response = 78.2 Kg/ha.

62(208)

(i) 582 Kg/ha. (ii) 143.5 Kg/ha. (iii) Main effect of B alone is highly significant. (iv) Mean and differential response table in Kg/ha.

	Mean response	Differential response											
		A		B		C		D		E		F	
A	4.6	—	—	-10.6	19.7	-17.0	26.1	-14.8	24.0	0.6	8.6	2.4	6.7
B	109.9	94.8	125.1	—	—	104.8	115.1	83.4	136.6	140.5	79.4	107.7	112.3
C	29.9	8.3	51.4	24.7	35.0	—	—	36.6	23.1	34.3	25.6	23.5	36.2
D	36.5	17.1	55.9	9.9	63.1	43.3	29.8	—	—	54.5	18.6	38.3	34.7
E	-14.9	-18.9	-10.9	15.6	-45.6	-10.5	-19.3	3.0	-32.9	—	—	-22.6	-7.2
F	9.9	7.8	12.1	7.6	12.2	3.5	16.3	11.7	8.1	2.2	8.1	—	—

C.D. for mean response = 50.8 Kg/ha.

63(259)

(i) 295 Kg/ha. (ii) 135.5 Kg/ha. (iii) None of the effects is significant. (iv) Mean and differential response table in Kg/ha.

	Mean response	Differential response											
		A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	-4.8	—	—	-8.3	-1.4	-21.9	21.2	-17.4	7.7	17.0	-26.6	-43.6	33.9
B	2.1	-1.3	5.5	—	—	12.3	-8.1	10.7	14.9	6.2	-2.0	21.3	-17.1
C	7.9	-9.1	24.9	18.1	2.3	—	—	12.4	3.4	-5.1	20.8	20.2	-4.4
D	23.9	11.4	36.4	11.1	36.7	28.4	19.4	—	—	23.3	24.5	18.0	29.9
E	10.9	32.7	-10.9	15.0	6.8	-2.0	23.8	10.3	11.5	—	—	18.4	3.4
F	-19.6	-58.4	19.2	-0.3	-38.8	-7.3	-31.9	-25.5	-13.6	-12.1	-27.1	—	—

64(214)

(i) 323 Kg/ha. (ii) 130.7 Kg/ha. (iii) None of the effects is significant. (iv) Mean and differential response table in Kg/ha.

	Mean response	Differential response											
		A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	-9.7	—	—	-12.1	-7.4	-41.8	22.3	5.0	-24.5	-3.1	-16.4	-26.1	6.6
B	19.3	16.9	21.6	—	—	3.6	34.9	56.7	-18.1	-16.3	54.8	43.0	-4.4
C	9.1	-22.9	41.1	-6.5	24.8	—	—	0.6	17.6	42.0	-23.7	12.5	5.8
D	43.6	58.4	28.8	81.0	6.2	35.1	52.1	—	—	48.6	38.7	56.6	30.6
E	27.2	33.8	20.5	-8.4	62.7	60.0	-5.7	32.1	22.2	—	—	30.9	23.4
F	15.8	-0.5	32.2	39.5	-7.9	19.2	12.5	28.8	2.8	19.6	12.1	—	—

65(120)

(i) 435 Kg/ha. (ii) 243.9 Kg/ha. (iii) Main effect of D alone is significant. (iv) Mean and differential response table in Kg/ha.

	Mean response	Differential response											
		A		B		C		D		E		F	
		-	+	-	+	-	+	-	+	-	+	-	+
A	-3.5	—	—	-26.9	20.0	-17.7	10.8	28.8	21.9	26.6	-33.5	-62.8	55.2
B	47.4	23.9	70.9	—	—	100.8	-6.0	45.3	49.5	76.8	18.0	40.3	54.5
C	-44.8	-59.1	-30.5	8.6	-98.2	—	—	-74.1	-15.5	-43.7	-45.9	2.1	-91.7
D	107.0	81.6	132.4	104.9	109.1	77.7	136.3	—	—	75.7	138.3	101.1	112.9
E	61.6	91.7	31.6	91.0	32.3	62.7	60.6	30.4	92.9	—	—	112.7	10.6
F	4.1	-55.2	63.4	-3.0	11.2	51.0	-42.8	-1.8	10.0	55.2	-47.0	—	—

C.D. for mean response = 86.2 Kg/ha.

**Crop :- Jowar (Kharif).**

**Ref :- Mh. 60, 61, 62, 63(M.A.E.)**

**Site :- M.A.E. Centre, Akola.**

**Type :- 'CM'.**

**Object :-**Type VIII : To study the effect of spacings along with different levels of N and P on the yield of Jowar.

**1. BASAL CONDITIONS :**

(i) (a) to (c) Nil. (ii) Medium black. (iii) N.A. ; 14.7.61 ; N.A. ; 14.7.63. (iv) (a) 3 harrowings. (b) Drilling with the cultured mogha attached with bowel. (c) 4.5 Kg/ha. (d) As per treatments. (e) —. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 3 hoeings and weedings. (ix) N.A. (x) N.A. ; 13.12.61 ; N.A. ; 20.12.63.

**2. TREATMENTS :**

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

(1) 3 spacings between rows:  $S_1=30$ ,  $S_2=46$  and  $S_3=61$  cm.

(2) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(3) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

**3. DESIGN :**

(i)  $3^3$  confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 10.40 m.  $\times$  4.90 m. (b) 9.80 m.  $\times$  4.30 m. (v) 30 cm.  $\times$  30 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—63. (b) No. (c) Nil. (v) to (vii) Nil.

**5. RESULTS :**

**60(M.A.E.).**

(i) 1378 Kg/ha. (ii) 298.0 Kg/ha. (iii) Main effect of N is highly significant. Main effect of S and interactions  $S \times N$ ,  $S \times P$  and  $N \times P$  are significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	Mean
$S_1$	618	1300	1679	1217	1051	1329	1199
$S_2$	1042	1420	1854	1522	1282	1513	1439
$S_3$	1254	1697	1540	1439	1817	1235	1497
Mean	971	1472	1691	1393	1383	1359	1378
$P_0$	941	1457	1781				
$P_1$	1180	1217	1752				
$P_2$	793	1743	1540				

C.D. for N or S marginal means = 205.8 Kg/ha.

C.D. for the body of any table = 356.9 Kg/ha.

**61(M.A.E.).**

(i) 978 Kg/ha. (ii) 235.6 Kg/ha. (iii) Interactions  $S \times N$  and  $SN^2P^2$  are significant. Interaction  $SNP^2$  is highly significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	Mean
$S_1$	1070	1079	876	986	1042	996	1008
$S_2$	802	775	1153	1014	876	839	910
$S_3$	904	1097	1050	1134	1153	764	1017
Mean	925	984	1026	1045	1024	866	978
$P_0$	931	1116	1088				
$P_1$	978	932	1162				
$P_2$	866	904	828				

C.D. of body of  $S \times N$  table = 282.1 Kg/ha.

62(M.A.E.)

(i) 1139 Kg/ha. (ii) 293.5 Kg/ha. (iii) Main effect of S alone is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
S <sub>1</sub>	1360	1089	1181	1235	1278	1117	1210
S <sub>2</sub>	1378	1061	1219	1087	1387	1184	1219
S <sub>3</sub>	897	1041	1022	941	1054	965	987
Mean	1212	1064	1141	1088	1240	1089	1139
P <sub>0</sub>	951	995	1317				
P <sub>1</sub>	1458	1128	1133				
P <sub>2</sub>	1226	1068	972				

C.D. for S marginal means=202.9 Kg/ha.

63(M.A.E.)

(i) 1094 Kg/ha. (ii) 67.5 Kg/ha. (iii) All main effects and interactions are highly significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
1	1102	1087	1113	1130	1126	1046	1101
S <sub>2</sub>	1119	1290	1181	1121	1294	1175	1197
S <sub>3</sub>	1037	1066	1049	963	1138	850	984
Mean	1086	1148	1048	1071	1186	1024	1094
P <sub>0</sub>	1050	1064	1099				
P <sub>1</sub>	1182	1343	1033				
P <sub>2</sub>	1025	1036	1011				

C.D. for any marginal mean=46.6 Kg/ha.

C.D. for body of any table=80.9 Kg/ha.

**Crop :- Jowar (Kharif).**

**Ref:- Mh. 62(145), 63(190), 64(157).**

**Site :- Agri. College Farm, Akola.**

**Type :- 'I'.**

**Object :-**To study the effect of irrigation on the yield of *Jowar*.

#### 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat ; *Jowar* ; cotton. (c) Nil ; 12.35 C.L./ha. of F.Y.M. ; N.A. (ii) Clayey. (iii) 27.7.62 ; 20.7.63 ; 17.7.64. (iv) (a) 2-4 harrowings. (b) Drilling. (c) 7 Kg/ha. (d) 46 cm. x 23 cm. (e) —. (v) 22.4 Kg/ha. of N as A/S + 22.4 Kg/ha of P<sub>2</sub>O<sub>5</sub> as Super. (vi) P.S. 13. (vii) As per treatments. (viii) Weeding and 2 hoeings ; 2 weedings and 2 hoeings ; weeding. (ix) 68 cm. ; 49 cm. ; 69 cm. (x) Jan., 63 ; 6.1.64 ; 10.2.65.



## 2. TREATMENTS:

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

(1) 4 intervals of irrigations :  $I_1=20$  days after sowing,  $I_2=60$  days after sowing,  $I_3=20$  and 60 days after sowing and  $I_4=As$  and when required.

(2) 3 levels of irrigation :  $L_1=2.5$  cm.,  $L_2=5$  cm. and  $L_3=7.5$  cm.

(c) Control: No irrigation (4 plots in each replication).

## 3. DESIGN :

(1) R.B.D. (ii) (a) 16 (4 control plots in each replication). (b) N.A. (iii) 3. (iv) (a)  $9.14$  m.  $\times$   $12.80$  m. (b)  $5.49$  m.  $\times$   $9.14$  m. (v)  $1.83$  m.  $\times$   $1.83$  m. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962-64. (b) No. (c) Nil. (v) and (vi) Nil. (vii) As the rainfall is sufficient, no irrigation was given for  $I_4$  treatment in 62.

## 5. RESULTS :

## 62(145)

(i) 2041 Kg/ha. (ii) 151.9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=2024 Kg/ha.

	$L_1$	$L_2$	$L_3$	Mean
$I_1$	2070	2018	2011	2033
$I_2$	1981	2157	2040	2059
$I_3$	2114	1965	2088	2056
Mean	2055	2047	2046	2049

## 63(190)

(i) 1672 Kg/ha. (ii) 593.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=1727 Kg/ha.

	$L_1$	$L_2$	$L_3$	Mean
$I_1$	1751	1319	2068	1713
$I_2$	1359	1894	1614	1622
$I_3$	1952	1176	1581	1570
$I_4$	1756	1647	1727	1710
Mean	1704	1509	1748	1654

## 64(157)

(i) 1030 Kg/ha. (ii) 299.0 Kg/ha. (iii) Interaction ( $I \times L$ ) is highly significant. (iv) Av. yield of grain in Kg/ha.

Control=887 Kg/ha.

	$L_1$	$L_2$	$L_3$	Mean
$I_1$	992	1083	1023	1033
$I_2$	1564	1143	541	1083
$I_3$	831	1264	1505	1200
$I_4$	1082	962	932	992
Mean	1117	1113	1000	1077

C.D. for ( $I \times L$ ) body of table=503 Kg/ha.

**Crop :- Jowar (Kharif).**  
**Site :- Agri. Res. Stn., Nagpur.**

**Ref :- Mh. 63(171), 64(143).**  
**Type :- 'P'.**

**Object:—**To study the effect of interval of irrigation and quantity of water on the yield of *Jowar*.

**1. BASAL CONDITIONS:**

(i) (a) Nil, (b) *Jowar*, (c) 22.4 Kg/ha of N+22.4 Kg/ha of P<sub>2</sub>O<sub>5</sub>, (ii) Black cotton soil, (iii) 24.7.63; 29.7.64, (a) Ploughing and harrowing, (b) Drilling, (c) N.A., (d) 61 cm.×23 cm. (e) 1 to 2, (v) 22.4 Kg/ha, of N as A/S+22.4 Kg/ha, of P<sub>2</sub>O<sub>5</sub> as Super at sowing, (vi) Improved saoner, (vii) As per treatments, (viii) : to 4 weedings and 2 hoeings, (ix) 68 cm. ; 62 cm. (x) 3.1.64 ; 2.1.65.

**2. TREATMENTS:**

All combinations of (1) and (2)

(1) 5 times and frequencies of irrigation : F<sub>1</sub>=One irrigation after 20 days after sowing, F<sub>2</sub>=One irrigation after 60 days after sowing F<sub>3</sub>=Two irrigations after 20 and 60 days after sowing, F<sub>4</sub>=As and when required and F<sub>5</sub>=At a regular interval of 8 to 10 days.

(2) 4 intensities of irrigation : I<sub>0</sub>=0, I<sub>1</sub>=1, I<sub>2</sub>=2 and I<sub>3</sub>=3 acre inches.

**3. DESIGN:**

(i) Fact. in R.B.D. (ii) (a) 20, (b) N.A. (iii) 4, (iv) (a) 9.14 m.×12.80 m. (b) 5.49 m.×9.14 m. (v) 1.82 m ×1.82 m. (vi) Yes.

**4. GENERAL:**

(i) Normal, (ii) Endrin sprayed for stem borer, (iii) Yield of grain, (iv) (a) 1963 to 64, (b) No, (c) Results of combined analysis are presented under 5-Results, (v) and (vi) Nil, (viii) Error variances are homogeneous and Treatment×years interaction is absent.

**5. RESULTS:**

Pooled results

(i) 1306 Kg/ha, (ii) 267.4 Kg/ha, (based on 114 d.f. made up of pooled error), (iii) Control vs. others effect and main effect of F are highly significant, (iv) Av. yield of grain in Kg/ha.

Control I<sub>0</sub>=1202 Kg/ha.

	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	F <sub>5</sub>	Mean
I <sub>1</sub>	1148	1320	1382	1364	1387	1320
I <sub>2</sub>	1261	1211	1298	1430	1612	1362
I <sub>3</sub>	1076	1227	1388	1445	1562	1340
Mean	1162	1253	1356	1413	1520	1341

C.D. for F marginal means=153.0 Kg/ha.  
 C.D. for control vs others=96.8 Kg/ha.

**Individual results**

Treatment	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	F <sub>5</sub>	Sig.	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	Sig.
Year										
1963	912	1069	1209	1215	1458	**	1110	1220	1189	N.S.
1964	1412	1437	1503	1611	1582	N.S.	1531	1505	1491	N.S.
Pooled	1162	1253	1356	1413	1520	**	1320	1362	1340	N.S.

Control	G.M.	S.E./plot
1063	1145	235.2
1341	1467	269.2
1202	1306	267.4

**Crop :- Jowar (Kharif).****Ref :- Mh. 65(157).****Site :- Agri. College Farm, Nagpur.****Type :- 'P'.**

Object :—To study the effect of irrigation.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Medium black. (iii) 27.7.65.  
 (iv) (a) Harrowing. (b) Drilling. (c) N.A. (d) 61 cm. (e) —. (v) 22.4 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$   
 at sowing. (vi) Improved saoner. (vii) As per treatments. (viii) 2 weedings and 1 hoeing. (ix) 40 cm.  
 (x) 23 to 25.12.65.

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 5 frequencies of irrigation :  $F_1$  = One irrigation 20 days after sowing,  $F_2$  = One irrigation 60 days  
 after sowing,  $F_3$  = Two irrigations 20 and 60 days after sowing,  $F_4$  =  
 Irrigation after every 21 days and  $F_5$  = Irrigation as and when required.

(2) 3 depths of irrigation :  $D_1$  = Surface,  $D_2$  = 2" and  $D_3$  = 3".

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 12.80 m. × 9.14 m. (b) 9.14 m. × 5.49 m.  
 (v) 183 cm. × 183 cm. (vi) Yes.

**4. GENERAL:**

(i) Normal. (ii) Nil. (iii) Height, no. of cobs and yield of grain etc. (iv) (a) 1965 contd. (b) and (c)  
 No. (v) Not known. (vi) and (vii) Nil.

**5. RESULTS:**

(i) 2059 Kg/ha. (ii) 365.70 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	$D_1$	$D_2$	$D_3$	Mean
$F_1$	1490	2143	2095	1909
$F_2$	2345	2237	2140	2241
$F_3$	2210	1981	2018	2070
$F_4$	1968	2006	2038	2004
$F_5$	1894	2098	2225	2072
Mean	1981	2093	2103	2059

**Crop :- Jowar (Rabi).****Ref :- Mh. 62(106).****Site :- Agri. College Farm, Parbhani.****Type :- 'P'.**Object :—To study the optimum interval and quantity of irrigation for the *Jowar* crop.**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Fodder *Jowar*. (c) Nil. (ii) N.A. (iii) 20.10.62. (iv) (a) Harrowing. (b) Drilling. (c) 9 to  
 11 Kg/ha. (d) 46 cm. × 23 cm. (e) —. (v) 12.5 C.L./ha. broadcast on 9.10.62, A/S and S/P also applied.  
 Quantity N A (vi) P.J. 4 R. (vii) As per treatments. (viii) 2 weedings. (ix) 10 cm. (x) 18 to 21st  
 March, 63.

**2. TREATMENTS:**

All combinations of (1) and (2)

(1) 4 intensities of irrigation :  $I_1=0$ ,  $I_2=1$ ,  $I_3=2$  and  $I_4=3$  acre inches.

(2) 4 times of irrigation :  $F_1$  = One irrigation 20 days after sowing,  $F_2$  = One irrigation 60 days after sow-  
 ing,  $F_3$  = Two irrigations 20 and 60 days after sowing and  $F_4$  = Irrigation as and  
 when required.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) 36.58 m. × 51.21 m. (iii) 4. (iv) (a) 9.14 m. × 12.80 m. (b) 5.49 m. × 9.14 m. (v) 1.83 m. × 1.83 m. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) 1962-only. (b) and (c) N.A. (v) to (vii) Nil.

## 5. RESULTS :

(i) 3755 Kg/ha. (ii) 629.9 Kg/ha. (iii) Main effects of I and F are significant. (iv) Av. yield of grain in Kg/ha.

	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	Mean
F <sub>1</sub>	4546	3269	3664	3448	3732
F <sub>2</sub>	4009	3593	3158	3802	3640
F <sub>3</sub>	3954	3054	3107	3676	3448
F <sub>4</sub>	4321	4214	4151	4118	4201
Mean	4207	3533	3520	3761	3755

C.D. of I or F marginal means = 518 Kg/ha.

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 64(74).**

**Site :- Trial Cum Demons. Farm, Bendsura Project, Bhir. Type :- 'IM'.**

Object: —To study the optimum time of irrigation for *Jowar*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 44.2 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Heavy black soil. (iii) 19 to 28.10.64. (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling. (c) 15 Kg/ha. (d) 40 cm. × 10 to 12 cm. (e) —. (v) Nil. (vi) M-35-1. (vii) As per treatments. (viii) 3 interculturings. (ix) 0.9 cm. (x) 6, 8.3.65.

## 2. TREATMENTS :

19 treatments: T<sub>0</sub>=Control, T<sub>1</sub>=22.4 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, T<sub>2</sub>=Irrigation as a pre-soaking dose, T<sub>3</sub>=Pre-soaking dose+T<sub>1</sub>, T<sub>4</sub>=Irrigation at advance tillering stage or grand growth period, T<sub>5</sub>=Irrigation at flag leaf stage or boot stage, T<sub>6</sub>=Irrigation at milk stage or peak flowering or fruiting stage, T<sub>7</sub>=Pre-soaking dose+T<sub>4</sub>, T<sub>8</sub>=Pre-soaking dose+T<sub>5</sub>, T<sub>9</sub>=Pre-soaking dose+T<sub>6</sub>, T<sub>10</sub>=Pre-soaking dose+T<sub>4</sub>+T<sub>5</sub>, T<sub>11</sub>=Pre-soaking dose+T<sub>4</sub>+T<sub>6</sub>, T<sub>12</sub>=Pre-soaking dose+T<sub>5</sub>+T<sub>6</sub>, T<sub>13</sub>=T<sub>4</sub>+T<sub>5</sub>, T<sub>14</sub>=T<sub>4</sub>+T<sub>6</sub>, T<sub>15</sub>=T<sub>5</sub>+T<sub>6</sub>, T<sub>16</sub>=Pre-soaking dose+T<sub>4</sub>+T<sub>5</sub>+T<sub>6</sub>, T<sub>17</sub>=Irrigation at an interval of 14 days and T<sub>18</sub>=Irrigation at an interval of 21 days.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 19. (b) N.A. (iii) 3. (iv) (a) 12.80 m. × 9.14 m. (b) 9.14 m. × 5.49 m. (v) 1.83 m. × 1.83 m. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) B.F.C. 10 % sprayed. (iii) Yield of grain. (iv) (a) 1964 only (b) to (c) No. (v) Golegaon and Khasapur. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 851 Kg/ha. (ii) 109.6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. yield	402	545	500	532	807	927	834	963	681	894
	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>	T <sub>17</sub>	T <sub>18</sub>	
	997	764	734	1030	887	777	1070	1494	1329	

C.D. for treatment means=182 Kg/ha.

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 63(90), 65(199).**

**Site :- Trial Cum Demons. Farm, Golegaon.**

**Type :- 'IM'.**

Object :- To study the optimum time of irrigation for *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar* and *Tur*; Wheat. (c) Nil. (ii) Black cotton soil. (iii) 28.10.63; 20, 21.10.65. (iv) (a) Ploughing and 4 harrowings; harrowing. (b) Drilling. (c) 6.72 Kg/ha.; 9 Kg/ha. (d) 46 cm. (e) —. (v) Nil. (vi) PJ 4 R. (vii) As per treatments. (viii) 2 weedings and 2 hoeings. (ix) Nil; 11.9 cm. (x) 9, 10.3.64; 15 to 17.3.66.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no 64(74) presented on page No. 278.

4. GENERAL :

(i) Normal. (ii) Nil; Sulphur dusted. (iii) Yield of grain. (iv) (a) 1963-67. (b) No. (c) Nil. (v) Bhir, Khasapur. (vi) Nil. (vii) Experiment was vitiated in 64.

5. RESULTS :

63(90)

(i) 1050 Kg/ha. (ii) 436.5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. yield	912	713	877	1034	1042	1223	877	1181	1071	892
	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>	T <sub>17</sub>	T <sub>18</sub>	
	1181	830	1186	1179	987	1037	1615	842	1271	

65(199)

(i) 918 Kg/ha. (ii) 324.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. yield	793	821	864	909	1123	850	862	951	790	859
	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>	T <sub>17</sub>	T <sub>18</sub>	
	817	1333	657	1099	1011	451	1226	789	1238	

**Crop :- Jowar (Rabi).**

**Ref :- Mh. 63(82), 64(67), 65(212).**

**Site :- Trial Cum. Demons. Farm, Khasapur. Type :- 'IM'.**

Object :- To study the optimum time of irrigation for *Jowar*.

**1. BASAL CONDITIONS:**

(i) (a) Nil. (b) *Jowar*; N.A.; *Chinamug*. (c) 44.2 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ ; N.A.; 12.4 Kg/ha. of N+24.7 Kg/ha. of  $P_2O_5$ . (ii) N.A.; N.A.; Medium black. (iii) 12 and 13.10.63; 26 10.64; 5.10.65. (iv) (a) 2 ploughings and 4 harrowings; ploughing and 2 harrowings; ploughing and harrowing. (b) Drilling. (c) N.A. in 63 and 64; 12.4 Kg/ha. in 65. (d) 46 cm. x 15 to 23 cm. (e) Nil in 63 and 64; one in 65. (v) Nil in 63 and 64; 24.7 Kg/ha. of N+37.1 Kg/ha. of  $P_2O_5$  in 65. (vi) M-35-1. (vii) As per treatments. (viii) Weeding and hoeing. (ix) 49 cm.; N.A.; 53.8 cm. (x) 8 to 13.2.64, 20 to 24.2.64; 11.3.65; 24.1.66 to 3.3.66.

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

Same as in expt. no. 64(74) presented on page No. 278.

**4. GENERAL:**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-67. (b) No. (c) Nil. (v) Golegoan and Bhir. (vi) Nil. (vii) Since expt. contd. beyond 65, hence the individual results are given under 5. Results.

**5. RESULTS:****63(82)**

(i) 1345 Kg/ha. (ii) 47.8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. yield	1010	1149	1329	777	1216	1143	1176	1010	1575	1130
	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>	T <sub>17</sub>	T <sub>18</sub>	
	1522	1728	1056	1781	1628	1382	1555	1854	1541	

C.D. for treatment means=79 Kg/ha.

**64(67)**

(i) 1030 Kg/ha. (ii) 121.2 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. yield	917	543	409	668	1101	653	807	903	1071	1281
	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>	T <sub>17</sub>	T <sub>18</sub>	
	1390	1420	822	1465	1141	1131	1525	1186	1131	

C.D. for treatment means=174 Kg/ha.

**65(212)**

(i) 1826 Kg/ha. (ii) 255.3 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. yield	863	687	1494	961	1638	1749	1532	1549	2006	2015
	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>	T <sub>17</sub>	T <sub>18</sub>	
	1901	1612	2439	1687	2285	1531	2812	3229	2707	

C.D. for treatment means=366 Kg/ha.

**Crop :- Bajri (Kharif).**

**Site :- Agri. Res. Stn., Chas.**

**Ref :- Mh. 60(4), 61(75).**

**Type :- 'M'.**

**Object :- To find out a suitable combination of N and P for Bajri.**

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black. (iii) 29.6.60 ; 24.6.61. (iv) (a) 1 ploughing, 2 to 3 harrowings. (b) Drilled. (c) 2 to 3 Kg/ha. (d) 30 cm. between rows. (e) —. (v) Nil. (vi) Akola. (vii) Unirrigated. (viii) 2 interculturings. (ix) 60 cm. ; 12 cm. (x) 24.10.60 ; 24.9.61.

2. **TREATMENTS :**

All combinations of (1) and (2)

(1) 4 levels of N as A/S :  $N_0=0$ ,  $N_1=11.2$ ,  $N_2=22.4$  and  $N_3=33.6$  Kg/ha.

(2) 4 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=11.2$ ,  $P_2=22.4$  and  $P_3=33.6$  Kg/ha.

Manures applied on 29.6.60 ; 24.6.61.

3. **DESIGN:**

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 15.85 m. x 4.88 m. (b) 14.63 m. x 3.66 m. (v) 61 cm. x 61 cm. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—61. (b) No. (c) Results of combined analysis, as well as individual analysis are presented under 5. Results. (v) Jeur, Sholapur. (vi) Nil. (vii) Expts. for the years 54 to 59 are also taken into consideration while giving the pooled results. The error variances are heterogeneous and Treatments x years interaction is present.

5. **RESULTS :**

Pooled results

(i) 447 Kg/ha. (ii) 141.6 Kg/ha. (based on 105 d.f. made up of Treatments x years interaction). (iii) Main effects of N and P are highly significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$N_2$	$N_3$	Mean
$P_0$	309	412	422	494	409
$P_1$	337	428	501	540	452
$P_2$	346	430	507	513	449
$P_3$	390	463	507	561	480
Mean	346	433	482	527	447

C.D. for N or P marginal means = 35.1 Kg/ha.

Individual results

Treatment Year	$N_0$	$N_1$	$N_2$	$N_3$	Sig.	$P_0$	$P_1$	$P_2$	$P_3$	Sig.	G.M.	S.E./plot
	1960	273	292	298		320	N.S.	252	330			
1961	103	92	85	88	N.S.	89	102	80	98	N.S.	92	31.4
Pooled	346	433	482	527	**	409	452	449	480	**	447	141.6

**Crop :- Bajri (Kharif).**

**Site :- Agri. Res. Stn., Chas.**

**Ref :- Mh. 60(5).**

**Type :- 'M'.**

**Object :-** To find out the suitable time and method of application of N to Bajri.

## 1. BASAL CONDITIONS :

(i) (a) Not fixed. (b) and (c) N.A. (ii) Medium black. (iii) 2.7.60. (iv) (a) 1 ploughing and 3 harrowings. (b) Drilling. (c) 3 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) Akola. (vii) Unirrigated. (viii) 2 interculturings. (ix) 60 cm. (x) 25.10.60.

## 2. TREATMENTS :

5 times of application of 44.8 Kg/ha. of N as A/S:  $M_1$ =Full dose broadcast at sowing,  $M_2$ = $\frac{1}{2}$  dose broadcast at sowing +  $\frac{1}{2}$  dose broadcast at one month after sowing,  $M_3$ =Full dose drilled at sowing,  $M_4$ = $\frac{1}{2}$  dose drilled at sowing +  $\frac{1}{2}$  dose one month after sowing and  $M_5$ =Full dose broadcast 15 days after sowing.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 6.40 m.  $\times$  10.97 m. (b) 4.57 m.  $\times$  9.14 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Growth was not satisfactory due to ill distribution of rains. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955-60. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 399 Kg/ha. (ii) 95.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$
Av. yield	406	397	400	362	428

C.D. = 42.8 Kg/ha.

**Crop :- Bajri (Kharif).**

**Ref :- Mh. 61(36), 63(34), 64(29), 65(117).**

**Site :- Agri. Res. Stn., Chas.**

**Type :- 'M'.**

Object :- To study the effect of placement of F.Y.M. on the yield of Bajri.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Bajri and *Tur* in 61; *Bajri* in 63, 64 and *Jowar* and *Tur* in 65. (c) As per treatments in 63, 64 and Nil for others. (ii) Medium black. (iii) 30.6.61; 10.7.63; 23.7.64; 19.7.65. (iv) (a) 2 ploughings and 2 harrowings. (b) Drilling. (c) 3 to 4 Kg/ha. (d) 30 cm. (e) Nil. (vi) *Bajri* 28 15. (vii) Unirrigated. (viii) Interculturing. (ix) 12 cm.; 21 cm.; 35 cm.; 29 cm. (x) 26.9.61; 13.10.63; 20.10.64; 8.11.65.

## 2. TREATMENTS :

**Main-plot treatments :**

5 levels of F.Y.M. :  $F_0=0$ ,  $F_1=1120$ ,  $F_2=2240$ ,  $F_3=3360$  and  $F_4=5600$  Kg/ha.

**Sub-plot treatments :**

3 methods of application :  $M_1$ =Broadcast,  $M_2$ =Band application between 2 rows and  $M_3$ =Drilling in the same row as seed broadcast was done one week before sowing and other applications were done at the time of sowing.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.98 m.  $\times$  7.32 m. (b) 8.53 m.  $\times$  4.88 m. (v) 122 cm.  $\times$  122 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Attack of beetles in 65; Nil for other years. (iii) Yield of grain. (iv) (a) 1961-65 (treatments changed in 62 only). (b) and (c) No. (v) Jeur. (vi) Due to dry spell, yields have been reduced for 61. (vii) Both the error variances are heterogeneous, hence results for individual years are presented under 5. Results.



## 5. RESULTS :

61(36)

(i) 272 Kg/ha. (ii) (a) 92.3 Kg/ha. (b) 87.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	252	312	293	271	287	283
M <sub>2</sub>	250	280	239	243	309	274
M <sub>3</sub>	228	264	216	279	309	259
Mean	243	285	266	264	302	272

63(34)

(i) 531 Kg/ha. (ii) (a) 198.7 Kg/ha. (b) 97.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	530	515	470	507	585	521
M <sub>2</sub>	429	511	477	613	593	525
M <sub>3</sub>	433	626	428	552	693	546
Mean	464	551	458	557	624	531

64(29)

(i) 373 Kg/ha. (ii) (a) 87.9 Kg/ha. (b) 37.7 Kg/ha. (iii) Main effect of F alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	276	346	369	391	488	374
M <sub>2</sub>	218	315	385	427	469	363
M <sub>3</sub>	254	351	359	445	492	382
Mean	249	341	371	421	483	373

C.D. for F marginal means = 78.2 Kg/ha.

65(117)

(i) 323 Kg/ha. (ii) (a) 74.9 Kg/ha. (b) 115.2 Kg/ha. (iii) Main effect of F alone is significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	288	305	444	339	296	334
M <sub>2</sub>	315	253	427	362	367	345
M <sub>3</sub>	305	247	295	361	312	304
Mean	303	268	389	354	325	328

C.D. for F marginal means = 66.6 Kg/ha.

Crop :- Bajri (*Kharif*).

Ref :- Mh. 61(52), 62(41), 63(64).

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

Type :- 'M'.

Object :- To find out the suitable time and method of application of N and P to Bajri.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Bajri—Tur in 61; Bajri in 62 and 63. (c) Nil for 61; As per treatments for 62 and 63. (ii) N.A. (iii) 27.6.61; 8.7.62; 13.7.63. (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling. (c) 3 Kg/ha. (d) 30 cm. (e) N.A. (v) Nil. (vi) 28—15—1. (vii) Unirrigated. (viii) Interculturing. (ix) 12 cm.; 28 cm.; 16 cm. (x) 25.9.61; 16, 17.10.62.; 1.11.63.

## 2. TREATMENTS:

All combinations of (1) and (2)

(1) 5 times and methods of application of N:  $N_0$ =Control (no N),  $N_1$ =11.2 Kg/ha. of N by broadcast at sowing,  $N_2$ =11.2 Kg/ha. of N as broadcast ( $\frac{1}{2}$  at sowing +  $\frac{1}{2}$  one month after sowing),  $N_3$ =11.2 Kg/ha. of N drilled at sowing and  $N_4$ =11.2 Kg/ha. of N ( $\frac{1}{2}$  drilled at sowing +  $\frac{1}{2}$  broadcast after one month of sowing.

(2) 3 times and methods of application of  $P_2O_5$ :  $P_0$ =Control (no  $P_2O_5$ ),  $P_1$ =11.2 Kg/ha of  $P_2O_5$  drilled at sowing and  $P_2$ =11.2 Kg/ha. of  $P_2O_5$  broadcast at sowing.

## 3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 10.97 m.  $\times$  6.40 m. (b) 9.14 m.  $\times$  4.57 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL:

(i) Normal. (ii) Nil for 61 and 63; blister beetles in 62. (iii) Yield of grain. (iv) 1961-63. (b) Yes. (c) No. (v) Jeur (vi) Dry spell in July and Aug. for 61, and 62; Nil for 63. (vii) Since the variances are heterogeneous and Treatments  $\times$  years interaction is absent, individual results are presented under 5. Results.

## 5. RESULTS:

## 61(52)

(i) 385 Kg/ha. (ii) 94.2 Kg/ha. (iii) Main effect of N is significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$N_2$	$N_3$	$N_4$	Mean
$P_0$	293	369	418	337	385	360
$P_1$	285	471	371	474	309	382
$P_2$	353	525	348	453	392	414
Mean	310	455	379	421	362	385

C. D. for N marginal means=90.9 Kg/ha.

## 62(41).

(i) 473 Kg/ha. (ii) 111.2 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$N_2$	$N_3$	$N_4$	Mean
$P_0$	302	503	576	490	418	458
$P_1$	341	568	430	545	537	484
$P_2$	379	532	407	518	553	478
Mean	341	534	471	518	503	473

C.D. for N marginal means=107.3 Kg/ha.

63(64).

(i) 180 Kg/ha. (ii) 58.1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	Mean
P <sub>0</sub>	120	175	196	173	177	168
P <sub>1</sub>	154	183	171	230	171	182
P <sub>2</sub>	184	267	189	157	150	189
Mean	153	208	185	187	166	180

**Crop :- Bajri (Kharif).****Ref :- Mh. 60(152), 61(29).****Site :- Agri. Res. Stn., Jeur.****Type :- 'M'.****Object :-** To study the effect of N and P on the yield of Bajri.**1. BASAL CONDITIONS :**

(i) (a) Groundnut—Bajri. (b) Groundnut. (c) Nil. (ii) N.A. (iii) 15.6.60; 9.6.61. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 2 Kg/ha. (d) 30 cm. (e) —. (v) Nil. (vi) Akola. (vii) Unirrigated. (viii) Interculturing. (ix) 48 cm.; 22 cm. (x) 22.10.60; 20.9.61.

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 4 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=11.2, N<sub>2</sub>=22.4 and N<sub>3</sub>=33.6 Kg/ha.(2) 4 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=11.2, P<sub>2</sub>=22.4 and P<sub>3</sub>=33.6 Kg/ha.**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 11.58 m. × 6.10 m. (b) 10.56 m. × 4.33 m. (v) 61 cm. × 61 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1951—61. (b) No. (c) Results of combined analysis as well as individual analysis are presented under 5. Results. (v) Chas. (vi) Due to heavy rains at the time of sowing the crop, growth was below normal in 60. (vii) Expts. for the years 54 to 59 are also taken into consideration while giving the pooled results. The error variances are heterogeneous and Treatments × years interaction is present.

**5. RESULTS :**

Pooled results

(i) 40 Kg/ha. (ii) 155.5 Kg/ha. (based on 95 d. f. made up of interaction Treatments × years). (iii) Main effects of N and P are highly significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	Mean
P <sub>0</sub>	372	429	474	554	457
P <sub>1</sub>	431	426	510	571	484
P <sub>2</sub>	416	472	504	535	482
P <sub>3</sub>	462	541	546	590	535
Mean	420	467	509	562	490

C. D. for N or P marginal means=38.8 Kg/ha.

## Individual results.

Years	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	Sig.	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	Sig.	G.M.	SE/plot
1960	300	319	440	432	**	352	365	365	409	N.S.	373	137.3
1961	319	340	407	437	**	291	359	400	454	**	376	64.6
Pooled	420	467	509	562	**	457	484	482	535	**	490	156.5

**Crop :- Bajri (Kharif).**

**Ref :- Mh. 62(21).**

**Site :- Agri. Res. Stn., Chas.**

**Type :- 'M'.**

Object :—To study the effect of placement of F.Y.M. on the Yield of *Bajri*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Bajri*. (c) As per treatments. (ii) Medium black. (iii) 12.7.62 (iv) (a) 2 ploughings and 2 harrowings. (b) Drilling. (c) 3 Kg/ha. (d) 30 cm. (e) —. (v) Nil. (vi) *Bajri* 28-15. (vii) Unirrigated. (viii) One interculturing. (ix) 33 cm. (x) 20, 21.10.62.

## 2. TREATMENTS :

All combinations of (1) and (2)+extra treatment (E).

(1) 5 levels of F.Y.M. : F<sub>0</sub>=0, F<sub>1</sub>=1120, F<sub>2</sub>=2240, F<sub>3</sub>=3360, and F<sub>4</sub>=5600 Kg/ha. (2) 3 methods of application : M<sub>1</sub>=Broadcast, M<sub>2</sub>=Band placement between 2 rows and M<sub>3</sub>=Drilling in the same rows of seed.

E=5600 Kg/ha. of F.Y.M. broadcast 15 days before sowing.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) 7.32 m. × 10.98 m. (b) 4.88 m. × 8.53 m. (v) 122 m. × 122 m. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961—contd. (b) No. (c) Nil. (v) Not known. (vi) and (vii) Nil.

## 5. RESULTS:

(i) 349 Kg/ha. (ii) 69.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

E=361 Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	339	307	392	335	354	345
M <sub>2</sub>	284	260	357	380	333	323
M <sub>3</sub>	294	420	404	339	419	375
Mean	306	329	384	351	369	348

**Crop :- Bajri (Kharif).**

**Ref :- Mh. 61(53), 62(42), 63(65).**

**Site :- Agri. Res. Stn., Jeur.**

**Type :- 'M'.**

Object :—To study the effect of time and method of application of N and P to *Bajri* crop.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram in 61 ; Bajri in 62 and 63. (c) Nil in 61 ; As per treatments for 62 and 63. (ii) N.A. (iii) 3.6.61 ; 1.7.62 ; 30.6.63. (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling (c) 2 Kg/ha. (d) 30 cm. (e) N.A. (v) Nil. (vi) Bajri Akola for 61 ; 28-15-1 for 62 and 63 (vii) Unirrigated. (viii) Interculturing. (ix) 22 cm. ; 32 cm. and 40 cm. (x) 30.9.61 ; 9.10.62. 11.10.63.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 5 times and methods of application N:  $N_0$ =Control (no N),  $N_1$ =11.2 Kg/ha. of N by broadcast at sowing,  $N_2$ =11.2 Kg/ha. of N as broadcast ( $\frac{1}{2}$  at sowing +  $\frac{1}{2}$  one month after sowing),  $N_3$ =11.2 Kg/ha. of N drilled at sowing, and  $N_4$ =11.2 Kg/ha. of N ( $\frac{1}{2}$  drilled at sowing +  $\frac{1}{2}$  broadcast after one month of sowing).

(2) 3 times and methods of application of  $P_2O_5$ :  $P_0$ =Control (no  $P_2O_5$ ),  $P_1$ =11.2 Kg/ha. of  $P_2O_5$  drilled at sowing and  $P_2$ =11.2 Kg/ha. of  $P_2O_5$  broadcast at sowing

## 3. DESIGN

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 10.97 m.  $\times$  6.40 m. (b) 9.14 m.  $\times$  4.57 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Sulphur and D.D.T. sprayed for blister beetle in 61 ; Nil for other. (iii) Yield of grain. (iv) (a) 1961-63. (b) Yes (c) Results of pooled analysis, as well as individual analysis are presented under 5. Results. (v) Chas. (vi) No useful rains in growth period in 61. (vii) Error variances are homogeneous and Treatments  $\times$  years interaction is absent.

## 5. RESULTS :

Pooled results :

(i) 393 Kg/ha. (ii) 80.1 Kg/ha. (based on 182 d. f. made up of pooled error). (iii) Main effect of N and interaction N  $\times$  P are highly significant. (iv) Av. yield of grain in Kg/ha.

	$N_0$	$N_1$	$N_2$	$N_3$	$N_4$	Mean
$P_0$	304	398	400	404	403	382
$P_1$	325	375	415	429	359	381
$P_2$	328	398	459	363	537	417
Mean	319	390	425	399	433	393

C.D. for N marginal means=43.2 Kg/ha.

C.D. for body of table =74.7 Kg/ha.

Individual results.

Year	$N_1$	$N_2$	$N_3$	$N_4$	Sig.	$P_0$	$P_1$	$P_2$	Sig.	G.M.	SE/plot	
1961	271	294	302	307	378	*	287	299	346	N.S.	311	68.4
1962	287	413	418	380	387	**	377	360	393	N.S.	377	74.3
1963	399	464	555	508	534	*	483	482	511	N.S.	492	99.8
Pooled	319	390	425	399	433	**	382	381	417	N.S.	393	80.1

Crop :- Bajri (*Kharif*).

Ref :- Mh. 61(70), 63(80), 64(69), 65(118).

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

Type :- 'M'.

Object :—To study the effect of placement of F.Y.M. on the yield of Bajri.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar* for 61 and 63 ; Groundnut for 64 and 65. (c) N.A. (ii) N.A. (iii) 16.6.61 ; 4.7.63 ; 23.7.64 ; 23.7.65. (iv) (a) 1 to 2 ploughings and 2 to 3 harrowings. (b) Drilling. (c) 2Kg/ha. (d) 30 cm. (e) N.A. (v) Nil. (vi) *Bajri* 28—15—1. (vii) Unirrigated. (viii) 2 interculturings. (ix) 13 cm. ; 46 cm. ; 40 cm. ; 29 cm. (x) 30.9.61 ; 22.10.63 ; 27.10.64 ; 23.10.65.

## 2. TREATMENTS :

## Main-plot treatments :

5 levels of F.Y.M. :  $F_0=0$ ,  $F_1=1120$ ,  $F_2=2240$ ,  $F_3=3360$  and  $F_4=5600$  Kg/ha.

## Sub-plot treatments :

3 methods of application :  $M_1$ =Broadcast,  $M_2$ =Band application and  $M_3$ =Drilling.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.98 m.  $\times$  7.32 m. (b) 8.53 m.  $\times$  4.88 m. (v) 122 cm.  $\times$  122 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) D.D.T. applied for blister beetles. (iii) Yield of grain. (iv) (a) 1961—65 (Treatments changed in 62). (b) and (c) No. (v) Chas. (vi) Nil. (vii) As sub-plot error variances are heterogeneous, the results for individual years are presented under 5. Results.

## 5. RESULTS :

## 61(70)

(i) 229 Kg/ha. (ii) (a) 68.2 Kg/ha. (b) 62.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	$F_0$	$F_1$	$F_2$	$F_3$	$F_4$	Mean
$M_1$	187	232	231	170	225	209
$M_2$	252	214	265	241	224	239
$M_3$	245	275	204	235	242	240
Mean	228	240	233	215	230	229

## 63(80)

(i) 284 Kg/ha. (ii) (a) 73.8 Kg/ha. (b) 59.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	$F_0$	$F_1$	$F_2$	$F_3$	$F_4$	Mean
$M_1$	272	329	278	276	198	271
$M_2$	272	301	305	271	315	293
$M_3$	264	322	266	284	315	290
Mean	269	317	283	277	276	284

## 64(69)

(i) 374 Kg/ha. (ii) (a) 105.3 Kg/ha. (b) 45.6 Kg/ha. (iii) Main effect of F is significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	283	308	405	404	392	358
M <sub>2</sub>	320	307	426	446	443	388
M <sub>3</sub>	317	236	378	521	419	374
Mean	307	284	403	457	418	374

C.D. for F marginal means=93.7 Kg/ha.

65(118)

(i) 350 Kg/ha. (ii) (a) 116.0 Kg/ha. (b) 77.1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	378	341	269	377	374	348
M <sub>2</sub>	343	309	396	464	352	373
M <sub>3</sub>	340	309	351	368	430	360
Mean	354	320	339	403	385	360

**Crop :- Bajri (Kharif).**

**Ref :- Mh. 62(61).**

**Site :- Agri. Res. Stn., Jeur.**

**Type :- 'M'.**

Object :- To study the effect of placement of F.Y.M. on the yield of Bajri.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Bajri (c) N.A. (ii) N.A. (iii) 11.7.62. (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling. (c) 2 Kg/ha. (d) 30 cm. (e) --. (v) Nil. (vi) Bajri-Akola. (vii) Unirrigated. (viii) 2 interculturations. (ix) 52 cm. (x) 19.10.62.

**2. TREATMENTS :**

All combinations of (1) and (2) + one extra treatment

(1) 5 levels of F.Y.M. : F<sub>0</sub>=0, F<sub>1</sub>=1120, F<sub>2</sub>=2240, F<sub>3</sub>=3360 and F<sub>4</sub>=5600 Kg/ha.

(2) 3 methods of application : M<sub>1</sub>=Broadcast, M<sub>2</sub>=Band application and M<sub>3</sub>=Drilling.

Extra treatment : E=5600 Kg/ha. of F.Y.M. before 15 days of sowing.

**3. DESIGN :**

(i) R B D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) 10.98 m. x 7.32 m. (b) 8.53 m. x 4.88 m. (v) 122 cm. x 122 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1951-65. (b) No. (c) Nil. (v) Sholapur and Chas. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 292 Kg/ha. (ii) 78.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

E=290 Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	333	286	297	295	304	303
M <sub>2</sub>	297	206	251	306	313	275
M <sub>3</sub>	285	278	313	335	286	299
Mean	305	257	287	312	301	292

**Crop :- Bajri (Kharif).****Ref :- Mh. 60(20).****Site :- Agri. Res. Stn., Sholapur.****Type :- 'M'.**Object :—To study the N and P requirements for *Bajri*.**1. BASAL CONDITIONS :**

(i) (a) *Bajri*—*Tur*—Groundnut, (b) Groundnut, (c) N.A. (ii) Medium deep black. (iii) 16, 17.7.60. (iv) (a) 2 harrowings, (b) Drilling, (c) *Bajri*—3 Kg/ha. (d) 30 cm. × 10 cm. (e) N.A. (v) Nil. (vi) *Bajri*—Akola. (vii) Unirrigated. (viii) 2 weedings and 1 interculturing. (ix) 60 cm. (x) *Bajri*—29.10.60.

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 4 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=11.2, N<sub>2</sub>=22.4 and N<sub>3</sub>=33.6 Kg/ha.(2) 4 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=11.2, P<sub>2</sub>=22.4 and P<sub>3</sub>=33.4 Kg/ha.

Manures drilled by ordinary 3 cultured drill at sowing.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 15.62 m. × 4.88 m. (b) 14.63 m. × 2.44 m. (v) 50 cm. × 122 cm. (vi) Yes.

**4. GENERAL :**

(i) Growth was satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1951—61. (b) No. (c) Nil. (v) Chas, Jeur. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 632 Kg/ha. (ii) 141.1 Kg/ha. (iii) Main effect of P is highly significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	Mean
P <sub>0</sub>	640	477	464	578	540
P <sub>1</sub>	464	618	707	645	608
P <sub>2</sub>	618	610	593	778	650
P <sub>3</sub>	694	704	694	830	730
Mean	604	602	614	708	632

C.D. for P marginal means=101 Kg/ha.



Crop :- Bajri (*Kharif*).

Ref :- Mh. 61(66), 62(52), 63(298).

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

Type :- 'M'.

Object:—To study the application of split-doses of N and method of application of P on the yield of *Bajri*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) Nil. (ii) Medium black. (iii) 4.7.61 ; 7.7.62 ; 2nd week of July, 63. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 4 Kg/ha. (d) 30 cm.×10 cm. (e) —. (v) Nil. (vi) 28-15-1. (vii) Unirrigated. (viii) 3 interculturings ; interculturing and weeding ; 2 weedings. (ix) 26 cm. ; 46 cm. ; N.A. (ix) 6.10.61 ; 7.10.62 ; 3rd week of Oct., 63.

## 2. TREATMENTS :

Same as in Expt. No. 61(52) conducted at Agri. Res. Stn., Chas and presented on page No. 284.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 10.97 m.×6.40 m. (b) 9.14 m.×4.57 m. (v) 91 cm.×91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961—63. (b) and (c) No. (v) N.A. (vi) Nil. (vii) As error variances are heterogeneous and Treatments×years interaction is absent, the results for individual years are presented under 5. Results.

## 5. RESULTS :-

61(66)

(i) 131 Kg/ha. (ii) 46.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	Mean
P <sub>0</sub>	117	163	132	118	80	122
P <sub>1</sub>	92	99	166	157	191	141
P <sub>2</sub>	92	134	122	152	154	131
Mean	100	132	140	142	142	131

62(52)

(i) 480 Kg/ha. (ii) 102.9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	Mean
P <sub>0</sub>	373	518	401	614	339	449
P <sub>1</sub>	438	555	502	417	529	488
P <sub>2</sub>	456	449	444	609	559	503
Mean	422	507	449	547	476	480

63(298)

(i) 389 Kg/ha. (ii) 104.4 Kg/ha. (iii) Main effect of N is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	Mean
P <sub>0</sub>	276	429	316	432	375	366
P <sub>1</sub>	333	402	333	528	394	398
P <sub>2</sub>	323	413	384	469	426	403
Mean	311	415	344	476	398	389

C.D. for N marginal means = 100.7 Kg/ha.

Crop :- Bajri (Kharif).

Ref :- Mh. 61(68), 63(79), 64(215), 65(121).

Site :- Agri. Res. Stn., Sholapur. Type :- 'M'.

Object :- To study the effect of placement of F.Y.M. on the yield of Bajri.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Jowar; Bajri-Tur; Gram; Bajri-Tur. (c) Nil. (ii) Black soil. (iii) 4.7.61; 25.6.63 24.8.64; 10.7.65. (iv) (a) 2 to 3 harrowings. (b) Drilling. (c) 4 Kg/ha. (d) 30 cm. between rows. (e) —. (v) Nil. (vi) Bajri 28-15-1. (vii) Unirrigated. (viii) Interculturing and hoeing. (ix) 26 cm.; 55 cm.; N.A.; 30 cm. (x) 17.10.61; 25.10.63; 17.11.64; 15.10.65.

## 2. TREATMENTS:

## Main-plot treatments:

5 levels of F.Y.M.:  $F_0=0$ ,  $F_1=1120$ ,  $F_2=2240$ ,  $F_3=3360$  and  $F_4=5600$  Kg/ha.

## Sub-plot treatments:

3 methods of application:  $M_1$ =Broadcast,  $M_2$ =Band application between 2 rows and  $M_3$ =Drilling in the same row.

Broadcast was done a week before sowing and Drilling at the time of sowing.

## 3. DESIGN:

(i) Split-plot. (ii) (a) 5 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.97m.  $\times$  7.32 m. (b) 8.53 m.  $\times$  4.88 m. for 61; 9.14 m.  $\times$  5.49 m. for 63, 64 and 65. (v) 122 cm.  $\times$  122 cm. for 61; 91 cm.  $\times$  91 cm. for other years. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory. (ii) Attack of blister beetles. (iii) Yield of grain. (iv) (a) 1961-65 (design and treatments changed in 62). (b) and (c) No. (v) Chas, Jeur. (vi) Heavy rains in July and Sept. affected the growth in 64. (vii) As sub-plot error variances are heterogeneous, results for individual years are given under 5. Results.

## 5. RESULTS:

## 61(68)

(i) 159 Kg/ha. (ii) (a) 50.5 Kg/ha. (b) 210.9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	$F_0$	$F_1$	$F_2$	$F_3$	$F_4$	Mean
$M_1$	177	151	148	139	163	156
$M_2$	171	243	157	114	157	164
$M_3$	195	111	225	127	128	157
Mean	181	168	177	127	143	159

## 63(79)

(i) 196 Kg/ha. (ii) (a) 61.4 Kg/ha. (b) 38.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	$F_0$	$F_1$	$F_2$	$F_3$	$F_4$	Mean
$M_1$	188	240	215	150	312	229
$M_2$	136	137	192	240	162	173
$M_3$	154	178	206	156	243	187
Mean	159	185	204	195	239	196

## 64(215)

(i) 38 Kg/ha. (ii) (a) 32.4 Kg/ha. (b) 34.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	47	51	84	31	57	54
M <sub>2</sub>	34	38	23	36	29	32
M <sub>3</sub>	30	14	30	37	30	28
Mean	37	34	46	35	39	38

65(121)

(i) 426 Kg/ha. (ii) (a) 152.3 Kg/ha. (b) 124.1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	378	431	354	421	485	424
M <sub>2</sub>	313	434	380	551	395	415
M <sub>3</sub>	430	444	456	467	399	439
Mean	374	453	397	480	426	426

**Crop :- Bajri (Kharif).**

**Ref :- Mh. 62(62).**

**Site :- Agri. Res. Stn., Sholapur.**

**Type :- 'M'.**

Object :—To study the effect of placement of F.Y.M. on the yield of *Bajri*.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Bajri*. (c) Nil. (ii) Medium light. (iii) 11.7.62. (iv) (a) 2 harrowings. (b) Drilling. (c) 4 Kg/ha. (d) 30 cm. × 8 to 10 cm. (e) —. (v) Nil. (vi) 28—15—1. (vii) Unirrigated (viii) 2 inter-culturings. (ix) 51 cm. (x) 24.10.62.

#### 2. TREATMENTS :

All combinations of (1) and (2)+one extra treatment

(1) 5 levels of F.Y.M. : F<sub>0</sub>=0, F<sub>1</sub>=1120, F<sub>2</sub>=2240, F<sub>3</sub>=3360 and F<sub>4</sub>=5600 Kg/ha.

(2) 3 methods of application : M<sub>1</sub>=Broadcast on 2.6.62, M<sub>2</sub>=Band application on 15.6.62 and M<sub>3</sub>=Drilling.

Extra treatment : E=5600 Kg/ha. of F.Y.M. applied as broadcast 15 days after sowing.

#### 3. DESIGN :

(i) R.B.D (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) 7.32 m × 10.97 m. (b) 5.49 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

#### 4. GENERAL :

(i) Satisfactory. (ii) Attack of blister beetles. (iii) Yield of grain. (iv) (a) 1961—65. (b) No. (c) Nil. (v) Chas and Jeur. (vi) and (vii) Nil.

#### 5. RESULTS :

(i) 468 Kg/ha. (ii) 84.9 Kg/ha. (iii) Extra vs. others are highly significant. (iv) Av. yield of grain in Kg/ha.

Extra (E)=635 Kg/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	Mean
M <sub>1</sub>	427	452	440	483	391	439
M <sub>2</sub>	515	466	456	510	468	483
M <sub>3</sub>	500	424	439	467	423	451
	481	447	445	487	427	457

C.D. for Extra vs. other means=144 Kg/ha.

**Crop :- Bajri (Kharif).****Ref :- Mh. 62(226), 63(297), 65(228).****Site :- Agri. Res. Stn., Niphad.****Type :- 'MV'.**

Object :- To study the suitability of out side strains and their responses to different doses of manures.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Mixed crop ; Mixed crop ; Wheat. (c) Nil ; Nil ; 44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.  
(ii) Medium black soil. (iii) 9.7.62 ; 13, 14.7.63 ; 11.7.65. (iv) (a) Ploughing and harrowing. (b) Drilling.  
(c) 7 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) 12.35 C.L./ha. of F.Y.M. (vi) As per treatments.  
(vii) Unirrigated. (viii) Weeding and hoeing. (ix) 48 cm. ; 59 cm. ; 60 cm. (x) 2nd week of Oct., 62 ;  
1st week of Nov., 63 ; 3rd week of Oct., 65.

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

3 manurial treatments: M<sub>0</sub>=0, M<sub>1</sub>=22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> and M<sub>2</sub>=44.8 Kg/ha. of  
N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

**Sub-plot treatments :**

7 varieties: V<sub>1</sub>=N.B.—119, V<sub>2</sub>=32—C, V<sub>3</sub>=Improved Ghana, V<sub>4</sub>=N 28—15—, V<sub>5</sub>=14—D, V<sub>6</sub>=  
N.B.—117 and V<sub>7</sub>=Local.

N applied as A/S and P<sub>2</sub>O<sub>5</sub> as Super.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 3 main-plots/replication, 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A.  
(b) 1/448.5 of ha. (v) N.A. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962—65 (failed in 64). (b) and (c) No. (v) and  
(vi) Nil. (vii) As sub-plot error variances are heterogeneous, results for individual years are presented  
under 5. Results.

**5. RESULTS :**

62(226)

(i) 704 Kg/ha. (ii) (a) 341.6 Kg/ha. (b) 136.7 Kg/ha. (iii) Main effect of M is significant. (iv) Av. yield  
of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	Mean
M <sub>1</sub>	493	471	421	583	556	525	628	525
M <sub>2</sub>	893	762	780	830	727	803	803	800
M <sub>3</sub>	646	749	848	951	682	830	812	788
Mean	677	661	683	788	655	719	748	704

C.D. for M marginal means=223.4 Kg/ha.

63(297)

- (i) 681 Kg/ha. (ii) (a) 301.9 Kg/ha. (b) 218.7 Kg/ha. (iii) Main effects of M and V are significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	Mean
M <sub>1</sub>	497	637	553	587	561	553	642	576
M <sub>2</sub>	630	717	683	542	685	671	868	685
M <sub>3</sub>	717	868	897	471	786	745	987	782
Mean	615	741	711	533	677	656	832	681

C.D. for M marginal means=197.5 Kg/ha.

C.D. for V marginal means=181.3 Kg/ha.

65(228)

- (i) 1100 Kg/ha. (ii) (a) 450.3 Kg/ha. (b) 261.4 Kg/ha. (iii) Main effect of M is highly significant and that of V is significant. (iv) Av. yield of grain in Kg/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	Mean
M <sub>1</sub>	461	542	888	654	670	505	827	650
M <sub>2</sub>	1065	1071	1174	1533	1295	1120	1344	1229
M <sub>3</sub>	1167	1244	1610	1700	1237	1245	1734	1420
Mean	898	952	1224	1296	1067	957	1302	1100

C.D. for M marginal means=294.6 Kg/ha.

C.D. for V marginal means=216.6 Kg/ha.

**Crop :- Bajri (Kharif).****Ref :- Mh. 61(46).****Site :- Agri. Res. Stn., Niphad.****Type :- 'C'.**

Object :- To find out the optimum time of sowing for Bajri crop.

**1. BASAL CONDITIONS :**

- (i) (a) Nil. (b) Dry wheat. (c) Nil. (ii) N.A. (iii) As per treatments. (iv) (a) 4 harrowings. (b) Drilling. (c) N.A. (d) 30 cm. (e) -. (v) Nil. (vi) N 28-15-1. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 41 cm. (x) 24.10.61.

**2. TREATMENTS :**6 dates of sowing : D<sub>1</sub>=23.6.61, D<sub>2</sub>=30.6.61, D<sub>3</sub>=8.7.61, D<sub>4</sub>=15.7.61, D<sub>5</sub>=23.7.61 and D<sub>6</sub>=31.7.61.**3. DESIGN :**

- (i) R.B.D. (ii) (a) 6 (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 6.40 m. (b) 9.14 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

- (i) Good (ii) Nil. (iii) Yield of grain. (iv) (a) 1961-64. (b) No. (c) Nil. (v) No. (vi) and (vii) Nil.

**5. RESULTS :**

- (i) 471 Kg/ha. (ii) 89.0 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	541	571	505	488	442	278

C.D. = 134 Kg/ha.

**Crop :- Bajri. (Kharif).**

**Ref :- Mh. 62(32).**

**Site :- Agri. Res. Stn., Niphad.**

**Type :- 'C'.**

Object :- To find out the optimum time of sowing for *Bajri* crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) N.A. (iii) As per treatments. (iv) (a) 4 harrowings. (b) Drilling. (c) N.A. (d) 30 cm. (e) —. (v) 12.5 C.L./ha. of F.Y.M. (vi) N 28-15-1. (vii) Unirrigated. (viii) 2 interculturings. (ix) 38 cm. (x) 15.10.62.

2. TREATMENTS :

4 dates of sowing : D<sub>1</sub>=8.7.62, D<sub>2</sub>=15.7.62, D<sub>3</sub>=23.7.62 and D<sub>4</sub>=31.7.62.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 10.97 m × 5.49 m. (b) 9.14 m × 4.57 m. (v) 91 cm × 91 cm. (vi) Yes

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961-64. (treatments modified every year). (b) No. (c) Nil. (v) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1985 Kg/ha. (ii) 284.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>
Av. yield	2180	2156	1785	1821

**Crop :- Bajri (Kharif).**

**Ref :- Mh. 63(53).**

**Site :- Agri. Res. Stn., Niphad.**

**Type :- 'C'.**

Object :- To find out the optimum time of sowing for *Bajri* crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 22.4 Kg/ha. of N + 22.4 Kg/ha. P<sub>2</sub>O<sub>5</sub>. (ii) N.A. (iii) As per treatments. (iv) (a) 2 harrowings. (b) Drilling. (c) 7 Kg/ha. (d) 30 cm. (e) —. (v) 12.5 C.L./ha. of F.Y.M. (vi) N 28-15-1. (vii) Unirrigated. (viii) 2 interculturings. (ix) 36 cm. (x) 4.10.63, 23.10.63.

2. TREATMENTS :

5 dates of sowing : D<sub>1</sub>=30.6.63, D<sub>2</sub>=8.7.63, D<sub>3</sub>=15.7.63, D<sub>4</sub>=23.7.63 and D<sub>5</sub>=31.7.63.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 10.97 m × 6.40 m. (b) 9.14 m × 4.57 m. (v) 91 cm × 91 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) At the time of flowering attack of aphids on the ear heads noticed. (iii) Yield of grain. (iv) (a) 1961-64. (Treatments modified every year). (b) No. (c) Nil. (v) No. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 1350 Kg/ha. (ii) 366.0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>
Av. yield	1300	1727	1486	1395	840

**Crop :- Bajri. (Kharif).**

**Ref :- Mh. 64(45).**

**Site :- Agri. Res. Stn., Niphad.**

**Type :- 'C'.**

Object:—To find out the optimum time of sowing for *Bajri* crop.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) N.A. (iii) As per treatments. (iv) (a) 2 harrowings. (b) Drilling. (c) 7 Kg/ha. (d) 30 cm. (e) —. (iv) 12.5 C.L./ha. of F.Y.M. (vi) N 28—15—1. (vii) Unirrigated. (viii) 3 interculturings. (ix) 30 cm. (x) 22.10.64.

## 2. TREATMENTS :

6 dates of sowing : D<sub>1</sub>=23.6.64., D<sub>2</sub>=30.6.64., D<sub>3</sub>=8.7.64., D<sub>4</sub>=15.7.64., D<sub>5</sub>=23.7.64., and D<sub>6</sub>=31.7.64.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 6.40 m. (b) 9.14 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961-64. (treatments modified every year). (b) No. (c) Nil. (v) No. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 551 Kg/ha. (ii) 1340 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment :	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	474	563	727	630	518	395

C.D. for treatment means=202 Kg/ha.

**Crop :- Bajri (Kharif).**

**Ref :- Mh. 62(75).**

**Site :- Bajra. Res. Sub. Stn., Vaijapur.**

**Type :- 'C'.**

Object:—To find out the optimum time of sowing for *Bajri* crop.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) Medium black. (iii) As per treatments. (iv) (a) Ploughing by Iron plough, harrowing (b) Dibbling. (c) 2 Kg/ha. (d) 46 cm. × 23 cm. (e) 2. (v) Nil. (vi) N 28-15-1. (vii) Unirrigated. (viii) 2 weedings. (ix) 52 cm. (x) 14.11.62.

## 2. TREATMENTS :

6 dates of sowing : D<sub>1</sub>=23.6.62, D<sub>2</sub>=30.6.62, D<sub>3</sub>=8.7.62, D<sub>4</sub>=15.7.62, D<sub>5</sub>=23.7.62 and D<sub>6</sub>=31.7.62.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 21.95 m. × 19.20 m. (iii) 4. (iv) (a) 10.97 m. × 6.40 m. (b) 9.14 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962-65. (treatments modified in 63). (b) No. (c) Nil. (v) No. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 259 Kg/ha. (ii) 62.2 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	309	317	276	293	200	160

C.D. for treatment means=94 Kg/ha.

**Crop :- Bajri (Kharif).**

**Ref :- Mh. 63(116), 64(101), 65(106).**

**Site :- Agri. Res. Stn., Vaijapur.**

**Type :- 'C'.**

Object :—To find out the optimum time of sowing of *Bajri* crop.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black soil. (iii) As per treatments. (iv) (a) 2 to 3 ploughings and harrowings. (b) Dibbling. (c) 4 Kg/ha. (d) 46 cm. × 23 cm. (e) 2. (v) 12.5 C.L./ha. of F.Y.M. in 63 (vi) N 28—15—1. (vii) Unirrigated. (viii) 2 hoeings and weedings. (ix) 54 cm.; 45 cm.; 48 cm. (x) 4.11.63; 19.10.64; 30.9.65 to 14.11.65.

## 2. TREATMENTS :

7 dates of sowing : D<sub>1</sub>=15th June, D<sub>2</sub>=23rd June, D<sub>3</sub>=30th June, D<sub>4</sub>=8th July, D<sub>5</sub>=15th July, D<sub>6</sub>=23rd July and D<sub>7</sub>=31st July.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) 25.60 m. × 21.95 m. (iii) 4. (iv) (a) 10.97 m. × 6.40 m. (b) 9.14 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962-65 (modified in 63.) (b) No. (c) Results of pooled analysis as well as individual analysis are presented under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

## 5. RESULTS :

Pooled results :

(i) 377 Kg/ha. (ii) 362.1 Kg/ha. (based on 12 d.f. made up of interaction of Treatments × years.) (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	D <sub>7</sub>
Av. yield	488	550	387	409	353	260	191

Individual results.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	D <sub>7</sub>	Sig.	G.M.	S.E./plot
Year										
1963	226	401	532	291	108	47	95	**	243	118.6
1964	960	927	364	579	597	465	198	**	584	217.7
1965	279	321	266	357	353	267	281	N.S.	303	99.3
Pooled	488	550	387	409	353	260	191	N.S.	377	362.1



**Crop :- Bajri. (Kharif).**

**Ref :- Mh. 63(145).**

**Site :- Bajra. Res. Sub. Stn., Vaijapur.**

**Type :- 'CM'.**

**Object :-** To study the effect of mixed cropping of legumes and cereals on the yield of *Bajri*.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Bajri*. (c) 12.35 C.L./ha. of F.Y.M. (ii) Medium black soil. (iii) 21.7.63. (iv) 3 ploughings and harrowing. (b) Drilling. (c) *Bajri* 4 Kg/ha., other crops 7 Kg/ha. (d) 46 cm. (e) —. (v) 12.35 C.L./ha. of F.Y.M. (vi) *Bajri*. (vii) Unirrigated. (viii) 1 weeding. (ix) 54 cm. (x) 3.11.63.

**2. TREATMENTS :**

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

(1) 3 leguminous crops :  $C_1 = \text{Sann}$ ,  $C_2 = \text{Moong}$  and  $C_3 = \text{Udid}$ .

(2) 3 methods of application :  $M_1 = \text{No application}$ ,  $M_2 = \text{crop uprooted and spread in between rows of Bajra}$  and  $M_3 = \text{crops uprooted and buried in between rows of Bajra}$ .

Leguminous crops and *Bajra* sown in alternate rows and *Bajra* alone in control plots.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 10. (b) 36.58 m.  $\times$  21.94 m. (iii) 4. (iv) (a) 10.97 m.  $\times$  7.32 m. (b) 9.14 m.  $\times$  5.49 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Attack of aphids on *Bajra*, cotton piller on other crops. (iii) Yield of grain. (iv) (a) 1963-Contd. (treatments modified in 64). (b) No. (c) Nil. (v) and (vi) Nil. (vii) *Sann*, *Udid* and *Moong* failed to produce any grain.

**5. RESULTS :**

(i) 282 Kg/ha. (ii) 91.69 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control = 257 Kg/ha.

	$C_1$	$C_2$	$C_3$	Mean
$M_1$	243	293	213	250
$M_2$	323	367	245	312
$M_3$	290	284	311	295
Mean	5	315	256	285

**Crop :- Bajri. (Kharif).**

**Ref :- Mh. 64(113).**

**Site :- Bajra Res. Sub. Stn., Vaijapur.**

**Type :- 'CM'.**

**Object :-** To study the effect of mixed cropping of legumes and cereals on the yield of *Bajra*.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Bajri*. (c) 12.35 C.L./ha. of F.Y.M. (ii) Medium black soil. (iii) 19.7.64. (iv) (a) Tractor ploughing and harrowing twice. (b) Drilling. (c) *Bajri* at 4 Kg/ha. and 7 Kg/ha. for *Udid*, *Moong* and *Sann*. (d) 30 cm. (e) —. (v) 12.35 C.L./ha. of F.Y.M. (vi) *Bajri* N 28.15.1, *Moong* J 781, *Udid*. D 6.7, *Sann* local. (vii) Unirrigated. (viii) 2 hoeings and 3 weedings. (ix) 45 cm. (v) 21.10.64.

## 2. TREATMENTS :

All combinations of (1) and (2)+extra treatments

(1) 3 leguminous crops :  $C_1$ =*Sonn*,  $C_2$ =*Moong* and  $C_3$ =*Udid*.

(2) 3 methods of application :  $M_1$ =No applications,  $M_2$ =crops uprooted and spread between the rows of *Bajra*, and  $M_3$ =crops uprooted and buried between the rows of *Bajra*.

Leguminous crops and *Bajra* sown in alternate rows.  $T_1$ =*Bajra* alone and  $T_2$ =*Bajra* alone with double spacings.

## 3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 11. (b) 80.47 m. × 10.97 m. (iii) 4. (iv) (a) 10.97 m. × 7.32 m (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-64. (b) No. (c) Nil. (v) to (vii) Nil.

## 5. RESULTS :

(i) 503 Kg/ha. (ii) 100.1 Kg/ha. (iii) Main effect of M is highly significant. Interaction C × M is significant. (iv) Av. yield of grain in Kg/ha.

$T_1$ =470 Kg/ha,  $T_2$ =477 Kg/ha.

	$M_1$	$M_2$	$M_3$	Mean
$C_1$	549	522	514	528
$C_2$	398	453	687	513
$C_3$	362	525	580	489
Mean	436	500	594	510

C.D. for M marginal mean=83.5 Kg/ha.

C.D. of body of table =144.4 Kg/ha.

**Crop :- Maize (Kharif).**

**Ref :- Mh. 62(123).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'CM'.**

Object :- To find out the suitable date of sowing and effect of N and P on the yield of Maize.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) N.A. (ii) Black cotton soil. (iii) As per treatments. (iv) (a) Harrowing. (b) Dibbled. (c) N.A. (d) 46 cm. × 30 cm. (e) 3 to 4. (v) 12.5 C.L./ha. of compost. (vi) Local. (vii) Unirrigated. (viii) 2 weedings. (ix) 76 cm. (x) 28.7.62, 9, 14, 16.8.62.

## 2. TREATMENTS :

**Main-plot treatments :**

4 dates of sowing :  $D_1$ =10.5.62,  $D_2$ =20.5.62,  $D_3$ =30.5.62 and  $D_4$ =9.6.62.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 2 levels of N as N/S :  $N_0$ =0 and  $N_1$ =22.4 Kg/ha.

(2) 2 levels of  $P_2O_5$  as Super :  $P_0$ =0 and  $P_1$ =22.4 Kg/ha.

Fertilizer applied at the time of sowing.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 4.11 m. × 3.65 m. (b) 3.20 m. × 3.05 m. (v) 46 cm. × 30 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962 only. (b) N.A. (c) Nil. (v) to (vii) Nil.

## 5. RESULTS :

(i) 7463 Kg/ha. (ii) (a) 1405.5 Kg/ha. (b) 1238.4 Kg/ha. (iii) Main effect of D and interaction N×D is highly significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	Mean
N <sub>2</sub>	6968	7134	9429	7013	8083	3679	7051
N <sub>1</sub>	7844	7906	9939	9222	6959	5381	7875
Mean	7406	7520	9684	8118	7521	4530	7463
D <sub>1</sub>	9787	9580					
D <sub>2</sub>	7521	8715					
D <sub>3</sub>	7114	7178					
D <sub>4</sub>	4452	4608					

C.D. for D marginal means = 1579.3 Kg/ha.

C.D. for N means at the same level of D = 1256.9 Kg/ha.

C.D. for D means at the same level of N = 1444.2 Kg/ha.

**Crop :- Ragi (Kharif).**

**Ref :- Mh. 60(109), 61(10).**

**Site :- Agri. Res. Sta., Igatpuri.**

**Type :- 'M'.**

Object :- To study the effect of G.M. on Ragi.

## 1. BASAL CONDITIONS :

(i) (a) Fallow—Nagfi. (b) Fallow. (c) Nil. (ii) Loamy (medium black to dark grey.) (iii) 20.6.60/18.7.60 9.6.61/7.8.61. (iv) (a) 1 ploughing. (b) Transplanting. (c) 6 Kg/ha. (d) 23 cm.×15 cm. (e) 1. (v) Nil; (vi) Nagfi.—100. (vii) Unirrigated. (viii) N.A. (ix) 274 cm.; 432 cm. (x) 5.11.60; 21.11.61.

## 2. TREATMENTS :

2 manurial treatments: T<sub>0</sub>=Control (no manure) and T<sub>1</sub>=3362 Kg/ha. of phagla (G.M.)

## 3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 7.32 m.×5.49 m. (b) 6.19 m.×5.03 m. (v) 61 cm.×22 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—61. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Experiment for 59 N.A., error variances are homogeneous, interaction Treatments×years is present.

## 5. RESULTS :

Pooled results

(i) 334 Kg/ha. (ii) 113.9 Kg/ha. (based on 1 d.f. made up of Treatments×years interaction). (iii) Treatment differences is not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>
Av. yield	290	379

## Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	Sig.	G.M.	S.E./plot
Year 1960	422	558	**	490	50.15
1961	157	200	*	178	28.75
Pooled	290	379	N.S.	334	113.9

Crop :- Ragi (*Kharif*).

Ref :- Mh. 60(111), 61(203).

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

Type :- 'M'.

Object :- To study the effect of different G.M. on the yield of Ragi.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Nagli; N.A. (c) As per treatments; N.A. (ii) Medium black. (iii) 11.6 60/30 7.60; 28.7.61. (iv) (a) N.A.; ploughing and harrowing. (b) Transplanting. (c) 3 to 4 Kg/ha. (d) 20 cm. x 20 cm. (e) 1; 3-4. (v) Nil. (vi) Nagli 50-1. (vii) Unirrigated. (viii) N.A.; weeding. (ix) 367 cm.; 409 cm. (x) 17.10.60; 24.10.61.

## 2. TREATMENTS:

6 G.M. treatments: G<sub>0</sub>=Control, G<sub>1</sub>=Bhena tree leaves at 3362 Kg/ha., G<sub>2</sub>=Karanj leaves at 3362 Kg/ha., G<sub>3</sub>=Glyricidia leaves at 3362 Kg/ha., G<sub>4</sub>=Sesbania at 3362 Kg/ha. and G<sub>5</sub>=Compost at 24.72 C.L./ha.

## 3. DESIGN:

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 4.27 m. x 1.83 m. (b) 3.86 m. x 1.42m. (v) 20 cm. x 20 cm. (vi) Yes.

## 4. GENERAL:

(i) Lodged completely on 18.9.60 due to heavy wind blow in the evening; normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959-61. (b) Yes. (c) Nil. (v) N.A. (vi) Lodging due to heavy wind blow on 18.9.60; heavy rain prior to harvesting. (vii) Error variances are heterogeneous and Treatments x years interaction is absent. Hence results for individual years are presented under 5. Results.

## 5. RESULTS:

## 60(111)

(i) 1530 Kg/ha. (ii) 196.7 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	G <sub>0</sub>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	G <sub>4</sub>	G <sub>5</sub>
Av. yield	1176	1603	1771	1577	1719	1332

C.D. for treatment means=296.4 Kg/ha.

## 61(203)

(i) 376 Kg/ha. (ii) 28.5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	G <sub>0</sub>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	G <sub>4</sub>	G <sub>5</sub>
Av. yield	296	338	442	429	406	347

C.D. for treatment means=42.9 Kg/ha.

**Crop :- Ragi (Kharif).****Ref :- Mh. 60(76).****Site :- Agri. Res. Stn., Hatkhambha.****Type :- 'CM'.**

Object: - To eliminate the fallow period in the cultivation of Nagli.

**1. BASAL CONDITIONS:**

(i) (a) Nagli-Nagli. (b) Nagli. (c) As per treatments. (ii) Laterite Soil. (iii) 1.6.60-22.7.60 to 24.7.60. (iv) (a) 3 ploughings. (b) Hand sowing. (c) N.A. (d) 15 cm. x 15 cm. (e) 1. (v) Nil. (vi) Nagli-A-16 (late), wari-13-11, Kodra-18-4. (vii) Unirrigated. (viii) 2 weedings. (ix) 351 cm. (x) 13.11.61 to 14.11.61.

**2. TREATMENTS:**

	A	B	C	D	E	F	G	H	I	J	K	L
1954-55	Nf	W	K	F	F	F	Nf	Ng	Nf	N	Ng	N
55-56	W	K	F	F	F	Nf	Nf	Ng	Nf	Nf	N	Ng
56-57	Not conducted											
57-58	K	F	F	F	Nf	W	Nf	Ng	Nf	N	Ng	N
58-59	F	F	F	Nf	W	K	Nf	Ng	N	Nf	N	Ng
59-60	F	F	Nf	W	K	F	Nf	Ng	Nf	N	Ng	N
60-61	F	Nf	W	K	F	F	Nf	Ng	N	Nf	N	Ng

N : Nagli unmanured.

Nf : Nagli manured with 3362 Kg/ha. of F.Y.M.

Ng : Nagli manured with 16.8 Kg/ha. of N as G.N.C.

W : Wari unmanured.

K : Kodra unmanured.

F : Fallow.

Manuring done at the time of transplanting.

**3. DESIGN:**

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 5.49 m. x 4.27 m. (b) 3.66 m. x 2.44 m. (v) 91 cm. x 91 cm. (vi) Yes.

**4. GENERAL:**

(i) Crop growth was satisfactory. (ii) Nil. (iii) Yield of grain, plant height, tillers etc. (iv) (a) 1948-60. (b) Yes. (c) Nil. (v) N.A. (vi) and (vii) Nil.

**5. RESULTS:**

(i) 909 Kg/ha. (ii) 349.9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	B	G	H	I	J	K	L	C	D
	Nf	Nf	Ng	N	Nf	N	Ng	W	K
Av. yield	1170	1096	767	731	954	709	937	799	498

**Crop :- Wari (Kharif).****Ref :- Mb. 60(75), 61(221), 62(218).****Site :- Agri. Res. Stn., Hatkhambha.****Type :- 'CM'.**

Object: - To study the optimum spacing and manurial requirements of Wari.

**1. BASAL CONDITIONS:**

(i) (a) Wari-Wari. (b) Wari. (c) As per treatments. (ii) Laterite soil. (iii) 1.6.60/8, 9.7.60; 29.5.61/27.7.61; 1.6.62/24, 25.7.62. (iv) (a) 2 ploughings. (b) Hand sowing; transplanting; transplanting. (c) N.A. (d) As per treatments. (e) N.A.; 1. (v) Nil. (vi) Wari 13-11. (vii) Unirrigated. (viii) 2 weedings; 2 weedings; weeding. (ix) 351 cm.; 418 cm.; 410 cm. (x) 21.10.60; 25, 26.10.61; 3 to 6.11.62.

## 2. TREATMENTS :

5 methods of planting :  $M_1$ =local method with no manure,  $M_2$ =15 cm.  $\times$  15 cm. spacing with 22.4 Kg/ha. of N+44.8 Kg/ha. of  $P_2O_5$ ,  $M_3$ =15 cm  $\times$  15 cm. spacing with 11.2 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ ,  $M_4$ =23 cm  $\times$  23 cm. spacing with 22.4 Kg/ha. of N+44.8 Kg/ha. of  $P_2O_5$  and  $M_5$ =23 cm.  $\times$  23 cm. spacing with 11.2 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ .

In treatments  $M_2$  to  $M_5$  Improved method was used.

N applied in the first week of August and P at transplanting.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 5.03 m.  $\times$  5.03 m. (b) 3.81 m.  $\times$  3.81 m. (v) 61 cm.  $\times$  61 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1969-62. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous, Treatments  $\times$  years interaction is absent. Hence results for individual years are presented under 5. Results.

## 5. RESULTS :

60(75)

(i) 1002 Kg/ha. (ii) 93.7 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in kg/ha.

Treatment	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$
Av. yield	860	1161	1021	1020	947

C.D. for treatment means=144.2 Kg/ha.

61(221)

(i) 286 Kg/ha. (ii) 52.8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$
Av. yield	166	357	292	338	279

C.D. for treatment means=81.4 Kg/ha.

62(218)

(i) 683 Kg/ha. (ii) 194.9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in kg/ha.

Treatment	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$
Av. yield	537	1212	851	990	725

C.D. for treatment means=300.1 Kg/ha.

**Crop :- Kodra (Kharif).**

**Site :- Agri. Res. Stn., Hatkhambha.**

**Ref :- Mh. 60(74)**

**Type :- 'CM'.**

Object --To study local vs. regular spacing and exact manurial requirement.

## 1. BASAL CONDITIONS :

(i) (a) Kodra-Kodra. (b) Kodra. (c) As per treatments. (ii) Laterite soil. (iii) 18.6.60/2.8.60. (iv) (a) 2 ploughings. (b) Hand sowing. (c) N.A. (d) As per treatments. (e) 1. (v) Nil. (vi) Kodra 18.4. (vii) Unirrigated. (viii) 4 weedings. (ix) 351 cm. (x) 5 and 6.12.60.

## 2. TREATMENTS :

3 methods of planting :  $M_1$ =planted by local method with no manure,  $M_2$ =Improved method with 15 cm.  $\times$  15 cm. spacing + 22.4 Kg/ha. of N + 44.8 Kg/ha. of  $P_2O_5$  and  $M_3$ = Improved method with 15 cm.  $\times$  15 cm. spacing + 11.2 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$ .

## 3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 5.03 m.  $\times$  5.03 m. (b) 3.81 m.  $\times$  3.81 m. (v) 61 cm.  $\times$  61 cm. (vi) Yes.

## 4. GENERAL :

(i) Crop growth was satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959-60. (b) Yes. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 346 Kg/ha. (ii) 93.7 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in kg/ha.

Treatment	$M_1$	$M_2$	$M_3$
Av. yield	224	449	365

C.D. for treatment means = 201.4 Kg/ha.

**Crop :- Gram (Rabi).**

**Ref :- Mh. 60(184), 61(133).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'M'.**

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

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat ; Gram. (c) Nil. ; As per treatments. (ii) Black cotton soil. (iii) 18.10.60 ; 10.11.61. (iv) (a) Harrowing. (b) Drilling. (c) 45 Kg/ha. (d) Rows 30 cm. apart. (e) 1 to 2. (v) Nil. (vi) Dacca. (vii) Irrigated. (viii) 1 weeding. (ix) 8 cm. ; 4cm. (x) 25 to 28.2.61 ; 17.3.62.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=5.6$  and  $N_2=11.2$  Kg/ha.

(2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=16.8$  and  $P_2=33.6$  Kg/ha.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 4.57 m.  $\times$  10.97 m. (b) 3.96 m.  $\times$  10.06 m. (v) 30 cm.  $\times$  30 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959-61. (b) Yes. (c) Results of combined analysis have been presented under 5- Results. (v) and (vi) Nil. (vii) Expt. No. 59(147) has also been considered for combining the results. Error variances are homogeneous and Treatments  $\times$  years interaction is absent.

## 5. RESULTS :

Pooled results

(i) 1658 Kg/ha. (ii) 179.5 Kg/ha. (based on 88 d.f. made up of pooled error and Treatments  $\times$  years interaction). (iii) Main effect of P alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
N <sub>0</sub>	1416	1666	1831	1638
N <sub>1</sub>	1565	1650	1693	1636
N <sub>2</sub>	1605	1685	1811	1700
Mean	1529	1667	1778	1658

C.D. for P marginal means=85.7 Kg/ha.

#### Individual results

Treatment	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Sig.	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Sig.	G.M.	S.E./plot
Year										
1960	1546	1521	1594	N.S.	1483	1553	1625	N.S.	1554	158.1
1961	2001	2042	2044	N.S.	1865	2048	2173	**	2029	151.1
Pooled	1638	1636	1700	N.S.	1529	1667	1778	**	1658	179.5

**Crop :- Gram. (Rabi).**

**Ref :- Mh. 60(199).**

**Site :- Agri. Res. Stn., Kopargaon.**

**Type :- 'CM'.**

Object :—To find out the optimum seed *Rate*, spacing and manurial doses for Gram.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Bajra*. (c) Nil. (ii) N.A. (iii) 1st week of January, 60. (iv) (a) 2 harrowings. (b) Drilling. (c) and (d) As per treatment. (e) N.A. (v) As per treatments. (vi) N.A. (vii) Irrigated (viii) 2 weedings. (ix) N.A. (x) 4th week of March, 60.

#### 2. TREATEMENTS :

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

- (1) 2 doses of N as A/S : A<sub>0</sub>=0 and A<sub>1</sub>=11.2 Kg/ha.
- (2) 2 doses of P as Super : B<sub>0</sub>=0 and B<sub>1</sub>=56.0 Kg/ha.
- (3) 2 doses of K as Pot. Sul : C<sub>0</sub>=0 and C<sub>1</sub>=56.0 Kg/ha.
- (4) 2 seed rates : D<sub>0</sub>=34 and D<sub>1</sub>=45 Kg/ha.
- (5) 2 spacings between rows E<sub>0</sub>=25 and E<sub>1</sub>=38 cms.

Manures were drilled with seed at sowing..

#### 3. DESIGN :

(i) 2<sup>5</sup> Fact. confd [ACE, BCD, ABDE are confounded]. (ii) (a) 8 plots/ block; 4 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 10.67 m. × 6.10 m. (b) 9.14 m. × 4.57 m. (v) 76 cm. × 76 cm. (vi) Yes.

#### 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955-60. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

#### 5. RESULTS :

(i) 364 Kg/ha. (ii) 65.5 Kg/ha. (iii) Interactions ABCD and ABCE are significant. (iv) Table of mean and differential response in Kg/ha.



## Differential response

Treatment	Mean response	A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	-18.2	-	-	-30.5	-5.9	-3.0	-33.4	-23.3	-13.1	-16.5	-19.9
B	5.5	-6.8	17.8	-	-	5.7	5.3	-9.7	-20.7	8.0	3.0
C	-4.9	10.3	-20.1	-4.7	-5.1	-	-	-27.3	17.5	-1.9	-7.9
D	13.5	8.4	18.6	-1.7	28.7	-8.9	35.9	-	-	41.1	-14.1
E	12.7	14.4	11.0	15.2	10.0	15.7	9.7	40.3	-14.9	-	-

Crop :- Gram. (Rabi).

Ref :- Mh. 60(102), 61(131).

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

Type :- 'CM'.

Object :- To study the effect of topping in combination with application of P on growth and yield of grain.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Jowar ; N.A. (c) Nil ; N.A. (ii) Black cotton soil. (iii) 16.10.60; 31.10.61. (iv) (a) 1 ploughing ; harrowing. (b) Argada sown ; drilling. (c) 45 Kg/ha. (d) 25 cm. ; 30 cm. between rows. (e) 1-2. (v) Nil. (vi) Dacca. (vii) Unirrigated. (viii) Nil. (ix) 1 cm. ; 4 cm. (x) 17.2.61 ; 20.3.62.

## 2. TREATMENTS :

All combinations of (1) and (2).

(1) 3 levels of  $P_2O_5$  as super :  $P_0=0$ ,  $P_1=11.2$  and  $P_2=22.4$  Kg/ha.

(2) 4 times of topping :  $T_0$ =control,  $T_1$ =20 days after sowing,  $T_2$ =30 days after sowing and  $T_3$ =40 days after sowing.

## 3. DESIGN

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 9.14 m. x 6.86 m. (b) 7.62 m. x 5.84 m. (v) 76 cm. x 57 cm. (vi) Yes.

## 4. GENERAL

(i) Poor germination ; satisfactory. (ii) Wilt attack ; Nil. (iii) Yield of grain (iv) (a) 1959-61. (b) and (c) No. (v) and (vi) Nil. (vii) Expt. No. 59(139) has also been considered for pooling. As error variances are heterogeneous and Treatments x years interaction is absent, results of individual years have been presented under 5. Results.

## 5. RESULTS

60(102)

(i) 1498 Kg/ha. (ii) 515.7 Kg/ha (iii) Main effect of T alone is significant. (iv) Av. yield of grain in Kg/ha.

	$T_0$	$T_1$	$T_2$	$T_3$	Mean
$P_0$	1707	1381	1314	1606	1502
$P_1$	1821	1685	1253	1399	1540
$P_2$	2068	1646	1095	1001	1452
Mean	1865	1571	1221	1335	1498

C.D. for T marginal means=495.0 Kg/ha

61(131)

(i) 679 Kg/ha. (ii) 144.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	Mean
P <sub>0</sub>	657	710	581	702	662
P <sub>1</sub>	677	851	562	674	691
P <sub>2</sub>	651	654	755	671	683
Mean	662	738	633	682	679

**Crop :- Gram. (Rabi).****Ref :- Mh. 62(122).****Site :- Agri. Collage. Farm, Nagpur.****Type :- 'CM'.**

Object :- To find out the optimum spacing and manurial dose for Gram.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) Black cotton soil. (iii) 18,10.62. (iv) (a) Ploughings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 1 to 2. (v) Nil. (vi) Dacca. (vii) Uuirrigated. (viii) Weeding. (ix) 17.0 cm. (x) 1st week of March, 63.

**2. TREATMENTS :****Main-plot treatments :**4 rows spacing between : S<sub>1</sub>=23, S<sub>2</sub>=30, S<sub>3</sub>=38 and S<sub>4</sub>=45 cm.**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 2 levels of Nas A/S : N<sub>0</sub>=0 and N<sub>1</sub>=16.8 Kg/ha.(2) 3 levels of P as super : P<sub>0</sub>=0, P<sub>1</sub>=16.8 and P<sub>2</sub>=33.6 Kg/ha.

Fertilizers applied on 17.10.62.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 4 main-plots/replication, 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 4.27 m. × 5.49 m. (b) 3.66 m. × 4.57 m. (v) N.A. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Ganmaxine dusted. (iii) Yield of grain. (iv) (a) 1962- only. (b) and (c) —. (v) to (vii) Nil.

**5. RESULTS :**

(i) 1435 Kg/ha. (ii) (a) 309.8 Kg/ha. (b) 217.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
S <sub>1</sub>	1378	1345	1360	1304	1420	1361
S <sub>2</sub>	1428	1323	1297	1529	1301	1376
S <sub>3</sub>	1505	1585	1510	1644	1480	1545
S <sub>4</sub>	1448	1465	1488	1398	1484	1457
Mean	1440	1429	1414	1469	1421	1435
P <sub>0</sub>	1409	1418				
P <sub>1</sub>	1486	1452				
P <sub>2</sub>	1424	1418				

**Crop :- Gram (Rabi).****Ref :- Mh. 60(69), 61(141).****Site :- Agri. Res. Stn., Tharsa.****Type :- 'CM'.**

Object : -To find out the suitable manurial dose for Gram and the effect of topping on the yield.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*; *Wheat*. (c) 11.2 Kg/ha. of N; Nil. (ii) Morand no. 2; black cotton soil. (iii) 4.11.60; 14.11.61. (iv) (a) 2ploughing and 2 *bakherings*; harrowing. (b) Sowing by *Tiffan*; drilling. (c) 45 Kg/ha. (d) 30 cm. x 10 cm. (e) N.A. (v) Nil. (vi) Warangal. (vii) Unirrigated. (viii) Nil; weeding. (ix) N.A. (x) 10.3.61; 20.3.62

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 3 levels of manures:  $M_0=0$ ,  $M_1=11.2$  Kg/ha. of  $P_2O_5$ +5.6 Kg/ha. of N and  $M_2=22.4$  Kg/ha. of  $P_2O_5$ +11.2 Kg/ha. of N.(2) 4 times of topping:  $T_0$ =Control,  $T_1$ =20 days after sowing,  $T_2$ =30 days after sowing and  $T_3$ =40 days after sowing.N as A/S and  $P_2O_5$  as Super broadcast at sowing.**3. DESIGN :**

(i) Fact. In R.B.D. (ii) (a) 12. (b) N.A. (iii) 3; 4. (iv) (a) 6.40 m. x 10.97 m. (b) 4.57 m. x 9.14 m. (v) 91 cm. x 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Crop was damaged due to some extent on account of late rain in Feb. and March; Normal. (ii) Nil.; hexaner sprayed for caterpillar. (iii) Yield of grain. (iv) (a) 1959-61. (b) No. (c) Results of combined analysis have been presented under 5. Results. (v) and (vi) Nil. (vii) Expt. no. 59(101) has also been considered for combining the results, error variances are heterogeneous and Treatments x years interaction is present.

**5. RESULTS**

Pooled results

(i) 894 Kg/ha. (ii) 335.7 Kg/ha. (based on 22 d.f. made up of Treatments x years interaction). (iv) Av. yield of grain in Kg/ha.

	$T_0$	$T_1$	$T_2$	$T_3$	Mean
$M_0$	840	850	986	751	857
$M_1$	858	936	915	847	889
$M_2$	952	948	1001	841	936
Mean	883	911	967	813	894

Individual results

Treatment	$M_0$	$M_1$	$M_2$	Sig.	$T_0$	$T_1$	$T_2$	$T_3$	Sig.	G.M.	S.E./plot
Year											
1960	690	798	732	N.S.	744	823	775	618	N.S.	740	170.8
1961	643	613	590	N.S.	548	648	598	668	*	615	102.8
Pooled	857	889	936	N.S.	883	911	967	813	N.S.	894	335.7

**Crop :- Red gram (Kharif).****Ref :- Mh. 61(194).****Site :- Agri. Res. Stn., Akola.****Type :- 'D'.**Object: -To study the effect of artificial inoculation with *Rhizobium* Sp. on the growth and yield of *Tur.*

## 1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Black cotton soil. (iii) 10.7.61/2.8.61. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) N.A. (d) 61 cm. × 61 cm. (e) 1—2. (v) 10 C.L./ha. of F.Y.M. (vi) N.A. (vii) Unirrigated. (viii) 2 hoeing and 3 weeding. (ix) 76 cm. (x) 4th week of Dec. 61.

## 2. TREATMENTS :

Two methods of seed soaking :  $C_0$  = Control and  $C_1$  = Seeds inoculated with rhizobium sp.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 15. (iv) (a) 10.36 m. × 4.88 m. (b) 9.14 m. × 3.66 m. (v) 61 cm. × 61 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) B.H.C. 5 % dusted. (iii) Yield of grain. (iv) (a) 1961 only. (b) and (c) —. (v) to (vii) Nil.

## 5. RESULTS :

(i) 867 Kg/ha. (ii) 139.6 Kg/ha. (iii) Treatment differences is not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	$C_0$	$C_1$
Av. yield	843	891

**Crop :- Chinamug (*Kharif*).**

**Ref :- Mh. 60(120), 62(143), 63(184),  
64(155), 65(76).**

**Site :- Agri. Res. Stn., parbhani.**

**Type :- 'M'.**

**Object :-** To study the effect of phosphate manuring with and without F.Y.M. on the yield of *Chinamug* and on the yield of succeeding wheat crop.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut in 60; fallow in 62; Cotton for other years. (c) 61.6 Kg/ha. of  $P_2O_5$  as Super in 60; nil for other years. (ii) Medium black soil. (iii) 26.6.60; 6.7.62; 15.6.63; 7.7.64; 22.6.65. (iv) (a) Ploughing and 3 to 5 harrowings. (b) Drilling. (c) 11 to 13 Kg/ha. (d) 30 cm. between rows in 60, 64 and 65; 46 cm. in 62 and 63. (e) N.A. (v) Nil. (vi) China 781. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 78 cm.; 78 cm.; N.A.; N.A.; 57 cm. (x) 27.8.60; 19.9.62; 8, 9.9.63; 3rd week of Sept. 64; 25.8.65.

## 2. TREATMENTS :

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

(i) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

(2) 2 levels of F.Y.M. :  $F_0=0$  and  $F_1=12.4$  C.L./ha.

Control : Fallow in *Kharif* and wheat in *Rabi*.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 6.40 m. (b) 9.14 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal in 60, 62, 64 and good in 63 while satisfactory in 65. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960—65 (Not. conducted in 61). (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous, interaction is absent. Hence results for individual years are presented under 5. Results.

## 5. RESULTS :

60(120)

(i) 985 Kg/ha. (ii) 188.5 Kg/ha. (iii) Main effect of P is significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
F <sub>0</sub>	794	1065	1044	968
F <sub>1</sub>	880	985	1141	1002
Mean	837	1025	1092	985

C.D. for P marginal means = 200.7 Kg/ha.

62(143)

(i) 644 Kg/ha (ii) 98.1 Kg/ha. (iii) Main effect of P alone is significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
F <sub>0</sub>	648	612	661	640
F <sub>1</sub>	608	532	805	648
Mean	628	572	733	644

C.D. for P marginal means = 104.6 Kg/ha.

63(184)

(i) 737 Kg/ha. (ii) 155.2 Kg/ha. (iii) Main effect of P alone is significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
F <sub>0</sub>	537	789	824	717
F <sub>1</sub>	731	749	914	798
Mean	634	769	869	757

C.D. for P marginal means = 165.4 Kg/ha.

64(155)

(i) 171 Kg/ha. (ii) 112.7 Kg/ha. (iii) Main effect of P alone is significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
F <sub>0</sub>	109	240	118	156
F <sub>1</sub>	105	298	158	187
Mean	107	269	138	171

C.D. for P marginal means = 120.2 Kg/ha.

65(76)

(i) 759 Kg/ha. (ii) 54.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
F <sub>0</sub>	724	758	765	749
F <sub>1</sub>	766	734	809	770
Mean	745	746	787	759

**Crop :- Wal (Rabi).**

**Ref :- Mh. 60(48), 61(89), 63(106), 64(92).**

**Site :- Agri. Res. Stn., Igatpuri.**

**Type :- 'C'.**

Object :- To find out suitable spacing for Wal crop.

**1. BASAL CONDITIONS :**

(i) (a) Paddy-Wal ; Nil for 1961 to 64. (b) Paddy. (c) 22.4 kg/ha. of N as A/S ; 44.8 kg/ha. of N+22.4 kg/ha. of P<sub>2</sub>O<sub>5</sub> for 61 to 64. (ii) Shallow and coarse. (iii) 21 and 22.11.60 ; 16 and 17.12.61 ; 12 and 13.12.63 15 and 15.12.64. (iv) (a) 1 ploughing and 2 plankings: ploughing ; 2 ploughings ; ploughing. (b) to (e); As per treatments. (v) Nil. (vi) Wal No. 21. (vii) Unirrigated. (viii) Nil ; N.A. for other years. (ix) 8 cm. ; N.A. for other years. (x) 10 and 29.3.61 ; 12, 15.4.62 and 4, 6.5.62 ; 9 to 30.4.64 ; 20, 23 4.65.

**2. TREATMENTS :**

7 methods of sowing : T<sub>1</sub>=Dibbling at 30 cm.×15 cm., T<sub>2</sub>=Dibbling at 30 cm.×30 cm., T<sub>3</sub>=Dibbling at 46 cm.×15 cm., T<sub>4</sub>=Dibbling at 46 cm.×30 cm., T<sub>5</sub>=Drilling at 30 cm. T<sub>6</sub>=Sowing behind the plough and T<sub>7</sub>=By broadcast and ploughing afterwards.

Dibbling with 4 seeds/hill and finally keeping 2 seedlings/hill. In all other treatments seed rate at 45 kg/ha.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 6.40 m.×10.97 m. ; 7.32 m.×9.14 m. ; 6.40 m.×10.36 m. for 63 and 64. (b) 4.57 m.×9.14 m. ; 6.71 m.×8.23 m. ; 4.57 m.×9.14 m. for 63 and 64. (v) 91 cm.×91 cm. ; 30 cm.×91 cm. ; 61 cm.×91 cm. for 63 and 64. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Aphid attack—Tobacco decoction was spread, crop was affected by virus disease in 60. (iii) Yield of grain. (iv) (a) 1960-64 (experiment vitiated in 62). (b) No. (c) Results of combined analysis have been presented under. 5-Results. (v) Karjat, Vadegaon. (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is present.

**5. RESULTS :**

Pooled results

(i) 1066 Kg/ha. (ii) 419.7 Kg/ha. (based on 18 d.f. made up of interaction years×Treatments). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>
Av. yield	1296	1094	1188	933	1044	1003	904

Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	Sig.	G.M.	S.E./plot
Year										
1960	1465	1763	1654	1323	1590	1723	1187	N.S.	1529	300.1
1961	1519	950	1161	835	626	702	654	* *	921	289.9
1963	688	565	722	686	827	406	468	N.S.	623	234.4
1964	1510	1099	1213	887	1133	1180	1308	N.S.	1190	344.4
pooled	1296	1094	1188	933	1044	1003	904	N.S.	1066	419.7

**Crop :- Wal (Rabi).****Ref :- Mh 60(169), 61(53), 63(107), 64(93).****Site :- Agri. Res. Stn., Karjat.****Type :- 'C'.**

Object :- To find out suitable spacing for Wal crop.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) 44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) N.A. (iii) 22 and 23.11.60 ; 4 to 6.12.61 ; 19.11.63 ; 26.11.64. (iv) (a) N.A. (b) to (e) As per treatments. (v) Nil. (vi) 2-K-2. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) 1.4 to 61 ; 4 to 9.4.62 ; 26.3.64 ; 29.3.65.

**2. TREATMENTS :**

Same as in Expts. No. 60(48), 61(89), 63(106), 64(92) on Wal crop conducted at Igatpuri and presented on page No. 312.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 6.40 m.  $\times$  10.97 m. (b) 4.57 m.  $\times$  9.14 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory ; Normal ; Normal ; Satisfactory. (ii) Wal aphids, Nicotin Sulphate sprayed in 60. (iii) Yield of grain. (iv) (a) 1960-64 (expt. failed in 62). (b) No. (c) Results of combined analysis have been presented under 5-Results. (v) Igatpuri and Vadgaon. (vi) Nil. (vii) Error variances are heterogeneous, Treatments  $\times$  years interaction is present.

**5. RESULTS :**

Pooled results.

(i) 853 Kg/ha. (ii) 544.9 Kg/ha. (based on 18 d.f. made up of Treatments  $\times$  years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>
Av. yield	640	907	678	1192	727	893	931

**Individual results**

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	Sig.	G.M.	S.E./plot
Year										
1960	1092	970	956	1621	1465	1349	1105	N.S.	1223	329.8
1961	606	480	512	301	270	810	937	N.S.	559	255.9
1963	194	765	415	1264	361	508	507	**	510	167.4
1964	667	1414	831	1581	811	905	1174	*	1055	404.2
Pooled	640	907	678	1192	727	893	931	N.S.	853	544.9

**Crop :- Wal (Rabi).****Ref :- Mh 60(125), 61(30), 62(63).****Site :- Agri. Res. Stn., Vadgaon.****Type :- 'C'.**

Object :- To study the effect of different spacings on the Wal crop.

**1. BASAL CONDITIONS :**

(i) (a) Paddy-Legumes-Paddy ; Nil ; Nil. (b) Paddy. (c) 44.8 Kg/ha. of N+67.2 Kg/ha. of  $P_2O_5$ . (ii) Medium black. (iii) 26.11.60 ; 1.12.61 ; 13.12.62. (iv) (a) 1 ploughing and 1 harrowing. (b) As per treatments. (c) 45 Kg/ha. (d) As per treatments. (e) 2. (v) Nil. (vi) 2-k-2. (vii) Unirrigated. (viii) 2 interculturings ; 1 weedings in 61 and 62. (ix) 1 cm. ; 0.2 cm. ; 6 cm. (x) 19.4.61 ; 11.4.62 ; 16.4.63.

**2. TREATMENTS :**

Same as in Expts. No. 60(48), 61(89), 63(106), 64(92) on Wal crop conducted at Igatpuri and presented on page No. 312.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 10.67 m. × 3.66 m. (b) 10.06 m. × 3.05 m. in 60; 10.06 m. × 2.74 m. in 61 and 62. (v) 30 cm. × 30 cm in 60; 30 cm. × 46 cm. in 61, and 62. (vi) Yes.

## 4. GENERAL :

(i) Normal; Normal; Satisfactory. (ii) Nil; An attack of Aphids in Jan., 62; Nil. (iii) Yield of grain. (iv) (a) 1960-62. (b) No. (c) Nil. (v) Igatpuri and Karjat. (vi) No. (vii) Error variances are heterogeneous, Treatments × years interaction is absent, hence results of individual years are presented under 5. Results.

## 5. RESULTS :

60(125)

(i) 614 Kg/ha. (ii) 134.5 Kg/ha. (iii) Treatment differences are not significant. (v) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>
Av. yield	727	758	499	640	534	573	570

61(30)

(i) 823 Kg/ha. (ii) 293.6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>
Av. yield	891	792	969	730	786	845	746

62(63)

(i) 596 Kg/ha. (ii) 172.5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>
Av. yield	593	620	588	511	618	681	563

**Crop :- Wal (Rabi).**

**Site :- Agri. Res. Stn., Igatpuri.**

**Ref :- Mh 60(49).**

**Type :- 'CV'.**

Object :—To find out suitable variety with method of sowing.

## 1. BASAL CONDITIONS :

(i) (a) Paddy-Wal. (b) Paddy. (c) 22.4 Kg/ha. of N as A/S+12.35 C.L./ha. of F.Y.M. (ii) Shallow and coarse. (iii) 26.10.60 to 16.11.60. (iv) (a) Nil. (b) As per treatments. (c) N.A. (d) 30 cm. between rows. (e) 4. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Thinning was done in treatment C<sub>4</sub> on 26.11.60. (ix) 8.2 cm. (x) 28.2.61 and 27.3.61.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 methods of sowing seeds : C<sub>1</sub>=Broadcasting seeds and then ploughing, C<sub>2</sub>=Broadcasting seeds soaked for 24 hours, 15 days after flowering of paddy, C<sub>3</sub>=Broadcasting, Unsoaked seeds after flowering of paddy and C<sub>4</sub>=Dibbling after the harvest of paddy at 30 cm. × 30 cm.

(2) 2 varieties : V<sub>1</sub>=2K-2 and V<sub>2</sub>=Wal-21.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 6.40 m. × 10.97 m. (b) 4.57 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Growth was normal. (ii) Aphids attack. Tobacco decoction was spread on 27.12.60 and 5.1.61. Crop was also affected by virus disease. (iii) Yield of grain. (iv) (a) 1960 contd. (modified in 61). (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.



## 5. RESULTS :

(i) 742 Kg/ha. (ii) 448.5 Kg/ha. (iii) Main effect of M is significant. (iv) Av. yield of grain in Kg/ha.

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	Mean
V <sub>1</sub>	1087	581	197	1087	738
V <sub>2</sub>	995	629	207	1152	746
Mean	1041	605	202	1120	742

C.D. for C marginal means=466.5 Kg/ha.

**Crop :- Wal (Rabi).**

**Ref :- Mh. 61(147), 62(134), 63(178), 64(148).**

**Site :- Agri. Res. Stu., Igatpuri. Type :- 'CV'.**

Object: -To find out the suitable method of sowing for different varieties of Wal.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wal for 61 ; Paddy for others. (c) 44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Shallow and coarse. (iii) 7, 8, 12.61 ; 21, 22, 11.62 ; 13, 14, 12.63 ; 19, 11.64 for C<sub>1</sub>V<sub>1</sub>, C<sub>1</sub>V<sub>2</sub>, C<sub>6</sub>V<sub>1</sub> and 1 to 3, 11.61 21 to 23, 10.62 ; 11, 12 11.63 ; 10, 11.64 for other treatments. (iv) (a) Ploughings. (b) As per treatments (c) N.A. (d) As per treatments. (e) 2. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding. (ix) N.A. ; 14 cm. ; 1 cm. and 7 cm. (x) 6 to 11, 3.62 and 1 to 4, 5.62 ; 26, 2.63 and 27, 3.63 ; 15, 31, 3.64 and 14, 23, 4.64. ; 14, 15, 17, 4.64.

## 2. TREATMENTS :

All combinations of 1 and 2

(1) 6 methods of sowing : C<sub>1</sub>=Local method, C<sub>2</sub>=Broadcasting soaked seed just before lodging of Paddy, C<sub>3</sub>=Broadcasting unsoaked seed just before lodging of Paddy, C<sub>4</sub>=Dibbling soaked seed 30 cm.×30 cm. when paddy is standing, C<sub>5</sub>=Dibbling unsoaked seed at 30 cm.×30 cm. when paddy is standing and C<sub>6</sub>=Dibbling at 30 cm.×30 cm. after harvesting of Paddy.

(2) 2 varieties : V<sub>1</sub>=2-k-8 2 and V<sub>2</sub>=No. 21.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 6.40 m.×10.97 m. (b) 4.57 m.×9.14 m. (v) 91 cm.×91 cm. (vi) Yes.

## 4. GENERAL :

(i) Good ; Fair ; Not satisfactory ; Normal. (ii) Endrix and tobacco decoction sprayed for aphids and virus diseases in 61 ; Nil in other years. (iii) Yield of grain. (iv) (a) 1960-64. (b) No. (c) Results of combined analysis have been presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is present. In 60, only 4 sowing methods were adopted.

## 5. RESULTS :

(i) 498 Kg/ha. (ii) 185.6 Kg/ha. (iii) C effect is highly significant while interaction C×V is significant. (iv) Av. yield of grain in Kg/ha.

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	C <sub>5</sub>	C <sub>6</sub>	Mean
V <sub>1</sub>	572	254	290	775	788	370	508
V <sub>2</sub>	612	163	318	653	694	484	487
Mean	592	208	304	714	741	427	498

C.D. for C marginal means=94.6 Kg/ha.

C.D. for two means in the body of the table=133.8 Kg/ha.

## Individual results

Treatment	V <sub>1</sub>	V <sub>2</sub>	Sig.	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	C <sub>5</sub>	C <sub>6</sub>
Year									
1961	1219	1150	N.S.	1222	602	766	1944	1875	696
1962	307	229	N.S.	284	81	364	331	380	170
1963	124	155	N.S.	230	121	35	123	112	216
1964	383	416	N.S.	630	30	52	458	597	628
Pooled	508	487	N.S.	592	208	304	714	741	427

Sig.	G.M.	S.E./plot.
**	1184	777.9
**	268	154.0
**	140	86.4
**	399	215.0
**	498	185.6

**Crop :- Wal (Rabi).**

**Ref :- Mh. 61(88), 63(105), 64(91).**

**Site :- Agri. Res. Stn., Karjat.**

**Type :- 'CV'.**

Object :—To study the suitable method of sowing for Wal crop.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 44.8 Kg/ha. of N in 61 ; 44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> in 63 and 64. (ii) N.A. (iii) 29.11.61 ; 15, 16.11.63 ; 23.11.64. (iv) (a) N.A. (b) As per treatments. (c) 45 Kg/ha. (d) 30 cm. × 30 cm. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) and (ix) N.A. (x) 28.12.61 ; 24 and 25.2.64 ; 9 and 10.3.65.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 6 methods of sowing: M<sub>1</sub>=Broadcasting of seed after harvest of paddy and then ploughing, M<sub>2</sub>=Broadcasting of soaked seed just before lodging of paddy, M<sub>3</sub>=Broadcasting of unsoaked seed just before lodging of Paddy, M<sub>4</sub>=Dibbling of soaked seed at 30 cm. × 30 cm. spacing when paddy crop is standing, M<sub>5</sub>=Dibbling of unsoaked seed at 30 cm. × 30 cm. spacing when paddy crop is standing and M<sub>6</sub>=Dibbling after harvest of Paddy at 30 cm. × 30 cm. sapcing.

(2) 2 varieties : V<sub>1</sub>=2 K—2 and V<sub>2</sub>=W—20.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 6.40 m. × 10.97 m. (b) 4.57 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory ; Normal ; Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960—64. (b) No. (c) Results of combined analysis have been presented under 5. Results. (v) and (vi) Nil. (vii) Experiments conducted during 60 and 62 failed. Error variances are homogeneous, Treatments × years interaction is not significant.

## 5. RESULTS :

## Pooled results

(i) 540 Kg/ha. (ii) 233.1 Kg/ha. (based on 121 d.f. made up of pooled error and Treatments × years interaction). (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	Mean
V <sub>1</sub>	496	404	421	657	807	683	578
V <sub>2</sub>	515	269	434	540	528	721	501
Mean	506	336	428	598	668	702	540

C.D. for M marginal means = 133.3 Kg/ha.

Individual results

Treatment	V <sub>1</sub>	V <sub>2</sub>	Sig.	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>
Year									
1961	389	414	N.S.	359	158	231	435	690	538
1963	830	767	N.S.	656	561	744	832	1082	915
1964	516	472	N.S.	502	290	312	528	680	653
Pooled	578	501	N.S.	506	336	428	598	668	702

  

Sig.	G.M.	S.E/plot
**	402	191.4
**	798	263.1
*	494	279.9
**	540	233.1

**Crop :- Bhendi (Rabi).**

**Ref :- Mh. 60(23).**

**Site :- Agri. Res. Stn., Nagpur.**

**Type :- 'D'.**

Object :- To find out the efficiency of insecticides towards control of fruit borers.

1. BASAL CONDITIONS :

(iv) (a) Nil. (b) Cotton. (c) 3.70 C.L./ha. of F.Y.M. (ii) Black cotton soil. (iii) 30.6.60 and 1.7.60.  
(iv) (a) 1 ploughing and 4 harrowings. (b) Dibbling. (c) 8 Kg/ha. (d) 46 cm. x 46 cm. (e) 2. (v) 3.70 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of Super on 29.6.60. (vi) Local. (vii) Unirrigated. (viii) 4 weedings. (ix) 76 cm. (x) 11 and 12.10.60.

2. TREATMENTS :

6 chemical treatments : T<sub>0</sub>=Control, T<sub>1</sub>=Technical Endrin at 140 gm./ha., T<sub>2</sub>=Technical Endrin at 210 gm./ha., T<sub>3</sub>=Technical Endrin at 280 gm./ha., T<sub>4</sub>=Endrix 1 % dust and T<sub>5</sub>=Mixture of 10 % D.D.T. + 10 % B.H.C. + 4 % Sulphur powder.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 12.80 m. x 9.14 m. (b) 9.14 m. x 5.49 m. (v) 183 cm. x 183 cm. (vi) Yes.

4. GENERAL :

(i) Growth was not satisfactory. (ii) Jassids attack heavy on control plot. (iii) Yield of grain. (iv) (a) 1959-60. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 70 Kg/ha. (ii) 52.18 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *bhendi* in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>
Av. yield	17	64	121	123	60	32

C.D. for treatment means=44 Kg/ha.

**Crop :- Potato (*Rabi*).**

**Ref :- Mh. 65(150).**

**Site :- Agri. College Farm, Poona.**

**Type :- 'C'.**

Object :—To study the effect of nature and size of tuber on the yield of Potato.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Nilawa. (c) Nil. (ii) Medium black. (iii) 17.11.65. (iv) (a) 2 ploughings and one harrowing. (b) Tubers planted as per treatments. (c) and (d) Nil. (e) One. (v) (39.3 Kg of N+78.6 Kg. of P<sub>2</sub>O<sub>5</sub>)/ha. as A/S and Super Phosphate broadcasted in furrows at sowing. (vi) 39.3 Kg. N/ha. as A/S applied on 20.12.65. (vii) Irrigated. (viii) 1 earthing up, 2 weedings. (ix) N.A. (x) 14.2.65.

## 2. TREATMENTS :

All combinations of (1) and (2)

- (1) Weights of tubers : W<sub>1</sub>=10, W<sub>2</sub>=20 and W<sub>3</sub>=30 gm.  
 (2) 2 sizes of the tubers : S<sub>1</sub>=Whole tuber and S<sub>2</sub>=Cut tubers.

## 3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

## 4. GENERAL :

(i) Crop was healthy. (ii) Nil. (iii) Yield of tuber. (iv) (a) 1965—67. (b) No. (c) Nil. (v) to (vii) Nil.

## 5. RESULTS :

(i) 13246 Kg/ha. (ii) 1490.2 Kg/ha. (iii) W and S effects are significant. (iv) Av. yield of tubers in Kg/ha.

Treatment	W <sub>1</sub>	W <sub>2</sub>	W <sub>3</sub>	S <sub>1</sub>	S <sub>2</sub>
Av. yield	10,831	15,422	13,487	16,833	9,659

C.D. at for W marginal means=1587.3 Kg/ha.

C.D. for S marginal means =1295.9 Kg/ha.

**Crop :- Sugarcane (*Adsali*).**

**Ref :- Mh. 60(135), 61(41), 62(25).**

**Site :- Agri. Res. Stn., Akluj.**

**Type :- 'M'.**

Object :—To find out the optimum dose of N application for Sugarcane.

## 1. BASAL CONDITIONS :

(i) (a) Nil ; *Rabi-Jowar*-Sugarcane for other years. (b) *Rabi-Jowar*. (c) Nil. (ii) D-type. (iii) 13.8.60 ; 10.8.61 ; 26.7.62. (iv) (a) 2 ploughings ; 2 ploughings, harrowings, ridging in 61 and 62. (b) Planted in furrows. (c) 24700 setts/ha. (d) 122 cm. between rows. (e) N.A. (v) 49.4 C.L./ha. of compost+112 Kg/ha. of P<sub>2</sub>O<sub>5</sub>+112 Kg/ha. of K<sub>2</sub>O. (vi) CO 419. (vii) Irrigated. (viii) Weeding ; two weedings ; slight earthing up. (ix) 45 cm. ; 51 cm. ; 44 cm. (x) 18.12.61 to 5.1.1962 ; 11 to 21.12.62 ; 5.1.64 to 12.1.64.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N:  $N_1=336.3$  and  $N_2=504.4$  Kg/ha.

(2) 4 method of application :  $S_1=In$  4 split doses as G.N.C. and A/S in 2 : 1 ratio,  $S_2=In$  4 split doses as A/S,  $S_3=In$  6 split doses A/S and  $S_4=In$  8 split doses as A/S.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) 13.11 m.  $\times$  9.75 m.; 11.73 m.  $\times$  10.97 m. in 61 and 62. (b) 10.36 m.  $\times$  7.32 m.; 8.99 m.  $\times$  8.53 m. in 61 and 62. (v) 137 cm.  $\times$  122 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Stem borer and top shoot borer attack, affected shoots removed. (iii) Yield of cane. (iv) (a) 1960 to 62. (b) and (c) No. (v) Deolali, Kopergaon and Lakhmapur. (vi) Nil. (vii) Error variances are heterogeneous, Treatments  $\times$  years interaction is absent. Hence results of individual years are presented under 5.— Results.

## 5. RESULTS :

60(135)

(i) 908 Q/ha. (ii) 81.8 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of Sugarcane in Q/ha.

	$S_1$	$S_2$	$S_3$	$S_4$	Mean
$N_1$	943	880	916	837	894
$N_2$	916	964	850	912	922
Mean	952	922	883	875	908

61(41)

(i) 1659 Q/ha. (ii) 121.2 Q/ha. (iii) Main effect of S is significant. (iv) Av. yield of Sugarcane in Q/ha.

	$S_1$	$S_2$	$S_3$	$S_4$	Mean
$N_1$	1573	1804	1518	1635	1632
$N_2$	1603	1704	1635	1801	1686
Mean	1588	1754	1576	1718	1659

C.D. for S marginal means=126.3 Q/ha.

62(25)

(i) 1800 Q/ha. (ii) 151.2 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of Sugarcane in Q/ha.

	$S_1$	$S_2$	$S_3$	$S_4$	Mean
$N_1$	1820	1706	1832	1656	1753
$N_2$	1834	1900	1848	1807	1847
Mean	1827	1803	1840	1732	1800

**Crop :- Sugarcane (Adsali).****Ref :- Mh. 60(136), 61(40), 62(24).****Site :- Agri. Res. Stn., Akluj.****Type :- 'M'.**

Object :—To find out the best method and time of application of P for increasing Sugarcane yield.

## 1. BASAL CONDITIONS :

(i) (a) *Jowar*-Sugarcane. (b) *Jowar*. (c) Nil. (ii) 'D' type ; clay for 61 and 62. (iii) 15.8.60 ; 12.8.61 ; 7.8.62. (iv) (a) 2 ploughings ; 2 ploughings and harrowing in 61 and 62. (b) Planted in furrows ; Wet method of planting in 61 and 62. (c) 24700 Setts/ha. (d) 122 cm. between rows. (e) 1. (v) 504.4 Kg/ha. of N as A/S+168.5 Kg/ha of K<sub>2</sub>O in 6 doses in 60 ; 49.4 C.L./ha. of compost+112 Kg/ha. of P<sub>2</sub>O<sub>5</sub>+112 Kg/ha. of K<sub>2</sub>O in 61 and 62. (vi) CO 419. (vii) Irrigated. (viii) Weedings ; 2 weedings+slight earthing up in 61 and 62. (ix) 45 cm. ; 51 cm. ; 44 cm. (x) 27.1.62 to 6.2.62 ; 4.12.62 to 9.1.63 ; 24.12.63 to 4.1.64.

## 2. TREATMENTS:

All combinations of (1) and (2)

(1) 3 methods of application of 168.1 Kg/ha. of P<sub>2</sub>O<sub>5</sub> : S<sub>1</sub>=Super with 1st dose of A/S (applied in 6 doses.), S<sub>2</sub>=Super applied with compost (P<sub>2</sub>O<sub>5</sub> in compost accounted for) and S<sub>3</sub>=Super applied when mixed with F.Y.M. (P<sub>2</sub>O<sub>5</sub> in F.Y.M. accounted for).

(2) 3 times of application : T<sub>1</sub>=At planting, T<sub>2</sub>= $\frac{1}{2}$  at planting+ $\frac{1}{2}$  at earthing up and T<sub>3</sub>= $\frac{1}{3}$  each at plating, after 3 weeks and at earthing up.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 13.11 m.×9.75 m. (b) 10.36 m.×7.32 m. (v) 137 cm.×122 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Attack of stem borer and top shoot borer. Affected shoots were removed. (iii) Yield of sugarcane. (iv) (a) 1960 to 62. (b) and (c) No. (v) Deolali, Kopergaon and Lakhmapur. (vi) Nil. (vii) Error variances are heterogeneous, Treatments×year interaction is absent. Hence results of individual years are presented under 5.—Results.

## 5. RESULTS :

60(136)

(i) 1019 Q/ha. (ii) 86.1 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	Mean
S <sub>1</sub>	1028	1041	951	1007
S <sub>2</sub>	1048	1030	984	1021
S <sub>3</sub>	1034	992	1063	1030
Mean	1437	1021	999	1019

61(40)

(i) 1845 Q/ha. (ii) 134.6 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	Mean
S <sub>1</sub>	1817	1868	1877	1855
S <sub>2</sub>	1935	1822	1849	1869
S <sub>3</sub>	1844	1765	1838	1812
Mean	1862	1818	1855	1845

62(24)

(i) 1935 Q/ha. (ii) 208.4 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	Mean
S <sub>1</sub>	1883	1900	1897	1893
S <sub>2</sub>	2005	2068	1861	1978
S <sub>3</sub>	1958	1811	2032	1934
Mean	1949	1926	1930	1935

**Crop :- Sugarcane (Adali).**

**Ref. :- Mh. 60(137), 61(39), 62(23).**

**Site :- Agri. Res. Stn. Akulj.**

**Type :- 'M'.**

**Object :-** To study the effect of different sources of N on the yield of sugarcane.

**1. BASAL CONDITIONS :**

(i) (a) Nil; *Rabi-Jowar*-Sugarcane in 61 and 62. (b) Nil; *Rabi Jowar* in 61 and 62. (c) Nil. (ii) 'D' type; clay in 61 and 62. (iii) 4.8.60; 31.8.61; 7.8.62. (iv) (a) 2 ploughings in 60; 2 ploughings, harrowing and ridging in 61 and 62. (b) Planted in furrows. (c) 24,700 setts/ha. (d) 122 cm. between rows. (e) N.A. (v) 49.4 C.L./ha. of compost+112 Kg/ha. of P<sub>2</sub>O<sub>5</sub>+112 Kg/ha. of K<sub>2</sub>O. (vi) CO419. (vii) Irrigated. (viii) Weeding in 60; 2 weedings and slight earthing up in 61 and 62. (ix) 45 cm.; 51 cm.; 44 cm. (x) 13 to 23.1.62; 10 to 21.1.63; 14.12.63 to 3.1.64.

**2. TREATMENTS :**

8 Sources of 504.4 Kg/ha. of N: S<sub>1</sub>=A/S and G.N.C. in 1:2 ratio, S<sub>2</sub>=A/S, S<sub>3</sub>=Urea, S<sub>4</sub>=A/S/N, S<sub>5</sub>=A.C, S<sub>6</sub>=Liquid Ammonia, S<sub>7</sub>=C/A/N and S<sub>8</sub>=A/S and Urea in 1:2 ratio.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 14.78 m.×8.53 m. (b) 9.91 m.×6.10 m. (v) 244 cm.×122 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Stem borer and top shoot borer attack. Affected shoots were removed. (iii) Yield of cane. (iv) (a) 1960-62. (b) No. (c) Results of the combined analysis are presented under 5.—Results. (v) Deolali, Kopergaon and Lakmapur. (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is present.

**5. RESULTS :**

**Pooled results**

(i) 1607 Q/ha. (ii) 265.7 Q/ha. (based on 14 d.f. made up of Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>
Av. yield	1665	1685	1713	1566	1620	1448	1595	1563

**Individual Results**

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>	Sig.	G.M.	S.E., plot
Year											
1960	1124	1157	1071	1168	1061	996	1134	1147	*	1107	60.4
1961	2051	2077	2121	1734	1906	1753	1711	1594	**	1868	162.1
1962	1879	1820	1947	1797	1893	1595	1941	1947	**	1852	94.0
Pooled	1665	1685	1713	1566	1620	1448	1595	1563	N.S.	1607	265.7

**Crop :- Sugarcane**

**Ref :- Mh. 61(38)**

**Site :- Agri. Res. Stn., Akluj.**

**Type :- 'M'.**

**Object :-** To study the relative merits of Cotton seed cake and Groundnut cake for Sugarcane.

**1. BASAL CONDITIONS :**

(i) (a) *Jowar*—Sugarcane. (b) *Jowar*. (c) Nil. (ii) Clay. (iii) 29.7.61. (iv) (a) Two ploughings, harrowing, ridging. (b) Wet method of planting. (c) 24,000 setts/ha. (d) 122 cm. between rows. (e) N.A. (v) Nil. (vi) Co 740. (vii) Irrigated. (viii) Two weedings and slight earthing up. (ix) 50 cm. (x) 1.12.62 to 3.1.63.

**2. TREATMENTS :**

2 sources of 50+4 Kg/ha. of N applied in 4 doses :  $S_1=A/S$  and cotton seed extraction in 1 : 2 ratio and  $S_2=A/S$  and G.N.C. in 1 : 2 ratio.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 9.75 m. × 16.50 m. (b) 7.32 m. × 13.72 m. (v) 137 cm. × 122 cm. (vi) Yes.

**4. GENERAL :**

(i) Slight lodging was observed, satisfactory. (ii) Attack of stem and top shoot borer were noticed and affected shoots were removed. (iii) Yield of cane. (iv) (a) 1961 only. (b) No. (c) Nil. (v) to (vii) Nil.

**5. RESULTS :**

(i) 2007 Q/ha. (ii) 164.5 Q/ha. (iii) Treatment difference is not significant. (iv) Av. yield of cane in Q/ha.

Treatment	$S_1$	$S_2$
Av. yield	2009	2005

**Crop :- Sugarcane (*Adsali*).**

**Ref :- Mh. 60(154), 61(49), 62(38).**

**Site :- Agri Res. Stn., Deolali.**

**Type :- 'M'.**

**Object :-** To find out the optimum dose and method of N application for Sugarcane.

**1. BASAL CONDITIONS :**

(i) (a) *Jowar*—Sugarcane—*Jowar*. (b) *Jowar*. (c) Nil. (ii) G type. (iii) 20.8.60 ; 5.8.61 ; 23.7.62. (iv) (a) 2 ploughings and harrowings. (b) Planted in ridges and furrows. (c) 24,700 setts/ha. (d) 122 cm. between rows. (e) 1 sett. (v) Nil. (vi) Co 419 (medium). (vii) Irrigated. (viii) Weeding and earthing up. (ix) 78 cm. ; 103 cm. ; 105 cm. (x) 10.1.62 ; 28.1.63 ; 16.1.64.

**2. TREATMENTS :**

Same as in Expt. Nos. 60(135), 61(41), 62(25) conducted at Akluj and presented on page No. 318.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 8. (b) 68.28 m. × 14.63 m. (iii) 4. (iv) (a) 14.63 m. × 8.53 m. (b) 12.19 m. × 6.10 m. (v) 122 cm. × 122 cm. (vi) Yes.

**4. GENERAL :**

(i) Good. (ii) Nil. (iii) Yield of cane. (iv) (a) 1960—62. (b) Yes. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) No. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

**5. RESULTS :**

Pooled results

(i) 1072 Q/ha. (ii) 161.4 Q/ha. (based on 63 d.f. made up of pooled error). (iii) None of the effects is significant. (iv) Av. yield of Sugarcane in Q/ha.



	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	Mean
N <sub>1</sub>	1008	1063	1045	961	1019
N <sub>2</sub>	1134	1079	1159	1132	1126
Mean	1071	1071	1102	1046	1072

## Individual results

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	Sig.	N <sub>1</sub>	N <sub>2</sub>	Sig.	G.M.	S.E./plot
Year										
1960	1027	1118	1072	998	*	1033	1074	*	1054	136.5
1961	836	754	879	874	N.S.	805	867	N.S.	836	180.6
1962	1351	1342	1354	1268	N.S.	1220	1438	**	1329	163.9
Pooled	1071	1071	1102	1046	N.S.	1019	1126	N.S.	1072	161.4

Crop :- Sugarcane.

Ref :- Mh. 60(139), 61(48), 62(37).

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

Type :- 'M'.

Object :- To find out the best time and method of application of P for increasing Sugarcane yield.

## 1. BASAL CONDITIONS

(i) (a) *Jowar-Sugarcane-Jowar*. (b) *Jowar*. (c) Nil. (ii) G type. (iii) 18.8.60 ; 27.8.61 ; 26.8.62.  
 (iv) (a) 2 ploughings and harrowing. (b) Planted in furrows and ridges. (c) 24,700 setts/ha. (d) 122 cm.  
 between rows. (e) 1. (v) Nil. (vi) Co 419 (medium). (vii) Irrigated. (viii) Weeding and earthing up.  
 (ix) 41 cm. ; 103 cm. ; 105 cm. (x) 30.1.62 ; 22.1.63 ; 10.2.64.

## 2. TREATMENTS

Same as in expts no. 60(136), 61(40) 62(24) conducted at Akluj and presented on page No. 320.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 14.63 m. x 8.53 m. (b) 12.19 m. x 6.10 m.  
 (v) 122 cm. x 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1960 to 62. (b) No. (c) Results of combined  
 analysis are presented under 5 Results (v) Akluj, Kopergaon and Lakhmapur. (vi) Nil. (vii) Error  
 variances are homogeneous and Treatments x years interaction is absent.

## 5. RESULTS :

## Pooled results

(i) 1149 Q/ha. (ii) 159.9 Q/ha. (based on 72 d.f. made up of pooled error). (iii) None of the effects is  
 significant. (iv) Av. yield of Sugarcane in Q/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	Mean
S <sub>1</sub>	1190	1082	1097	1123
S <sub>2</sub>	1157	1179	1164	1167
S <sub>3</sub>	1126	1202	1141	1156
Mean	1158	1154	1134	1149

## Individual results.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	Sig.	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>
Year							
1960	1142	1121	1065	N.S.	1106	1073	1150
1961	1204	1197	1218	N.S.	1158	1256	1206
1962	1127	1144	1119	N.S.	1106	1171	1113
Pooled	1158	1154	1134	N.S.	1123	1167	1156

Sig.	G.M.	S.E./plot.
N.S.	1110	120.9
N.S.	1206	194.9
NS.	1130	150.5
N.S.	1149	159.9

**Crop :- Sugarcane (*Adsali*).**

**Ref :- Mh. 60(161), 61(67), 62(51).**

**Site :- Agri. Res. Stn., Deolali.**

**Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Sugarcane—*Jowar*. (b) *Jowar*. (c) Nil. (ii) G type. (iii) 31.8.60 ; 20.8.61 ; 7.8.62. (iv) (a) 2 ploughings and harrowings. (b) Planted in ridges and furrows. (c) 24700 setts/ha. (d) 122 cm. between rows. (e) 1 sett. (v) 49.4 C.L./ha. of compost+112 Kg/ha. of P<sub>2</sub>O<sub>5</sub>+112 Kg/ha. of K<sub>2</sub>O. (vi) Co 419 (medium). (vii) Irrigated. (viii) Weeding and earthing up. (ix) 78 cm. ; 103 cm ; 105 cm. (x) 19.1.62 ; 14.1.63 ; 6.2.64.

2. TREATMENTS :

8 sources of 504.4 Kg/ha. of N: S<sub>1</sub>=A/S and G.N.C. in 1 : 2 ratio., S<sub>2</sub>=A/S, S<sub>3</sub>=Urea, S<sub>4</sub>=A/S/N, S<sub>5</sub>=A/C, S<sub>6</sub>=Liquid Ammonia, S<sub>7</sub>=C/A/N and S<sub>8</sub>=A/S and Urea in 1 : 2 ratio.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) 117.04 m. × 8.53 m. (iii) 4. (iv) (a) 14.63 m. × 8.53 m. (b) 12.19 m. × 6.10 m. (v) 122 cm. × 122 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of cane. (iv) (a) 1960 to 62. (b) Yes. (c) No. (v) Akluj, Kopergaon and Lakhmapur. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent. Hence the individual year results are presented under 5. Results.

5. RESULTS :

60(161)

(i) 1064 Q/ha. (ii) 146.4 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of cane in Q/ha.

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>
Av. yield	1248	1120	1084	1192	1126	652	937	1155.

C.D. for treatment means=215.3 Q/ha.

61(67)

(i) 1273 Q/ha. (ii) 258.4 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>
Av. yield	1387	1193	1343	1188	1448	943	1332	1347

62(51)

(i) 1177 Q/ha. (ii) 194.6 Q/ha. (iii) Treatment differences are significant. (iv) Av. yield of cane in Q/ha.

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>
Av. yield	1282	1194	1215	1316	1337	820	1168	1088

C.D. for treatment means = 286.2 Q/ha.

**Crop :- Sugarcane.**

**Ref :- Mh. 60(163), 61(79), 62(66).**

**Site :- Reg. Sugarcane Res.-Stn.,  
Kolhapur**

**Type :- 'M'**

Object :- To study the best time and distribution of N application under Rayungan planting for Sugarcane.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow ; N.A. ; N.A. (c) N.A. (ii) Alluvial clay. (iii) 10.10.60 : 31.8.61 ; 13.10.62. (iv) (a) Deep ploughing. (b) In ridges and furrows. (c) N.A. (d) 122 cm. between rows. (e) 1 sett. (v) 49.4 C.L. ha. of F.Y.M. (vi) Co 419. (vii) Irrigated. (viii) Weeding and interculturing. (ix) 174 cm ; 142 cm. ; 144 cm. (x) 16 to 18.12.61 ; 15.11.62 ; Dec., 63.

#### 2. TREATMENTS :

4 times of application of 302.6 Kg/ha. of N as A/S : T<sub>1</sub>=10 % at planting+15 % at 3 weeks+25 % at 6 weeks+15 % at 12 weeks+35 % at 18 weeks after planting, T<sub>2</sub>=25 % at 3 weeks+35 % at 12 weeks+40 % at 18 weeks after planting, T<sub>3</sub>=10 % at planting+40 % at 6 weeks+10 % at 12 weeks+40 % at 18 weeks after planting and T<sub>4</sub>=20 % at 3 weeks+30 % at 12 weeks+35 % at 18 weeks after planting +15 % pre-monsoon application.

#### 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 16.59 m. × 9.75 m. (b) 13.72 m. × 7.32 m. (v) 143 cm. × 122 cm. (vi) Yes.

#### 4. GENERAL :

(i) Normal (ii) Nil. (iii) Yield of cane. (iv) (a) 1960 to 62. (b) and (c) No. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent. Hence the individual year results are presented under 5. Results.

#### 5. RESULTS :

60(163)

(i) 713 Q/ha. (ii) 92.3 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Av. yield	679	762	780	633

61(79)

(i) 944 Q/ha. (ii) 98.2 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Av. yield	971	962	909	933

## 62(66)

(i) 1537 Q/ha. (ii) 259.7 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Av. yield	1517	1608	1506	1517

**Crop :- Sugarcane.**

**Ref. :- Mh. 60(165), 61(80), 62(67).**

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

Object :—To find out the best time of application of N for Sugarcane.

## 1. BASAL CGNDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Alluvial clay. (iii) 10.10.60 ; 17.10.61 ; 8.9.62. (iv) (a) Deep ploughing. (b) Planted in ridges and furrows. (c) N.A. (d) 122 cm. between rows. (e) N.A. (v) 49.4 C L./ha. of F.Y.M. (vi) CO-419. (vii) Irrigated. (viii) Weeding and interculturing. (ix) 174 cm. ; 104 cm. ; 151 cm. (x) 18.12.61 to 21.12.61 ; 15.11.62 ; 18.1.64.

## 2. TREATMENTS:

4 times of application of 302.6 Kg/ha. of N as A/S : T<sub>1</sub>=25% at 3 weeks+25% at 8 weeks and 50% at 18 weeks after planting. T<sub>2</sub>=10% at planting+40% at 8 weeks +10% at 16 weeks and 40% at 20 weeks after planting. T<sub>3</sub>=10% at planting+10% at 4 weeks+20% at 8 weeks +20% at 12 weeks+40% at 18 weeks after planting and T<sub>4</sub>=10% at plating+25% at 8 weeks+15% at 12 weeks +40% at 18 weeks after planting+10% at mid August after floods are over.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 16.59 m. × 9.75 m. (b) 13.72 m. × 7.32 m. (v) 143 cm. × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1960 to 62. (b) No. (c) Results of combined analysis are presented under 5.—Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

## 5. RESULTS :

## Pooled results

(i) 793 Q/ha. (ii) 105.2 Q/ha. (based on 27 d.f. made up of pooled error). (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in Q/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Av. yield	799	710	847	815

C.D. for treatment means=88.1 Kg/ha.

## Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	Sig.	G.M.	S.E./plot
Year							
1960	833	729	863	802	N.S.	807	83.3
1961	644	710	685	702	N.S.	685	107.8
1962	920	691	993	942	N.S.	886	121.0
Pooled	799	710	847	815	**	793	105.2

**Crop :- Sugarcane.****Ref :- Mh. 60(167), 63(94), 64(83).****Site :- Reg. Sugarcane Res. Stn., Kolhapur. Type :- 'M'.**

Object :- To study the best combination of N, P, K manuring with lime under basal doses of F.Y.M. on the yield of Sugarcane.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Fallow ; N.A. ; N.A. (c) Nil ; N.A. ; N.A. (ii) Silty loam. (iii) 4.12.60 to 8.12.60 ; 24.12.63 to 30.12.63 ; 21.12.64 to 29.12.64. (iv) (a) Deep ploughing and harrowing. (b) In ridges and furrows. (c) N.A. (d) 99 cm. between rows. (e) N.A. (v) 48 C.L./ha. of F.Y.M. (vi) CO-419. (vii) Irrigated. (viii) Weeding and interculturing. (ix) 173.7 cm. ; 115.5 cm. ; N.A. (x) 11.1.62 to 20.1.62 ; 7.1.65 to 26.1.65 ; 5.1.66 to 21.1.66

**2. TREATMENTS :**

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

(1) N at 3 levels as A.S :  $N_1=168$ ,  $N_2=252$  and  $N_3=336$  Kg/ha.

(2) P at 3 levels as Super :  $P_0=0$ ,  $P_1=84$  and  $P_2=168$  Kg/ha.

(3) K at 3 levels as M.P. :  $K_0=0$ ,  $K_1=168$  and  $K_2=336$  Kg/ha.

(4) Lime at 3 levels :  $L_1=0$ ,  $L_2=1.25$  and  $L_3=2.50$  Tonne/ha.

**3. DESIGN :**

(i) 3<sup>4</sup> confd. (ii) (a) 9 plots/block, 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 9.5 m. × 11.0 m. for 60 ; 12.2 m. × 8.5 m. for others. (b) 7.6 m. × 8.5 m. for 60 ; 10.1 m. × 6.1 m. for others. (v) One row for 60 ; two rows for others. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1960-64 (experiment was not conducted in 61 and 62). (b) and (c) No. (v) and (vi) No. (vii) Error variances are heterogeneous and Treatments × years interactions are absent, hence results of individual years are presented under 5.—Results.

**5. RESULTS :****60(167)**

(i) 910 Q/ha (ii) 161.62 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	$L_1$	$L_2$	$L_3$	Mean
$N_1$	911	980	878	885	977	907	840	930	1000	923
$N_2$	914	878	931	907	869	947	853	972	897	907
$N_3$	950	808	938	890	878	927	928	881	886	898
Mean	925	889	915	894	908	927	874	928	928	910
$L_1$	888	843	891	872	847	903				
$L_2$	966	953	865	901	937	944				
$L_3$	921	870	991	908	940	934				
$K_0$	869	866	948							
$K_1$	970	879	875							
$K_2$	936	921	924							

**63(94)**

(i) 895 Q/ha. (ii) 100.83 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Mean
N <sub>1</sub>	916	843	827	840	867	879	882	839	864	862
N <sub>2</sub>	906	910	892	925	873	909	911	896	901	902
N <sub>3</sub>	926	903	910	923	936	901	891	928	940	920
Mean	916	885	883	896	892	896	895	888	902	895
L <sub>1</sub>	921	865	898	879	908	897				
L <sub>2</sub>	923	860	880	885	872	906				
L <sub>3</sub>	904	930	871	923	896	886				
K <sub>0</sub>	910	874	903							
K <sub>1</sub>	904	884	887							
K <sub>2</sub>	934	897	859							

64(83)

(i) 1313 Q/ha. (ii) 153.52 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Mean
N <sub>1</sub>	1328	1319	1251	1204	1324	1370	1286	1298	1314	1299
N <sub>2</sub>	1355	1303	1172	1157	1296	1377	1316	1278	1236	1277
N <sub>3</sub>	1326	1346	1416	1251	1427	1410	1284	1352	1452	1363
Mean	1336	1322	1280	1204	1349	1386	1295	1309	1334	1313
L <sub>1</sub>	1318	1259	1309	1213	1324	1349				
L <sub>2</sub>	1321	1369	1238	1167	1364	1398				
L <sub>3</sub>	1371	1339	1291	1233	1359	1410				
K <sub>0</sub>	1216	1203	1194							
K <sub>1</sub>	1373	1332	1341							
K <sub>2</sub>	1420	1433	1304							

**Crop :- Sugarcane.****Ref :- Mh. 60(168), 64(84).****Site :- Reg. Sugarcane Res. Stn., Kolhapur.****Type :- 'M'.**

Object :—To find out the best combination of N, P, K manuring with lime.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Fallow ; N.A. (c) N.A. (ii) N.A. (iii) 4.12.60 to 8.12.60 ; 21.12.64 to 29.12.64. (iv) (a) Deep ploughing. (b) In ridges and furrows. (c) N.A. (d) 122 cm. between rows. (e) N.A. (v) Nil. (vi) CO-419. (vii) Irrigated. (viii) Weeding and interculturing. (ix) 173.7 cm. ; N.A. (x) 20.1.62 to 27.1.62.

**2. TREATMENTS :**

Same as in Experiment No. 68(167), 63(94) and 64(83) on sugarcane and presented on page No. 327.

## 3. DESIGN :

(i) 3<sup>4</sup> confd. factorial. (ii) (a) 9 plots/block, 9 blocks/replications. (b) N.A. (iii) 1. (iv) (a) 11'00 m. × 9'40 m.; 12'20 m. × 8'50 m. (b) 8'50 m. × 7'60 m.; 10'10 m. × 6'10 m. (v) One row. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1960-64 (Expts during 61 to 63 N.A.). (b) No. (c) Results of combined analysis presented under 5.—Results. (v) and (vi) N.A. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

## 5. RESULTS :

## Pooled results

(i) 1057 Q/ha. (ii) 152.7 Q/ha. (based on 80 d.f. made up of pooled error). (iii) Main effects of N, P and K are significant. (iv) Av. yield of cane in Q/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	L <sub>0</sub>	L <sub>1</sub>	L <sub>2</sub>	Mean
N <sub>1</sub>	913	1018	1051	851	1053	1038	998	973	1012	994
N <sub>2</sub>	1003	1080	1130	993	1053	1165	1081	1048	1083	1071
N <sub>3</sub>	1051	1068	1201	1037	1137	1147	1111	1129	1081	1107
Mean	989	1055	1127	974	1081	1117	1063	1050	1058	1057
L <sub>0</sub>	1013	1067	1109	938	1097	1154				
L <sub>1</sub>	994	1054	1102	985	1102	1063				
L <sub>2</sub>	960	1045	1170	999	1043	1134				
K <sub>0</sub>	949	931	1042							
K <sub>1</sub>	961	1131	720							
K <sub>2</sub>	1057	1103	1191							

C.D. for N, P or K marginal means = 59 Q/ha.

## Individual results

Treatment	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	Sig.	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Sig.
Year								
1960	870	980	1017	*	927	944	995	N.S.
1964	1117	1161	1196	N.S.	1050	1166	1259	**
Pooled	994	1071	1107	N.S.	989	1055	1127	*

  

K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Sig.	L <sub>0</sub>	L <sub>1</sub>	L <sub>2</sub>	Sig.	G.M.	S.E./plot
938	982	947	N.S.	959	936	972	N.S.	956	158.3
1009	1179	1286	**	1167	1163	1145	N.S.	1158	147.0
974	1081	1117	*	1063	1050	1058	N.S.	1057	152.7

**Crop :- Sugarcane.****Ref :- Mh. 61(82).****Site :- Reg. Sugarcane Res. Stn., Kolhapur.****Type :- 'M'.**

Object :—Effects of different types of Phosphatic fertilizers on the yield of Sugarcane.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Alluvial clay. (iii) 20, 21.12.61. (iv) (a) Ploughing, leveling, formation of furrows and ridges. (b) End to end planting. (c) 24700 Setts/ha. (d) 107 cm. between rows. (e) 1. (v) Nil. (vi) CO-775. (vii) Irrigated. (viii) Weeding, interculturing. (ix) 113.3 cm. (x) 26, 27.12.62.

**2. TREATMENTS :**

6 sources of  $P_2O_5$  to supply 112.1 Kg/ha. :  $S_1$ =Single Super Phosphate,  $S_2$ =Di-Calcium Phosphate,  $S_3$ =Rock Phosphate,  $S_4$ =Bone meal,  $S_5$ =Ammo-Phosphate and  $S_6$ =Fish meal.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 16.72 m. × 8.04 m. (b) 14.90 m. × 5.90 m. (v) 91 cm. × 107 cm. (vi) Yes.

**4. GENERAL**

(i) Crop was lodged. (ii) Nil. (iii) Yield of cane. (iv) (a) 1961 to 64 (Modified in 63). (b) and (c) No. (v) No. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 689 Q/ha. (ii) 138.9 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$
Av. yield	624	706	669	703	716	715

**Crop :- Sugarcane.****Ref :- Mh. 63(95), 64(85).****Site :- Reg. Sugarcane Res. Stn., Kolhapur.****Type :- 'M'.**

Object : To study the effect of different sources of P on the yield of Sugarcane.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Sugarcane. (c) N.A. (ii) Alluvial clay. (iii) 27.12.63 ; 12.12.64. (iv) (a) Deep ploughing. (b) Planted in ridges and furrows. (c) N.A. (d) 105 cm. (e) N.A. (v) 302.6 Kg/ha. of N as A/S in 4 doses. (vi) Co-775. (vii) Irrigated. (viii) Weeding and interculturing (ix) 115 cm. ; N.A. (x) 5, 6.1.65 ; 21.2.66.

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

9 sources of  $P_2O_5$  :  $S_0$ =Control,  $S_1$ =Single Super Phosphate,  $S_2$ =Di-Calcium Phosphate,  $S_3$ =Rock Phosphate,  $S_4$ =Bone meal,  $S_5$ =Ammonium Phosphate,  $S_6$ =Fish meal,  $S_7$ =Nitro-Phosphate ODDA and  $S_8$ =Nitro-Phosphate PEC.

**Sub-plot treatments :**

2 levels of F.Y.M. :  $F_0$ =0 and  $F_1$ =22417 Kg/ha.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 9 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 11.58 m. × 5.94 m. (b) 9.75 m. × 3.96 m. (v) 91 cm. × 99 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Stem borer attack. (iii) Yield of cane. (iv) (a) 1961 to 64 (not conducted in 62 modified in 63). (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Both the error variances are homogeneous and Treatments × years interaction are absent.



## 5. RESULTS :

## Pooled results

(i) 950 Q/ha. (ii) (a) 142.3 Q/ha. (based on 32 d.f. made up of pooled error). (b) 120.4 Q/ha. (based on 36 d.f. made up of pooled error). (iii) Main effect of F is significant. (iv) Av. yield of cane in Q/ha.

	S <sub>0</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>	Mean
F <sub>0</sub>	769	956	923	906	950	961	877	971	963	919
F <sub>1</sub>	908	976	1023	954	1018	960	917	997	1076	981
Mean	838	966	973	930	984	960	897	984	1020	950

C.D. for F marginal means = 47.0 Q/ha.

## Individual results

Treatment	S <sub>0</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>	Sig.	F <sub>0</sub>	F <sub>1</sub>
year												
1963	813	915	1015	977	985	974	884	1041	981	N.S.	902	1007
1964	864	6017	931	884	983	947	909	927	1059	N.S.	938	955
Pooled	838	966	973	930	984	960	897	984	1020	N.S.	919	981

Sig.	G.M.	S.E./Plot	
		(a)	(b)
*	953	157.0	141.9
N.S.	947	126.0	94.2
*	950	142.3	120.4

Crop :- Sugarcane.

Ref :- Mh. 63(96), 64(86).

Site :- Reg. Sugarcane Res. Stn., Kolhapur.

Type :- 'M'

Object :- To study the effect of mode of application of P and K under different N levels on the nutrition and quality of cane as judged by the up take of N, P, K nutrients.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Alluvial clay. (iii) 23.12.63 ; 21.12.64. (iv) (a) Deep ploughing and harrowing. (b) In ridges and furrows. (c) N.A. (d) 107 cm. × 107 cm. (e) N.A. (v) Nil. (vi) Co-740 (vii) Irrigated. (viii) Weeding and interculturing. (ix) 115 cm. ; N.A. (x) 10.3.65 ; 4.2.66.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N : N<sub>1</sub> = 168.1 and N<sub>2</sub> = 336.2 Kg/ha.

(2) 4 methods of application : M<sub>1</sub> = N with P and K at planting, M<sub>2</sub> = N with P in one dose and K in 3 split dose, M<sub>3</sub> = with K in one dose and P in 3 split-doses and M<sub>4</sub> = N with P and K in three split doses.

Split-doses are  $\frac{1}{4}$ th at planting +  $\frac{1}{4}$ th 6-8 weeks after planting +  $\frac{1}{2}$  at earthing up.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 6.10 m. × 4.95 m. (b) 4.27 m. × 2.96 m. (v) 91 cm. × 100 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1963-64. (b) and (c) No. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is absent. Hence the results of individual years are presented under 5. Results.

## 5. RESULTS:

63(96)

(i) 1200 Q/ha. (ii) 48.2 Q/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of sugarcane in Q/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	Mean
N <sub>1</sub>	1078	1126	1100	1096	1100
N <sub>2</sub>	1285	1285	1323	1307	1300
Mean	1182	1206	1212	1201	1200

C.D. for N marginal means = 35.4 Q/ha.

64(86)

(i) 1516 Q/ha. (ii) 202.8 Q/ha. (iii) Main effect of N is significant. (iv) (a) Av. yield of sugarcane in Q/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	Mean
N <sub>1</sub>	1437	1366	1400	1540	1436
N <sub>2</sub>	1487	1601	1654	1642	1596
Mean	1462	1484	1527	1591	1516

C.D. for N marginal means = 149.1 Q/ha.

**Crop :- Sugarcane (Adali).**

**Ref :- Mh. 64(87), 65(200).**

**Site :- Reg. Sugarcane Res. Stn., Kolhapur.**

**Type :- 'M'.**

Object :- To study the suitable time of application of N for Sugarcane.

## 1. BASAL CONDITIONS :

(i) (a) Nil. ; Sugarcane—Fallow—Sugarcane (b) N.A. ; Fallow. (c) N.A. (ii) N.A. Medium black (iii) 3 to 6.12.64 ; 15.10.65. (iv) (a) Deep ploughing ; 2 ploughings (b) Planted in ridges and furrows ; Dry Method. (c) N.A. ; 30875 setts/ha. (d) 122 cm. between rows ; 100 cm. between rows (e) N.A. (v) 49.4 C.L./ha. of compost ; Nil. (vi) Co-740. (vii) Irrigated. (viii) Weeding. (ix) N.A. ; 243.9 cm. (x) 2 to 11.3.66 ; 22.12.66 to 12.1.67.

## TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N: N<sub>1</sub>=168.1, N<sub>2</sub>=252.2 and N<sub>3</sub>=336.2 Kg/ha.

(2) 5 times of applications: T<sub>1</sub>=At germination, T<sub>2</sub>= $\frac{1}{2}$  at earthing up +  $\frac{1}{2}$  after germination, T<sub>3</sub>= $\frac{1}{4}$  at planting +  $\frac{3}{4}$  at tillering, T<sub>4</sub>= $\frac{1}{4}$  at planting +  $\frac{1}{4}$  at 8 weeks after +  $\frac{1}{2}$  at earthing up and T<sub>5</sub>=1/10 at planting + 2/5 at 8 weeks after + 1/10 at 16 weeks after + 2/5 at earthing up.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 14.63 m. × 7.92 m. (b) 12.19 m. × 5.94 m. (v) 122 cm. × 99 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Stem borer attack ; Nil. (iii) Yield of cane. (iv) (a) 1964-65. (b) N.A. (c) The results of the combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

## 5. RESULTS :

Pooled results

(i) 1472 Q/ha. (ii) 120.9 Q/ha. (based on 56 d.f. made up of pooled error). (iii) Main effects of N and T are highly significant. (iv) Av. yield of cane in Q/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	Mean
N <sub>1</sub>	1391.0	1553.0	1247.0	1403.0	1482.5	1415.3
N <sub>2</sub>	1421.5	1507.0	1456.5	1440.0	1587.0	1482.3
N <sub>3</sub>	1489.5	1549.0	1506.0	1151.0	1532.5	1517.6
Mean	1434.0	1536.3	1403.1	1451.3	1534.0	1471.7

C.D. for N marginal means = 64.1 Q/ha.

C.D. for T marginal means = 82.5 Q/ha.

## Individual results

Treatment	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	Sig.	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>
Year									
1964	1428.0	1467.0	1533.0	*	1420.0	1505.0	1427.3	1463.0	1565.0
1965	1402.8	1497.7	1502.0	N.S.	1448.1	1567.1	1379.5	1439.5	1503.1
Pooled	1415.3	1482.4	1517.6	**	1434.3	1536.3	1403.1	1451.3	1534.0

Sig.	G.M.	S.E./plot
N.S.	1476	111.9
N.S.	1467	129.3
**	1472	120.9

**Crop :- Sugarcane.**

**Ref :- Mh. 65(161).**

**Site :- Reg. Sugarcane Res. Stn., Kolhapur.**

**Type :- 'M'.**

Object :- To study the nature of nutrition, growth and development effect on soil composition and quality of Sugarcane by ratooning.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Alluvial caly. (iii) 8.11.65. (iv) (a) Two ploughings. (b) Set method. (c) 30875 setts/ha. (d) 100 cm. between rows. (e) —. (v) 50 C.L./ha of F.Y.M. + 247 Kg/ha. of P<sub>2</sub>O<sub>5</sub> + 247 Kg/ha. of K<sub>2</sub>O. (vi) Co-740 (medium). (vii) Lift irrigation, 18-20 at an interval of 10-15 days. (viii) Weeding and earthing up. (ix) N.A. (x) 8 to 12.2.67.

## 2. TREATMENTS:

All combinations of (N) and (R).

(N) Levels of N as A/S :  $N_1=168$ ,  $N_2=252$  and  $N_3=336$  Kg/ha. of N.

(R) Application of N to ratoons :  $R_1$ =Plant cane,  $R_2$ =First ratoon and  $R_3$ =Second ratoon.

$R_2$  was planted in 63-64 and  $R_3$  in 64-65.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 12.20 m.  $\times$  7.85 m. (b) 10.20 m.  $\times$  5.85 m.  
(v) 100 cm.  $\times$  100 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Smut. affected shoots up-rooted and destroyed. (iii) Plant count, growth observations and yield of cane. (iv) (a) 1965-67. (b) and (c) No. (v) Padegaon. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 916 Q/ha. (ii) 103.1 Q/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of cane in Q/ha.

	$R_1$	$R_2$	$R_3$	Mean
$N_1$	790	704	830	775
$N_2$	888	903	923	905
$N_3$	1092	951	1161	1068
Mean	923	852	971	916

C.D. for marginal means of N=87 Q/ha.

**Crop :- Sugarcane (*Adsali*).**

**Ref :- Mh. 60(141), 61(175), 62(171).**

**Site :- Agri. Res. Stn., Kopergaon.**

**Type :- 'M'.**

Object :- To find out the optimum duration of N application to Sugarcane.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy+Gram ; Gram ; Groundnut (c) Nil. (ii) A-type. (iii) 4.8.60 ; 16.8.61 ; 17.8.62.  
(iv) (a) Ploughing and harrowing. (b) Planted in ridges and furrows. (c) 24710 setts/ha. (d) 122 cm. between rows. (e) 1 sett. (v) 49.42 C.L./ha. of F.Y.M. (vi) CO-419. (vii) Irrigated. (viii) 3 weedings. (ix) 41 cm. ; N.A. ; N.A. (x) 28.1.62 ; 12.2.63 ; 3.1.64.

## 2. TREATMENTS :

Same as in Expts. No. 60(135), 61(41), 62(25) on sugarcane presented at page No. 318.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 8.53 m.  $\times$  15.24 m. (b) 6.10 m.  $\times$  12.80 m. (v) 122 cm.  $\times$  122 cm. (vi) Yes.

## 4. GENERAL :

(i) Lodging observed after 15.8.61 ; Satisfactory ; Normal. (ii) Light attack of stem borer ; Nil ; Nil.  
(iii) Yield of cane. (iv) (a) 1960-62. (b) and (c) No. (v) Akluj, Deolali, Lakhmapur. (vi) Nil. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is absent. Hence the individual results are presented under 5.—Results.

## 5. RESULTS :

60(141)

(i) 886 Q/ha. (ii) 420.1 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	Mean
N <sub>1</sub>	882	852	1058	875	917
N <sub>2</sub>	874	811	939	800	856
Mean	878	832	998	838	886

61(175)

(i) 994 Q/ha. (ii) 141.0 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	Mean
N <sub>1</sub>	979	848	1004	1048	970
N <sub>2</sub>	983	1175	950	963	1018
Mean	986	1012	977	1006	994

62(171)

(i) 951 Q/ha. (ii) 137.8 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	Mean
N <sub>1</sub>	984	842	940	931	924
N <sub>2</sub>	902	962	1068	976	977
Mean	943	902	1004	954	951

**Crop :- Sugarcane (*Adsali*).****Ref :- Mh. 60(142), 62(175), 63(292).****Site :- Agri. Res. Stn., Kopergaon.****Type :- 'M'.**

Object :--To find out the best method and time of application of Phosphate for increasing the yield of Sugarcane.

**1. BASAL CONDITIONS :**

(i) (a) No. (b) Paddy and Gram; Wheat; Groundnut. (c) 168.1 Kg/ha. of A S to Paddy and 188 Kg/ha. of Super to Gram; Nil; 123 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> to Groundnut.  
(ii) A type. (iii) 28.8.60; 1.8.62; 11.9.63. (iv) (a) 2 ploughings and harrowing. (b) Furrows and ridges.  
(c) 24710 setts/ha. (d) 122 cm. (e) 1. (v) 504.4 Kg/ha. of N as A/S + 56 Kg/ha. of K<sub>2</sub>O for 60; Nil for others. (vi) CO-149. (vii) Irrigated. (viii) Weedings. (ix) 41 cm.; N.A. for 62, 63. (x) 27.2.62; 30.12.64; 8.3.65 to 16.3.65.

**2. TREATMENTS:**

All combinations of (1) and (2)

(1) 3 sources of 168.1 Kg/ha. of P<sub>2</sub>O<sub>5</sub>: S<sub>1</sub>=Super, S<sub>2</sub>=Compost and S<sub>3</sub>=F.Y.M.(2) 3 times of application: T<sub>1</sub>=at planting, T<sub>2</sub>= $\frac{1}{2}$  at plating +  $\frac{1}{2}$  at earthing up, and T<sub>3</sub>= $\frac{1}{3}$ rd at planting +  $\frac{1}{3}$ rd 8 weeks after +  $\frac{1}{3}$ rd at earthing up.**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 14.63 m. × 8.53 m. (b) 12.19 m. × 6.10 m. (v) 122 cm. × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Light attack of stem borer. (iii) Yield of cane. (iv) (a) 1960-63 (not conducted in 61). (b) and (c) No. (v) Akluj, Deolali and Lakhmapur. (vi) Nil. (vii) Error variances are heterogeneous and Treatments $\times$ years interaction is absent. Hence the results of individual years are presented under 5.—Results.

## 5. RESULTS :

60(142)

(i) 1037 Q/ha. (ii) 92.0 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	Mean
S <sub>1</sub>	1034	1052	1045	1044
S <sub>2</sub>	977	1038	1074	1030
S <sub>3</sub>	1056	1036	1017	1036
Mean	1022	1042	1045	1037

62(175)

(i) 1369 Q/ha. (ii) 154.5 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	Mean
S <sub>1</sub>	1453	1371	1528	1417
S <sub>2</sub>	1362	1284	1222	1289
S <sub>3</sub>	1387	1423	1391	1400
Mean	1401	1326	1380	1369

63(292)

(i) 911 Q/ha. (ii) 236.7 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	Mean
S <sub>1</sub>	847	948	899	898
S <sub>2</sub>	857	898	844	866
S <sub>3</sub>	1100	957	845	967
Mean	935	934	863	911

**Crop :- Sugarcane (Adsali).**

**Ref. :- Mh. 60(143), 61(174), 62(170).**

**Site :- Agri Res. Stn., Korergaon.**

**Type :- 'M'.**

**Object :-** To compare the efficiency of different forms of available Nitrogen fertilizers as to replace those which are not easily available.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut and Wheat for 60 and 61; N.A. for 63. (c) Nil. (ii) 'A' type. (iii) 16.3.1960; 16.8.61; 18.8.62. (iv) (a) 2 ploughings and harrowings. (b) Planted in ridges and furrows (c) 24710 seeds/ha. (d) 122 cm. between rows. (e) 1. (v) 49.42 C.L./ha. of F.Y.M. (vi) CO—419. (vii) Irrigated. (viii) 3 weedings. (ix) 41 cm.; N.A. for 61 and 62. (x) 15.2.62; 14.2.63; 1.1.64.

## 2. TREATMENTS :

8 sources of 504 Kg/ha. of N :  $S_1=A/S$  and G.N.C. in 1 : 2 ratio,  $S_2=A/S$ ,  $S_3=Urea$ ,  $S_4=A/S/N$ ,  $S_5=A/C$ ,  $S_6=Liquor Ammonia$ ,  $S_7=C/A/N$  and  $S_8=A/S$  and Urea in 1 : 2 ratio.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 14'63 m. × 9'75m. (b) 12'19 m. × 7'32 m. (v) 122 m. × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Lodged after 15.8.61 ; Normal in 61 and 62. (ii) Slight attack of top shoots and stem borer ; Nil in 61 and 62. (iii) Yield of sugarcane. (iv) (a) 1960-62. (b) No. (c) Results of combined analysis are presented under 5.- Results. (v) Akluj, Deolali and Lakmapur. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

## 5. RESULTS :

## Pooled results

(i) 767 Q/ha. (ii) 357.4 Q/ha. (based on 14 d.f. made up of Treatments × years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

Treatment	$S_1$	$S_2$	$S_3$	$S_4$	$S_5$	$S_6$	$S_7$	$S_8$
Av. yield	591	804	932	806	758	716	794	733

## Individual results :

Treatment	$S_1$	$S_2$	$S_3$	$S_4$	$S_5$	$S_6$	$S_7$	$S_8$	Sig.	G.M.	S.E./plot
Year											
1960	93	483	782	556	386	452	372	54	N.S.	397	397.5
1961	957	954	1047	1156	1240	863	1134	1252	*	1075	174.2
1962	724	975	967	706	647	833	877	894	**	828	84.4
Pooled	591	804	932	806	758	716	794	733	N.S.	767	357.4

**Crop :- Sugarcane.**

**Site :- Agri. Res. Stn., Kopergaon.**

**Ref. :- Mh. 61(227).**

**Type :- 'M'.**

Object : — To study the relative merits of C/A/N, A/S and Urea in presence of F.Y.M. on the yield of Sugarcane.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) 'A' type. (iii) 15.8.61. (iv) 2 ploughings, clod crushing, harrowing. (v) Planting in furrows from end to end. (c) 24700 three budded setts/ha. (d) 122 cm. between rows. (e) N.A. (v) As per treatments. (vi) CO-740. (vii) Irrigated, Irrigation at 8, 10 and 12 days interval. (viii) 3 weedings, 2 hoeings, earthing up. (ix) N.A. (x) 7.2.63.

## 2. TREATMENTS :

## Main-plot treatments :

9 treatment combinations of (S) and (L)

S : Sources of Nitrogen :  $S_1=C/A/N$ , and  $S_2=S/A$ ,  $S_3=Urea$ .

L : levels of Nitrogen :  $L_1=336$ ,  $L_2=420$  and  $L_3=504$  Kg/ha. of N.

## Sub-plot treatments :

$F_0=0$  and  $F_1=49$  C.L./ha. of F.Y.M.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 2 sub-plots/main plot, 9 main-plots/replication. (b) N.A. (iii) 4. (iv) (a) 16'28 m. × 9'76 m. (b) 13'84 m. × 7'32 m. (v) 122 cm. × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Top shoot borer. (iii) Germination count, tillers and yield of cane. (iv) (a) to (c) No. (v) to (vii) No.

## 5. RESULTS :

(i) 1310 Q/ha. (ii) (a) 194.0 Q/ha. (b) 169.4 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
S <sub>1</sub>	1259	1304	1358	1372	1242	1307
S <sub>2</sub>	1351	1265	1477	1382	1346	1364
S <sub>3</sub>	1178	1303	1294	1244	1273	1259
Mean	1263	1291	1376	1333	1287	1310
F <sub>0</sub>	1273	1299	1425			
F <sub>1</sub>	1252	1282	1327			

**Crop :- Sugarcane. (Adsali).**

**Ref :- Mh. 60(145), 61(184), 62(185).**

**Site :- Agri. Res. Stn., Lakhmapur.**

**Type :- 'M'.**

Object :—To find out the best method and time of application of P for increasing Sugarcane yield.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Bajri* and *Tur*; *Bajri*; *Bajri* and *Tur*. (c) Nil. (ii) N.A. (iii) 22.8.60; 28.8.61; 5.9.62. (iv) (a) Ploughing and harrowing. (b) Planted in furrows and ridges. (c) 24710 setts/ha. (d) 122 cm. between rows. (e) —. (v) 504.4 Kg/ha. of N as A/S in 6 doses+168.1 Kg/ha. of K<sub>2</sub>O; Nil for other years. (vi) Co-419. (vii) Irrigated. (viii) Weeding and interculturings. (ix) 65 cm.; N.A.; N.A. (x) 26.2.62; N.A.; 5.1.64.

## 2. TREATMENTS :

Same as in Expt. Nos. 60(136), 61(40), 62(24) conducted at Akhuj, presented on page No. 320.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 8.53 m. × 14.63 m. (b) 6.10 m. × 12.19 m. (v) 122 cm. × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of cane. (iv) (a) 1960 to 62. (b) and (c) No. (v) Akhuj, Deolali and Kopergaon. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent. Hence the results of individual years are presented under 5. Results.

## 5. RESULTS :

**60(145)**

(i) 423 Q/ha. (ii) 115.3 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
T <sub>1</sub>	505	351	400	419
T <sub>2</sub>	367	356	477	400
T <sub>3</sub>	346	533	473	451
Mean	406	413	450	423



61(184)

(i) 642 Q/ha. (ii) 104.3 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
T <sub>1</sub>	600	588	767	652
T <sub>2</sub>	655	606	591	617
T <sub>3</sub>	676	592	704	657
Mean	644	595	687	642

62(185)

(i) 608 Q/ha. (ii) 171.7 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
T <sub>1</sub>	596	588	569	584
T <sub>2</sub>	613	470	547	543
T <sub>3</sub>	602	806	682	697
Mean	604	621	600	608

**Crop :- Sugarcane.****Ref :- Mh. 60(146), 61(186), 62(187), 63(295).****Site :- Agri. Res. Stn., Lakhmapur. Type :- 'M'.**

Object : -To compare the efficiency of different forms of available N fertilizers so as to replace those which are not easily available.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Bajri* and *Tur* ; N.A. for other years. (c) Nil ; N.A. for other years. (ii) 'U' type. (iii) 17.8.60 ; 26.8.61 ; 3.9.62 ; 31.8.63. (iv) (a) Ploughing and harrowing. (b) Planted in furrows and ridges. (c) 24710 setts/ha. (d) 122 cm. between rows. (e) 1 sett. (v) 49.4 C.L./ha. of compost for 60 ; Nil for other years. (vi) Co-419. (vii) Irrigated. (viii) Weeding and interculturing. (ix) 65 cm. ; N.A. for other years. (x) 25.2.62 ; 6.1.63 ; 27.12.63 ; 9.12.64.

**2. TREATMENTS :**

Same as in Expt. Nos. 60(143), 61(174), 62(170) conducted at Kopergaon, presented on page No. 336.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 12.95 m. × 9.75 m. (b) 10.36 m. × 7.32 m. (v) 130 cm. × 122 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) N.A. (iii) Yield of cane. (iv) (a) 1960 to 63. (b) and (c) No. (v) Akluj, Deolal, Kopergaon. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent, crop failed in II and IV replication in the year 60, analysis done with 2 replications only. The results of individual years are presented under 5. Results.

**5. RESULTS :****60(146)**

(i) 308 Q/ha. (ii) 100.6 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>
Av. yield	323	270	290	409	275	158	326	414

**61(180)**

(i) 767 Q/ha. (ii) 189.8 Q/ha. (iii) Treatment differences are significant. (iv) Av. yield of cane in Q/ha.

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>
Av. yield	867	882	763	890	480	607	916	732

C.D.=279.1 Q/ha.

**62(187)**

(i) 651 Q/ha. (ii) 109.5 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>
Av. yield	659	597	676	701	714	582	696	585

**63(295)**

(i) 631 Q/ha. (ii) 199.7 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>
Av. yield	803	714	664	515	563	594	557	639

**Crop :- Sugarcane. (Adjali).**

**Ref :- Mh. 60(144), 61(185), 62(186), 63(296).**

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

**Object :-** To find out the optimum duration of N application for Sugarcane.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) 'U' type. (iii) 14.8.60 ; 17.8.61 ; 22.8.62 ; 1.9.63. (iv) (a) Ploughing and harrowing. (b) Planted in furrows and ridges. (c) 24710 setts/ha. (d) 122 cm. between rows. (e) I. (v) 49.4 C.L./ha. of compost ; Nil for 61 and 62 ; 49.4 C.L./ha. of compost + 112.1 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super + 112.1 Kg/ha. of K<sub>2</sub>O as Mur. pot. (vi) Co-419. (vii) Irrigated. (viii) Weeding. (ix) 65 cm ; N.A. for other years. (x) 28.2.62 ; N.A. ; 23.12.63 ; 6.7.12.64.

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 2 levels of N : N<sub>1</sub>=326.2 and N<sub>2</sub>=504.4 Kg/ha.

(2) 4 sources of N : S<sub>1</sub>=A/S and cake in 1 : 2 ratio in 4 doses, S<sub>2</sub>=A/S alone in 4 doses, S<sub>3</sub>=A/S alone in 6 doses and S<sub>4</sub>=A/S alone in 8 doses.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 8.53 m. × 14.63 m. (b) 6.10 m. × 12.19 m. (v) 122 cm. × 122 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1960—63. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Kopergaon. (vi) Nil. (vii) Crop failed in replication III and IV in 60. Error variances are homogeneous and Treatments × years interaction is absent.

**5. RESULTS :**

Pooled results

(i) 678 Q/ha. (ii) 122.1 Q/ha. (based on 70 d.f. made up of pooled error). (iii) Main effect of S is significant. (iv) Av. yield of cane in Q/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	Mean
N <sub>1</sub>	650	615	761	663	672
N <sub>2</sub>	658	678	720	683	684
Mean	654	647	740	673	678

C.D. for S marginal means=65.2 Q/ha.

#### Individual results

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	Sig.	N <sub>1</sub>	N <sub>2</sub>	Sig.	G.M.	S.E. plot
Year										
1960	647	584	737	638	N.S.	676	626	N.S.	651	100.4
1961	630	530	537	508	N.S.	509	593	N.S.	551	144.5
1962	523	582	700	633	N.S.	594	626	N.S.	609	116.9
1963	816	892	986	913	*	913	891	N.S.	902	108.3
Pooled	654	647	740	673	*	672	684	N.S.	678	122.1

**Crop :- Sugarcane.**

**Ref :- Mh. 60(183).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'M'.**

Object.—To study the effect of N applied as based and sprayed on the yield of Sugarcane.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Black cotton soil. (iii) 1.3.60. (iv) (a) Ploughing. (b) Furrows and ridges. (c) 25,000 setts/ha. (d) 91 cm. × 91 cm. (e) 1. (v) 56 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. (vi) CO-419. (vii) Irrigated. (viii) 4 weedings. (ix) 101 cm. (x) 16.2 61 to 13.3.61.

#### 2. TREATMENTS :

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

(1) 3 levels of N as A/S+G.N.C. : N<sub>1</sub>=112, N<sub>2</sub>=168, and N<sub>3</sub>=224 Kg/ha.

(2) 3 methods of application of Urea : N<sub>0</sub>=No spray of Urea. M<sub>1</sub>=4% Urea sprayed every month, and M<sub>2</sub>=4% Urea sprayed once in every 2 month.

N applied in 2 doses : M<sub>1</sub>—4 sprayings on 2.5.60, 4.6.60, 10.7.60 and 7.8.60. and M<sub>2</sub>—2 sprayings—3rd week of April and June. N on 15.4.60 and 7.7.60.

#### 3. DESIGN .

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 5.49 m. × 3.66 m. (b) 3.66 m. × 3.66 m. (v) 91 cm. 91 cm. (vi) Yes.

#### 4. GENERAL .

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) One year only. (b) No. (c) Nil. (v) to (vii) Nil.

#### 5. RESULTS :

(i) 933 Q/ha. (ii) 152.86 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

Control=919 Q/ha.

	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	Mean
N <sub>1</sub>	939	863	878	893
N <sub>2</sub>	1064	875	1004	981
N <sub>3</sub>	916	879	987	927
Mean	973	872	956	934

**Crop :- Sugarcane.****Ref. :- Mh. 60(127), 61(205), 62(198).****Site :- Agri. Res. Stn., Padegaon.****Type :- 'M'.**

Object :—To compare the effect of application of N by foliar spray and through irrigation water.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) N.A.; *Sannhemp* and Wheat in 61 and 62. (c) Nil. (ii) 'B' type. (iii) 24.7.60 ; 12.7.61 18.7.62. (iv) (a) Ploughing ; Ploughing and harrowings in 61 and 62. (b) Planting in furrows and ridges. (c) 24710 setts/ha. (d) 122 cm. between rows. (e) —. (v) Nil. ; 49.4 C.L./ha. of compost + 168 kg/ha. of P<sub>2</sub>O<sub>5</sub> and 168 kg/ha. of K<sub>2</sub>O in 61 and 62. (v) CO-419. (vii) Irrigated. (viii) Weeding and inter-culturing ; weeding and earthing up in 61 and 62. (ix) 106 cm. : N.A.; N.A. (x) 3 to 7.11.61 ; 14.11.62 ; 7 to 11.11.63 .

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 2 levels of N as A/S : N<sub>1</sub>=336.2 and N<sub>2</sub>=504.4 Kg/ha.(2) 4 methods of application : M<sub>1</sub>=Soil application, M<sub>2</sub>=2 doses (at planting and at 8 weeks by soil application of 10 to 16 weeks after by spraying), M<sub>3</sub>=4 doses (soil application)+2 doses by irrigation and M<sub>4</sub>=4 doses (soil application) and 4 doses by irrigation.**3. DESIGN :**

(j) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 12.95 m. × 9.75 m. (b) 0.36 m. × 7.32 m. (v) 130 cm. × 122 cm. (vi) yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1960 to 62. (b) No. (c) Results of combined analysis are presented under 5.—Results. (v) and (vi) N.A. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

**5. RESULTS :**

Pooled results

(i) 1628 Q/ha. (ii) 177.0 Q/ha. (based on 63 d.f. made up of pooled error). (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	Mean
N <sub>1</sub>	1606	1574	1585	1581	1612
N <sub>2</sub>	1705	1560	1624	1690	1645
Mean	1656	1567	1655	1635	1628

## Individual results

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	Sig.	N <sub>1</sub>	N <sub>2</sub>	Sig.	G.M.	S.E./plot
Year										
1960	1348	1409	1340	1466	N.S.	1367	1414	N.S.	1391	210.0
1961	1699	1657	1740	1703	N.S.	1679	1721	N.S.	1700	137.8
1962	1920	1635	1884	1737	*	1789	1799	*	1794	175.6
Pooled	1656	1567	1655	1635	N.S.	1612	1945	N.S.	1628	177.0

**Crop :- Sugarcane (*Adsali*).**

**Ref :- 60(133), 61(177), 62(173).**

**Site :- Agri. Res. Stn., Padegaon.**

**Type :- 'M'.**

Object :- To study the suitable method and time of application of P to Sugarcane.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A.; *Rabi-Jowar* in 61 and 62. (c) Nil. (ii) 'B' type. (iii) 5.8.60; 11.7.61; 27.7.62. (iv) (a) Ploughing and harrowing. (b) Planted in furrows and ridges. (c) 24710 setts/ha. (d) 122 cm. between rows. (e) 1 (v) N.A.; 168:1 Kg/ha. of K<sub>2</sub>O in 61 and 62. (vi) CO-419. (vii) Irrigated. (viii) *Interculturings and weeding; weeding and earthing up* in 61 and 62. (ix) 104 cm.; N.A.; N.A. (x) 23 to 28.11.61; 12 to 14.11.62; 26 to 29.11.63.

## 2. TREATMENTS :

Same as in Expt. Nos. 60(136), 61(40), 62(24) conducted at Agri. Res. Stn., Akluj, presented on page No. 320

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 16.59 m. × 9.75 m. (b) 13.85 m. × 7.32 m. (v) 137 cm. × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1960 to 62. (b) No. (c) Results of combined results are presented under 5.—Results. (v) Akluj, Deolaj and Lakhmapur. (vi) No. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

## 5. RESULTS :

Pooled results

(i) 1459 Q/ha. (ii) 313.9 Q/ha. (based on 72 d.f. made up of pooled error). (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
T <sub>1</sub>	1456	1463	1426	1448
T <sub>2</sub>	1447	1586	1507	1513
T	1376	1373	1497	1415
Mean	1426	1474	1477	1459

## Individual results

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Sig.	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	Sig.	G.M.	S.E./plot
year										
1960	1624	1661	1692	N.S.	1653	1627	1697	N.S.	1659	339.3
1961	1218	1339	1357	**	1295	1480	1138	N.S.	1305	323.8
1962	1436	1422	1382	N.S.	1397	1432	1411	N.S.	1413	275.1
Pooled	1426	1474	1477	N.S.	1448	1513	1415	N.S.	1459	313.9

**Crop :- Sugarcane (*Adsali*).** **Ref. :- Mh. 60(131), 61(178), 62(174), 63(223).**  
**Site :- Agri. Res. Stn., Padegaon. Type :- 'M'.**

**Object :-**To study the optimum dose of N and its level on the yield of Sugarcane.

1. **BASAL CONDITIONS :**

(i) (a) N A. (b) Nil ; *Rabi-Jowar* for other years. (c) Nil ; (ii) 'B' type. (iii) 23.7.60 ; 10.7.61 ; 27.7.62 ; 28.7.63. (iv) (a) Ploughing and harrowing. (b) Planted in furrows and ridges. (c) 24710 setts/ha. (d) 122 cm. between rows. (e) 1. (v) 168.1 Kg/ha. of  $P_2O_5$ +168.1 Kg/ha. of  $K_2O$ . (vi) CO-419. (vii) Irrigated. (viii) Interculturing and weeding ; weeding and earthing up for other years. (ix) 106 cm. ; N.A. for other years. (x) 15 to 23.11.61 ; 5 to 12.11.62 ; 20 to 26.11.63 ; 26.12.64 to 1.1.65.

2. **TREATMENTS :**

**Main-plot treatments :**

4 level of N as A/S :  $N_1=252.2$ ,  $N_2=336.2$ ,  $N_3=420.3$  and  $N_4=504.4$  Kg/ha.

**Sub-plot treatments :**

4 split dose applications :  $S_1=4$ ,  $S_2=6$ ,  $S_3=8$  and  $S_4=10$  equal doses.

3. **DESIGN :**

(i) Split-plot. (ii) (a) 4 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 16.59 m.  $\times$  9.75 m. (b) 13.85 m.  $\times$  7.32 m. (v) 137 cm.  $\times$  122 cm. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) N.A. (iii) Yield of Sugarcane, (iv) (a) 1960 to 63. (b) No. (c) Results of combined analysis are presented under 5.—Results. (v) and (vi) Nil. (vii) Both the error variances are homogeneous and Treatments  $\times$  years interactions are absent.

5. **RESULTS :**

**Pooled results**

(i) 1419 Q/ha. (ii) (a) 212.8 Q/ha. (based on 36 d.f. made up of pooled error). (b) 165.5 Q/ha. (based on 144 d.f. made up of pooled error). (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	$N_1$	$N_2$	$N_3$	$N_4$	Mean
$S_1$	1279	1396	1404	1488	1392
$S_2$	1318	1402	1433	1477	1408
$S_3$	1399	1440	1452	1448	1435
$S_4$	1412	1500	1459	1401	1443
Mean	1352	1435	1437	1454	1419

**Individual results**

Treatment	$N_1$	$N_2$	$N_3$	$N_4$	Sig.	$S_1$	$S_2$	$S_3$	$S_4$
Year									
1960	1281	1335	1516	1356	N.S.	1419	1319	1380	1370
1961	1337	1547	1469	1643	**	1396	1539	1527	1534
1960	1643	1635	1537	1658	N.S.	1547	1615	1587	1724
1963	1148	1222	1227	1157	N.S.	1206	1158	1246	1143
Pooled	1352	1435	1437	1454	N.S.	1392	1408	1435	1443

Sig.	G.M.	S.E./plot	
		(a)	(b)
N.S.	1372	233.9	147.4
*	1499	177.6	146.8
*	1618	250.1	154.2
N.S.	1188	179.7	206.2
N.S.	1419	212.8	165.5

**Crop :- Sugarcane (*Adsalu*).**

**Ref :- Mh. 60(209), 61(187), 62(188), 63(229),  
64(252), 65(204).**

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

Object :—To study the effect of A/S and G.N.C. with and without compost and artificial manure on the yield of Sugarcane

**1. BASAL CONDITIONS :**

(i) (a) Nil (b) *Rabi Jowar* and Groundnut for 61, 62, 63 and Groundnut for others. (c) Nil. (ii) 'B' type (iii) 24.1.60 ; 23.1.61 ; 20.1.62 ; 8.2.63 ; 23.1.64 ; 24.1.65. (iv) (a) Ploughing and clod crushing. (b) In ridges and furrows. (c) 24710 setts/ha. (d) 122 cm. between rows. (e) 1 for 60, 64 and 65 ; N.A. for others. (v) As per treatments. (vi) Co-419. (vii) Irrigated. (viii) Weeding and earthing up. (ix) N.A. (x) 1st week Feb , 61 ; 8.2.62 ; 12.2.63 ; 29.1.64 ; last week of Jan., 65 and 21, 23.1.66.

**2. TREATMENTS:**

**Main-plot treatments :**

4 basal dressing treatments :  $B_0$  = No basal dressing (control),  $B_1$  = 49 C.L./ha. of compost,  $B_2$  = Inorganic equivalent of 49 C.L./ha. of compost (i.e. 134.4 Kg/ha. of N+134.4Kg/ha. of  $P_2O_4$ +728.0 Kg/ha. of  $K_2O$ ) and  $B_3 = B_1 + B_2$

**Sub-plot treatments :**

(i) 6 top dressing treatments applying 336 Kg/ha. of N :  $R_0$  = No top dressing,  $R_1$  = A/S alone,  $R_2$  = G.N.C. alone,  $R_3$  = A/S+G.N.C. in 1 : 1 ratio,  $R_4$  = A/S+G.N.C. in 1 : 2 ratio and  $R_5$  = A/S+G.N.C. in 2 : 1 ratio.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 6 sub-plots/main-plot, 4 main-plots/replication. (b) N.A. (iii) 4. (iv) (a) 15.44 m. x 4.84 m. (b) 13.90 m. x 2.40 m. (v) 122 cm. x 122 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory for 60, 62 and normal for others. (ii) Nil. (iii) Yield of cane. (iv) (a) 1939—continued. (b) and (c) No. (v) and (vi) Nil. (vii) As the experiment is continued beyond 65, results of individual years are presented under 5. Results.

**5. RESULTS :**

**60(209)**

(i) 1889.7 Q/ha. (ii) (a) 421.8 Q/ha. (b) 405.2 Q/ha. (iii) Main effects of B and R are highly significant. (iv) Av. yield of cane in Q/ha.

	$R_0$	$R_1$	$R_2$	$R_3$	$R_4$	$R_5$	Mean
$B_0$	830.8	1717.0	1481.8	1646.7	2001.8	1495.8	1529.0
$B_1$	989.8	1642.3	2291.1	1858.3	1913.1	1843.5	1756.4
$B_2$	1780.6	2063.9	2245.9	2150.5	2350.3	2221.5	2135.5
$B_3$	1867.2	2041.8	2610.7	2328.8	2231.2	1748.8	2138.1
Mean	1367.1	1866.3	2157.4	1996.1	2124.1	1827.4	1889.7

C.D. for B marginal means = 275.3 Q/ha.

C.D. for R marginal means = 286.5 Q/ha.

**61(187)**

(i) 1922.8 Q/ha. (ii) (a) 258.7 Q/ha. (b) 291.5 Q/ha. (iii) Main effects of B and R are highly significant. (iv) Av. yield of cane in Q/ha.

	R <sub>0</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	Mean
B <sub>0</sub>	609.2	1718.1	1482.7	1647.8	2003.1	1849.9	1551.8
B <sub>1</sub>	960.9	2292.6	1643.4	1859.5	1914.3	1844.7	1752.6
B <sub>2</sub>	1781.8	2065.3	2247.4	2151.9	2351.8	2222.9	2136.9
B <sub>3</sub>	1868.4	2612.4	2043.1	2330.3	2232.6	2413.2	2250.0
Mean	1305.1	2172.1	1854.2	1997.4	2125.5	2082.7	1922.8

C.D. for B marginal means=168.9 Q/ha.

C.D. for R marginal means=206.1 Q/ha.

62(188)

- (i) 923.4 Q/ha. (ii) (a) 151.0 Q/ha. (b) 206.2 Q/ha. (iii) Main effects of B and R are highly significant.  
(iv) Av. yield of cane in Q/ha.

	R <sub>0</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	Mean
B <sub>0</sub>	361.9	951.2	675.9	738.0	766.9	754.3	708.1
B <sub>1</sub>	585.5	1122.2	1072.6	1005.3	1054.1	1006.7	974.4
B <sub>2</sub>	694.4	1040.1	989.7	758.0	1043.0	982.3	917.9
B <sub>3</sub>	855.7	1181.4	1101.5	1054.9	1211.8	1153.3	1093.1
Mean	624.4	1073.7	959.9	889.0	1018.9	974.2	923.4

C.D. for B marginal means=98.6 Q/ha.

C.D. for R marginal means=145.8 Q/ha.

63(229)

- (i) 811.0 Q/ha. (ii) (a) 158.9 Q/ha. (b) 155.0 Q/ha. (iii) Main effects of B and R are highly significant.  
(iv) Av. yield of cane in Q/ha.

	R <sub>0</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	Mean
B <sub>0</sub>	279.8	833.5	439.7	698.1	743.9	706.9	617.0
B <sub>1</sub>	483.4	833.5	733.6	852.0	877.2	827.6	767.9
B <sub>2</sub>	706.2	979.4	929.0	993.4	894.2	959.4	910.3
B <sub>3</sub>	883.1	978.6	1009.7	1037.1	1010.4	775.0	949.0
Mean	588.1	906.3	778.0	895.2	881.5	817.2	811.0

C.D. for B marginal means=103.7 Q/ha.

C.D. for R marginal means=109.6 Q/ha.

64(252)

- (i) 859.1 Q/ha. (ii) (a) 163.7 Q/ha. (b) 201.4 Q/ha. (iii) Main effects of B and R are highly significant.  
(iv) Av. yield of cane in Q/ha.



	R <sub>0</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	Mean
B <sub>0</sub>	298.9	888.5	652.5	759.0	790.1	704.3	682.2
B <sub>1</sub>	415.8	756.1	988.3	867.8	1057.1	739.0	804.0
B <sub>2</sub>	705.7	1085.9	1026.1	830.0	947.7	994.3	931.6
B <sub>3</sub>	992.8	1060.1	1046.8	846.3	1187.3	977.9	1018.5
Mean	603.3	947.7	928.4	825.8	995.6	853.9	859.1

C.D. for B marginal means = 106.9 Q/ha.

C.D. for R marginal means = 142.4 Q/ha.

65(204)

(i) 1115.6 Q/ha. (ii) (a) 80.3 Q/ha. (b) 132.4 Q/ha. (iii) Main effects of B and R are highly significant. Interaction B × R is significant. (iv) Av. yield of cane in Q/ha.

	R <sub>0</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	Mean
B <sub>0</sub>	426.7	1086.7	899.6	956.5	967.6	914.4	875.3
B <sub>1</sub>	648.0	1168.1	1238.4	1251.7	1225.1	1185.1	1119.4
B <sub>2</sub>	896.6	1257.6	1294.6	1360.4	1063.1	1082.3	1159.1
B <sub>3</sub>	1122.9	1275.4	1328.6	1359.7	1413.7	1352.3	1308.8
Mean	773.6	1196.9	1190.3	1232.1	1167.4	1133.5	1115.6

C.D. for B marginal means = 52.4 Q/ha.

C.D. for R marginal means = 93.6 Q/ha.

C.D. for B marginal means at the same level of R = 128.4 Q/ha.

C.D. for R marginal means at the same level of B = 187.2 Q/ha.

**Crop :- Sugarcane.**

**Ref :- Mh. 61(204), 62(197).**

**Site :- Agri. Res. Stn., Padegaon.**

**Type :- 'M'.**

Object :- To study the relative merits of Nitrophosphate fertilizer complex prepared by ODDA and PEC process.

#### 1. BASAL CONDITIONS :

(i) (a) Sugarcane—*Rabi Jowar*. (b) *Rabi Jowar*. (c) Nil. (ii) Type 'B'. (iii) 31.8.61 ; 22.8.62. (iv) (a) Ploughing, harrowing and formation of ridges. (b) On ridges. (c) 24710 setts/ha. (d) 122 cm. between rows. (e) 1. (v) Nil. (vi) Co-740. (vii) Irrigated. (viii) Weeding and earthing up. (ix) N.A. (x) 31.12.62 to 3.1.63; 20 to 25.12.63.

#### 2. TREATMENTS :

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

(1) 3 sources of N and P : S<sub>1</sub>=Single Super+A/S, S<sub>2</sub>=Nitrophos. ODDA process and S<sub>3</sub>=Nitrophos. PEC process.

(2) 3 levels of N : N<sub>1</sub>=336, N<sub>2</sub>=420 and N<sub>3</sub>=504 Kg/ha.

(3) 3 levels of P<sub>2</sub>O<sub>5</sub> : P<sub>1</sub>=56, P<sub>2</sub>=112 and P<sub>3</sub>=168 Kg/ha.

#### 3. DESIGN :

(i) 3<sup>3</sup> fact. confd. partially. (ii) (a) 3 blocks/replication ; 9 plots/block. (b) N.A. (iii) 2. (iv) (a) 21.60 m. × 3.90 m. (b) 14.40 m. × 3.00 m. (v) 360 cm. × 45 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1961 to 62. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) No. (vii) Error variances are homogeneous and Treatments  $\times$  years interactions are absent.

## 5. RESULTS :

## Pooled results

(i) 1932 Q/ha. (ii) 335.6 Q/ha. (based on 44 d.f. made up of pooled error). (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	S <sub>0</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
N <sub>0</sub>	1935	1848	1921	2042	1956	1706	1901
N <sub>1</sub>	1905	1871	2175	1994	2030	1927	1984
N <sub>2</sub>	1836	1876	2023	1900	1896	1939	1912
Mean	1892	1865	2040	1979	1961	1857	1932
S <sub>0</sub>	1932	1836	2068				
S <sub>1</sub>	1884	1961	2038				
S <sub>2</sub>	1860	1698	2014				

## Individual results

Treatment	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Sig.	S <sub>0</sub>	S <sub>1</sub>	S <sub>2</sub>	Sig.
Year								
1961	1682	1636	1872	*	1791	1746	1652	N.S.
1962	2102	2094	2208	N.S.	2166	2176	2062	N.S.
Pooled	1892	1865	2040	N.S.	1979	1961	1857	N.S.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Sig.	G.M.	S.E./plot
	1811	1702	1677	N.S.	1730	328.2
	1992	2266	2147	*	2135	342.9
	1901	1984	1912	N.S.	1932	335.6

**Crop :- Sugarcane.**

**Ref :- Mh. 61(225).**

**Site :- Agri. Res. Stn., Padegaon.**

**Type :- 'M'.**

Object :- To test the relative merits of cotton seed extraction and G.N.C. in combination with A/S.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Rabi Jowar*. (c) Nil. (ii) 'U' type. (iii) 29.7.61. (iv) (a) 2 ploughings, clod crushing, discing. (b) In ridges and furrows. (c) 24,700 setts/ha. (3 budded). (d) 122 cm. between rows. (e) 1. (v) 49.4 C.L./ha of compost. (vi) Co-740. (vii) Unirrigated. (viii) Weeding and earthing up. (ix) N.A. (x) 8.12.62 and 11.12.62.

## 2. TREATMENTS :

2 methods of applying 504 Kg/ha. of N :  $M_1=A/S$  and cotton seed extraction in the ratio of 1 : 2 and  $M_2=A/S$  and G.N.C. in the ratio of 1 : 2.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) N.A. (b) 7.2 m.  $\times$  14.0 m. (v) N.A. (vi) Yes

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1961 only (b) to (c) No. (v) to (vii) Nil.

## 5. RESULTS :

(i) 1833 Q/ha. (ii) 152.8 Q/ha. (iii) Treatment differences is significant. (iv) Av. yield of sugarcane in Q/ha.

Treatment	$M_1$	$M_2$
Av. yield	1763	1902

C.D. for treatment means=137 Q/ha.

**Crop :- Sugarcane.**

**Ref :- 63 (287).**

**Site :- Agri. Res. Stn , Padegaon.**

**Type :- 'M'.**

Object :- To study the effect of digested compost on the yield of Sugarcane.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Nilwa - Gram. (c) Nil. (ii) 'B' type. (iii) 3,3,63. (iv) (a) Ploughing, discing. (b) In ridges and furrows (c) 24700 setts/ha. (3 budded). (d) 120 cm. between rows. (e) 1. (v) 350 Kg/ha of N+175 Kg/ha. of  $K_2O$  (vi) Co 740. (vii) Irrigated. (viii) Weeding and earthing up. (ix) N.A. (x) 30, 31.1.64.

## 2. TREATMENTS

6 manuring treatments :  $M_1$ =Control,  $M_2$ =15000 Kg/ha. of compost,  $M_3=M_4$  and 175 Kg/ha. of  $P_2O_5$  as S/P applied separately.,  $M_4=(M_2+175$  Kg/ha. of  $P_2O_5$  as S/P) both mixed and kept for one month before application,  $M_5=M_2$  through digested compost and added with 80 Kg/ha. of  $P_2O_5$  as S/P and  $M_6=175$  Kg/ha. of  $P_2O_5$  as S/P.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 10.80 m.  $\times$  9.60 m. (b) 8.40 m.  $\times$  7.20 m. (v) 120 cm.  $\times$  120 cm. (vi) Yes

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane (iv) (a) 1963 only. (b) No. (c) Nil. (v) to (vii) Nil.

## 5. RESULTS :

(i) 855 Q/ha. (ii) 63.4 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$	$M_6$
Av. yield	887	868	906	858	815	896

**Crop :- Sugarcane (Adsal).**

**Ref. :- 63(226), 64(179), 65(206).**

**Site :- Agri Res. Stn., Padegaon.**

**Type :- 'M'.**

Object :- To study the possibility of reducing N doses by intercropping and burying legume in *situ*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil for 63 and 64 ; 44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$  for 65. (ii) 'U' type. (iii) 19.8.63 ; 8.8.64 ; 19.7.65. (iv) (a) Ploughing. (b) In ridges and furrows. (c) 24710 setts/ha. (d) 122 cm. (e) 1. (v) 168.1 Kg/ha. of  $P_2O_5$ +168.1 Kg/ha. of  $K_2O$ . (vi) CO-740. (vii) Irrigated. (viii) Weeding and earthing up. (ix) N.A. (x) 6.2.65 ; 21.12.65 ; 13.1.67.

## 2. TREATMENTS :

## Main-plot treatments :

6 levels of N as A/S :  $N_1=112.1$ ,  $N_2=168.1$ ,  $N_3=224.2$ ,  $N_4=280.2$ ,  $N_5=336.2$  and  $N_6=392.3$  Kg/ha.

## Sub-plot treatments :

3 levels of G.M. :  $G_0$ =No G.M.,  $G_1$ =*Sannhemp* and  $G_2$ =*Dhaincha* as G.M.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 6 main plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 7.32 m.  $\times$  9.14 m. (b) 4.88 m.  $\times$  6.70 m. (v) 122 cm.  $\times$  122 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1963-65. (b) and (c) No. (v) N.A. (vi) Nil. (vii) Sub-plot error variances are heterogeneous and hence results of individual years are presented under 5. - Results.

## 5. RESULTS :

## 63(226)

(i) 1865 Q/ha. (ii) (a) 408.7 Q/ha. (b) 291.4 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	$N_1$	$N_2$	$N_3$	$N_4$	$N_5$	$N_6$	Mean
$G_0$	1701	1986	1797	2078	1892	1971	1904
$G_1$	1871	1864	1735	1587	1878	1979	1819
$G_2$	1569	1885	1722	1939	2166	1957	1873
Mean	1714	1912	1751	1868	1979	1969	1865

## 64 (179)

(i) 2001 Q/ha. (ii) (a) 223.9 Q/ha. (b) 168.9 Q/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of cane in Q/ha.

	$N_1$	$N_2$	$N_3$	$N_4$	$N_5$	$N_6$	Mean
$G_0$	1420	1839	2007	2199	2078	2217	1960
$G_1$	1835	1862	2022	2263	2005	2286	2046
$G_2$	1385	1977	2069	2310	2071	2168	1997
Mean	1547	1893	2033	2257	2051	2224	2001

C.D. for N marginal means=331.7 Q/ha.

## 65(206)

(i) 1676 Q/ha. (ii) (a) 499.9 Q/ha. (b) 207.1 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	N <sub>5</sub>	N <sub>6</sub>	Mean
G <sub>0</sub>	1138	1868	1681	1782	1605	1682	1626
G <sub>1</sub>	1249	1625	1772	1662	1806	2129	1707
G <sub>2</sub>	1406	1599	1835	1723	1782	1822	1694
Mean	1264	1697	1763	1722	1731	1878	1676

**Crop :- Sugarcane (*Alsali*).**

**Ref :- 64(180), 65(207).**

**Site :- Agri. Res. Stn., Padegaon.**

**Type :- 'M'.**

Object :- To study the effect of varying doses of N<sub>1</sub> on the fertility status of soil and yield performance.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Nilwa and gram. (c) Nil. (ii) 'F' type. (iii) 15.7.64 ; 23.7.65. (iv) (a) Ploughing and harrowing ; ploughing and clod crushing. (b) In ridges and furrows. (c) 24710 setts/ha. (d) 122 cm. between rows. (e) one. (v) 40 C. L./ha. F.Y.M.+168 Kg/ha. of P<sub>2</sub>O<sub>5</sub>+168 Kg/ha. of K<sub>2</sub>O. (vi) CO-740. (vii) Irrigated. (viii) Weeding, Earthing up. (ix) N.A. (x) 22 to 25.11.65 ; 11, 13.12.66.

2. TREATMENTS :

6 manurial treatments: T<sub>1</sub>=Control. (no manure), T<sub>2</sub>=168 Kg/ha. of N as A/S, T<sub>3</sub>=336 Kg/ha. of N as A/S, T<sub>4</sub>=504 Kg/ha. of N as A/S, T<sub>5</sub>=673 Kg/ha. of N as A/S and T<sub>6</sub>=504 Kg/ha. of N as A/S+G.N.C. in the ratio 1 : 2.

T<sub>6</sub> has been tried in 65 only.

3. DESIGN :

(i) R.B.D. (ii) (a) 5 : 6. (b) N.A. (iii) 4. (iv) (a) 15'30 m. × 9'60 m. (b) 12'80 m. × 7'20 m. (v) 125 cm. - 120 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1964-66 (Treatments modified in 1965. (b) No. (c) Nil. (v) to (vii) Nil

5. RESULTS :

**64(180)**

(i) 1837 Q/ha. (ii) 154'6 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of cane in Q/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>
Av. yield	1002	1717	2055	2058	2052

C.D. = 238.2 Q/ha.

**65(207)**

(i) 1954 Q/ha. (ii) 212.8 Q/ha. (iii) Treatment differences are significant. (iv) Av. yield of cane in Q/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>
Av. yield	1281	1947	2067	2193	2169	2069

C.D. = 320.6 Q/ha.

**Crop :- Sugarcane (Adsali).**

**Ref :- Mh. 62(26), 63(36), 64(31).**

**Site :- Agri. Res. Stn., Akulj.**

**Type :- 'CM'.**

**Object :-**To see the effect of seed material on Sugarcane.

**1. BASAL CONDITIONS :**

(i) *Jowar*-Sugarcane. (b) *Jowar*. (c) Nil. (ii) Clay. (iii) 28.9.62 ; 5.9.63 ; 2.9.64. (iv) (a) 2 ploughings, harrowing, loading and ridging. (b) Wet method of planting. (c) 24710 Kg/ha. (d) 122 cm. between rows. (e) —. (v) 49.42 CL/ha. of compost+112.1 Kg/ha. of  $P_2O_5$ +112.1 Kg/ha. of  $K_2O$ . (vi) CO-419. (vii) Irrigated. (viii) 2 weedings, slight earthing up. (ix) 44 cm. ; 76 cm. ; 41 cm. (x) 13 to 20.1.64 ; 16 to 20.1.65 ; 4.1. 66 to 13.1.66.

**2. TREATMENTS :**

4 types of seed materials :  $T_1$ =Substation old seed (unselected),  $T_2$ =Substation old seed (selected),  $T_3$ =Seed brought from Agri. Res. Stn., Padegaon (selected) and  $T_4$ =Seed from one of the cultivations chosen for trial (selected).

**3. DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 15.24 m.  $\times$  7.32 m. (b) 12.19 m.  $\times$  4.88 m. (v) 152 cm.  $\times$  122 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Slight attack of stem borer ; Nil ; Nil. (iii) Yield of cane. (iv) (a) 1962-64. (b) No. (c) Results of combined analysis are presented under 5.—Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatment  $\times$  years interaction is absent.

**5. RESULTS :**

Pooled results

(i) 3279 Q/ha. (ii) 310.8 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$
Av. yield	3224	3290	3387	3215

Individual results

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	Sig.	G.M.	S.E./plot
Year							
1962	2808	2824	2915	2714	N.S.	2815	319.6
1963	3175	3270	3369	3195	N.S.	3252	225.4
1964	3689	3776	3878	3737	N.S.	3770	370.0
Pooled	3224	3290	3387	3215	N.S.	3279	310.8

**Crop :- Sugarcane.**

**Ref :- Mh. 60(166), 61(81), 62(68).**

**Site :- Sugarcane Res. Stn., Sub-station ,  
Kolhapur.**

**Type :- 'C'.**

**Object :-**To study the suitable time of planting and method under flood conditions.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Fallow ; Sugarcane for 61 and 62. (c) N.A. (ii) Alluvial black soil. (iii) As per treatments. (iv) (a) Deep ploughing. (b) As per treatments. (c) N.A. (d) 99 cm. between rows. (e) —. (v) 302 Kg/ha. of N as A/S and cake in 1 : 2 ratio. (vi) CO-419. (vii) Irrigated. (viii) Weeding and interculturing. (ix) 174 cm. ; 133 cm. ; 122 cm. (x) 21 to 28.12.61 ; N.A. ; 25 to 29.1.64.

## 2. TREATMENTS :

## Main-plot treatments :

6 times of planting :  $T_1$ =2nd week of Aug.,  $T_2$ =2nd week of Sep.,  $T_3$ =2nd week of Oct.,  $T_4$ =2nd week of Nov.,  $T_5$ =2nd week of Dec. and  $T_6$ =2nd week of Jan.

## Sub-plot treatments :

2 methods of planting :  $M_1$ =Rayungan and  $M_2$ =setts.

## 3. DESIGN :

(i) Split plot. (ii) (a) 6 main-plots/replication ; 2 sub-plots/main plot. (b) N.A. (iii) 5. (iv) (a) 13.41 m.  $\times$  9.75 m. (b) 10.36 m.  $\times$  7.32 m. (v) 152 cm.  $\times$  122 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1960 to 62. (b) and (c) No. (v) and (vi) Nil. (vii) Sub-plot error variances are heterogeneous, hence results of individual years are presented under 5.— Results.

## 5. RESULTS :

## 60(166)

(i) 834 Q/ha. (ii) (a) 168.2 Q/ha. (b) 163.9 Q/ha. (iii) Main effect of T is highly significant. (iv) Av. yield of cane in Q/ha.

	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	Mean
$M_1$	992	1156	923	730	651	502	826
$M_2$	955	1109	688	849	809	638	841
Mean	974	1132	806	790	730	570	834

C.D. for T marginal means = 156.9 Q/ha.

## 61(81)

(i) 742 Q/ha. (ii) (a) 133.5 Q/ha. (b) 95.9 Q/ha. (iii) Main effect of T is highly significant. (iv) Av. yield of cane in Q/ha.

	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	Mean
$M_1$	871	758	865	783	620	628	754
$M_2$	800	826	778	829	571	568	729
Mean	836	792	822	806	596	598	742

C.D. for T marginal means = 124.7 Q/ha.

## 62(68)

(i) 878 Q/ha. (ii) (a) 181.2 Q/ha. (b) 144.0 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	Mean
$M_1$	1061	870	932	867	824	918	912
$M_2$	983	928	866	754	784	749	844
Mean	1022	899	899	810	804	834	878

**Crop :- Sugarcane.****Ref :- Mh. 64(237), 65(201).****Site :- Reg. Sugarcane. Res. Stn., Kolhapur.****Type :- 'C'.**

Object :—To study the possibility of growing Paddy or Dhaincha prior to early planted Cane crops.

**1. BASAL CONDITIONS :**

(i) (a) Sugarcane-Paddy-Sugarcane. (b) Paddy (c) N.A. (ii) Alluvial clay ; Medium black. (iii) 27.9.64 ; 25.9.65. (iv) (a) Ploughing. (b) As per treatments. (c) 30888 setts/ha. (d) 100 cm. between rows. (e) —. (v) 48 C.L./ha. of F.Y.M. (vi) Co-740. (vii) Irrigated. (viii) Interculturing ; weeding. (ix) 116.7 cm. (x) 28.12.65 to 4.1.66 ; 16 to 22.2.67.

**2. TREATMENTS :**

8 cultural practices and previous crops of Sugarcane plantation: P<sub>1</sub>=Paddy—Sugarcane (Rayungan method), P<sub>2</sub>=Paddy—Sugarcane (Sett method), P<sub>3</sub>=Dhaincha—Sugarcane (Rayungan method), P<sub>4</sub>=Dhaincha—Sugarcane (Sett method), P<sub>5</sub>=Paddy drilled on flat bed and cane planted after its harvest (Rayungan method), P<sub>6</sub>=Paddy drilled on flat bed and cane planted after its harvest (Sett method) P<sub>7</sub>=Control (Rayungan method) and P<sub>8</sub>=Control (Sett method).

**3. DESIGN :**

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 12.90 m. × 9.90 m. (b) 10.10 m. × 7.90 m. (v) 100 cm. × 100 cm. (vi) Yes.

**4. GENERAL :**

(i) Medium ; normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1964—66. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Since the expt. is continued beyond 65, the results of individual years are presented under 5. Results.

**5. RESULTS :**

64(237)

(i) 1289 Q/ha. (ii) 126.0 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of cane in Q/ha.

Treatment	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	P <sub>5</sub>	P <sub>6</sub>	P <sub>7</sub>	P <sub>8</sub>
Av. yield	1429	1308	1337	1337	1015	1053	1394	1442

C.D.=185.3 Q/ha.

65(201)

(i) 1240 Q/ha. (ii) 130.9 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of cane in Q/ha.

Treatment	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	P <sub>5</sub>	P <sub>6</sub>	P <sub>7</sub>	P <sub>8</sub>
Av. yield	1198	1203	1443	1334	937	1015	1421	1373

C.D.=192.5 Q/ha.

**Crop :- Sugarcane. (Adsali).****Ref :- Mh. 60(134).****Site :- Agri. Res. Stn., Padegaon.****Type :- 'C'.**

Object :—To compare the effect of growing different leguminous crops as rotational crops with Sugarcane.

**1. BASAL CONDITIONS :**

(i) (a) and (b) As per treatments. (c) Nil. (ii) 'B' type. (iii) 19.9.60. (iv) (a) Ploughing and harrowing. (b) Planted in furrows (c) 24710 setts/ha. (d) 122 cm. between rows. (e) N.A. (v) Nil. (vi) Co-419. (vii) Irrigated. (viii) Weeding. (ix) 91.0 cm. (x) 9, 10.1.62.



## 2. TREATMENTS :

8 previous crops : T<sub>1</sub>=Jowar, T<sub>2</sub>=Lucerne and Jowar (mixed), T<sub>3</sub>=Jowar+lucerne (inter-crop), T<sub>4</sub>=Wheat  
T<sub>5</sub>=Wheat and lucerne, T<sub>6</sub>=Lucerne alone flat-beds, T<sub>7</sub>=Buseen alone flat-beds and  
T<sub>8</sub>=Gram alone.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 2. (iv) (a) 10.97 m. × 12.19 m. (b) 8.53 m. × 9.75 m. (v) 122 cm. × 122 cm.  
(vi) Yes

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1959-60. (b) No. (c) Nil. (v) to (vii) Nil.

## 5. RESULTS :

(i) 1167 Q/ha. (ii) 175.2 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in  
Q/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. yield	1075	1274	1128	1125	1202	964	1367	1198

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**Crop :- Sugarcane. (Adasali).**

**Ref :- Mh. 60(126), 61(176), 62(172).**

**Site :- Agri. Res. Stn., Padegaon.**

**Type :- 'C'.**

**Object :-** To study the effect of planting setts with varying eye buds planted horizontally, vertically etc. on  
the yield of Sugarcane.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Nil; *Rabi Jowar*; *Rabi Jowar*. (c) Nil. (ii) 'B' type. (iii) 2.8.60; 3.8.61; 4.8.62. (iv) (a)  
Ploughing and harrowing. (b) and (c) As per treatments. (d) 122 cm. between rows. (e) 1. (v) Nil.  
(vi) Co-419. (vii) Irrigated. (viii) Weeding and interculturing; weeding and earthing up in 61 and 62.  
(ix) 104 cm.; N.A.; N.A. (x) 21 to 29.12.61; 10 to 15.12.62; 4 to 9.12.63.

## 2. TREATMENTS :

**Main-plot treatments :**

2 methods of sowing : T<sub>1</sub>=Shallow furrow and T<sub>2</sub>=Deep furrow.

**Sub-plot treatments :**

6 cultural practices : S<sub>1</sub>=One eye budded setts planted horizontally with 19768 setts/ha., S<sub>2</sub>=One eye  
budded setts planted vertically with 19768 setts/ha., S<sub>3</sub>=Two eye budded setts  
horizontally, S<sub>4</sub>=Two eye budded setts slight slanting, S<sub>5</sub>=Three eye budded setts  
slightly slanting with 19768 setts/ha. and S<sub>6</sub>=Three eye budded setts planted vertically  
with 34710 setts/ha.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots (repetition); 6 sub-plots/main plot. (b) N.A. (iii) 3. (iv) (a) 9.75 m. ×  
12.80 m. (b) 7.32 m. × 10.36 m. (v) 122 cm. × 122 cm. (vi) Yes

## 4. GENERAL :

(i) Satisfactory; normal; satisfactory. (ii) No. (iii) Yield of cane. (iv) (a) 1960-62. (b) No.  
(c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Both error variances  
are homogeneous and Treatments × years interaction is absent.

## 5. RESULTS :

**Pooled results.**

(i) 1801 Q/ha. (ii) (a) 357.9 Q/ha (based on 6 d.f. made up of pooled error). (b) 291.1 Q/ha. (based on  
60 d.f. made up of pooled error). (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	Mean
T <sub>1</sub>	1627	1961	1880	1836	2030	1896	1872
T <sub>2</sub>	1644	1743	1710	1921	1671	1687	1730
Mean	1636	1852	1795	1879	1851	1791	1801

## Individual Results.

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	Sig.	T <sub>1</sub>	T <sub>2</sub>	Sig.
Year										
1960	1774	1648	1735	1828	1878	1754	N.S.	1872	1667	N.S.
1961	1579	1841	1991	1991	1990	1859	*	1951	1799	*
1962	1555	2068	1660	1818	1685	1761	*	1793	1723	N.S.
Pooled	1636	1852	1795	1879	1851	1791	N.S.	1872	1730	N.S.

G.M.	S.E./plot	
	(a)	(b)
1770	537.9	286.6
1875	280.0	238.3
1758	128.5	339.0
1801	357.9	291.1

**Crop :- Sugarcane (*Adsali*).**

**Ref :- Mh. 60(206).**

**Site :- Agri. Res. Stn., Padegaon.**

**Type :- 'C'.**

Object :- To study the effect of plant population on the yield of Sugarcane.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Type 'A'. (iii) 29.9.60. (iv) (a) Ploughing and harrowing. (b) Planting in furrows. (c) and (d) As per treatments. (e) N.A. (v) 505 Kg/ha. of N as (A/S+cake) in 1 : 2 ratio, 112 Kg./ha. of P<sub>2</sub>O<sub>5</sub>, as Super and 112 Kg/ha. of K<sub>2</sub>O as Pot. Sulph. and 24.7 C.L./ha. of F.Y.M. (vi) CO-419. (vii) Irrigated. (viii) Weeding. (ix) 91.0 cm. (x) 12.1.62.

## 2. TREATMENTS :

All the 12 combinations of (1), (2) and (3)

- (1) 3 plant population : A<sub>1</sub>=Unrestricted, A<sub>2</sub>=50,000 plants and A<sub>3</sub>=70,000 plants.
- (2) 2 spacing between rows : B<sub>1</sub>=122 cm. and B<sub>2</sub>=152 cm.
- (3) 2 seed rates maintained : C<sub>1</sub>=24,700 setts/ha. and C<sub>2</sub>=29,640 setts/ha.

## 3. DESIGN :

(i) 3 × 2<sup>2</sup> confd. (ABC and BC confd.). (ii) (a) 6 plots/block, 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) (B<sub>1</sub>) 8.50 m. × 18.40 m. (B<sub>2</sub>) 9.10 m. × 18.40 m. (b) 6.10 m. × 16.60 m. (v) and (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1958-60. (b) and (c) No. (v) to (vii) Nil.

## 5. RESULTS :

(i) 1442 Q/ha. (ii) 164.2 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	B <sub>1</sub>	B <sub>2</sub>	C <sub>1</sub>	C <sub>2</sub>	Mean
A <sub>1</sub>	1528	1362	1415	1475	1445
A <sub>2</sub>	1442	1442	1444	1440	1442
A <sub>3</sub>	1465	1414	1396	1483	1440
Mean	1478	1406	1418	1466	1442
C <sub>1</sub>	1487	1349			
C <sub>2</sub>	1470	1463			

**Crop :- Sugarcane (*Adali*).**

**Ref. :- Mh. 62(224), 63(286), 64(248).**

**Site :- Agri. Res. Sta., Padegaon.**

**Type :- 'C'.**

Object :- To study the effect of molasses solution on Sugarcane.

#### 1. BASAL CONDITIONS :

(i) (a) *Jowar*-Sugarcane. (b) *Jowar*. (c) 44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) 'U' type. (iii) 28.9.62; 14.9.63; 11.8.64. (iv) (a) Ploughing and discing. (b) Ridges and furrows. (c) 24710 setts/ha. (d) 122 cm. (e) 1. (v) 420.3 Kg/ha. of N+168.1 Kg/ha. of P<sub>2</sub>O<sub>5</sub>+168.1 Kg/ha. of K<sub>2</sub>O. (vi) CO-740. (vii) Irrigated. (viii) Weeding and earthing up. (ix) N.A. (x) 11.1.64 and 14.1.64; 20.2.65; 26.12.65.

#### 2. TREATMENTS :

5 soaking treatments : T<sub>1</sub>=Control-soaked setts in plain water and irrigated as usual with plain water and sprayed with water from Feb.-Aug. T<sub>2</sub>=Soaking the setts over night in 30% solution of molasses neutralised with lime. T<sub>3</sub>=Soaking the setts over night in water and crop injected with water flowing over the channel filled with molasses, which was gently stirred while water passed over it. T<sub>4</sub>=Soaking setts over night in water and crop foliage sprayed with 20% molasses solution in water from Feb.-Aug. and irrigated with plain water and T<sub>5</sub>=Cane setts planted after soaking in 35% solution of molasses neutralised with lime. Irrigated with the water flowing over the pit filled with molasses, molasses being stirred while flowed over it. Crop sprayed with molasses solution 20% in water from Feb.-Aug.

#### 3. DESIGN :

(i) R.B.D. (ii) (i) 5. (b) N.A. (iii) 4. (iv) (a) 27.70 m. × 7.20 m. (b) 22.00 m. × 4.80 m. (v) 285 cm. × 120 cm. (vi) Yes.

#### 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1962-54. (b) No. (c) Results of combined analysis are presented under 5.—Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

#### 5. RESULTS :

Pooled results

(i) 1634 Q/ha. (ii) 258.3 Q/ha. (based on 36 d.f. made up of pooled error). (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>
Av. yield	1670	1521	1675	1648	1654

## Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	Sig.	G.M.	S.E./plot
Year 1962	1768	1564	1832	1670	1395	*	1645	237.4
1963	1674	1649	1624	1682	2005	N.S.	1727	269.9
1964	1568	1351	1568	1591	1562	N.S.	1528	266.4
Pooled	1670	1521	1675	1648	1654	N.S.	1634	258.3

**Crop :- Sugarcane (*Adsalii*).**

**Ref :- Mh. 63(288), 64(251), 65(205).**

**Site :- Agri. Res. Stn., Padegaon.**

**Type :- 'C'.**

Object :- To study the effect of different dates of planting and harvesting on the quality of Sugarcane and its ratoon.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Rabi-Jowar*. (c) Nil. (ii) 'U' type. (iii) As per treatments. (iv) (a) Nil. (b) In ridges and furrows (c) 24,700 setts/ha. (d) 122 cm. between rows. (e) 1. (v) 48 C.L./ha. of compost + 504.3 Kg/ha. of N + 168.1 Kg/ha of K. (vi) CO-740. (vii) Irrigated. (viii) Weeding and earthing up. (ix) N.A. (x) As per treatments.

**2. TREATMENTS :**

**Main-plot treatments :**

6 dates of planting : P<sub>1</sub>=On the on set of monsoon, P<sub>2</sub>=During 32 M.W., P<sub>3</sub>=During 34 M.W., P<sub>4</sub>=During 36 M.W., P<sub>5</sub>=During 38 M.W. and P<sub>6</sub>=During 40 M.W.

**Sub-plot treatments :**

6 dates of harvesting : H<sub>1</sub>=During 42 M.W., H<sub>2</sub>=During 45 M.W., H<sub>3</sub>=During 48 M.W., H<sub>4</sub>=During 51 M.W., H<sub>5</sub>=During 2 M.W. and H<sub>6</sub>=During 5 M.W.

M.W.=Meteorological week.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 6 sub-plots/main-plot : 6 main-plots/replication. (b) N.A. (iii) 4. (iv) (a) 10.02 m. × 4.92 m. for 63, 9.20 m. × 6.10 m. for 64 and 65. (b) 9.80 m. × 3.70 m. for 63, 6.70 m. × 3.60 m. for 64 and 65. (v) 61 cm. × 61 cm. for 63, 125 cm. × 125 cm. for 64 and 65. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1963-66. (b) and (c) No. (v) and (vi) Nil. (vii) As the experiment is continued beyond 65, the results of individual years are presented under 5. results.

**5. RESULTS :**

**63(288)**

(i) 500 Q/ha. (ii) (a) 95.0 Q/ha. (b) 58.0 Q/ha. (iii) Main effect of P alone is significant. (v) Av. yield of cane in Q/ha.

	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	H <sub>4</sub>	H <sub>5</sub>	H <sub>6</sub>	Mean
P <sub>1</sub>	503	563	551	468	490	494	511
P <sub>2</sub>	534	577	555	589	573	540	561
P <sub>3</sub>	538	559	551	527	500	527	534
P <sub>4</sub>	469	489	471	515	473	456	479
P <sub>5</sub>	447	438	457	477	432	506	460
P <sub>6</sub>	437	486	461	461	435	456	453
Mean	488	515	508	506	484	497	500

C.D. for P marginal means = 58 Q/ha.

64(251)

(i) 1745 Q/ha. (ii) (a) 430.0 Q/ha. (b) 820.0 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	H <sub>4</sub>	H <sub>5</sub>	H <sub>6</sub>	Mean
P <sub>1</sub>	1976	2599	2041	1795	1852	1733	1999
P <sub>2</sub>	1398	2006	2020	1547	1601	1754	1721
P <sub>3</sub>	1563	2257	1577	1708	1449	1552	1684
P <sub>4</sub>	1298	2385	1825	1682	1918	1401	1752
P <sub>5</sub>	1642	2148	1857	1818	1669	1316	1742
P <sub>6</sub>	1534	1793	1384	1450	1627	1631	1570
Mean	1568	2198	1784	1667	1686	1564	1745

65(205)

(i) 1936 Q/ha. (ii) (a) 283.4 Q/ha. (b) 163.5 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	H <sub>4</sub>	H <sub>5</sub>	H <sub>6</sub>	Mean
P <sub>1</sub>	2028	1882	2211	2048	2039	2065	2045
P <sub>2</sub>	1974	2063	2006	1987	2198	2061	2048
P <sub>3</sub>	1821	1892	2030	2117	1971	1932	1961
P <sub>4</sub>	1942	1791	1798	1847	1837	1907	1854
P <sub>5</sub>	1908	1977	1855	1936	1974	1834	1914
P <sub>6</sub>	1648	1846	1762	1812	1791	1906	1794
Mean	1887	1909	1943	1958	1968	1951	1936

**Crop :- Sugarcane (Adsali).**

**Site :- Agri. Res. Stn, Padegaon.**

**Ref :- Mh. 65(208).**

**Type :- 'C'.**

Object :- To study the effect of subsoiling on the growth of Sugarcane.

### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Rabi-Jowar*. (c) Nil. (ii) 'B' type. (iii) 25.7.65. (iv) (a) Ploughing. (b) In ridges and furrows. (c) 24710 setts/ha. (d) 122 cm. between rows. (e) 1. (v) 504 Kg./ha. of N+168 Kg./ha. of P<sub>2</sub>O<sub>5</sub>+168 Kg./ha. of K<sub>2</sub>O (vi) CO-740. (vii) Irrigated. (viii) Weeding (ix) N.A. (x) 24.1.67.

### 2. TREATMENTS :

T<sub>1</sub>=Normal ploughing (control), T<sub>2</sub>=Subsoiling by subsoiler (bullock drawn) after ploughing 46 cm. deep, T<sub>3</sub>=By subsoiler before ploughing 46 cm. deep, T<sub>4</sub>=By subsoiler after ploughing 61 cm. deep, T<sub>5</sub>=By subsoiler before ploughing 61 cm. deep and T<sub>6</sub>=Subsoiling in furrows by subsoiler (46 cm deep) for the both of the furrow.

### 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 16.60 m. × 4.80 m. (b) 14.20 m. × 2.40 m. (v) 120 cm × 120 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1965-67. (b) No. (c) Nil. (v) to (vii) Nil.

## 5. RESULTS :

(i) 812 Q/ha. (ii) 70.5 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>
Av. yield	822	799	783	874	760	832

**Crop :- Sugarcane.**

**Ref :- 64(256), 65(224).**

**Site :- Agri. Res. Stn., Lakhmapur.**

**Type :- 'CV'.**

**Object :-** To find the optimum period of harvesting of Sugarcane varieties to get maximum yield.

## 1. BASAL CONDITIONS :

(i) (a) N.I. (b) *Bajri*. (c) Nil. (ii) 'U' type. (iii) 12.8.64; 13.9.65. (iv) Ploughing, formation of ridges and furrows. (b) End to end dibbling; end to end planting. (c) 24700 setts/ha. (d) 122 cm. between rows. (e) N.A. (v) 49.4 C.L./ha. of F.Y.M. + 112 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super + 112 Kg/ha. of K<sub>2</sub>O as Murate of Potash, 504 Kg/ha. of N as top dressing from A/S : Urea :: 1 : 2. (vi) As per treatments. (vii) Irrigated. (viii) Weeding, earthing up. (ix) N.A. (x) As per treatments.

## 2. TREATMENTS :

**Main-plot treatments :**

6 varieties of Sugarcane : V<sub>1</sub>=CO-419, V<sub>2</sub>=CO-678, V<sub>3</sub>=CO-740, V<sub>4</sub>=CO-775, V<sub>5</sub>=CO-798 and V<sub>6</sub>=CO-853.

**Sub-plot treatments :**

4 dates of harvest : H<sub>1</sub>=Nov., H<sub>2</sub>=Dec., H<sub>3</sub>=Jan. and H<sub>4</sub>=Feb.

(Harvesting done during the I-week of months)

## 3. DESIGN :

(i) Split plot. (ii) (a) 6 main plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 14.62 m. × 8.52 m. (b) 12.20 m. × 6.10 m. (v) 122 cm × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1964-66, (b) No. (c) Nil. (v) and (vi) Nil. (vii) As experiment continued beyond 65, the results of individual years are presented under 5. -Results.

## 5. RESULTS :

64(256)

(i) 405 Q/ha. (ii) (a) 140.6 Q/ha. (b) 72.4 Q/ha. (iii) Main effect of V is significant only. (iv) Av. yield of cane in Q/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	Mean
H <sub>1</sub>	404	594	330	224	465	382	400
H <sub>2</sub>	294	629	521	241	420	426	422
H <sub>3</sub>	293	596	408	246	486	449	413
H <sub>4</sub>	228	668	391	263	471	300	387
Mean	305	622	413	243	460	389	405

C.D. for V marginal means=127.9 Q/ha.

65(224)

(i) 612 Q/ha. (ii) (a) 183.2 Q/ha. (b) 87.6 Q/ha. (iii) Main effect of V is significant only. (iv) Av. yield of cane in Q/ha.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	Mean
H <sub>1</sub>	644	880	589	270	661	475	587
H <sub>2</sub>	622	710	602	331	728	508	584
H <sub>3</sub>	671	890	686	385	658	599	648
H <sub>4</sub>	625	844	659	365	681	593	628
Mean	641	831	634	338	682	544	612

C.D. for V marginal means = 166.6 Q/ha.

**Crop :- Sugarcane (*Adsali*).**

**Ref. :- Mh. 63(37), 64(32), 65(86).**

**Site :- Agri. Res. Stn., Akluj.**

**Type :- 'CM'.**

Object: To find out the optimum 'N' level upto which the dose can be reduced by taking advantage of G.M. by a leguminous crop grown as intercrop and buried in *Situ* and also to study the effect of earthing-up on the response to 'N' dose.

#### 1. BASAL CONDITIONS:

(i) (i) *Jowar*-Sugarcane. (b) *Jowar*. (c) Nil. (ii) Clay. (iii) 13.8.63; 9.8.64; 28.7.65. (iv) (a) 2 ploughings and 1 harrowing. (b) In ridges and furrows. (c) 24710 sets/ha. (d) 122 cm. between rows. (e) 1. (v) 49.4 C.L./ha. of compost + 112.1 Kg/ha. of P<sub>2</sub>O<sub>5</sub> + 112.1 Kg/ha. of K<sub>2</sub>O. (vi) CO-740. (vii) Irrigated. (viii) 2 Weedings. (ix) 76 cm; 41 cm.; 41 cm. (x) 12.12.64 to 15.1.65; 5.12.65 to 2.1.66; 23.12.66 to 13.1.67.

#### 2. TREATMENTS:

##### Main-plot treatments:

All combinations of (1) and (2)

(1) 3 levels of N as A/S: N<sub>1</sub>=280.2, N<sub>2</sub>=336.2 and N<sub>3</sub>=392.2 Kg/ha.

N applied in 4 equal doses.

(2) 3 inter-crops: T<sub>0</sub>=No inter crop, T<sub>1</sub>=*Dhaincha* and T<sub>2</sub>=*Sannhemp*.

##### Sub-plot treatments:

2 levels of earthing-up: E<sub>0</sub>=No earthing up and E<sub>1</sub>=Earthing-up.

#### 3. DESIGN:

(i) Split-plot. (ii) (a) 9 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 14.63 m. × 8.53 m. (b) 12.19 m × 6.10 m. (v) 122 cm. × 122 cm. (vi) Yes.

#### 4. GENERAL:

(i) Satisfactory. (ii) Stem borer was noticed and affected pests removed. (iii) Yield of cane. (iv) (a) 1963-65. (b) No. (c) Results of the combined analysis are presented under 5.—Results. (v) Deolali. (vi) Nil. (vii) Both the error variances are homogeneous and Treatments × years interactions are absent.

#### 5. RESULTS:

##### Pooled results

(i) 1935 Q/ha. (ii) (a) 171.9 Q/ha. (based on 72 d.f. made up of pooled error). (b) 163.7 Q/ha. (based on 81 d.f. made up of pooled error). (iii) Main effect of N is highly significant. (iv) Av. yield of cane in Q/ha.

	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	E <sub>0</sub>	E <sub>1</sub>	Mean
T <sub>0</sub>	1851	1911	1946	1893	1912	1903
T <sub>1</sub>	1893	1988	1972	1925	1977	1951
T <sub>2</sub>	1907	1934	2013	1935	1968	1951
Mean	1884	1944	1978	1918	1952	1935
E <sub>0</sub>	1871	1916	1966			
E <sub>1</sub>	1896	1973	1988			

C D for N marginal means = 57.1 Q/ha.

## Individual results

Treatment	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	Sig.	E <sub>0</sub>	E <sub>1</sub>	Sig.	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	Sig.	G.M.	S.E./plot
Year													(a) (b)
1963	1757	1753	1815	*	1728	1822	N.S.	1762	1803	1760	N.S.	1775	177.0 176.9
1964	1801	1952	1914	*	1852	1926	N.S.	1844	1873	1950	N.S.	1889	177.0 165.5
1965	2093	2128	2202	*	2173	2109	N.S.	2102	2177	2144	N.S.	2141	161.2 147.3
Pooled	1887	1944	1978	**	1918	1952	N.S.	1903	1951	1951	N.S.	1935	171.9 163.7

Crop :- Sugarcane (*Adsali*).

Ref. :- 63(61), 64(59), 65(59).

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

Type :- 'CM'.

Object :- To find out the optimum 'N' level upto which the dose could be reduced by taking advantage of G.M. by legume grown as inter crop and buried in *Situ* and also to study the effect of earthing up on the response to N dose.

## 1. BASAL CONDITIONS :

(i) (a) *Jowar*-Sugarcane. (b) *Jowar*. (c) Nil. (ii) N.A. (iii) 26.8.63 ; 30.8.64 ; 10.8.65. (iv) (a) 2 ploughings and harrowing. (b) In ridges and furrows. (c) 24710 setts/ha. (d) 122 cm. between rows. (e) 1. (v) 168 Kg/ha. of P<sub>2</sub>O<sub>5</sub>+168 Kg/ha. of K<sub>2</sub>O in 2 doses 12-16 weeks after planting and the other at final earthing-up for 63 and 64, 112 Kg/ha. of P<sub>2</sub>O<sub>5</sub>+112 Kg/ha. of K<sub>2</sub>O for 65. (vi) CO-740. (vii) Irrigated. (viii) Weeding and earthing-up. (ix) 95 cm. ; 91 cm ; 74 cm. (x) 18.1.65 ; 11.2.66 ; 19.2.67.

## 2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N<sub>1</sub>=280.2, N<sub>2</sub>=336.2 and N<sub>3</sub>=392.2 Kg/ha.(2) 3 inter crops: T<sub>0</sub>=No inter crop., T<sub>1</sub>=*Dhaincha* and T<sub>2</sub>=*Sunnhemp*.

N applied in 4 equal doses.

Sub-plot treatments :

2 levels of earthing-up : E<sub>0</sub> =No earthing up and E<sub>1</sub> =Earthing-up.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 13.41 m. × 7.32 m. (b) 10.97 m. × 4.88 m. (v) 122 cm. × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) *Pyrilla*. Dusting of B.H.C. 10%. (iii) Yield of cane. (iv) (a) 1963-65. (b) Yes. (c) No. (v) *Akluj*. (vi) Nil. (vii) Both the error variances are heterogeneous and hence the results of individual years are presented under 5.—Results.

## 5. RESULTS :

63(61)

(i) 965 Q/ha. (ii) (a) 289 l Q/ha. (b) 149.7 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	E <sub>0</sub>	E <sub>1</sub>	Mean
T <sub>0</sub>	876	1027	960	917	992	954
T <sub>1</sub>	829	832	1078	868	959	913
T <sub>2</sub>	986	1042	1059	1006	1052	1029
Mean	897	967	1032	930	1001	965
E <sub>0</sub>	897	921	972			
E <sub>1</sub>	887	1013	1093			



64(59)

(i) 1547 Q/ha. (ii) (a) 553.8 Q/ha. (b) 235.5 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	E <sub>0</sub>	E <sub>1</sub>	Mean
T <sub>0</sub>	1544	1666	1753	1653	1656	1654
T <sub>1</sub>	1264	1455	1720	1377	1583	1480
T <sub>2</sub>	1462	1602	1455	1470	1543	1506
Mean	1423	1574	1643	1500	1594	1547
E <sub>0</sub>	1428	1502	1570			
E <sub>1</sub>	1419	1647	1715			

65(59)

(i) 1410 Q/ha. (ii) (a) 316.0 Q/ha. (b) 276.0 Q/ha. (iii) Interaction T×E is significant. (iv) Av. yield of cane in Q/ha.

	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	E <sub>0</sub>	E <sub>1</sub>	Mean
T <sub>0</sub>	1357	1562	1253	1280	1502	1391
T <sub>1</sub>	1587	1435	1403	1570	1379	1475
T <sub>2</sub>	1317	1264	1516	1326	1405	1366
Mean	1420	1420	1391	1392	1429	1410
E <sub>0</sub>	1358	1406	1411			
E <sub>1</sub>	1482	1434	1370			

C.D. for T means at the same level of E=248.5 Q/ha.

C.D. for E means at the same level of T=231.9 Q/ha.

**Crop :- Sugarcane.**

**Ref :- Mh. 61(99), 62(85), 63(126).**

**Site :- Reg. Sugarcane Res. Sub-stn.,  
Kolhapur.**

**Type :- 'CM'.**

**Object :-** To study the effect of varying plant population under different manurial doses.

**1. BASAL CONDITIONS :**

(i) Nil. (b) and (c) N.A. (ii) N.A. (iii) 27.1.61 ; 28.12.61 to 1.1.62 ; 2.12.63 to 4.12.63. (iv) (a) Deep ploughing. (b) Planted in furrows and ridges. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) CO-419. (vii) Irrigated. (viii) Weeding and interculturing. (ix) 174 cm. ; 113 cm. ; N.A. (x) 3 to 8.1.62 ; 3.1.63 ; 17 to 31.12.64.

**2. TREATMENTS :**

**Main-plot treatments :**

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

(1) 3 spacings : S<sub>1</sub>=107 cm., S<sub>2</sub>=122 cm. and S<sub>3</sub>=137 cm.

(2) 3 plant populations : R<sub>1</sub>=24710, R<sub>2</sub>=30888 and R<sub>3</sub>=37066 setts/ha.

(3) 3 levels of N : N<sub>1</sub>=168.1, N<sub>2</sub>=252.2 and N<sub>3</sub>=336.2 Kg/ha.

**Sub-plot treatments :**

2 levels of F.Y.M. : F<sub>0</sub>=0 and F<sub>1</sub>=49.42 C.L./ha.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block, 3 blocks/replication ; 2 Sub-plots/main-plot. (b) N.A. (iii) 1.  
 (iv) (a) 13.72 m. × 10.97 m. for 61, 14.63 m × 9.75 m. for 62 and 63. (b) 10.97 m. × 8.15 m. for 61, 12.80 m.  
 × 6.86 m. for 62 and 63. (v) 137 cm × 141 cm. for 61, 91 cm × 144 cm. for 62 and 63.

## 4. GENERAL :

(i) Normal. (ii) Heavy attack of stem borer, dead hearts removed. (iii) Yield of cane. (iv) (a) 1961-63.  
 (b) No. (c) Results of combined analysis are presented under 5.—Results. (v) and (vi) Nil. (viii) Both  
 the error variances are homogeneous and Treatments × years interactions are absent.

## 5. RESULTS :

Pooled results

(i) 772 Q/ha. (ii) (a) 147.1 Q/ha. (based on 18 d.f. made up of pooled error). (b) 122.3 Q/ha. (based on  
 60 d.f. made up of pooled error). (iii) None of the effects is significant. (iii) Av. yield of cane in Q/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	Mean
F <sub>0</sub>	770	731	755	743	769	744	732	751	773	752
F <sub>1</sub>	805	799	770	757	784	834	788	765	821	791
Mean	788	765	763	750	776	789	760	758	797	772
N <sub>1</sub>	782	754	744	740	763	777				
N <sub>2</sub>	763	769	742	704	788	782				
N <sub>3</sub>	818	771	803	805	778	808				
R <sub>1</sub>	737	758	755							
R <sub>2</sub>	783	781	765							
R <sub>3</sub>	843	755	769							

## Individual results

Treatment	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	Sig.	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	Sig.	F <sub>0</sub>	F <sub>1</sub>	Sig.
Year											
1961	697	685	691	N.S.	645	690	738	N.S.	673	709	N.S.
1962	700	759	761	N.S.	814	687	719	N.S.	735	745	N.S.
1963	853	885	915	N.S.	821	897	934	N.S.	849	919	*
Pooled	750	776	789	N.S.	760	758	797	N.S.	752	791	N.S.

S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Sig.	G.M.	S.E./plot
669	695	709	N.S.	691	(a) 163.0 (b) 144.2
745	748	727	N.S.	740	127.0 105.2
949	851	853	N.S.	884	195.3 114.2
788	765	763	N.S.	772	147.1 122.3

**Crop :- Sugarcane.****Ref :- Mh. 64(88).****Site :- Reg. Sugarcane Res. Stn., Kolhapur.****Type :- 'CM'.**

Object :- Studies of paddy for green or *Dhaincha* for G.M. prior to cane planting by Rayungan sett planting.

**1. BASAL CONDITIONS:**

(i) (a) to (c) N.A. (ii) Alluvial soil. (iii) 27.9.64. (iv) (a) Ploughing. (b) As per treatments. (c) N.A. (d) 99 cm between rows. (e) —. (v) Nil. (vi) Co 748. (vii) Irrigated. (viii) Weeding and interculturing. (ix) N.A. (x) 28.12.65 to 4.1.66.

**2. TREATMENTS:**

All combinations of (1) and (2).

(1) 4 previous crops :  $C_0$  = Control,  $C_1$  = Paddy,  $C_2$  = *Dhaincha* and  $C_3$  = Paddy drilled on flat bed.

(2) 2 types of seed material :  $T_1$  = Rayungan and  $T_2$  = Setts.

**3. DESIGN :**

(i) Fact in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 11.89 m. × 9.90 m. (b) 10.05 m. × 7.92 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1964 only (b) to (c) No. (v) N.A. (vi) and (vii) Nil.

**5. RESULTS:**

(i) 1291 Q/ha. (ii) (a) 126.1 Q/ha. (iii) Main effect of C is highly significant. (iv) (a) Av. yield of cane in Q/ha.

	$C_0$	$C_1$	$C_2$	$C_3$	Mean
$T_1$	1396	1431	1338	1016	1295
$T_2$	1443	1309	1338	1054	1286
Mean	1420	1370	1338	1035	1291

C.D. for C marginal means = 131 Q/ha.

**Crop :- Sugarcane (*Adsali*).****Ref :- 'Mh. 60(129),62(176).****Site :- Agri. Res. Stn., Padegaon.****Type :- 'CM'.**

Object :- To study the effect of growing different legumes as inter crop on the yield of Sugarcane.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) B type. (iii) 10.860 ; 21.8.62. (iv) (a) Ploughing and harrowing. (b) Planting in ridges and furrows. (c) 24710 setts/ha. (d) 122 cm. between rows. (e) 1. (v) Nil. (vi) Co 419. (vii) Irrigated. (viii) Weeding and earthing. (ix) 104 cm. ; N.A. (x) 29.12.61 to 2.1.62 ; 28.12.63 to 1.1.64.

**2. TREATMENTS:**

7 cultural manurial treatments :  $T_1$  = Lucerne as inter crop + 336.2 Kg/ha. of N,  $T_2$  = *Stunhemp* as inter crop + 336.2 Kg/ha. of N,  $T_3$  = *Dhaincha* as inter crop + 336.2 Kg/ha. of N,  $T_4$  = *Moong* as inter crop + 336.2 Kg/ha. of N,  $T_5$  = 336.2 Kg/ha. of N,  $T_6$  = 420.3 Kg/ha. of N and  $T_7$  = 504.4 Kg/ha. of N.

N applied as A/S.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 7.32 m. × 16.50 m. (b) 4.83 m. × 13.85 m. (v) 122 cm. × 137 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of cane. (iv) (a) 1960-62 (failed in 61). (b) No. (c) Results of combined analysis are presented under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments  $\times$  years interaction is absent.

## 5. RESULTS:

Pooled results

(i) 1823 Q/ha. (ii) 200.7 Q/ha. (based on 36 d.f. made up of pooled error). (iii) Treatment differences are significant. (iv) Av. yield of cane in Q/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>
Av. yield	1856	1743	1989	1699	1762	1703	2008

C.D. for treatment means = 81.9 Q/ha.

Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	Sig.	G.M.	S.E./plot
Year										
1960	1848	1772	2013	1568	1720	1718	1879	N.S.	1788	228.9
1962	1864	1714	1965	1831	1804	1688	2136	*	1857	167.9
Pooled	1856	1743	1989	1699	1762	1703	2008	*	1823	200.7

**Crop :- Sugarcane (*Adsalii*).**

**Ref :- Mh. 60(130), 61(173).**

**Site :- Agri. Res. Stn., Padegaon.**

**Type :- 'CM'.**

Object: —To study the effect of earthing up vs no earthing up of Sugarcane.

## 1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) B type. (iii) 2.1.8.60 ; 8.8.61. (iv) (a) Ploughing and harrowing. (b) Planted in ridges and furrows. (c) and (d) As per treatments. (e) 1. (v) As per treatments. (vi) Co 470. (vii) Irrigated. (viii) Weeding. (ix) 102 cm. ; N.A. (x) 2.1.62 ; 18.12.62 to 25.12.62.

## 2. TREATMENTS:

Main-plot treatments :

4 cultural treatments : C<sub>1</sub> = Normal planting 122 cm apart and earthing up, C<sub>2</sub> = Normal planting 122 cm. apart and no earthing up, C<sub>3</sub> = Planting 24710 setts/ha. in deep furrows 153 cm. apart plus no earthing up and C<sub>4</sub> = Planting in deep furrows 153 cm. apart with 19768 setts/ha. plus no earthing up.

Sub-plot treatments :

2 levels of N : N<sub>1</sub> = 336.2 and N<sub>2</sub> = 504.4 Kg/ha.  
168.1 Kg/ha. of P<sub>2</sub>O<sub>5</sub> + 224.2 Kg/ha. of K<sub>2</sub>O applied to all the plots.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 2 sub-plots/main-plot, (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  12.19 m. for C<sub>1</sub> and C<sub>2</sub>. 12.19 m.  $\times$  12.19 m. for C<sub>3</sub> and C<sub>4</sub>. (b) 8.53 m.  $\times$  9.75 m. for C<sub>1</sub> and 9.14 m.  $\times$  9.14 m. for C<sub>3</sub> and C<sub>4</sub>. (v) 122 cm.  $\times$  122 cm. for C<sub>1</sub> and C<sub>2</sub>. 153 cm.  $\times$  153 cm. for C<sub>3</sub> and C<sub>4</sub>. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1959 to 61. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vi) Both the error variances are homogeneous and Treatments  $\times$  years interaction are absent.

## 5. RESULTS :

## Pooled results

(i) 1839 Q/ha. (ii) (a) 283.6 Q/ha. (based on 27 d.f. made up pooled error). (b) 224.9 Q/ha. (based on 36 d.f. made up of pooled error). (iii) Main effect of C alone is significant. (iv) Av. yield of cane in Q/ha.

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	Mean
N <sub>1</sub>	1829	1945	1751	1839	1841
N <sub>2</sub>	1723	1931	1889	1807	1837
Mean	1776	1938	1820	1823	1839

C.D. for C marginal means=119 Q/ha.

## Individual results.

Treatment	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	Sig.	N <sub>1</sub>	N <sub>2</sub>	Sig.	G.M.	S. E./plot	
										(a)	(b)
Year											
1960	1823	1932	1790	1652	N.S.	1814	1786	N.S.	1800	255.8	269.4
1961	1881	2085	1902	2015	N.S.	1982	1959	N.S.	1971	303.8	169.8
Pooled	1776	1938	1820	1823	*	1841	1837	N.S.	1839	283.6	224.9

**Crop :- Sugarcane (Adsali).**

**Ref :- Mh. 60(128), 62(178), 63(225), 64(178).**

**Site :- Agri. Res. Stn., Padegaon. Type :- 'P'.**

**Object :-** To study the possibility of using tensionometer in studying the effect of water requirements on Sugarcane.

## 1. BASAL CONDITIONS.

(i) (a) Nil. (b) Groundnut. (c) Nil. (iv) N.A. (iii) 30, 12.60 ; 16 to 18.2.62 ; 16, 17.2.63 ; 18.2.64. (iv) (a) Ploughing and harrowing. (b) Planting in furrows and ridges. (c) 24710 setts/ha. (d) 122 cm. between rows. (e) 1. (v) Nil for 60 and 64. 336.2 Kg/ha. of N+112.1 Kg/ha. of P<sub>2</sub>O<sub>5</sub> and 112.1 Kg/ha. of K<sub>2</sub>O for 62 and 63. (vi) Co 419 for 60 ; Co 740 for other years. (vii) Irrigated. (viii) Weeding and interculturing. (ix) 63 cm ; N.A. for others. (x) 23.1.62 ; 16 to 18.2.63 ; 29, 30.1.64 ; 19.3.65.

## 2. TREATMENTS :

6 irrigational treatments : T<sub>1</sub>=Control, irrigation to be given at an interval of 10 days at 7.5 cm., T<sub>2</sub>=7.5 cm. irrigation to be given when tensionometer fixed at 25 cm—30 cm. depth reads 30 to 40 (i.e. soil will be at moisture equivalent), T<sub>3</sub>=5 cm. of water to be given at an interval of 10 days, T<sub>4</sub>=Irrigation at 10 days interval and on the basis of soil moisture loss during the period (loss to be determined by putting the soil sample in the oven), T<sub>5</sub>=Irrigation at an interval of 15 days at 7.5 cm. and T<sub>6</sub>=Irrigation to be given on the basis of water evaporation from the free surface in 10 days interval.

## 3. DESIGN :

(i) R.B.D. (ii) 6. (b) N.A. (iii) 5 : 4 : 5 : 4. (iv) (a) 10.36 m.×9.75 m. (b) 8.34 m.×7.32 m. (v) 101 cm.×122 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of cane. (iv) (a) 1960—64 (not conducted in 61). (b) No. (c) Results of combined analysis are presented under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments×Years interaction is absent.

## RESULTS :

## Pooled results

(i) 1199 Q/ha. (ii) 106.3 Q/ha. (based on 75 d.f. made up of pooled error and Treatments  $\times$  years interaction).  
 (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>
Av. yield	1222	1218	1157	1203	1168	1225

## Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T.	Sig.	G.M.	S.E./plot
Year										
1960	1222	1133	1119	1202	1126	1175		N.S.	1163	116.8
1962	1224	1349	1158	1162	1215	1157		N.S.	1211	111.5
1963	1195	1159	1192	1166	1160	1209		N.S.	1180	75.3
1964	1255	1268	1160	1290	1185	1377		*	1256	65.9
Pooled	1222	1218	1157	1203	1168	1225		N.S.	1199	106.3

**Crop :- Sugarcane. (Adesai). Ref :- Mh. 61(226), 62(223), 63(285), 64(247)**

**Site :- Agri. Res. Stn., Padegaon. Type :- 'P'.**

Object :- To study the water requirements of Sugarcane during its various growth periods.

## 1. BASAL CONDITIONS :

(i) (a) Nilwa, Gram—Sugarcane. (b) Nilwa, Gram. (c) Nil. (ii) 'B' type. (iii) 21.8.61 ; 11.8.62 ; 9.8.63 ; 9.8.64. (iv) (a) Ploughing, discing. (b) Planted in ridges and furrows. (c) 24710 setts/ha. (d) 122 cm. between rows. (e) 1. (v) 49.4 C.L./ha. of compost + 504.4 Kg/ha. of N + 168.1 Kg/ha. of P<sub>2</sub>O<sub>5</sub> + 168.1 Kg/ha. of K<sub>2</sub>O. (vi) Co-740. (vii) As per treatments. (viii) Weeding and earthing up. (ix) N.A. (x) 17.1.63 to 24.1.63 ; 9.12.63 to 16.12.63 ; 23.1.65 to 31.1.65 ; 10, 12.12.65.

## 2. TREATMENTS :

## Main-plot treatments :

Following irrigation intervals in days were followed during different periods of crop growth.

	July-Oct	Nov-Feb.	March-June.	July to harvest.	July-Oct.	Nov-Feb.	March-June.	July to harvest
M <sub>1</sub> =	10	10	10	10	M <sub>7</sub> =	10	10	15
M <sub>2</sub> =	15	15	15	15	M <sub>8</sub> =	15	10	10
M <sub>3</sub> =	15	10	10	10	M <sub>9</sub> =	10	10	15
M <sub>4</sub> =	10	15	15	15	M <sub>10</sub> =	15	15	10
M <sub>5</sub> =	10	15	10	10	M <sub>11</sub> =	10	15	10
M <sub>6</sub> =	15	10	15	15	M <sub>12</sub> =	15	10	15

## Sub plot treatments :

3 depths of irrigations : I<sub>1</sub> = 5 cm., I<sub>2</sub> = 8 cm and I<sub>3</sub> = 10 cm.

## 3 DESIGN :

(i) Split-plot. (ii) (a) 12 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 12.00 m.  $\times$  16.60 m. (b) 9.60 m.  $\times$  10.40 m. (v) 120 cm.  $\times$  310 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1961—64. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Both the error variances are homogeneous and Treatments  $\times$  years interactions are absent.

## 5. RESULTS :

## Pooled results

(i) 1599 Q/ha. (ii) (a) 255.8 Q/ha. (based on 44 d.f. made up of pooled error). (b) 216.3 Q/ha. (based on 96 d.f. made up of pooled error). (iii) Main effects of M and I are highly significant. (iv) Av. yield of cane in Q/ha

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>	M <sub>10</sub>	M <sub>11</sub>	M <sub>12</sub>	Mean
I <sub>1</sub>	1720	1084	1594	1130	1544	1016	1196	1491	1584	1308	1400	1460	1377
I <sub>2</sub>	1905	1382	1870	1504	1824	1385	1470	1695	1752	1497	1503	1839	1635
I <sub>3</sub>	2083	1626	1914	1587	1956	1688	1544	1938	1882	1599	1680	1919	1785
Mean	1903	1364	1793	1407	1774	1363	1403	1708	1739	1468	1528	1739	1599

C.D. for M marginal means = 148.9 Q/ha.

C.D. for I marginal means = 62.1 Q/ha.

## Individual results

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>	M <sub>10</sub>	M <sub>11</sub>	M <sub>12</sub>
Year												
1961	1793	1334	1772	1253	1826	1522	1209	1732	1698	1440	1418	1610
1962	2204	1618	1802	1735	1958	1512	1782	2044	2063	1807	1847	2074
1963	1756	1198	1662	1351	1448	1238	1350	1385	1456	1245	1171	1589
1964	1856	1312	1934	1289	1865	1180	1272	1672	1740	1380	1676	1685
Pooled	1903	1364	1793	1407	1774	1363	1403	1708	1739	1468	1528	1739

Sig.	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	Sig.	G.M.	S.E./plot
**	1353	1576	1722	**	1550	(a) 176.44 (b) 196.40
**	1757	1811	2043	**	1870	226.67 251.61
*	1157	1439	1596	**	1404	232.58 167.67
*	1241	1696	1778	**	1572	353.66 240.11
**	1377	1635	1785	**	1599	255.8 216.3

**Crop :- Sugarcane, (Adsali).**

**Ref :- Mh. 62(177), 63(224).**

**Site :- Agri. Res. Stn., Padegaon.**

**Type :- 'P'.**

Object :- To study the requirements of water for Sugarcane.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) *Tur* and *Bajri*; *Sannhemp*. (c) Nil. (ii) N.A. (iii) 26.8.62; 3.9.63. (iv) (a) Ploughing and harrowing (b) Planted in ridges and furrows. (c) 24710 setts/ha. (d) 122 cm. between rows (e) 1 sett (v) 504 Kg/ha. of N+112 Kg/ha. of P<sub>2</sub>O<sub>5</sub>+112 Kg/ha. of K<sub>2</sub>O. (vi) Co-740. (vii) As per treatments. (viii) Weeding, earthing up (ix) N.A. (x) 25, 27.12.63; 22.2.65.

## 2. TREATMENTS:

4 irrigations : I<sub>1</sub> - Irrigation to be given @ 3 acre inch at an interval of 10 days, I<sub>2</sub> - Irrigation to be given @ 2 acre inch at an interval of 10 days, I<sub>3</sub> - Irrigation to be given @ 3 acre inch at an interval of 15 days and I<sub>4</sub> - Irrigation to be given @ 3 acre inch when the tensionometer is fixed at 30 to 46 cm. depth and read 30-40.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 9'60 m. × 15'60 m. (b) 7'20 m. × 13'20 m. (v) 120 cm. × 120 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1962 to 63. (b) and (c) No. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent, hence results of individual years are presented under 5. Results.

## 5. RESULTS :

62(177)

(i) 1464 Q/ha. (ii) 410.4 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>
Av. yield	1637	1384	1293	1543

63(224)

(i) 1428 Q/ha. (ii) 129.1 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>
Av. yield	1454	1414	1344	1499

**Crop :- Sugarcane (*Adzali*).**

**Ref :- Mh. 65(209).**

**Site :- Agri. Res. Stn , Padegaon.**

**Type :- 'IM'.**

Object :—To study the water requirements for Sugarcane.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Nilwa and Gram. (c) Nil. (ii) 'B' type. (iii) 7.8.65. (iv) (a) Ploughing. (b) In ridges and furrows. (c) 24710 setts/ha. (d) 122 cm. (e) 1. (v) 49.4 C.L./ha. of compost + 168 Kg/ha. of N + 168 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) Co-740. (vii) As per treatments. (viii) Weeding, earthing up. (ix) N.A. (x) 2 to 11.1.67.

## 2. TREATMENTS :

**Main-plot treatments :**

4 treatments of irrigation intervals in days during different crop growth period.

Period	July-Oct.	Oct-Feb.	Feb-July.	July to harvest.	Period	July-Oct	Oct-Feb	Feb-July	July to harvest
I <sub>1</sub>	15	10	10	15	I <sub>3</sub>	20	10	10	15
I <sub>2</sub>	10	15	10	15	I <sub>4</sub>	15	10	10	20

**Sub-plot treatments :**

3 quantities of water irrigated: F<sub>1</sub>=75, F<sub>2</sub>=95 and F<sub>3</sub>=115 acre inch.

**Sub-sub-plot treatments :**

2 levels of N as A/S applied in four doses : N<sub>1</sub>=252 and N<sub>2</sub>=504 Kg/ha. of N.

## 3. DESIGN :

(i) Split-split plot. (ii) (a) 2 sub-sub-plots/sub-plot, 3 sub-plots/main-plot, 4 main-plots/replication. (b) N.A. (iii) 3. (iv) (a) 16'33 m. × 12'00 m. (b) 13'63 m. × 7'20 m. (v) 135 cm. × 240 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1965—67. (b) and (c) No. (v) to (vii) Nil.

## 5. RESULTS :

(i) 1871 Q/ha. (ii) (a) 186.4 Q/ha. (b) 158.2 Q/ha. (c) 145.6 Q/ha. (iii) Main effect of F is significant. (iv) Av. yield of cane in Q/ha.



	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	N <sub>1</sub>	N <sub>2</sub>	Mean
I <sub>1</sub>	1645	2021	2051	1829	1982	1906
I <sub>2</sub>	1675	1832	1923	1833	1787	1810
I <sub>3</sub>	1765	1819	1853	1789	1842	1816
I <sub>4</sub>	1864	1998	1994	1930	1975	1952
Mean	1737	1920	1955	1845	1896	1871
N <sub>1</sub>	1711	1881	1944			
N <sub>2</sub>	1764	1959	1956			

C.D. for F marginal means=97 Q/ha.

**Crop :- Sugarcane. (Adsali).**

**Ref :- Mh. 60(132).**

**Site :- Agri. Res. Stn., Padegaon.**

**Type :: 'IMV'.**

Object :—To study the varietal response to manure and irrigation.

**1. BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) 'B' type. (iii) 22.7.60. (iv) (a) Ploughing. (b) Planted in furrows and ridges. (c) 24710 setts/ha. (d) 122 cm. between rows. (e) N.A. (v) N.A. (vi) and (vii) As per treatments. (viii) Weeding and interculturing (ix) 106 cm. (x) 6 12.61 to 16.12.61.

**2. TREATMENTS :**

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

(1) 3 varieties : V<sub>1</sub>=CO-419, V<sub>2</sub>=CO-775 and V<sub>3</sub>=CO-740

(2) 3 levels of N : N<sub>1</sub>=336.2, N<sub>2</sub>=420.3 and N<sub>3</sub>=504.4 Kg/ha.

(3) 2 levels of irrigations : I<sub>1</sub>=95 and I<sub>2</sub>=115 acre inch.

**3. DESIGN :**

(i) 3<sup>2</sup> × 2 Confd. (ii) (a) 6 plots/block, 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 16.59 m. × 9.75 m. (b) 13.85 m. × 7.32 m. (v) 137 cm. × 122 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) N.A. (iii) Yield of cane. (iv) (a) 1958-60. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 1668 Q/ha. (ii) 254.8 Q/ha. (iii) Main effect of V is highly significant. (iv) Av. yield of cane in Q/ha.

	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	I	I	Mean
V <sub>1</sub>	1405	1511	1560	1518	1466	1492
V <sub>2</sub>	1552	1477	1527	1532	1506	1519
V <sub>3</sub>	2000	2043	1938	2032	1956	1994
Mean	1653	1677	1675	1694	1643	1668
I <sub>1</sub>	1609	1731	1742			
I <sub>2</sub>	1696	1624	1608			

C.D. for V marginal means=156 Q/ha.

**Crop :- Sugarcane.****Ref :- Mh. 63(290), 64(250), 65(203).****Site :- Agri. Res. Stn., Padegaon.****Type :- 'IC'.**

Object :-To study the relative merits of graded and straight furrows in combination of irrigation intervals.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Nilwa, gram. (c) Nil. (ii) 'D' type. (iii) 25.9.63 ; 17.8.64 ; 28.8.65. (iv) (a) Ploughing, discing. (b) Ridges and furrows. (c) 24710 setts/ha. (d) 122 cm. (e) 1. (v) 49.4 C.L./ha. of compost + 504.4 Kg/ha. of N + 168.1 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) CO-740. (vii) As per treatments. (viii) Weeding, earthing-up. (ix) N.A. (x) 4 to 9.3.65 ; 6.1.66 ; 17.1.67.

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 2 intervals of irrigations : I<sub>1</sub>=10 and I<sub>2</sub>=15 days.(2) 2 methods of irrigations : M<sub>1</sub>=Straight furrows and M<sub>2</sub>=Graded furrows.**3. DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 29.26 m. × 14.63 m. for 63 ; 28.40 m. × 14.40 m. for 64 and 65. (b) 28.04 m. × 13.41 m. for 63 ; 26.00 m. × 12.00 m. for 64 and 65. (v) 61 cm. × 61 cm. for 63 ; 120 cm. × 120 cm. for 64 and 65. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of cane. (iv) (a) 1963-65. (b) No. (c) Results of combined analysis are presented under 5.—Results. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

**5. RESULTS :**

Pooled results

(i) 1844 Q/ha. (ii) 240.2 Q/ha. (based on 6 d.f. made up of interaction of Treatments × years). (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	M <sub>1</sub>	M <sub>2</sub>	Mean
I <sub>1</sub>	1803	2013	1908
I <sub>2</sub>	1737	1821	1779
Mean	1770	1917	1844

Individual results

Treatment	M <sub>1</sub>	M <sub>2</sub>	Sig.	I <sub>1</sub>	I <sub>2</sub>	Sig.	G.M.	S.E./plot.
Year								
• 1963	1340	1431	N.S.	1484	1287	N.S.	1386	68.39
1964	2050	2374	N.S.	2247	2177	N.S.	2212	215.50
1965	1920	1946	N.S.	1994	1872	N.S.	1933	111.44
Pooled	1770	1917	N.S.	1908	1779	N.S.	1844	240.2

**Crop :- Sugarca ne.****Ref :- Mh. 63(97).****Site :- Reg Sugarcane Res. Stn., Kolhapur.****Type :- 'D'.**

Object :-To study the comparative effectiveness of different weedcides in regard to their efficiency in eradication of weeds.

## 1. BASAL CONDITIONS :

(i) Nil. (b) and (c) N.A. (ii) N.A. (iii) 11.12.63. (iv) (a) Ploughing and harrowing. (ii) In ridges and furrows. (c) N.A. (d) 107 cm. between rows. (e) . (v) 112.1 Kg/ha. of  $P_2O_5$  + 112.1 Kg/ha. of  $K_2O$  302.6 Kg/ha. of N as A S for treatments except in  $T_9$  and  $T_1$ . (vi) CO-740. (vii) Irrigated (viii) Weeding and interculturing (ix) 115 cm. (x) 13.1.65 to 15.1.65.

## 2. TREATMENTS :

9 weedicidal treatments:  $T_0$ =Control,  $T_1$ =Normal cultural method,  $T_2$ =Bladex A—2-4-D (Na salt liquid) at 2.2 Kg/ha.,  $T_3$ =Bladex B—Butoxy ethanol ester of 2-4-D at 4.20 litres/ha.,  $T_4$ =Bladex C—Ethyl ester of 2-4-D at 5.61 litres/ha.,  $T_5$ =Fenoc—Na salt powder of Trichlorophenol acetic acid at 4.2 Kg/ha.,  $T_6$ =Bladex O—Aminotrizol at 3.71 litres/ha.,  $T_7$ =Tropotox—MCPB—Na salt liquid at 4.3 Kg/ha. and  $T_8$ =Sportox mixture of 2-4-D and 2, 4, 5 at 2.4 Kg/ha. of 3.71 A.E./ha. 7 weedicides will be applied at the rate of 898.66 litres of water as per emergence spray 5 to 7 days after one planting followed by second spray 4 weeks after planting

## 3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 9.75 m. × 5.94 m. (b) 7.92 m. × 3.96 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1963 only. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 895 Q/ha. (ii) 134.5 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	$T_0$	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$	$T_8$
Av. yield	812	876	922	1026	906	965	804	895	852

**Crop :- Sugarcane.**

**Ref. :- 65(160).**

**Site :- Reg. Sugarcane Res. Stn. Kolhapur.**

**Type :- 'D'.**

Object :- To find out the comparative effectiveness of different weedicides and method of application.

## 1. BASAL CONDITIONS :

(i) Nil. (ii) Fallow. (c) Nil. (ii) Alluvial. (iii) 12.11.65. (iv) (a) 2 tractor ploughings. (b) Set planting. (c) 33718 sets/ha. (d) 100 cm. between rows. (e) N.A. (v) 49.4 C.L./ha. of F.Y.M. (vi) CO-740—medium (vii) 18-20 irrigation at an interval of 10-15 days. Lift Irrigation. (viii) As per treatments. (ix) N.A. (x) 29 to 31.12.66.

## 2. TREATMENTS :

**Main-plot treatments**

$M_1$ =Control—no weeding,  $M_2$ =Normal cultural method,  $M_3$ =Bladox A—12 gm/plot.,  $M_4$ =Bladox B—21 c.c./plot.,  $M_5$ =Bladox C—28 c.c./plot.,  $M_6$ =Fenoc—22 gm./plot.,  $M_7$ =Bladox O—14 c.c./plot.,  $M_8$ =Tropotox—27 c.c./plot and  $M_9$ =Sportox—33 c.c./plot

**Sub-plot treatments**

2 times of application of weedicidn:  $T_1$ =Application before sowing season and  $T_2$ =Application before planting.

## 3. DESIGN :

(i) Split plot. (ii) (a) 9 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 8.70 m. × 6.00 m. (b) 6.70 m. × 4.00 m. (v) 100 cm. × 100 cm. (vi) Yes.

## 4. GENERAL :

(i) Good. (ii) Nil. (iii) Plant count., growth and yield of cane. (iv) (a) 1965 only (b) to (c) No. (v) Padegaon. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 1423 Q/ha. (ii) (a) 169.7 Q/ha. (b) 146.9 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>	Mean
T <sub>1</sub>	1403	1541	1339	1292	1496	1373	1508	1474	1354	1420
T <sub>2</sub>	1414	1280	1429	1413	1475	1383	1447	1663	1336	1427
Mean	1409	1410	1384	1353	1486	1378	1478	1568	1345	1423

**Crop :- Sugarcane (*Adsali*).**

**Ref :- Mh. 63(289), 64(249).**

**Ref :- Agri. Res. Stn., Padegaon.**

**Type :- 'D'.**

Object :- To study the comparative effectiveness of weedicides in controlling weeds.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) 44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> (ii) 'B' type. (iii) 2.9.63 ; 29.7.64. (iv) (a) Ploughing and discing. (b) In ridges and furrows. (c) 24710 setts/ha. (d) 122 cm. (e) 1. (v) 49.4 C.L./ha. of compost+504 Kg/ha. of N+168 Kg/ha. of P<sub>2</sub>O<sub>5</sub>+168 Kg/ha. of K<sub>2</sub>O. (vi) Co 740. (vii) Irrigated. (viii) Earthing up. (ix) N.A. (x) 16.2.65 ; 10.2.66.

## 2. TREATMENTS :

9 weedicial uncultural treatments : T<sub>0</sub>=Control, T<sub>1</sub>=Normal culture method, T<sub>2</sub>=Bladox—A, T<sub>3</sub>=Bladox—B, T<sub>4</sub>=Bladox—C, T<sub>5</sub>=Fenac, T<sub>6</sub>=Bladox—O, T<sub>7</sub>=Tropotox and T<sub>8</sub>=Spontox.

Sprays on 10.9.63 and 5.10.63 for 63, 6.8.64 and 8.9.64 for 64.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 12.20 m. × 6.10 m. ; 13.30 m. × 9.70 m. (b) 9.75 m. × 3.65 m. ; 10.60 m. × 7.30 m. (v) 122 cm. × 122 cm. ; 135 cm. × 120 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) 1963—64. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

## 5. RESULTS :

Pooled results

(i) 1874 Q/ha. (ii) 224.1 Q/ha. (based on 48 d.f. made up of pooled error). (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. yield	1852	1904	1820	1831	1936	1877	1831	1870	1947

Individual results

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	Sig.	G.M.	S.E./plot
Year 1963	1860	1901	1796	1869	1950	1771	1905	1805	2029	N.S.	1876	208.1
1964	1845	1907	1844	1793	1923	1982	1758	1934	1866	N.S.	1872	239.0
Pooled	1852	1904	1820	1831	1936	1877	1831	1870	1947	N.S.	1874	224.1

**Crop :- Tobacco****Ref :- Mh. 63(48), 64(43), 65(49).****Site :- Agri. Res. Stn., Achalpur.****Type :- 'M'.**

Object :- To study the effect of N, P and K with and without F.Y.M.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton (c) 24.71 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of N + 11.2 Kg/ha. of  $P_2O_5$ . (ii) Medium black. (iii) 15.9.63 ; 25.8.64 ; 21.6.65/21.8.65. (iv) (a) 2 harrowings ; 1 ploughing and 4 harrowings ; heavy *bakherings*, 3 harrowings (b) Transplanting. (c) N.A. (d) 91 cm. x 91 cm. (e) 1 (v) Nil. (vi) S-7.0 (Nipani). (viii) Irrigated (viii) 3 to 5 weedings and 3 hoeings. (ix) 7 cm. ; 19 cm. ; 45 cm. (x) 2.3.64 ; 9.2.65 ; 8.1.66.

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

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

(1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.(2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.(3) 3 levels of  $K_2O$  as Pot. Sul. :  $K_0=0$ ,  $K_1=44.8$  and  $K_2=89.6$  Kg/ha.**Sub-plot treatments :**2 levels of F.Y.M. :  $F_0=0$  and  $F_1=11,200$  Kg/ha.**3. DESIGN :**

(i) Split-plot confd. (ii) (a) 3 blocks, replication ; 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 11.89 m. x 7.32 m. (b) 10.06 m. x 5.49 m. (v) 91 cm. x 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Growth uneven due to shortage of mixture in the soil in 63 ; Normal ; Satisfactory. (ii) Nil. (iii) Green dry leaf weight (iv) (a) 1963-65. (b) No. (c) Results for combined analysis are presental under 5. Results (v) Digraj (vi) Nil. (vii) Both the error variances are homogeneous.

**5. RESULTS :**

## Pooled results

(i) 464 Kg/ha. (ii) (a) 85.3 Kg/ha. (based on 18 d.f. made up of pooled error). (b) 87.0 Kg/ha. (based on 24 d.f. made up of pooled error). (iii) Interaction  $N \times P$  is highly significant. (iv) Av. yield of cured leaf in Kg/ha.

	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	$F_0$	$F_1$	an
$N_0$	480	473	396	444	447	458	470	430	450
$N_1$	494	481	432	445	489	473	456	482	469
$N_2$	426	477	515	431	502	485	353	493	473
Mean	467	477	448	440	479	473	460	468	464
$F_0$	468	465	445	447	471	461			
$F_1$	465	489	450	432	488	484			
$K_0$	460	460	399						
$K_1$	480	469	489						
$K_2$	460	502	456						

C.D. for body of  $N \times P$  table = 59.7 Kg/ha.

## Individual results

Treatment	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Sig.	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Sig.	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>
Year											
1963	424	386	394	N.S.	400	420	384	N.S.	400	434	370
1964	416	466	486	N.S.	450	488	430	N.S.	442	456	469
1965	510	555	539	N.S.	551	524	530	N.S.	478	549	579
Pooled	450	469	473	N.S.	467	477	448	N.S.	440	479	473

Sig.	F <sub>0</sub>	F <sub>1</sub>	Sig.	G.M.	S.E./plot	
					(a)	(b)
N.S.	384	419	N.S.	401	64.9	102.0
N.S.	444	468	N.S.	456	67.8	55.4
N.S.	552	518	N.S.	535	114.2	96.2
N.S.	460	468	N.S.	464	85.3	87.0

**Crop :- Tobacco (Kharif).**

**Ref :- Mh. 63(58), 64(49), 65(57).**

**Site :- Agri. Res. Stn., Digraj.**

**Type :- 'M'.**

Object :—To study the effect of different levels of N, P and K with and without F.Y.M.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Groundnut for 63; *Kharif Jowar* for others. (c) Nil; N.A. for others. (ii) N.A. (iii) 21.8.63; 28.8.64; 22.8.65. (iv) (a) 3-4 harrowings; Tractor ploughings in 63, 64; 1 ploughing and 4 harrowings in 65. (b) Transplanting (c) 420 to 560 gm./ha. (d) 107 cm. × 107 cm. (e) —. (v) N:1 (vi) S. 20. (vii) Irrigated. (viii) Nil. (ix) 36 cm.; 39 cm.; 28 cm. (x) 28.1.64; 6 to 17.2.65; 28.1.66 to 4.2.66.

**2. TREATMENTS :**

**Main-plot treatments :**

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

(1) 3 levels of N: N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 3 levels of P<sub>2</sub>O<sub>5</sub>: P<sub>0</sub>=0, P<sub>1</sub>=22.4 and P<sub>2</sub>=44.8 Kg/ha.

(3) 3 levels of K<sub>2</sub>O: K<sub>0</sub>=0, K<sub>1</sub>=44.8 and K<sub>2</sub>=89.7 Kg/ha.

**Sub-plot treatments :**

2 levels of F.Y.M.: F<sub>0</sub>=0 and F<sub>1</sub>=1121 Kg/ha.

Sources, time and methods of application N.A.

**3. DESIGN:**

(i) Split-plot confd. (ii) (a) 3 blocks/replication; 9 main-plots/blocks and 2 sub-plots/main-plot, (b) N.A. (iii) 2. (iv) (a) 12.80 m. × 7.47 m. (b) 10.67 m. × 5.33 m. (v) 107 cm. × 107 cm (vi) Yes.

**4. GENERAL :**

(i) Good; good; Satisfactory (ii) Aphid attack in 63 and 64 only. (iii) Weight of leaves. (iv) (a) 1963-65 (b) and (c) No. (v) Achalpur. (vi) Nil. (vii) Expt. continued beyond 65 and hence results for individual years are given under 5. Results.

**5. RESULTS :**

**63(58)**

(i) 945 Kg/ha. (ii) (a) 107.6 Kg/ha. (b) 99.5 Kg/ha. (iii) Main effects of N and P are highly significant. (iv) Av. yield of cured leaf in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>0</sub>	827	886	893	871	893	842	879	859	869
N <sub>1</sub>	879	967	1010	1003	945	908	967	937	952
N <sub>2</sub>	923	1025	1098	952	1076	1018	1015	1015	1015
Mean	876	959	1000	942	971	923	953	937	945
F <sub>0</sub>	884	967	1010	932	986	942			
F <sub>1</sub>	869	952	991	952	957	903			
K <sub>0</sub>	850	944	1032						
K <sub>1</sub>	915	967	1032						
K <sub>2</sub>	864	967	937						

C.D. for N or P marginal means = 73.36 Kg/ha.

64(49)

(i) 578 Kg/ha. (ii) (a) 66.8 Kg/ha (b) 50.0 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of cured leaf in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>0</sub>	498	513	527	513	505	520	498	527	513
N <sub>1</sub>	585	593	608	600	600	586	595	596	596
N <sub>2</sub>	622	630	630	630	615	637	620	635	627
Mean	568	579	588	581	573	581	571	586	578
F <sub>0</sub>	561	566	586	566	576	571			
F <sub>1</sub>	576	591	591	596	571	591			
K <sub>0</sub>	534	609	600						
K <sub>1</sub>	578	556	586						
K <sub>2</sub>	593	571	579						

C.D. for N marginal means = 45.34 Kg/ha.

65(57)

(i) 635 Kg/ha. (ii) (a) 131.8 Kg/ha. (b) 86.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of cured leaf in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>0</sub>	636	541	650	624	630	573	600	618	609
N <sub>1</sub>	652	655	646	679	630	644	647	656	651
N <sub>2</sub>	623	637	678	656	618	664	630	662	646
Mean	637	611	658	653	626	627	626	645	635
F <sub>0</sub>	617	606	653	642	622	613			
F <sub>1</sub>	657	646	663	664	631	641			
K <sub>0</sub>	668	617	675						
K <sub>1</sub>	613	602	664						
K <sub>2</sub>	632	615	634						

**Crop :- Cotton (Kharif).**

**Ref. :- Mh. 60(13), 61(44), 62(29).**

**Site :- Agri. Res. Stn., Achalpur.**

**Type :- 'M'.**

**Object :-**To study the effect of soil and foliar applications of N in the form of Urea on the yield of Cotton.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black. (iii) 29.5.60 ; 30.5.61 ; 10.7.62. (iv) (a) 3 *bakharings* (b) Hand dibbling. (c) 1 t Kg/ha. (d) 61 cm. x 30 cm. (e) N.A. (v) Nil. (vi) B-147. (vii) Unirrigated. (viii) 2 weedings, 2 hoeings (ix) 57 cm. ; 164 cm. ; 72 cm. (x) 4 pickings from 13.11.60 to 18.1.61 ; 3 pickings from 26.11.61 to 2.2.62 ; 2 pickings from 14.12.62 to 11.1.63.

**2. TREATMENTS :**

All combinations of (1) and (2)+3 extra treatments :

(1) 3 levels of N as Urea :  $N_1=11.2$ ,  $N_2=22.4$  and  $N_3=33.6$  Kg/ha.

(2) 3 methods of application :  $M_1$ =Full dose through soil,  $M_2$ = $\frac{1}{2}$  dose at sowing+ $\frac{1}{2}$  dose 6 week after sowing and  $M_3$ = $\frac{1}{2}$  dose through soil at sowing+ $\frac{1}{2}$  dose through foliar spray 6 weeks after sowing.

Extra treatments :  $E_1=11.2$  Kg/ha. of N through foliar spray six weeks after sowing,  $E_2=22.4$  Kg/ha. of N through foliar spray—1/2 dose 6 weeks after sowing and 1/2 dose 8 weeks after sowing and  $E_3=33.6$  Kg/ha. of N through foliar spray— $\frac{1}{2}$  dose 6 weeks after sowing+ $\frac{1}{2}$  dose 8 weeks after sowing+ $\frac{1}{2}$  dose 10 weeks after sowing.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 19.97 m x 7.32 m. (b) 9.14 m. x 5.49 m (v) 91 cm. x 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Jassids, Aphids ; Boll worm attack, dusting of B.H.C., D.D.T. and Sulphur. (iii) Yield of *kapas*. (iv) (a) 1960—62. (b) No. (c) The results of combined analysis are presented under 5. Results. (v) Akola and Nagpur. (vi) Lack of moisture in the soil affected the yield. (vii) Error variances are heterogeneous and Treatments x years interaction is present.

**5. RESULTS :**

Pooled results

(i) 581 Kg/ha. (ii) 146.4 Kg/ha. (based on 22 d.f. made up of Treatments x years interaction). (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

$E_1=531$ ,  $E_2=546$  and  $E_3=551$  Kg/ha.

	$N_1$	$N_2$	$N_3$	Mean
$M_1$	551	585	605	580
$M_2$	574	604	593	590
$M_3$	542	582	712	612
Mean	556	590	637	594

Individual results

at ment	$N_1$	$N_2$	$N_3$	Sig.	$M_1$	$M_2$	$M_3$	Sig.	$E_1$	$E_2$	$E_3$
Year											
1960	930	949	1094	*	988	955	1029	N.S.	813	900	922
1961	330	339	369	N.S.	354	358	326	N.S.	284	334	402
1962	408	483	448	N.S.	399	458	482	N.S.	495	405	330
Pooled	556	590	637	N.S.	580	590	612	N.S.	531	546	551



Sig.	G.M.	S.E./plot
*	963	147.4
N.S.	344	71.8
N.S.	437	93.7
N.S.	581	146.4

**Crop :- Cotton (Kharif).**

**Ref. :- Mh. 61(42), 62(27), 63(42).**

**Site :- Argi. Res. Stn., Achalpur.**

**Type :- 'M'.**

**Object :-** To study the relative merits of C/A/N, Urea and A/S in the presence and absence of F.Y.M.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Lowar*. (c) N.A. (iii) Medium black. (iii) (a) 3.7.61 ; 8.7.62 ; 15.6.63. (iv) (a) *Bakharings*. (b) Dibbling. (c) 7 Kg/ha. (d) 61 cm. × 46 cm. (e) 1-2. (v) Nil. (vi) B-147. (vii) Unirrigated. (viii) 2 to 3 hoeings and weedings. (ix) 164 cm. ; 84 cm. ; 56 cm. (x) 2.12.61 and 2.2.62 ; 13.12.62 to 13.1.63 ; 19.11.63 to 20.1.64.

**2. TREATMENTS :**

**Main-plot treatments :**

All combinations of (1) and (2)+Control (3 plots)

(1) 3 sources of N :  $S_1=A/S$ ,  $S_2=C/A/N$  and  $S_3=Urea$ .

(2) 2 levels of N :  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

**Sub-plot treatments :**

2 levels of F.Y.M. :  $F_0=0$  and  $F_1=56.0$  Q/ha.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 9 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 6.40 m. (b) 9.14 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) No.

**4. GENERAL :**

(i) Satisfactory. (ii) Attack of Jassids and aphids. A mixture of B.H.C. 5%, D.D.T. 5% and Sulphur in 30 : 30 : 40 ratio at the rate of 22.4 Kg/ha. applied. (iii) Yield of *kapas*. (iv) (a) 1961-63. (b) No. (c) The results of the combined analysis are presented under 5.—Results. (v) Akola, Jalgaon, Nagpur and Nanded. (vi) Nil. (vii) Both the main-plot and sub-plot error variances are homogeneous and Treatments × years interaction is absent.

**5. RESULTS :**

**Pooled results**

(i) 497 Kg/ha. (ii) (a) 130.0 Kg/ha. (based on 78 d.f. made up of pooled error). (b) 70.9 Kg/ha. (based on 90 d.f. made up of pooled error). (iii) Main effect of N is highly significant. Main effect of F is significant. Interaction  $S \times F$  is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Control ( $F_0$ )=341 and control ( $F_1$ )=397 Kg/ha.

	$N_1$	$N_2$	$F_0$	$F_1$	Mean
$S_1$	509	605	524	589	557
$S_2$	530	558	522	566	544
$S_3$	533	638	598	573	585
Mean	524	600	548	576	562
$F_0$	520	576			
F	528	624			

C.D. for N marginal means =43.2 Kg/ha.  
 C.D. for F marginal means =23.5 Kg/ha.  
 C.D. for F means at the same level of S=40.7 Kg/ha.  
 C.D. for S means at the same level of F=59.9 Kg/ha.

## Individual results

Treatment	N <sub>1</sub>	N <sub>2</sub>	Sig.	F <sub>0</sub>	F <sub>1</sub>	Sig.	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Sig.
Year										
1961	345	331	N.S.	324	352	*	344	334	336	N.S.
1962	380	416	N.S.	387	409	*	440	346	408	N.S.
1963	847	1053	**	933	967	N.S.	886	952	1012	N.S.
Pooled	524	600	**	548	576	*	557	544	585	N.S.

Control (F <sub>0</sub> )	Control (F <sub>1</sub> )	Sig.	G.M.	S.E./plot	
				Main	sub
226	306	N.S.	314	121.7	57.4
206	307	N.S.	351	108.2	81.3
550	577	N.S.	821	155.6	71.8
341	397	N.S.	497	130.0	70.9

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 61(189), 62(189), 63(230).**

**Site :- Agri Res. Stn., Akola.**

**Type :- 'M'.**

Object :—To study the relative merits of Nitrophosphate complex by ODDA and PEC process on the yield of Cotton.

## 1. BASAL CONDITIONS :

(i) Groundnut-Cotton. (b) Groundnut. (c) 12.4 C.L./ha. of F.Y.M.+11.2 Kg/ha. of N as A/S+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. (ii) Black cotton soil. (iii) 7.7.61 ; 3.7.62 ; 10.7.63. (iv) (a) Ploughing and harrowings. (b) Dibbling. (c) 13 Kg/ha. (d) 46 cm × 23 cm. (e) 1. (v) 12 C.L./ha. of F.Y.M. at sowing. (vi) AK-277. (vii) Unirrigated. (viii) 5 hoeings, 2 weedings. (ix) 80.3 cm. ; 84.3 cm. ; 50.7 cm. (x) Six pickings upto the last week of March.

## 2. TREATMENTS :

All combinations of (1), (2) and (3)+ 5 extra treatments.

(1) 3 types of fertilizers : F<sub>1</sub>=Super+ A/S, F<sub>2</sub>=O.D.D.A and F<sub>3</sub>=P.E.C.

(2) 3 levels of fertilizers : L<sub>1</sub>=13.4 Kg/ha. of N+11.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, L<sub>2</sub>=26.9 Kg/ha. of N+23.5Kg/ha. of P<sub>2</sub>O<sub>5</sub> and L<sub>3</sub>=53.8 Kg/ha. of N+47.1 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

(3) 3 methods of application of fertilizers : M<sub>1</sub>=Broadcast, M<sub>2</sub>=6.3 cm. below seed and M<sub>3</sub>=Band placement.

5 extra treatments : N<sub>0</sub>=0, N<sub>1</sub>=13.4, N<sub>2</sub>=26.9, N<sub>3</sub>=40.3 and N<sub>4</sub>=53.8 Kg/ha. of N as A/S.

## 3. DESIGN

(i) 3<sup>3</sup> confd. +5 extra treatments in each block. (ii) (a) 14 plots/block, 3 blocks/replication. (b) 47.50 m. × 69.50 m. (iii) 2. (iv) (a) 6.40 m. × 11.47 m. (b) 4.57 m. × 9.65 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1961-63. (b) No. (c) Nil. (v) Amaravati and Nanded. (vi) Nil. (vii) As error variances are heterogeneous and Treatments  $\times$  years interaction is absent, results of individual years are presented under 5.—Results.

## 5. RESULTS :

61(189)

(i) 328 Kg/ha. (ii) 72.5 Kg/ha. (iii) Main effect of F is significant. Interaction  $F \times L$ , extra treatments vs. others of  $F \times L \times M$  interaction and between extra treatments are highly significant, W and X components of  $F \times L \times M$  interaction are significant. (iv) Av. yield of *kapas* in Kg/ha.

$N_0=290$ ,  $N_1=316$ ,  $N_2=207$ ,  $N_3=417$ ,  $N_4=236$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
F <sub>1</sub>	426	239	454	380	387	352	373
F <sub>2</sub>	315	394	365	321	376	377	358
F <sub>3</sub>	246	384	309	283	302	354	313
Mean	329	339	376	328	355	361	348
M <sub>1</sub>	259	348	377				
M <sub>2</sub>	368	355	342				
M <sub>3</sub>	360	314	409				

C.D. for F marginal means = 48.7 Kg/ha.

C.D. for extra treatments vs. others = 33.3 Kg/ha.

C.D. for body of  $F \times L$  table = 84.4 Kg/h.

C.D. of extra treatment means = 84.4 Kg/ha.

62(189)

(i) 549 Kg/ha. (ii) 169.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

$N_0=432$ ,  $N_1=509$ ,  $N_2=492$ ,  $N_3=567$ ,  $N_4=533$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
F <sub>1</sub>	527	598	651	582	539	655	592
F <sub>2</sub>	636	555	534	537	642	546	575
F <sub>3</sub>	505	614	528	513	565	569	549
Mean	556	589	571	544	582	590	572
M <sub>1</sub>	503	563	566				
M <sub>2</sub>	606	605	535				
M <sub>3</sub>	559	599	612				

63(230)

(i) 730 Kg/ha. (ii) 100.0 Kg/ha. (iii) Main effect of L, interactions  $F \times L$ ,  $F \times M$  and  $L \times M$  and Z component of  $F \times L \times M$  are significant. Extra treatments among themselves are also significant. (iv) Av. yield of *kapas* in Kg/ha.

$N_0=712, N_1=618, N_2=729, N_3=754$  and  $N_4=813$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
F <sub>1</sub>	741	598	797	635	780	721	712
F <sub>2</sub>	673	738	728	716	721	702	713
F <sub>3</sub>	692	797	827	845	689	782	772
Mean	702	711	784	732	730	735	732
M <sub>1</sub>	649	718	829				
M <sub>2</sub>	792	699	699				
M <sub>3</sub>	665	716	824				

C.D. for L marginal means =67.1 Kg/ha.

C.D. for body of any table =116.2 Kg/ha.

C.D. for extra treatment means =116.2 Kg/ha.

**Crop :- Cotton (Kharif).**

**Ref. :- Mh. 60(41), 61(190), 62(191).**

**Site :- Agri. Res. Stn., Akola.**

**Type :- 'M'.**

Object :- To study the effect of soil and foliar applications of Urea on the yield of Cotton.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton; Groundnut; Groundnut. (c) 9.9 C.L./ha of F.Y.M.+11.2 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub> for 60; 9.9 C.L./ha. of F.Y.M. for others. (ii) Black cotton soil. (iii) 29.6, 60; 11.7, 61; 2.7, 62. (iv) (a) *Bakharings* and harrowings. (b) Dibbling. (c) 11 Kg/ha. (d) 46 cm. × 23 cm. (e) 1 to 2. (v) 12.4 C.L./ha. of F.Y.M. broadcasted. (vi) AK-277 for 60 and 61; AK-235. (vii) Unirrigated for 60; Irrigated for others. (viii) Hoeings and weedings. (ix) 62 cm.; 81.2 cm.; 76.9 cm. (x) 25.11 60 to 18.2, 61; 6 pickings up to the end of March, 62; 6 pickings upto the end of March, 63.

#### 2. TREATMENTS :

All combinations of (1) and (2)+3 extra treatments :

(1) 3 levels of N as Urea :  $N_1=11.2, N_2=22.4$  and  $N_3=33.6$  Kg/ha.

(2) 3 methods of application :  $M_1$ =Full dose through soil,  $M_2$ = $\frac{1}{2}$  dose at sowing+ $\frac{1}{2}$  dose 6 weeks after sowing and  $M_3$ = $\frac{1}{2}$  dose through soil at sowing+ $\frac{1}{2}$  dose through foliar spray 6 weeks after sowing.

Extra treatments :  $E_1=11.2$  Kg/ha. of N through foliar spray six weeks after sowing,  $E_2=22.4$  Kg/ha. of N through foliar spray— $\frac{1}{2}$  dose 6 weeks after sowing and  $\frac{1}{2}$  dose eight weeks after sowing and  $E_3=33.6$  Kg/ha. of N through foliar spray— $\frac{1}{2}$  dose 6 weeks after sowing+ $\frac{1}{2}$  dose 8 weeks after sowing+ $\frac{1}{2}$  dose 10 weeks after sowing.

#### 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 10.97 m × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

#### 4. GENERAL:

(i) Satisfactory. (ii) Mild attack of pink boll worm. Dusting of B.H.C. and Sulphur in 60; Nil for other years. (iii) Yield of *kapas* (iv) (a) 1960-62. (b) No. (c) The results of the combined analysis are presented under 5.—Results (v) Achalpur and Nagpur. (vi) Heavy rains in Oct., 61. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

#### 5. RESULTS :

Pooled results

(i) 603 Kg/ha. (ii) 115.8 Kg/ha. (based on 121 d.f. made up of pooled error and Treatments × years interaction). (iii) Extra treatments vs. others is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

$E_1=540, E_2=564$  and  $E_3=547$  Kg/ha.

	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	Mean
M <sub>1</sub>	577	642	624	614
M <sub>2</sub>	673	676	575	641
M <sub>3</sub>	610	623	580	604
Mean	620	647	593	620

C.D. for extra treatments vs. others=44.2 Kg/ha.

Final results

Treatm	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	Sign.	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Sign.	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>
Year 1960	659	717	641	N.S.	658	712	647	N.S.	566	598	647
1961	376	384	400	N.S.	407	398	356	N.S.	374	367	297
1962	825	840	739	N.S.	778	816	810	N.S.	680	728	695
Pooled	620	647	593	N.S.	614	641	604	N.S.	540	564	547

Sign.	G.M.	S.E./plot
N.S.	655	118.0
*	377	97.8
*	776	141.8
**	607	115.8

**Crop :- Cotton (Kharif).**

**Ref. :- Mh. 61(115), 62(102), 63(141).**

**Site :- Agri. Res. Stn., Akola.**

**Type :- 'M'.**

Object :- To study the relative merits of C/A/N, A/S and Urea in the presence and absence of F.Y.M.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) 9.9 C.L./ha. of F.Y.M.+11.2 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Black cotton soil. (iii) 6.7.61; 6.7.62; 2.7.63. (iv) (a) 1 ploughing and 3 to 4 harrowings. (b) Dibbling. (c) 13 Kg/ha. (d) 46 cm. x 23 cm. (e) 2-3 (v) Nil. (vi) AK-277 for 61; AK-235 for others. (vii) Unirrigated. (viii) 5 hoeings and 2 weedings (ix) 75 cm.; 105 cm.; 51 cm. (x) 1st week of March (final picking) for 61 and 62; 3 pickings from 20.11.63 to 9.1.64 for 63.

2. TREATMENTS :

**Main-plot treatments:**

All combinations of (1) and (2)+control (3 plots)

(1) 3 sources of N : S<sub>1</sub>=A/S, S<sub>2</sub>=C/A/N and S<sub>3</sub>=Urea.

(2) 2 levels of N : N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

**Sub-plot treatments :**

2 levels of F.Y.M. : F<sub>0</sub>=0 and F<sub>1</sub>=56.04 Q/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication, 2 sub-plots/main-plot. (b) 69.49 m. x 20.42 m. (iii) 4. (iv) (a) 10.97 m. x 6.40 m. (b) 9.14 m. x 4.57 m. (v) 91 cm. x 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1961-63. (b) No. (c) Nil. (v) Achalpur, Jalgaon, Nagpur and Nanded. (vi) Nil. (vii) Main-plot error variances are heterogeneous and sub-plot error variances are homogeneous but main-plot Treatments  $\times$  years interaction is absent. Hence results of individual years have been presented under 5—Results.

## 5. RESULTS :

61(115)

(i) 419 Kg/ha. (ii) (a) 109.8 Kg/ha. (b) 89.9 Kg/ha. (iii) Control vs. others alone is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Control ( $F_0$ )=319 Kg/ha. and control ( $F_1$ )=356 Kg/ha.

	$N_1$	$N_2$	$F_0$	$F_1$	Mean
$S_1$	509	451	450	511	480
$S_2$	499	458	488	469	478
$S_3$	408	438	439	408	423
Mean	472	449	459	462	460
$F_0$	451	467			
$F_1$	494	431			

C.D. for control vs. others=56.7 Kg/ha.

62(102)

(i) 517 Kg/ha. (ii) (a) 177.5 Kg/ha. (b) 86.8 Kg/ha. (iii) Main effect of F is highly significant and interactions  $F \times S$ ,  $N \times S$  and control vs. others are significant. (iv) Av. yield of *kapas* in Kg/ha.

Control ( $F_0$ )=401 and control ( $F_1$ )=489 Kg/ha.

	$N_1$	$N_2$	$F_0$	$F_1$	Mean
$S_1$	650	419	489	580	534
$S_2$	643	537	478	701	590
$S_3$	486	588	510	564	537
Mean	593	514	492	615	554
$F_0$	534	450			
$F_1$	652	578			

C.D. for F marginal means 1.5 Kg/ha.

C.D. for F means at the same level of S=88.8 Kg/ha.

C.D. for S means at the same level of F=143.9 Kg/ha.

C.D. for  $N \times S$  table = 116.8 Kg/ha.

C.D. for control vs. others = 45.5 Kg/ha.

63(141)

(i) 904 Kg/ha. (ii) (a) 182.0 Kg/ha. (b) 111.9 Kg/ha. (iii) Main effects of F and control vs. others are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Control ( $F_0$ )=794 Kg/ha., control ( $F_1$ )=814 Kg/ha.

	$N_1$	$N_2$	$F_0$	$F_1$	Mean
$S_1$	943	946	919	971	945
$S_2$	872	1035	889	1018	953
$S_3$	957	891	896	952	924
Mean	924	957	901	980	941
$F_0$	857	945			
$F_1$	991	970			

C.D. for F marginal means = 66.3 Kg/ha.  
 C.D. for control vs. others = 93.9 Kg/ha.

**Corp :- Cotton. (Kharif).**

**Ref :- Mh. 61(45), 62(30), 63(44).**

**Site :- Govt. Exptl. Farm, Amaravati.**

**Type :- 'M'.**

Object:—To study the relative merits of Nitro-phosphate complex by O.D.D.A. and P.E.C. processes on the yield of Cotton.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. ; Wheat ; Tur. (c) N.A. ; G.M. ; 11.2 Kg/ha. of N+11.2 Kg/ha. of  $P_2O_5$ . (ii) Medium black. (iii) 2.7.61 ; 19.7.62 ; 6.7.53. (iv) (a) Cross *bakharig*. (b) Hand dibbling. (c) 8 to 12 Kg/ha. (d) 61 cm. x 30 cm. (e) 2. (v) Nil. (vi) B-147. (vii) Unirrigated. (viii) 3 to 4 hoeings and 3 weedings (ix) 100 cm. ; 100 cm. ; 159 cm. (x) 4 pickings 25.11.61 to 30.1.62 ; 2 pickings 29.12.62 and 21.1.63 ; 5 pickings 14.11.63 to 30.1.64.

#### 2. TREATMENTS :

All combinations of (1), (2) and (3) — 5 additional treatments in each block.

(1) 3 types of fertilizers :  $P_1$ =Super+A/S,  $P_2$ =O.D.D.A. and  $P_3$ =P.E.C.

(2) 3 levels of fertilisers :  $L_1$ =13.4 Kg/ha. of N+11.8 Kg/ha. of  $P_2O_5$ ,  $L_2$ =2  $L_1$  and  $L_3$ =4  $L_1$ .

(3) 3 methods of application :  $M_1$ =Broad cast,  $M_2$ =6.4 cm. below seed and  $M_3$ =Band placement, Additional treatments :  $N_0$ =0,  $N_1$ =13.4,  $N_2$ =26.9,  $N_3$ =40.3 and  $N_4$ =53.8 Kg/ha.

#### 3. DESIGN :

(i)  $3^3$  confd. — 5 additional treatments. (ii) (a) 14 plots/block, 3 blocks/replication. (b) 51.21 m. x 21.95 m. (iii) 2. (iv) (a) 10.97 m. x 6.40 m. (b) 9.14 m. x 5.49 m. (v) 91 cm. x 46 cm. (vi) Yes.

#### 4. GENERAL :

(i) Satisfactory. (ii) Attack of aphids, jassids etc. Endrin sprayed twice. (iii) Yield of *kapas*. (iv) (a) 1961-63. (b) No. (c) The results of the combined analysis have been presented under 5. Results. (v) Akola and Nanded. (vi) Nil. (vii) Error variances are homogeneous and Treatments x years interaction is absent.

#### 5. RESULTS :

Pooled results

(i) 878 Kg/ha. (ii) 122.8 Kg/ha. (based on 141 d.f. made up of pooled error). (iii) Main effect of L is highly significant. Main of effect M and interaction  $L \times M$  is significant. Extra treatments among themselves are also significant. (iv) Av. yield of *kapas* in Kg/ha.

$N_0=767$ ,  $N_1=852$ ,  $N_2=860$ ,  $N_3=883$  and  $N_4=899$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
P <sub>1</sub>	818	924	972	913	929	872	905
P <sub>2</sub>	835	869	895	875	915	810	866
P <sub>3</sub>	847	923	957	944	917	866	909
Mean	833	905	941	911	920	849	893
M <sub>1</sub>	837	970	924				
M <sub>2</sub>	823	907	1030				
M <sub>3</sub>	839	839	871				

C.D. for L or M marginal means = 46.3 Kg/ha.

C.D. for body of L × M table = 80.2 Kg/ha.

C.D. for extra treatment means = 80.2 Kg/ha.

#### Individual results

Treatment	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Sig.	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Sig.	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	Sig.
Year 1961	418	505	593	**	526	546	444	**	538	491	487	N.S.
1962	1111	1154	1218	N.S.	1178	1143	1162	N.S.	1131	1116	1236	*
1963	971	1057	1014	N.S.	1028	1071	943	*	1045	993	1004	N.S.
Pooled	833	905	941	**	911	920	849	*	905	866	909	N.S.

N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	Sig.	G.M.	S.E./plot
388	474	533	542	537	N.S.	502	97.0
1018	1155	1040	1069	1096	**	1130	134.9
896	927	1006	1037	1064	N.S.	1004	132.7
767	852	860	883	899	N.S.	878	122.8

**Crop :- Cotton. (Kharif).**

**Ref :- Mh. 63(212), 64(170).**

**Site :- Reg. Res. Centre, Amaravati.**

**Type :- 'M'.**

**Object :-** To study the effect of different methods of fertilizer placement on the development and yield of Cotton.

#### 1. BASAL CONDITIONS:

(i) (a) Nil. (b) *Jowar*, Cotton. (c) Nil. (ii) Medium black Cotton soil. (iii) 1.7.63 ; 3.7.64. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) 11 Kg/ha. (d) 61 cm. × 30 cm. (e) 1. (v) 12.35 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of K<sub>2</sub>O ; Nil. (vi) 'B-147. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 49 cm. ; 66 cm. (x) 27.11.63 to 3.2.64 ; 10.11.64 to 21.1.65.



## 2. TREATMENTS :

**Main-plot treatments:**

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

(1) 2 levels of N as A/S :  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.(2) 2 levels of  $P_2O_5$  :  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.**Sub-plot treatments:**3 methods of application:  $M_1$ =Broadcast at sowing,  $M_2$ =Ring method at sowing and  $M_3$ =Two side placement 5 cm. away and 5 cm. below soil.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication ; 3 sub-plots/ main-plot. (b) N.A. (iii) 4. (iv) (a) 5.49 m.  $\times$  3.66 m. (b) 4.27 m.  $\times$  2.74 m. (v) 61 cm.  $\times$  61 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1963-65 (treatments modified in 65). (b) No. (c) Nil. (v) and (vi) Nil. (vii) As sub-plot error variances are heterogeneous, results of individual years have been presented under 5. Results.

## 5. RESULTS :

**63(212)**(i) 1147 Kg/ha. (ii) (a) 483.5 Kg/ha. (b) 170.9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=1099 Kg/ha.

	$N_1$	$N_2$	$P_1$	$P_2$	Mean
$M_1$	1100	1046	1130	1116	1123
$M_2$	1179	1157	1169	1167	1168
$M_3$	1268	1162	1211	1159	1185
Mean	1196	1122	1170	1148	1159
$P_1$	1208	1132			
$P_2$	1183	1113			

**64(170)**(i) 1413 Kg/ha. (ii) (a) 262.3 Kg/ha. (b) 304.1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=1383 Kg/ha.

	$N_1$	$N_2$	$P_1$	$P_2$	Mean
$M_1$	1410	1469	1391	1488	1440
$M_2$	1424	1515	1539	1400	1469
$M_3$	1398	1304	1352	1351	1351
Mean	1411	1429	1427	1413	1420
$P_1$	1360	1495			
$P_2$	1462	1364			

**Crop :- Cotton (Kharif).****Ref :- Mh. 65(179).****Site :- Reg. Res. Centre, Amravati.****Type :- 'M'.**

**Object :-** To study the relative efficacy of different nitrogenous fertilizers applied at different stages of crop growth of *Cotton*.

**1. BASAL CONDITIONS:**

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black Cotton soil. (iii) 1, 2.7.65. (iv) (a) Harrowing and bakhering. (b) Dibbling. (c) 9.9 Kg/ha. to 12.0 Kg/ha. (d) 61 cm. x 46 cm. (e) 1. (v) 12 C.L./ha. of F.Y.M. (vi) B-147. (vii) Unirrigated. (viii) 3 weedings, hoeings and thinning. (ix) 51.5 cm. (x) 3 pickings from 6.10.65 to 24.11.65.

**2. TREATMENTS :**

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

(1) 4 sources of N to supply 44.8 Kg/ha. of N :  $S_1=A/S$ ,  $S_2=Chilian\ nitrate$ ,  $S_3=Urea$  and  $S_4=Nitro-phosphate\ O.D.D.A.$

(2) 3 stages of N application :  $M_1=Entire\ dose\ at\ sowing$ ,  $M_2=Entire\ doses\ at\ sowing\ and\ flowering$  and  $M_3=Entire\ doses\ at\ sowing,\ thinning\ and\ flowering.$

**3. DESIGN :**

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) 6.10 m. x 3.05 m. (b) 4.87 m. x 2.12 m (v) 61 cm. x 46 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Height, no. of internodes and yield of *kapas*. (iv) (a) 1965—only. (b) and (c) No. (v) to (vii) No.

**5. RESULTS :**

(i) 1519 Kg/ha. (ii) 306.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=1347 Kg/ha.

	$S_1$	$S_2$	$S_3$	$S_4$	Mean
$M_1$	1602	1412	1493	1579	1522
$M_2$	1725	1283	1515	1422	1486
$M_3$	1796	1497	1436	1634	1591
Mean	1708	1397	1481	1545	1533

**Crop :- Cotton (Kharif).****Ref :- Mh. 65(182).****Site :- Reg. Res. Centre, Amravati.****Type :- 'M'.**

**Object :-** To study the effect of different methods of fertilizer placement on the development and yield of *Cotton*.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black cotton soil. (iii) 2, 3.7.65. (iv) (a) Harrowing and bakhering. (b) Dibbling. (c) 10 to 12 Kg/ha. (d) 61 cm. x 46 cm. (e) 1. (v) 12 C.L./ha. of F.Y.M. (vi) B-147. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 51.5 cm. (x) 9.11.65, 23.11.65 and 14.12.65.

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

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

(1) 2 levels of N as A/S :  $N_1=22.5$  and  $N_2=45.0$  Kg/ha.

(2) 2 levels of  $P_2O_5$  as Super :  $P_1=22.5$  and  $P_2=45.0$  Kg/ha.

**Sub-plot treatments :**

4 methods of application :  $M_1=Broadcast$ ,  $M_2=Ring\ method\ at\ surface$ ,  $M_3=5\ cm.\ to\ the\ side\ and\ 5\ cm.\ deep$  and  $M_4=5\ cm.\ to\ the\ side\ and\ 10\ cm.\ deep.$

## 3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 5.48 m. × 3.66 m. (b) 4.27 m. × 2.74 m. (v) 61 cm. × 46 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of *kapas*. (iv) 1963-65 (Treatments modified in 65). (b) No. (c) Nil. (v) to (vii) Nil.

## 5. RESULTS:

(i) 1539 Kg/ha. (ii) (a) 344.4 Kg/ha. (b) 211.3 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=1530 Kg/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
N <sub>1</sub>	1358	1340	8539	1492	1469	1395	1432
N <sub>2</sub>	1692	1727	1555	1507	1657	1645	1651
Mean	1617	1603	1525	1507	1563	1519	1541
P <sub>1</sub>	1617	1603	1525	1507			
P <sub>2</sub>	1432	1464	1569	1613			

C.D. for N marginal means=181 Kg/ha.

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 63(31), 64(25), 65(130).**

**Site :- Agri. College Farm, Dhulia.**

**Type :- 'M'.**

**Object :-** To study the effect of different levels of N, P and K on the yield of Cotton.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton for 63; Wheat for others. (c) 44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>; 44.8 Kg/ha. of N; G.M. (ii) Medium black soil. (iii) 17.5.63; 3, 4.5.64; 11.5.65. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) N.A. (d) 122 cm. × 91 cm. (e) 2. (v) 24.7 CL/ha. of F.Y.M.; 125.5 Q/ha. of F.Y.M.; 62.8 Q/ha. of F.Y.M. (vi) 170—CO<sub>2</sub>. (vii) Irrigated. (viii) Weeding and hoeing. (ix) 51 cm.; 65 cm.; 46 cm. (x) 1.12.63 to 28.1.64; 14.12.64 to 15.2.65; 6.12.65 to 4.3.66.

## 2. TREATMENTS :

All combinations of (1), (2) and (3)+a control in each block.

(1) 3 levels of N as A/S : N<sub>1</sub>=44.8, N<sub>2</sub>=89.7 and N<sub>3</sub>=134.5 Kg/ha.

(2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=44.8 and P<sub>2</sub>=89.7 Kg/ha.

(3) 3 levels of K<sub>2</sub>O as Pot. Sul. : K<sub>0</sub>=0, K<sub>1</sub>=67.2 and K<sub>2</sub>=134.5 Kg/h.

## 3. DESIGN :

(i) 3<sup>3</sup> confd. +1 control. (ii) (a) 10 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 12.80 m. × 9.75 m. (b) 10.97 m. × 7.31 m. (v) 91 cm. × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Jassids and aphids attack. Endrin and Ultra Sulphur sprayed. (iii) Yield of *kapas*. (iv) (a) 1963-65. (b) No. (c) Nil. (v) Kopergaon. (vi) Nil. (vii) As error variances are heterogeneous and Treatments × years interaction is absent, results of individual years are presented under 5. Results.

## 5. RESULTS :

63(31)

- (i) 1401 Kg/ha. (ii) 1607 Kg/ha. (iii) Control vs. others is highly significant. Main effect of N is significant.  
 (iv) Av. yield of *kapas* in Kg/ha.

Control=1582 Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
N <sub>1</sub>	1397	1485	1538	1464	1519	1437	1473
N <sub>2</sub>	1348	1247	1417	1387	1344	1281	1337
N <sub>3</sub>	1295	1377	1322	1409	1274	1310	1331
Mean	1347	1370	1426	1420	1379	1343	1381
K <sub>0</sub>	1338	1424	1498				
K <sub>1</sub>	1404	1369	1364				
K <sub>2</sub>	1228	1317	1415				

C.D. for N marginal means=109.9 Kg/ha.

C.D. for control vs. others =141.9 Kg/ha.

64(25)

- (i) 625 Kg/ha. (ii) 128.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=654 Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
N <sub>1</sub>	684	584	725	707	600	686	664
N <sub>2</sub>	605	574	562	590	571	581	581
N <sub>3</sub>	595	605	666	598	616	652	622
Mean	628	588	651	632	596	640	622
K <sub>0</sub>	702	525	669				
R <sub>1</sub>	577	644	566				
K <sub>2</sub>	606	594	719				

65(130)

- (i) 348 Kg/ha. (ii) 84.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=314 Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
N <sub>1</sub>	384	385	341	389	345	377	370
N <sub>2</sub>	309	348	354	317	334	360	337
N <sub>3</sub>	362	353	336	360	344	347	350
Mean	351	362	344	355	341	361	352
K <sub>0</sub>	358	359	348				
K <sub>1</sub>	335	353	335				
K <sub>2</sub>	362	374	348				

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 61(27), 62(8), 63(8).**

**Site :- Agri. Res. Stn., Jalgaon.**

**Type :- 'M'.**

**Object :-** To study the relative merits of C/A/N with Urea and A/S in the presence and absence of F.Y.M. on the yield of Cotton.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Coriander : *Sesamum* ; Groundnut. (c) N.A. (ii) Deep black cotton soil. (iii) 3.7.61 ; 9.7.62 ; 29.6.63. (iv) (a) N.A. (b) Dibbling. (c) 9 to 11 Kg/ha. (d) 46 cm. × 20 cm. (e) 2. (v) Nil. (vi) Virnar 197-3. (vii) Unirrigated. (viii) Hoeing and weeding. (ix) N.A. ; 44 cm. ; 51 cm. (x) 3 pickings 14.11.61 to 4.1.62 ; 2 pickings 20.11.62 to 12.12.62 ; Nov., Dec. 63.

**2. TREATMENTS .**

**Main-plot treatments :**

All combinations of (1) and (2) + control (3 plots)

(1) 3 sources of N :  $S_1 = A/S$ ,  $S_2 = C/A/N$  and  $S_3 = Urea$ .

(2) 2 levels of N :  $N_1 = 22.4$  and  $N_2 = 44.8$  Kg/ha.

**Sub-plot treatments :**

2 levels of F.Y.M. :  $F_0 = 0$  and  $F_1 = 56.0$  Q/ha.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 9 main-plots replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 6.40 m (b) 9.14 m. × 4.57 m (v) 91 cm × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Attack of boll worm 5 % B.H.C. and Sulphur in 1 : 1 ratio sprayed. (iii) Yield of *kapas*. (iv) (a) 1961-63. (b) No. (c) The results of the combined analysis have been presented under 5. Results. (v) Achalpur, Akola, Nagpur and Nanded. (vi) Nil. (vii) Both the main-plot and sub-plot error variances are homogeneous and Treatments × years interaction are absent.

**5. RESULTS :**

**Pooled results**

(i) 819 Kg/ha. (ii) (a) 107.4 Kg/ha. (based on 78 d.f. made up of pooled error). (b) 78.6 Kg/ha. (based on 90 d.f. made up of pooled error). (iii) Main effect of N is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Control ( $F_0$ ) = 662 and control ( $F_1$ ) = 703 Kg/ha.

	$N_1$	$N_2$	$F_0$	$F_1$	Mean
$S_1$	844	886	869	861	865
$S_2$	849	911	856	904	880
$S_3$	898	936	911	923	917
Mean	864	911	879	896	887
$F_0$	857	900			
$F_1$	870	922			

C.D. for N marginal means = 35.7 Kg/ha.

## Individual results

Treatment	N <sub>1</sub>	N <sub>2</sub>	Sig.	F <sub>0</sub>	F <sub>1</sub>	Sig.	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Sig.
Year 1961	374	520	* *	421	473	N.S.	451	453	437	N.S.
1962	1125	1119	N.S.	1133	1111	N.S.	1103	1087	1176	N.S.
1963	1092	1094	N.S.	1082	1104	N.S.	1041	1100	1138	N.S.
Pooled	864	911	* *	879	896	N.S.	865	880	917	N.S.

Control (F <sub>0</sub> )	Control (F <sub>1</sub> )	Sig.	G.M.	S.E./plot	
				Main plot	Sub-plot
233	261	* *	380	81.1	71.7
905	973	* *	1061	121.8	95.7
848	876	* *	1016	115.0	65.1
662	703	N.S.	819	107.4	78.6

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 63(41), 64(36), 65(217).**

**Site :- Agri. Res. Stn., Kopergaon.**

**Type :- 'M'.**

Object :- To study the effect of different levels of N, P and K on the yield of Cotton.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*; *Tur*; *Wheat*. (c) 44.8 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>; 22.4 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>; 12.4 C.L./ha. of F.Y.M.+22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) N.A. (iii) 2.5.63; 15.5.64; 16.5.65. (iv) (a) Ploughings and harrowings. (b) Dibbling. (c) 5 K<sub>2</sub>/ha (d) 122 cm. × 122 cm. (e) 2. (v) 62.8 Q/ha. of F.Y.M. for 63 and 64; 12.4 C.L./ha. of F.Y.M. for 65. (vi) 170-CO<sub>2</sub> (vii) Irrigated. (viii) Weedings and interculturings. (ix) 24 cm.; 41 cm.; 60 cm. (x) 4 pickings from 25.10.63 to 21.1.64; 3 pickings 25.12.64 to 22.2.65; 16.1.66.

#### 2. TREATMENTS :

All combinations of (1), (2) and (3)+a control

(1) 3 levels of N as A/S : N<sub>1</sub>=44.8, N<sub>2</sub>=89.6 and N<sub>3</sub>=134.5 Kg/ha.

(2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=44.8 and P<sub>2</sub>=89.6 Kg/ha.

(3) 3 levels of K<sub>2</sub>O as Pot Sul. : K<sub>0</sub>=0, K<sub>1</sub>=67.2 and K<sub>2</sub>=134.5 Kg/ha.

#### 3. DESIGN :

(i) 3<sup>3</sup> confd.+1 control. (ii) (a) 10 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 13.41 m. × 9.75 m. (b) 10.97 m. × 7.31 m. (v) 122 cm. × 122 cm. (vi) Yes.

#### 4. GENERAL :

(i) Satisfactory. (ii) Slight attack of boll worm, aphids and Jassids etc. Endrin, wettable Sulphur and Blitox applied. (iii) Yield of *kapas*. (iv) (a) 1963-65. (b) No. (c) The results of the combined analysis have been presented under 5. Results. (v) Dhulia. (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

#### 5. RESULTS :

Pooled results

(i) 1006 Kg/ha. (ii) 249.8 Kg/ha. (based on 81 d.f. made up of pooled error). (iii) Main effect of N is highly significant. Control vs. others is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=606 Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
N <sub>1</sub>	901	840	898	877	914	848	880
N <sub>2</sub>	1020	932	928	1048	999	833	960
N <sub>3</sub>	1226	1372	1330	1335	1334	1261	1310
Mean	1049	1048	1052	1087	1082	981	1050
K <sub>0</sub>	1037	1103	1120				
K <sub>1</sub>	1092	1058	1095				
K <sub>2</sub>	1019	983	941				

C.D. for N marginal means=95.8 Kg/ha.

C.D. for control vs. others =123.7 Kg/ha.

## Individual results

Treatment	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Sig.	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Sig.	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	Sig.
Year												
1963	1412	1392	1342	N.S.	1458	1453	1234	*	1124	1164	1857	**
1964	740	802	828	N.S.	804	782	784	N.S.	802	726	842	N.S.
1965	996	952	987	N.S.	998	1011	925	N.S.	713	987	1231	**
Pooled	1049	1048	1052	N.S.	1087	1082	981	N.S.	880	960	1310	**

Control	Sig.	G.M.	S.E. plot
827	**	1326	296.5
492	**	760	200.6
500	**	930	243.1
606	**	1006	249.8

**Crop :- Cotton (Kharif).****Ref. :- Mh. 60(95).****Site :- Agri. Res. Stn., Latur.****Type :- 'M'.**

Object :- To study the effect of different levels of N and P with and without F.Y.M. on the yield of Cotton.

## 1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Medium black cotton soil. (iii) 22.7.60. (iv) (a) 1 ploughing and 3 harrowings. (b) Hand sowing in furrows. (c) 17.9 Kg/ha. (d) 46 cm. x 8 to 10 cm. (e) N.A. (v) Nil. (vi) G-1422. (vii) Unirrigated. (viii) 2 weedings and 1 hoeing. (ix) N.A. (x) 15.11.60.

## 2. TREATMENTS :

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

(1) 3 levels of N as A.S : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 2 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0 and P<sub>1</sub>=33.6 Kg/ha.

(3) 2 levels of F.Y.M. : F<sub>0</sub>=0 and F<sub>1</sub>=24.7 C.L./ha.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 7.31 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Poor. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) to (c) Nil. (v) Nil. (vi) Dry spell in August due to which growth was checked. (vii) Due to dry spell in July, sowing was late.

## 5. RESULTS :

(i) 397 Kg/ha. (ii) 121.2 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of *kapas* in Kg/ha

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
P <sub>0</sub>	316	406	443	341	436	388
P <sub>1</sub>	333	403	482	419	393	406
Mean	324	404	462	380	414	397
F <sub>0</sub>	312	402	426			
F <sub>1</sub>	337	407	499			

C.D. for N marginal means = 87.2 Kg/ha.

**Crop :- Cotton (Kharif).**

**Ref. :- Mh. 61(142).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'M'.**

**Object :-** To find out the relative merits of cotton seed cake and G.N.C. with A/S on the yield of Cotton.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Black Cotton soil. (iii) 3.7.61. (iv) (a) Harrowing. (b) Dibbling. (c) 11 Kg/ha. (d) 61 cm. × 30 cm. (e) 1—2. (v) Nil. (vi) B-147. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 127 cm. (x) 4.12.61 to 13.3.62.

## 2. TREATMENTS :

6 manurial treatments : M<sub>0</sub> = Control, M<sub>1</sub> = 44.8 Kg/ha. of N as A/S + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super, M<sub>2</sub> = 44.8 Kg/ha. of N as G.N.C., M<sub>3</sub> = 44.8 Kg/ha. of N as G.N.C. + P<sub>2</sub>O<sub>5</sub> as Super to make up 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, M<sub>4</sub> = 44.8 Kg/ha. of N as cotton seed cake and M<sub>5</sub> = 44.8 Kg/ha. of N as cotton seed cake + P<sub>2</sub>O<sub>5</sub> as Super to make up 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 6.10 m. (b) 9.14 m. × 4.88 m. (v) 91 cm. × 61 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1961—only. (b) and (c) —. (v) to (vii) Nil.

## 5. RESULTS :

(i) 389 Kg/ha. (ii) 67.2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>
Av. yield	323	454	383	387	380	408



**Crop :- Cotton (Kharif).**

**Ref. :- Mh. 61(116), 62(103), 63(142).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'M'.**

Object :- To study the relative merits of C/A/N with A/S and Urea in the presence and absence of F.Y.M. on the yield of Cotton.

1. BASAL CONDITIONS

(i) (a) Nil. (b) Wheat ; Jowar ; Fallow. (c) Nil. (ii) Black cotton soil. (iii) 3.7.61 ; 3.7.62 ; 27.6.63. (iv) (a) Tractor ploughing and harrowing. (b) Dibbling. (c) N.A. (d) 61 cm. x 23 cm. (e) N.A. (v) Nil. (vi) B-147. (vii) Unirrigated. (viii) 3 weeding and hoeings. (ix) 128 cm. ; 110 cm. ; 83 cm. (x) 4 pickings from 12.12.61 to 27.2.62 ; 6 pickings from 23.11.62 to 28.1.63 ; pickings between 21.10.63 and 10.1.64.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1) and (2) + control (3 plots)

(1) 3 sources of N :  $S_1 = A/S$ ,  $S_2 = C/A/N$  and  $S_3 = Urea$ .

(2) 2 levels of N :  $N_1 = 22.4$  and  $N_2 = 44.8$  Kg/ha.

**Sub-plot treatments :**

2 levels of F.Y.M. :  $F_0 = 0$  and  $F_1 = 5604$  Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication, 2 sub-plots/main-plot. (iii) N.A. (iv) 4. (v) (a) 10.97 m. x 6.40 m. (b) 9.14 m. x 4.57 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Boll-worm attack. Endrin sprayed and B.H.C. dusted. (iii) Yield of kapas. (iv) (a) 1961-63. (b) No. (c) Nil. (v) Achalpur, Akola, Jalgaon and Nanded. (vi) Nil. (vii) As both the main-plot and sub-plot error variances are heterogeneous, the results of individual years are presented under 5.—Results.

5. RESULTS

**61(116)**

(i) 351 Kg/ha. (ii) (a) 312.5 Kg/ha. (b) 93.8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of kapas in Kg/ha.

Control ( $F_0$ )=238 and control ( $F_1$ )=263 Kg/ha.

	$N_1$	$N_2$	$F_0$	$F_1$	Mean
$S_1$	384	689	514	559	536
$S_2$	413	251	313	351	332
$S_3$	335	332	314	354	334
Mean	377	424	380	421	401
$F_0$	362	399			
$F_1$	392	450			

**62(103)**

(i) 784 Kg/ha. (ii) (a) 170.6 Kg/ha. (b) 149.3 Kg/ha. (iii) Control vs. others is highly significant. Interaction S x N is significant. (iv) Av. yield of kapas in Kg/ha.

Control ( $F_0$ )=701 and control ( $F_1$ )=667 Kg/ha.

	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
S <sub>1</sub>	841	1006	950	897	924
S <sub>2</sub>	844	765	801	808	804
S <sub>3</sub>	843	703	801	744	773
Mean	842	825	851	816	834
F <sub>0</sub>	863	839			
F <sub>1</sub>	822	811			

C.D. for control vs others=87.7 Kg/ha.

C.D. for body of S×N table=175.4 Kg/ha.

63(142)

(i) 1609 Kg/ha. (ii) (a) 456.0 Kg/ha. (b) 262.8 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of kapas in Kg/ha.

Control ( $F_0$ )=1529 and control ( $F_1$ )=1599 Kg/ha.

	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
S <sub>1</sub>	1626	1700	1584	1741	1663
S <sub>2</sub>	1180	1763	1403	1539	1471
S <sub>3</sub>	1581	1939	1710	1810	1760
Mean	1462	1801	1566	1696	1631
F <sub>0</sub>	1405	1727			
F <sub>1</sub>	1519	1874			

C.D. for N marginal means=270.6 Kg/ha.

**Crop :- Cotton (Kharif).****Ref :- Mh. 60(189), 61(139), 62(127).****Site :- Agri. College Farm, Nagpur.****Type :- 'M'.****Object :-**To study the effect of soil and foliar application of Urea on the yield of Cotton.**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) Black cotton soil. (iii) 25.6.60; 6.7.61; 8.7.62. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) 11 Kg/ha. (d) 61 cm.×30 cm. (e) 11. (v) Nil. (vi) B-147. (vii) Un-irrigated. (viii) 2 to 3 weedings and hoeings. (ix) 101 cm.; 127 cm.; 110 cm. (x) 10.11.60 to 8.1.61; 7.12.61 to 12.2.62; 24.11.62 to 1.2.63.

**2. TREATMENTS :**

All combinations of (1) and (2)

(i) 3 levels of N as Urea : N<sub>1</sub>=11.2, N<sub>2</sub>=22.4 and N<sub>3</sub>=33.6 Kg/ha.(2) 4 times and method of application : M<sub>1</sub>=Full dose through soil at sowing, M<sub>2</sub>= $\frac{1}{2}$  dose at sowing and  $\frac{1}{2}$  dose 6 weeks later through soil, M<sub>3</sub>= $\frac{1}{2}$  dose through soil at sowing +  $\frac{1}{2}$  dose as foliar spray after 6 weeks of sowing and M<sub>4</sub>=Full dose after 6 weeks of sowing as foliar spray.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *kapas*. (vi) (a) 1960-62. (b) No. (c) Nil. (v) Achalpur and Akola. (vi) Nil (vii) As the error variances are heterogeneous and Treatments × years as interaction is absent, results of individual years are presented under 5.—Results.

## 5. RESULTS :

60(189)

(i) 314 Kg/ha. (ii) 154.8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	Mean
N <sub>1</sub>	512	153	304	300	317
N <sub>2</sub>	377	281	369	225	313
N <sub>3</sub>	314	329	305	297	311
Mean	401	254	326	274	314

61(139)

(i) 433 Kg/ha. (ii) 85.9 Kg/ha. (iii) Main effect of N is significant. (iv) Av. yield of *kapas* in Kg/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	Mean
N <sub>1</sub>	435	370	335	410	388
N <sub>2</sub>	463	413	453	374	426
N <sub>3</sub>	527	529	426	455	484
Mean	475	437	405	413	433

C.D. for N marginal means = 62.5 Kg/ha.

62(127)

(i) 746 Kg/ha. (ii) 87.5 Kg/ha. (iii) Main effect of M is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	Mean
N <sub>1</sub>	676	772	793	647	722
N <sub>2</sub>	841	760	740	603	736
N <sub>3</sub>	785	810	867	663	781
Mean	767	781	800	638	746

C.D. for M marginal means = 72.7 Kg/ha.

**Crop :- Cotton. (Kharif).**

**Ref :- Mh. 61(28), 62(9), 63(9), 64(5).**

**Site :- Cotton. Res. Stn., Nanded.**

**Type :- 'M'.**

**Object :-** To study the relative merits of C/A/N with A/S and Urea in the presence and absence of F.Y.M. on the yield of Cotton.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*, Cotton, *Jowar*, N.A. (c) 56 Kg/ha. of N as A/S for 61 ; N.A. for other years. (ii) Black soil. (iii) 29.6.61 ; 2.7.62 ; 29.6.63 ; 27.6.64. (iv) (a) 2 harrowings. (b) By draw tube behind seed drill (c) N.A. (d) 46 cm. between rows. (e) 2. (v) Nil. (vi) Gaorani 1946. (vii) Unirrigated. (viii) Hoeing and weeding. (ix) 122 cm. ; 119 cm. ; 111 cm. 66 cm. (x) 27.12.61 ; 11.12.62 and 5.2.63 ; 25.12.63 and 6.2.64 ; 29.11.64 to 30.12.64.

## 2. TREATMENTS :

## Main-plot treatments :

All combinations of (1) and (2)+control (3 plots)

(1) 3 sources of N :  $S_1=A/S$ ,  $S_2=C/A/N$  and  $S_3=Urea$ .

(2) 2 levels of N :  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

## Sub-plot treatments :

2 levels of F.Y.M. :  $F_0=0$  and  $F_1=5604$  Kg/ha.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  6.10 m. (b) 9.14 m.  $\times$  4.57 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Attack of Pink boll worm, Jassids and Dahiya. Sulphur dusted and Endrin sprayed. (iii) Yield of *kapas*. (iv) (a) 1961-64. (b) No. (c) Nil. (v) Achalpur, Akola, Jalgaon and Nagpur. (vi) Nil. (vii) As both the main-plot and sub-plot error variances are heterogeneous, the results of individual years are presented under 5. Results.

## 5. RESULTS :

61(28)

(i) 103 Kg/ha. (ii) (a) 47.3 Kg/ha. (b) 19.1 Kg/ha. (iii) Control vs. others is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control ( $F_0$ )=80 and control ( $F_1$ )=91 Kg/ha.

	$N_1$	$N_2$	$F_0$	$F_1$	Mean
$S_1$	104	148	127	125	126
$S_2$	130	100	119	111	115
$S_3$	104	84	91	98	94
Mean	113	111	112	112	112
$F_0$	110	115			
$F_1$	116	107			

C.D. for control vs. others = 24.3 Kg/ha.

62(9)

(i) 167 Kg/ha. (ii) (a) 121.8 Kg/ha. (b) 38.2 Kg/ha. (iii) Main effect of F is highly significant. Control vs others is significant. (iv) Av. yield of *Kapas* in Kg/ha.

Control ( $F_0$ )=108 and control ( $F_1$ )=111 Kg/ha.

	$N_1$	$N_2$	$F_0$	$F_1$	Mean
$S_1$	139	253	183	209	196
$S_2$	205	189	173	221	196
$S_3$	197	194	169	222	195
Mean	180	212	175	217	196
$F_0$	162	188			
$F_1$	199	236			

C.D. for control vs. others = 62.6 Kg/ha.  
C.D. for F marginal means = 22.5 Kg/ha.

63(9)

(i) 326 Kg/ha. (ii) (a) 54.1 Kg/ha. (b) 52.6 Kg/ha. (iii) Main effects of N, F and control vs. others are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Control ( $F_0$ )=226 and control ( $F_1$ )=234 Kg/ha.

	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
S <sub>1</sub>	322	428	358	393	375
S <sub>2</sub>	326	432	351	406	379
S <sub>3</sub>	302	436	335	403	369
Mean	317	432	348	401	374
F <sub>0</sub>	312	385			
F <sub>1</sub>	322	480			

C.D. for N marginal means =32.1 Kg/ha.

C.D. for F marginal means =31.0 Kg/ha.

C.D. for control vs. others =27.8 Kg/ha.

64(5)

(i) 173 Kg/ha. (ii) (a) 81.3 Kg/ha. (b) 57.4 Kg/ha. (iii) Control vs others is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Control  $F_0$ =113 and Control  $F_1$ =134 Kg/ha.

	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
S <sub>1</sub>	161	212	181	193	187
S <sub>2</sub>	156	214	181	190	185
S <sub>3</sub>	214	230	198	246	222
Mean	177	219	187	210	198
F <sub>0</sub>	160	213			
F <sub>1</sub>	194	225			

C.D. for control vs. others =41.8 Kg/ha.

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 61(19), 62(2), 63(2), 64(2).**

**Site :- Cotton, Res. Stn., Nanded.**

**Type :- 'M'.**

**Object :-** To study the relative merits of Nitro-phosphate complex by O.D.D.A. and P.E.C. processes on the yield of Cotton,

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar* for 61 and 62, *Wheat* for others. (c) Nil. (ii) Black cotton soil. (iii) 24.6.61 ; 10.7.62 ; 20.6.63 ; 29.6.64. (iv) (a) Ploughings and harrowings. (b) Drilling. (c) N.A. (d) 46 cm. between rows. (e) N.A. (v) Nil. (vi) Gao-46. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 127 cm. ; 101 cm ; 121 cm ; 67 cm. (x) 21.12.61 ; 24.12.62 to 14.2.63 ; 24.12.63 to 29.1.64 ; 23.11.64 to 8.1.65.

## 2. TREATMENTS:

All combinations of (1), (2) and (3)+5 additional treatments in each block

(1) 3 types of fertilizers:  $P_1$ =Super+A/S,  $P_2$ =O.D.D.A. and  $P_3$ =P.E.C.

(2) 3 levels of fertilizers:  $L_1$ =13.4 Kg/ha. of N+11.8 Kg/ha. of  $P_2O_5$ ,  $L_2$ =26.9 Kg/ha. of N+23.5 Kg/ha. of  $P_2O_5$  and  $L_3$ =53.8 Kg/ha. of N+47.1 Kg/ha. of  $P_2O_5$ .

(3) 3 methods of application:  $M_1$ =Broadcast,  $M_2$ =6.3 cm. below seed and  $M_3$ =Band-placement.  
5 additional treatments:  $N_0$ =0,  $N_1$ =13.4,  $N_2$ =26.9,  $N_3$ =40.3 and  $N_4$ =53.8 Kg/ha. of N.

## 3. DESIGN:

(i)  $3^3$  confd.+5Extra treatments (ii) (a) 14 plots/block, 3 blocks/replication. (b) N.A. (iii) 2.  
(iv) (a) 10.97 m.×7.32 m. (b) 9.14 m.×5.49 m. (v) 91 cm.×91 cm. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory. (ii) Ball worm thrips and Jassids attack Blitox sprayed and Sulphur dusted. (iii) Yield of *kapas* (iv) (a) 1961—64. (b) No. (c) The results of the combined analysis have been presented under 5. Results (v) Akola and Amaravati. (vi) Heavy rains affected the growth in 62 and 63. (vii) Error variances are heterogeneous and various components of Treatments×years interactions are present except  $M \times P \times$  years interaction.

## 5. RESULTS:

Pooled results

(i) 139 Kg/ha. (ii) 78.5 Kg/ha. (based on 54 d.f. made up of interactions of years with  $M, P, L, M \times L$  and  $P \times L$  and extra treatments. (iii) Main effect of L is highly significant. Extra treatments among themselves are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

$N_0$ =85,  $N_1$ =120,  $N_2$ =164,  $N_3$ =138 and  $N_4$ =182 Kg/ha.

	$P_1$	$P_2$	$P_3$	$M_1$	$M_2$	$M_3$	Mean
$L_1$	116	102	112	100	117	112	110
$L_2$	134	128	120	140	122	119	127
$L_3$	168	169	203	191	183	167	180
Mean	139	133	145	144	141	133	139

C.D. for L marginal means=26.2 Kg/ha.

C.D. for N means =45.4 Kg/ha.

## Individual results

Treatment	$M_1$	$M_2$	$M_3$	Sig.	$P_1$	$P_2$	$P_3$	Sig.	$L_1$	$L_2$	$L_3$	Sig.
Year												
1961	82	82	71	N.S.	78	73	84	N.S.	68	82	85	N.S.
1962	109	91	94	N.S.	81	107	106	N.S.	78	91	125	**
1963	234	234	216	N.S.	229	203	252	*	163	206	315	**
1964	150	156	150	N.S.	169	149	138	N.S.	130	130	196	**
Pooled	144	141	133	N.S.	139	133	155	N.S.	110	127	180	**

$N_0$	$N_1$	$N_2$	$N_3$	$N_4$	Sig.	G.M.	S.E./plot.
53	78	126	85	99	N.S.	82	37.9
71	98	102	78	98	N.S.	95	35.9
105	172	233	217	339	N.S.	223	49.8
111	133	196	173	190	N.S.	155	61.8
85	120	164	138	182	N.S.	139	78.5

**Crop :- Cotton. (Kharif).****Ref :- Mh. 60(77).****Site :- Agri. Res. Stn., Parbhani.****Type :- 'M'.**

Object :—To study the effect of different levels and sources of N on the yield of Cotton.

**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) Groundnut. (c) As per treatments. (ii) Medium black. (iii) 1.7.60. (iv) (a) 3 harrowings. (b) Drilling. (c) 13.4 Kg/ha. (d) 46 cm. between rows. (e) N.A. (v) Nil. (vi) Daulak (2204). (vii) Unirrigated. (viii) 2 weedings and hoeings. (ix) 77.6 cm. (x) Pickings on 7 and 8.11.60, 25 and 26.11.60, 15 and 16.12.60, 11.1.61.

**2. TREATMENTS :**

All combinations of (1), (2) and (3)+2 extra treatments (2 plots each)

(1) 2 sources of N :  $S_1=A/S$  and  $S_2=A/C$ .(2) 2 levels of N :  $N_1=33.6$  and  $N_2=67.2$  Kg/ha.(3) 2 levels of  $P_2O_5$  : as Super  $P_0=0$  and  $P_1=33.6$  Kg/ha.Extra treatments :  $E_0=Control$  and  $E_1=33.6$  Kg/ha. of  $P_2O_5$  as Super applied to previous Groundnut crop.**3. DESIGN :**

(i) R.B.D. (ii) (a) 12. (b) 32.92 m. × 29.26 m. (iii) 3. (iv) (a) 7.31 m. × 10.97 m. (b) 5.49 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Crop growth was vigorous. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1958–60. (b) No. (c) Nil. (v) to (vi) Nil.

**5. RESULTS :**

(i) 1086 Kg/ha. (ii) 128.8 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of *kapas* in Kg/ha.

 $E_0=1043$  and  $E_1=1100$  Kg/ha.

	$S_1$	$S_2$	$P_0$	$P_1$	Mean
$N_1$	1040	1024	995	1069	1032
$N_2$	1180	1130	1156	1154	1155
Mean	1110	1077	1076	1111	1093
$P_0$	1152	1000			
$P_1$	1068	1155			

C.D. for N marginal means = 109.0 Kg/ha.

**Crop :- Cotton. (Kharif).****Ref :- Mh. 63(49).****Site :- Agri. Res. Stn., Achalpur.****Type :- 'C'.**

Object :—To study the possibility of reducing the quantity of irrigation water by raising seedlings in the nursery and then transplanting them.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*. (c) 22.4 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$ . (ii) Medium black. (iii) As per treatments/ 21.6.63. (iv) (a) 1 heavy *Bakharnig* and 2 light *bakharing*. (b) Transplanting after flood irrigation. (c) 7.4 Kg/ha. 122 cm. × 91 cm. (e) N.A. (v) 125.5 Q/ha. of F.Y.M. + 50.4 Kg/ha. of N on 22.7.63 and 50.4 Kg/ha. of N on 26.8.63. (vi) B-147. (vii) Irrigated. (viii) 3 hoeings and 3 weedings. (ix) 38.9 cm. (x) 29.11.63, 22.12.63 and 21.1.64.

## 2. TREATMENTS :

6 dates of sowing for raising seedlings :  $D_1=20.4.63$ ,  $D_2=1.5.63$ ,  $D_3=10.5.63$ ,  $D_4=20.5.63$ ,  $D_5=30.5.13$  and  $D_6=$  Monsoon sowing directly in the field on the date of transplanting other treatments.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a)  $10.97 \text{ m.} \times 6.40 \text{ m.}$  (b)  $8.53 \text{ m.} \times 4.57 \text{ m.}$  (v)  $122 \text{ cm.} \times 91 \text{ cm.}$  (vi) Yes.

## 4. GENERAL :

(i) Germination was satisfactory. (ii) B.H.C. 10% dusted. (iii) Final stand, height, boll count and yield of *kapas*. (iv) (a) 1963—66 (treatments modified in 1964). (b) No. (c) Nil. (v) Akola. (vi) Nil. (vii) Seedling sown on  $D_1$ ,  $D_2$  and  $D_3$  were tender and sickly and heavy mortality was observed in  $D_1$  and  $D_2$  after transplanting. The plants could not develop despite heavy application of N till 22.8.63. The showers during first fortnight of August however forced the plants towards vegetative growth. The flowering was delayed despite early sowing and could be observed after 98 days in  $D_1$ . Usually the variety flowers in 55 to 58 days.

## 5. RESULTS :

(i) 1459 Kg/ha. (ii) 230.6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	$D_1$	$D_2$	$D_3$	$D_4$	$D_5$	$D_6$
Av. yield.	1611	1558	1389	1523	1468	1207

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 64(44), 65(27).**

**Site :- Agri. Res. Stn., Achalpur.**

**Type :- 'C'.**

Object :- To study the possibility of reducing the quantity of irrigation water by raising seedlings.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco ; Cotton. (c)  $24.7 \text{ C.L./ha.}$  of F.Y.M.+ $89.7 \text{ Kg/ha.}$  of N ;  $22.4 \text{ Kg/ha.}$  of N+ $22.4 \text{ Kg/ha.}$  of  $P_2O_5$ . (ii) Medium black ; Morand II. (iii) As per treatments/28.6.64 ; 4.7.65. (iv) (a) One heavy *bakhhering* and 2 harrowings. (b) Transplanting. (c) 7-8 Kg/ha. (d) and (e) As per treatments. (v)  $67.2 \text{ Kg/ha.}$  of  $P_2O_5$  as Super at transplanting+ $50.4 \text{ Kg/ha.}$  of N on 8.7.64 and  $50.4 \text{ Kg/ha.}$  of N on 28.8.64  $67.2 \text{ Kg/ha.}$  of  $P_2O_5$  as Super at transplanting+ $50.4 \text{ Kg/ha.}$  of N on 3.8.65 and  $50.4 \text{ Kg/ha.}$  of N on 3.9.65. (vi) Buri-147. (vii) Irrigated ; Unirrigated. (viii) 2 hoeings and 4 weedings. (ix)  $67.2 \text{ cm.}$  ; N.A. (x) 3 pickings from 16.11.64 to 30.1.65 ; 3 pickings from 3.11.65 to 4.1.66.

## 2. TREATMENTS :

7 sowing dates for raising seedlings :  $D_1=10\text{th May}$ ,  $D_2=20\text{th May}$ ,  $D_3=30\text{th May}$ ,  $D_4=10\text{th June}$ ,  $D_5=20\text{th June}$ ,  $D_6=2 \text{ seeds/dibble}$ , dibbled in *itu* the on-set of Monsoon at  $122 \text{ cm.} \times 91 \text{ cm.}$  spacing and  $D_7=2 \text{ seeds/dibble}$ , dibbled in *Situ* at the on-set of Monsoon at  $61 \text{ cm.} \times 30 \text{ cm.}$  spacing.

For raising seedling, 'Drons, (leaf cups) were filled with mixture of soil and F.Y.M., thoroughly mixed, in the ratio 3 : 1. In each *Dron*, 2 seeds were dibbled. The seedlings were transplanted along with the *Dron* in the field at the on-set of Monsoon at a spacing of  $122 \text{ cm.} \times 91 \text{ cm.}$

## 3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a)  $12.80 \text{ m.} \times 9.75 \text{ m.}$  (b)  $10.97 \text{ m.} \times 7.31 \text{ m.}$  (v)  $91 \text{ cm.} \times 122 \text{ cm.}$  (vi) Yes.

## 4. GENERRAL

(i) Satisfactory. (ii) Endrin sprayed ; Nil. (iii) Yield of *kapas*. (iv) (a) 1963-66 (with modified treatments in 63). (b) No. (c) Nil. (v) Akola. (vi) Nil. (vii) As the experiment is continued beyond 65, the results for the individual years are presented under 5.—Results.



## 5. RESULTS :

64(44)

(i) 1282 Kg/ha. (ii) 2579 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	D <sub>7</sub>
Av. yield	1751	1552	1351	1402	1115	533	1273

C.D.=383.1 Kg/ha.

65(27)

(i) 574 Kg/ha. (ii) 86.6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	D <sub>7</sub>
Av. yield	753	752	740	704	568	163	340

C.D.=128.6 Kg/ha.

Crop :- Cotton (*Kharif*).

Ref :- Mh. 63(59).

Site :- Agri. College Farm, Akola.

Type :- 'C'.

Object :—To study the possibility of reducing the quantity of irrigation water by raising seedlings.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) Nil. (ii) Black cotton soil. (iii) As per treatments/29.6.63. (iv) (a) 3 harrowings. (b) Transplanting. (c) N.A. (d) 122 cm.×91 cm. (e) 2. (v) 125.5 Q/ha. of M.C.+ 67.2 Kg/ha. of Super at transplanting+100.9 Kg/ha. of A/S in 2 doses. (vi) Buri-147. (vii) Irrigated. (viii) 3 hoeings and 2 weedings. (ix) N.A. (x) 8, 22.11.63, 3, 27.12.63 and 14.2.64.

## 2. TREATMENTS :

6 sowing dates for raising seedlings : D<sub>1</sub>=Dibbled in plastic bag on 10.5.63, D<sub>2</sub>=Dibbled in plastic bag on 20.5.63, D<sub>3</sub>=Dibbled in plastic bag on 30.5.63, D<sub>4</sub>=Dibbled in plastic bag on 9.6.63, D<sub>5</sub>=Dibbled in plastic bag on 19.6.63 and D<sub>6</sub>=Dibbled directly in the field on the date of transplanting other treatments.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 12.80 m.×9.75 m. (b) 10.97 m.×7.31 m. (v) 91 cm.×122 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Endrix sprayed. (iii) Yield of *kapas*. (iv) (a) 1963-65 (Treatments modified in 64). (b) No. (c) Nil. (v) Achalpur. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 1025 Kg/ha. (ii) 112.1 Ka/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	1231	1097	1036	1001	1060	725

C.D.=168.9 Kg/ha.

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 64(50), 65(28).**

**Site :- Agri. College Farm, Akola.**

**Type :- 'C'.**

**Object :-** To study the possibility of reducing the quantity of irrigation water by raising seedlings.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Groundnut ; *Jowar*. (c) N.A. : 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Black cotton soil. (iii) As per treatments/28, 29.6.64 ; As per treatments/17.7.65. (iv) (a) 1 ploughing, 3 harrowings. (b) Transplanting. (c) N.A. (d) As per treatments. (e) 2. (v) 125.5 Q/ha. of F.V.M.+67.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super at transplanting+101 Kg/ha. of N as A/S, in two equal doses at transplanting and 6 weeks after. (vi) Buri-147. (vii) Unirrigated. (viii) 2-4 hoeings and 1 weeding. (ix) 93 cm. ; 59 cm. (x) 3 pickings from 14.11.64 to 23.12.64 ; 3 pickings from 2.11.65 to 24.12.65.

**2. TREATMENTS :**

7 sowing dates for raising seedlings : D<sub>1</sub>=Seed dibbled in polythene bags on 10th May, D<sub>2</sub>=Seeds dibbled in polythene bags on 20th May, D<sub>3</sub>=Seeds dibbled in polythene bags on 30th May, D<sub>4</sub>=Seeds dibbled in polythene bags on 10 June, D<sub>5</sub>=Seeds dibbled in polythene bags on 20th June, D<sub>6</sub>=Seeds dibbled directly in the field on the date of transplanting at 122 cm.×91 cm. spacing, and D<sub>7</sub>=Seed dibbled directly in the field on the date of transplanting at 76 cm.×46 cm. spacing.

For raising seedlings, Polythene bags were filled with soil mixed with F.Y.M. in the proportion of 3 : 1. In each bags 2 seeds were dibbled. Seedlings were transplanted on the on-set of Monsoon with spacing 122 cm.×91 cm.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 12.80 m.×9.75 m. (b) 10.97 m.×7.31 m. (v) 91 cm.×122 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Endrex sprayed. (iii) Yield of *kapas*. (iv) (a) 1963-65 (Treatments modified in 64). (b) No. (c) The results of the combined analysis have been presented under 5.—Results. (v) Achalpur. (vi) Nil. (vii) Error variances are heterogenous and Treatments×years interaction is present.

**5. RESULTS :**

**Pooled results**

(i) 1011 Kg/ha. (ii) 342.1 Kg/ha. (based on 6 d.f. made up of Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	D <sub>7</sub>
Av. yield	1146	1152	1190	1187	1096	487	818

**Individual results**

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	D <sub>7</sub>	Sig.	G.M.	S.E/plot
Year										
1964	1511	1519	1443	1472	1147	741	1238	**	1296	200.5
1965	782	785	937	902	1044	233	398	**	726	85.8
Pooled	1146	1152	1190	1187	1196	487	818	N.S.	1011	342.1

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 60(197).**

**Site :- Govt. Exptl. Farm., Amravati.**

**Type :- 'C'.**

**Object :-** To study the effect of different spacings and number of plants per hill on the yield of Cotton.

## 1. BASAL CONDITIONS :

(i) Nil. (b) Groundnut. (c) N.A. (iii) Medium black. (iii) 6, 7.7.60. (iv) (a) Harrowing. (b) As per treatments. (c) —. (d) and (e) As per treatments. (v) 12.35 C.L./ha. of F.Y.M.+22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) BO-394. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 52 cm. (x) 14.11.60 to 24.1.61.

## 2. TREATMENTS :

All combinations of (1) and (2)+an extra treatment.

(1) 2 spacings : S<sub>1</sub>=61 cm. × 61 cm. and S<sub>2</sub>=76 cm. × 76 cm.

(2) No. of plants/hill : P<sub>1</sub>=1 and P<sub>2</sub>=2.

Extra treatment : T<sub>1</sub>=Sowing by Argada with 61 cm. × 30 cm. spacings.

Except in T<sub>1</sub>, dibbling was done in all other treatments.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 15.24 m. × 9.14 m. (b) 9.14 m. × 3.05 m. (v) 3.05 m. × 3.05 m. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Endrin sprayed for Jassids and thrips. (iii) Yield of kapas. (iv) (a) 1956-60. (b) No. (c) Nil. (v) to (vii) Nil.

## 5. RESULTS :

(i) 1537 Kg/ha. (ii) 339.8 Kg/ha. (iii) Main effect of P is highly significant. (iv) Av. yield of kapas in Kg/ha.

T<sub>1</sub>=1400 Kg/ha.

	P <sub>1</sub>	P <sub>2</sub>	Mean
S <sub>1</sub>	1240	1784	1512
S <sub>2</sub>	1170	2089	1630
Mean	1205	1936	1571

C.D. for P marginal means=321.6 Kg/ha.

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 63(32), 64(27), 65(37).**

**Site :- Agri. College Farm, Dhulia.**

**Type :- 'C'.**

**Object :-** To find out the optimum date of sowing for Cotton.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 24.7 C.L./ha. of F.Y.M.+44.8 Kg/ha. of N. (ii) Medium soil. (iii) As per treatments. (iv) (a) Ploughings and harrowings. (iv) (a) Dibbling. (c) —. (d) 122 cm. × 91 cm. (e) 1 to 2. (v) 12.4 C.L./ha. of F.Y.M. in 63; 24.7 C.L./ha. of F.Y.M.+100.9 Kg/ha. of A/S+67.2 Kg/ha. of Super for others. (vi) 170-CO<sub>2</sub>. (vii) Irrigated. (viii) Interculturing and weeding. (ix) 51 cm. ; 65 cm. ; 46 cm. (x) 4, 20.12.63, 18.1.64, 4.2.64 ; 30.12.65, 18. .65 and 12.2.65 ; 16.12.65, 17.1.66, 22.2.66 and 3.3.66.

## 2. TREATMENTS :

<sup>6</sup> dates of sowing : D<sub>1</sub>=1st April, D<sub>2</sub>=15th April, D<sub>3</sub>=1st May, D<sub>4</sub>=15th May, D<sub>5</sub>=1st June and D<sub>6</sub>=15th June.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 25.60 m. × 29.26 m. (iii) 4. (iv) (a) 12.80 m. × 9.75 m. (b) 10.97 m. × 7.31 m. (v) 91 cm. × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Attack of Jassids, Aphids and mites. Folidol and Sulphur sprayed. (iii) Yield of *kapas*. (iv) (a) 1963—55. (b) No. (c) Results of combined analysis have been presented under 5. Results (v) Kopergaon and Padegaon. (vi) Nil. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is present.

## 5. RESULTS :

## Pooled results

(i) 814 Kg/ha. (ii) 241.6 Kg/ha. (based on 10 d.f. made up of Treatments  $\times$  years interaction). (iii) Treatments differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	843	830	914	942	786	568
C.D. = 219.8 Kg/ha						

## Individual results

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	Sig.	G.M.	S.E./plot
Year									
1963	930	952	1079	1114	890	411	**	896	100.9
1964	787	850	970	1010	840	740	N.S.	866	213.0
1965	813	688	694	701	629	553	N.S.	680	160.3
Pooled	843	830	914	942	786	568	*	814	241.6

Crop :- Cotton (*Kharif*).

Ref :- Mh. 63(30), 64(24), 65(129).

Site :- Agri. College Farm, Dhulia.

Type : 'C'.

Object :—To study the optimum spacing with different No. of plants per hill for Cotton.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. for 63, wheat for other years. (c) N.A. ; 44.8 Kg/ha. of N ; G.M. (ii) Medium black soil. (iii) 25.5.63 ; 6.5.64 ; 17.18.5.65. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) 9 Kg/ha. (d) and (e) As per treatments. (v) 12.4 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) 170—CO<sub>2</sub>. (vii) Irrigated. (viii) Weeding and hoeing. (ix) 50 cm. ; 65 cm., 46 cm. (x) 12.12.63 to 5.2.64 ; 7.12.64 to 17.2.65 ; 24.12.65 to 3.3.66.

## 2. TREATMENTS :

## Main-plot treatments :

4 spacings : S<sub>1</sub> = 91 cm.  $\times$  61 cm., S<sub>2</sub> = 91 cm.  $\times$  91 cm., S<sub>3</sub> = 122 cm.  $\times$  91 cm. and S<sub>4</sub> = 122 cm.  $\times$  122 cm.

## Sub-plot treatments :

No. of plants/hill : H<sub>1</sub> = 1 and H<sub>2</sub> = 2.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) 14.63 m.  $\times$  10.97 m. (b) 10.97  $\times$  7.31 m. (v) 183 cm.  $\times$  183 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Jassids and aphids attack ; Endrin sprayed. (iii) Yield of *kapas*. (iv) (a) 1963—65. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Main-plot error variances are homogeneous and Sub-plot error variances are heterogeneous. Hence results of individual years are presented under 5. Results.

## 5. RESULTS :

## 63(30)

(i) 1004 Kg/ha. (ii) (a) 175.5 Kg/ha. (b) 118.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	Mean
H <sub>1</sub>	1029	1028	1007	941	1001
H <sub>2</sub>	954	1088	1054	930	1007
Mean	992	1058	1030	936	1004

64(24)

(i) 616 Kg/ha. (ii) (a) 167.1 Kg/ha. (b) 165.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of kapas in Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	Mean
H <sub>1</sub>	541	599	732	620	623
H <sub>2</sub>	539	582	663	655	610
Mean	540	590	692	638	616

65(129)

(i) 328 Kg/ha. (ii) (a) 87.7 Kg/ha. (b) 86.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of kapas in Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	Mean
H <sub>1</sub>	335	335	334	306	328
H <sub>2</sub>	353	357	309	292	328
Mean	344	346	322	299	328

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 63(39), 64(34), 65(219).**

**Site :- Agri. Res. Stn., Kopergaon.**

**Type :- 'C'.**

**Object :-** To find the possibility of reducing the quantity of irrigation water by raising seedlings and transplanting them.

### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tur; Jowar; N.A. (c) 12.4 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of N + 11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>; 22.4 Kg/ha. of N + 11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>; N.A. (ii) N.A. (iii) As per treatments/28.6.63; As per treatments 27.6.64; As per treatments/12.6.65. (iv) (a) 1-2 ploughings and harrowings. (b) Transplanting. (c) —. (d) 122 cm. × 122 cm. (e) 2. (v) 125.5 Q/ha. of F.Y.M. + 1009 Kg/ha. of N as A/S + 67.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. (vi) 170—CO<sub>2</sub>. (vii) Irrigated. (viii) Interculturings and weedings etc. (ix) 24 cm.; 41 cm.; 60 cm. (x) 2.1.64 and 3.2.64; 3 pickings from 26.12.64 to 24.2.65; 16.1.66.

### 2. TREATMENTS :

6 sowing dates for raising seedlings : D<sub>1</sub> = 20th April, D<sub>2</sub> = 1st May, D<sub>3</sub> = 10th May, D<sub>4</sub> = 20th May, D<sub>5</sub> = 30th May and D<sub>6</sub> = Sowing in situ (control).

Sowing dates for D<sub>1</sub> = 28.5.63; 13.5.64; 12.5.65.

### 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 13.41 m. × 9.75 m. (b) 10.97 m. × 7.31 m. (v) 122 cm. × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Boll worm, aphids and jassids attack ; Endrin, Bliton and Weltable Sulphur applied. (iii) Yield of *kapas*. (iv) (a) 1963-65. (b) No. (c) Nil. (v) Nanded. (vi) Nil. (vii) As error variances are heterogeneous and Treatments  $\times$  years interaction is absent, results of individual years are presented under 5. Results.

## 5. RESULTS :

## 63(39)

(i) 642 Kg/ha. (ii) 184.4 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	621	649	589	466	551	976

C.D. = 277.9 Kg/ha.

## 64(34)

(i) 450 Kg/ha. (ii) 114.6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	514	335	431	301	401	716

C.D. = 172.7 Kg/ha.

## 65(219)

(i) 1117 Kg/ha. (ii) 262.1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	1072	1442	970	1025	1017	1176

Crop :- Cotton (*Kharif*).

Ref :- Mh. 63(38), 64(33), 65(218).

Site :- Agri. Res. Sta., Kopeergaon.

Type :- 'C'.

Object :- To find out the optimum spacing and No. of plants per hill for Cotton.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar* ; Wheat ; *Jowar*. (c) 44.8 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> for 63 and 64 ; 12.35 C.L./ha. of F.Y.M. for 65. (ii) N.A. (iii) 30.5.63 ; 24.5.64 ; 23.4.65. (iv) (a) 1-2 ploughings and harrowings. (b) Dibbling. (c) —. (d) and (e) As per treatments. (v) 125.5 Q/ha. of F.Y.M. + 100.9 Kg/ha. of N + 67.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) 170-CO<sub>2</sub>. (vii) Irrigated. (viii) 2 weedings ; 6 interculturings ; 7 weedings. (ix) 24 cm. ; 41 cm. ; 60 cm. (x) 28 11.63 to 13.2.64 ; 28.12.64 to 26.2.65 ; 26.11.65.

## 2. TREATMENTS :

## Main-plot treatments :

All combinations of (1) and (2)

(1) 3 rows spacings : R<sub>1</sub>=91, R<sub>2</sub>=137 and R<sub>3</sub>=183 cm.

(2) 2 plant spacings : P<sub>1</sub>=91 and P<sub>2</sub>=122 cm.

## Sub-plot treatments :

No. of plants/hill : H<sub>1</sub>=1 and H<sub>2</sub>=2 plants/hill.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication, 2 sub-plots/main-plot. (b) 43.89 m.  $\times$  49.38 m. (iii) 4. (iv) (a) 16.46 m.  $\times$  10.97 m. (b) 10.97 m.  $\times$  7.32 m. (v) 274 cm.  $\times$  183 cm. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory. (ii) Boll worm, Jassids and Aphids attack Endrin, Blitox and wettable Sulphur applied. (iii) Yield of *kapas*. (iv) (a) 1963-65. (b) No. (c) The results of the combined analysis have been presented under 5. Results. (v) and (vi) Nil. (vii) Both the main-plot and sub-plot error variances are homogeneous and main-plot Treatments  $\times$  years and sub-plot Treatments  $\times$  years interaction is absent.

## 5. RESULTS:

Pooled results

(i) 1257 Kg/ha. (ii) (a) 264.1 Kg/ha. (based on 45 d.f. made up of pooled error). (b) 203.2 Kg/ha. (based on 54 d.f. made up of pooled error). (iii) Main effects of R and H are significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>1</sub>	P <sub>2</sub>	H <sub>1</sub>	H <sub>2</sub>	Mean
R <sub>1</sub>	1368	1285	1366	1287	1327
R <sub>2</sub>	1320	1245	1290	1274	1282
R <sub>3</sub>	1208	1114	1247	1075	1161
Mean	1299	1215	1301	1212	1257
H <sub>1</sub>	1337	1265			
H <sub>2</sub>	1261	1164			

C.D. for R marginal means=108.6 Kg/ha.

C.D. for H marginal means=67.9 Kg/ha.

Individual results

Treatment	P <sub>1</sub>	P <sub>2</sub>	Sig.	H <sub>1</sub>	H <sub>2</sub>	Sig.	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>
Year									
1963	946	830	N.S.	975	801	**	956	911	797
1964	840	880	N.S.	895	825	N.S.	884	874	822
1965	2117	1927	N.S.	2026	2018	N.S.	2140	2062	1864
Pooled	1299	1215	N.S.	1301	1212	*	1327	1282	1161

Sig.	G.M.	S.E. main - plot	plot sub
N.S.	888	208.0	202.8
N.S.	860	271.3	176.2
N.S.	2022	367.5	227.3
*	1257	264.1	203.2

Crop :- Cotton (*Kharif*).

Ref :- 63(40), 64(35), 65(220).

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

Type :- 'C'

Object :- To find out the optimum date of planting for Cotton.

## 1. BASAL CONDITIONS :

(i) Nil (b) *Tur*; *Jowar*; *Tur*. (c) 12.4 C.L./ha. of F.Y.M.+22.4 Kg/ha. of N+11.2 Kg/ha. of  $P_2O_5$ ; 44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ ; 12.4 C.L./ha. of F.Y.M.+22.4 Kg/ha. of N and  $P_2O_5$  (ii) N.A. (iii) As per treatments. (iv) (a) 1-2 ploughings and harrowings. (b) Dibbling by hand. (c) 5 Kg/ha. (d) 122 cm.  $\times$  122 cm. (e) 1-2. (v) 125.5 Q/ha. of F.Y.M.+100.9 Kg/ha. of N+67.2 Kg/ha. of  $P_2O_5$  as Super. (vi) 170-CO<sub>2</sub>. (vii) Irrigated. (viii) Weedings, earthings and interculturings. (ix) 24 cm.; 41 cm.; 60 cm. (x) 27.10.63 to 20.2.64; 16.11.64 to 23.2.65; 27.11.65 to 31.1.66.

## 2. TREATMENTS :

6 dates of sowing: D<sub>1</sub>=8th April; D<sub>2</sub>=23rd April; D<sub>3</sub>=8th May, D<sub>4</sub>=27th May, D<sub>5</sub>=8th June and D<sub>6</sub>=28th June.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 13.41 m.  $\times$  9.75 m. (b) 10.97 m.  $\times$  7.31 m. (v) 122 cm.  $\times$  122 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Attack of Aphids, Jassids, Boll worms etc. Dusting of B.H.C., Sulphur and Endrin sprayed. (iii) Yield of *kapas*. (iv) (a) 1963-65. (b) No. (c) The results of the combined analysis have been presented under 5.—Results. (v) Dhulia and Padegaon. (vi) Nil. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is present.

## 5. RESULTS :

## Pooled results

(i) 869 Kg/ha. (ii) 469.8 Kg/ha. (based on 10 d.f. made up of Treatments  $\times$  years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	1203	1180	1197	897	514	225

C.D.=427.3 Kg/ha.

## Individual results

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	Sig.	G.M.	S.E./plot
Year									
1963	1277	1539	1208	986	599	37	**	941	265.4
1964	837	971	807	584	479	316	**	666	138.3
1965	1496	1031	1576	1576	463	321	*	1001	417.1
pooled	1203	1180	1197	897	514	226	**	869	469.8

Crop :- Cotton (*Kharif*).

Ref :- Mh. 63(176).

Site :- Agri. College Farm, Nagpur.

Type :- 'C'.

Object :- To find out a suitable method of sowing cotton under pre-monsoon conditions.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Black cotton soil. (iii) As per treatments. (iv) (a) Harrowing. (b) As per treatments. (c) 11 Kg/ha. (d) As per treatment. (e) N.A. (v) 5 C.L./ha. of F.Y.M.+44.8 Kg/ha. of N as A/S. (vi) B-147. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 105 cm. (x) 24.9.63 to 22.10.63



## 2. TREATMENTS :

6 cultural treatments : C<sub>1</sub>=Cotton seed sown in plastic bags on 28.5.63 and transplanted on 2.7.63 at 122 cm.×91 cm. spacing, C<sub>2</sub>=As in C<sub>1</sub> but sown on 4.6.63, C<sub>3</sub>=Cotton seed sown in field on 28.5.63 at 122 cm.×91 cm. spacing, C<sub>4</sub>=As in C<sub>3</sub> but sown on 4.6.63, C<sub>5</sub>=Dry sowing of cotton on 11.6.63 at 61 cm.×30 cm. spacing and C<sub>6</sub>=Sowing of cotton seed at normal time i.e. 30.6.63 at 61 cm.×30 cm. spacing.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) 8.53 m.×12.80 m. (b) 6.10 m.×10.97 m. (v) 122 cm.×91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1963 only. (b) and (c) —. (v) to (vii) Nil.

## 5. RESULTS :

(i) 800 Kg/ha. (ii) 113.5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	C <sub>5</sub>	C <sub>6</sub>
Av. yield	663	579	1095	1045	875	544

C.D.—171.0 Kg/ha.

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 63(153), 64(123), 65(40).**

**Site :- Agri. Res. Stn., Nanded.**

**Type :- 'C'.**

Object :- To find out the possibility of reducing the quantity of irrigation water by raising seedlings.

## 1. BASAL CONDITIONS

(i) (a) Nil; (b) Cotton; Wheat; *Mug* and Wheat. (c) 44.8 Kg/ha. of N; 24.7 C.L./ha. of F.Y.M.+22.4 Kg/ha. of N; 33.6 Kg/ha. of N; (ii) Black cotton soil. (iii) As per treatments (iv) (a) One ploughing and 3 harrowings. (b) Transplanting. (c) N.A. (d) 122 cm.×91 cm. (e) 2. (v) 12.4 C.L./ha. of F.Y.M.+101 Kg/ha. of N as A/S+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. (vi) 170-CO<sub>2</sub>. (vii) Irrigated. (viii) 4 weedings. (ix) 136 cm.; 79 cm.; 101 cm. (x) 30.12.63 and 3.2.64; N.A.; 29.12.65 to 15.2.66.

## 2. TREATMENTS :

6 dates of sowing for raising seedlings : D<sub>1</sub>=20th April, D<sub>2</sub>=1st May, D<sub>3</sub>=10th May, D<sub>4</sub>=20th May, D<sub>5</sub>=30th May and D<sub>6</sub>=Dibbling of seeds in *situ* on 20th May.

For raisings, seedlings, 'Dron' (leaf cups) were filled with thoroughly mixed mixture of soil and F.Y.M. in the proportion of 3 : 1. 2 seeds were dibbled in the 'Dron'. On the on-set of Monsoon *Dron* were transplanted in the field at a spacing of 122 cm.×91 cm.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 12.80 m.×9.75 m. (b) 10.97 m.×7.31 m. (v) 91 cm.×122 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Attack of Ball worm, Jassids, Thrips, Blade arm, Red leaf, etc. spraying with Endrine (iii) Yield of *kapas*. (iv) (a) 1963-65. (b) No. (c) The results of the combined analysis have been presented under 5.—Results. (v) Kopergaon. (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is present.

## 5. RESULTS :

Pooled results

(i) 964 Kg/ha. (ii) 377.5 Kg/ha. (based on 10 d.f. made up of Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	881	912	900	1003	853	1233

## Individual results

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	Sig.	G.M.	S.E./plot
Year									
1963	288	391	456	605	434	946	*	520	221.8
1964	1402	1341	1291	1167	1190	1166	N.S.	1259	247.9
1965	953	1003	953	1236	935	1588	**	1111	168.3
Pooled	881	912	900	1003	853	1233	N.S.	964	377.5

Crop :- Cotton (*Kharif*).

Ref :- Mh. 63(57), 64(48), 65(69).

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

Type :- 'C'.

Object :—To find out the best method and time of sowing for Cotton.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) Black cotton soil. (iii) As per treatments. (iv) (a) 3 to 4 harrowings. (b) As per treatments. (c) N.A. (d) As per treatments. (e) 2. (v) 112 Kg/ha. of A/S ; 12.4 C.L./ha. of F.Y.M.+33.6 Kg/ha. of N as A/S ; 44.8 Kg/ha. of N as A/S. (vi) Gaorani—46. (vii) Unirrigated. (viii) 2 to 3 weedings and hoeings. (ix) 136 cm. ; 67 cm. ; 95 cm. (x) N.A. ; 3 pickings 17.11.64 to 22.12.64 ; 4 pickings 8.11.65 to 2.1.66.

## 2. TREATMENTS :

## Main-plot treatments :

4 methods of sowing : M<sub>1</sub>=Dibbling on flat land with 46 cm.×23 cm. spacing, M<sub>2</sub>=Dibbling on broad ridges of 46 cm. width with 46 cm×23 cm. spacing, M<sub>3</sub>=Dibbling on broad ridges of 91 cm. width with 46 cm.×23 cm. spacing and M<sub>4</sub>=Drilling on flat land with 46 cm. spacing.

## Sub-plot treatments :

2 times of sowing : T<sub>1</sub>=Dry sowing before Monsoon and T<sub>2</sub>=Normal Sowing after the break of Monsoon. Dates of sowing : Dry sowing in 2nd week of June and normal sowing in 3rd week of Time for 63. Dry sowing in last week of June and normal sowing in 1st week of July for others.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) (a) 18.29 m.×7.31 m. (b) 16.46 M.×5.49 m. (v) 91 cm.×91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Jassids, Boll worms attack and mild attack of Dahiya, Sulphur dusted. (iii) Yield of *kapas*. (iv) (a) 1963-65. (b) No. (c) Nil. (v) Nil. (vi) Due to heavy rains in Aug., there was flower and boll shedding for 63. (vii) As both the main-plot and sub-plot error variances are heterogeneous, results of individual years are presented under 5.—Results.

## 5. RESULTS :

## 63(57)

(i) 223 Kg/ha. (ii) (a) 31.0 Kg/ha. (b) 68.9 Kg/ha. (iii) Main effect of T is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	Mean
T <sub>1</sub>	317	324	316	323	320
T <sub>2</sub>	71	123	163	147	126
Mean	194	224	239	235	223

C.D. for T marginal means = 53.1 Kg/ha.

64(48)

(i) 340 Kg/ha. (ii) (a) 110.7 Kg/ha. (b) 55.7 Kg/ha. (iii) Main effect of T is highly significant. (iv) Av. yield of kapas in Kg/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	Mean
T <sub>1</sub>	451	357	372	388	392
T <sub>2</sub>	393	241	219	300	288
Mean	422	299	296	344	340

C.D. for T marginal means = 42.9 Kg/ha.

65(59)

(i) 1055 Kg/ha. (ii) (a) 150.9 Kg/ha. (b) 121.5 Kg/ha. (iii) Main effect of T is highly significant. (iv) Av. yield of kapas in Kg/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	Mean
T <sub>1</sub>	1231	1258	1358	1072	1228
T <sub>2</sub>	790	767	979	993	882
Mean	1010	1012	1166	1033	1055

C.D. for T marginal means = 93.6 Kg/ha.

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 63(154), 64(124), 65(41).**

**Site :- Agri. Res. Stn., Padegaon.**

**Type :- 'C'.**

**Object :-** To study the optimum date of sowing irrigated Cotton.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Sugarcane ; Sugarcane and Gram ; *Sannhemp*. (c) A/S and Super applied (quantity N.A.).  
 (ii) N.A. ; N.A. ; Type 'U'. (iii) As per treatments. (iv) (a) 1-2 ploughings and harrowing. (b) Dibbling.  
 (c) N.A. (d) 122 cm. x 122 cm. (e) 4 to 5. (v) 12.4 C.L./ha. of F.Y.M. in 63 ; 12.4 C.L./ha. of F.Y.M. + 101 Kg/ha. of N as A/S + 67.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super in others. (vi) 170-CO<sub>2</sub>. (vii) Irrigated.  
 (viii) Interculturings. (ix) 38 cm. ; 56 cm. ; 41 cm. (x) 6 pickings from 9.11.63 to 27.1.64 ; 6 pickings from 24.10.64 to 4.3.65, 5 pickings from 9.10.65 to 2.12.65.

**2. TREATMENTS :**

6 dates of sowing : D<sub>1</sub> = 1st April, D<sub>2</sub> = 15th April, D<sub>3</sub> = 1st May, D<sub>4</sub> = 15th May, D<sub>5</sub> = 1st June and D<sub>6</sub> = 15th June.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 13.41 m. × 9.75 m. (b) 10.97 m. × 7.31 m. (v) 122 cm. × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Affected by Jassids and Aphids, spraying with Endrin. (iii) Yield of *kapas*. (iv) (a) 1963—65. (b) No. (c) The results of the combined analysis have been presented under 5. Results. (v) Dhulia and Kopergaon. (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is present.

## 5. RESULTS :

Pooled results

(i) 1058 Kg/ha. (ii) 951.7 Kg/ha. (based on 10 d.f. made up of Treatments × years interaction.) (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	1734	1499	1322	1032	600	161

C.D. 865.6 Kg/ha.

Individual results

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	Sig.	G.M.	S.E./plot
Year									
1963	1042	840	889	936	661	215	**	764	161.6
1964	1083	1045	676	501	193	144	**	607	176.9
1965	3078	2611	2402	1660	945	123	**	1803	256.9
Pooled	1734	1499	1322	1032	600	161	*	1058	951.7

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 63(152), 65(42).**

**Site :- Agri. Res. Stn., Padegaon.**

**Type :- 'C'.**

Object :—To study the possibility of reducing the quantity of irrigation water by raising seedling.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Nilwa*, *Sannhemp*. (c) N.A. ; A/S and Super. (ii) Alkalive chopan ; Type 'U'. (ii) As per treatments. (iv) (a) 2 ploughings and harrowings. (b) As per treatments. (c) N.A. (d) 122 cm. × 122 cm. (e) 2. (v) 12.4 C.L./ha. of F.Y.M. + 101 Kg/ha. of N as A/S + 67.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. (vi) 170—Co<sub>2</sub>. (vii) Irrigated. (viii) Interculturings. (ix) 38 cm. ; 36 cm. (x) 9.11.63 to 27.1.64 ; 10.10.65 to 2.12.65.

## 2. TREATMENTS :

6 dates of sowing for raising seedlings : D<sub>1</sub>—20th April, D<sub>2</sub>—1st May, D<sub>3</sub>—10th May, D<sub>4</sub>—20th May, D<sub>5</sub>—30th May and D<sub>6</sub>—2 seeds/dibbled, dibbled *in situ* at the time of transplanting other treatments.

Two seeds were dibbled in *Drons* (leaf cups) filled up with thoroughly mixed soil and F.Y.M. in the ratio of 3 : 1. The seedlings thus raised were planted in the field along with the '*Dron*' at the on—set of Monsoon at a spacing of 122 cm. × 122 cm.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 13.41 m. × 9.75 m. (b) 10.97 m. × 7.31 m. (v) 122 cm. × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Attack of Jassids and Aphids. Insecticides sprayed. (iii) Yield of *kapas*. (iv) (a) 1963—65 (Expt. failed in 1964). (b) No. (c) The results of the combined analysis have been presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

## 5. RESULTS :

## Pooled results

(i) 1088 Kg/ha. (ii) 164.0 Kg/ha. (based on 35 d.f. made up of pooled error and Treatments  $\times$  years interaction). (iii) Treatment s differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>
Av. yield	1161	1112	1087	942	806	1420

C.D. = 166.5 Kg/ha.

## Individual results

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	Sig.	G.M.	S.E./plot
Year									
1963	1031	998	854	724	647	1107	**	894	114.6
1965	1291	1227	1320	1160	964	1733	**	1283	181.3
Pooled	1161	1112	1087	942	806	1420	**	1088	164.0

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 63(150), 64(120), 65(48).**

**Site :- Agri. Res. Stn., Yeotmal.**

**Type :- 'C'.**

**Object :-** To find out the best method of sowing Cotton.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut, *Sesamum*; *Jowar*. (c) 11.2 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>; 11.2 Kg/ha. of N; 22.4 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black soil. (iii) 29.6.63, 9.7.64, 29.6.65. (iv) (a) 1 ploughing add 4 harrowings. (b) to (e) As per treatments. (v) 12.4 C.L./ha. of F.Y.M. + 11.2 Kg/ha. of N for 63 and 64; 24.7 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of N + 11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub> for 65. (vi) B-147. (vii) Unirrigated. (viii) Hoings and weedings. (ix) 76 cm.; 96 cm.; 81 cm. (x) 3 pickings 18.11.63 to 18.1.64; 4 pickings 30.11.64 to 27.1.65, 3 pickings 12.11.65 to 8.1.66.

## 2. TREATMENTS :

4 cultural treatments : T<sub>1</sub> = Dibbling on Flat land with 61 cm.  $\times$  30 cm. spacing, T<sub>2</sub> = Dibbling on broad ridges of 61 cm. width with 61 cm.  $\times$  30 cm. spacing, T<sub>3</sub> = Dibbling on broad ridges 122 cm. width with 61 cm.  $\times$  30 cm. spacing and T<sub>4</sub> = Drilling seeds on flat land at 61 cm. apart at 15 Kg/ha.

3—4 seeds/dibble was dibbled.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 29.26 m.  $\times$  21.94 m. (iii) 6. (iv) (a) 7.31 m.  $\times$  21.94 m. (b) 4.88 m.  $\times$  20.73 m. (v) 122 cm.  $\times$  61 cm. (v) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1963—65. (b) No. (c) Nil. (v) and (vi) Nil. (vii) As error variances are heterogeneous and Treatments  $\times$  years interaction is absent, results of individual years are presented under 5. Results.

## 5. RESULTS:

## 63(150)

(i) 528 Kg/ha. (ii) 157.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Av. yield	578	448	562	523

64(120)

(i) 474 Kg/ha. (ii) 61.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Av. yield	484	453	461	499

65(48)

(i) 478 Kg/ha. (ii) 74.1 Kg/ha. (iii) Treatment differences are not significant. (vi) Av. yield of *kapas* in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Av. yield	427	475	505	505

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 60(24), 61(163), 62(152), 63(197).**

**Site :- Agri. Res. Stn., Achalpur. Type :- CM<sup>2</sup>.**

**Object :-** To study the effect of N, P and K alone and in combination with different spacings on the yield of American Cotton.

#### 1. BASAL CONDITIONS :

(i) (a) Groundnut—Cotton—*Jowar*. (b) Groundnut. (c) 11.2 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Morond II. (iii) 4.5.60 ; 29.6.61 ; 15.6.63. (iv) (a) 3 *bakherings* in 60 ; 1 ploughing and 4 harrowings. for others. (b) Dibbling. (c) 11—12 Kg/ha. (d) As per treatments. (e) 1. (v) 12.35 C.L./ha. of F.Y.M. (vi) B—147 cm. (vii) Unirrigated. (viii) 2—3 hoeings and weedings. (ix) 57 cm. ; 89 cm. ; 86 cm. ; 42.3 cm. (x) 4 pickings from 13.11.60 to 16.1.61 ; 25.11.61 to 30.1.62 ; 14.12.62 to 11.1.63 ; 28.11.63 to 20.1.64.

#### 2. TREATMENTS :

##### Main-plot treatments :

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

(1) 3 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=22.4 and P<sub>2</sub>=44.8 Kg/ha.

(3) 3 levels of K<sub>2</sub>O as Pot. Sul. : K<sub>0</sub>=0, K<sub>1</sub>=22.4 and K<sub>2</sub>=44.8 Kg/ha.

##### Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 spacings between rows : R<sub>1</sub>=61 cm. and R<sub>2</sub>=76 cm.

(2) 2 spacings between plants : S<sub>1</sub>=23 cm. and S<sub>2</sub>=30 cm.

Super and Pot. Sul. drilled in the soil at sowing and A/S applied 21 days after sowing.

#### 3. DESIGN :

(i) Split-plot confd. (ii) (a) 3 blocks/replication ; 9 main-plots/block ; 4 sub-plots/main-plot. (b) N.A.

(iii) 1. (iv) (a) 7.32 m. × 10.97 m. (b) 5.49 m. × 9.14 m. (v) 91 cm. × 91 cm. (vi) Yes.

#### 4. GENERAL :

(i) Satisfactory. (ii) Jassids, aphids and boll worm attack ; Endrin sprayed and Sulphur dusted. (iii) Yield of *kapas*. (iv) (a) 1960—63. (b) No. (c) Nil. (v) Akola Buldana, Nagpur, Washim and Yeotmal.

(vii) As main-plot and sub-plot error variances are heterogeneous results of individual years are presented under 5. Results.

#### 5. RESULTS :

60(24)

(i) 961 Kg/ha. (ii) (a) 385.6 Kg/ha. (b) 193.8 Kg/ha. (iii) Main effect of R is significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
N <sub>0</sub>	1021	770	861	888	1041	723	908	860	915	853	884
N <sub>1</sub>	952	937	1014	1097	893	913	1009	927	1005	931	968
N <sub>2</sub>	1163	967	962	1119	888	1087	1089	973	1069	993	1031
Mean	1045	891	946	1034	941	908	1002	920	996	926	961
S <sub>1</sub>	1056	944	987	1079	948	962	1033	959			
S <sub>2</sub>	1034	838	905	989	933	855	971	881			
R <sub>1</sub>	1113	939	954	1100	966	939					
R <sub>2</sub>	978	844	938	968	916	877					
K <sub>0</sub>	1228	868	1006								
K <sub>1</sub>	1064	890	869								
K <sub>2</sub>	845	915	964								

C.D. for R marginal means = 75.7 Kg/ha.

61(163)

- (i) 211 Kg/ha. (ii) (a) 49.2 Kg/ha. (b) 46.6 Kg/ha. (iii) Main effects of N, K and R are significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
N <sub>0</sub>	207	191	192	158	198	234	222	172	197	197	197
N <sub>1</sub>	194	196	198	165	194	229	213	179	195	197	196
N <sub>2</sub>	224	207	288	242	228	249	268	211	262	218	240
Mean	208	198	226	188	207	237	234	187	218	204	211
S <sub>1</sub>	213	207	233	212	234	257	240	195			
S <sub>2</sub>	203	189	219	164	180	218	229	179			
R <sub>1</sub>	232	220	252	192	219	242					
R <sub>2</sub>	184	176	200	184	195	233					
K <sub>0</sub>	204	168	193								
K <sub>1</sub>	168	208	226								
K <sub>2</sub>	235	218	259								

C.D. for N or K marginal means = 28.4 Kg/ha.

C.D. for R marginal means = 18.2 Kg/ha.

62(152)

- (i) 774 Kg/ha. (ii) (a) 239.4 Kg/ha. (b) 123.9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
N <sub>0</sub>	617	789	686	703	643	746	703	692	776	619	697
N <sub>1</sub>	834	830	818	815	816	851	832	822	885	769	827
N <sub>2</sub>	656	841	924	750	797	874	812	802	855	758	807
Mean	702	820	809	756	752	824	782	772	838	716	777
S <sub>1</sub>	778	873	865	797	855	884	856	820			
S <sub>2</sub>	626	767	753	715	669	763	708	724			
R <sub>1</sub>	712	833	801	721	757	868					
R <sub>2</sub>	692	807	817	791	747	778					
K <sub>0</sub>	678	818	772								
K <sub>1</sub>	659	878	719								
K <sub>2</sub>	770	764	937								

63(197)

(i) 864 Kg/ha. (ii) (a) 212.3 Kg/ha. (b) 141.3 Kg/ha. (iii) Main effect of N is highly significant. Interaction KXR is significant. (iv) Av. yield of kapas in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
N <sub>0</sub>	682	623	618	605	630	688	688	594	651	631	641
N <sub>1</sub>	959	985	864	886	983	939	944	928	949	923	936
N <sub>2</sub>	1046	1009	989	1031	965	1048	1037	993	1041	989	1015
Mean	896	872	824	841	859	892	890	838	880	848	864
S <sub>1</sub>	935	859	847	882	835	924	936	824			
S <sub>2</sub>	857	885	801	800	883	960	844	852			
R <sub>1</sub>	948	901	820	863	926	880					
R <sub>2</sub>	844	843	828	819	792	904					
K <sub>0</sub>	868	836	818								
K <sub>1</sub>	920	862	796								
K <sub>2</sub>	899	919	857								

C.D. for N marginal means = 122.4 Kg/ha.  
 C.D. for R means at the same level of K = 95.6 Kg/ha.  
 C.D. for K means at the same level of R = 139.4 Kg/ha.

**Crop :- Cotton. (Kharif).**

**Ref :- Mh. 60(44), 61(146), 62(133).**

**Site :- Agri. Res. Stn., Achalpur.**

**Type :- 'CM'.**

**Object :-** To study the effect of N, P and K alone and in combination with different spacings on the yield of deshi Cotton.



## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Groundnut and *Jowar* for 62; N.A. for others. (c) N.A. (ii) Black cotton soil. (iii) 6.7.60; 28.6.61; 9.7.62. (iv) (a) Ploughing and harrowing for 62; 4 bakherings for others. (b) Hand dibbling. (c) N.A. (d) As per treatments. (e) 1. (v) Nil. (vi) AK 277. (vii) Unirrigated. (viii) H eings and weedings. (ix) 57 cm.; N.A.; 84 cm. (x) 4 pickings from 15.11.60. to 13.1.61; 26.11.61 and 31.1.62; 15.12.62 and 12.1.63.

## 2. TREATMENTS:

## Main-plot treatments:

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

- (1) 3 levels of N as A/S:  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.  
 (2) 3 levels of  $P_2O_5$  as Super:  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.  
 (3) 3 levels of  $K_2O$  as Pot. Sul.:  $K_0=0$ ,  $K_1=28.0$  and  $K_2=56.0$  Kg/ha.

## Sub-plot treatments:

All combinations (1) and (2)

- (1) 2 spacings between rows:  $R_1=46$  cm., and  $R_2=61$  cm.  
 (2) 2 spacings between plants:  $S_1=15$  cm. and  $S_2=23$  cm.

Super and Pot. Sul. applied at sowing and A/S applied 21 days after sowing.

## 3. DESIGN:

(i) Split-plot confd. (ii) (a) 3 blocks/replication, 9 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 7.32 m.  $\times$  10.77 m. (b) 5.49 m.  $\times$  9.14 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory. (ii) Attack of Boll worm, Dahiya, etc. Dusting with Sulphur and B.H.C. (iii) Yield of *kapas* (iv) (a) 196—62. (b) No. (c) Nil. (v) Akola, Buldhana, Nanded, Parbhani, Washim and Yeotmal. (vi) Incessant showers immediately after sowing in 62. (vii) As main-plot and sub-plot error variances are heterogeneous, results of individual years have been presented under 5. Results.

## 5. RESULTS:

60(44)

(i) 1095 Kg/ha. (ii) (a) 310.1 Kg/ha. (b) 60.0 Kg/ha. (iii) Main effect of R and interaction  $P \times R$  and  $K \times S$  are highly significant. Main effect of N and interaction  $N \times S$  are significant. (iv) Av. yield of *kapas* in Kg/ha.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	$S_1$	$S_2$	Mean
$R_1$	943	1165	1263	1253	1050	1067	1169	1170	1030	1116	1130	1123
$R_2$	911	1100	1190	1147	1054	1000	1108	1134	958	1060	1074	1067
Mean	927	1132	1226	1200	1052	1033	1139	1152	994	1088	1102	1095
$S_1$	921	1107	1237	1194	1047	1024	1149	1172	945			
$S_2$	932	1157	1216	1106	1057	1042	1129	1132	1043			
$K_0$	943	1111	1362	1272	1087	1057						
$K_1$	1019	1205	1233	1221	1018	1219						
$K_2$	819	1079	1084	1107	1050	825						
$P_0$	1166	1263	1271									
$P_1$	830	1051	1273									
$P_2$	884	1082	1134									

C.D. for N marginal means = 178.9 Kg/ha.

C.D. for R marginal means = 23.3 Kg/ha.

C.D. for R or S mean at the same level of N or P or K = 40.6 Kg/ha.

C.D. for N or P or K means at the same level of R or S = 152.4 Kg/ha.

61(146)

(i) 197 Kg/ha. (ii) (a) 72.4 Kg/ha (b) 57.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of kapas in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
R <sub>1</sub>	166	220	209	221	203	171	196	213	186	200	197	198
R <sub>2</sub>	174	211	201	224	185	177	210	192	184	196	194	195
Mean	170	216	205	223	194	174	203	203	185	198	195	197
S <sub>1</sub>	179	203	212	217	198	179	199	205	190			
S <sub>2</sub>	162	228	197	28	190	169	207	200	180			
K <sub>0</sub>	169	192	248	220	210	178						
K <sub>1</sub>	184	231	193	217	209	182						
K <sub>2</sub>	158	224	174	230	163	162						
P <sub>0</sub>	187	266	215									
P <sub>1</sub>	181	186	215									
P <sub>2</sub>	143	194	185									

62(133)

(i) 707 Kg/ha. (ii) (a) 103.4 Kg/ha. (b) 122.6 Kg/ha. (iii) Main effects of N and S are highly significant. Interaction N×K is significant. (iv) Av. yield of kapas in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
R <sub>1</sub>	635	677	906	731	738	750	735	729	755	722	757	740
R <sub>2</sub>	609	643	769	693	659	669	613	666	742	677	670	674
Mean	622	660	838	712	698	709	674	697	749	700	714	707
S <sub>1</sub>	649	656	793	690	709	699	676	710	712			
S <sub>2</sub>	595	664	882	734	687	720	671	684	786			
K <sub>0</sub>	691	600	731	649	702	669						
K <sub>1</sub>	560	731	800	724	616	751						
K <sub>2</sub>	615	649	982	762	776	708						
P <sub>0</sub>	617	697	882									
P <sub>1</sub>	651	637	806									
P <sub>2</sub>	598	645	885									

C.D. for N marginal means=75.1 Kg/ha.

C.D. for S marginal means=47.9 Kg/ha.

C.D. for body of N×K table=92.0 Kg/ha.

Crop :- Cotton (*Khairif*).

Ref :- Mh. 60(40), 61(150).

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

Type :- 'CM'.

Object :- To find out the best rotation of Cotton after Cotton with and without manuring.

## 1. BASAL CONDITIONS :

(i) (a) to (c) As per treatments. (ii) Black cotton soil. (iii) 28.6.60 ; 7.7.61. (iv) (a) 3 bakharings ; 4 bakharings. (b) *Argada* sowing. (c) 13 Kg/ha. for Buri 0394 and 11 Kg/ha. for Ak 277. (d) 61 cm.  $\times$  30 cm. for Buri 0 74 ; 46 cm.  $\times$  23 cm. for AK 277. (e) 1. (v) 12.4 C.L./ha. of F.Y.M. applied before sowing ; Nil. (vi) AK 277 Deshi and Buri 0394. (v) Unirrigated. (viii) 3 hoeings and 3 weedings. (ix) 62 cm. ; 74 cm. (x) 25.11.60 to 18.12.61 ; 2.12.61 to 5.3.62.

## 2. TREATMENTS :

All combination of (1) and (2)

(1) 4 crop rotations  $\times$  Cotton :  $R_1$  = Deshi after Deshi,  $R_2$  = Deshi after Buri,  $R_3$  = Buri after Buri and  $R_4$  = Buri after Deshi.

(2) 2 levels of N as A S.  $N_0$  = 0 and  $N_1$  = 22.4 Kg/ha. N applied at sowing.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 3. (b) 47.85 m.  $\times$  20.12 m. ; N.A. (iii) 4. (iv) (a) N.A. (b) 20.12 m.  $\times$  5.03 m. (v) One row on all sides. (vi) Yes.

## 4. GENERAL :

(i) Good. (ii) Endrin sprayed in case of Buri plots, for Aphids. (iii) Yield of *kapas*. (iv) (a) 1952-61. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) As error variances are heterogeneous and Treatments  $\times$  years interaction is absent, results of individual years have been presented under 5. Results.

## 5. RESULTS :

60(40)

(i) 531 Kg/ha. (ii) 131.4 Kg/ha. (iii) Main effect of N is highly significant. Main effect of R is significant (iv) Av. yield of *kapas* in Kg/ha.

	$R_1$	$R_2$	$R_3$	$R_4$	Mean
$N_0$	336	420	477	608	460
$N_1$	511	563	652	687	603
Mean	423	491	564	647	531

C.D. for N marginal means = 96.6 Kg/ha.

C.D. for R marginal means = 136.6 Kg/ha.

61(150)

(i) 146 Kg/ha. (ii) 35.2 Kg/ha. (iii) Main effects of N and R are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

	$R_1$	$R_2$	$R_3$	$R_4$	Mean
$N_0$	104	108	67	138	104
$N_1$	180	199	151	218	187
Mean	142	154	109	178	146

C.D. for N marginal means = 25.9 Kg/ha.

C.D. for R marginal means = 36.6 Kg/ha.

**Crop :- Cotton. (Kharif).****Ref :- Mh. 60(176), 61(107), 62(93), 63(136).****Site :- Agri. Res. Stn., Akola.****Type :- 'CM'.**

Object :—To study the effect of N, P and K alone and in combination with different spacings on the yield of American Cotton.

**1 BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton for 60; Groundrnt for others. (c) 10 C.L./ha. of F.Y.M. + 11.2 Kg/ha. of N + 11.2 Kg/ha. of  $P_2O_5$ . (ii) Black cotton soil. (iii) 6.7.60; 10.7.61; 5.7.62; 2.7.63. (iv) (a) 2 to 4 harrowings. (b) Dibbling. (c) 16 Kg/ha. (d) As per treatments. (e) N.A. (v) 12.4 C.L./ha. of F.Y.M. (vi) B-147. (vii) Unirrigated. (viii) 3 to 6 hoeings and 3 weedings. (ix) N.A.; 75 cm.; 105 cm.; 51 cm. (x) 6.2.61 to 23.2.61; 1st week of March, 62; 1st week of March, 63; 22.11.63 to 9.1.64.

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

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

(1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(2) 3 levels of  $P_2O_5$  as super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

(3) 3 levels of  $K_2O$  as Pot. Sul. :  $K_0=0$ ,  $K_1=28.0$  and  $K_2=56.0$  Kg/ha.

**Sub-plot treatments :**

All combinations of (1) and (2).

(1) 2 spacings between rows :  $R_1=61$  cm. and  $R_2=76$  cm.

(2) 2 spacing between rows :  $S_1=23$  cm. and  $S_2=30$ .

**3. DESIGN :**

(i) Split-plot confd. (ii) (a) 3 blocks/replication, 9 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 7.62 m.  $\times$  10.97 m. (b) 6.10 m.  $\times$  9.14 m. (v) 76 cm.  $\times$  91 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Mild attack of pink Boll worm, Endrin sprayed. (iii) Yield of kapas. (iv) (a) 1960--63 (b) No. (c) Nil. (v) Achalpur, Buldhana, Nagpur, Yeotmal and Washim. (vi) Due to rains there was heavy shedding of bolls in 61. (vi) As main-plot and sub-plot error variances are heterogeneous results of individual years are presented under 5. Results.

**5. RESULTS :****60(176)**

(i) 371 Kg/ha. (ii) (a) 156.6 Kg/ha. (b) 88.6 Kg/ha. (iii) Main effect of R is highly significant. Interaction  $N \times S$  is significant. (iv) Av yield of kapas in Kg/ha.

	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	$S_1$	$S_2$	$R_1$	$R_2$	Mean
$N_0$	322	297	395	335	364	316	358	318	382	295	338
$N_1$	352	366	324	333	364	345	309	386	398	296	347
$N_2$	350	522	408	381	356	543	429	424	461	392	427
Mean	341	395	376	350	361	401	365	376	414	328	371
$R_1$	369	439	433	375	402	465	382	445			
$R_2$	314	351	318	324	321	338	348	307			
$S_1$	339	367	390	331	355	410					
$S_2$	344	423	361	368	368	393					
$K_0$	336	400	313								
$K_1$	333	315	435								
$K_2$	354	470	380								

C.D. for R marginal means = 34.6 Kg/ha.

C.D. for S means at the same level of N = 59.9 Kg/ha.

C.D. for N means at the same level of S = 99.5 Kg/ha.

## 61(107)

(i) 126 Kg/ha (ii) (a) 34.5 Kg/ha. (b) 31.7 Kg/ha. (iii) Main effects of N and P are significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	95	112	124	115	118	98	117	104	105	115	110
N <sub>1</sub>	113	146	125	111	147	126	132	124	129	128	128
N <sub>2</sub>	111	142	164	128	131	158	146	132	140	139	139
Mean	106	133	138	118	132	127	132	120	125	127	126
R <sub>1</sub>	100	136	138	119	128	126	130	119			
R <sub>2</sub>	113	131	138	117	136	128	134	121			
S <sub>1</sub>	103	143	149	120	130	135					
S <sub>2</sub>	110	124	127	107	135	111					
K <sub>0</sub>	99	116	139								
K <sub>1</sub>	108	152	138								
K <sub>2</sub>	112	133	137								

C.D. for N or P marginal means=19.9 Kg/ha.

## 62(93)

(i) 716 Kg/ha. (ii) (a) 133.2 Kg/ha. (b) 79.4 Kg/ha. (iii) Main effects of S and R are highly significant. Main effect of N is significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	645	633	643	651	657	613	664	617	655	626	640
N <sub>1</sub>	693	781	720	701	741	752	796	667	758	705	731
N <sub>2</sub>	712	814	801	809	758	750	836	715	820	721	775
Mean	683	743	721	720	719	708	765	666	747	684	716
R <sub>1</sub>	697	786	759	746	762	734	782	713			
R <sub>2</sub>	670	699	683	695	676	682	749	619			
S <sub>1</sub>	723	798	776	770	786	741					
S <sub>2</sub>	644	688	667	671	652	676					
K <sub>0</sub>	717	701	743								
K <sub>1</sub>	668	766	723								
K <sub>2</sub>	665	762	698								

C.D. for N marginal means=76.8 Kg/ha.

C.D. for S or R marginal means=31.0 Kg/ha.

## 63(136)

(i) 853 Kg/ha. (ii) (a) 169.3 Kg/ha. (b) 128.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	779	822	829	789	736	906	808	813	805	816	810
N <sub>1</sub>	877	799	861	886	821	830	872	819	882	810	846
N <sub>2</sub>	874	886	949	915	951	843	899	907	912	894	903
Mean	844	836	880	863	836	860	860	846	866	840	853
R <sub>1</sub>	858	852	888	847	865	888	862	871			
R <sub>2</sub>	829	819	871	880	807	832	857	822			
S <sub>1</sub>	833	855	891	875	830	874					
S <sub>2</sub>	855	816	868	852	841	846					
K <sub>0</sub>	843	860	887								
K <sub>1</sub>	793	824	890								
K <sub>2</sub>	894	823	862								

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 60(118), 61(109), 62(94), 63(137).**

**Site :- Agri. Res. Stn., Akola.**

**Type :- 'GM'.**

**Object :-** To study the effect of N, P and K alone and combination with different spacings on the yield of *deshi* Cotton.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton for 60 ; Groundnut for others. (c) 10 C.L./ha. of F.Y.M.+11.2 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Black cotton soil. (iii) 7.7.60 ; 7.7.61 ; 4.7.62 ; 2.7.63. (iv) (a) 3 to 4 harrowings. (b) Sown by Argada. (c) 13 Kg/ha. (d) As per treatments. (e) N.A. (v) 12.4 C.L./ha. of F.Y.M. in 60, 61 and 62 ; 140 Q/ha. of F.Y.M. for 63. (vi) AK 277 for 60 and 61 ; AK-235 for 62 and 63. (vii) Unirrigated. (viii) 4 to 6 hoeings and 2 to 3 weedings. (ix) N.A. ; 15 cm. ; 82 cm. ; N.A. (x) N.A. pickings completed in last week of Feb. 62 ; N.A. ; 3 pickings from 22.11.63 to 13.1.64.

#### 2. TREATMENTS :

##### Main-plot treatments :

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

(1) 3 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=22.4 and P<sub>2</sub>=44.8 Kg/ha.

(iii) 3 levels of K<sub>2</sub>O as Pot. Sul. : K<sub>0</sub>=0, K<sub>1</sub>=28.0 and K<sub>2</sub>=56.0 Kg/ha.

##### Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 spacings between rows : R<sub>1</sub>=46 cm. and R<sub>2</sub>=61 cm.

(2) 2 spacings between plants : S<sub>1</sub>=15 cm. and S<sub>2</sub>=23 cm.

#### 3. DESIGN :

(i) Split-plot confd. (ii) (a) 3 blocks/replication, 9 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

#### 4. GENERAL :

(i) Satisfactory. (ii) Sulphur dusted against *Dahiya*. (iii) Yield of *kapas*. (iv) (a) 1960-53. (b) No. (c) Nil. (v) Achalpur, Buldhana, Nanded, Parbhani, Washin and Yeotmal. (vi) Due to incessant rains in Oct. shedding of bolls in 61. (vii) As the main-plot and sub-plot error variances are heterogeneous, results of individual years are presented under 5. Results.

## 5. RESULTS :

60(118)

(i) 260 Kg/ha. (ii) (a) 174.0 Kg/ha. (b) 94.5 Kg/ha. (iii) Main effect of R is significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	235	280	277	289	271	233	298	230	277	251	264
N <sub>1</sub>	271	275	268	249	278	288	279	263	319	223	271
N <sub>2</sub>	225	258	252	260	228	248	224	266	277	213	245
Mean	244	271	265	266	259	256	267	253	291	229	260
R <sub>1</sub>	271	310	293	291	292	289	302	281			
R <sub>2</sub>	217	231	238	241	225	223	233	226			
S <sub>1</sub>	253	272	276	301	253	247					
S <sub>2</sub>	235	270	255	231	265	264					
K <sub>0</sub>	268	247	283								
K <sub>1</sub>	249	250	277								
K <sub>2</sub>	214	317	238								

C.D. for R marginal means=36.9 Kg/ha.

61(109)

(i) 300 Kg/ha. (ii) (a) 72.2 Kg/ha. (b) 67.5 Kg/ha. (iii) Main effects of N and R are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	253	213	227	207	241	244	227	235	266	195	231
N <sub>1</sub>	286	315	288	302	283	304	317	275	304	289	296
N <sub>2</sub>	386	333	304	380	360	387	362	387	392	357	374
Mean	308	287	306	296	295	311	302	299	321	280	300
R <sub>1</sub>	242	297	323	310	309	342	319	322			
R <sub>2</sub>	274	278	289	283	280	279	285	276			
S <sub>1</sub>	315	295	296	299	301	306					
S <sub>2</sub>	302	279	305	294	288	315					
K <sub>0</sub>	272	303	315								
K <sub>1</sub>	334	289	310								
K <sub>2</sub>	319	320	293								

C.D. for N marginal means=41.6 Kg/ha.

C.D. for R marginal means=26.3 Kg/ha.

62(94)

(i) 653 Kg/ha. (ii) (a) 123.4 Kg/ha. (b) 93.0 Kg/ha. (iii) Main effect of R and interaction R×S are highly significant. Interaction P×K is significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	595	617	606	626	600	592	612	600	679	533	606
N <sub>1</sub>	664	670	730	657	666	741	668	709	731	645	688
N <sub>2</sub>	627	671	696	719	553	723	650	680	695	634	665
Mean	629	653	677	668	606	685	643	663	702	604	653
R <sub>1</sub>	672	719	714	741	635	729	659	745			
R <sub>2</sub>	585	587	641	594	577	641	627	581			
S <sub>1</sub>	617	632	680	646	600	684					
S <sub>2</sub>	640	674	675	689	612	687					
K <sub>0</sub>	610	643	750								
K <sub>1</sub>	660	544	614								
K <sub>2</sub>	616	772	668								

C.D. for R marginal means = 36.3 Kg/ha.

C.D. for body of P × K table = 123.3 Kg/ha.

C.D. for body of R × S table = 51.4 Kg/ha.

63(137)

(i) 680 Kg/ha. (ii) (a) 247.7 Kg/ha. (b) 134.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of kapas in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	623	605	541	540	599	630	592	587	604	575	590
N <sub>1</sub>	642	683	751	675	726	674	679	705	703	681	692
N <sub>2</sub>	737	831	705	691	766	817	777	738	793	723	758
Mean	667	706	666	635	697	707	683	677	700	660	680
R <sub>1</sub>	710	727	662	676	699	724	683	717			
R <sub>2</sub>	624	686	669	594	695	691	683	637			
S <sub>1</sub>	688	691	669	639	692	718					
S <sub>2</sub>	647	721	663	631	702	697					
K <sub>0</sub>	600	691	614								
K <sub>1</sub>	684	743	664								
K <sub>2</sub>	718	685	720								

Crop :- Cotton (Kharif).

Ref :- Mh. 65(181).

Site :- Regional Res. centre, Amaravati.

Type :- 'CM'.

Object :- To study the manurial requirements of cotton grown with different plant populations.



## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black cotton soil. (iii) 3, 4 7.65. (iv) (a) Harrowing and bakhering, (b) Dibbling, (c) 9.9 to 12.3 Kg/ha. (d) 61 cm. x 30 cm. (e) 1. (v) 12 C.L./ha. of F.Y.M. (vi) B-147. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 51.5 cm. (x) 3 pickings from 27.11.65 to 18.1.66.

## 2. TREATMENTS :

## Main-plot treatments

All combinations of (1) and (2)

(1) 3 spacings between rows :  $R_1=46$  cm,  $R_2=61$  cm. and  $R_3=91$  cm.

(2) 3 spacings between plants :  $S_1=23$  cm,  $S_2=38$  cm. and  $S_3=53$  cm.

## Sub-plot treatments

4 levels of manuring :  $M_0$  = Control,  $M_1=22.4$  Kg/ha. of N as A/S,  $M_2=22.4$  Kg/ha. of N as A/S + 22.4 Kg/ha. of  $P_2O_5$  as Super and  $M_3=44.8$  Kg/ha. of N as A/S + 44.8 Kg/ha. of  $P_2O_5$  as Super.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6.10 m. x 3.66 m. (b) 4.87 m. x 2.44 m. (v) 61 cm. x 61 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory (ii) Nil. (iii) Yield of *karas*. (iv) (a) 1965—only. (b) and (c) No. (v) to (vii) No.

## 5. RESULTS :

(i) 1144 Kg/ha. (ii) (a) 552.9 Kg/ha. (b) 301.9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

	$S_1$	$S_2$	$S_3$	$M_0$	$M_1$	$M_2$	$M_3$	Mean
$R_1$	1025	1059	1152	933	1054	1041	1288	1079
$R_2$	1273	1222	1146	1289	1154	1197	1215	1214
$R_3$	1264	1089	1063	1281	1117	1053	1103	1139
Mean	1187	1123	1120	1168	1108	1097	1202	1144
$M_0$	1301	1017	1185					
$M_1$	1064	1100	1160					
$M_2$	1144	1227	920					
$M_3$	1241	1150	1215					

Crop :- Cotton (*Kharif*).

Ref :- 60(46), 61(26), 62(11), 63(10).

Site :- Agri. Res Stn., Buldhana.

Type :- 'CM'.

Object : To study the effect of N, P and K alone and in combination with different spacings on the yield of *deshi* Cotton.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) 22.4 Kg/ha. of  $P_2O_5$ . (ii) Medium black cotton soil (iii) 8.7.60 ; 2.7.61 ; 3.7.62 ; 13.7.63. (iv) (a) 2 to 3 harrowings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 3. (v) Nil. (vi) Unirrigated. (vii) AK-277. (viii) Weeding and hoeing. (ix) N.A. ; 91 cm ; 65 cm. ; 74 cm. (x) 21.12.60 to 17.1.61 ; 3 pickings from 12.12.61 to 29.1.62 ; 4 pickings from 20.11.62 to 14.2.63 ; 3 pickings from 24.12.63 to 12.2.64.

## 2. TREATMENTS :

**Main-plot treatments**

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

(1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

(3) 3 levels of  $K_2O$  as Pot-Sul. :  $K_0=0$ ,  $K_1=28.0$  and  $K_2=56.0$  Kg/ha.

**Sub-plot treatments**

All combinations of (1) and (2).

(1) 2 spacing between row :  $R_1=46$  cm. and  $R_2=61$  cm.

(2) 2 spacing between plants :  $S_1=15$  cm. and  $S_2=23$  cm.

## 3. DESIGN :

(i) Split-plot confd. (ii) (a) 3 blocks/replication ; 9 main-plots/block, 4 sub-plots/main plot. (b) N.A.

(iii) I. (iv) (a) 7.32 m.  $\times$  10.97 m. (b) 5.49 m.  $\times$  9.14 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Aphids and ball-worm attack ; Sulphur dusted. (iii) Yield of *kapas*. (iv) 1960-63. (b) No. (c) Nil. (v) Akola, Achalpur, Nanded, Parbhani, Washim and Yeotmal. (vi) Gap in rainfall affected the germination in 60 ; heavy rains in the first fortnight of oct. affected the crop in 61. (vii) As main-plot and sub-plot error variances are heterogeneous, the results of individual years are presented under 5. — Results.

## 5. RESULTS :

60(46)

(i) 573 Kg/ha. (ii) (a) 212.0 Kg/ha. (b) 84.1 Kg/ha. (iii) Main effect of S and interactions  $P \times R$  and  $N \times S$  are significant (iv) Av. yield of *kapas* in Kg/ha.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	$S_1$	$S_2$	Mean
$R_1$	521	611	569	566	568	567	518	572	613	N.A.	N.A.	567
$R_2$	540	632	567	597	597	542	551	555	632	N.A.	N.A.	580
Mean	530	621	568	581	582	554	534	563	622	594	552	573
$S_1$	551	627	605	607	606	569	548	591	644			
$S_2$	510	616	531	557	559	540	521	536	609			
$K_0$	462	614	528	530	482	591						
$K_1$	548	609	532	570	577	542						
$K_2$	582	641	644	646	690	531						
$P_0$	550	616	579									
$P_1$	533	703	512									
$P_2$	508	545	613									

C.D. for S marginal means = 32.9 Kg/ha.  
 C.D. for R or S means at the same level of P or N = 56.8 Kg/ha.  
 C.D. for P or N means at the same level of R or S = 124.4 Kg/ha.

61(26)

(i) 469 Kg/ha. (ii) (a) 211.4 Kg/ha. (b) 72.5 Kg/ha. (iii) Interaction  $P \times R$  alone is significant. (iv) Av. yield of *kapas* in Kg/ha

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
R <sub>1</sub>	386	478	540	445	481	478	508	447	449	464	472	468
R <sub>2</sub>	388	490	533	475	424	511	492	454	465	489	452	470
Mean	387	484	536	460	452	494	500	450	457	476	462	469
S <sub>1</sub>	386	484	559	467	467	495	507	460	462			
S <sub>2</sub>	388	485	513	453	438	494	493	441	451			
K <sub>0</sub>	436	421	643	495	468	537						
K <sub>1</sub>	366	534	451	461	449	440						
K <sub>2</sub>	358	498	515	424	440	516						
P <sub>0</sub>	380	480	520									
P <sub>1</sub>	392	474	492									
P <sub>2</sub>	388	498	597									

C.D. for R means at the same level of P=49.1 Kg/ha.

C.D. for P means at the same level of R=126.2 Kg/ha.

62(11)

(i) 783 Kg/ha. (ii) (a) 228.3 Kg/ha. (b) 134.6 Kg/ha. (iii) Main effect of S is highly significant and that of R is significant. (iv) Av. yield of *kapas* in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
R <sub>1</sub>	809	816	810	783	829	824	844	821	771	827	797	812
R <sub>2</sub>	714	807	743	716	800	748	698	807	759	810	699	754
Mean	761	811	776	749	814	786	771	814	765	818	748	783
S <sub>1</sub>	791	830	834	773	864	819	822	868	766			
S <sub>2</sub>	731	795	718	726	765	753	720	760	764			
K <sub>0</sub>	854	663	796	629	895	789						
K <sub>1</sub>	749	894	798	827	812	802						
K <sub>2</sub>	681	881	733	793	736	766						
P <sub>0</sub>	685	823	741									
P <sub>1</sub>	900	801	792									
P <sub>2</sub>	698	814	845									

C.D. for R or S marginal means = 52.6 Kg/ha.

63(10)

(i) 353 Kg/ha. (ii) (a) 42.3 Kg/ha. (b) 62.1 Kg/ha. (iii) Main effects of P and R are highly significant. Main effects of N and P and interaction P×K are significant. (iv) Av. yield of *kapas* in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
R <sub>1</sub>	365	350	394	402	365	342	359	400	349	384	355	369
R <sub>2</sub>	358	310	339	370	333	304	328	347	332	332	339	336
Mean	361	330	366	386	349	323	343	373	340	358	347	353
S <sub>1</sub>	380	320	374	386	356	332	346	377	351			
S <sub>2</sub>	344	339	358	387	342	313	341	370	330			
K <sub>0</sub>	349	328	355	380	318	333						
K <sub>1</sub>	382	330	409	384	405	332						
K <sub>2</sub>	355	332	335	395	324	303						
P <sub>0</sub>	383	378	397									
P <sub>1</sub>	373	300	373									
P <sub>2</sub>	329	311	319									

C.D. for N, P or K marginal means = 24.4 Kg/ha.

C.D. for R marginal means = 24.3 Kg/ha.

C.D. for body of P × K table = 42.2 Kg/ha

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 60(151), 61(25), 62(10).**

**Site :- Agri. Res. Stn., Buldhana.**

**Type :- 'CM'.**

Object :—To study the effect of N, P and K alone and in combination with different spacings on the yield of Cotton American.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut (c) 22.4 Kg/ha of P<sub>2</sub>O<sub>5</sub> (ii) Medium black. (iii) 7.7.60 ; 3.7.61 ; 5.7.62. (iv) 3 to 4 bakherings. (b) Dibbling. (c) N.A. (d) As per treatments (e) 3. (v) Nil. (vi) B-147. (vii) Unirrigated. (viii) Weedings and hoeings. (ix) 62 cm. ; 110 cm. ; 65 cm. (x) 6 pickings for 30.11.60 to 25.1.61 ; 5 pickings from 2.12.61 to 27.2.62 ; 3 pickings from 3.12.62 to 23.1.63.

#### 2. TREATMENTS :

##### Main-plot treatments

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

(1) 3 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=22.4 and P<sub>2</sub>=44.8 Kg/ha.

(3) 3 levels of K<sub>2</sub>O as Pot-sul. : K<sub>0</sub>=0, K<sub>1</sub>=28.0 and K<sub>2</sub>=56.0 Kg/ha.

##### Sub-plot treatments

All combinations (1) and (2).

(1) 2 spacing between rows : R<sub>1</sub>=61 cm. and R<sub>2</sub>=76 cm.

(2) 2 spacing between plants : S<sub>1</sub>=23 cm. and S<sub>2</sub>=30 cm.

#### 3. DESIGN :

(i) Split-plot confd. (ii) (a) 3 blocks/replication ; 9 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 7.31 m. × 10.97 m. and 7.62 m. × 10.97 m. (b) 6.10 m. × 9.14 m. (v) 61 cm. × 91 cm. and 76 cm. × 91 cm. (vi) Yes.

#### 4. GENERAL :

(i) Germination defective for 60 ; satisfactory for others. (ii) Jassids and Aphids attack caused 1% damage in 60 and 61. Boll worm attack for which Endrin and Ultra Sulphur sprayed in 62. (iii) Yield of kapas. (iv) (a) 1960-62. (b) No (c) The results of combined analysis have been presented under 5—Results.

(v) Akola, Achalpur, Nagpur, Washim and Yeotmal. (vi) Gap in rainfall after sowing affected the yield in 60. The crop was affected due to heavy rains in Oct. in 61. (vii) Both the main-plot and sub-plot error variances are homogeneous and main-plot Treatments  $\times$  years and sub-plot Treatment  $\times$  years interaction are absent.

## 5. RESULTS :

Pooled results :

(i) 782 Kg/ha (ii) (a) 354.5 Kg/ha. (based on 18 d.f. made up of pooled error). (b) 123.5 Kg/ha. (based on 108 d.f. made up of pooled error). (iii) Main effects of N, R and S are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
R <sub>1</sub>	710	831	937	744	865	870	769	855	853	845	807	826
R <sub>2</sub>	658	725	829	692	762	758	703	753	756	761	714	737
Mean	684	778	883	718	813	814	736	804	805	803	760	782
S <sub>1</sub>	708	811	889	747	824	837	763	826	820			
S <sub>2</sub>	659	745	877	689	802	790	709	783	789			
K <sub>0</sub>	656	740	812	723	711	774						
K <sub>1</sub>	685	831	897	731	823	859						
K <sub>2</sub>	710	764	940	699	906	808						
P <sub>0</sub>	594	772	788									
P <sub>1</sub>	728	781	931									
P <sub>2</sub>	729	783	930									

C.D. for N marginal means = 101.4 Kg/ha.

C.D. for R or S marginal means = 27.2 Kg/ha.

### Individual results

Treatment	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Sig.	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Sig.	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>
Year											
1960	565	730	820	N.S.	708	729	678	N.S.	646	754	715
1961	619	769	841	*	674	743	812	N.S.	775	716	738
1962	868	837	989	N.S.	772	969	952	N.S.	788	944	962
Pooled	684	778	883	**	718	813	814	N.S.	736	804	805

Sig.	S <sub>1</sub>	S <sub>2</sub>	Sig.	R <sub>1</sub>	R <sub>2</sub>	Sig.	G.M.	S.E./Plot	
								(a)	(b)
N.S.	742	668	**	746	664	**	705	345.2	118.4
N.S.	754	732	N.S.	775	711	**	743	205.5	121.2
N.S.	914	882	N.S.	958	838	**	898	464.3	130.5
N.S.	803	760	**	826	738	**	782	354.5	123.5

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 64(52), 65(216).**

**Site :- Agri. Res. Stn., Kopargaon.**

**Type :- 'CM'.**

**Object :-** To study the effect of N and P fertilizers in combination with spacings on the yield of Cotton.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) N.A. ; *Jowar*. (c) N.A. ; 12 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$ .  
 (ii) N.A. (iii) 6.6.64, 25 4.65. (iv) (a) 1 ploughing and 2 harrowings. (b) Dibbling by hand. (c) N.A. ;  
 4.9 Kg/ha. (d) As per treatments. (e) 1. (v) 12 C L./ha. of F.Y.M. (vi) Andrews. (vii) Irrigated. (viii)  
 4.5 interculturings. (ix) N.A. ; 59.5 cm. (x) 23.12.64 and 28.1.65 ; 29.10.65.

**2. TREATMENTS :**

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

(1) 3 levels of N as A/S :  $N_1=44.8$ ,  $N_2=89.7$  and  $N_3=134.5$  Kg/ha.

(2) 2 spacings :  $S_1=61$  cm.  $\times$  30 cm. and  $S_2=61$  cm.  $\times$  61 cm.

(3) 2 levels of  $P_2O_5$  as Super :  $P_0=0$  and  $P_1=56.0$  Kg/ha.

Extra treatments :  $E_1=61$  cm.  $\times$  30 cm. and  $E_2=61$  cm.  $\times$  61 cm. spacings.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 14. (b) N.A. ; 42.7 m.  $\times$  30.5 m. (iii) 4. (iv) (a) 15.24 m.  $\times$  6.10 m. (b)  
 14.02 m.  $\times$  4.88 m. (v) 61 cm.  $\times$  61 cm. (vi) Yes.

**4. GENERAL :**

(i) Not uniform ; normal (ii) Jassids and red leaf, Spraying of Endrin. (iii) Yield of *kapas*. (iv) (a) 1964-66.  
 (b) No. (c) Nil. (v) and (vi) Nil. (vii) As the experiment is continued beyond 65, results of individual  
 years have been presented under 5. —Results.

**5. RESULTS :**

64(52)

(i) 371 Kg/ha. (ii) 220.8 Kg/ha. (iii) Interaction N  $\times$  P alone is significant. (iv) Av. yield of *kapas* in  
 Kg/ha.

$E_1=242$  and  $E_2=332$  Kg/ha.

	$S_1$	$S_2$	$P_0$	$P_1$	Mean
$N_1$	385	220	290	315	302
$N_2$	431	485	491	425	458
$N_3$	410	383	210	583	396
Mean	408	363	330	441	385
$P_0$	354	307			
$P_1$	463	419			

C.D. for body of N  $\times$  P table = 223.0 Kg/ha.

65(216)

(i) 2390 Kg/ha. (ii) 326.8 Kg/ha. (iii) Main effect of N and extra treatments vs. others are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

E<sub>1</sub>=1550 and E<sub>2</sub>=1588 Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	Mean
N <sub>1</sub>	2103	2203	2076	2229	2153
N <sub>2</sub>	2571	2596	2617	2550	2583
N <sub>3</sub>	2921	2767	2818	2870	2844
Mean	2532	2522	2504	2550	2527
P <sub>0</sub>	2501	2506			
P <sub>1</sub>	2562	2537			

C.D. for N marginal means=233.4 Kg/ha.

C.D. for extra treatments vs. others=252.1 Kg/ha.

**Crop :- Cotton (Kharif).****Ref :- Mh. 60(190), 61(140).****Site :- Agri. College Farm, Nagpur.****Type :- 'CM'.****Object :-**To find out suitable sowing date and manurial dose for Cotton.**1. BASAL CONDITIONS:**

(i) (a) Nil. (b) and (c) N.A. (ii) Black cotton soil. (iii) As per treatments. (iv) (a) 1 ploughing and 4 harrowings. (b) Dibbling. (c) 11 Kg/ha. (d) 61 cm. x 30 cm. (e) 1. (v) Nil. (vi) BO-394. (vii) Irrigated. (viii) 4 to 6 weedings and 4 to 5 hoeings. (ix) 101 cm.; 138 cm. (x) 2.11.60 to 31.12.60.; 10.11.61 to 27.1.62.

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

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=33.6 and N<sub>2</sub>=67.2 Kg/ha.(2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=33.6 and P<sub>2</sub>=67.2 Kg/ha.**Sub-plot treatments:**3 dates of sowing : D<sub>1</sub>=28th May, D<sub>2</sub>=6th June and D<sub>3</sub>=13th June.**3. DESIGN:**

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 6.40 m x 6.10 m. (b) 5.49 m. x 4.88 m. (v) 46 cm. x 61 cm. (vi) Yes.

**4. GENERAL:**

(i) Normal. (ii) Endrin sprayed. (iii) Yield of kapas. (iv) (a) 1959-61. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. No. 59(73) has also been taken into consideration for testing the homogeneity of variances. As the main-plot and sub-plot error variances are heterogeneous results of individual years have been presented under 5. Results.

**5. RESULTS:****60(190)**

(i) 952 Kg/ha. (ii) (a) 275.5 Kg/ha. (b) 230.8 Kg/ha. (iii) Main effect of D is highly significant. (iv) Av. yield of kapas in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	Mean
N <sub>0</sub>	999	868	998	1049	1023	794	955
N <sub>1</sub>	958	950	1013	1270	952	698	974
N <sub>2</sub>	1021	879	882	1128	878	776	927
Mean	993	899	964	1149	951	756	952
D <sub>1</sub>	1200	1041	1205				
D <sub>2</sub>	945	988	1000				
D <sub>3</sub>	833	748	688				

C.D. for D marginal means=127.5 Kg/ha.

61(140)

(i) 303 Kg/ha. (ii) (a) 117.7 Kg/ha. (b) 84.8 Kg/ha. (iii) Main effect of D is highly significant. (vi) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	Mean
N <sub>0</sub>	281	284	326	425	297	170	297
N <sub>1</sub>	277	316	284	383	284	211	293
N <sub>2</sub>	354	332	268	421	261	273	318
Mean	304	311	293	410	280	218	303
D <sub>1</sub>	444	379	407				
D <sub>2</sub>	255	307	279				
D <sub>3</sub>	213	247	194				

C.D. for D marginal means=46.9 Kg/ha.

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 60(203), 61(180), 62(182).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'CM'.**

**Object :-** To study the effect of N, P and K alone and in combination with different spacings on the yield of American Cotton.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Fallow for 60 ; Cotton for others. (c) Nil for 60 ; As per treatments for others. (ii) Medium black. (iii) 12.7.60 ; 10.7.61 ; 5.7.62. (iv) (a) 2-3 harrowings. (b) Dibbling. (c) 15 Kg/ha. (d) As per treatments. (e) 1. (v) Nil. (vi) B-147. (vii) Unirrigated. (viii) 2-3 weedings and 3-6 hoeings. (ix) 101 cm. ; 139 cm. ; 110 cm. (x) 15.12.60 to 27.1.61 ; 13.12.61 to 26.2.62 ; 14.11.62 to 27.1.63.

**2. TREATMENTS :**

**Main-plot treatments :**

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

(1) 3 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=22.4 and P<sub>2</sub>=44.8 Kg/ha.

(3) 3 levels of K<sub>2</sub>O as Pot. Sul : K<sub>0</sub>=0, K<sub>1</sub>=22.4 and K<sub>2</sub>=44.8 Kg/ha.

**Sub-plot treatments :**

(1) 2 spacings between rows : R<sub>1</sub>=61 cm. and R<sub>2</sub>=76 cm.

(2) 2 spacings between plants : S<sub>1</sub>=23 cm. and S<sub>2</sub>=30 cm.



## 3. DESIGN :

(i) Split-plot confd. (ii) (a) 3 blocks/replication ; 9 main-plots/block ; 4 sub-plots/main-plot. (b) 92.66 m.  $\times$  34.14 m. (iii) 1. (iv) (a) 10.97 m.  $\times$  7.32 m. (b) 9.14 m.  $\times$  5.49 m. for 60 ; 9.14 m.  $\times$  6.10 m. for others. (v) 91 cm  $\times$  91 cm. for 60 ; 91 cm.  $\times$  61 cm. for others. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1960—62. (b) Yes. (c) Nil. (v) Achalpur, Akola, Buldhana, Washim and Yeotmal. (vi) Yes. (vii) As main-plot and Sub-plot error variances are heterogeneous, results of individual years have been presented under 5. Results.

## 5. RESULTS :

## 60(203)

(i) 1260 Kg/ha. (ii) (a) 806.9 Kg/ha. (b) 254.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	1158	1170	1058	1108	1186	1093	1113	1145	1167	1091	1129
N <sub>1</sub>	1181	1359	1288	1291	1273	1263	1287	1264	1283	1269	1276
N <sub>2</sub>	1519	1254	1350	1673	1034	1415	1396	1353	1478	1270	1374
Mean	1286	1261	1232	1358	1164	1257	1265	1254	1309	1210	1260
R <sub>1</sub>	1357	1305	1266	1412	1154	1363	1321	1298			
R <sub>2</sub>	1215	1216	1198	1303	1175	1151	1210	1210			
S <sub>1</sub>	1335	1235	1226	1351	1245	1200					
S <sub>2</sub>	1237	1287	1238	1264	1084	1314					
K <sub>0</sub>	1179	1407	1487								
K <sub>1</sub>	1370	1049	1074								
K <sub>2</sub>	1309	1326	1136								

## 61(180)

(i) 131 Kg/ha. (ii) (a) 134.8 Kg/ha. (b) 41.7 Kg/ha. (iii) Main effect of R is highly significant and that of S is significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	129	92	108	83	125	121	120	100	113	107	110
N <sub>1</sub>	172	131	108	95	133	183	146	128	147	127	137
N <sub>2</sub>	145	136	155	96	196	145	159	132	171	120	145
Mean	149	120	124	91	151	150	142	120	144	118	131
R <sub>1</sub>	159	137	136	98	175	159	156	132			
R <sub>2</sub>	139	102	112	85	127	140	128	107			
S <sub>1</sub>	151	125	149	94	161	170					
S <sub>2</sub>	146	114	99	89	141	129					
K <sub>0</sub>	83	92	99								
K <sub>1</sub>	185	108	161								
K <sub>2</sub>	178	160	111								

C.D. for R or S marginal means=163 Kg/ha.

62(182)

(i) 905 Kg/ha. (ii) (a) 199.4 Kg/ha. (b) 164.0 Kg/ha. (iii) Main effect of N and interaction N×P are highly significant. Main effect of R, P and K and interaction N×K and R×K are significant. (iv) Av. yield of kapas in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	618	720	869	798	657	752	753	718	754	717	736
N <sub>1</sub>	944	955	1247	1194	1033	918	1024	1072	1084	1013	1049
N <sub>2</sub>	876	1062	857	932	807	1056	956	908	974	889	932
Mean	813	912	991	975	832	909	911	899	938	873	905
R <sub>1</sub>	863	902	1047	947	889	977	929	946			
R <sub>2</sub>	762	922	935	1003	775	841	893	852			
S <sub>1</sub>	814	887	1032	971	827	936					
S <sub>2</sub>	812	937	950	979	838	882					
K <sub>0</sub>	863	1009	1053								
K <sub>1</sub>	809	838	850								
K <sub>2</sub>	767	889	1070								

C.D. for N, P or K marginal means =95.4 Kg/ha.  
 C.D. for R marginal means =64.0 Kg/ha.  
 C.D. for body of N×P or N×K tables =95.4 Kg/ha.  
 C.D. for R means at the same level of K =110.9 Kg/ha.  
 C.D. for K means at the same level of R =137.4 Kg/ha.

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 61(222), 62(219), 63(276), 64(234).**

**Site :- Cotton Res. Stn., Nanded, Type :- 'CM'.**

**Object :-** To study the effect of N, P and K alone and in combination with different spacings on the yield of *deshi* Cotton.

### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar* for 61 and 62 ; Wheat for 63 and 64. (c) 56 Kg/ha. of N for 61 and nil for others.  
 (ii) Black soil. (iii) 22.6.61 ; 13, 14.7.62 ; 16, 17.6.63 ; 9.7.64. (iv) (a) 2 to 4 harrowings. (d) Dibbling.  
 (c) 9 Kg/ha. (d) As per treatments. (e) 2. (v) Nil. (vi) Gao 46. (vii) Unirrigated. (viii) 1 weeding and 3 hoeings. (ix) N.A. (x) 19.12.61 and 6.2.62 ; 29.12.62 and 13.2.63 ; 12.12.63 ; 3 pickings from 29.12.64 to 27.1.65.

### 2. TREATMENTS :

#### Main-plot treatments :

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

(1) 3 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=22.4 and P<sub>2</sub>=44.8 Kg/ha.

(3) 3 levels of K<sub>2</sub>O as Pot. Sul. : K<sub>0</sub>=0, K<sub>1</sub>=23.0 and K<sub>2</sub>=56.0 Kg/ha.

#### Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 spacings between rows : R<sub>1</sub>=46 cm. and R<sub>2</sub>=61 cm.

(2) 2 spacings between plants : S<sub>1</sub>=15 cm. and S<sub>2</sub>=23 cm.

### 3. DESIGN :

(i) Split-plot confd. (ii) (a) 3 blocks/replication ; 9 main-plots/block ; 4 sub-plots/main-plot. (b) N.A.  
 (iii) 1. (iv) (a) 10.97 m.×7.32 m. (b) 9.14 m.×5.49 m. (v) 91 cm.×91 cm. (vi) Yes.

## 4. GENERAL :

(i) Stunted growth in 61 and 62 ; normal in 63 and 64. (ii) Attack of Boll worm, Jassids, thrips, Dahiya, etc. Sulphur dusted. (iii) Yield of *kapas*. (iv) (a) 1961-64. (b) No. (c) The results of combined analysis have been presented under 5. Results. (v) Achalpur, Akola, Buldhana, Parbhani washim and Yeotmal. (vi) Heavy rains in 61, 62 and 63. (vii) Both the main-plot and sub-plot error variances are homogeneous and main-plot Treatments  $\times$  years and sub-plot Treatments  $\times$  years interactions are absent.

## 5. RESULTS :

## Pooled results

(i) 219 Kg/ha. (ii) (a) 82.8 Kg/ha. (based on 24 d.f. made up of pooled error). (b) 37.1 Kg/ha. (based on 144 d.f. made up of pooled error). (iii) Main effect of N is highly significant and that of is significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	191	191	207	195	205	189	196	197	201	192	196
N <sub>1</sub>	216	243	227	219	242	225	236	221	228	230	229
N <sub>2</sub>	236	250	214	253	219	228	238	229	231	236	234
Mean	214	228	216	222	222	214	223	215	220	219	219
R <sub>1</sub>	213	226	220	226	220	213	223	216			
R <sub>2</sub>	215	230	212	219	224	215	224	215			
S <sub>1</sub>	217	233	220	225	228	218					
S <sub>2</sub>	211	223	212	220	217	210					
K <sub>0</sub>	216	233	218								
K <sub>1</sub>	226	230	211								
K <sub>2</sub>	201	221	219								

C.D. for N marginal means = 20.14 Kg/ha.

C.D. for S marginal means = 7.00 Kg/ha.

## Individual results

Treatment	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Sig.	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Sig.	S <sub>1</sub>	S <sub>2</sub>	Sig.
year											
1961	138	160	133	N.S.	151	138	142	N.S.	150	137	N.S.
1962	131	147	139	N.S.	137	141	139	N.S.	143	136	N.S.
1963	178	180	179	N.S.	185	189	163	N.S.	191	167	**
1964	413	427	415	N.S.	418	423	414	N.S.	413	424	N.S.
Pooled	214	228	216	N.S.	222	222	214	N.S.	223	215	*
R <sub>1</sub> R <sub>2</sub>	Sig.	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Sig.	G.M.	S.E. per				
							Main-plot	sub-plot			
136 151	*	142	165	123	N.S.	144	71.7	35.5			
135 143	N.S.	132	149	136	N.S.	139	65.2	34.1			
191 167	**	206	174	156	N.S.	179	91.6	32.0			
419 417	N.S.	307	428	520	**	418	98.1	45.4			
220 219	N.S.	196	229	234	**	219	82.8	37.1			

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 60(123).**

**Site :- Agri. Res. Sta., Parbhani.**

**Type :- 'GM'.**

**Object :-**To study the effect of N, P and K alone and in combinations with different spacings on the yield of *deshi* Cotton.

**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) *Jowar*. (c) N.A. (ii) Medium black soil. (iii) 6, 7.7.60 (iv) (a)  $\infty$  harrowings. (b) Dibbling. (c) 11.2 Kg/ha. (d) As per treatments. (e) 3 to 4 seeds/dibble. (v) Nil. (vi) G—2204. (vii) Unirrigated. (viii) 3 weedings and 1 hoeing. (ix) 77.6 cm. (x) Pickings on 10, 28.11.60, 15.12.60 and 10.1.61.

**2. TREATMENTS :**

**Main-plot treatments:**

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

(1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

(3) 3 levels of  $K_2O$  as Pot. Sul :  $K_0=0$ ,  $K_1=22.4$  and  $K_2=44.8$  Kg/ha.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 2 spacings between rows ;  $R_1=46$  cm. and  $R_2=61$  cm.

(2) 2 spacings between plants :  $S_1=15$  cm. and  $S_2=23$  cm.

**3. DESIGN :**

(i) Split-plot confd. (ii) (a) 3 blocks/replication ; 9 main-plots/block ; 4 sub-plots/main-plot. (b) 32.92 m.  $\times$  21.94 m. (iii) 1. (iv) (a) 10.97 m.  $\times$  7.31 m. (b) 9.14 m.  $\times$  5.49 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1960—65 (failed in 61 and modified in 62). (b) No. (c) Nil. (v) Achalpur, Akola, Buldhana, Washim and Yeotmal. (vi) Nil. (vii) Yields very low for which reasons N.A.

**5. RESULTS :**

(i) 104.6 Kg/ha. (ii) (a) 92.2 Kg/ha. (b) 24.0 Kg/ha. (iii) Main effect of R is highly significant. Interaction  $K \times S$  is significant. (iv) Av. yield of *kapas* in Kg/ha.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	$R_1$	$R_2$	Mean
$S_1$	78.5	112.1	118.8	109.8	111.0	88.5	113.2	98.6	97.6	93.0	113.2	103.1
$S_2$	86.3	109.9	122.2	111.0	109.8	97.5	105.4	122.2	90.7	100.9	111.0	106.1
Mean	82.4	111.0	120.5	110.4	110.4	93.0	109.3	110.4	94.2	97.0	112.2	104.6
$R_1$	72.9	98.6	121.1	102.0	103.1	86.3	103.1	89.7	99.8			
$R_2$	91.9	123.4	119.9	118.8	117.7	99.7	115.5	131.1	88.6			
$K_0$	112.1	104.2	118.8	106.5	113.2	108.7						
$K_1$	58.3	113.2	124.4	124.4	81.8	81.8						
$K_2$	76.8	115.6	118.3	100.3	136.2	88.5						
$P_0$	88.5	116.6	126.7									
$P_1$	93.0	126.7	111.0									
$P_2$	65.7	89.7	123.8									

C.D. for R marginal means = 9.4 Kg/ha.

C.D. for K means at the same level of S = 37.7 Kg/ha.

C.D. for S means at the same level of K = 9.4 Kg/ha.

Crop :- Cotton (*Kharif*).

Ref :- Mh. 62(86), 63(127), 64(106), 65(149).

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

Type :- 'CM'.

Object :- To study the effect of N, P and K alone and in combination with different spacings on the yield of *deshi* Cotton.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Rabi Jowar* ; Chillies ; *Jowar* ; *Rabi Jowar*. (c) N.A. ; N.A. ; N.A. ; 22.4 Kg/ha. of N (ii) Medium black soil. (iii) 7.6.62 ; 26, 29, 30.6.63 ; 27, 28.6.64 ; 26, 27.6.65. (iv) (a) Ploughing and harrowings. (b) Dibbling. (c) 11 Kg/ha. (d) As per treatments. (e) 2 to 4. (v) Nil. (vi) G-2204. (vii) Unirrigated. (viii) Interculturing, weeding and hoeings. (ix) N.A. ; 100 cm. ; 70 cm. ; 78 cm. (x) N.A. ; 4 pickings from 14.11.63 to 21.12.63 ; 5 pickings from 23.11.64 to 28.12.64 ; 4 pickings from 10.11.65 to 29.12.65.

## 2. TREATMENTS :

## Main-plot treatments :

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

- (1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.  
 (2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.  
 (3) 3 levels of  $K_2O$  as Pot Sul :  $K_0=0$ ,  $K_1=28.0$  and  $K_2=56.0$  Kg/ha.

## Sub-plot treatments :

All combinations of (1) and (2).

- (1) 2 spacings between rows :  $R_1=46$  cm. and  $R_2=61$  cm.  
 (2) 2 spacings between plants :  $S_1=15$  cm. and  $S_2=23$  cm.

## 3. DESIGN :

(i) Split-plot confd. (ii) (a) 9 main-plots/block ; 3 blocks/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 10.97 m.  $\times$  7.32 m. (b) 9.14 m.  $\times$  5.49 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Sulphur dusted in 65 against Dahiya. (iii) Yield of *kapas*. (iv) (a) 1960-65 (failed in 61 and modified from 62). (b) No. (c) Results of combined analysis have been presented under 5.—Results. (v) Achalpur, Akola, Buldhana, Nanded, Washim and Yeotmal. (vi) Nil. (vii) Both the main-plot and sub-plot error variances are homogeneous and Main-plot Treatments  $\times$  Years and Sub-plot Treatments  $\times$  years interactions are absent.

## 5. RESULTS :

## Pooled results

(i) 572 Kg/ha. (ii) (a) 196.7 Kg/ha. (based on 24 d.f. made up of pooled error). (b) 79.8 Kg/ha. (based on 144 d.f. made up of pooled error). (iii) Main effects of N and R are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	$S_1$	$S_2$	Mean
$R_1$	508	611	660	596	604	579	597	583	599	602	584	593
$R_2$	499	568	587	530	577	547	557	541	556	560	543	551
Mean	504	589	624	563	591	563	577	562	578	581	564	572
$S_1$	495	602	644	572	606	564	582	564	597			
$S_2$	512	576	603	553	575	563	572	560	559			
$K_0$	505	620	606	582	577	572						
$K_1$	479	582	625	549	574	562						
$K_2$	528	565	640	557	621	555						
$P_0$	503	576	609									
$P_1$	535	602	634									
$P_2$	473	590	627									

C.D. for N marginal means = 47.8 Kg/ha.

C.D. for R marginal means = 15.0 Kg/ha.

## Individual results

Treatment	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Sig.	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Sig.	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>
Year											
1962	619	686	693	N.S.	653	665	680	N.S.	695	641	662
1963	403	523	565	**	490	504	497	N.S.	501	504	486
1964	440	515	467	N.S.	465	508	449	N.S.	458	460	504
1965	555	635	772	**	645	688	629	N.S.	656	644	661
Pooled	504	589	624	**	563	591	563	N.S.	577	562	578

  

Sig.	S <sub>1</sub>	S <sub>2</sub>	Sig.	R <sub>1</sub>	R <sub>2</sub>	Sig.	G.M.	S.E./plot.	
								Main-plot	Sub-plot
N.S.	674	658	N.S.	724	608	**	666	253.7	72.5
N.S.	499	495	N.S.	513	481	N.S.	497	118.4	93.2
N.S.	504	444	**	497	451	**	474	194.5	82.9
N.S.	647	660	N.S.	640	668	*	654	196.5	68.0
N.S.	581	564	N.S.	593	551	**	572	196.7	79.8

Crop :- Cotton (*Kharif*).

Ref :- 60(159), 61(55), 62(46).

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

Type :- 'CM'.

Object :—To study the effect of N, P and K alone and in combination with different spacings on the yield of American Cotton.

## 1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. for 60 ; Wheat for others. (c) N.A. ; 2.4 C.L./ha. of F.Y.M. ; 7.4 C.L./ha. of F.Y.M.  
(ii) Deep black cotton soil. (iii) N.A. ; 6.7.61 ; 4.7.62. (iv) (a) 3 harrowings. (b) Dibbling. (c) N.A.  
(d) As per treatments. (e) 2. (v) Nil. (vi) B-147. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 91 cm. for 62 ; N.A. for others. (x) N.A. ; 5.2.62 and 27.3.62 ; 3 pickings from 28.11.62 to 23.1.63.

## 2. TREATMENTS :

## Main-plot treatments :

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

(1) 3 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.

(2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=22.4 and P<sub>2</sub>=44.8 Kg/ha.

(3) 3 levels of K<sub>2</sub>O as Pot-Sul. : K<sub>0</sub>=0, K<sub>1</sub>=28.0 and K<sub>2</sub>=56.0 Kg/ha.

## Sub-plots treatments :

All combinations of (1) and (2).

(1) 2 spacings between rows : R<sub>1</sub>=61 cm. and R<sub>2</sub>=76 cm.

(2) 2 spacings between plants : S<sub>1</sub>=23 cm. and S<sub>2</sub>=30 cm.

## 3. DESIGN :

- (i) Split-plot confd. (ii) (a) 3 blocks/replication ; 9 main-plots/block ; 4 sub-plots/main-plot. (b) N.A.  
(iii) 1. (iv) (a) 10.97 m. × 7.31 m. (b) 9.14 m. × 6.10 m. (v) 91 cm. × 61 cm. (vi) Yes.

## 4. GENERAL :

- (i) Normal. (ii) B.H.C., Sulphur and Endrin dusted against Jassids and Aphids. (iii) Yield of *kapas*.  
(iv) (a) 1960-62. (b) No. (c) Nil. (v) Achalpur, Akola, Buldhana, Nagpur and Yeotmal. (vi) Heavy rains affected the yield in 61. (vii) As the main-plot and sub-plot error variances are heterogeneous, results of individual years are presented under 5.—Results.

## 5. RESULTS:

60(159)

(i) 694 Kg/ha. (ii) (a) 186.5 Kg/ha. (b) 99.8 Kg/ha. (iii) Main effects of N and R are significant. (iv) Av. yield of *kapas* in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
R <sub>1</sub>	608	766	775	683	759	707	695	732	722	734	698	716
R <sub>2</sub>	558	735	723	620	737	660	699	675	643	664	680	672
Mean	583	750	749	652	748	684	697	704	682	699	689	694
S <sub>1</sub>	584	751	762	674	741	682	687	714	695			
S <sub>2</sub>	582	750	736	629	754	685	706	693	669			
K <sub>0</sub>	610	707	772	575	824	691						
K <sub>1</sub>	601	769	740	675	761	675						
K <sub>2</sub>	537	775	734	703	659	685						
P <sub>0</sub>	530	773	668									
P <sub>1</sub>	648	757	838									
P <sub>2</sub>	588	721	741									

C.D. for N marginal means=107.4 Kg/ha.

C.D. for R marginal means=39.0 Kg/ha.

61(55)

(i) 158 Kg/ha. (ii) (a) 29.1 Kg/ha. (b) 18.6 Kg/ha. (iii) Main effects of P and R and interaction N×S are highly significant. Main effects of N, K and S and interaction P×K are significant. (iv) Av. yield of *kapas* in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
R <sub>1</sub>	154	181	180	158	191	166	178	178	159	180	163	172
R <sub>2</sub>	131	148	154	129	163	141	154	149	130	149	140	144
Mean	142	165	167	143	177	154	166	163	145	164	152	158
S <sub>1</sub>	136	172	185	149	182	162	172	164	157			
S <sub>2</sub>	149	158	148	137	172	146	160	162	133			
K <sub>0</sub>	151	177	170	138	165	175						
K <sub>1</sub>	146	173	170	168	167	155						
K <sub>2</sub>	130	144	160	123	179	132						
P <sub>0</sub>	130	140	159									
P <sub>1</sub>	171	184	176									
P <sub>2</sub>	127	170	165									

C.D. for N, P or K marginal means =17.1 Kg/ha.

C.D. for S or R marginal means =7.3 Kg/ha.

C.D. for S means at the same level of K=12.6 Kg/ha.

C.D. for K means at the same level of S=19.1 Kg/ha.

C.D. for body of P×K table =24.1 Kg/ha.

62(46)

- (i) 587 Kg/ha. (ii) (a) 102.0 Kg/ha. (b) 97.0 Kg/ha. (iii) Main effects of N, P and R are significant.  
 (iv) Av. yield of kapas in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
R <sub>1</sub>	569	604	655	550	613	666	569	633	626	609	610	610
R <sub>2</sub>	528	547	615	522	606	563	549	541	601	589	539	564
Mean	548	576	635	536	609	614	559	587	613	599	574	587
S <sub>1</sub>	572	565	660	550	639	607	553	610	634			
S <sub>2</sub>	525	587	611	522	580	622	565	565	593			
K <sub>0</sub>	512	551	614	506	582	588						
K <sub>1</sub>	517	589	656	552	558	653						
K <sub>2</sub>	617	587	637	551	688	602						
P <sub>0</sub>	504	533	571									
P <sub>1</sub>	610	576	643									
P <sub>2</sub>	532	618	692									

C.D. for N or P marginal means = 58.7 Kg/ha.

C.D. for R marginal means = 37.9 Kg/ha.

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 60(175), 61(106), 62(92), 63(135).**

**Site :- Agri. Res. Stn., Washim.**

**Type :- 'CM'.**

**Object :-** To study the effect of N, P and K alone and in combination with different spacings on the yield of *deshi* Cotton.

### 1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Gram for 61 and 62; N.A. for other. (c) 12.3 C.L./ha. of F.Y.M. for 61; 7.4 C.L./ha. of F.Y.M. for 62; N.A. for others. (ii) Medium black soil. (iii) 7.7.60; 2, 3.7.61; 5.7.62; 9.7.63. (iv) (a) 3 to 4 harrowings. (b) Dibbling. (c) 9 to 13 Kg/ha. (d) As per treatments. (e) 2 to 3. (v) Nil. (vi) AK-277. (vii) Unirrigated. (viii) Weedings and hoeings. (ix) N.A. (x) N.A., 3 pickings from 28.12.61 to 27.2.62; 3 pickings from Dec. to Feb., 21.12.63 and 18.1.64.

### 2. TREATMENTS :

#### Main-plot treatments :

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

- (1) 3 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.  
 (2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=22.4 and P<sub>2</sub>=44.8 Kg/ha.  
 (3) 3 levels of K<sub>2</sub>O as Pot-sul : K<sub>0</sub>=0, K<sub>1</sub>=28.0 and K<sub>2</sub>=56.0 Kg/ha.

#### Sub-plot treatments :

All combinations of (1) and (2).

- (1) 2 spacings between rows : R<sub>1</sub>=46 cm. and R<sub>2</sub>=61 cm.  
 (2) 2 spacings between plants : S<sub>1</sub>=15 cm. and S<sub>2</sub>=23 cm.

### 3. DESIGN :

- (i) Split-plot confd. (ii) (a) 3 blocks/replication; 9 main-plots/block; 4 sub-plots/main-plot. (iii) 1.  
 (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.



## 4. GENERAL :

(i) Satisfactory. (ii) Sulphur dusted 62. B.H.C. 10% applied against Aphids and Jassid. for 63. (iii) Yield of *kapas*. (iv) (a) 1960-63. (b) No. (c) Nil. (v) Achalpur, Akola, Buldhana, Nanded, Parbhani and Yeotmal. (vi) Heavy rains affected the yield from 61 to 63. (vii) As Main-plot and Sub-plot error variances are heterogeneous, results of individual years are presented under 5.—Results.

## 5. RESULTS :

60(175)

(i) 714 Kg/ha. (ii) (a) 106.1 Kg/ha. (b) 81.8 Kg/ha. (iii) Main effects of N and R are significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	638	621	617	586	640	650	637	613	725	626	625
N <sub>1</sub>	684	737	743	727	684	752	732	710	689	754	721
N <sub>2</sub>	763	813	812	766	829	793	802	790	776	816	796
Mean	695	723	724	693	718	732	724	705	696	732	714
R <sub>1</sub>	673	717	698	677	697	715	699	693			
R <sub>2</sub>	717	730	749	709	739	749	748	716			
S <sub>1</sub>	696	747	728	689	729	753					
S <sub>2</sub>	694	700	719	697	707	710					
K <sub>0</sub>	682	699	698								
K <sub>1</sub>	712	720	721								
K <sub>2</sub>	692	751	752								

C.D. for N marginal means=92.3 Kg/ha.

C.D. for R marginal means=32.0 Kg/ha.

61(106)

(i) 412 Kg/ha. (ii) (a) 55.9 Kg/ha. (b) 48.9 Kg/ha. (iii) Main effects of N and R are highly significant, Interaction of N×K×R is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	372	358	335	336	353	377	355	356	367	343	355
N <sub>1</sub>	415	417	422	401	442	411	409	427	450	386	418
N <sub>2</sub>	439	488	460	469	454	464	463	462	476	448	462
Mean	409	421	405	402	416	417	409	415	431	392	412
R <sub>1</sub>	423	437	433	426	442	426	423	439			
R <sub>2</sub>	394	405	378	379	390	408	394	391			
S <sub>1</sub>	402	419	406	407	410	409					
S <sub>2</sub>	416	423	435	397	422	425					
K <sub>0</sub>	390	422	394								
K <sub>1</sub>	416	420	413								
K <sub>2</sub>	421	421	409								

C.D. for N marginal means=32.2 Kg/ha.

C.D. for R marginal means=19.1 Kg/ha.

62(92)

(i) 579 Kg/ha. (ii) (a) 81.3 Kg/ha. (b) 72.2 Kg/ha. (iii) Main effect of N is highly significant. Interaction R×S is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	531	542	539	498	581	533	543	532	564	510	537
N <sub>1</sub>	527	581	590	570	621	505	569	563	577	554	566
N <sub>2</sub>	644	614	647	633	612	659	632	637	638	631	635
Mean	567	579	592	567	605	566	581	577	593	565	579
R <sub>1</sub>	564	587	629	567	625	587	576	611			
R <sub>2</sub>	570	571	555	567	584	544	587	544			
S <sub>1</sub>	556	586	601	577	598	568					
S <sub>2</sub>	578	571	583	557	611	563					
K <sub>0</sub>	548	554	599								
K <sub>1</sub>	601	636	577								
K <sub>2</sub>	552	546	599								

C.D. for N means=46.9 Kg/ha.

C.D. for body of R×S table=39.9 Kg/ha.

63(135)

(i) 433 Kg/ha. (ii) (a) 238.2 Kg/ha. (b) 113.9 Kg/ha. (iii) Main effect of N is significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	283	329	285	336	291	270	303	295	278	320	299
N <sub>1</sub>	479	435	496	497	509	404	469	471	479	460	470
N <sub>2</sub>	405	676	511	474	579	539	524	538	522	539	531
Mean	389	480	430	436	460	404	432	434	427	440	433
R <sub>1</sub>	384	447	449	426	439	416	424	429			
R <sub>2</sub>	395	513	411	446	481	393	440	439			
S <sub>1</sub>	382	476	439	418	477	401					
S <sub>2</sub>	397	484	421	453	442	407					
K <sub>0</sub>	425	453	429								
K <sub>1</sub>	378	524	476								
K <sub>2</sub>	365	462	386								

C.D for N marginal means=137.4 Kg/ha.

**Crop :- Cotton (Kharif).****Ref :- Mh. 60(147), 61(59), 62(45).****Site :- Agri. Res. Stn., Yeotmal.****Type :- 'CM'.**

Object :- To study the effect of N, P and K alone and in combinations with different spacings on the yield of American Cotton.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton; *Jowar*; Groundnut. (c) Nil; 112 Kg/ha. of A/S+125.5 Kg/ha. of Super 56 Kg/ha. of A/S+134.5 Kg/ha. of Super. (ii) Medium black. (iii) 11.7.60; 20.6.61, 30.6.62. (iv) 1 ploughing and 3 harrowings. (b) Dibbled. (c) 11 Kg/ha. (d) As per treatments. (e) 2. (v) Nil. (vi) B-147. (vii) Unirrigated. (viii) 6 hoeings and 3 weedings. (ix) 78 cm.; 112 cm.; 105 cm. (x) 4th week of Nov. 60; 4 pickings from 28.11.61 to 2.2.62; 4 pickings from 24.11.62 to 22.1.63.

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

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

(1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

(3) 3 levels of  $K_2O$  as Pot. Sul. :  $K_0=0$ ,  $K_1=28.0$  and  $K_2=56.0$  Kg/ha.

**Sub-plot treatments :**

All combinations of (1) and (2).

(1) 2 spacings between rows :  $R_1=61$  cm. and  $R_2=76$  cm.

(2) 2 spacings between plants :  $S_1=23$  cm. and  $S_2=30$  cm.

**3. DESIGN :**

(i) Split-plot confd. (ii) (a) 3 blocks/replication; 9 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 7.31 m.  $\times$  10.97 m. and 7.62 m.  $\times$  10.97 m. (b) 6.10 m.  $\times$  9.14 m. (v) 61 cm.  $\times$  91 cm. and 76 cm.  $\times$  91 cm. (vi) Yes.

**4. GENERAL :**

(i) Unsatisfactory. (ii) Attack of Jassids, Boll worm etc. Endrin sprayed. (iii) Yield of *kapas*. (iv) (a) 1960-62. (b) No. (c) Nil. (v) Achalpur, Akola, Buldhana, Nagpur and Washim. (vi) Continuous rains from 8th July to 22 July in 61. Delayed monsoon and later heavy rains in 62 affected the crop adversely. (vii) Due to late sowing in 60, growth was unsatisfactory. Defective germination due to scarcity of rains after sowing in 61. As the main-plot error variances are homogeneous and sub-plot error variances are heterogeneous, results of individual years are presented under 5.—Results.

**5. RESULTS :**

60(147)

(i) 441 Kg/ha. (ii) (c) 105.8 Kg/ha. (b) 73.6 Kg/ha. (iii) Interaction  $N \times K$  is significant. (iv) Av. yield of *kapas* in Kg/ha.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	$S_1$	$S_2$	Mean
$R_1$	398	481	450	428	472	429	445	441	443	433	453	443
$R_2$	408	475	435	422	478	419	415	443	460	436	444	440
Mean	403	478	443	425	475	424	430	442	452	434	448	441
$S_1$	386	476	441	406	459	437	436	416	450			
$S_2$	420	480	444	444	490	411	424	468	453			
$K_0$	399	398	493	338	499	454						
$K_1$	369	552	406	488	451	387						
$K_2$	441	485	429	450	476	431						
$P_0$	390	456	429									
$P_1$	422	515	487									
$P_2$	397	464	413									

C.D. for body of  $N \times K$  table = 105.7 Kg/ha.

61(59)

- (i) 388 Kg/ha. (ii) (a) 121.8 Kg/ha. (b) 53.2 Kg/ha. (iii) Main effect of R alone is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
R <sub>1</sub>	368	391	459	405	375	437	381	450	387	411	401	406
R <sub>2</sub>	343	360	406	362	371	376	353	397	359	382	357	369
Mean	356	376	432	384	373	406	367	424	373	396	379	388
S <sub>1</sub>	362	385	443	401	388	401	382	433	374			
S <sub>2</sub>	349	367	421	367	358	412	352	414	372			
K <sub>0</sub>	312	411	378	351	366	384						
K <sub>1</sub>	415	378	477	452	390	429						
K <sub>2</sub>	339	338	441	348	363	407						
P <sub>0</sub>	395	363	394									
P <sub>1</sub>	327	373	419									
P <sub>2</sub>	345	391	484									

C.D. for R marginal means=20.7 Kg/ha.

62(45)

- (i) 489 Kg/ha. (ii) (a) 350.1 Kg/ha. (b) 130.5 Kg/ha. (iii) Main effect of R is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
R <sub>1</sub>	446	513	621	470	575	534	433	602	545	532	521	526
R <sub>2</sub>	385	420	549	442	474	438	389	458	507	453	449	451
Mean	415	466	585	456	525	486	411	530	526	492	485	489
S <sub>1</sub>	416	463	598	467	524	487	406	524	548			
S <sub>2</sub>	414	470	572	445	526	485	416	536	504			
K <sub>0</sub>	318	386	530	350	432	451						
K <sub>1</sub>	452	500	636	567	485	537						
K <sub>2</sub>	476	514	589	450	657	471						
P <sub>0</sub>	345	451	572									
P <sub>1</sub>	499	464	611									
P <sub>2</sub>	401	484	572									

C.D. for R marginal means=50.9 Kg/ha.

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 60(148), 61(215), 62(210).**

**Site :- Agri. Res. Stn., Yeotmal.**

**Type :- 'CM'.**

**Object :-** To study the effect of N, P and K alone and in combination with different spacings on the yield of *deshi* Cotton.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton : *Jowar* ; Cotton. (c) 100.4 Q/ha. of T.C. and 112.1 Kg/ha. of A/S ; 112 Kg/ha. of A/S+124 Kg/ha. of Super ; 67.2 Kg/ha. of Super+112 Kg/ha. of A/S. (ii) Medium black. (iii) 11.7.60 ; 21.6.61 ; 2.7.62. (iv) (a) 1 ploughing and 2 to 3 harrowings. (b) Dibbling. (c) 1<sup>st</sup> Kg/ha. (d) As per treatments. (e) 1—2. (v) Nil. (vi) *Deshi*—AK—277. (vii) Unirrigated. (viii) 3 hoeings and weedings. (ix) 79 cm. ; 112 cm. ; 105 cm. (x) 24.11.60 and 2.1.61 ; 4 pickings from 17.11.61 to 1.2.62 ; 3 pickings from 17.11.62 to 1.1.63.

**2. TREATMENTS :**

Same as in expts. No. 60(175), 61(105), 62(92), 63(135) conducted at Washim and reported on page. No. 442.

**3. DESIGN :**

(i) Split-plot confd. (ii) (a) 3 blocks/replication ; 9 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Flowering suffered for want of moisture ; germination defective due to late showers ; Attack of Boll-worm and Sulphur dusted. (iv) (a) 1960—52. (b) No. (c) Nil. (v) Achalpur, Akola, Buldhana, Nanded, Parbhani and Washim. (vi) Nil. (vii) Main-plot error variances are heterogeneous and sub-plot error variances are homogeneous. As Main-plot Treatments × years interaction is absent, the results of individual years are presented under 5. Results.

**5. RESULTS:**

**60(148)**

(i) 679 Kg/ha. (ii) (a) 245.3 Kg/ha (b) 78.7 Kg/ha. (iii) Main effect of R is highly significant. Main effect of N and interaction N × R are significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	475	537	588	501	534	566	545	522	541	526	533
N <sub>1</sub>	744	783	696	694	790	739	739	743	774	708	741
N <sub>2</sub>	694	771	821	730	814	743	771	753	817	707	762
Mean	637	696	702	641	712	682	685	673	711	647	679
R <sub>1</sub>	692	724	715	649	763	719	708	713			
R <sub>2</sub>	583	669	689	634	662	645	662	633			
S <sub>1</sub>	653	702	694	641	728	685					
S <sub>2</sub>	622	691	704	642	697	679					
K <sub>0</sub>	576	660	689								
K <sub>1</sub>	745	735	658								
K <sub>2</sub>	592	696	759								

C.D. for N marginal means = 57.8 Kg/ha.

C.D. for R marginal means = 30.6 Kg/ha.

C.D. for R means at the same level of N = 53.2 Kg/ha.

C.D. for N means at the same level of R = 146.2 Kg/ha.

61(215)

(i) 391 Kg/ha. (ii) (a) 65.1 Kg/ha. (b) 66.2 Kg/ha. (iii) Main effect of N is highly significant. Interaction N × P is significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	277	327	337	293	334	314	317	310	326	301	313
N <sub>1</sub>	426	371	377	429	383	362	395	387	393	390	391
N <sub>2</sub>	435	436	532	503	440	460	481	454	474	461	468
Mean	379	378	415	408	386	379	398	384	398	384	391
R <sub>1</sub>	387	375	432	409	390	395	398	397			
R <sub>2</sub>	372	382	398	408	381	362	397	370			
S <sub>1</sub>	375	392	426	409	402	382					
S <sub>2</sub>	384	364	404	408	369	375					
K <sub>0</sub>	396	408	421								
K <sub>1</sub>	357	371	428								
K <sub>2</sub>	385	355	396								

C.D. for N marginal means = 37.5 Kg/ha.

C.D. for body of N × P table = 65.0 Kg/ha.

62(210)

(i) 313 Kg/ha. (ii) (a) 67.0 Kg/ha. (b) 64.6 Kg/ha. (iii) Main effects of N and R are highly significant. Interaction P × S is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Mean
N <sub>0</sub>	204	202	207	231	175	208	203	206	218	191	205
N <sub>1</sub>	379	340	314	339	346	347	345	343	370	318	344
N <sub>2</sub>	402	352	414	335	420	414	383	396	425	354	389
Mean	328	298	312	302	313	323	310	315	338	288	313
R <sub>1</sub>	360	320	332	327	326	360	323	352			
R <sub>2</sub>	296	276	291	276	301	286	297	278			
S <sub>1</sub>	332	319	280	296	321	314					
S <sub>2</sub>	325	277	343	307	306	333					
K <sub>0</sub>	321	282	302								
K <sub>1</sub>	352	307	281								
K <sub>2</sub>	312	305	353								

C.D. for N marginal means = 38.6 Kg/ha.

C.D. for R marginal means = 25.2 Kg/ha.

C.D. for S means at the same level of P = 43.7 Kg/ha.

C.D. for P means at the same level of S = 49.2 Kg/ha.

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 62(144), 63(189), 64(156).**

**Site :- Agri. College Farm, Akola.**

**Type :- 'I'.**

**Object :-**To study the effect of irrigation on crop growth and yield of Cotton.

**1. BASAL CONDITIONS :**

(i) (a) Nil (b) *Jowar*. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Black soil. (iii) 15.7.62 ; 25.6.63 ; 1.7.64. (iv) (a) 1 ploughing and 3 harrowings. (b) Dibbling. (c) N.A. (d) 91 cm.×76 cm. (e) 2. (v) 44.8 Kg/ha. of N as A/S+22.4 Kg/ha. of  $P_2O_5$  as Super ; 12.35 C.L./ha. of compost+22.4 Kg/ha. of N +22.4 Kg/ha. of  $P_2O_5$  ; 24.71 C.L./ha. of F.Y.M.+44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (vi) B—147. (vii) As per treatments. (viii) 2—3 hoeings and weedings. (ix) 91 cm. ; 49 cm. ; 68 cm. (x) Nov., 62 to Feb., 63. ; 12.11.63 to 12.2.64 ; 7.11.64 to 4.3.65.

**2. TREATMENTS :**

All combinations of (1) and (2)+control (4 plots).

(1) 4 intervals of irrigations :  $I_1=40$ ,  $I_2=100$ ,  $I_3=40$  and 100 days and  $I_4=$ Every 21 days after sowing.

(2) 3 levels of irrigations :  $L_1=2.5$ ,  $L_2=5$  and  $L_3=7.5$  cm.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 7.32 m.×9.14 m. for 62; 12.80 m.×9.14 m. for others. (b) 5.49 m.×7.32 m. for 62 ; 9.14 m.×6.10 m. for others. (v) 91 cm.×91 cm. for 62 ; 183 cm.×152 cm. for others. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) *Endrin* sprayed. (iii) Yield of *kapas*. (iv) (a) 1962—69 (modified in 65). (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent. Hence results of individual years are presented under 5. Results.

**5. RESULTS :**

62(144)

(i) 610 Kg/ha. (ii) 152.1 Kg/ha. (iii) Main effect of I is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=548 Kg/ha.

	$L_1$	$L_2$	$L_3$	Mean
$I_1$	658	789	726	724
$I_2$	632	693	723	683
$I_3$	560	570	572	567
$I_4$	472	549	653	551
Mean	580	650	664	631

C.D. for I marginal means=94 Kg/ha.

63(189)

(i) 1034 Kg/ha. (ii) 188.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=1062 Kg/ha.

	$L_1$	$L_2$	$L_3$	Mean
$I_1$	944	1108	961	1001
$I_2$	996	948	991	978
$I_3$	1026	1250	967	1081
$I_4$	1038	1074	988	1033
Mean	1001	1095	977	1024

64(156)

(i) 417 Kg/ha. (ii) 126.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=427 Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Mean
I <sub>1</sub>	511	436	465	471
I <sub>2</sub>	455	318	398	389
I <sub>3</sub>	312	445	423	393
I <sub>4</sub>	395	359	454	403
Mean	418	389	435	414

**Crop :- Cotton (Kharif).****Ref :- Mh. 65(222).****Site :- Agri. College Farm, Akola.****Type :- 'P'.**

Object :—To study the effect of irrigation on crop growth and yield of Cotton.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Sugarcane. (iii) 50 C.L./ha. of F.Y.M. (ii) Black cotton soil. (iii) 12.7.65. (iv) (a) 1 ploughing and 2 harrowings. (b) Dibbling. (c) 11.2 Kg/ha. (d) 91 cm.×76 cm. (e) 3 (2 after thinning and interculturing). (v) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> drilled at sowing. 22.4 Kg/ha. of N as top dressing. (vi) Buri—147. (vii) As per treatments. (viii) 3 weedings, 2 hoeing and thinning. (ix) 48.0 cm. (x) 4 pickings from 30.10.65 to 15.12.65.

**2. TREATMENTS :**

All combinations of (1) and (2)+control (4 plots).

(1) 5 intervals of irrigation : I<sub>1</sub>=Irrigation at first critical phase i.e. 40 days after sowing, I<sub>2</sub>=Irrigation at second critical phase i.e. 100 days after sowing, I<sub>3</sub>=I<sub>1</sub>+I<sub>2</sub>, I<sub>4</sub>=Irrigation after every 21 days, starting from sowing and I<sub>5</sub>=Irrigation as and when required.

(2) 2 levels of irrigation : L<sub>1</sub>=5.1 and L<sub>2</sub>=7.6 bm/ha.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 12.80 m.×9.14 m. (b) 9.14 m.×6.10 m. (v) 91 cm.×76 cm. (vi) Yes.

**4. GENERAL :**

(i) Germination satisfactory. (ii) Jassids. (iii) Yield of *kapas*. (iv) (a) 1962—70 (modified from 65). (b) No. (c) Nil. (v) to (vii) Nil.

**5. RESULTS :**

(i) 497 Kg/ha. (ii) 114.8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=494 Kg/ha.

	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>	Mean
L <sub>1</sub>	502	430	460	577	538	501
L <sub>2</sub>	422	496	397	570	596	496
Mean	462	463	428	574	567	499



**Crop :- Cotton (Kharif).**

**Ref :- Mh. 63(33), 64(28), 65(166).**

**Site :- Agri. College Farm, Dhulia.**

**Type :- 'P'.**

**Object :-** To study the optimum interval of irrigation for Cotton.

**1. BASAL CONDITIONS :**

(i) (a) Cotton—Groundnut for 63 and 64; Nil (b) Wheat for 65; Cotton for others. (c) N.A. (i) Medium black. (iii) 30.5.63; 10.5.64; 6.5.65. (iv) (a) 1 ploughing and harrowing. (b) Dibbling. (c) N.A. (d) 122 cm. × 91 cm. (e) 2 to 4. (v) 125.5 Q/ha. of F.Y.M. + 101 Kg/ha. of N as A/S + 67 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super for 63 and 64; 101 Kg/ha. of N as A/S + 67 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super for 65. (vi) CO<sub>2</sub>—170. (vii) As per treatments. (viii) weeding and hoeing. (ix) 50 cm.; 65 cm.; 46 cm. (x) 10, 24.12.63 and 6, 29.1.64; 8, 28.12.64, 12.1.65 and 8.2.65; 22.12.65, 10.1.66, 7.2.66 and 3.3.66.

**2. TREATMENTS :**

5 intervals of irrigation : I<sub>1</sub>=8 to 10 days, I<sub>2</sub>=15 days, I<sub>3</sub>=20 days, I<sub>4</sub>=Irrigation as and when required and I<sub>5</sub>=As indicated by indicator plant (sunflower).

**3. DESIGN :**

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4 for 63 and 64; 5 for 65. (iv) (a) 15.85 m. × 12.80 m. (b) 10.97 m. × 7.31 m. (v) 244 cm. × 274 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Attack of Jassids and Aphids. Frequent spraying with Endrin. (iii) Yield of kapas. (iv) (a) 1963—65. (b) No. (c) Results of combined analysis have been presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is present.

**5. RESULTS :**

Pooled results

(i) 1315 Kg/ha. (ii) 206.5 Kg/ha. (based on 8 d.f. made up of Treatments × Years interaction), (iii) Treatment differences are significant. (iv) Av. yield of kapas in Kg/ha.

Treatment	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>
Av. yield	1400	1356	1375	1343	1099

C.D.=186.7 Kg/ha.

Individual results :

Treatment	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>	Sig.	G.M.	S.E./plot
Year								
1963	1617	1664	1442	1611	1477	N.S.	1562	152.0
1964	1716	1678	1785	1614	1388	**	1636	89.7
1965	973	852	992	913	565	**	859	111.8
Pooled	1400	1356	1375	1343	1099	*	1315	206.5

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 60(73).**

**Site :- Agri. Res. Stn., Amravati.**

**Type :- 'D'.**

**Object :-** To find out control measures for Dahiya disease of Cotton.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) Medium black. (iii) 17.6.60. (iv) (a) 3 bakherings. (b) Drilling. (c) 15.7 Kg/ha. (d) 46 cm. × 23 cm. (e) —. (v) Nil. (vi) 197—3. (vii) Unirrigated. (viii) Nil. (ix) 78.0 cm. (x) 22.10.60 to 5.1.61.

## 2. TREATMENTS :

All combinations of (1), (2) and +control (2 plots).

(1) 6 insecticidal treatments :  $T_1$ =Sulphur,  $T_2$ =Sulphur and D.D.T. 5% (1 : 1),  $T_3$ =Sulphur+D.D.T. 5% (3 : 1),  $T_4$ =D.D.T. 5%,  $T_5$ =B.H.C. 7% and  $T_6$ =Copper dust 4%+ B.H.C. 7% (1 : 1).

(2) 2 numbers of dusting :  $D_1$ =Dusting on the 1st week of Sept. and  $D_2$ = $D_1$ +dusting 3 weeks after first dusting ( $D_1$ ). Each insecticides is applied at 22.4 Kg/ha.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 9.14 m. × 5.49 m. (v) N.A. (vi) Yes.

## 4. GENERAL :

(i) Normal growth. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1960—only. (b) and (c) —. (v) to (vii) Nil.

## 5. RESULTS :

(i) 390 Kg/ha. (ii) 45.8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=372 Kg/ha.

	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	Mean
$D_1$	386	439	400	411	402	369	401
$D_2$	387	384	401	364	381	391	385
Mean	386	411	400	387	391	380	393

**Crop :- Cotton (*Kharif*).**

**Ref :- Mh. 65(180).**

**Site :- Regl. Res. Centre, Amravati.**

**Type :- 'D'.**

Object :—To study the effect of hormonal spray on the yield and quality of Cotton.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black cotton soil. (iii) 1.7.65. (iv) (a) Harrowing and *bakharing*. (b) Dibbling. (c) 4 to 5 Kg/ha. (d) 61 cm. × 30 cm. (e) 1. (v) 12 C.L./ha. of F.Y.M. (vi) B-147. (vii) Unirrigated. (viii) Weeding, thinning and hoeing. (ix) 51.5 cm. (x) From 3.11.65 to 12.12.65.

## 2. TREATMENTS :

6 hormonal sprays :  $T_0$ =Control (no spray),  $T_1$ =Water spray,  $T_2$ =N.A.A. at 10 p.p.m.,  $T_3$ =N.A.A. at 20 p.p.m.,  $T_4$ =N.O.A. at 10 p.p.m. and  $T_5$ =N.O.A. at 20 p.p.m.  
Wetting agent was added to the hormones.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 6.10 m. × 3.66 m. (b) 4.88 m. × 2.44 m. (v) 61 cm. × 61 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Height, number of internods, Yield of *kapas*. (iv) (a) 1965—only. (b) and (c) No. (v) to (vii) Nil.

## 5. RESULTS :

(i) 1457 Kg/ha. (ii) 160.2 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>
Av. yield	1445	1436	1608	1262	1664	1326

C,D.=241.4 Kg/ha.

**Crop :- Cotton (Kharif).**

**Ref :- Mh. 65(183).**

**Site :- Regl. Res. Centre, Amravati.**

**Type :- 'D'.**

**Object :-** To study the effect of foliar vs. soil application of N and P nutrients in the presence and absence of plant hormones, on the yield of Cotton.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black cotton soil. (iii) 1.7.65. (iv) (a) Harrowing and *bakherings*. (b) Dibbling. (c) 10 to 12.0 Kg/ha. (d) 61 cm. × 30 cm. (e) 1. (v) 12 C.L./ha. of F.Y.M. (vi) B-147. (vii) Unirrigated. (viii) Hoeing and weeding. (ix) 51.5 cm. (v) From 6.11.65 to 11.12.65.

## 2. TREATMENTS :

9 manurial cum. chemical treatments : T<sub>0</sub>=Control, T<sub>1</sub>=Soil application of N and P both at 45 Kg/ha., T<sub>2</sub>=Foliar application of N and P both at 22.5 Kg/ha., T<sub>3</sub>=N and P both at 22.5 Kg/ha. as soil application and at 11.3 Kg/ha. as foliar application, T<sub>4</sub>=T<sub>1</sub>+NAO @ 25 p.p.m., T<sub>5</sub>=T<sub>2</sub>+N.A.O. @ 25 p.p.m., T<sub>6</sub>=T<sub>3</sub>+NAO @ 25 p.p.m., T<sub>7</sub>=N and P both at 22.5 Kg/ha. as soil application and at 22.5 Kg/ha. as foliar application+NAO @ 25 p.p.m., T<sub>8</sub>=Water spray.

(N as A/S and P as Super).

## 3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 6.10 m. × 4.57 m. (b) 3.66 m. × 2.13 m. (v) 122 cm. × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1965—only. (b) and (c) —. (v) to (vii) Nil.

## 5. RESULTS :

(i) 2099 Kg/ha. (ii) 479.9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. yield	1823	2066	2188	2118	2204	1903	2194	1951	2441

**Crop :- Groundnut (Kharif),**

**Ref :- Mh. 60(12).**

**Site :- Agri. Res. Stn., Achalpur.**

**Type :- 'M'.**

**Object :-** To study the effect of N and P with and without F.Y.M. on the yield of Groundnut.

## 1. PASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Medium black. (iii) 30.6.60 (iv) (a) 4 *bakherings*. (b) Drilling. (c) 89.7 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) AK—12-24. (vii) Unirrigated. (viii) 2 hoeings. (ix) 56.7 cm. (x) 14.10.60.

## 2. TREATMENTS :

## Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=11.2$  and  $N_2=22.4$  Kg/ha.(2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

## Sub-plot treatments :

2 levels of F.Y.M. :  $F_0=0$  and  $F_1=12.3$  C.L./ha.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  7.32 m. (b) 9.14 m.  $\times$  5.49 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL:

(i) Growth was checked due to lack of moisture in the soil. (ii) Nil. (iii) Yield of pods and germination count. (iv) (a) 1960-62. (b) Yes. (c) Nil. (v) (a) Budhana, Achalpur, Akola and Washim. (b) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 1178 Kg/ha. (ii) (a) 191.8 Kg/ha. (b) 193.7 Kg/ha. (iii) Main effect of F alone is highly significant. (iv) Av. yield of pods in Kg/ha.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	Mean
$F_0$	1074	1101	1077	1069	1094	1050	1084
$F_1$	1267	1217	1333	1216	1286	1313	1272
Mean	1171	1159	1205	1143	1190	1202	1178
$P_0$	1163	1152	1113				
$P_1$	1151	1128	1291				
$P_2$	1198	1197	1210				

C.D. for F marginal means=93.8 Kg/ha.

Crop :- Groundnut (*Kharif*).

Ref :- Mh. 61(108), 62(96).

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

Type :- 'M'.

Object :- To study the effect of N and P with and without F.Y.M. on the yield of Groundnut.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. ; Cotton. (c) N.A. ; 22.4 Kg/ha. of N. (ii) Medium black. (iii) 3.7.61 ; 9.7.62. (iv) (a) 5 harrowings ; 3 ploughing and 3 harrowings. (b) Dibbling. (c) 74 Kg/ha. (d) 30 cm.  $\times$  15 cm. (e) 1 to 2. (v) N.A. (vi) AK 12-24. (vii) Unirrigated. (viii) 2 weedings and 1 hoeing ; 1 weeding and 2 hoeings. (ix) 164 cm. ; 72 cm. (x) 29.10.61 ; 30.11.62.

## 2. TREATMENTS :

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

(1) 3 levels of N :  $N_0=0$ ,  $N_1=11.2$  and  $N_2=22.4$  Kg/ha.(2) 3 levels of P :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.(3) 2 levels of F.Y.M. :  $F_0=0$  and  $F_1=12.4$  C.L./ha.

## 3. DESIGN :

(i) Fact. in R B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  7.32 m. (b) 9.14 m.  $\times$  5.49 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Height, plant count and yield of pods. (iv) (a) 1960-62 (Design changed in 61). (b) No. (c) The results of the combined analysis have been presented under 5.—Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments  $\times$  years interactions are absent.

## 5. RESULTS :

## Pooled results

(i) 1065 Kg/ha. (ii) 196.4 Kg/ha. (based on 102 d.f. made up of pooled error). (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
P <sub>0</sub>	1058	1022	978	976	1062	1019
P <sub>1</sub>	1061	1071	1083	1103	1041	1072
P <sub>2</sub>	1084	1148	1083	1072	1138	1105
Mean	1068	1080	1048	1050	1080	1065
F <sub>0</sub>	1050	1063	1038			
F <sub>1</sub>	1086	1097	1058			

## Individual results

reatm ent	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Sig.	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Sig.
Year								
1961	1066	1080	953	N.S.	1031	1020	1048	N.S.
1962	1070	1081	1143	**	1007	1124	1163	N.S.
Pooled	1068	1080	1048	N.S.	1019	1072	1105	N.S.

F <sub>0</sub>	F <sub>1</sub>	Sig.	G.M.	S.E./plot
1022	1044	N.S.	1033	198.9
1079	1117	N.S.	1098	193.9
1050	1080	N.S.	1065	279.9

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 60(192). 61(162).**

**Site :- Agri. Res. Stn., Achalpur.**

**Type :- 'M'.**

**Object :- To study the effect of micronutrients on the yield of Groundnut.**

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black; Monand II. (iii) 1.7.60; 4.7.61. (iv) (a) 4 to 5 harrowings. (b) Dibbling. (c) 89.6 Kg/ha. (d) 30 cm.  $\times$  23 cm. (e) 1. (v) 22.4 Kg/ha. of N as A/S + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super; 11.2 Kg/ha. of N as A/S + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. (vi) AK 12-24. (vii) Unirrigated (viii) 2 hoeings; weeding. (ix) Nil. (x) 14.10.60; 30.10.61.

## 2. TREATMENTS :

All 32 combinations due to 5 micro-nutrients, each at 2 levels (0) and (1).

A=Zinc—22.4 Kg/ha. as Zn SO<sub>4</sub>. B=Manganese—22.4 Kg/ha. as Mn SO<sub>4</sub>. C=Copper—22.4 Kg/ha. as Cu SO<sub>4</sub>. D=Molybdenum 175 gm./ha. as Sodium Molybdate and E=Boron—22.4 Kg/ha. as Borax.

## 3. DESIGN :

(i) 2<sup>5</sup> Factorial in R.B.D. (ii) (a) 32. (b) N.A. (iii) 4. (iv) (a) 9.02 m. × 5.42 m. (b) 7.20 m. × 3.60 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of pods. (iv) (a) 1960-61. (b) N.A. (c) The results of the combined analysis are presented under 5.—Results. (v) Akola and Mohol. (vi) No. (vii) Error variances are heterogeneous and Treatments × years interactions are absent. Hence the results of individual years are presented under 5.—Results.

## 5. RESULTS :

60(192)

(i) 2062 Kg/ha. (ii) 371.3 Kg/ha. (iii) Interaction A × C × D and B × C × E are significant. (iv) Table of mean and differential responses in Kg/ha.

	Mean response	Differential response									
		A		B				D		E	
		-	+	-	+	-	+	-	+	-	+
A	-7.2	-	-	-103.1	-88.7	-7.3	-7.1	39.5	-53.9	12.8	-27.2
B	54.0	-41.9	149.9	-	-	53.9	54.1	6.2	101.8	-65.5	173.5
C	47.5	47.4	47.6	96.3	-1.3	-	-	-23.4	118.4	135.1	-40.1
D	40.1	86.8	-6.6	-7.7	87.9	30.8	111.0	-	-	52.0	28.2
E	32.4	52.4	12.4	-87.1	151.9	120.0	-55.2	44.3	20.5	-	-

61(162)

(i) 952.5 Kg/ha. (ii) 250.0 Kg/ha. (iii) Interaction B × C is highly significant. (iv) Table of mean and differential responses in Kg/ha.

	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	22.4	-	-	31.2	13.6	18.1	26.7	-30.6	75.4	72.5	-27.7
B	-0.1	8.1	-8.9	-	-	-120.2	120.0	-8.9	8.7	-9.2	9.0
C	-42.2	-46.5	37.9	-162.3	77.9	-	-	-51.0	33.4	-51.3	-33.1
D	-43.7	-96.7	9.3	-52.5	-34.9	-79.8	-7.6	-	-	-0.1	-87.3
E	16.7	66.8	-33.4	7.6	25.8	-11.1	44.5	60.3	-26.9	-	-

C.D. for differential response of B × C = 84.0 Kg/ha.

**Crop :- Groundnut (Kharif).**

**Ref :- Mh.60(3), 61(192), 62(193).**

**Site :- Agri. Res. Stn., Akola.**

**Type :- 'M'.**

**Object :-** To study the effect of N and P with and without F.Y.M. on the yield of Groundnut.

## 1 BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) 10 C.L./ha. of F.Y.M. + 11.2 Kg/ha. of N + 11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Black cotton soil. (iii) 29.6.60 ; 12.7.61 ; 8.7.62. (iv) (a) N.A. ; Harrowing ; 4 harrowings. (b) Drilling ; Argade drilling ; dibbling. (c) 89.7 Kg/ha. (d) 30 cm. × 15 cm. (e) N.A. ; 1 to 2 ; 1 to 2. (v) Nil. (vi) A.K. 12-24. (vii) Unirrigatdd. (viii) N.A. ; 2 hoeings and weeding ; 3 hoeings and 2 weedings. (ix) 62.5 cm. (x) 25.10.60 ; 1 to 4.11.61 ; 8.11.62.

## 2. TREATMENTS :

## Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S:  $N_0=0$ ,  $N_1=11.2$  and  $N_2=22.4$  Kg/ha.(2) 3 levels of  $P_2O_5$  as Super:  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

## Sub-plot treatments :

2 levels of F.Y.M.:  $F_0=0$  and  $F_1=12.3$  C.L./ha.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7.32 m.  $\times$  10.97 m. (b) 5.49 m.  $\times$  9.14 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL ;

(i) N.A. (ii) Nil. (iii) Yield of pods. (iv) (a) 1960-62. (b) No. (c) Nil. (v) No. (vi) Nil. (vii) Both the error variances are heterogeneous. Hence the individual results are presented below.

## 5. RESULTS :

60(3)

(i) 1623 Kg/ha. (ii) (a) 459.8 Kg/ha. (b) 126.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	Mean
$F_0$	1564	1604	1623	1549	1623	1618	1597
$F_1$	1562	1678	1707	1690	1673	1581	1649
Mean	1563	1641	1665	1619	1648	1599	1623
$P_0$	1525	1606	1730				
$P_1$	1542	1638	1767				
$P_2$	1621	1680	1500				

61(192)

(i) 956 Kg/ha. (ii) (a) 182.0 Kg/ha. (b) 130.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	Mean
$F_0$	889	936	960	931	940	913	928
$F_1$	937	1007	1004	1029	937	982	983
Mean	913	972	982	980	939	948	956
$P_0$	900	980	1059				
$P_1$	951	920	945				
$P_2$	887	1014	942				

62(193)

(i) 723 Kg/ha. (ii) (a) 142.3 Kg/ha. (b) 76.7 Kg/ha. (iii) Main effects of N and F are highly significant. (iv) Av. yield of pods in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
F <sub>0</sub>	616	716	754	676	714	695	695
F <sub>1</sub>	614	817	820	726	781	744	750
Mean	615	766	787	701	748	720	723
P <sub>0</sub>	570	743	790				
P <sub>1</sub>	666	763	814				
P <sub>2</sub>	609	793	757				

C.D. for N marginal means = 89.0 Kg/ha.

C.D. for F marginal means = 37.1 Kg/ha.

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 60(173), 61(104)**

**Site :- Agri. Res. Stn., Akola.**

**Type :- 'M'.**

Object :—To study the effect of micronutrients on the yield of Groundnut.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*; Cotton. (c) 9.9 C.L./ha. of F.Y.M.+11.2 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>; 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Black cotton soil. (iii) 27.6 60; 13.7.61. (iv) (a) One ploughing and 3 to 4 harrowings. (b) Drilling. (c) 89.6 Kg/ha. (d) 38 cm.×15 cm.; 46 cm.×23 cm. (e) N.A. (v) 9.9 C.L./ha. of F.Y.M.+11.2 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>; 12.3 C.L./ha. of F.Y.M.+112.1 Kg/ha. of Super at sowing. (vi) AK 12—24. (vii) Unirrigated. (viii) 5 hoeings and 3 weedings; 3 hoeings and 1 weeding. (ix) 63 cm.; 74 cm. (x) 5.10.60; 18.11.61.

**2. TREATMENTS :**

Same as in experiment No. 60(192), 61(162) conducted on Groundnut and presented on page. No. 455.

**3. DESIGN :**

(i) 2<sup>5</sup> fact. Confd. (ii) (a) 32. (b) 50.30 m.×39.30 m. (iii) 4. (iv) (a) 9.12 m.×5.52 m. (b) 7.30 m.×3.70 m. (v) 91 cm.×91 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Slight attack of Tikka, Sulphur dusted. (iii) Height and yield of pods. (iv) (a) 1959—61 (b) No. (c) Nil. (v) Achalpur and Mohol. (vi) Nil. (vii) Since error variances are heterogeneous and all Treatments×years interactions are absent, the results of individual years are presented under 5. Results.

**5. RESULTS :**

60(173)

(i) 1910 Kg/ha. (ii) 232.1 Kg/ha. (iii) Interaction (B×C) and (B×C×D) are significant. (iv) Table of mean and differential responses in Kg/ha.

	Mean response	Differential response									
		A		B		C		D		E	
		—	+	—	+	—	+	—	+	—	+
A	66.15	—	—	34.76	97.54	101.66	30.65	18.31	113.99	106.14	26.16
B	91.19	59.80	122.58	—	—	—24.29	2.68	54.19	128.19	45.22	137.16
C	—46.72	—11.21	—82.22	—162.20	68.77	—	—	—86.71	—6.73	8.22	101.66
D	9.34	—38.49	57.18	—27.66	46.34	—30.65	49.33	—	—	58.30	—39.62
E	—54.57	—14.58	—94.56	—100.54	—8.60	0.37	—109.51	—5.61	—103.53	—	—

C.D. for differential response of (B×C)=94.8 Kg/ha.



61(104)

(i) 726 Kg/ha. (ii) 1021 Kg/ha. (iii) None of the effects is significant. (iv) Table of Mean and differential responses in Kg/ha.

	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	-0.37	-	-	-32.89	32.14	2.99	-3.74	-36.25	35.50	-10.46	9.72
B	6.73	-25.79	39.24	-	-	33.26	-19.81	5.61	7.85	-13.08	26.54
C	-9.72	-6.35	-13.08	16.82	-36.25	-	-	0.37	-19.81	-4.86	14.58
D	5.23	-30.65	41.11	4.11	6.35	15.32	-4.86	-	-	35.50	-25.04
E	8.22	-1.87	18.31	-11.59	28.03	13.08	-3.36	38.49	-22.05	-	-

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 65(30).**

**Site :- Agri. Res. Stn., Akola.**

**Type :- 'M'.**

Object :—To study the response of graded levels of N on the yield of Groundnut.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton. (c) 22.4 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$ . (ii) Black cotton soil. (iii) 18.7.65. (iv) (a) 3 harrowings. (b) Dibbling. (c) 78 Kg/ha. (d) 30 cm.  $\times$  18 cm. (e) One. (v) 33 Kg/ha. of  $P_2O_5$ /ha. as single super as top dressing in furrows on 18.7.65. (vi) AK—12—24. (vii) Unirrigated. (viii) 2 weedings and 3 hoeings. (ix) 39.4 cm. (x) 15.11.65.

**2. TREATMENTS :**

A/S applied in three doses to supply Nitrogen at 3 levels :  $N_0=0$ ,  $N_1=44.8$  and  $N_2=89.6$  Kg/ha.

$\frac{1}{2}$  N applied at sowing :  $\frac{3}{8}$  N applied at flowering and  $\frac{3}{8}$  N applied at flag formation.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 10.82 m.  $\times$  7.22 m. (b) 9.00 m.  $\times$  5.40 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Attack of Aphids. 10 % B.H.C. + Sulphur dusted on 8.8.65. (iii) Yield of pods. (iv) (a) 1965—67. (b) and (c) No. (v) No. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 302 Kg/ha. (ii) 93.1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	$N_0$	$N_1$	$N_2$
Av. yield	325	336	244

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 65(52).**

**Site :- Agri. Res. Stn., Akola.**

**Type :- 'M'.**

Object :—To study the effect of split application of Nitrogen and Phosphoric acid on the yield of Groundnut

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Black cotton soil. (iii) 19.7.65. (iv) (a) One tractor ploughing, five harrowings. (b) Dibbling. (c) 78 Kg/ha. (d) 30 cm. × 18 cm. (e) 1. (v) Nil. (vi) AK 12-24. (vii) Un-irrigated. (viii) 2 weedings and 3 hoeing. (ix) 34.1 cm. (x) 16.11.65.

## 2. TREATMENTS :

## Main-plot treatments :

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

(1) 2 levels of N in the form of A/S :  $N_1=22.4$  and  $N_2=44.8$  Kg/ha. of N.

(2) 3 times of application of N :  $T_1=At$  sowing,  $T_2=At$  flowering and  $T_3=T_1+T_2$  half dose at each time.

(c) Control: No Nitrogen.

## Sub-plot treatments :

$P_2O_5$  at 3 levels applied in the furrows in the form of Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha. of  $P_2O_5$ .

## 3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.22 m. × 5.72 m. (b) 9.00 m. × 4.50 m. (v) 61 cm. × 61 cm. (vi) Yes.

## 4. GENERAL :

(i) Germination was good. (ii) Slight attack of Aphids. (iii) Yield of pods. (iv) (a) 1965-67. (b) and (c) No. (v) Badnapur. (vi) No. (vii) Nil.

## 5. RESULTS :

(i) 533 Kg/ha. (ii) (a) 154.3 Kg/ha. (b) 91.8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

$CP_0=556$ ,  $CP_1=542$  and  $CP_2=610$  Kg/ha.

	$T_1$	$T_2$	$T_3$	$P_0$	$P_1$	$P_2$	Mean
$N_1$	561	533	506	517	543	540	533
$N_2$	572	467	525	528	510	426	521
Mean	566	500	516	522	527	533	527
$P_0$	582	492	493				
$P_1$	556	505	518				
$P_2$	551	502	535				

Crop :- Groundnut (Kharif).

Ref :- Mh. 65(164).

Site :- Agri. College Farm, Akola.

Type :- 'M'.

Object :- To study the response of Groundnut to spartin.

## 1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) 22.4 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$ . (ii) Black cotton soil. (iii) 3.7.65. (iv) (a) One ploughing and 2 harrowings. (b) Dibbling. (c) 44.8 Kg/ha. (d) 46 cm × 15 cm. (e) 2. (v) As per treatments. (vi) A.K. 12-24. (vii) Unirrigated. (viii) 1 weeding and 3 hoeings. (ix) 50 cm. (x) 3.11.65.

## 2. TREATMENTS :

4 manurial treatments :  $T_1=5600$  Kg/ha. of F.Y.M.,  $T_2=11.2$  Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ ,  $T_3=5600$  Kg/ha. of F.Y.M.+371 Kg/ha. of spartin,  $T_4=T_2+371$  Kg/ha. of spartin.

N as A/S was hand sown in furrows.  $P_2O_5$  as Super was drilled. F.Y.M. was broadcasted. Time and method of application of spartin N.A.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 21.94 m.  $\times$  12.80 m. (iii) 6. (iv) (a) 10.97 m.  $\times$  6.40 m. (b) 9.14 m.  $\times$  4.57 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Aphids attack on 1.8.65 and Tikka was noticed on 1.9.65. B.H.C. 10% was dusted on 3.8.65. (iii) Yield of pods. (iv) (a) 1965—only. (b) No. (c) Nil. (v) Digraj and Jalgaon. (vi) and (vii) No.

## 5. RESULTS :

(i) 761 Kg/ha. (ii) 206.2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$
Av. yield	748	738	843	714

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 63(52), 64(38).**

**Site :- Agri. Res. Stn., Amravati.**

**Type :- 'M'.**

Object :—To study the residual effect of Nitrophosphate fertilizers applied to Cotton crop on Groundnut.

## 1. BASAL CONDITIONS :

(i) Cotton—Groundnut (b) Cotton. (c) As per treatments. (ii) Medium black. (iii) 11.7.63; 6.7.64. (iv) (a) Harrowing and cross harrowing. (b) Dibbling. (c) 89.7 Kg/ha. (d) 30 cm.  $\times$  15 cm. (e) 3. (v) Nil. (vi) AK 12-24. (vii) Unirrigated. (viii) 3 weedings and one hoeing; 2 hoeings and 2 weedings. (ix) 45.7 cm.; 66.1 cm. (x) 26.11.63 to 2.12.63; 29, 30.10.64.

## 2. TREATMENTS :

All combinations of (1), (2) and (3)+5 additional treatments

(1) 3 types of fertilizers :  $P_1=$  Super+A/S,  $P_2=$  O.D.D.A. and  $P_3=$  P.E.C.

(2) 3 levels of fertilizers :  $L_1=13.4$  Kg/ha. of N+11.8 Kg/ha. of  $P_2O_5$ ,  $L_2=26.9$  Kg/ha. of N+23.5 Kg/ha. of  $P_2O_5$  and  $L_3=53.8$  Kg/ha. of N+47.1 Kg/ha. of  $P_2O_5$

(3) 3 methods of application :  $M_1=$  Broadcasting,  $M_2=6.3$  cm. below seed and  $M_3=$  Band placement.

Additional treatments are :  $N_0=0$ ,  $N_1=13.4$ ,  $N_2=26.9$ ,  $N_3=40.3$  and  $N_4=53.8$  Kg/ha.

Fertilizers applied to cotton crop in 62 and 63.

## 3. DESIGN :

(i) 3<sup>3</sup> confd.+5 extra treatments in each block. (ii) (a) 14 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 10.97 m.  $\times$  6.40 m. (b) 9.14 m.  $\times$  5.49 m. (v) 91 cm.  $\times$  46 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of pods. (iv) (a) 1963-64. (b) No. (c) No. (v) Sholapur. (vi) Nil. (vii) Due to prolonged dry spell during the 2nd fortnight of Sept. and onwards the pod development and mortality was severely affected. Error variances are heterogeneous and Treatments  $\times$  years interaction is absent. Hence the individual result are presented below.

## 5. RESULTS :

63(52)

(i) 615 Kg/ha. (ii) 128.8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha

$N_0=691$ ,  $N_1=574$ ,  $N_2=624$ ,  $N_3=634$  and  $N_4=597$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
P <sub>1</sub>	624	564	657	597	661	588	615
P <sub>2</sub>	638	657	578	621	651	601	624
P <sub>3</sub>	564	617	584	546	624	597	589
Mean	609	613	606	588	645	595	609
M <sub>1</sub>	538	634	591				
M <sub>2</sub>	624	651	660				
M <sub>3</sub>	664	554	568				

64(38)

(i) 1759 Kg/ha. (ii) 350.4 Kg/ha. (iii) Interaction M×L alone is significant. (iv) Av. yield of pods in Kg/ha.

$N_0=1744$ ,  $N_1=1644$ ,  $N_2=1810$ ,  $N_3=1860$  and  $N_4=1694$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
P <sub>1</sub>	1793	1644	1893	1760	1661	1910	1777
P <sub>2</sub>	1694	1810	1661	1677	1843	1644	1721
P <sub>3</sub>	1727	1810	1843	1893	1611	1877	1793
Mean	1738	1755	1793	1777	1705	1810	1764
M <sub>1</sub>	1411	1933	1926				
M <sub>2</sub>	1843	1594	1677				
M <sub>3</sub>	1960	1677	1793				

C.D. for body of M×L table=494.8 Kg/ha.

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 65(34).**

**Site :- Agri. Res. Stn., Badnapur.**

**Type :- 'M'.**

Object :- To study the response of graded doses of Nitrogen on the yield of Groundnut.

**1. BASAL CONDITIONS :**

(i) (a) Nit. (b) Tur. (c) Nil. (ii) Light. (iii) 30.6.65. (iv) (a) 3 harrowings. (b) Drilling (c) 89.7 Kg/ha. (d) 46 cm. × 46 cm. (e) N.A. (v) 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as single Super drilled on 22.6.65. (vi) S.B.-xi. (vii) Unirrigated, (viii) 4 hoeings and 2 weedings (ix) 54.9 cm. (x) 15.10.65.

**2. TREATMENTS :**

3 levels of N in the form of A/S. :  $N_0=0$  Kg/ha.,  $N_1=44.8$  Kg/ha. and  $N_2=89.6$  Kg/ha.

'N' was applied as  $\frac{1}{4}$  dose at sowing (30.6.65),  $\frac{3}{8}$  does at flowering (29.7.65) and  $\frac{3}{8}$  dose at pod formation (29.8.65).

**3. DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 10.82 m. × 7.22 m. (b) 9.00 m. × 5.40 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Infection of Aphids. BHC 10% dusted. (iii) Yield of pods. (iv) (a) 1965-contd. (b) and (c) No. (v) Jalgaon. (vi) No. (vii) Distribution of rainfall was not uniform.

## 5. RESULTS :

(i) 547 Kg/ha. (ii) 85.2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of dry pods in Kg/ha.

Treatment	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>
Av. yield	600	540	502

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 65(54).**

**Site :- Agri. Res. Stn., Badnapur.**

**Type :- 'M'.**

Object :—To study the effect of split application of N and P<sub>2</sub>O<sub>5</sub> on the yield of Groundnut.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) 22.4 Kg/ha. of N. (ii) Light black. (iii) 1.7.65. (iv) (a) 3 harrowings. (b) Drilling. (c) 89.7 Kg/ha. (d) 30 cm. × 30 cm. (e) N.A. (v) Nil. (vi) SB-xi. (vii) Unirrigated. (viii) 2 weedings. and 2 hoeing. (ix) 43.0 cm. (x) 28.1 .65.

## 2. TREATMENTS :

Same as in experiment No. 65(52), presented on page No. 459.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 3 sub-plots/main-plot, 7 main-plots/ replication. (b) N.A. (iii) 4. (iv) (a) 10.22 m. × 5.72. (b) 9.00 m. × 4.50 m. (v) 61 cm. × 61 cm. (vi) Yes.

## 4. GENERAL :

(i) Germination satisfactory. (ii) Infection of Aphids. 10% B.H.C. and mesh Sulphur dusted. (iii) Yield of pods. (iv) (a) 1965-67. (b) and (c) No. (v) Akola. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 593 Kg/ha. (ii) (a) 97.7 Kg/ha. (b) 71.7 Kg/ha. (iii) 'C vs. others' effect and interaction (N × T) are significant. (iv) Av. yield of pods in Kg/ha.

CP<sub>0</sub>=460, CP<sub>1</sub>=541, CP<sub>2</sub>=571

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	Mean
N <sub>1</sub>	566	604	607	623	607	548	593
N <sub>2</sub>	666	553	632	628	603	619	617
Mean	616	579	620	626	605	584	605
P <sub>1</sub>	642	604	631				
P <sub>2</sub>	643	546	627				
P <sub>3</sub>	565	586	601				

C.D. for (N × T) table mean = 83 Kg/ha.

C.D. for 'C vs. (NXT)' table mean = 83 Kg/ha.

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 60 (45), 61(224).**

**Site :- Agri. Res. Stn., Buldhana.**

**Type :- 'M'.**

**Object :-**To study the effect of N and P<sub>2</sub>O<sub>5</sub> with and without F.Y.M. on the yield of Groundnut.

**1. BASAL CONDITIONS :**

(i) (a) N.A. ; Nil. (b) Cotton. (c) 24.7 C.L./ha. of F.Y.M. ; Nil. (ii) Medium black. (iii) 4.7.60 ; 8.7.61. (iv) (a) 3 bahakerings ; Harrowing. (b) Drilling. (c) 78 Kg/ha. ; 74 Kg/ha. (d) 30 cm. × 15 cm. ; 30 cm. (e) One ; N.A. (v) Nil. (vi) Spanish improved. (vii) Unirrigated. (viii) 2 weedings and 3 hoeings. (ix) 66.5 cm. ; 107 cm. (x) 31.10.60 to 2.11.60 ; 1.11.61.

**2. TREATMENTS :**

**Main-plot treatments :**

(1) 3 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=11.2 and N<sub>2</sub>=22.4 Kg/ha.

(2) 3 levels of P<sub>2</sub>O<sub>5</sub> as P<sub>2</sub>O<sub>5</sub> : P<sub>0</sub>=0, P<sub>1</sub>=22.4 and P<sub>2</sub>=44.8 Kg/ha.

**Sub-plot treatments :**

2 levels of F.Y.M. : F<sub>0</sub>=0 and F<sub>1</sub>=12.3 C.L./ha.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 2 sub-plots/main-plot, 9 main-plots/Replication. (b) 43.86 m. × 32.91 m. (iii) 4. (iv) (a) 7.31 m. × 10.97 m. (b) 5.40 m. × 9.24 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Good. (ii) Severe attack of Mawa and Tikka., Slight attack of Tikka and Aphids control by dusting B.H.C. 10% and Sulphur. (iii) Yield of pods. (iv) (a) 1960-61. (b) and (c) No. (v) Actalpur, Akola and Washim. (vi) Nil. (vii) Sub-plot error variances are heterogeneous hence results of individual years are presented under 5.—Results.

**5. RESULTS :**

60(45)

(i) 2786 Kg/ha. (ii) (a) 481.4 Kg/ha. (b) 383.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
F <sub>0</sub>	2664	2752	2856	2706	2703	2864	2758
F <sub>1</sub>	2728	2849	2869	2918	2540	2987	2815
Mean	2696	2801	2862	2812	2621	2925	2786
P <sub>0</sub>	2683	2718	3034				
P <sub>1</sub>	2723	2711	2431				
P <sub>2</sub>	2679	2973	3123				

61(224)

(i) 1811 Kg/ha. (ii) (a) 440.3 Kg/ha. (b) 136.8 Kg/ha. (iii) Main effect of F is highly significant. (iv) Av. yield of pods in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
F <sub>0</sub>	1515	1660	1889	1697	1689	1678	1688
F <sub>1</sub>	1819	1947	2038	2004	1872	1928	1935
Mean	1667	1803	1963	1850	1780	1803	1811
P <sub>0</sub>	1652	1899	2001				
P <sub>1</sub>	1530	1739	2072				
P <sub>2</sub>	1820	1771	1818				

C.D. for F marginal means=67 Kg/ha.

**Crop :- Groundnut (*Khairf*).**  
**Site :- Agri. Res. Stn., Chas.**

**Ref :- Mh. 60(6).**  
**Type :- 'M'.**

Object :- To study separately the effect of P, Ca, S and Na<sub>2</sub>SO<sub>4</sub> which are normally in the Super-Phosphate on the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Bajri-Tur. (c) N.A. (ii) Medium black. (iii) 20.6.60. (iv) (a) 1 ploughing and 1 harrowing. (b) Drilling. (c) 89.7 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) K-4-11. (vii) Unirrigated. (viii) 1 interculturing. (ix) 61.2 cm. (x) 19.12.60.

2. TREATMENTS :

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

(1) 2 levels of P<sub>2</sub>O<sub>5</sub> as Na<sub>2</sub>HPO<sub>4</sub> : P<sub>0</sub>=0 and P<sub>1</sub>=33.6 Kg/ha.

(2) 2 levels of CaO as lime : L<sub>0</sub>=0 and L<sub>1</sub>=44.8 Kg/ha.

(3) 2 levels of Sulphur : S<sub>0</sub>=0 and S<sub>1</sub>=26.9 Kg/ha.

(4) 2 levels of Na<sub>2</sub>SO<sub>4</sub> : N<sub>0</sub>=0 and N<sub>1</sub>=62.8 Kg/ha.

Manures applied on 30.7.60.

3. DESIGN :

(i) 2<sup>d</sup> Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 5.49 m. × 9.14 m. (b) 3.66 m. × 7.32 m. (v) 91 cm. × 91 cm. (vi) Yes.

4. GENERAL :

(i) Growth was not satisfactory due to ill distribution of rains. (ii) Nil. (iii) Yield of pods. (iv) (a) 1957-60 (b) No. (c) Nil. (v) Sholapur. (vi) and (vii) Nil.

5. RESULTS :

(i) 1105 Kg/ha. (ii) 219.2 Kg/ha. (iii) None of the effects is significant. (iv) Table of Mean and differential response in Kg/ha.

		Differential response							
		P		L		S		N	
	Mean response	-	+	-	+	-	+	-	+
P	68.6	—	—	76.2	60.9	109.9	27.2	86.7	50.4
L	13.4	21.1	5.8	—	—	64.7	-37.8	-33.9	60.8
S	49.9	91.2	8.6	101.2	-1.4	—	—	-23.3	124.1
N	0.4	18.5	-17.7	-46.9	47.8	-72.8	73.6	—	—

**Crop :- Groundnut (*Khairf*).**  
**Site :- Agri. Res. Stn., Chas.**

**Ref :- Mh. 60(7).**  
**Type :- 'M'.**

Object :- To study the effect of different levels and methods of application of P with and without Sulphur.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Groundnut. (c) Nil. (ii) Medium black. (iii) 20.6.60. (iv) (a) 1 ploughing and 3 harrowings. (b) Drilling. (c) 89.7 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) K-4-11 (vii) Unirrigated. (viii) 2 interculturings. (ix) 61.2 cm. (x) 17.12.60.

2. TREATMENTS :

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

(1) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>1</sub>=11.2, P<sub>2</sub>=22.4 and P<sub>3</sub>=33.6 Kg/ha.

(2) 2 levels of Sulphur : S<sub>0</sub>=0 and S<sub>1</sub>=627.7 Kg/ha.

(3) 3 methods of application : M<sub>1</sub>=Broadcast, M<sub>2</sub>=Drilled in rows and M<sub>3</sub>=Drilled in between rows.

Extra treatments are P<sub>0</sub>S<sub>0</sub>=0 and P<sub>0</sub>S<sub>1</sub>=627.7 Kg/ha. of Sulphur drilled in between rows.

P<sub>2</sub>O<sub>5</sub> applied at sowing.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 3. (iv) (a) 5.49 m.×9.14 m. (b) 3.66 m.×7.31 m. (v) 91 cm.×91 cm. (v) Yes.

## 4. GENERAL :

(i) Seed used having 97% germination. Growth was not satisfactory due to ill distribution of rains. (ii) Nil. (iii) Yield of pods and plant counts. (iv) (a) 1957 to 60. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 1223 Kg/ha. (ii) 222.6 Kg/ha. (iii) Interaction P×M alone is significant. (iv) Av. yield of pods in Kg/ha.

$P_0S_0=1278$  and  $P_0S_1=1233$  Kg/ha.

	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
S <sub>0</sub>	1202	1274	1251	1216	1222	1290	1243
S <sub>1</sub>	1149	1298	1143	1246	1197	1147	1197
Mean	1175	1286	1197	1231	1209	1218	1219
M <sub>1</sub>	1225	1299	1169				
M <sub>2</sub>	1157	1117	1354				
M <sub>3</sub>	1144	1442	1069				

C.D. for body of P×M table=185.0 Kg/ha.

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 65(165).**

**Site :- Agri. Res. Stn., Digraj**

**Type :- 'M'.**

Object :—To study the response of Groundnut to spartin.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Kharif-Jowar*. (c) 12.35 C.L./ha. of F.Y.M. (ii) Medium black soil. (iii) 19.7.65. (iv) (a) One ploughing and 3 harrowings. (b) Dibbling. (c) 86.4 Kg/ha. (d) 46 cm.×15 cm. (e) 1. (v) As per treatments. (vi) Karad 4-1-1. (vii) Unirrigated. (viii). One weeding. (ix) 48.3 cm. (x) 17.12.65.

## 2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 65(164) conducted at Akola on Groundnut and presented on page No. 460.

## 4. GENERAL :

(i) Normal. (ii) Attack of tikka was noticed. 10% BHC and 300 mesh Sulphur dusted on 26.8.65. (iii) Yield of pods. (iv) (a) and (b) No. (v) Jalgaon and Akola. (vi) and (vii) No.

## 5. RESULTS :

(i) 2151 Kg/ha. (ii) 106.7 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of pods in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Av. yield	2048	2216	2113	2227

C.D.=131.3 Kg/ha.



**Crop :- Groundnut (Kharif).****Ref :- Mh. 60(8).****Site :- Agri. Res. Stn., Jalgaon.****Type :- 'M'.****Object :-** To study the effect of N, P and K with and without F.Y.M. on Groundnut.**1. BASAL CONDITIONS :**(i) (a) N.A. (b) *Jawar*. (c) N.A. (ii) Deep black cotton soil. (iii) 1.7.60. (iv) (a) N.A. (b) Drilling. (c) 67.2 Kg/ha (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) Faizpur 1-5. (vii) Unirrigated. (viii) 3 interculturings. (ix) 78.8 cm. (x) 3.11.60.**2. TREATMENTS :****Main-plot treatments :**

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

(1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=11.2$  and  $N_2=22.4$  Kg/ha.(2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=56.0$  and  $P_2=112.1$  Kg/ha.(3) 3 levels of  $K_2O$  as Pot. Sul. :  $K_0=0$ ,  $K_1=112.1$  and  $K_2=224.2$  Kg/ha.**Sub-plot treatments :**2 levels of F.Y.M.  $F_0=0$  and  $F_1=12.3$  C.L./ha.**3. DESIGN :**

(i) Split-plot confd. (ii) (a) 2 sub-plots/main-plot ; 9 main-plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 11.0 m. x 6.4 m. (b) 9.2 m. x 4.6 m. (v) 91 cm. x 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Growth was Normal. (ii) Aphids attack. Tikka disease was also observed. 16.8 Kg/ha. of each of B.H.C. and Sulphur was sprayed. (iii) Yield of Pods. (iv) (a) 1957-60. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 2017 Kg/ha. (ii) (a) 218.9 Kg/ha. (b) 235.9 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of pods in Kg/ha.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	Mean
$F_0$	1993	2122	2034	2109	2071	1968	2070	2123	1956	2050
$F_1$	1742	2236	1975	1993	1913	2047	2012	1963	1978	1984
Mean	1867	2179	2005	2051	1963	1967	2041	2043	1967	2017
$K_0$	1783	2257	2081	2057	2079	1986				
$K_1$	1905	2199	2025	2084	1921	2124				
$K_2$	1914	2079	1908	2014	1977	1910				
$P_0$	1993	2090	2070							
$P_1$	1810	2237	1930							
$P_2$	1799	2208	2014							

C.D. for N marginal means=178.6 Kg/ha.

**Crop :- Groundnut (Kharif).****Ref :- Mh. 62(36).****Site :- Agri. Res. Stn., Jalgaon.****Type :- 'M'.****Object :-** To study the effect of different levels and sources of N with and without F.Y.M. on the yield of Groundnut.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 22.4 Kg/ha. of N. (ii) Deep black cotton soil. (iii) 14.7.62. (iv) (a) 3 harrowings. (b) Hand dibbling. (c) 67.2 Kg/ha. (d) 30 cm. × 15 cm. (e) 1. (v) Nil. (vi) SB—XI (vii) Un-irrigated. (viii) 2 hoeings. (ix) 48.5 cm. (x) 10.11.62.

## 2. TREATMENTS :

## Main-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of N :  $N_1=11.2$  and  $N_2=22.4$  Kg/ha.

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

## Sub-plot treatments :

2 levels of F.Y.M. :  $F_0=0$ ,  $F_1=12.3$  C.L./ha.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication, 2 sub-plots/main-plot. (b) 25.60 m. × 26.52 m. (iii) 4. (iv) (a) 12.80 m. × 6.40 m. (b) 10.97 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Aphids in 1st week of August and Tikka in Oct. and Nov. Control measures N.A. (iii) Height of plants and yield of pods. (iv) (a) 1962—contd. (modified in 63). (b) No. (c) Nil. (v) No. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 2218 Kg/ha. (ii) (a) 109.4 Kg/ha. (b) 60.3 Kg/ha. (iii) Main effect of F is highly significant and interaction  $N \times F$  is significant. (v) Av. yield of pods in Kg/ha.

	$N_1$	$N_2$	$F_0$	$F_1$	Mean
$S_1$	2200	2249	2138	2311	2224
$S_2$	2169	2253	2145	2277	2211
Mean	2184	2251	2142	2294	2218
$F_0$	2082	2202			
$F_1$	2287	2301			

C.D. for F marginal means = 46.4 Kg/ha.

C.D. for F means at the same level of N = 65.6 Kg/ha.

C.D. for N means at the same level of F = 99.1 Kg/ha.

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 63(56), 64(47), 65(155).**

**Site :- Agri. Res. Stn., Jalgaon.**

**Type :- 'M'.**

**Object :-** To study the effect of N, P and F.Y.M. on the yield of Groundnut.

## 1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Deep black cotton soil. (iii) 2.7.63 ; 1, 2.7.64 ; 17, 18.7.65. (iv) (a) Harrowings. (b) Hand dibbling. (c) 67.2 Kg/ha. (d) 30 cm. × 15 cm. (e) 1. (v) Nil. (vi) SB—XI. (vii) Unirrigated. (viii) 2 hoeings. (ix) 48 cm. ; 51 cm. ; 64 cm. (x) 15.11.63 ; 22.10.64 ; 1.11.65.

## 2. TREATMENTS :

## Main-plot treatments :

6 manurial treatments :  $M_0$  = Control (no manure),  $M_1$  = 11.2 Kg/ha. of N as A/S,  $M_2$  = 22.4 Kg/ha. of N as A/S,  $M_3$  = 11.2 Kg/ha. of N as C/A/N,  $M_4$  = 22.4 Kg/ha. of N as C/A/N and  $M_5$  = 22.4 Kg/ha. of  $P_2O_5$  as Super.

## Sub-plot treatments :

2 levels of F.Y.M.:  $F_0$  = 0 and  $F_1$  = 5604 Kg/ha.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 2 sub-plots/main-plot. (b) 27.13 m.  $\times$  38.40 m. (iii) 4. (iv) (a) 12.80 m.  $\times$  6.40 m. (b) 10.97 m.  $\times$  4.57 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Mild attack of Aphids and Tikka. B.H.C. 10 % was sprayed. (iii) Yield of pods. (iv) (a) 1962—65 (modified in 63). (b) No. (c) Nil. (v) Nil. (vi) Due to heavy rains, yield was poor in 64 and 65. (vii) Sub-plot error variances are heterogeneous, hence results of individual years are presented under 5. Results.

## 5. RESULTS :

63(56)

(i) 1557 Kg/ha. (ii) (a) 127.6 Kg/ha. (b) 148.5 Kg/ha. (iii) Main effect of F alone is significant. (iv) Av. yield of pods in Kg/ha.

	$M_0$	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$	Mean
$F_0$	1417	1454	1454	1516	1560	1603	1501
$F_1$	1515	1573	1659	1603	1668	1662	1613
Mean	1466	1514	1556	1559	1614	1632	1557

C.D. for F marginal means = 90.1 Kg/ha.

64(47)

(i) 611 Kg/ha. (ii) (a) 127.6 Kg/ha. (b) 79.4 Kg/ha. (iii) Main effect of F is highly significant and that of M is significant. (iv) Av. yield of pods in Kg/ha.

	$M_0$	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$	Mean
$F_0$	435	598	593	619	690	458	566
$F_1$	526	655	696	686	738	634	656
Mean	481	626	644	652	714	546	611

C.D. for M marginal means = 136.0 Kg/ha.

C.D. for F marginal means = 48.1 Kg/ha.

65(155)

(i) 336 Kg/ha. (ii) (a) 172.0 Kg/ha. (b) 73.2 Kg/ha. (iii) Main effect of F is highly significant. (iv) Av. yield of pods in Kg/ha.

	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	Mean
F <sub>0</sub>	191	230	394	242	358	299	286
F <sub>1</sub>	241	414	426	364	448	431	387
Mean	216	322	410	303	403	365	336

C.D. for F marginal means=44.4 Kg/ha.

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 65(39).**

**Site :- Agri. Res. Stn., Jalgaon.**

**Type :- 'M'.**

Object :—To study the response of graded doses of Nitrogen on the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 12.35 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of N. (ii) Black cotton soil. (iii) 18.7.65. (iv) (a) 1 ploughing by mould board plough and 2 harrowings. (b) Dibbling. (c) 89.7 Kg/ha. (d) 30 cm. x 18 cm. (e) One seed/dibble. (v) 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as single Super, applied on 23.6.65 by drill. (vi) S.B.—XI. (vii) Unirrigated. (viii) 3 weedings and hoeings. (ix) 55 cm (x) 1.11.65.

2. TREATMENTS :

3 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=44.8, N<sub>2</sub>=89.6 Kg/ha.  
N applied in the furrows by hand sowing at :  $\frac{1}{4}$  dose at sowing on 18.7.65,  $\frac{3}{8}$  dose 1 month after sowing on 17.8.65 and  $\frac{3}{8}$  dose at pod formation on 7.9.65.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 10.40 m. x 20.10 m. (iii) 8. (iv) (a) 10.36 m. x 6.70 m. (b) 9.14 m. x 5.48 m. (v) 61 cm. x 61 cm. (vi) Yes.

4. GENERAL :

(i) Germination good. (ii) *Tikka* attack, 10 % B.H.C. dusted. Super at 16.8 Kg/ha. dusted for Aphids. (iii) Yield of dry pods. (iv) (a) 1965—67. (b) and (c) No. (v) Badnapur. (vi) No. (vii) After August, there were no rains. This affected the growth of the crop as well as pod formation.

5. RESULTS :

(i) 157 Kg/ha. (ii) 59.5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of dry pods in Kg/ha.

Treatment	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>
Av. yield	181	283	338

C.D. = 63.8 Kg/ha.

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 65(66).**

**Site :- Agri. Res. Stn., Jalgaon.**

**Type :- 'M'.**

Object :—To study the effect of split application of 'N' and P<sub>2</sub>O<sub>5</sub> on the yield of Groundnut.

1. BASAL CONDITIONS:

(i) Cotton-Groundnut-Cotton. (b) Cotton. (c) 12 C.L./ha. of F.Y.M. (ii) Black cotton soil. (iii) 19, 20.7.65 (iv) (a) One ploughing and 2 harrowings. (b) Dibbling. (c) 89.7 Kg/ha. (d) 30 cm. x 18 cm. (e) 1 seed/dibble. (v) Nil. (vi) SB XI. (vii) Unirrigated. (viii) 2 weedings, 5 hoeings. (ix) 49.4 cm. (x) 1.11.65.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. No. 65(52) conducted at Akola and presented on page No. 459.

## 4. GENERAL :

(i) Satisfactory. (ii) Attack of Aphids and *Tikka*. B.H.C. 0.10% @ 22.4 Kg/ha. and Sulphur @ 16.8 Kg/ha. dusted on 6.9.65. (iii) Yield of pods. (iv) (a) 1965-68. (b) and (c) No. (v) Akola and Badnapur. (vi) Nil. (vii) August onwards there were no rains.

## 5. RESULTS :

(i) 210.3 Kg/ha. (ii) (a) 86.3 Kg/ha. (b) 55.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

CP<sub>0</sub>=183.6, CP<sub>1</sub>=217.7, CP<sub>2</sub>=215.3 Kg/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
N <sub>1</sub>	225.0	182.4	193.3	196.5	198.5	205.7	200.3
N <sub>2</sub>	221.1	202.3	242.8	209.5	229.3	227.6	222.1
Mean	223.1	192.3	218.1	203.0	213.8	216.7	211.1
P <sub>0</sub>	189.3	226.9	192.9				
P <sub>1</sub>	211.4	191.1	238.9				
P <sub>2</sub>	268.5	159.1	222.5				

**Crop :- Groundnut (*Kharif*).**

**Site :- Agri. Res. Stn., Jalgaon.**

**Ref :- Mh. 65(163).**

**Type :- 'M'.**

**Object :-** To study the response of Groundnut to spartin.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 12.35 C.L./ha. of F.Y.M. (ii) Black cotton soil. (iii) 18.7.65. (iv) (a) One ploughing with mould broad plough, Two harrowings. (b) Dibbling. (c) 89.6 Kg/ha. (d) 30 cm. x 15 cm. (e) 1. (v) As per treatments. (vi) S.B.-XI. (vii) Unirrigated. (viii) 3 weedings, 2 harrowings. (ix) 49 cm. (x) 15, 21.11.65.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. No. 65(164) conducted at Akola on Groundnut crop and presented on page No. 460.

## 4. GENERAL :

(i) Normal. (ii) Attack of Aphids and *Tikka*. B.H.C. 10% @ 20 Kg/ha. applied on 2.8.65, Sulphur @ 15 Kg/ha. applied on 6.9.65. (iii) Yield of pods. (iv) (a) 1965-66. (b) and (c) No. (v) Digraj and Akola. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 614 Kg/ha. (ii) 152.5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Av. yield	628	661	694	475

**Crop :- Groundnut (Kharif).****Ref - Mh. 60(31),****Site :- Agri. Res. Stn., Jeur.****Type :- 'M'.**

Object :- To study the effect of different methods of application and levels of P on the yield of Groundnut.

**1. BASAL CONDITIONS :**

(i) (a) Groundnut—Groundnut. (b) Groundnut. (c) As per treatments. (ii) Medium deep. (iii) 21.6.60. (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling. (c) 89.7 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) K-4-11. (vii) Unirrigated. (viii) 1 weeding and 1 interculturing. (ix) 49.3 cm. (x) 13.12.60.

**2. TREATMENTS :**

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

(1) 3 levels of  $P_2O_5$  as Super :  $P_1=11.2$ ,  $P_2=22.4$  and  $P_3=33.6$  Kg/ha.(2) 2 levels of Sulphur :  $S_0=0$  and  $S_1=627.8$  Kg/ha.(3) 3 methods of application :  $M_1$ =Broadcast,  $M_2$ =Drilling in lines and  $M_3$ =Drilling between lines. $T_0$ =Control and  $T_1=627.8$  Kg/ha. of Sulphur.**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 3. (iv) (a) 9.14 m. × 5.49 m. (b) 7.31 m. × 3.66 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Growth was satisfactory. (ii) Nil. (iii) Germination counts and yield of pods. (iv) (a) 1957-60 (modified in 57). (b) Yes. (c) Nil. (v) Sholapur. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 1743 Kg/ha. (ii) 318.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

 $T_0=1505$  and  $T_1=1820$  Kg/ha.

	$P_1$	$P_2$	$P_3$	$M_1$	$M_2$	$M_3$	Mean
$S_0$	1729	1648	1894	1743	1738	1790	1757
$S_1$	1733	1758	1751	1639	1880	1722	1747
Mean	1731	1703	1822	1691	1809	1756	1752
$M_1$	1620	1689	1765				
$M_2$	1864	1661	1902				
$M_3$	1709	1759	1800				

**Crop :- Groundnut (Kharif).****Ref :- Mh. 64(3), 65(68).****Site :- Oilseed Res. Stn., Latur.****Type :- 'M'.**

Object :- To study the effect of N, P and K with and without F.Y.M. on the yield of Groundnut.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Jowar ; Wheat. (c) 12.35 C.L./ha. of F.Y.M. + 11.2 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$  ; Nil. (ii) Medium to heavy black. (iii) 22.7.64 ; 18, 19.7.65. (iv) (a) Ploughing , harrowing ; 1 ploughing and 1 harrowing. (b) Dibbling. (c) 74 Kg/ha. (d) 46 cm. × 15 cm. (e) 1. (v) Nil. (vi) Karad-4-11. (vii) Unirrigated. (viii) Interculturing ; 1 weeding and 1 hoeing. (ix) N.A. ; 53 cm. (x) 30.12.64 to 4.1.65 ; 12.1.66 to 14.1.66.

## 2. TREATMENTS :

## Main-plot treatments :

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

(1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=11.2$  and  $N_2=22.4$  Kg/ha.

(2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

(3) 3 levels of  $K_2O$  as Pot. Sul :  $K_0=0$ ,  $K_1=44.8$  and  $K_2=97.6$  Kg/ha.

## Sub-plot treatments :

2 levels of F.Y.M. :  $F_0=0$  and  $F_1=5600$  Kg/ha.

N, P and K drilled while F.Y.M. broadcasted on 14.7.65.

## 3. DESIGN :

(i) Split-plot confd. (ii) (a) 9 main-plots/block ; 3 blocks/replication and 2 sub-plots/main-plot. (b) N.A.  
(iii) 2. (a) 6.40 m.  $\times$  10.97 m. (b) 4.57 m.  $\times$  9.14 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory ; Germination satisfactory. (ii) Aphids—B.H.C. 10 % dusted and *Tikka* was observed ; Nil (ii) Yield of pods. (iv) (a) 1964—66. (b) No. (c) Nil. (v) Nil. (vi) Rain started very late during the year 64 and hence sowing was delayed. The late rains were absent. In 65, the season was not satisfactory for developments of pods. (vii) Since expt. is continued beyond 65, hence the individual years results are presented under 5. Results.

## 5. RESULTS :

## 64(3)

(i) 829 Kg/ha. (ii) (a) 227.0 Kg/ha. (b) 217.5 Kg/ha. (iii) Main effect of N is highly significant and interaction  $P \times F$  is significant. (iv) Av. yield for pods in Kg/ha.

	$N_0$	$N_1$	$N_2$	$K_0$	$K_1$	$K_2$	$F_0$	$F_1$	Mean
$P_0$	691	836	930	854	840	764	839	800	819
$P_1$	714	851	892	882	764	812	848	790	819
$P_2$	669	867	1011	761	955	831	766	931	849
Mean	691	851	944	832	853	802	818	840	829
$F_0$	722	837	895	801	833	820			
$F_1$	660	866	994	863	873	784			
$K_0$	655	917	924						
$K_1$	686	850	1023						
$K_2$	732	787	887						

C.D. for N marginal means = 111.0 Kg/ha.

C.D. for F means at the same levels of P = 147.7 Kg/ha.

C.D. for P means at the same level of F = 153.0 Kg/ha.

## 65(68)

(i) 433 Kg/ha. (ii) (a) 90.6 Kg/ha. (b) 84.9 Kg/ha. (iii) Main effect of P is significant. (iv) Av. yield of pods in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
P <sub>0</sub>	452	559	435	477	431	538	526	438	482
P <sub>1</sub>	374	417	373	369	409	386	394	382	388
P <sub>2</sub>	458	381	445	465	437	382	421	435	428
Mean	428	452	418	437	426	437	447	418	433
F <sub>0</sub>	437	494	410	441	425	475			
F <sub>1</sub>	419	410	426	434	427	399			
K <sub>0</sub>	452	432	427						
K <sub>1</sub>	426	428	423						
K <sub>2</sub>	406	497	403						

C.D. for P marginal means=44.4 Kg/ha.

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 63(140).**

**Site :- Agri. Res. Stn., Mohol.**

**Type :- 'MP'.**

**Object :-** To study the effect of micronutrients on the yield of Groundnut.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) N.A. (iii) 8.7.63. (iv) (a) Ploughing and harrowing. (b) Drilling. (e) 89.7 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) K-4-11. (vii) Unirrigated. (viii) 2 weedings. (ix) 28.8 cm. (x) N.A.

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

Same as in Expt. No. 60(192), 61(162) on groundnut conducted at Achalpur and presented on page. No. 455

**4. GENERAL :**

(i) Normal. (ii) B.H.C. and Sulphur dusted against leaf curl and *Tikka* attack. (iii) Yield of pods. (iv) (a) 1953 only. (b) No. (c) Nil. (v) Achalpur, and Akola. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 1050 Kg/ha. (ii) 256.6 Kg/ha. (iii) Interaction C×D and C×D×E are significant. (iv) Table of mean and differential responses in Kg/ha.

	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	-61.67	-	-	-94.18	-29.15	-83.72	-39.62	-91.94	-31.39	-55.69	-67.65
B	16.07	-16.44	48.59	-	-	2.62	29.53	80.36	-48.21	31.02	1.12
C	-39.62	-51.67	-17.57	-53.07	-26.16	-	-	62.79	-142.03	-45.97	33.26
D	-48.59	-78.86	-18.31	-15.70	-112.87	53.82	-151.00	-	-	-91.57	-5.61
E	-2.24	3.74	-8.22	12.71	-17.19	-8.60	4.11	-45.22	40.74	-	-

C.D. of mean response = 89.0 Kg/ha.  
C.D. of differential response = 125.6 Kg/ha.



**Crop :- Groundnut (Kharif).****Ref :- Mh. 62(124).****Site :- Agri. College Farm, Nagpur.****Type :- 'M'.**

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

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) Black cotton soil. (iii) 11, 14.7.62. (iv) (a) Ploughing and harrowing. (b) Dibbled. (c) N.A. (d) 30 cm. × 23 cm. (e) 1. (v) Nil. (vi) AK—12—24. (vii) Unirrigated. (viii) 2 hoeings and 2 weedings. (ix) 98.3 cm. (x) 10.11.62.

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

All combinations of (1) and (2)

(1) 2 levels of N :  $N_0=0$  and  $N_1=17.3$  Kg/ha.(2) 4 levels of  $P_2O_5$  :  $P_0=0$ ,  $P_1=17.3$ ,  $P_2=34.6$  and  $P_3=51.9$  Kg/ha.**Sub-plot treatments :**4 levels of  $K_2O$  :  $K_0=0$ ,  $K_1=17.3$ ,  $K_2=34.6$  and  $K_3=51.9$  Kg/ha.**3. DESIGN :**

(i) Split-plot. (ii) (a) 8 main-plots/replication, sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 4.27 m. × 4.88 m. (b) 3.66 m. × 4.42 m. (v) 30 cm. × 23 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of pods. (iv) (a) 1962—only. (b) N.A. (c) Nil. (v) to (vii) Nil.

**5. RESULTS :**

(i) 2462 Kg/ha. (ii) (a) 382.7 Kg/ha. (b) 231.4 Kg/ha. (iii) Main effect of N is highly significant. (i) Av. yield of pod in Kg/ha.

	$P_0$	$P_1$	$P_2$	$P_3$	$K_0$	$K_1$	$K_2$	$K_3$	Mean
$N_0$	2361	2338	2291	2395	2410	2351	2263	2361	2346
$N_1$	2477	2444	2554	2836	2598	2580	2560	2572	2578
Mean	2419	2391	2423	2615	2504	2466	2411	2466	2462
$K_0$	2335	2464	2418	2799					
$K_1$	2299	2418	2500	2645					
$K_2$	2552	2340	2320	2434					
$K_3$	2490	2340	2454	2583					

C.D. for N marginal means = 167.5 Kg/ha.

**Crop :- Groundnut (Kharif).****Ref :- Mh. 60(78), 62(2), 63(17), 64(11), 65(102).****Site :- Agri Res. Stn., Parbhani.****Type :- 'M'.**

Object :—To study the effect of N and P with and without F.Y.M. on the yield of Groundnut.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat ; Cotton and Jowar (fodder) ; Cotton ; Jowar ; Jowar. (c) 112.1 Kg/ha. of A/S ; N.A. ; 11.4 C.L. ha. of F.Y.M. + N + P ; N.A. ; Nil. (ii) Medium black. (iii) 11.7.60 ; 20.7.62 ; 1.7.63 ; 16.7.64 ; 29.6.65. (iv) (a) 1 ploughing and 2 to 3 harrowings. (b) Drilling. (c) 56 to 90 Kg/ha. (d) 30 cm. × 30 cm. (e) N.A. (v) Nil. (vi) Koperaan No. 1 for 60 and 62 ; K-4-11 for other years. (vii) Unirrigated. (viii) Weeding and hoeing or interculturing. (ix) 78 cm. ; N.A. ; 108 cm. ; 70 cm. ; 60 cm. (x) 29.11.60 to 1.12.60 ; 17 to 19.12.62 ; 5 to 11.12.63 ; 1, 2.12.64 ; 4, 12.12.65.

## 2. TREATMENTS:

## Main-plot treatments

All combinations of (1) and (2)

(1) 3 levels of N as A/S:  $N_0=0$ ,  $N_1=11.2$  and  $N_2=22.4$  Kg/ha.

(2) 3 levels of  $P_2O_5$  as Super:  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

## Sub-plot treatments

2 levels of F.Y.M.:  $F_0=0$  and  $F_1=12.3$  C.L./ha.

Manures applied (at sowing).

## 3. DESIGN:

(i) Split-plot. (ii) (a) 9 main-plots/replication; 2 sub plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  7.32 m. (b) 9.14 m.  $\times$  5.49 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of pods. (iv) (a) 1950-55 (failed in 61). (b) No. (c) Nil. (v) Achalpur, Akola, Washim. (vi) Nil. (vii) Both the error variances are heterogeneous. Hence the individual years results are presented under 5. Results.

## 5. RESULTS:

60(78)

(i) 557 Kg/ha. (ii) (a) 170.0 Kg/ha. (b) 108.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods. in Kg/ha.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	Mean
$F_0$	555	547	549	534	588	529	550
$F_1$	577	518	598	581	555	558	564
Mean	566	532	573	557	571	543	557
$P_0$	629	470	573				
$P_1$	647	517	651				
$P_2$	521	611	498				

62(20)

(i) 555 Kg/ha. (ii) (a) 241.7 Kg/ha. (b) 135.3 Kg/ha. (iii) Main effect of F alone is significant. (iv) Av. yield of pods in Kg/ha.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	Mean
$F_0$	487	541	517	485	579	481	515
$F_1$	583	585	615	553	588	642	594
Mean	535	563	566	519	584	562	555
$P_0$	494	543	521				
$P_1$	596	572	582				
$P_2$	516	574	595				

C.D. for F marginal means=65.5 Kg/ha.

63(17)

(i) 1401 Kg/ha. (ii) (a) 414.3 Kg/ha. (b) 143.7 Kg/ha. (iii) None of effects is significant. (iv) Av. yield of pods. in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
F <sub>0</sub>	1297	1404	1407	1405	1424	1280	1369
F <sub>1</sub>	1435	1416	1448	1481	1428	1390	1433
Mean	1366	1410	1428	1443	1426	1335	1401
P <sub>0</sub>	1434	1392	1504				
P <sub>1</sub>	1241	1566	1471				
P <sub>2</sub>	1424	1273	1307				

64(11)

- (i) 1387 Kg/ha. (ii) (a) 290.0 Kg/ha. (b) 109.9 Kg/ha. (iii) Main effect of F is highly significant.  
 (iv) Av. yield of pods in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
F <sub>0</sub>	1276	1335	1385	1219	1311	1466	1332
F <sub>1</sub>	1443	1360	1520	1392	1394	1537	1441
Mean	1359	1348	1453	1306	1352	1502	1387
P <sub>0</sub>	1160	1308	1449				
P <sub>1</sub>	1387	1265	1407				
P <sub>2</sub>	1531	1470	1502				

C.D. for F marginal means=53.1 Kg/ha.

65(102)

- (i) 1037 Kg/ha. (ii) (a) 198.3 Kg/ha. (b) 181.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
F <sub>0</sub>	971	1057	1037	1029	1031	1000	1020
F <sub>1</sub>	1018	1048	1098	1119	955	1090	1054
Mean	995	1053	1063	1074	993	1045	1037
P <sub>0</sub>	1000	1078	1086				
P <sub>1</sub>	992	1064	972				
P <sub>2</sub>	934	1018	1182				

**Crop :- Groundnut (Kharif).****Ref :- Mh. 60(19).****Site :- Agri. Res. Stn., Sholapur.****Type :- 'M'.**Object :- To study the effect of Na<sub>2</sub>SO<sub>4</sub>, Na<sub>2</sub>HPO<sub>4</sub> and Sulphur on the yield of Groundnut.

## 1. BASAL CONDITIONS :

(i) (a) N.A. (b) Bajra-Tur. (c) Nil. (ii) Deep soil. (iii) 15.7.60. (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling. (c) 39.7 Kg/ha. (d) 30 cm. × 15 cm. (e) N.A. (v) Nil. (vi) Big Japan. (vii) Unirrigated. (viii) 1 interculturing and 1 weeding. (ix) 60 cm. (x) 19.12.60.

## 2. TREATMENTS :

7 manurial treatments :  $M_0$ =Control( 3 plots),  $M_1$ =112.1 Kg/ha of Sulphur,  $M_2$ =224.2 Kg/ha. of Sulphur,  $M_3$ =112.1 Kg/ha. of  $Na_2SO_4$ ,  $M_4$ =224.2 Kg/ha. of  $Na_2SO_4$ ,  $M_5$ =168.1 Kg/ha. of  $Na_2HPO_4$  and  $M_6$ =336.2 Kg/ha. of  $P_2O_5$  as  $Na_2HPO_4$ .

Sulphur applied on 16.6.60 and  $Na_2SO_4$  and  $Na_2HPO_4$  applied on 10.8.60.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 6.40 m. × 10.97 m. (b) 4.57 m. × 9.14 m. (v) 91 cm × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Growth was satisfactory. (ii) Nil. (iii) Germination counts and yield of pods. (iv) (a) 1958-60. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 417 Kg/ha. (ii) 67.0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	$M_0$	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$	$M_6$
Av. yield	420	410	420	408	420	425	408

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**Crop :- Groundnut (*Khari*).**

**Ref :- Mh. 60/35).**

**Site :- Agri. Res. Stn., Sholapur.**

**Type :- 'M'.**

Object :—To study the effects of P, Ca, S and Sodium Sulphate alone and in combination on the yield of Groundnut.

## 1. BASAL CONDITIONS :

(i) (a) Bajra-Tur-Groundnut. (b) Bajra-Tur. (c) Nil. (ii) Deep black soil. (iii) 15.7.60. (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling. (c) 89.7 Kg/ha. (d) 30 cm. × 15 cm. (e) N.A. (v) Nil. (vi) Big-Japan. (vii) Unirrigated. (viii) 2 weedings and 1 interculturing. (ix) 60 cm. (x) 15.12.60

## 2. TREATMENTS :

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

(1) 2 levels of  $P_2O_5$  as  $Na_2HPO_4$  :  $P_0=0$  and  $P_1=33.6$  Kg/ha.

(2) 2 levels of Calcium as lime :  $L_0=0$  and  $L_1=44.8$  Kg/ha.

(3) 2 levels of Sulphur :  $S_0=0$  and  $S_1=26.9$  Kg/ha.

(4) 2 levels of Sodium Sulphate :  $N_0=0$  and  $N_1=62.8$  Kg/ha.

$P_2O_5$ , Sulphur and  $Na_2SO_4$  mixed with fine soil and spread by hand on 10.8.60. and Calcium Oxide broadcast on 10.8.60.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 9.14 m. × 5.49 m. (b) 7.32 m. × 3.66 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Growth was satisfactory and dry spell from 6.8.60 to 2.9.60 resulted in low yield. (ii) Nil. (iii) Yield of pods. (iv) (a) 1957-60. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 373.9 Kg/ha. (ii) 52.9 Kg/ha. (iii) Main effect of P is highly significant and that of L is significant. (iv) Table of mean and differential responses in Kg/ha.

	Mean response	Differential responses							
		P		L		S		N	
		+	-	+	-	+	-	+	-
P	42.30	—	—	37.86	46.75	45.81	38.89	42.53	42.08
L	-32.03	-36.47	-27.58	—	—	-55.18	-8.87	-35.06	-28.98
S	10.53	14.04	7.02	-12.63	33.68	—	—	10.75	10.30
N	-4.92	-4.69	-5.14	-7.96	-1.88	-4.69	-5.14	—	—

C.D. for mean response=37.6 Kg/ha.

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 60(55).**

**Site :- Agri. Res. Stn., Sholapur.**

**Type :- 'M'.**

**Object :-**To study the effect of the application of different micronutrients on Groundnut.

**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) *Bajri*. (c) Nil. (ii) Medium deep. (iii) 20.7.60. (iv) (a) 2 harrowings. (b) Drilling. (c) 89.7 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) 112.1 Kg/ha. of  $P_2O_5$  as Super drilled on 20.7.60. (vi) *Big-Japan*. (vii) Unirrigated. (viii) 1 weeding and 1 interculturing. (ix) 49.5 cm. (x) 9 and 10.12.60.

**2. TREATMENTS :**

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

- (1) 2 levels of Zn as  $Zn SO_4$  :  $Z_0$ =Absent and  $Z_1$ =Present.
- (2) 2 level of Mn as  $Mn SO_4$  :  $M_0$ =Absent and  $M_1$ =Present.
- (3) 2 levels of Cu as  $Cu SO_4$  :  $C_0$ =Absent and  $C_1$ =Present.
- (4) 2 levels of Mo as Sod. Moly bdate :  $N_0$ =Absent and  $N_1$ =Present.
- (5) 2 levels of B as Borax :  $B_0$ =Absent and  $B_1$ =Present.

Micronutrients mixed with fine soil and spread on 10.8.60 and Borax broadcast.

**3. DESIGN :**

(i)  $2^5$  fact. in R.B.D. (ii) (a) 32. (b) N.A. (iii) 4. (iv) (a) 9.14 m.  $\times$  5.49 m. (b) 7.32 m.  $\times$  3.66 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

**4. GENERAL :**

(i) Due to dry spell from 6.8.60 to 2.9.60 the growth was affected. (ii) Nil. (iii) Yield of pods. (iv) (a) 1957-60 (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 551 Kg/ha. (ii) 129.7 Kg/ha. (iii) None of the effects is significant. (iv) Table of mean and differential responses in Kg/ha

	Mean response	Differential response									
		Z		M		C		N		B	
		-	+	-	+	-	+	-	+	-	+
Z	-11.79	—	—	-12.73	-10.85	1.66	-25.24	0.94	-24.51	23.60	-47.17
M	-2.35	-3.29	-1.41	—	—	19.15	-23.85	1.38	-6.08	9.09	-13.79
C	0.59	14.04	-12.85	22.09	-20.90	—	—	38.33	-37.14	-7.46	8.65
N	-4.32	8.40	-17.05	-0.59	-8.06	33.41	-42.06	—	—	-3.68	-4.67
B	4.55	39.93	-30.84	15.99	-6.89	-3.51	12.60	4.89	4.20	—	—

**Crop :- Groundnut (*Kharif*).**

**Ref :- Mh. 62(49), 63(75).**

**Site :- Agri. Res. Stn., Sholapur.**

**Type :- 'M'.**

Object :- To study the effect of N and P on the yield of Groundnut.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) *Bajri, Tur* ; N.A. (c) 11.2 Kg/ha. of N and  $P_2O_5$  each ; N.A. (ii) Medium soil. (iii) 14.7.62 ; 25.6.63. (iv) (a) 1 ploughing and 2 harrowings ; 2 harrowings. (b) Drilling. (c) 89.7 Kg/ha. (d) 30 cm. (e) N.A. (v) Nil. (vi) Spanish improved. (vii) Unirrigated. (viii) Weeding once ; weeding once and 2 interculturings. (ix) 45 cm. ; 42 cm. (x) 8.11.62 ; 4.12.63.

2. **TREATMENTS :**

7 manurial treatments :  $M_0$  = Pure control,  $M_1$  = No  $P_2O_5$  and compost,  $M_2$  = Compost,  $M_3$  = 22.4 Kg/ha. of  $P_2O_5$  as Super,  $M_4$  = 22.4 Kg/ha. of  $P_2O_5$  as Super through digested compost,  $M_5$  =  $M_3$  + compost mixed one week before application and  $M_6$  =  $M_3$  + compost applied separately.

11.2 Kg/ha. of N applied to all the plots except  $M_0$ .

3. **DESIGN :**

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 13.32 m. x 7.32 m. (b) 11.89 m. x 5.49 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) Nil ; *Tikka*, 5 % B.H.C. applied. (iii) Yield of pods. (iv) (a) 1962-63. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Since error variances are heterogeneous and Treatments x years interaction is absent, the results of individual years are presented under 5. Results.

5. **RESULTS :**

62(49)

(i) 782 Kg/ha. (ii) 83.9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	$M_0$	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$	$M_6$
Av. yield	737	745	756	793	798	837	858

63(75)

(i) 1244 Kg/ha. (ii) 245.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	$M_0$	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$	$M_6$
Av. yield	1112	1276	1257	1265	1219	1200	1380

**Crop :- Groundnut (*Kharif*).**

**Ref :- Mh. 62(50), 63(74).**

**Site :- Agri. Res. Stn., Sholapur.**

**Type :- 'M'.**

Object :- To study the residual effect of the Nitrophosphates on the succeeding crop of Groundnut.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*. (c) As per treatments. (ii) Medium soil ; Deep soil. (iii) 6.7.62 ; 29.6.63. (iv) (a) 2 harrowings. (b) Drilling. (c) 89.7 Kg/ha. (d) 30 cm. x 10 to 15 cm. (e) N.A. (v) Nil. (vi) Spanish improved. (vii) Unirrigated. (viii) Interculturing ; Weeding (ix) 51.2 cm. ; 41.7 cm. (x) 13.11.62 ; 31.10.63.

2. **TREATMENTS :**

All combinations of (1), (2) and (3) + 5 extra treatments in each block

(1) 3 types of fertilizers :  $P_1$  = Super + A/S,  $P_2$  = O.D.V. and  $P_3$  = P.E.

(2) 3 methods of application :  $M_1$  = Broadcasting,  $M_2$  = Band placement and  $M_3$  = 6.3 cm below seed.

(3) 3 levels of fertilizers :  $L_1$  = 13.4 Kg/ha. of N + 11.8 Kg/ha. of  $P_2O_5$ ,  $L_2$  = 26.9 Kg/ha. of N + 23.5 Kg/ha. of  $P_2O_5$  and  $L_3$  = 53.8 Kg/ha. of N + 47.1 Kg/ha. of  $P_2O_5$ .

Extra treatments :  $N_0$  = 0,  $N_1$  = 13.4,  $N_2$  = 26.9,  $N_3$  = 40.3 and  $N_4$  = 53.8 Kg/ha.

All fertilizers were applied to the preceding crop of *Jowar*.

## 3. DESIGN :

(i) 3<sup>3</sup> confd. + 5 extra treatments. (ii) (a) 14 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 10.97 m. × 6.40 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of pods. (iv) (a) 1962-63. (b) No. (c) The results of the combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is present.

## 5. RESULTS :

Pooled results.

(i) 1044 Kg/ha. (ii) 126.8 Kg/ha. (based on 96 d.f. made up of pooled error). (iii) Main effects of P and M are significant. Interaction L × M is significant. (iv) Av. yield of pods in Kg/ha.

$N_0=1003$ ,  $N_1=1025$ ,  $N_2=931$ ,  $N_3=951$  and  $N_4=974$  Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
P <sub>1</sub>	1058	1148	1149	1131	1037	1188	1118
P <sub>2</sub>	1087	1041	1094	1068	1062	1092	1074
P <sub>3</sub>	962	1085	1064	1077	996	1038	1037
Mean	1036	1091	1103	1092	1032	1106	1076
M <sub>1</sub>	1018	1106	1152				
M <sub>2</sub>	980	1106	1009				
M <sub>3</sub>	1109	1062	1147				

C.D. for P or M marginal means = 59.4 Kg/ha.  
C.D. for body of L × M table = 102.9 Kg/ha.

## Individual results

Treatment	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Sig.	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Sig.	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	Sig.
Year 1962	1058	1118	1158	N.S.	1130	1071	1130	N.S.	1126	1113	1095	*
1963	1014	1065	1048	N.S.	1054	991	1082	N.S.	1112	1036	979	*
Pooled	1036	1091	1103	N.S.	1092	1032	1106	*	1119	1074	1037	*

N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	Sig.	G.M.	S.E./plot
1089	1113	1016	1197	1062	N.S.	1111	114.7
916	937	845	705	887	**	977	137.4
1003	1025	931	951	974	N.S.	1044	126.8

**Crop :- Groundnut (Kharif).****Ref :- Mh. 60(79).****Site :- Agri. Res. Stn., Washim.****Type :- 'M'.**

Object:—To study the effect of N and P with and without F.Y.M. on the yield of Groundnut.

**1. BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) Medium black. (iii) 28.6.60. (iv) (a) 1 ploughing and 3 harrowings. (b) Dibbling. (c) N.A. (d) 30 cm. × 23 cm. (e) 1. (v) Nil. (vi) AK—12—24. (vii) Unirrigated. (viii) 3 hoeings and 3 weedings. (ix) 51.7 cm. (x) 18.10.60.

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

Same as in expt. No. 60(78) presented on Page No. 475.

**4. GENERAL :**(i) Growth was satisfactory. (ii) Aphids and *Tikka* attack, moderate dusting of 10 % B.H.C. (iii) Yield of pods. (iv) (a) 1960 only. (b) and (c) Nil. (v) Achalpur, Akola, Buldhana and Parbhani. (vi) and (vii) Nil.**5. RESULTS :**

(i) 2639 Kg/ha. (ii) (a) 191.4 Kg/ha. (b) 112.1 Kg/ha. (iii) Main effect of N, P and F are highly significant. (iv) Av. yield of pods in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
F <sub>0</sub>	2352	2501	2653	2304	2359	2642	2502
F <sub>1</sub>	2690	2727	2912	2543	2802	2984	2776
Mean	2521	2614	2782	2423	2680	2813	2639
P <sub>0</sub>	2182	2475	2615				
P <sub>1</sub>	2534	2706	2801				
P <sub>2</sub>	2846	2662	2931				

C.D. for N or P marginal means=113.9 Kg/ha.

C.D. for F marginal means=54.2 Kg/ha.

**Crop :- Groundnut (Kharif).****Ref :- Mh. 65(33).****Site :- Agri. Res. Stn. Badnapur.****Type :- 'C'.**

Object :—To study the value of wider spacing between rows in order to facilitate interrow cultivation to control weeds particularly during long spell of rainfall.

**1. BASAL CONDITIONS :**(i) (a) Nil. (b) Cotton. (c) Nil. (ii) Medium black cotton soil. (iii) 6.7.65. (iv) (a) 6 harrowings. (b) to (c) As per treatments. (v) 22.4 Kg/ha. of N as A/S by spreading on 25.6 65+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as super by drilling on 25.6.65. (vi) S.B.—xi. (vii) Unirrigated. (viii) One weeding and hoeing. (ix) 43.0 cm. (x) 13.11.65.**2. TREATMENTS**4 methods of sowing : M<sub>1</sub>=Dibbling at 30 cm. × 15 cm., M<sub>2</sub>=Dibbling at 15 cm. × 15 cm. in paired rows at a distance of 46 cm. between pairs of rows., M<sub>3</sub>=Dibbling at 15 cm. × 10 cm. in paired rows at distance of 46 cm. between pairs of rows and M<sub>4</sub>=Drilling at 30 cm. apart at 90 Kg/ha.Seed-rate for M<sub>1</sub> to M<sub>2</sub>=1 Seed/dibble.**3. DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) 21.34 m. × 12.19 m. (iii) 6. (iv) (a) 10.34 m. × 5.79 m. (b) 9.14m. × 4.57 m. (v) 60 cm. × 60 cm. (vi) Yes.



## 4. GENERAL :

(i) Germination was Satisfactory. (ii) Attack of aphids was controlled by dusting 10% B.H.C. on 4.8.65 and 13.9.65. (iii) Yield of pods. (iv) 1965-67. (b) and (c) No. (v) Jalgaon. (vi) Nil. (vii) During growth period, there was break in rain which affected flowering and peg formation.

## 5. RESULTS :

(i) 515 Kg/ha. (ii) 161.7 Kg/ha. (iii) Treatment differences are not significant. (vi) Av. yield of pod in Kg/ha.

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>
Av. yield	425	485	548	601

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 60(18), 61(171), 62 (164), 63 (215).**

**Site :- Agri. Res. Stn., Digraj.**

**Type :- 'C'.**

Object :- To ascertain the optimum spacing and number of seeds per dibble for Groundnut.

## 1. BASAL CONDITIONS :

(i) (a) N.A. (b) Chillies. (c) Nil. (ii) Black soil. (iii) 10; 11.7.60; 17.6.61; 8.7.62; 11.7.63. (iv) (a) 1 ploughing and 3 harrowings. (b) Dibbling. (c) 89.7 Kg/ha. (d) and (e) As per treatments. (v) 12.3 C.L/ha. of F.Y.M. (vi) Karad-4-11. (vii) Unirrigated (viii) Interculturing, weeding, thinning, Gap filling. (ix) 52.1 cm.; 45.5 cm.; 48.0 cm.; 47.4 cm. (x) N.A.; 2nd fortnight of Dec., 61; 22.12.62; 27.11.63.

## 2. TREATMENTS :

**Main-plot treatments**

All combinations of (1) and (2)

(1) 2 Spacings between rows : R<sub>1</sub>=46 and R<sub>2</sub>=61 cm.

(2) 3 Spacings between plants : P<sub>1</sub>=15, P<sub>2</sub>=30 and P<sub>3</sub>=46 cm.

**Sub-plot treatments**

3 No. of seeds per dibble : A<sub>1</sub>=1, A<sub>2</sub>=2 and A<sub>3</sub>=3 seeds per dibble.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication; 3 sub-plots/main-plot (b) 32.92 m. × 43.89 m. (iii) 4. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Aphids attack was observed in the first fortnight of August 60. Spraying of Endrex-20 EC was done to check it. Tikka attack was also observed; Nil for others. (iii) Yield of pods. (iv) (a) 1960-63. (b) No. (c) The results of the combined analysis are given under 5. Results. (v) N.A. (iv) Nil (vii) Both the error variances are homogeneous and Treatments × years interaction is present.

## 5. RESULTS :

**Pooled results**

(i) 1477 Kg/ha. (ii) (a) 228.3 Kg/ha. (based on 60 d.f. made up of pooled error). (b) 159.2 Kg/ha. (based on 144 d.f. made up of pooled error). (iii) Main effect of R is significant. Interaction R × P is significant. Main effect of A is highly significant. (iv) Av. yield of pods in Kg/ha.

	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	Mean
R <sub>1</sub>	1499	1510	1523	1405	1541	1586	1511
R <sub>2</sub>	1530	1396	1404	1298	1473	1558	1443
Mean	1514	1453	1463	1352	1507	1572	1477
A <sub>1</sub>	1408	1325	1322				
A <sub>2</sub>	1537	1511	1472				
A <sub>3</sub>	1598	1522	1596				

C.D. for R marginal means = 53.8 Kg/ha.

C.D. for A marginal means = 45.0 Kg/ha.

C.D. for body of (R × P) table = 93.2 Kg/ha.

## vidual results

atmen	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	Sig.	R <sub>1</sub>	R <sub>2</sub>	Sig.	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>
Year										
1960	1525	1717	1850	**	1722	1673	N.S.	1816	1666	1610
1961	1109	1115	1200	N.S.	1153	1129	N.S.	1077	1150	1197
1962	1112	1120	1201	*	1155	1133	N.S.	1084	1153	1196
1963	2022	1912	1844	*	2014	1838	N.S.	1722	2009	2047
P pooled	1514	1453	1463	N.S.	1511	1443	*	1352	1507	1572

Sig.	G.M.	S.E./plot	
		(a)	(b)
**	1697	161.1	170.4
N.S.	1142	227.2	131.3
N.S.	1144	229.6	134.3
**	1926	279.6	192.4
**	1477	228.3	159.2

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 60(195).**

**Site :- Agri. Res. Stn., Jalgaon.**

**Type :- 'C'.**

Object : -To decide optimum distance between 2 plants in a row in Groundnut, row placed at 30 cm. apart.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) Deep black Soil. (iii) 25.6.60. (iv) (a) Harrowing (b) As per treatments. (c) 67 Kg/ha. (d) As per treatments. (e) 1. (v) 12.3 C.L/ha. of F.Y.M. (vi) Faijpur I-5 (vii) Unirrigated. (viii) Weeding and Hoeing. (ix) 48 cm. (x) 25, 26.10.60.

**2. TREATMENTS :**

4 Spacings : S<sub>1</sub>=30 cm. × 15 cm., S<sub>2</sub>=30 cm. × 23 cm., S<sub>3</sub>=30 cm. × 30 cm. and S<sub>4</sub>=30 cm.  
In S<sub>1</sub> to S<sub>3</sub> method of sowing is dibbling and in S<sub>4</sub> method of sowing is drilling.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 15.54 m. × 4.57 m. (b) 13.72 m. × 3.66 m. (v) 91 cm. × 46 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) B.H.C. and Sulphur 16.8 Kg/ha. dusted for Aphids and *tikka*. (iii) Yield of pod. (iv) (a) 1959-61. (b) and (c) No. (v) to (vii) Nil.

**5. RESULTS :**

(i) 1572 Kg/ha. (ii) 161.0 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of pods in Kg/ha.

Treatment	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>
Av. yield	2041	1388	1267	1592

C.D.=198.1 Kg/ha.

**Crop :- Groundnut. (Kharif)****Ref :- Mh. 61(152).****Site :- Agri. Res. Stn., Jalgaon.****Type :- 'C'.**

Object :—To decide optimum distance between 2 plants in a row in Groundnut row, placed at 46 cm. apart.

- BASAL CONDITIONS:**  
(i) (a) Nil. (b) Cotton. (c) N.A. (ii) Deep black. (iii) 27.6.61. (iv) (a) 5 harrowings. (b) As per treatments. (c) 67 Kg/ha. (d) As per treatments. (e) One. (v) Nil. (vi) Faizpur 1-5. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 82.7 cm. (x) 28.10.61.
- TREATMENTS :**  
4 spacings :  $S_1=46 \text{ cm.} \times 15 \text{ cm.}$ ,  $S_2=46 \text{ cm.} \times 23 \text{ cm.}$ ,  $S_3=46 \text{ cm.} \times 30 \text{ cm.}$  and  $S_4=46 \text{ cm.}$   
In  $S_1$  to  $S_4$  method of sowing is dibbling in  $S_4$  is drilling.
- DESIGN :**  
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 15.54 m.  $\times$  4.57 m. (b) 13.72 m.  $\times$  3.66 m. (v) 91 cm.  $\times$  46 cm. (vi) Yes.
- GENERAL :**  
(i) Normal. (ii) Sulphur dusted for *tikka*. (iii) Yield of pod. (iv) (a) 1959—61. (b) and (c) No. (v) to (vii) Nil.
- RESULTS :**  
(i) 628 Kg/ha. (ii) 24.0 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of pods in Kg/ha.

Treatment	$S_1$	$S_2$	$S_3$	$S_4$
Av. yield	700	635	534	644

C.D.=38.4 Kg/ha.

**Crop :- Groundnut (Kharif).****Ref :- Mh. 62(48).****Site :- Agri. Res. Stn., Jalgaon.****Type :- 'C'.**

Object :—To study the effect of earthing up on the yield of Groundnut with different spacings.

- BASAL CONDITIONS :**  
(i) (a) Nil. (b) Groundnut. (c) 11.2 Kg/ha. of N. (ii) Deep black cotton soil. (iii) 15.7.62. (iv) 3 harrowings. (v) Dibbling. (c) 67.2 Kg/ha. (d) As per treatments. (e) 1. (v) 22.4 Kg/ha of N drilled on 15.7.62. (vi) SB—xi. (vii) Unirrigated. (viii) 3 hoeings. (ix) 48.5 cm. (x) 8.11.62.
- TREATMENTS :**  
All combinations of (1) and (2)  
(1) 2 spacings :  $S_1=30 \text{ cm.} \times 15 \text{ cm.}$ ,  $S_2=46 \text{ cm.} \times 15 \text{ cm.}$   
(2) 4 cultural treatments :  $C_1$ =Cultivator's practise,  $C_2$ =Earthing once, 30 days after sowing,  $C_3$ =Earthing once, 45 days after sowing and  $C_4$ =Earthing twice, 30 and 45 days after sowing.
- DESIGN :**  
(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  9.14 m. (b) 9.14 m.  $\times$  7.31 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.
- GENERAL :**  
(i) Normal. (ii) Aphids and Tikka attack, Control measures N.A. (iii) Yield of pods. (iv) (a) 1962-65, (Modified in 53). (b) and (c) Nil. (v) to (vii) Nil.
- RESULTS :**  
(i) 2018 Kg/ha. (ii) 76.2 Kg/ha. (iii) Main effect of S is highly significant and that of C is significant. (iv) Av. yield of pod is Kg/ha.

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	Mean
S <sub>1</sub>	2137	2214	2196	2291	2210
	1768	1831	1860	1845	1826
Mean	1952	2022	2028	2068	2018

C.D. for S marginal means=56.0 Kg/ha.

C.D. for C marginal means=79.3 Kg/ha.

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 63(70), 64(61), 65(136).**

**Site :- Agri. Res. Stn., Jalgaon.**

**Type :- 'C'.**

**Object :-**To study the effect of earthing up on the yield of Groundnut with different spacings.

**1. BASAL CONDITIONS :**

(i) (a) Groundnut—Cotton for 65 ; Nil for others. (b) Cotton. (c) 22.4 Kg/ha. of N ; 12.3 C.L./ha. of F.Y.M +22.4 Kg/ha. of N ; 22.4 Kg/ha. of N. (ii) Deep black cotton soil. (iii) 5,7.63 ; 3, 4,7.64 ; 18, 19,7.65. (iv) (a) 3 harrowings. (b) Dibbling. (c) 89.6 Kg/ha. for 65 ; 67.2 Kg/ha. for others. (d) As per treatments. (e) 1. (v) 22.4 Kg/ha. of N drilled. (vi) S B—X1. (vii) Unirrigated. (viii) 2 hoeings ; N.A. ; Interculturing and weeding twice. (ix) 48.5 cm. ; 46 cm. ; 63.6 cm. (x) 1.11.63 ; 23, 24,10.64 ; 5,11.65.

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 2 spacings : S<sub>1</sub>=30 cm. × 15 cm. and S<sub>2</sub>=46 cm. × 10 cm.

(2) 4 cultural treatments : C<sub>1</sub>=Cultivator's practice of interculturing with local hoes, C<sub>2</sub>=Earthing up once 30 days after sowing, C<sub>3</sub>=Earthing up once 45 days after sowing and C<sub>4</sub>=Earthing up twice 30 and 45 days after sowing.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 8. (b) 22.86 m. × 36.58 m. (iii) 4. (iv) (a) 10.97 m. × 9.14 m. (b) 9.14 m. × 7.31 m. (v) 91 cm. × 46 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal for 63 and 64 ; Satisfactory. (ii) Attack of Aphids and Tikka BHC 10% and Sulphur dusted. Control measures taken N.A. for other years. (iii) Yield of pods. (iv) (a) 1962-65. (b) No. (c) The results of combined analysis are given under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is present.

**5. RESULTS :**

**Pooled results**

(i) 604 Kg/ha. (ii) 152.0 Kg/ha. (based on 14 d.f. made up of of interaction Treatments × years). (iii) None of the effects is significant. (iv) Av. yield of Pods in Kg/ha.

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	Mean
S <sub>1</sub>	567	565	610	580	580
S <sub>2</sub>	593	575	713	631	628
Mean	580	570	661	605	604

## Individual results

Treatment	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	Sig.	S <sub>1</sub>	S <sub>2</sub>	Sig.	G.M.	S.E./plot
Year										
1963	824	919	906	934	N.S.	878	914	N.S.	896	92.7
1964	530	574	597	525	N.S.	556	556	N.S.	556	91.2
1965	386	216	481	356	**	307	413	**	360	61.6
Pooled	580	570	661	605	N.S.	580	628	N.S.	604	152.0

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 65(38).**

**Site :- Agri. Res. Stn., Jalgaon.**

**Type :- 'C'.**

**Object :—**To Study the value of wider spacing between rows in order to facilitate interrow cultivation to control weeds, particularly during long spell of rain.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton. (c) 12.35 C.L./ha. of F.Y.M. (ii) Black cotton soil. (iii) 20.7.65. (iv) (a) 1 ploughing with board plough and 2 harrowings. (b) to (e) As per treatments. (v) 22.4 Kg/ha. of N as A/S, applied by hand in furrows before sowing. (vi) SB XI. (vii) Unirrigated. (viii) 2 weedings and 2 hoeings. (ix) 55.0 cm. (x) 29.10.65.

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

Same as in expt. No. 65(33) conducted at Badnapur and presented on page No. 482.

**4. GENERAL :**

(i) Germination was satisfactory. (ii) Attack of aphids and tikka. B.H.C. 10% dusted on 4.8.65 Sulphur 10% dusted on 6.9.65. (iii) Yield of pod. (iv) (a) 1965—67. (b) and (c) No. (v) Badnapur. (vi) and (vii) Nil.

**5. RESULTS:**

(i) 239 Kg/ha. (ii) 71.2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>
Av. yield	220	222	272	242

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 62(165), 63(216), 64(173).**

**Site :- Agri. Res. Stn., Digraj.**

**Type :- 'CM'.**

**Object :—**To decide the suitable spacings and doses of manures to the groundnut crop.

**1. BASAL CONDITIONS :**

(i) (a) Jowar—Pulses—Groundnut. (b) Gram. (c) Nil. (ii) Medium black clay loam. (iii) 22.7.62 ; 17.6.63 ; 23.7.64. (iv) (a) 5-6 harrowings. (b) Dibbling. (c) to (e). As per treatments. (v) As per treatments. (vi) Kopergaon—1. (vii) Unirrigated. (viii) 4 interculturalures. (ix) 48.0 cm. ; 47.4 cm. ; 51 cm. (x) 14, 15.12.62 ; 5 to 10.12.63 ; 18.12.64.

## 2. TREATMENTS :

## Main-plot treatments:

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

(1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=11.2$  and  $N_2=22.4$  Kg/ha. of N.(2) 3 levels of  $P_2O_5$  as Super:  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha. of  $P_2O_5$ .(3) 3 spacings between rows :  $R_1=45$ ,  $R_2=60$  and  $R_3=75$  cm.(4) 3 spacings between plants :  $T_1=15$ ,  $T_2=30$  and  $T_3=45$  cm.

## Sub-plot treatments:

All combinations of (1) and (2)

(1) 2 levels of FYM:  $F_0=0$  and  $F_1=12$  C.L./ha. of F.Y.M(2) 2 levels of seed-rate:  $S_1=0$  and  $S_2=2$  seeds/dibble.

## 3. DESIGN :

(i)  $(3^4 \times 2^2)$  Split plot confd. (ii) 4 sub-plots/main plot, 9 main-plots/block and 9 blocks/replication.(b) N.A. (iii) I. (iv) (a)  $10.97$  m.  $\times$   $6.40$  m. for treatment  $R_1$  and  $R_2$ ,  $10.67$  m.  $\times$   $6.40$  m. for treatment  $R_3$ .(b)  $10.06$  m.  $\times$   $4.57$  m. (v) 1 row by sides and 1 plant at ends. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory ; poor germination for 63 and 64. (ii) Nil. (iii) Yield of pods. (iv) (a) 1962-64. (b) No. (c) Nil. (v) and (vi) No. (vii) Both the error variances are heterogeneous, hence results of individual years are presented under 5. Results.

## 5. RESULTS :

62(165)

(i) 781 Kg/ha. (ii) (a) 258.2 Kg/ha. (b) 172.3 Kg/ha. (iii) Main effects of R and T are highly significant.

(iv) Av. yield of pods in Kg/ha.

	$T_1$	$T_2$	$T_3$	$R_1$	$R_2$	$R_3$	$P_0$	$P_1$	$P_2$	$S_1$	$S_2$	$F_0$	$F_1$	Mean
$N_0$	756	822	671	862	681	707	684	771	793	788	711	758	742	750
$N_1$	823	807	773	842	812	749	714	882	808	790	812	783	819	801
$N_2$	725	865	790	841	802	737	836	720	823	772	814	790	796	793
Mean	768	831	745	848	765	731	745	791	808	784	779	777	785	781
$F_0$	766	836	730	841	766	725	755	794	783	780	775			
$F_1$	770	828	759	855	764	737	735	788	833	788	783			
$S_1$	781	833	737	845	769	737	723	817	810					
$S_2$	755	830	752	851	671	725	766	765	806					
$P_0$	740	773	721	814	719	701								
$P_1$	785	819	769	833	798	742								
$P_2$	778	902	744	898	777	750								
$R_1$	830	922	792											
$R_2$	775	808	711											
$R_3$	698	764	731											

C.D. for marginal mean of R or T=48 Kg/ha.

63(216)

(i) 915 Kg/ha. (ii) (a) 340.2 Kg/ha. (b) 218.0 Kg/ha. (iii) Main effects of N, R, T and F are highly significant. Interaction (S  $\times$  F) is significant. (iv) Av. yield of pods in Kg/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>0</sub>	898	864	723	957	730	798	766	838	881	761	896	792	865	828
N <sub>1</sub>	1179	973	804	1187	959	804	971	976	1009	964	1005	935	1035	984
N <sub>2</sub>	1100	930	771	1150	883	767	958	973	870	954	913	904	962	933
Mean	1059	922	766	1099	857	790	898	929	919	893	938	877	954	915
F <sub>0</sub>	1058	873	700	1073	829	729	867	880	884	904	850			
F <sub>1</sub>	1060	972	831	1125	886	851	930	978	955	882	1027			
S <sub>1</sub>	1030	922	727	1056	855	768	872	902	906					
S <sub>2</sub>	1088	923	803	1141	860	813	925	957	933					
P <sub>0</sub>	939	991	765	1076	857	763								
P <sub>1</sub>	1135	868	784	1119	838	827								
P <sub>2</sub>	1103	908	749	1102	877	779								
R <sub>1</sub>	1236	1118	943											
R <sub>2</sub>	999	892	681											
R <sub>3</sub>	941	756	672											

C.D. for N or R or T marginal means = 65 Kg/ha.

C.D. for F marginal means = 33 Kg/ha.

C.D. for (S × F) body of table = 47 Kg/ha.

64(173)

(i) 714 Kg/ha. (ii) (a) 184.0 Kg/ha. (b) 149.6 Kg/ha. (iii) Main effects of N, R, T and S are highly significant. (iv) Av. yield of pods in Kg/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>0</sub>	813	662	518	796	641	556	682	650	661	557	771	649	680	664
N <sub>1</sub>	930	723	535	835	740	612	710	722	756	623	835	731	727	729
N <sub>2</sub>	916	753	579	924	741	583	726	791	732	672	827	738	761	750
Mean	886	713	544	852	708	584	706	721	716	618	811	706	723	714
F <sub>0</sub>	880	717	521	851	697	571	681	730	707	610	802			
F <sub>1</sub>	852	709	567	853	719	597	731	712	725	626	820			
S <sub>1</sub>	805	598	451	731	603	514	608	617	629					
S <sub>2</sub>	967	828	637	967	813	654	804	825	863					
P <sub>0</sub>	864	684	570	821	704	594								
P <sub>1</sub>	879	741	543	850	723	589								
P <sub>2</sub>	916	714	519	884	697	568								
R <sub>1</sub>	1031	895	629											
R <sub>2</sub>	890	698	534											
R <sub>3</sub>	737	546	468											

C.D. for N or R or T marginal means = 50 Kg/ha.

C.D. for S marginal means = 25 Kg/ha.

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 62(146), 63(191), 64(158).**

**Site :- Agri. College Farm, Akola.**

**Type :- 'P'.**

**Object :-**To study the effect of irrigation on the yield of Groundnut.

**1. BASAL CONDITIONS:**

(i) (a) Nil. (b) Cotton. (c) Nil; 12.35 C.L./ha. of F.Y.M.+22.4 Kg/ha. of N; Manured quantity N.A. (ii) Medium black. (iii) 9.7.62; 3.7.63; 10.7.64. (iv) (a) 1 ploughing in 62 and 63; Ploughing and harrowing (b) Drilling. (c) 112 Kg/ha. (d) 30 cm. x 8-10 cm. (e) 1. (v) 5.6 Kg/ha. of N as A/S+11.2 Kg/ha. of  $P_2O_5$  as Super; 11.2 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ ; 24.71 C.L./ha. of F.Y.M.+11.2 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$  (vi) AK-12-24. (vii) As per treatments. (viii) 3 weedings and 1 hoeing; 3 hoeings; interculturations. (ix) 87 cm.; 49 cm.; 67 cm. (x) 1st week of Nov. 62; Last week of Oct., 63; 4.11.64.

**2. TREATMENTS:**

All combinations of (1) and (2)+control (4 plots in each replication)

(1) 4 intervals of irrigation:  $I_1=35$ ,  $I_2=70$ ,  $I_3=35$  and 70 days after sowing and  $I_4=As$  and when required.

(2) 3 depths of irrigations:  $L_1=2.54$ ,  $L_2=5.08$  and  $L_3=7.62$  cm.

(c) Control: No irrigation.

**3. DESIGN:**

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 9.14 m. x 12.80 m. (b) 5.49 m. x 9.14 m. (v) 183 cm. x 183 cm. (vi) Yes.

**4. GENERAL:**

(i) Normal. (ii) 10% B.H.C. for Aphids in 62. (iii) Height, population and yield of grain. (iv) (a) 1962-68 (treatments modified in 65). (b) No. (c) Nil. (v) Nil. (vi) As the rainfall was sufficient, no irrigation was given for  $I_4$  treatments in 62. (vii) For analysis of variances there were 7 control plots for 62, as treatment  $I_4$  was not conducted. Error variances for 63 and 64 are homogeneous and interaction is absent.

**5. RESULTS:**

**62(146)**

(i) 1280 Kg/ha. (ii) 172.6 Kg/ha. (iii) None of effects is significant. (iv) Av. yield of pods in Kg/ha.

C=1287 Kg/ha.

	$L_1$	$L_2$	$L_3$	Mean
$I_1$	1258	1239	1295	1265
$I_2$	1246	1265	1325	1279
$I_3$	1362	1241	1242	1282
Mean	1289	1248	1287	1275

**Pooled results (for 63 and 64)**

(i) 884 Kg/ha. (ii) 279.4 Kg/ha. (based on 101 d.f. made up of pooled error and interaction of I, L and  $(I \times L)$  with years). (iii) Main effect of I is significant. (iv) Av. yield of pods in Kg/ha.



C=861 Kg/ha.

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Mean
I <sub>1</sub>	862	955	960	926
I <sub>2</sub>	864	732	914	837
I <sub>3</sub>	930	1028	1138	1032
I <sub>4</sub>	730	674	920	775
Mean	846	847	983	892

C.D. for I marginal means=160.2 Kg/ha.

## Individual results

Treatment	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	Sig.	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Sig.
Year 1963	1104	1046	1281	925	*	978	1050	1239	N.S.
1964	747	628	783	674	N.S.	715	644	728	N.S.
Pooled	926	837	1032	775	*	846	847	983	N.S.

Control	G.M.	S.E./plot
1099	1092	301.6
623	677	264.4
861	884	279.4

Crop :- Groundnut (*Kharif*).

Ref :- Mh. 65(31).

Site :- Agri. College Farm, Akola.

Type :- 'P'.

Object :- To study the effect of irrigation on the growth of Groundnut.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 49 Kg/ha. of N+49 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black. (iii) 13, 14.7.65. (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling. (c) 90 Kg/ha. (d) 30 cm. (e) — (v) 11.2 Kg/ha. of N as A/S+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super at sowing. (vi) AK—12—24. (vii) As per treatments. (viii) 1 weeding. (ix) 48 cm. (x) 8, 10, 11.65.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of irrigation : I<sub>0</sub>=0, I<sub>1</sub>=5.1 cm. and I<sub>2</sub>=7.6 cm.

(2) 5 times of irrigation : M<sub>1</sub>=One irrigation at the 1st critical phase i.e. 35 days after sowing, M<sub>2</sub>=One irrigation at the 2nd critical phase i.e. 70 days after sowing, M<sub>3</sub>=Two irrigations at 1st and 2nd critical phases of growth, M<sub>4</sub>=Fixed irrigation, after every 21 days from the date of sowing and M<sub>5</sub>=Irrigated as and when required.

## 3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 12.80 m. × 9.14 m. (b) 9.14 m. × 5.49 m. (v) 183 cm. × 183 cm. (vi) Yes.

## 4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of pods. (iv) (a) 1962-68 (modified in 65). (b) and (c) No. (v) No. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 792 Kg/ha. (ii) 141.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

$I_0 = 759$  Kg/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	Mean
I <sub>1</sub>	768	763	815	798	840	797
I <sub>2</sub>	775	818	840	833	833	820
Mean	772	790	828	816	836	805

**Crop :- Groundnut (Summer).**

**Ref :- Mh. 65(186).**

**Site :- Trial-Cum-Dmons. Farm, Dheku Project.**

**Type :- 'I'**

**Object :-** To see the effect of irrigation doses at various intervals on the yield of Groundnut (Summer).

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Medum black. (iii) 1.4.65. (iv) (a) 2 ploughings and 2 harrowings. (b) Dibbling. (c) 74 Kg/ha. (d) 30 cm. × 15 cm. (e) 1. (v) 11.2 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) Spanish (Improved). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 19.8.65.

## 2. TREATMENTS :

All combinations (1) and (2).

(1) 4 intervals of irrigation : I<sub>1</sub>=6 days, I<sub>2</sub>=9 days, I<sub>3</sub>=12 days and I<sub>4</sub>=15 days.

(2) 2 intensities of irrigation : L<sub>1</sub>=5.1 and L<sub>2</sub>=7.6 cm.

## 3. DESIGN :

(1) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 6.71 m. × 9.75 m. (b) 3.05 m. × 6.10 m. (v) 183 cm. × 183 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of pods. (iv) (a) 1965-contd. (b) N.A. (c) Nil. (v) to (vii) Nil.

## 5. RESULTS:

(i) 3396 Kg/ha. (ii) 462.9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	Mean
L <sub>1</sub>	3471	3111	3613	3518	3428
L <sub>2</sub>	3350	3064	3397	3640	3363
Mean	3410	3088	3505	3579	3396

**Crop :- Groundnut (Kharif).****Ref :- Mh. 63(28), 64(22).****Site :- Agri. College Farm, Dhulia.****Type :- 'P'.**

Object:—To study the effect of levels and intensities of irrigations on the yield of Groundnut.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*; Cotton. (c) N.A.; 24.7 C.L./ha. of F.Y.M. + 57.2 Kg/ha. of  $P_2O_5$  + 100.9 Kg/ha. of A/S. (ii) Medium black. (iii) 3.7.63; 30.6.64. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 90 Kg/ha. (d) 30 cm. (e) N.A. (v) 29.6 C.L./ha. of F.Y.M.; 12.4 C.L./ha. of F.Y.M. (vi) Spanish (Improved). (vii) As per treatments. (viii) Weeding and hoeing. (ix) 30 cm.; 52 cm. (x) 26.10.63; 16.10.64.

**2. TREATMENTS :**

All combinations of (1) and (2) + a control (4 plots).

(1) 4 intervals of irrigations:  $T_1$  = One irrigation 35 days after sowing,  $T_2$  = One irrigation 70 days after sowing,  $T_3$  = One irrigation 35 days and other 70 days after sowing and  $T_4$  = Irrigation as and when required.

(2) 3 intensities of Irrigation:  $I_1$  = 2.5,  $I_2$  = 5.0 and  $I_3$  = 7.5 cm.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 12.80 m. × 9.14 m. (b) 9.14 m. × 5.49 m. (v) 183 cm. × 183 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Attack of leaf roller, B.H.C. 10% and Endrin sprayed. (iii) Yield of pods. (iv) (a) 1963-69 (modified in 1965). (b) No. (c) Nil. (v) Poona. (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

**5. RESULTS:**

Pooled results

(i) 903 Kg/ha. (ii) 278.0 Kg/ha. (based on 96 d.f. made up of pooled error). (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

Control = 886 Kg/ha.

	$T_1$	$T_2$	$T_3$	$T_4$	Mean
$I_1$	760	712	937	985	848
$I_2$	855	962	877	1050	936
$I_3$	960	814	882	1112	942
Mean	858	829	899	1049	909

Individual results

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	Sig.	$I_1$	$I_2$	$I_3$	Sig.
Year 1963	781	746	816	1162	**	790	910	928	N.S.
1964	935	913	981	936	N.S.	907	961	955	N.S.
Pooled	858	829	899	1049	N.S.	848	936	942	N.S.

Control	G.M.	S.E./plot.
808	859	243.2
963	947	309.0
886	903	278.0

**Crop :- Groundnut (Kharif).****Ref :- Mh. 65(148).****Site :- Agri. College Farm, Dhulia.****Type :- 'P'.****Object :-**To study the irrigation requirements of Groundnut.**1. BASAL CONDITIONS:**

(i) (a) Nil. (b) Cotton. (c) 67.2 Kg/ha. of N+44.8 Kg/ha. of  $P_2O_5$ +44.8 Kg/ha. of  $K_2O$ . (ii) Medium black. (iii) 15.7.65. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 90 Kg/ha. (d) 30 cm. (e) —. (v) 12.36 C.L./ha. of F.Y.M. applied by broadcast on 1.7.65. (vi) SBXI. (vii) As per treatments. (viii) 3 weedings and 1 hoeing. (ix) 33 cm. (x) 5.11.65.

**2. TREATMENTS :**

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

(1) 2 levels of irrigation :  $I_1=5.1$  cm. and  $I_2=7.6$  cm.(2) 5 times of irrigation :  $M_1=$ One irrigation 35 days after sowing,  $M_2=$ One irrigation 70 days after sowing,  $M_3=$ Two irrigation 35 and 70 days after sowing,  $M_4=$ Every 21 days after sowing and  $M_5=$ As and when required.

(c) Control : No irrigation (5 plots in each replication).

**3. DESIGN :**(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 12.80 m.  $\times$  9.14 m. (b) 9.14 m.  $\times$  5.49 m. (v) 183 cm.  $\times$  183 cm. (vi) Yes. |**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Height, spread, no. of branches and yield of pods. (iv) (a) 1965—69. (b) No (c) Nil. (v) Poona. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 314 Kg/ha. (ii) 220.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

C=310 Kg/ha.

	$M_1$	$M_2$	$M_3$	$M_4$	$M_5$	Mean
$I_1$	153	168	364	364	387	287
$I_2$	199	278	234	402	616	346
Mean	176	223	299	383	501	317

**Crop :- Groundnut (Kharif).****Ref :- Mh. 62(34), 63(55), 64(46).****Site :- Agri. College Farm, Poona.****Type :- 'P'.****Object :-**To study the effect of irrigation on the yield of Groundnut.**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Caillies for 62; Groundnut for others. (c) 44.8 Kg/ha. of N for 62; Nil for others. (ii) N.A. (iii) 23.7.62; 13.7.63; 14.7.64. (iv) (a) N.A. (b) Drilling for 62 and 63; dibbling for 64. (c) 90 Kg/ha. for 62 and 63; 185 Kg/ha. for 64. (d) 30 cm. (e) 1—2. (v) Nil. (vi) Spanish (Improved). (vii) Irrigated. (viii) Weedings and interculturings. (ix) 42 cm.; 104 cm.; 36 cm. (x) 8.11.62; 28.10.63 to 30.10.63; 22, 23.10.64.

**2. TREATMENTS :**

All combinations of (1) and (2)+a control (4 plots)

(1) 3 intensities of irrigations :  $I_1=2.5$ ,  $I_2=5$  and  $I_3=7.5$  cm.(2) 4 intervals of irrigations :  $T_1=35$  days after sowing,  $T_2=70$  days after sowing,  $T_3=35$  and 70 days after sowing and  $T_4=$ As and when required.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) 12.80 m. × 9.14 m. (b) 9.14 m. × 5.49 m. (v) 183 cm. × 183 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of Pods. (iv) (a) 1962-69 (modified in 65). (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent. Hence results of individual years are presented under 5. Results.

## 5. RESULTS :

62(34)

(i) 4151 Kg/ha. (ii) 749.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

Control=3940 Kg/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	Mean
I <sub>1</sub>	4265	4472	3781	3867	4096
I <sub>2</sub>	3854	3940	4093	4159	4011
I <sub>3</sub>	4093	4658	4631	4850	4558
Mean	4071	4357	4168	4292	4222

63(55)

(i) 1918 Kg/ha. (ii) 528.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

Control=1948 Kg/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	Mean
I <sub>1</sub>	2113	1541	1973	1442	1767
I <sub>2</sub>	1947	2080	1223	2292	1886
I <sub>3</sub>	2193	2093	1980	2026	2073
Mean	2084	1905	1725	1920	1908

64(46)

(i) 1891 Kg/ha. (ii) 436.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

Control=1719 Kg/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	Mean
I <sub>1</sub>	1568	1860	1722	1766	1729
I <sub>2</sub>	1592	2135	1963	2498	2047
I <sub>3</sub>	2164	2095	2259	1759	2069
Mean	1775	2030	1981	2008	1948

**Crop :- Groundnut (Kharif).**

**Ref :- M.h. 65(147).**

**Site :- Agri. College Farm, Poona.**

**Type :- 'I'.**

Object:—To study the effect of irrigation on the yield of Groundnut.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Groundnut. (c) Nil. (ii) Medium black. (iii) 19.7.65. (iv) (a) Harrowing. (b) Dibbling. (c) 75 Kg/ha. (d) 30 cm. × 15 cm. (e) One. (v) 11.2 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) Spanish (Improved). (vii) As per treatments. (viii) Interculturing and weeding. (ix) N.A. (x) 19 to 24.10.65.

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 5 intervals of irrigations : I<sub>1</sub>=One irrigation 35 days after sowing, I<sub>2</sub>=One irrigation 70 days after sowing, I<sub>3</sub>=2 irrigations 35 and 70 days after sowing, I<sub>4</sub>=Every 21 days after sowing and I<sub>5</sub>=As and when required.

(2) 3 intensities of irrigation : A<sub>1</sub>=0, A<sub>2</sub>=5.1 and A<sub>3</sub>=7.6 cm.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 12.80 m. × 7.32 m. (b) 9.14 m. × 4.27 m. (v) 183 cm. × 152 cm. (vi) Yes.

**4. GENERAL :**

(i) Growth was stunted in 'No irrigation' plots. (ii) Aphids and *Tikka*. (iii) Yield of dry pods. (iv) (a) 1965 to 69. (b) No. (c) Nil. (v) Dhulia. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 1513 Kg/ha. (ii) 305.5 Kg/ha. (iii) Main effect of A is highly significant. (iv) Av. yield of pods in Kg/ha.

A<sub>1</sub>=1257

	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>	Mean
A <sub>1</sub>	1226	1435	1727	1850	1848	1617
A <sub>2</sub>	1340	1535	1802	1898	1754	1666
Mean	1283	1485	1764	1874	1801	1642

C.D. for A marginal means=229.2 Kg/ha.

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 64(160), 65(158).**

**Site :- Agri. Res. Stn., Washim.**

**Type :- 'I'.**

Object:—To study the effect of irrigation on the yield of Groundnut.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) N.A. ; *Moong*, Wheat. (c) N.A. ; 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black soil. (iii) 3.7.64 ; 30.6.65. (iv) (a) 1 ploughing and 3 harrowings. (b) Drilling. (c) 86 Kg/ha. (d) 30 cm. (e) —. (v) 22.4 Kg/ha. of N at sowing. (vi) AK-12-24. (vii) As per treatments. (viii) 3 hoeings and 1 weeding. (ix) N.A. ; 53 cm. (x) 29.9.64 ; 15.10.65.

**2. TREATMENTS:**

All combinations of (1) and (2)+control (4 plots).

(1) 4 intervals of irrigations : I<sub>1</sub>=35, I<sub>2</sub>=70, I<sub>3</sub>=35 and 70 days after sowing and I<sub>4</sub>=As and when required.

(2) 3 depths of irrigations : L<sub>1</sub>=2.5, L<sub>2</sub>=5.1 and L<sub>3</sub>=7.6 cm.

## 3. DESIGN:

(i) Fac. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 12.80 m. × 9.14 m. (b) 9.14 m. × 5.49 m. (v) 183 cm × 183 cm. (vi) Yes.

## 4. GENERAL:

(i) Normal. (ii) B.H.C. and Sulphur dusted for *Tikka*. (iii) Yield of pods. (iv) (a) 1964-69. (b) and (c) No. (v) Akola. (vi) Nil. (vii) As experiment is continued beyond 65, Results of individual years have been presented under 5. Results.

## 5. RESULTS:

64(160)

(i) 740 Kg/ha. (ii) 204.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

Control=703 Kg/ha.

	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	Mean
L <sub>1</sub>	680	687	669	748	696
L <sub>2</sub>	1017	617	718	833	796
L <sub>3</sub>	670	865	905	621	965
Mean	789	723	764	734	752

65(158)

(i) 1338 Kg/ha. (ii) 198.5 Kg/ha. (iii) Main effect of L is significant. Interaction I × L is highly significant. (iv) Av. yield of pods in Kg/ha.

Control=1271 Kg/ha.

	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	Mean
L <sub>1</sub>	1151	1201	1227	1372	1238
L <sub>2</sub>	1863	1141	1316	1527	1462
L <sub>3</sub>	1144	1585	1661	1138	1382
Mean	1386	1309	1401	1345	1360

C.D. for L marginal means=141.4 Kg/ha.

C.D. for body of I × L table=283.0 Kg/ha.

**Crop :- Groundnut (Kharif).****Ref :- Mh. 60(2).****Site :- Agri. Res. Stn., Akola.****Type :- 'D'.**

Object :- To find out the effect of fertilizers insecticides and fungicides on Groundnut.

## 1. BASAL CONDITIONS:

(i) (a) N.A. (b) *Jowar*. (c) 11.2 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub> + 9.9 C.L./ha. of F.Y.M. (ii) Black cotton soil. (iii) 27.6.60. (iv) (a) N.A. (b) Drilling. (c) 89.7 Kg/ha. (d) 30 cm. × 15 cm. (e) N.A. (v) Nil. (vi) AK-12-24. (vii) Unirrigated. (viii) N.A. (ix) 62.5 cm. (x) 15 10.60.

## 2. TREATMENTS:

6 treatments: T<sub>0</sub>=Control, T<sub>1</sub>=11.2 Kg/ha. of N as A/S+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super, T<sub>2</sub>=113 gm. of Agrosan in 45.3 Kg/ha. of Kernels, T<sub>3</sub>=10% B.H.C. 3 times, T<sub>4</sub>=Sulphur dusted 3 times, T<sub>5</sub>=T<sub>1</sub>+T<sub>2</sub>+T<sub>3</sub>+T<sub>4</sub>.

N and P applied before sowing.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 66.45 m. × 44.81 m. (iii) 4. (iv) (a) N.A. (b) 10.06 m. × 10.06 m. (v) N.A. (vi) Yes.

## 4. GENERAL :

(i) Not satisfactory. (ii) Slight attack of *Tikka* and Aphids. (iii) Yield of pods. (iv) (a) 1960 only. (b) N.A. (c) Nil. (v) Dhulia. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 2061 Kg/ha. (ii) 194.9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of pods in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>
Av. yield	1777	2056	2014	2095	1937	2488

C.D.=293.5 Kg/ha.

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 61(197), 62(195), 63(234).**

**Site :- Agri. College Farm, Akola.**

**Type :- 'D'.**

**Object :-** To assess the effect of individual factors of improved cultural practices on the yield of Groundnut.

## 1. BASAL CONDITIONS :

(i) (a) Cotton - Jowar - Groundnut. (b) Jowar. (c) Nil. (ii) Medium black soil. (iii) 17, 18.7.61; 8, 9.7.62; 1, 2.7.63. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 17 Kg/ha. (d) 46 cm. × 15 cm. (e) N.A. (v) 12.4 C.L./ha. of F.Y.M. broadcasted. (vi) AK-12-24. (vii) Unirrigated. (viii) Interculturing. (ix) 74.3 cm.; 88.0 cm.; N.A. (x) 14.11.61; 12, 15.1.62; 1, 3.11.63.

## 2. TREATMENTS :

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

(1) 2 levels of Agrosan : A<sub>0</sub>=Untreated, A<sub>1</sub>=Treated with Agrosan.

(2) 2 levels of B.H.C. : B<sub>0</sub>=Untreated, B<sub>1</sub>=10 % B.H.C. dusted.

(3) 2 levels of Sulphur : C<sub>0</sub>=Untreated, C<sub>1</sub>=Sulphur dusting.

(4) 2 levels of N as A/S : D<sub>0</sub>=No Nitrogen, D<sub>1</sub>=11.2 Kg/ha. of N.

(5) 2 levels of P as Super : E<sub>0</sub>=No P<sub>2</sub>O<sub>5</sub>, E<sub>1</sub>=22.4 Kg/ha.

## 3. DESIGN :

(i) 2<sup>5</sup> factorial confd. (ABD, BCE and ACDE effects confd. in all replis). (ii) (a) 8 plots/block, 4 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 10.96 m. × 6.39 m. (b) 9.14 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of pods. (iv) (a) 1961-63. (b) No. (c) The results of the combined analysis are given under 5. Results. (v) Not known. (vi) No. (vii) Error variances are heterogeneous and Treatments × years interactions are present.

## 5. RESULTS :

Pooled results

(i) 910.0 Kg/ha. (ii) 456.6 Kg/ha. (based on 10 d.f. made up of main effects × years). (iii) None of the effects is significant. (iv) Table of mean and differential responses in Kg/ha.



	Mean response	Differential responses									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	100.8	—	—	99.1	102.6	82.8	118.9	106.5	95.2	68.4	133.3
B	36.9	35.1	38.7	—	—	45.5	28.2	29.7	44.0	20.6	53.2
C	50.1	32.0	68.2	58.7	41.4	—	—	45.3	54.8	37.2	62.9
D	42.6	48.2	37.0	35.5	49.7	37.9	47.4	—	—	25.4	59.8
E	53.4	21.0	85.8	37.1	69.7	40.6	66.2	36.2	70.6	—	—

## Individual results

Treatment	Mean responses							
	A	Sig.	B	Sig.	C	Sig.	D	Sig.
Year 1961	191.4	**	60.0		33.0	N.S.	25.9	N.S.
1962	135.6	**	65.2	N.S.	104.4	*	103.3	
1963	47.6	N.S.	-14.4	N.S.	13.0	N.S.	-1.3	N.S.
Pooled	100.8	N.S.	36.9	N.S.	50.1	N.S.	42.6	N.S.

E	Sig.	G.M.	S.E./plot
1.2	N.S.	651	131.4
149.0	**	1206	215.4
10.11	N.S.	872	151.3
53.4	N.S.	910	456.6

Crop :- Groundnut (*Kharij*)

Ref :- Mh. 61(223), 62(221), 64(238).

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

Type :- 'D'.

Object:—To study the effect of individual factors of improved cultivation practices on the yield of Groundnut.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) *Jowar* (Kh.); *Kulthi* and *Tur*; *Jowar*. (c) 112 Kg/ha. of A/S for 61; 12.4 C.L./ha. of F.Y.M. for others. (ii) Medium black soil. (iii) 28, 30.7.61; 17.7.62; 19.7.64. (iv) (a) 2 harrowings; 5 harrowings; 4 harrowings. (b) Dibbling. (c) N.A. (d) 46 cm. × 15 cm. (e) One. (v) 12 C.L./ha. of F.Y.M. broadcasted in 64; Nil for others. (vi) Kopergaon—1. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 21 cm.; 33 cm.; 47 cm. (x) 30.11.61 and 5.12.61; 2.12.62; 30, 31.12.64.

## 2. TREATMENTS:

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

(1) 2 seed treatments: A<sub>0</sub>=Not treated and A<sub>1</sub>=Seeds treated.(2) 2 control measures for Aphids: B<sub>0</sub>=Not controlled, B<sub>1</sub>=Controlled by 10% of B.H.C. @ 28 Kg/ha.(3) 2 control measures for *Tikka*: C<sub>0</sub>=Not controlled, C<sub>1</sub>=Controlled by dusting Sulphur @ 28 Kg/ha.(4) 2 levels of N as A/S: D<sub>0</sub>=Control and D<sub>1</sub>=11.2 Kg/ha. of N.(5) 2 levels of P as Super: E<sub>0</sub>=Control and E<sub>1</sub>=22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

## 3. DESIGN:

(i) 2<sup>5</sup> confd. (ABD, BCE and ACDE effects confd. in all replications). (ii) (a) 8 plots/block, 4 blocks/replication. (b) 51.12 m. × 13.84 m. (iii) 4. (iv) (a) 10.95 m. × 6.39 m (b) 9.14 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Germination not good for 61 ; Satisfactory for others. (ii) As per treatments. (iii) Yield of pods. (iv) (a) 1961—64 (experiment not conducted in 63). (b) No. (c) Nil. (v) and (vi) No. (vii) Error variances are heterogeneous and main effects  $\times$  years interactions are absent. Hence the results of individual years are presented under 5. Results.

## 5. RESULTS :

61(223)

(i) 1614 Kg/ha. (ii) 132.0 Kg/ha. (iii) None of the effects is significant. (iv) Table of mean and differential responses in Kg/ha.

	Mean response	Differential responses									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	-19.8	0.0	0.0	-25.1	-14.4	-49.4	9.9	-23.5	-15.9	-34.6	-4.9
B	-16.5	-21.8	-11.1	0.0	0.0	-31.9	-1.0	-16.5	-16.4	-23.8	-9.1
C	-50.3	-79.9	-20.7	-65.8	-34.9	0.0	0.0	-52.7	-47.9	-20.3	-80.4
D	-1.9	-5.7	1.9	-1.9	-1.9	-4.3	0.4	0.0	0.0	22.8	-26.6
E	29.8	14.9	44.6	22.4	37.2	59.9	-0.3	54.5	5.1	0.0	0.0

62(221)

(i) 1878 Kg/ha. (ii) 219.9 Kg/ha. (iii) Main effect of D alone is significant. (iv) Table of mean and differential responses in Kg/ha.

	Mean response	Differential responses									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	-24.3	-	-	-28.9	-19.7	-7.5	-41.1	-36.6	-11.9	-4.9	-43.6
B	35.1	30.6	39.7	-	-	20.6	49.6	79.2	-9.0	80.0	-9.7
C	53.4	70.2	36.6	38.9	67.9	-	-	150.8	-44.1	34.7	72.1
D	71.0	58.7	83.3	115.1	26.9	168.5	-26.5	-	-	86.7	55.3
E	30.2	49.6	10.8	75.0	-14.7	11.5	48.9	45.9	14.5	-	-

C.D. for mean responses=77 Kg/ha.

64(238)

(i) 576.7 Kg/ha. (ii) 101.5 Kg/ha. (iii) None of the effects is significant. (iv) Table of mean and differential responses in Kg/ha.

	Mean response	Differential responses									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	-35.9	0.0	0.0	44.8	26.1	48.6	23.2	16.4	55.3	22.4	49.3
B	-23.2	-14.2	-32.1	0.0	0.0	-54.6	8.2	-17.9	-28.4	-14.9	-31.4
C	-20.9	-8.2	-33.6	-52.3	10.5	0.0	0.0	-44.8	2.9	16.4	-25.4
D	-5.2	-24.7	14.2	0.0	-10.5	-29.2	18.7	0.0	0.0	32.9	-43.4
E	5.2	-8.2	18.7	13.5	-2.9	9.7	0.7	43.4	-32.9	0.0	0.0

**Crop :- Groundnut (Kharif).****Ref :- Mh. 60(103).****Site :- Agri. Res. Stn., Dhulia.****Type :- 'D'.**

Object :—To study the effect of fertilizers and insecticides on the yield of Groundnut.

**1. BASAL CONDITIONS :**

(i) (a) N.A. (b) Gram. (c) 12 C.L./ha. of F.Y.M. (ii) Medium black. (iii) 27.6.60. (iv) (a) N.A. (b) Drilling. (c) 89.7 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) D—103—10. (vii) Unirrigated (viii) 2 weedings and 2 hoeings. (ix) 52.2 cm. (x) 16.10.60.

**2. TREATMENTS:**

6 treatments :  $T_0$  = Control,  $T_1$  = 11.2 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$ ,  $T_2$  = Seed treated with Agrosan,  $T_3$  = 10% B.H.C.,  $T_4$  = Sulphur dusting and  $T_5$  = ( $T_1 + T_2 + T_3 + T_4$ ).

**3. DESIGN :**

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 12.19 m. × 8.84 m. (b) 10.97 m. × 7.01 m. (v) 61 cm. × 61 cm. (vi) Yes.

**4. GENERAL :**

(i) N.A. (ii) Slight attack of Aphids and *Tikka*; control measures N.A. (iii) Yield of pods. (iv) (a) 1960 only. (b) No. (c) Nil. (v) Akola. (vi) and (vii) Nil.

**5. RESULTS :**

(i) 2216 Kg/ha. (ii) 210.5 Kg/ha. (iii) Treatment differences are significant. (vi) Av. yield of pods in Kg/ha.

Treatment	$T_0$	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$
Av. yield	1909	2255	2078	2160	2447	2447

C.D. = 317.2 Kg/ha.

**Crop :- Groundnut (Kharif).****Ref :- Mh. 60(196), 61(153).****Site :- Agri. Res. Stn., Jalgaon.****Type :- 'D'.**

Object :—To study the effect of insecticides in controlling Aphids on the yield of Groundnut.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) Deep black cotton soil. (iii) 27.6.60, 26.6.61. (iv) (a) 4 to 6 harrowings. (b) Drilling. (c) 67 Kg/ha. (d) 38 cm. (e) One. (v) 12.35 C.L./ha. of F.Y.M. + 125.5 Kg/ha. of  $P_2O_5$ ; 12.35 C.L./ha. of F.Y.M. (vi) Faizpur 1—5. (vii) Unirrigated. (viii) 3 interculturings; 3 hoeings and 2 weedings. (ix) 48 cm.; 83 cm. (x) 19.10.60; 23.10.61.

**2. TREATMENTS :**

5 insecticidal treatments :  $T_0$  = Control,  $T_1$  = Endrin 0.5% dusted at 16.8 Kg/ha.,  $T_2$  = Endrin 10% dusted at 16.8 Kg/ha.,  $T_3$  = B.H.C. 10% dusted at 16.8 Kg/ha. and  $T_4$  = B.H.C. 10% + Sulphur (mixed in 1 : 1 ratio) at 16.8 Kg/ha.

Dusting will be done once as soon as the Aphids are appeared.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 10.97 m. × 10.97 m.; 21.94 m. × 7.32 m. (b) 10.06 m. × 10.06 m.; 20.73 m. × 4.88 m. (v) 46 cm. × 46 cm.; 61 cm. × 122 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory; Normal. (ii) Aphids and *Tikkas* both years, control measures applied as per treatments (iii) Yield of pods. (iv) (a) 1960-61. (b) No. (c) The results of the combined analysis are give under 5. Results. (v) to (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

## 5. RESULTS :

## Pooled results

(i) 1208 Kg/ha. (ii) 281.0 Kg/ha. (base on 4 d.f. made up of Treatments×year interaction). (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Av. yield	1145	1181	1153	1374	1186.

## Individual results

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	Sig.	G.M.	S.E/plot
Year								
1960	1456	1547	1466	1900	1507	**	1575	183.0
1961	834	815	840	847	865	N.S.	840	49.5
Pooled	1145	1181	1153	1374	1186	N.S.	1208	281.0

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 61(155).**

**Site :- Agri. Res. Stn., Jalgaon.**

**Type :- 'D'.**

**Object :-**To study the effect of artificial inoculation with Rhizobium sp. on the growth and yield of Groundnut.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Deep black cotton soil. (b) N.A. (iii) 4.7.61. (iv) (a) 6 harrowings. (b) Dibbling. (c) 67 Kg/ha. (d) 30 cm.×15 cm. (e) 1. (v) Nil. (vi) Faizpur 1-5. (vii) Unirrigated. (viii) 4 hoeings and 2 weedings. (ix) 83 cm. (x) 30.10.61.

## 2. TREATMENTS :

3 inoculation treatments : T<sub>0</sub>=No. inoculation. T<sub>1</sub>=Seed inoculated with culture No. VII-5 and T<sub>2</sub>=Seed inoculated with culture No GIa.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 10. (iv) 10.36 m.×4.88 m. (b) 9.75 m.×4.27 m. (v) 30 cm.×30 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) B.H.C. 10% for Aphids. (iii) Yield of pods. (iv) (a) 1961-62 (modified in 62). (b) and (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 854 Kg/ha. (ii) 58.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>
Av.	869	838	855

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 62(148).**

**Site :- Agri. Res. Stn., Jalgaon.**

**Type :- 'D'.**

**Object :-**To study the effect of artificial inoculation with Rhizobium sp. on the growth and yield of Groundnut.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Deep black cotton soil. (b) N.A. (iii) 18.7.62. (iv) (a) 3 harrowings. (b) Dibbling. (c) 67 Kg/ha. (d) 30 cm. × 15 cm. (e) 1. (v) 12.35 C.L./ha. of F.Y.M. (vi) Faizpur—1-5. (vii) Unirrigated. (viii) 2 hoeings. (ix) 54 cm. (x) 12.11.62.

## 2. TREATMENTS :

4 seed treatments :  $T_0$  = Control (no inoculation),  $T_1$  = Seed inoculated with R G R,  $T_2$  = Seed inoculated with T II and  $T_3$  = Seed inoculated with VII 21,

## 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 10.36 m. × 4.83 m. (b) 9.75 m. × 4.27 m. (v) 30 cm. × 30 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) B.H.C. 10% and Sulphur in 1 : 1 proportion for Aphids. (iii) Yield of pods. (iv) (a) 1961-62 (modified in 62). (b) and (c) No. (v) Not known. (vi) and (vii) No.

## 5. RESULTS :

(i) 1782 Kg/ha. (ii) 2001 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	$T_0$	$T_1$	$T_2$	$T_3$
Av. yield	1833	1687	1780	1826

**Crop :- Groundnut (Kharif).**

**Ref :- Mh. 61(156), 62(149), 63(195).**

**Site :- Agri. Res. Stn, Jalgaon.**

**Type :- 'D'.**

Object :—To study the effect of factors of improved cultural practices individually and in combinations on the yield of Groundnut.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton ; Jowar ; Cotton. (c) N.A. ; Nil ; 22.4 Kg/ha. of N. (ii) Deep black soil. (iii) 5 to 7.7.61 ; 15.7.62 ; 19.7.63. (iv) (a) 2-6 harrowings. (b) Dibbling. (c) 67.2 Kg/ha. (d) 30 cm. × 15 cm. (e) One. (v) Nil. (vi) Faizpur 1-5. (vii) Unirrigated. (viii) 2-3 harrowings in 61 and 62 ; 3 interculturings (ix) 71 cm. ; 54 cm. ; 51 cm. (x) 30.10.61 ; 12.11.61 ; 18.10.63.

## 2. TREATMENTS :

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

(1) 2 levels of seed treatment :  $A_0$  = Untreated and  $A_1$  = Treated.

(2) 2 levels of pest control :  $B_0$  = Not control and  $B_1$  = Application of B.H.C. at 10% for Aphids.

(3) 2 levels of disease control :  $C_0$  = No control,  $C_1$  = application of Sulphur dusting for Tikka.

(4) 2 levels of 'N' as A/S :  $D_0$  = 0 and  $D_1$  = 11.2 Kg/ha. of N.

(5) 2 levels of 'P' as Super :  $E_0$  = 0 and  $E_1$  = 22.4 Kg/ha of  $P_2O_5$ .

## 3. DESIGN :

(i) 2<sup>5</sup> fact. confd. (ABD, BCE, ACDE effects cond.). (ii) (a) 8. (b) 51.12 m. × 43.84 m. (iii) 4. (iv) (a) 10.96 m. × 6.39 m. (b) 9.14 m. × 4.57 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Attack of Aphids, control measures per treatments. (iii) Yield of pods. (iv) (a) 1961-63. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Since error variances are heterogeneous and all Treatments × years interactions are not present, the results of individual years are presented under 5. Results.

## 5. RESULTS :

61(156)

(i) 924.7 Kg/ha. (ii) 87.2 Kg/ha. (iii) Main effects of A and D are highly significant. Main effect of C is significant. (iv) Table of mean and differential responses in Kg/ha.

	Mean response	Differential responses									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	46.7	-	-	49.4	44.0	55.0	38.4	44.8	48.6	34.6	58.8
B	1.0	3.7	-1.7	-	-	9.3	-7.3	18.8	-16.8	-20.6	22.6
C	37.0	45.3	28.7	49.4	24.6	-	-	54.8	19.2	15.4	58.6
D	74.5	72.6	76.4	92.3	56.7	74.6	74.4	-	-	82.5	66.5
E	23.5	11.4	35.6	1.9	45.1	17.9	29.1	31.5	15.5	-	-

C.D. for mean response of A or C or D = 20.7 Kg/ha.

62(149)

(i) 1882 Kg/ha. (ii) 111.4 Kg/ha. (iii) Main effects of C, D and E are highly significant. Interaction B×C is significant. Interaction D×E is highly significant. (iv) Table of mean and differential responses in Kg/ha.

	Mean response	Differential responses									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	20.7	-	-	36.1	5.3	22.1	19.3	45.8	-4.4	44.4	-3.0
B	32.8	48.2	17.4	-	-	-7.4	73.3	18.3	47.3	33.7	31.9
C	54.8	56.2	53.4	14.6	95.0	-	-	35.5	74.1	40.3	69.3
D	145.6	170.7	120.5	131.1	160.1	136.3	164.9	-	-	214.5	76.7
E	53.0	76.7	29.3	53.9	52.1	38.5	67.5	121.9	-15.9	-	-

C.D. for mean response of C or D or E = 26.5 Kg/ha.

C.D. for differential response of B×C or D×E = 37.4 Kg/ha.

63(195)

(i) 893.9 Kg/ha. (ii) 152.1 Kg/ha. (iii) Main effects of B and D are highly significant. Main effect of E is significant. (iv) Table of mean and differential responses in Kg/ha.

	Mean response	Differential responses									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	51.9	-	-	60.9	42.9	36.9	66.9	52.1	51.7	65.5	38.3
B	109.3	118.3	100.3	-	-	138.1	80.5	141.8	76.8	104.2	114.4
C	45.6	30.6	60.6	74.4	16.8	-	-	38.4	52.8	25.5	65.7
D	78.5	78.7	78.3	111.0	46.0	71.3	85.7	-	-	102.9	54.1
E	54.3	67.9	40.7	49.2	59.4	34.2	74.4	78.7	29.9	-	-

C.D. for mean response of B or D or E = 36.1 Kg/ha.

**Crop :- Groundnut (Kharif).**  
**Site :- Agri. Res. Stn., Kopargaon.**

**Ref :- Mb. 60(34).**  
**Type :- 'D'.**

Object :—To study the effect of fertilizers and insecticides on the yield of Groundnut.

1. **BASAL CONDITIONS :**

(i) (a) N.A. (b) Fallow. (c) N.A. (ii) 'A' type soil. (iii) 15.7.60. (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling. (c) 89.7 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) Kopagaon-3. (vii) Un-irrigated. (viii) N.A. (ix) 29.4 cm. (x) 8.12.60.

2. **TREATMENTS :**

6 treatments :  $T_0$ =Control,  $T_1$ =11.2 Kg/ha. of N as A/S+22.4 Kg/ha. of  $P_2O_5$  as Super,  $T_2$ =Mercurial compound at 112 gm. in 45.3 Kg. of Kernels,  $T_3$ =10% B.H.C.,  $T_4$ =Sulphur dusting and  $T_5$ = $T_1$  to  $T_4$ .

N and P applied before sowing

3. **DESIGN :**

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10.06 m. × 10.06 m. (v) N.A. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of pods. (iv) (a) 1960-only. (b) and (c) No. (v) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

(i) 1089 Kg/ha. (ii) 289.4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	$T_0$	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$
Av. yield	1121	1412	919	1188	807	1087

**Crop :- Groundnut (Kharif).**  
**Site :- Oilseeds Res. Stn., Latur.**

**Ref :- Mh. 61(123), 62(116), 64(140),**  
**Type :- 'D'.**

Object :—To study the effect of individual factors of improved cultivation practices on the yield of Groundnut.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat ; *Sannhemp* ; *Jowar* and *Wheat*. (c) Nil. (ii) N.A. (iii) 2.7.61 ; 20.6.62 ; 26.7.64. (iv) (a) One ploughing and 2-3 harrowings. (b) Drilling and (c) N.A. (d) 46 cm. × 15 cm. (e) One. (v) 12 C.L./ha. of F.Y.M. for 64 ; Nil for others. (vi) K. 4-11. (vii) Unirrigated. (viii) Hoeing and weeding ; Interculturing thrice ; Interculturing once (ix) 65.8 cm. ; N.A. for others. (x) 4.12.61 ; 22.12.62 ; 3.2.65.

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

Same as in Expt. No. 61(156), 62(149) 63(195) on Groundnut at Jalgaon and presented on page No. 503.

4. **GENERAL :**

(i) Normal for 62 ; Germination not uniform for others. (ii) Aphids and *tikka*. (iii) Yield of pods. (iv) (a) 1961-68 (not conducted in 63 and failed in 65). (b) No. (c) Nil. (v) Nil. (vi) Heavy rain in July ; rain distribution uneven ; Nil. (vii) Since the Expt. is continued beyond 65, the results of individual years are presented under 5. Results.

5. **RESULTS :**

**61(123)**

(i) 756.9 Kg/ha. (ii) 191.5 Kg/ha. (iii) Interaction A × C is significant. (iv) Table of mean and differential responses in Kg/ha.

	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	-14.1	--	--	23.6	-51.8	59.1	-87.3	23.8	-52.0	-7.7	-20.5
B	-63.7	-26.0	-101.4	--	--	-30.0	-97.4	-18.4	-109.0	-77.5	-49.9
C	24.7	97.9	-48.5	58.4	-9.0	--	--	25.7	23.7	42.4	7.0
D	14.1	52.0	-23.8	59.4	-31.2	15.1	13.1	--	--	4.2	24.0
E	2.8	3.6	-9.2	-16.6	11.0	14.9	-20.5	-12.7	7.1	--	--

C.D. for differential response of (A × C) = 64.3 Kg/ha.

62(116)

(i) 1544 Kg/ha. (ii) 76.5 Kg/ha. (iii) Main effects of D and E are highly significant. Interaction B × C and D × E are highly significant. Interactions C × E and BCDE are significant. (iv) Table of mean and differential responses in Kg/ha.

	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	18.3	--	--	28.7	-7.9	30.8	5.8	17.6	19.0	24.0	12.6
B	-7.7	2.7	-18.1	--	--	-44.1	28.7	13.1	-28.5	-25.3	9.9
C	-13.0	-0.5	-25.5	-49.4	23.4	--	--	-27.5	1.5	22.8	-48.8
D	42.9	42.9	43.6	63.7	22.1	28.4	57.4	--	--	-4.4	90.2
E	80.3	86.0	74.6	62.7	97.9	116.1	44.5	33.0	127.6	--	--

C.D. for mean response of D or E = 18.2 Kg/ha.  
C.D. for differential responses of B × C or C × E or D × E = 25.7 Kg/ha.

64(140)

(i) 394 Kg/ha. (ii) 121.6 Kg/ha. (iii) Main effect of B and interaction A B C D are significant. (iv) Table of mean and differential responses in Kg/ha.

	Mean response	Differential response									
		A		B		C		D		E	
		-	+	-	+	-	+	-	+	-	+
A	33.3	--	+	40.7	25.9	51.1	15.5	63.2	3.4	4.6	62.0
B	54.5	61.9	47.1	--	--	50.8	58.2	14.0	95.0	23.7	85.3
C	-10.8	7.0	-28.6	-14.5	-7.1	--	--	-24.6	3.0	-5.3	-16.3
D	28.8	58.7	-1.1	-11.7	69.3	15.0	42.6	--	--	54.9	2.7
E	31.3	2.6	60.0	0.5	62.1	36.8	25.8	57.4	5.2	--	--

C.D. for mean response for B = 40.9 Kg/ha.

Crop :- Groundnut (*Kharif*).

Ref :- Mh. 62(19), 63(16), 64(16), 65(156).

Site :- Agri. College Farm, Parbhani. Type :- 'D'.

Object :- To study the effect of factors of improved cultivation practices on the yield of Groundnut.



## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton and Groundnut ; *Rabi Jowar* for fodder ; *Kharif Jowar* ; *Jowar*. (c) N.A. in 1962—64 ; 12.5 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of N. (ii) Light medium black. (iii) N.A. ; 5 to 7.7.63 ; 17 and 23.7.64 ; 1.7.65. (iv) (a) N.A. ; 5 harrowings ; one ploughing and 4 harrowings for 64 and 65. (b) Drilling. (c) 78.5 Kg/ha. ; 56.0 Kg/ha. ; 67.2 Kg/ha. ; 89.2 Kg/ha. (d) 30 cm. ; 46 cm. ; 30 cm. ; 30 cm. between rows. (e) N.A. (v) Nil. (vi) Kōpergaon No.—1 for 62 ; Karad 4—11 for others. (vii) Unirrigated. (viii) N.A. ; Weeding and hoeing ; Weeding ; 2 weedings and 2 hoeings. (ix) N.A. ; 108 cm. ; 70 cm. ; 79 cm. (x) N.A. for 62 and 63 ; 5, 9.12.64 ; 1 to 12.12.65.

## 2. TREATMENTS and 3. DETAILED :

Same as in expt. No. 61(156), 62(149) 63(195) on Groundnut at Jalgaon and presented on page no. 503.

## 4. GENERAL :

(i) Normal for 62 and 64 ; Satisfactory for 63 ; Good for 65. (ii) Nil ; B.H.C. and Sulphur dusted thrice. Endrin sprayed. (iii) Yield of pods. (iv) (a) 1962—65. (b) No. (c) The results of the combined analysis have been given under 5. Results. (v) Jalgaon. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction are present.

## 5. RESULTS :

Pooled results

(i) 960.5 Kg/ha. (ii) 331.2 Kg/ha. (based on 15 d.f. made up of interaction of main-effects × years). (iii) None of the effects is significant. (iv) Table of mean and differential responses in Kg/ha.

	Mean response	Differential responses									
		A		B		C		D		E	
		—	+	—	+	—	+	—	+	—	+
A	—1.1	0.0	0.0	14.2	—16.5	1.9	—4.2	14.6	—16.9	—15.0	10.2
B	—23.1	—7.7	—38.5	0.0	0.0	—30.6	—15.6	—13.1	—33.1	—37.4	—8.8
C	—3.3	—0.2	—6.4	—10.8	4.2	0.0	0.0	6.2	—12.9	—14.1	7.5
D	30.1	45.9	14.3	40.1	20.2	39.7	20.6	0.0	0.0	16.0	44.2
E	6.2	—7.7	20.1	—8.1	20.5	—31.7	44.1	—7.9	20.2	0.0	0.0

Individual results

Treatment	Mean responses									
	A	Sig.	B	Sig.	C	Sig.	D	Sig.	E	Sig.
Year										
1962	3.8	N.S.	—0.9	N.S.	—9.7	N.S.	33.1	*	—7.7	N.S.
1963	—22.8	N.S.	—73.1	**	26.0	N.S.	15.9	N.S.	21.5	N.S.
1964	32.5	N.S.	20.9	N.S.	—62.8	N.S.	59.1	N.S.	—12.0	N.S.
1965	46.9	N.S.	—39.4	N.S.	33.2	N.S.	12.6	N.S.	22.9	N.S.
Pooled	—1.1	N.S.	—23.1	N.S.	—3.3	N.S.	30.1	N.S.	6.2	N.S.

G, M	S.E./plot
340	86.1
1096	180.6
1177	193.7
1229	195.4
960.5	331.2

**Crop :- Sesamum (Kharif).**

**Ref :- Mh. 64(164), 65(67).**

**Site :- Agri. Res. Stn., Jalgaon.**

**Type :- 'M'.**

**Object :-**To study the effect of N, P and K on the yield of Sesamum in the presence and absence of F.Y.M.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton ; *Jowar*. (c) 12.35 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of N as A/S. (ii) Black cotton soil. (iii) 29, 30.6.64 ; 15, 16.7.65. (iv) (a) 4 harrowings ; 3 harrowings. (b) Hand sowing in furrows. (c) 5 Kg/ha. (d) 46 cm. x 23 cm. (e) 1 to 2. (v) Nil. (vi) D-7-11-1. (vii) Un-irrigated. (viii) 2 weedings, 2 interculturing ; 2 weedings, 3 hoeings. (ix) 64 cm ; 49 cm. (x) 16, 17.10.64 ; 12 and 15.10.65.

**2. TREATMENTS :**

**Main-plot treatments :**

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

(1) 3 levels of N as A/S :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(2) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=22.4$  and  $P_2=44.8$  Kg/ha.

(3) 3 levels of  $K_2O$  as Pot. Sul. :  $K_0=0$ ,  $K_1=44.8$  and  $K_2=89.6$  Kg/ha.

**Sub-plot treatments :**

2 levels of F.Y.M. :  $F_0=0$  and  $F_1=5600$  Kg/ha. of F.Y.M.

In 64, N applied in one dose before sowing and P, K at the time of sowing and F.Y.M. on 22.6.64.

In 65, N applied in two equal doses at 30 day and 60 days after sowing. P and K at sowing by drilling and F.Y.M. spread uniformly on 19.6.65.

**3. DESIGN :**

(i) Split-plot confd (ii) (a) 3 blocks/replication, 9 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 11.89 m. x 6.40 m. (b) 10.05 m. x 4.57 m. (v) 91 cm. x 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Good ; Germination satisfactory (ii) Slight attack of fly ; mild attack of very few plants were affected. (iii) Yield of seeds. (iv) (a) 1964-67. (b) No. (c) Nil. (v) Not known. (vi) Continuous rain for second week of Aug. for about 3 weeks. (vii) As the experiment is conducted beyond 65, results for individual years are given under 5. Results.

**5. RESULTS :**

64(164)

(i) 80 Kg/ha. (ii) (a) 32.40 Kg/ha. (b) 20.22 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of seeds in Kg/ha.

	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	$F_0$	$F_1$	Mean
$N_0$	65	54	60	60	60	60	58	62	60
$N_1$	82	95	83	87	94	79	86	87	87
$N_2$	88	109	83	101	88	90	89	98	93
Mean	78	86	75	83	81	76	78	82	80
$F_0$	84	76	74	76	83	75			
$F_1$	73	96	77	90	79	78			
$K_0$	93	71	85						
$K_1$	76	91	75						
$K_2$	67	96	65						

C.D. for N marginal means = 37.63 Kg/ha.

65(67)

- (i) 220 Kg/ha. (ii) (a) 44.7 Kg/ha. (b) 31.3 Kg/ha. (iii) Main effects of N and F are highly significant only, (iv) Av. yield of seeds in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>0</sub>	145	138	140	143	143	137	127	155	141
N <sub>1</sub>	212	269	218	230	236	234	209	257	233
N <sub>2</sub>	291	292	269	260	320	272	262	306	284
Mean	216	233	209	211	233	214	200	239	220
F <sub>0</sub>	189	213	197	200	215	184			
F <sub>1</sub>	243	253	221	223	251	244			
K <sub>0</sub>	211	225	198						
K <sub>1</sub>	249	222	227						
K <sub>2</sub>	188	253	201						

C.D. for N marginal means = 36.38 Kg/ha.

C.D. for F marginal means = 19.67 Kg/ha.

**Crop :- Safflower (Rabi).**

**Ref :- Mh. 64(8), 65(56).**

**Site :- Agri. Res. Stn., Badnapur.**

**Type :- 'M'.**

Object:—To find out the N, P and K requirements with and without F.Y.M. under dry conditions.

#### 1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Wheat. (c) 12.35 C.L/ha. of F.Y.M. (iii) Black cotton soil. (iii) 10.10.64 ; 2, 3.10.65.  
 (iv) (a) N.A. (b) Drilling. (c) 22 Kg/ha. (d) 46 cm. ; 46 cm. × 23 cm. after thinning. (e) N.A. (v) As per treatments. (vi) N. 62—8. (vii) N.A. ; unirrigated. (viii) Weeding and hoeing ; 2 weedings and 3 hoeings. (ix) 1 cm. ; 1.5 cm. (x) 11, 12.3.65 ; 21, 22.2.66.

#### 2. TREATMENTS :

##### Main-plot treatments:

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

- (1) 3 levels of N as A/S : N<sub>0</sub>=0, N<sub>1</sub>=22.4 and N<sub>2</sub>=44.8 Kg/ha.  
 (2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0, P<sub>1</sub>=22.4 and P<sub>2</sub>=44.8 Kg/ha.  
 (3) 3 levels of K<sub>2</sub>O as Pot. Sul. : K<sub>0</sub>=0, K<sub>1</sub>=22.4 and K<sub>2</sub>=44.8 Kg/ha.

##### Sub-plot treatments :

2 levels of F.Y.M. : F<sub>0</sub>=0 and F<sub>1</sub>=5604 Kg/ha.

N, P and K applied in one dose at the time of sowing by drilling.

F.Y.M. applied 2 days before sowing by spreading.

#### 3. DESIGN :

- (i) Split-plot. (i) (a) 27 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 10.97 m. × 5.49 m. (b) 9.14 m. × 3.66 m. (v) 91 cm. × 91 cm. (vi) Yes.

#### 4. GENERAL :

- (i) Not satisfactory ; Satisfactory. (ii) Nil. (iii) Yield of seeds. (iv) (a) 1964—66. (b) No. (c) Nil. (v) N.A. (vi) Moisture was inadequate in the soil for the good growth in 64 and nil in 65. (vii) As experiment is continued beyond 65, results for individual years are given under 5. Results.

## 5. RESULTS :

64(8)

(i) 392 Kg/ha. (ii) (a) 21.8 Kg/ha. (b) 63.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of seeds in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>0</sub>	397	359	366	384	368	370	376	372	374
N <sub>1</sub>	359	385	406	392	384	374	382	385	383
N <sub>2</sub>	409	428	415	406	474	372	404	431	417
Mean	389	390	396	394	409	372	387	396	392
F <sub>0</sub>	371	391	399	398	412	351			
F <sub>1</sub>	406	390	392	390	405	394			
K <sub>0</sub>	344	440	399						
K <sub>1</sub>	408	388	429						
K <sub>2</sub>	414	343	360						

65(56)

(i) 703 Kg/ha. (ii) (a) 128.04 Kg/ha. (b) 93.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of seeds in Kg/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	Mean
F <sub>0</sub>	671	715	678	719	658	687	646	717	700	688
F <sub>1</sub>	704	743	706	699	747	707	725	696	732	718
Mean	687	729	692	709	702	697	685	706	716	703
K <sub>0</sub>	657	659	739	730	660	615				
K <sub>1</sub>	667	759	692	678	705	735				
K <sub>2</sub>	738	769	645	719	721	711				
P <sub>0</sub>	686	695	746							
P <sub>1</sub>	698	723	685							
P <sub>2</sub>	653	769	615							

**Crop :- Safflower (Rabi).**

**Ref :- Mh. 60(98).**

**Site :- Agri. Res. Stn., Niphad.**

**Type :- 'M'.**

Object :- To ascertain the N, P and K requirement of Safflower.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Medium black to deep black. (iii) 26.10.60. (iv) (a) N.A. (b) Drilling. (c) 4 Kg/ha. (d) 91 cm. x 23 to 25 cm. (v) Nil. (vi) N-630. (vii) Unirrigated. (viii) 2 hoeings. (ix) 13 cm. (x) 8.3.61.

## 2. TREATMENTS :

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

- (1) 2 levels of N as A/S :  $N_0=0$  and  $N_1=22.4$  Kg/ha.  
 (2) 2 levels of  $P_2O_5$  as Super :  $P_0=0$  and  $P_1=22.4$  Kg/ha.  
 (3) 2 levels of  $K_2O$  :  $K_0=0$ , and  $K_1=44.8$  Kg/ha.

## 3. DESIGN :

- (i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 3.05 m.  $\times$  9.75 m. (b) 1.52 m.  $\times$  8.38 m.  
 (v) 76 cm.  $\times$  68 cm. (vi) Yes.

## 4. GENERAL :

- (i) Crop suffered due to lack of moisture. (ii) Attack of leaf eating pest and Aphids. (iii) Yield of seeds.  
 (iv) (a) 1953 to 60 (vitiating in 1953 and 55 and not conducted during 57 and 58). (b) No. (c) Nil.  
 (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

- (i) 429 Kg/ha. (ii) 148.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of seeds in Kg/ha.

	$P_0$	$P_1$	$K_0$	$K_1$	Mean
$N_0$	446	384	399	431	415
$N_1$	429	458	444	443	444
Mean	438	421	421	437	429
$K_0$	446	396			
$K_1$	429	446			

**Crop :- Linseed (Rabi).**

**Ref :- Mh. 60(185), 61(134).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'M'.**

Object :—To study the effect of N and Sulphur on the yield of Linseed.

## 1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. ; Linseed. (c) Nil. (ii) Black cotton soil. (iii) 6.10.60 ; 17.10.61. (iv) (a) 2 harrowings. (b) Drilling. (c) N.A. (d) 30 cm. (e) —. (v) Nil. (vi) X 4—29. (vii) Unirrigated. (viii) 1 weeding. (ix) 7 cm. ; 4 cm. (x) 9.2.61 ; 7.3.62.

## 2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 levels of N as Urea :  $N_0=0$  and  $N_1=11.2$  Kg/ha.  
 (2) 3 levels of Sulphur :  $S_0=0$ ,  $S_1=112$  and  $S_2=224$  Kg/ha.

## 3. DESIGN :

- (i) Fact. in R.B.D. (ii) (a) 6 (b) N.A. (iii) 4. (iv) (a) 5.43 m  $\times$  6.10 m. (b) 4.88 m  $\times$  5.49 m. (v) 30 cm.  $\times$  30 cm. (vi) Yes.

## 4. GENERAL :

- (i) Normal (ii) Nil. (iii) Yield of seeds. (iv) (a) 1959—61. (b) No. (c) Nil. (v) and (vi) Nil.  
 (vii) Error variances for the years 59 to 61 are heterogeneous and Treatments  $\times$  years interaction is absent. Hence results for individual years are presented under 5. Results.

## 5. RESULTS :

60(185)

- (i) 247 Kg/ha. (ii) 42.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of seeds in Kg/ha.

	S <sub>0</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
N <sub>0</sub>	291	227	202	240
N <sub>1</sub>	252	235	275	254
Mean	272	231	238	247

61(134)

(i) 376 Kg/ha. (ii) 82.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of seeds in Kg/ha.

	S <sub>0</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
N <sub>0</sub>	346	336	355	346
N <sub>1</sub>	392	397	425	405
Mean	369	366	390	376

**Crop :- Linseed (Rabi).****Site :- Agri. College Farm, Nagpur.****Ref :- Mh. 62(112).****Type :- 'M'.**

Object.—To study the effect of Linseed crop growing continuously and in rotation on the fertility of the soil.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Gram. (c) Nil. (ii) Black cotton soil. (iii) 21.10.62. (iv) (a) Harrowing. (b) Drilling. (c) 16.8 Kg/ha. (d) 30 cm. (e) 3. (v) Nil. (vi) X. 4/29. (vii) Unirrigated. (viii) 2 weedings. (ix) 17.2 cm. (x) 25.2.63.

**2. TREATMENTS :**2 treatments applied to linseed : T<sub>1</sub>=No manuring and T<sub>2</sub>=22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> (2 plots for each treatment).**3. DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 10.35 m. × 6.10 m. (b) 9.14 m. × 4.83 m. (v) 61 cm. × 61 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Dusting of 5% D.D.T. and 10% B.H.C. (iii) Yield of seeds. (iv) (a) to (c) No. (v) to (vii) Nil.

**5. RESULTS :**

(i) 710.0 Kg/ha. (ii) 79.3 Kg/ha. (iii) Treatment differences is not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>
Av. yield	691	729

**Crop :- Linseed (Rabi).****Ref :- Mh. 62(111), 63(164), 64(136), 65(71)****Site :- Agri. College Farm, Nagpur. Type :- 'C'.**

Object :- To study the suitable sowing date for Linseed.

**A L CONDITIONS :**

(i) (a) Nil. (b) Wheat ; Linseed ; Wheat ; N.A. (c) Nil. (ii) Black cotton soil. (iii) As per treatments. (iv) (a) 2 *bakharings* in 62 ; 2, 4 harrowings in 63 and 64 ; 1 ploughing and 1 harrowing in 65. (b) Drilling. (c) 17 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) C-429. (vii) Unirrigated. (viii) 2 weedings in 62 and 63 ; Nil in 64 and 65. (ix) 17 cm. ; 83 cm. ; 62 cm. ; 25 cm. (x) 8, 15.2.63 and 4 to 14.3.63 ; 6, 12, 24.2.64 and 9.3.64 ; 15.2.65, 9.3.65 ; 20, 28.1.66 and 3.2.66.

**2. TREATMENTS :**

6 sowing dates :  $D_1=19\text{th Sept.}$ ,  $D_2=28\text{th Sept.}$ ,  $D_3=7\text{th Oct.}$ ,  $D_4=16\text{th Oct.}$ ,  $D_5=25\text{th Oct.}$  and  $D_6=3\text{rd of Nov., 63.}$

In the year 62,  $D_1$  was not tried.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) 10.97 m.  $\times$  6.40 m. (b) 9.14 m.  $\times$  4.57 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Gammexene for cut worm sprayed in 62 ; White ant attack in 63 ; Nil in 64 and 65. (iii) Yield of seeds. (iv) (a) 1962-66. (b) No. (c) Nil. (v) N.A. (vi) The crop sown under  $D_1$  treatment in 62 and 64 could not germinate due to heavy showers after sowing and no seed transformation under treatment  $D_6$  in 65. (vii) Experiment continued beyond 65, hence results of individual years are given below.

**5. RESULTS :****62(111)**

(i) 810 Kg/ha. (ii) 108.6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	$D_2$	$D_3$	$D_4$	$D_5$	$D_6$
Av. yield	864	1021	930	643	591

C.D. = 145.7 Kg/ha.

**63(164)**

(i) 249 Kg/ha. (ii) 94.0 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	$D_1$	$D_2$	$D_3$	$D_4$	$D_5$	$D_6$
Av. yield	203	325	373	242	230	120

C.D. = 125.9 Kg/ha.

**64(136)**

(i) 255 Kg/ha. (ii) 85.6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	$D_2$	$D_3$	$D_4$	$D_5$	$D_6$
Av. yield	321	270	263	270	151

**65(71)**

(i) 103 Kg/ha. (ii) 48.1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	$D_1$	$D_2$	$D_3$	$D_4$	$D_5$
Av. yield	63	100	134	180	39

65(55)

(i) 58 Kg/ha. (ii) (a) 14.5 Kg/ha. (b) 15.8 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of seeds in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>0</sub>	59	71	61	69	59	63	61	67	64
N <sub>1</sub>	59	42	48	52	49	49	47	52	50
N <sub>2</sub>	60	62	58	65	51	64	59	61	60
Mean	59	58	56	62	53	59	56	60	58
F <sub>0</sub>	56	57	54	60	53	54			
F <sub>1</sub>	62	61	57	64	53	63			
K <sub>0</sub>	61	68	57						
K <sub>1</sub>	56	49	55						
K <sub>2</sub>	61	59	55						

C.D. for N marginal means=11.8 Kg/ha.

**Crop :- Niger (Kharif).**

**Ref :- Mh. 65(159).**

**Site :- Agri. Res. Stn., Igatpuri.**

**Type :- 'C'.**

**Object :-** To find out the optimum time of sowing of Niger.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Nagli (*Kharif*) and Fallow (*Rabi*). (c) 22.4 Kg/ha. of N and 11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Loam (medium black to deep gray). (iii) As per treatments. (iv) (a) 2 ploughings. (b) Dibbling. (c) N.A. (d) 30 cm. × 15 cm. (e) 3. (v) Nil. (vi) N -12-3. (vii) Unirrigated. (viii) 3 weedings. (ix) 238 cm. (x) 27, 31, 10.65 and 14.11.65.

**2. TREATMENTS :**

4 sowing dates : D<sub>1</sub>=23rd, D<sub>2</sub>=24th, D<sub>3</sub>=25th and D<sub>4</sub>=26th meteorological week.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 11.88 m. × 6.70 m. (b) 10.06 m. × 4.83 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Not good. (ii) Nil. (iii) Height, No. of branches and yield of seeds. (iv) (a) 1965-66. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Due to less rain at the time of flowering and after, the yield was very low.

**5. RESULTS :**

(i) 10.6 Kg/ha. (ii) 8.4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>
Av. yield	6.9	12.4	15.7	7.3



**Crop :- Chillies.****Ref :- Mh. 64(245), 65(193).****Site :- Trial-Cum-Demons. Farm, Golegaon.****Type :- 'I'.**

Object :—To study the irrigation interval and suitable layout of irrigation for Chillies.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton; Chillies. (c) 22.4 Kg/ha. of  $P_2O_5$ ; Nil. (ii) Medium black. (iii) 26.9.64 17.7.65.  
 (iv) (a) As per treatments. (b) Transplanting. (c) N.A. (d) 75 cm. x 75 cm. (e) 2. (v) Nil; 12.35 C.L./ha.  
 of F.Y.M.+44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (vi) Local. (vii) As per treatments. (viii) Weeding  
 and hoeing. (ix) 19.76 cm.; 85.24 cm. (x) 6 to 9.1.65, 10 to 12.2.65, 10 and 11.3.65; 6.11.65, 17.11.65,  
 2.12.65 and 27.1.66.

**2. TREATMENTS :**

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

(1) 3 irrigation intervals :  $I_1=10-12$  days,  $I_2=18-20$  days and  $I_3=30-32$  days.(2) 2 methods of irrigation :  $M_1=$ Irrigation on flat bed and  $M_2=$ Irrigation through ridges and furrows.

Control=No irrigation.

**3. DESIGN :**(i) Fact. in R.B.D. (ii) (a) 8 (two control plots in each replication). (b) N.A. (iii) 6. (iv) and (v) N.A.  
(vi) Yes.**4. GENERAL :**(i) Normal. (ii) Nil. (iii) Yield of chillies. (iv) (a) 1964-68. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii)  
Since expt. is continued beyond 65, the results of individual years have been presented under 5. Results.**5. RESULTS :**

64(245)

(i) 1205 Kg/ha. (ii) 363.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of chillies in Kg/ha.

C=614 Kg/ha.

	$I_1$	$I_2$	$I_3$	Mean
$M_1$	2147	1513	1549	1736
$M_2$	1140	1100	962	1067
Mean	1644	1307	1256	1402

65(193)

(i) 3939 Kg/ha. (ii) 857.1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of chillies in Kg/ha.

C=3726 Kg/ha.

	$I_1$	$I_2$	$I_3$	Mean
$M_1$	5039	3201	3477	3906
$M_2$	4111	4173	4061	4115
Mean	4575	3687	3769	4010

**Crop :- Chillies (Kharif).****Ref :- Mh. 60(21).****Site :- Agri. College Farm, Nagpur.****Type :- 'D'.**

Object :—To find out the efficiency of the insecticides for the control of leaf curl on Chillies.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Black cotton soil. (iii) 7.6.60. (iv) (a) 1 ploughing and 3 harrowings. (b) Transplanting. (c) N.A. (d) 46 cm. × 46 cm. (e) 2. (v) 2.47 C.L./ha. of F.Y.M.+22.4 Kg/ha. of N as A/S+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. (vi) Local. (vii) Irrigated. (viii) 6 weedings. (ix) 94 cm. (x) N.A.

## 2. TREATMENTS :

6 insecticidal treatments : T<sub>0</sub>=Control, T<sub>1</sub>=140 gm./ha. Endrine, T<sub>2</sub>=210 gm/ha. Endrine, T<sub>3</sub>=180 gm/ha. Endrine, T<sub>4</sub>=0.2 % D.D.T. suspension and spray and T<sub>5</sub>=0.2 % D.D.T.+Ultra Sulphur 1 : 1 suspension and spray.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 6.40 m. × 5.49 m. (b) 4.57 m. × 3.66 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Crop is damaged in half of the portion of the whole plot due to water lodging. (ii) Nil. (iii) Yield of Chillies. (iv) (a) 1960—only. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 336 Kg/ha. (ii) 403.6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of chillies in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>
Av. yield	86	416	424	409	236	447

**Crop :- Chillies (Kharif).**

**Ref :- Mh. 60(22).**

**Site :- Agri. Res. Stn., Nagpur.**

**Type :- 'D'.**

Object :- To find out the efficiency of insecticides to control leaf curl of Chillies.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 3.71 C.L./ha. of F.Y.M. (ii) Black cotton soil. (iii) 7.6.60/12.7.60. (iv) (a) 1 ploughing and 4 harrowings. (b) Transplanting. (c) N.A. (d) 46 cm. × 46 cm. (e) —. (v) 597 Kg/ha. of F.Y.M. on 10.6.60, 22.4 Kg/ha. of A/S top dressed on 20.7.60, 22.4 Kg/ha. of Super. (vi) Local. (vii) Unirrigated. (viii) 3 weedings. (ix) 94 cm. (x) N.A.

## 2. TREATMENTS :

5 insecticidal treatments : T<sub>0</sub>=Control, T<sub>1</sub>=16.8 Kg/ha. of mixture of D.D.T. 10%+Sulphur in 1 : 1 ratio, T<sub>2</sub>=16.8 Kg/ha. of mixture of D.D.T. 10%+Sulphur in 1 : 2 ratio, T<sub>3</sub>=16.8 Kg/ha. of mixture of D.D.T. 10%+Sulphur in 1 : 3 ratio and T<sub>4</sub>=1% Endrine dust at 16.8 Kg/ha.

First dusting on 15.9.60 and 2nd on 26.9.60.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 8.23 m. × 7.32 m. (b) 6.40 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Below normal. (ii) Nil. (iii) Yield of chillies. (iv) (a) 1959—60. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 201 Kg/ha. (ii) 109.1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of chillies in Kg/ha.

Treatment	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Av. yield	194	251	156	198	207

Crop :- Onion (Rabi).

Ref :- Mh. 61(17), 62(216).

Site :- Agri. Res. Sta., Niphad.

Type :- 'M'.

Object :- To find out the requirement of N, P, K and F.Y.M. for Onion crop.

## 1. BASAL CONDITIONS :

(i) (a) *Sann*—Onion. (b) *Sann*. (c) Nil. (ii) Medium black. (iii) Jan., 62 ; N.A. (iv) (a) 1 ploughing and 4 harrowings ; 1 ploughing, 3 harrowings and clod crushing. (b) Transplanting. (c) 6.7 to 8.9 Kg/ha. ; 8.96 Kg/ha. (d) 12.7 cm. × 7.6 cm. (e) One. (v) As per treatments. (vi) N—207. (vii) Irrigated. (viii) Weeding. (ix) Nil ; N.A. (x) 4th week of May, 62 ; N.A.

## 2. TREATMENTS :

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

(1) 3 levels of N :  $N_0=0$ ,  $N_1=44.8$  and  $N_2=89.7$  Kg/ha.(2) 3 levels of  $P_2O_5$  :  $P_0=0$ ,  $P_1=44.8$  and  $P_2=89.7$  Kg/ha.(3) 3 levels of  $K_2O$  :  $K_0=0$ ,  $K_1=44.8$  and  $K_2=89.7$  Kg/ha.(4) 3 levels of F.Y.M. :  $F_0=0$ ,  $F_1=112.08$  and  $F_2=224.17$  Q/ha.

## 3. DESIGN :

(i)  $3^4$  confd. (ii) (a) 9 plots/block, 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 4.27 m. × 1.83 m. (b) 3.66 m. × 1.52 m. (v) 30 cm. × 15 cm. (vi) Yes.

## 4. GENERAL :

(i) Good ; Normal. (ii) Nil. (iii) Yield of onion. (iv) (a) 1961—62. (b) and (c) No. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interactions are absent, hence results for individual years are presented under 5. Results.

## 5. RESULTS :

## 61(17)

(i) 226 Q/ha. (ii) 57.5 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of onion bulbs in Q/ha.

	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	$F_0$	$F_1$	$F_2$	mean
$N_0$	211	203	213	210	209	208	190	215	223	209
$N_1$	206	246	252	236	239	220	224	241	239	235
$N_2$	204	239	260	226	251	227	228	233	242	234
Mean	207	229	242	227	233	218	214	230	234	226
$F_0$	177	240	226	205	224	213				
$F_1$	217	216	256	228	256	207				
$F_2$	228	232	243	249	219	236				
$K_0$	182	233	266							
$K_1$	228	249	222							
$K_2$	212	206	237							

## 62(216)

(i) 144 Q/ha. (ii) 26.7 Q/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of onion bulbs in Q/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	Mean
N <sub>0</sub>	159	154	156	137	156	176	130	159	151	157
N <sub>1</sub>	157	159	162	145	162	170	132	163	183	159
N <sub>2</sub>	149	96	107	109	114	128	126	172	53	117
Mean	155	136	142	130	144	158	129	164	139	144
F <sub>0</sub>	126	128	134	117	130	141				
F <sub>1</sub>	160	160	173	146	165	183				
F <sub>2</sub>	178	121	118	129	137	151				
K <sub>0</sub>	141	127	129							
K <sub>1</sub>	155	134	143							
K <sub>2</sub>	168	152	154							

C.D. for N marginal means=14.69 Q/ha.

**Crop :- Onion (Kharif).**

**Ref :- Mh. 64(260).**

**Site :- Agri. Res. Stn., Niphad.**

**Type :- 'M'.**

**Object :-** To study the response of the N, P, K and F.Y.M. on the yield of Onion bulbs when applied in graded doses.

#### 1. BASAL CONDITIONS :

(i) (a) Wheat—Onion. (b) Wheat in *Rabi*. (c) N.A. (ii) Medium black soil. (iii) 20.6.64/27.8.64. (iv) (a) 3 ploughings and harrowing. (b) Planting in bed. (c) 9.88 Kg/ha. (d) 15.24 cm. × 10.16 cm. (e) One. (v) Nil. (vi) Niphad—53. (vii) Lift-irrigated, irrigation interval 8—10 days. Total irrigations 8 to 10. (viii) 3 weedings. (ix) 39.53 cm. (x) 10.1.65.

#### 2. TREATMENTS :

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

(1) Ammonium Sulphate to supply following levels of Nitrogen. : N<sub>0</sub>=0, N<sub>1</sub>=44.8 and N<sub>2</sub>=89.6 Kg/ha.

(2) Super-Phosphate to supply following levels of P<sub>2</sub>O<sub>5</sub> : P<sub>0</sub>=0, P<sub>1</sub>=44.8 and P<sub>2</sub>=89.6 Kg/ha.

(3) Mur. of Potash to supply following levels of K<sub>2</sub>O : K<sub>0</sub>=0, K<sub>1</sub>=44.8 and K<sub>2</sub>=89.6 Kg/ha.

(4) F.Y.M. supplied at following levels : F<sub>0</sub>=0, F<sub>1</sub>=11200 and F<sub>2</sub>=22409 Kg/ha.

#### 3. DESIGN:

(i) 3<sup>4</sup> confd. (ii) (a) 9 plots/block, 9 blocks/replication. (b) 38.40 m. × 16.46 m. (iii) One. (iv) (a) 4.26 m. × 1.82 m. (b) 3.65 m. × 1.52 m. (v) 30 cm. × 15 m. (vi) Yes.

#### 4. GENERAL :

(i) Normal. (ii) Endrine sprayed. (iii) Yield of onion bulbs. (iv) (a) to (c) No. (v) No. (vi) and (vii) Nil.

#### 5. RESULTS :

(i) 323.7 Q/ha. (ii) 48.35 Q/ha. (iii) Only main effect of N is highly significant. (iv) Av. yield of onion bulbs in Q/ha.

	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Mean
N <sub>0</sub>	241.8	218.9	235.6	228.8	236.6	230.9	230.2	246.4	219.7	232.1
N <sub>1</sub>	365.5	373.9	358.0	360.8	379.1	357.5	351.2	357.7	388.5	366.8
N <sub>2</sub>	360.5	374.3	385.3	362.9	380.3	376.9	340.5	367.2	411.9	373.2
Mean	322.6	322.3	326.2	317.5	332.0	321.6	307.3	323.8	339.9	323.7
P <sub>0</sub>	288.4	319.3	314.5	305.9	306.3	309.7				
P <sub>1</sub>	339.9	323.9	307.5	313.3	343.1	314.9				
P <sub>2</sub>	339.3	323.9	356.5	332.9	346.4	340.4				
K <sub>0</sub>	331.1	298.3	323.3							
K <sub>1</sub>	310.3	361.3	323.9							
K <sub>2</sub>	326.2	307.5	331.3							

C.D. for N marginal means = 26.1 Q/ha.

**Crop :- Onion (Kharif).**

**Ref :- Mh. 64(258), 65(230).**

**Site :- Agri. Res. Stn., Niphad.**

**Type :- 'M'.**

**Object :-** To study the response of different Nitrogenous fertilizers applied at different doses of nitrogen to *kharif* crop of Onion bulb.

**1. BASAL CONDITIONS :**

(i) (a) Wheat—Onion. (b) Wheat. (c) Nil. (ii) Medium black. (iii) 20.6,64/25.8,64 ; 10.7,65/2.9,65.  
 (iv) (a) 3 ploughings and Harrowing. (b) Planting in bed. (c) 9.83 Kg/ha. (d) 15.24 cm. × 10.16 cm. (e) One.  
 (v) 22.42 Kg/ha. of P<sub>2</sub>O<sub>6</sub>. (vi) Niphad—53. (vii) Irrigated at the interval of 8—10 days. (viii) 3 weedings.  
 (ix) 39.53 cm. ; 54.94 cm. (x) 8.1.65 ; 11.1.66.

**2. TREATMENTS :**

**Main-plot treatments :**

6 Nitrogenous fertilizers were used to supply N levels : S<sub>1</sub>=Ammonium sulphate, S<sub>2</sub>=Urea, S<sub>3</sub>=Ammonium Sulphate Nitrate, S<sub>4</sub>=Nitrophosphate, S<sub>5</sub>=Calcium Ammonium Nitrate and S<sub>6</sub>=Ammonium Chloride.

**Sub-plot treatments :**

3 N levels were applied : N<sub>1</sub>=33.6, N<sub>2</sub>=50.4 and N<sub>3</sub>=67.2 Kg/ha.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 3 sub-plots/main-plot, 6 main-plots/block. (b) 22.55 m. × 12.19 m. (iii) 4.  
 (iv) (a) 5.48 m. × 3.04 m. (b) 4.87 m. × 2.43 m. (v) 30 cm. × 30 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) 3 Endrine sprays. (iii) Yield of onion. (iv) (a) 1964—65. (b) No. (c) Nil. (v) and (vi) Nil. (vii) As error variances for sub-plots are heterogeneous, hence results for individual years are presented under 5. Results.

**5. RESULTS :**

**64(258)**

(ii) 264 Q/ha. (ii) (a) 50.41 Q/ha. (b) 26.13 Q/ha. (iii) Main effects of N and S are highly significant. (iv) Av. yield of the onion bulbs in Q/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	Mean
N <sub>1</sub>	270	275	277	256	175	251	251
N <sub>2</sub>	290	297	284	252	207	283	269
N <sub>3</sub>	283	294	275	285	215	286	273
Mean	281	289	279	264	199	273	264

C.D. for S marginal means=43.8 Q/ha.

C.D. for N marginal means=15.3 Q/ha.

65(230)

- (i) 195 Q/ha. (ii) (a) 38.38 Q/ha. (b) 15.77 Q/ha. (iii) Main effects of N and S are highly significant only. (iv) Av. yield of onion bulbs in Q/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	Mean
N <sub>1</sub>	186	204	207	205	110	179	182
N <sub>2</sub>	208	231	221	220	109	226	203
N <sub>3</sub>	203	217	219	205	126	230	200
Mean	199	217	216	210	115	212	195

C.D. for S marginal means=33.4 Q/ha.

C.D. for N marginal means=9.2 Q/ha.

**Crop :- Onion (Rabi).**

**Ref :- Mh. 61(16), 62(215).**

**Site :- Agri. Res. Stn., Niphad.**

**Type :- 'C'.**

Object :- To study the effect of different crops on the yield of succeeding Onion crop.

**1. BASAL CONDITIONS :**

- (i) (a) and (b) As per treatments. (c) Nil. (ii) Medium black. (iii) Jan. 62 ; N.A. (iv) (a) Ploughings, harrowings and clod crushing. (b) Seedlings transplanted. (c) 7 to 9 Kg./ha. (d) 13 cm. × 8 cm. (e) 1. (v) Nil ; 22.4 Kg/ha. of N as A/S + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super at the time of transplanting + 22.4 Kg/ha. of N as A/S top dressing 1½ month after planting. (vi) N 241. (vii) Irrigated. (viii) Weeding. (ix) Nil ; N.A. (x) 4th week of May 62 ; N.A.

**2. TREATMENTS :**

5 previous crops: C<sub>0</sub>=Fallow, C<sub>1</sub>=Bajri, C<sub>2</sub>=Groundnut, C<sub>3</sub>=Sann green manuring and C<sub>4</sub>=Chinamug

**3. DESIGN :**

- (i) R.B.D. (ii) 5. (b) N.A. (iii) 4. (iv) (a) 9.14 m. × 5.49 m. (b) 7.62 m. × 4.88 m. (v) 76 cm. × 30 cm. (vi) Yes.

**4. GENERAL :**

- (i) Good. (ii) Nil. (iii) Yield of onion. (iv) (a) 1961—62. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent, hence results for individual years are presented under 5. Results.

**5. RESULTS :**

61(16)

- (i) 140 Q/ha. (ii) 62.9 Q/ha. (iii) Treatment differences are significant. (iv) Av. yield of onion in Q/ha.

Treatment	C <sub>0</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>
Av. yield	195	63	110	202	130

C.D. for treatment means=96.9 Kg/ha.

62(215)

(i) 248 Q/ha. (ii) 29.5 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of onion in Q/ha.

Treatment	C <sub>0</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>
Av. yield	229	243	262	241	264

**Crop :- Onion (Kharif).**

**Ref :- Mh. 65(229).**

**Site :- Agri. Res. Stn., Niphad.**

**Type :- 'C'.**

Object :- To find out the suitable method of planting for onion bulbs for getting higher yields.

**1. BASAL CONDITIONS :**

(i) (a) Wheat—onion. (b) Wheat in *Rabi*. (c) Nil. (ii) Medium black soil. (iii) 23.6, 65/31.8, 65. (iv) (a) 3 ploughings and harrowing. (b) As per treatments. (c) 9.88 Kg/ha. (d) 15.24 cm. × 10.16 cm. (e) One. (v) 9.1 Kg/ha. of N and 11.1 Kg/ha. of P<sub>2</sub>O<sub>5</sub> at planting and 9.1 Kg/ha. of N after 1½ months. (vi) Niphad—53. (vii) Lift irrigation, Irrigation interval 8—10 days total irrigations 8—10. (viii) 3 weedings. (ix) 58.65 cm. (x) 4.1.66.

**2. TREATMENTS :**

6 different methods of planting were used : T<sub>1</sub>=Drilling seed, T<sub>2</sub>=Planting in bed, T<sub>3</sub>=Planting on broad ridges, T<sub>4</sub>=Planting on ridges 45.72cm. apart one seedling on each side of the ridge at 10.16 cm. apart, T<sub>5</sub>=Planting one line on each side and one seedling at the top of the ridge and T<sub>6</sub>=Planting two lines on each side of ridge.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 6. (b) 10.97 m. × 13.71 m. (iii) 4. (iv) (a) 5.43 m. × 4.57 m. (b) 4.57 m. × 3.65 m. (v) 46 cm. × 46 cm. (vi) Yes.

**4. GENERAL :**

(i) —. (ii) Endrine sprays 3. (iii) Yield of bulbs. (iv) (a) 1965—69. (b) No. (c) Nil. (v) to (vii) Nil.

**5. RESULTS :**

(i) 315 Q/ha. (ii) 22.3 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of onion in Q/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>
Av. yield	343	418	195	275	317	341

C.D. for treatment means=33.6 Q/ha.

**Crop :- Onion (Rabi).**

**Ref :- Mh. 61(15), 62(217).**

**Site :- Agri. Res. Stn., Niphad.**

**Type :- 'I'.**

Object :- To study the irrigation intervals for the onion crop in field conditions and to seedlings of different age groups in seed beds.

## 1. BASAL CONDITIONS:

(i) (a) *Sannhemp*—Onion. (b) *Sannhemp*. (c) Nil. (ii) Medium black. (iii) 6.1.62; N.A. (iv) (a) Ploughing, 3 to 4 harrowings, clod ploughing. (b) Transplanting. (c) 7 to 9 Kg/ha. (d) 13 cm. × 8 cm. (e) 1. (v) Nil.; 22.4 Kg/ha. of N as A/S at planting and 1½ months after planting, 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super at planting. (vi) Niphad 2-4-1. (vii) Irrigated. (viii) Weeding; N.A. (ix) Nil; N.A. (x) 4th week of May, 62; N.A.

## 2. TREATMENTS:

## Main-plot treatments:

All combinations of (1) and (2)

(1) 3 intervals of irrigation in fields: I<sub>1</sub>=5 I<sub>2</sub>=10 and I<sub>3</sub>=15 days after planting.

(2) 3 age of seedlings: A<sub>1</sub>=8 A<sub>2</sub>=9 and A<sub>3</sub>=10 weeks old.

## Sub-plot treatments:

3 intervals of irrigation to seedlings in seed bed: S<sub>1</sub>=Irrigation after 6 days, S<sub>2</sub>=After 10 days and S<sub>3</sub>=After 14 days.

## 3. DESIGN:

(i) Split-plot. (ii) (a) 9 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 3; 4. (iv) (a) 5.49 m. × 3.66 m. (b) 4.57 m. × 3.05 m. (v) 46 cm. × 30 cm. (vi) Yes.

## 4. GENERAL:

(i) Good. (ii) Nil. (iii) Yield of onion. (iv) (a) 1961-62. (b) No. (c) Nil. (v) to (vi) Nil.

## 5. RESULTS:

61(15)

(i) 164.0 Q/ha. (ii) (a) 46.7 Q/ha. (b) 35.0 Q/ha. (iii) Main effect of I is highly significant and that of A is significant. (iv) Av. yield of onion in Q/ha.

	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
I <sub>1</sub>	182.4	165.4	216.8	173.7	178.2	212.7	188.2
I <sub>2</sub>	162.8	156.0	193.6	169.7	162.4	180.3	170.8
I <sub>3</sub>	119.2	137.0	142.8	122.5	140.3	136.2	133.0
Mean	154.8	152.8	184.4	155.3	150.3	176.4	164.0
S <sub>1</sub>	150.3	141.4	174.2				
S <sub>2</sub>	157.1	154.5	169.3				
S <sub>3</sub>	157.0	162.5	209.7				

C.D. for I or A marginal means=26.9 Q/ha.

62(217)

(i) 286.2 Q/ha. (ii) (a) 67.3 Q/ha. (b) 28.8 Q/ha. (iii) Main effect of I is highly significant. Interaction A × S is significant. (iv) Av. yield of onion in Q/ha.

	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
I <sub>1</sub>	335.6	349.3	343.2	356.2	333.0	338.9	342.7
I <sub>2</sub>	258.8	286.8	316.0	296.2	286.6	278.8	287.2
I <sub>3</sub>	204.2	258.2	223.7	230.8	239.3	216.0	228.7
Mean	266.2	298.1	294.3	294.4	286.3	277.9	286.2
S <sub>1</sub>	260.7	297.3	325.2				
S <sub>2</sub>	279.2	285.8	293.9				
S <sub>3</sub>	258.7	311.2	263.8				

C.D. for I marginal means =32.7 Q/ha.

C.D. for S means at the same level of A=23.6 Q/ha.

C.D. for A means at the same level of S=38.0 Q/ha.



Crop :- Turmeric (*Rabi*).

Ref :- Mh. 64(55), 65(82).

Site :- Turmeric Res. Stn., Tasgaon.

Type :- 'M'.

Object :—To study the effect of N, P, K and F.Y.M. on the yield of Turmeric.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) 4.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ ; 860 Kg/ha. of A/S and 74.1 Kg/ha. of Suphala and G.M. (ii) Medium black soil. (iii) 26.5.64; 27.5.65. (iv) (a) Ploughing with K.I. plough and harrowing. (b) Dibbling, sets on broad ridges 152 cm. apart. (c) 2375 Kg/ha.; 3387 Kg/ha. (d) 30 cm. × 30 cm. (e) One. (v) Nil; 50 C.L./ha. of F.Y.M. (vi) Rajapuri. (vii) Irrigated. (viii) Weeding with *Khurpi* (ix) 75 cm.; 61 cm. (x) 2.3.65; 15.2.66.

## 2. TREATMENTS :

## Main-plot treatments :

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

(1) 3 levels of N :  $N_0=0$ ,  $N_1=112$  and  $N_2=224$  Kg/ha.(2) 3 levels of  $P_2O_5$  :  $P_0=0$ ,  $P_1=56$  and  $P_2=112$  Kg/ha.(3) 3 levels of  $K_2O$  :  $K_0=0$ ,  $K_1=56$  and  $K_2=112$  Kg/ha.

## Sub-plot treatments :

2 levels of F.Y.M. :  $F_0=No$  F.Y.M. and  $F_1=22,400$  Kg/ha. of F.Y.M.

## 3. DESIGN :

(i) Split-plot confd. (ii) 9 main-plots/block; 3 blocks/replication and 2 sub-plots/main-plot. (b) 54.86 m. × 21.96 m. (iii) 1. (iv) (a) 9.14 m. × 7.32 m. (b) 6.10 m. × 6.10 m. (v) 152 cm. × 61 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal; Not satisfactory. (ii) Nil. (iii) Yield of grain, height and no. of levels etc. (iv) (a) 1964—67. (b) Yes. (c) No. (v) and (vi) No. (vii) Expt. continued beyond 65. Hence the results for individual years are given under 5. Results.

## 5. RESULTS:

## 64(55)

(i) 4309 Kg/ha. (ii) (a) 916.8 Kg/ha. (b) 979.0 Kg/ha. (iii) Main effect N is highly significant and interaction  $P \times K$  is significant. (iv) Av. yield of turmeric in Kg/ha.

	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	$F_0$	$F_1$	Mean
$N_0$	3176	3648	2925	2876	3648	3225	2939	3559	3249
$N_1$	5155	4291	5326	5205	4649	4918	4494	5354	4924
$N_2$	4878	4582	4806	4658	4658	4949	4043	5467	4755
Mean	4403	4174	4352	4246	4318	4364	3825	4794	4309
$F_0$	3918	3746	3813	3855	3719	3903			
$F_1$	4888	4601	4891	4637	4918	4825			
$K_0$	3915	4434	4390						
$K_1$	4712	4467	3776						
$K_2$	4582	3619	4891						

C.D. for N marginal means = 799.2 Kg/ha.

C.D. for  $P \times K$  body of table = 1384.2 Kg/ha.

## 65(82)

(i) 161 Q/ha. (ii) 36.38 Q/ha. (b) 91.49 Q/ha. (iii) Main effect of N is significant and F is highly significant. (iv) Av. yield of turmeric in Kg/ha.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
N <sub>0</sub>	171	163	135	161	170	138	130	183	156
N <sub>1</sub>	153	131	164	163	133	153	122	177	150
N <sub>2</sub>	136	190	209	183	184	168	145	211	178
Mean	153	161	169	169	162	153	132	190	161
F <sub>0</sub>	130	126	140	138	134	125			
F <sub>1</sub>	177	196	198	200	191	181			
K <sub>0</sub>	167	160	180						
K <sub>1</sub>	148	161	179						
K <sub>2</sub>	145	163	150						

C.D. for N marginal means=29.67 Kg/ha.

C.D. for F marginal means=13.48 Q/ha.

**Crop :- Turmeric (Kharif).**

**Ref :- Mh. 64(54), 65(83).**

**Site :- Turmeric Res. Stn. Tasgaon.**

**Type :- 'C'.**

**Object:—**To study the effect of time of planting, material for planting and spacing on the yield of Turmeric.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat ; Cotton. (c) 44.8 Kg/ha. of N+33.6 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black soil. (iii) As per treatments. (iv) (a) Ploughing with K.I. plough and harrowing ; 2 ploughing and harrowing (b) and (c) N.A. (d) As per treatments. (e) I. (v) Nil. (vi) Rajapuri. (vii) Irrigated. (viii) Weeding with *Khurpt* ; weeding, light earthing up. (ix) 75 cm. ; 62 cm. (x) 21.2.65 ; 10.2.66.

#### 2. TREATMENTS :

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

(1) 3 times of planting : D<sub>1</sub>=1st May, D<sub>2</sub>=15th May and D<sub>3</sub>=1st June.

(2) 2 materials for planting : M<sub>1</sub>=Finger rhizomes and M<sub>2</sub>=Mother rhizomes.

(3) 3 spacings : S<sub>1</sub>=15 cm., S<sub>2</sub>=30 cm. and S<sub>3</sub>=46 cm.

Treatment D<sub>1</sub> was dropped during 64.

#### 3. DESIGN :

(i) 3<sup>2</sup>×2 confd. (ii) (a) 6 plots/block ; 3 blocks replication. (b) N.A. (iii) 4. (iv) (a) 7.32 m.×6.40 m. ; 7.62 m.×7.32 m. (b) 6.40 m.×6.10 m. ; 6.10 m.×6.10 m. (v) 46 cm.×15 cm. ; 76 cm.×61 cm. (vi) Yes.

#### 4. GENERAL :

(i) Normal ; Not satisfactory. (ii) Nil. (iii) Yield of turmeric. (iv) (a) 1964—67. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Experiment conducted during the year 64 analysed as fact. in R.B.D. As expt. continued beyond 65, results for individual years are presented under 5. Results.

#### 5. RESULTS :

64(54)

(i) 5856 Kg/ha. (ii) 1329.2 Kg/ha. (iii) Main effect of D and interaction D×M and D×S×M are significant and main effect of S is highly significant. (iv) Av. yield of turmeric in Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	Mean
D <sub>2</sub>	6909	6512	5328	7001	5499	6250
D <sub>3</sub>	6415	5204	4766	5241	5682	5462
Mean	6662	5858	5047	6121	5591	5856
M <sub>1</sub>	6593	5792	5977			
M <sub>2</sub>	6731	5924	4117			

C.D. for D marginal means=780.8 Kg/ha.  
 C.D. for S marginal means=956.23 Kg/ha.  
 C.D. for D×M table =1104.28 Kg/ha.

65(83)

(i) 9871 Kg/ha. (ii) 2048.7 Kg/ha, (iii) Main effect D and interaction D×M and D×S×M are significant and main effects of S and M are highly significant. (iv) Av. yield of turmeric in Kg/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	M <sub>1</sub>	M <sub>2</sub>	Mean
D <sub>1</sub>	13438	11352	7848	7268	14490	10879
D <sub>2</sub>	10865	8826	8016	6954	11517	9236
D <sub>3</sub>	11706	9351	7440	7508	11490	9499
Mean	12003	9843	7768	7243	12499	9871
M <sub>1</sub>	9744	6512	5474			
M <sub>2</sub>	14262	13174	10062			

C.D. for D or S marginal means=1188.7 Kg/ha.  
 C.D. for M marginal means=973.57 Kg/ha.  
 C.D. for D×M table =1681.08 Kg/ha.

**Crop :- Turmeric (Kharif).**

**Ref :- Mh. 64(56), 65(81).**

**Site :- Turmeric Res. Stn., Tasgaon.**

**Type :- 'CM'.**

**Object :-** To study the effect of different methods of planting, spacing and manurial doses on the yield.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 44.8 Kg/ha. of N+33.6 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black. (iii) 6.5.64 ; 31.5.65 and 1.6.65. (iv) (a) Ploughing with K.I. plough and harrowing ; 2 ploughings and harrowing. (b) to (d) As per treatments. (e) 1. (v) 25 tonnes/ha. of F.Y.M. broadcast on 23.4.64 and 50 C.L./ha. of F.Y.M. in 65. (vi) Rajapuri. (vii) Weeding with *Khurpi* ; weeding and light earthing up. (ix) 75 cm. ; 61 cm. (x) 15. 2.65 ; 12.2.66 .

#### 2. TREATMENTS :

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

- (1) 3 methods of planting : P<sub>1</sub>=Broad ridges 152 cm. apart, P<sub>2</sub>=Ridges and furrows 76 cm apart and P<sub>3</sub>=Ridges and furrows 76 cm. apart with maize as mixed crop.
- (2) 3 spacings : S<sub>1</sub>=15, S<sub>2</sub>=30 and S<sub>3</sub>=46 cm. between setts.
- (3) 3 manurings : M<sub>0</sub>=No manure, M<sub>1</sub>=112 Kg/ha. of N+56 Kg/ha. of P<sub>2</sub>O<sub>5</sub> and M<sub>2</sub>=224 Kg/ha. of N+112 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.

## 3. DESIGN :

(i) 3<sup>3</sup> confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) 22.86 m. × 20.58 m. (iii) 2. (iv) (a) 7.62 m. × 6.86 m. (b) 4.57 m. × 4.57 m. (v) 152 cm. × 114 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal ; Not satisfactory. (ii) Nil. (iii) Yield of turmeric. (iv) (a) 1964—67. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. continued beyond 65, hence results for individual years are presented under 5. Results.

## 5. RESULTS :

64(56)

(i) 127 Q/ha. (ii) 13.02 Q/ha. (iii) All the main effects P, S and M and interaction (P×S), (S×M) and (P×M) are highly significant. (iv) Av. yield of turmeric in Q/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	Mean
P <sub>1</sub>	93	81	77	81	96	74	84
P <sub>2</sub>	189	140	134	137	150	176	154
P <sub>3</sub>	169	144	118	125	148	157	144
Mean	150	122	109	114	131	136	127
M <sub>0</sub>	118	114	112				
M <sub>1</sub>	175	116	103				
M <sub>2</sub>	159	135	113				

C.D. for P, S or M marginal means = 9.01 Q/ha.

C.D. for (P×S), (S×M) or (M×P) table = 15.60 Q/ha.

65(81)

(i) 121 Q/ha. (ii) 36.76 Q/ha. (iii) Main effect P is highly significant and S is significant. (iv) Av yield of turmeric in Q/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	M <sub>0</sub>	M <sub>1</sub>	M <sub>2</sub>	Mean
P <sub>1</sub>	123	114	99	105	113	118	112
P <sub>2</sub>	184	167	102	176	133	143	151
P <sub>3</sub>	111	103	97	106	96	97	100
Mean	139	128	96	129	114	119	121
M <sub>0</sub>	140	165	82				
M <sub>1</sub>	149	104	89				
M <sub>2</sub>	128	115	116				

C.D. for P or S marginal means = 25.42 Q/ha.

Crop :- Turmeric.

Ref :- Mh. 64(54), 65(84).

Site :- Turmeric Res. Stn., Tasgaon.

Type :- 'P'.

Object :- To study the effect of irrigation intervals during different season of plant growth.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat; Cotton. (c) 44.8 Kg/ha. of N+33.6 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black soil. (iii) 5.6.64; 19.5.65 (iv) (a) Ploughing with K.I. plough and harrowing. (b) Dibbling setts on broad ridges. (c) 1853 Kg/ha. (d) 30 cm. x 30 cm. (e) 1. (v) 251 Q/ha. of F.Y.M.+550 Kg/ha. of P<sub>2</sub>O<sub>5</sub>+112.1 Kg/ha. of N in two doses; 12.3 C.L./ha. of F.Y.M. (vi) Rajapuri. (vii) Irrigated. (viii) Weeding with *khurpi*. (ix) 75 cm.; 61 cm. (x) 25.2.65; 17.2.66.

## 2. TREATMENTS:

9 intervals of irrigation in days:

	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>	I <sub>6</sub>	I <sub>7</sub>	I <sub>8</sub>	I <sub>9</sub>
During high evaporation period	3	3	3	6	6	6	9	9	9
During medium evaporation period	5	8	11	8	11	14	11	14	17

## 3. DESIGN:

(i) R.E.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 9.14 m. x 7.32 m. (b) 6.10 m. x 6.10 m. (v) 152 cm. x 61 cm. (vi) Yes.

## 4. GENERAL:

(i) Normal; Not satisfactory. (ii) Nil. (iii) Yield of turmeric (iv) (a) 1964-67. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Since expt. contd. beyond 65, hence the individual results are presented under 5. Results.

## 5. RESULTS:

64(57)

(i) 7393 Kg/ha. (ii) 1321.3 Kg/ha. (iii) Treatment differences are significant. (iv) (a) Av. yield of turmeric in Kg/ha.

Treatment	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>	I <sub>6</sub>	I <sub>7</sub>	I <sub>8</sub>	I <sub>9</sub>
Av. yield	9217	8725	6108	7905	6815	7360	7407	6929	6075

C.D. for treatment means=2030 Kg/ha.

65(84)

(i) 12034 Kg/ha. (ii) 2747.8 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of turmeric in Kg/ha.

Treatment	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>	I <sub>6</sub>	I <sub>7</sub>	I <sub>8</sub>	I <sub>9</sub>
Av. yield	18568	13859	10697	14195	11538	8544	12479	8746	10226

C.D. for treatment means=4222 Kg/ha.

**Crop :- Mango.**

**Ref :- Mh. 61(92), 62(77), 63(118), 64(103).**

**Site :- Reg. Fruit Res. Sub-Stn., Vengurla.**

**Type :- 'M'.**

**Object :- To study the manurial requirements for Mango.**

## 1. BASAL CONDITIONS:

(i) Fallow. (ii) Laterite. (iii) Inarch grafting. (iv) Alphonso. (v) Aug., 60. (vi) One year. (vii) to (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Tree did not bear during the period. April and May every year. (Observations taken).

## 2. TREATMENTS :

## Main-plot treatments

All combinations of (1), (2) and (3)+3 extra treatments in each block.

(1) 3 levels of N:  $N_0=0$ ,  $N_1=0.68$  and  $N_2=1.46$  Kg/tree.

(2) 3 levels of  $P_2O_5$ :  $P_0=0$ ,  $P_1=0.68$  and  $P_2=1.36$  Kg/tree.

(3) 3 levels of K:  $K_0=0$ ,  $K_1=0.45$  and  $K_2=0.91$  Kg/tree.

Extra treatments are  $E_0$ =No manure,  $E_1$ =Bihar recommendation : 63.6 Kg. of F.Y.M., 4.5 Kg. of Super, 2.3Kg. of A/S and Potash 1.8 Kg. of lime and  $E_2$ =Dept. recommendation : 45.4 Kg. of F.Y.M., +6.8 Kg. of B.M. and 13.6 Kg. of ashes per tree.

## Sub-plot treatments :

2 levels of F.Y.M. :  $F_0=0$  and  $F_1=44.8$  Kg/tree.

## 3. DESIGN :

(i) Split-plot confd. (ii) (a) 12 Main-plots/block, 3 blocks/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 4. (v) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Height, girth measurements. (iv) 1961-continued. (v) N.A. (vi) and (vii) Nil (viii) In expt No 63(118) data for scion girth and stock girth N.A.

## 5. RESULTS :

61(92)

## Height

(i) 105.4 cm/tree. (ii) (a) 22.6 cm/tree. (b) 15.9 cm/tree. (iii) None of the effects is significant. (iv) Av. height in cm/tree.

$E_0=105.8$ ,  $E_1=106.0$  and  $E_2=112.0$  cm.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	Mean
$F_0$	105.7	108.4	97.8	103.1	100.0	108.8	106.1	106.1	99.7	104.0
$F_1$	104.2	105.3	106.5	100.9	104.8	110.3	109.2	105.5	101.3	105.3
Mean	105.0	106.8	102.1	102.0	102.4	109.6	107.6	105.8	100.5	104.6
$K_0$	113.4	104.0	105.6	102.4	106.4	114.2				
$K_1$	95.0	116.1	106.2	105.8	98.4	113.1				
$K_2$	106.5	100.4	94.6	97.8	102.4	101.3				
$P_0$	110.6	107.1	88.4							
$P_1$	100.8	101.4	105.0							
$P_2$	103.6	112.0	113.0							

## Scion girth

(i) 10.6 cm/tree. (ii) (a) 1.81 cm/tree. (b) 1.05 cm/tree. (iii) NKF and NPKF interactions are significant. (iv) Av. scion girth in cm/tree.

$E_0=10.2, E_1=10.4$  and  $E_2=11.5$  cm/tree.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	Mean
$F_0$	10.5	11.0	10.3	10.5	10.6	10.7	10.8	10.7	10.2	10.6
$F_1$	10.2	10.6	10.6	10.4	10.2	10.8	10.8	10.4	10.2	10.5
Mean	10.3	10.8	10.4	10.4	10.4	10.8	10.8	10.5	10.2	10.5
$K_0$	10.8	11.0	10.7	10.7	10.6	11.1				
$K_1$	9.6	11.1	10.8	10.8	10.4	10.4				
$K_2$	10.6	10.3	9.8	9.9	10.2	11.0				
$P_0$	10.4	11.2	9.8							
$P_1$	10.3	10.2	10.6							
$P_2$	10.2	11.0	11.0							

#### Stock girth

- (i) 12.6 cm/tree. (ii) (a) 2.30 cm/tree. (b) 1.65 cm/tree. (iii)  $N \times P$  interaction alone is significant. (iv) Av. stock girth in cm/tree.

$E_0=12.8, E_1=12.8$  and  $E_2=13.5$  cm.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	Mean
$F_0$	12.2	13.1	12.5	12.5	12.5	12.8	13.0	12.5	12.3	12.6
$F_1$	11.8	12.4	12.7	12.1	12.2	12.7	12.4	12.4	12.1	12.3
Mean	12.0	12.7	12.6	12.3	12.4	12.7	12.7	12.4	12.2	12.4
$K_0$	12.4	12.9	12.8	12.5	12.8	12.8				
$K_1$	11.2	13.1	12.9	12.6	11.6	13.0				
$K_2$	12.3	12.2	12.2	11.8	12.5	12.3				
$P_0$	12.5	13.2	11.1							
$P_1$	11.9	12.0	13.0							
$P_2$	11.5	13.0	13.7							

C.D. for body of  $N \times P$  table = 1.90 cm/tree.

62(77)

#### Height

- (i) 164.3 cm/tree. (ii) (a) 18.8 cm/tree. (b) 15.1 cm/tree. (iii) None of the effects is significant. (iv) Av. height in cm/tree.

$E_0=162.1$ ,  $E_1=169.6$  and  $E_2=171.1$  cm.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	Mean
$F_0$	165.0	168.2	156.5	158.6	163.0	168.0	163.6	167.5	158.6	163.2
$F_1$	158.3	167.6	163.7	161.9	164.0	163.7	166.5	162.0	161.1	163.2
Mean	161.7	167.9	160.1	160.3	163.5	165.8	165.1	164.7	159.8	163.2
$K_0$	166.5	163.7	165.0	160.2	161.5	173.5				
$K_1$	155.6	176.2	162.4	168.5	165.4	160.3				
$K_2$	162.9	163.7	152.9	152.1	163.7	163.7				
$P_0$	161.9	170.2	148.7							
$P_1$	164.6	164.0	162.1							
$P_2$	158.5	169.6	169.5							

**Scion girth**

(i) 20.8 cm/tree. (ii) (a) 2.0 cm/tree. (b) 1.87 cm/tree. (iii) None of the effects is significant. (iv) Av. scion girth in cm/tree.

$E_0=20.2$ ,  $E_1=21.3$  and  $E_2=21.5$  cm/tree

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	Mean
$F_0$	20.3	21.2	20.4	20.4	20.5	21.0	20.7	21.0	20.2	20.6
$F_1$	20.3	21.1	20.8	20.9	20.9	20.5	21.0	20.7	20.6	20.8
Mean	20.3	21.1	20.6	20.6	20.7	20.8	20.9	20.8	20.4	20.7
$K_0$	20.9	21.2	20.5	20.9	20.6	21.1				
$K_1$	19.6	21.7	21.1	21.5	20.6	20.4				
$K_2$	20.4	20.5	20.2	19.5		20.8				
$P_0$	21.0	21.3	19.5							
$P_1$	20.1	20.8	21.1							
$P_2$	19.7	21.3	21.2							

**Stock girth**

(i) 23.8 cm/tree. (ii) (a) 3.48 cm/tree. (b) 3.63 cm/tree. (iii) Extra treatments are significant. (iv) Av. stock girth in cm/tree.



$E_0=23.0$ ,  $E_1=24.5$  and  $E_2=27.0$  cm/tree.

	$N_0$	$N_1$	$N_2$	$K_0$	$K_1$	$K_2$	$P_0$	$P_1$	$P_2$	Mean
$F_0$	22.9	24.4	23.6	23.3	23.3	24.3	22.9	24.1	22.9	23.6
$F_1$	23.2	23.6	23.7	23.7	23.7	23.2	23.6	23.6	23.3	23.5
Mean	23.1	24.0	23.6	23.5	23.5	23.8	23.7	23.8	23.1	23.5
$K_1$	23.6	24.0	23.6	23.6	23.5	24.1				
$K_2$	22.3	25.2	24.0	24.3	23.3	23.9				
$K_1$	23.3	22.7	23.3	22.4	23.7	23.3				
$P_0$	23.9	24.1	22.4							
$P_1$	23.2	23.2	24.1							
$P_2$	22.1	24.6	24.5							

C.D. of extra treatment means=2.87 cm/tree

63(118)

Height

- (i) 150.5 cm/tree. (ii) (a) 25.5 cm/tree. (b) 16.6 cm/tree. (iii)  $P \times K \times F$  interaction alone is significant.  
 (iv) Av. height in cm/tree.

$E_0=N.A.$ ,  $E_1=N.A.$  and  $E_2=N.A.$

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	Mean
$F_1$	198.5	200.8	194.2	195.8	195.0	202.6	197.6	202.2	193.6	197.8
$F_2$	200.8	208.2	201.4	200.2	206.2	203.9	208.3	201.6	200.4	203.4
Mean	199.6	204.5	197.8	198.0	200.6	203.2	203.0	201.9	197.0	200.6
$K_0$	204.2	204.6	200.2	197.9	197.5	213.5				
$K_1$	192.2	210.0	203.5	202.9	205.6	197.2				
$K_2$	202.5	199.0	189.6	193.3	198.7	198.0				
$P_0$	200.2	210.0	184.0							
$P_1$	204.0	199.2	198.8							
$P_2$	194.8	204.4	210.6							

64 103)

Height

- (i) 237.1 cm/tree. (ii) (a) 27.5 cm/tree. (b) 18.3 cm/tree. (iii) Main effect of F and extra treatments are highly significant. (iv) Av. height in cm/tree.

$E_0=218.2, E_1=254.7$  and  $E_2=256.9$  cm/tree

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	Mean
$F_0$	226.6	234.2	230.4	224.9	226.4	239.9	234.1	232.2	225.0	230.4
$F_1$	234.2	247.6	237.2	232.1	238.7	248.1	247.2	239.9	231.9	239.7
Mean	230.4	240.9	233.8	228.5	232.5	244.0	240.6	236.1	228.4	235.0
$K_0$	240.2	242.3	239.2	231.0	230.8	260.0				
$K_1$	219.1	251.9	237.1	234.1	236.5	237.5				
$K_2$	231.8	228.4	225.1	220.5	230.3	234.5				
$P_0$	228.0	237.8	219.7							
$P_1$	233.5	232.9	231.2							
$P_2$	229.7	251.9	250.4							

C.D. for F marginal Means = 7.1 cm/tree

C.D. for Extra treatment means = 22.7 cm/tree

**Scion girth**

(i) 38.0 cm/tree. (ii) (a) 4.02 cm/tree. (b) 2.37 cm/tree. (iii) Main effect of F and treatments are highly significant. Interaction  $N \times K \times F$  is significant. (v) Av. scion girth in cm/tree.

 $E_0=35.7, E_1=40.0$  and  $E_2=40.6$  cm/tree

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	Mean
$F_0$	36.4	38.8	37.2	37.0	37.4	38.1	37.6	37.8	37.0	37.5
$F_1$	37.2	39.0	38.2	37.7	37.9	38.8	38.5	37.8	38.1	38.1
Mean	36.8	38.9	37.7	37.4	37.7	38.5	38.1	37.8	37.6	37.8
$K_0$	37.4	39.3	37.5	37.7	37.2	39.3				
$K_1$	35.1	39.5	38.8	38.2	37.7	37.6				
$K_2$	38.0	37.8	37.0	36.2	38.1	38.5				
$P_0$	37.1	38.9	36.0							
$P_1$	37.0	37.7	38.4							
$P_2$	36.5	40.1	38.7							

C.D. for F marginal means = 0.92 cm/tree

C.D. for extra treatment means = 3.32 cm/tree

**Stock girth**

(i) 42.5 cm/tree. (ii) (a) 4.58 cm/tree. (b) 3.39 cm/tree. (iii) Main effect of F is significant while effect between extra's is highly significant. (iv) Av. stock girth in cm/tree.

$E_0=39.4$ ,  $E_1=44.9$  and  $E_2=45.3$  cm/tree.

	$N_0$	$N_1$	$N_2$	$P_0$	$P_1$	$P_2$	$K_0$	$K_1$	$K_2$	Mean
$F_0$	40.1	43.2	41.6	41.0	41.1	42.9	41.5	41.9	41.6	41.7
$F_1$	41.7	43.9	43.0	42.2	42.9	43.5	43.0	42.9	42.8	42.9
Mean	40.9	43.6	42.3	41.6	42.0	43.2	42.2	42.4	42.2	42.3
$K_0$	41.2	43.8	41.6	41.7	40.9	44.1				
$K_1$	39.2	44.6	43.3	42.8	42.1	42.2				
$K_2$	42.3	42.3	42.0	40.3	42.9	43.4				
	41.2	43.5	40.1							
$P_1$	40.7	42.2	43.0							
$P_2$	40.8	45.1	43.7							

C.D. for F marginal means = 1.31 cm/tree  
C.D. for extra treatment means = 3.78 cm/tree

**Crop :- Mango.**

**Site :- Reg. Fruit Res. Sub-Stn., Vengurla.**

**Ref :- Mh. 65(91),**

**Type :- 'M'.**

Object :—To Find out the effect of different levels of N, P, K, F.Y.M. and time on the growth and yield of Mango.

1. BASAL CONDITIONS :

- (i) Grass land. (ii) Laterite soil. (iii) Inarched mango grafts from a single scion tree was prepared. (iv) Alphonso. (v) Sept., 60; spacing 10.67 m. × 10.67 m. (vi) N.A. (vii) Nil. (viii) Nil. (ix) Nil. (x) Unirrigated. (xi) 284.9 cm. (xii) The tree did not bearfruit.

2. TREATMENTS :

Main-plot treatments :

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

- (1) 3 levels of  $P_2O_5$  as Super :  $P_0=0$ ,  $P_1=0.68$  Kg. and  $P_2=1.36$  Kg/tree.  
(2) 3 levels of  $K_2O$  as  $K_2SO_4$  :  $K_0=0$ ,  $K_1=0.45$  and  $K_2=0.91$  Kg/tree.  
(3) 2 levels of N as A/S :  $N_1=0.68$  and  $N_2=1.36$  Kg/tree.  
(4) 2 levels of F.Y.M. :  $F_0=0$  and  $F_1=45.4$  Kg/tree.

Sub-plot treatments :

2 levels of lime :  $L_0=0$  and  $L_1$  = Lime sufficient to bring the pH to 6.5.

3. DESIGN :

- (i) Split-plot confd. (ii) 6 main plots/block, 6 blocks/replication, 2 sub-plots/main plot. (iii) 1 (iv) (a) 21.34 m. × 21.34 m. (b) 4. (v) One common guard row is kept.

4. GENERAL :

- (i) Normal (ii) Nil (iii) Height, Spread and girth. (iv) 1965—contd. (v) to (viii) Nil.

5. RESULTS :

Height

- (i) 266 cm/tree. (ii) (a) 34.4 cm/tree. (b) 21.3 cm/tree. (iii) Interaction L × N alone is significant. (iv) Mean height in cm/tree.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
L <sub>0</sub>	269	261	260	262	262	266	275	253	263	264	264
L <sub>1</sub>	271	273	261	278	260	267	267	269	268	268	268
Mean	270	267	260	270	261	267	271	261	266	266	266
F <sub>0</sub>	262	270	265	266	262	269	272	259			
F <sub>1</sub>	278	264	256	274	260	264	269	263			
N <sub>1</sub>	271	276	265	265	272	276					
N <sub>2</sub>	269	258	256	275	260	267					
K <sub>0</sub>	275	244	291								
K <sub>1</sub>	265	276	242								
K <sub>2</sub>	271	281	248								

C.D. for L means at the same level of N=1.9 cm/tree

C.D. for N means at the same level L = 2.1 cm/tree

#### Girth of scion

(i) 43 cm/tree. (ii) (a) 5.5 cm/tree. (b) 3.9 cm/tree. (iii) None of the effects is significant. (iii) Mean girth of scion in cm/tree.

	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	Mean
L <sub>0</sub>	45	43	41	43	42	44	44	42	43	43	43
L <sub>1</sub>	44	43	42	46	41	42	43	43	43	43	43
Mean	44	43	42	44	42	43	44	42	43	43	43
F <sub>0</sub>	43	43	43	44	42	43	43	43			
F <sub>1</sub>	44	43	42	44	42	43	44	42			
N <sub>1</sub>	44	44	44	44	43	44					
N <sub>2</sub>	44	42	40	44	41	42					
K <sub>0</sub>	46	41	45								
K <sub>1</sub>	43	44	40								
K <sub>2</sub>	43	44	42								

Crop :- Mango.

Ref :- Mh. 61(91), 62(78),  
63(119), 64(104), 65(90).

Site :- Regional Fruit Res. Sub-Stn., Vengurla.

Type :- 'C'.

Object :- To study the effect of different root stocks on the growth of Mango.

## 1. BASAL CONDITIONS :

(i) Fallow. (ii) Laterite. (iii) Inarch grafting. (iv) As per treatments. (v) August, 60, 10.67 m. x 10.67 m.  
 (vi) One year. (vii) to (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Observations taken during April and  
 May of every year. Trees not bearing.

## 2. TREATMENTS :

8 root stocks : T<sub>1</sub>=Alphonso, T<sub>2</sub>=Pairi, T<sub>3</sub>=Shahbuddin, T<sub>4</sub>=Seedlings (mix), T<sub>5</sub>=Neelam, T<sub>6</sub>=Totapuri,  
 T<sub>7</sub>=Vilai calumbon and T<sub>8</sub>=Peshwa.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 3. (v) One row.

## 4. GENERAL :

(i) Normal. (ii) Mealy bugs and Shoot borer at the time of new growth of leaves for 61; Nil for others.  
 (iii) Height and girth. (iv) 1961—contd. (v) to (viii) Nil.

## 5. RESULTS :

61(91)

## Height

(i) 51.5 cm./tree. (ii) 25.7 cm./tree. (iii) Treatment differences are not significant. (iv) Av. height  
 in cm./tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Mean height	33.8	69.8	30.8	56.8	62.8	61.1	57.2	39.6

## Scion girth.

(i) 4.2 cm./tree. (ii) 1.8 cm./tree. (iii) Treatment differences are not significant. (iv) Av. scion girth  
 in cm./tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Mean scion	2.2	5.7	2.6	4.3	5.2	5.3	4.9	3.3

## Stock girth.

(i) 5.6 cm./tree. (ii) 2.7 cm./tree. (iii) Treatment differences are not significant. (iv) Av. stock girth  
 in cm./tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Mean stock girth	3.3	7.3	4.1	6.2	6.6	7.1	6.5	3.6

62(78)

## Height

(i) 116.2 cm./tree. (ii) 17.1 cm./tree. (iii) Treatment differences are not significant. (iv) Av. height in  
 cm./tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. height	110.6	113.2	126.9	117.5	124.0	115.6	115.8	105.8

## Scion girth

(i) 13.0 cm./tree. (ii) 1.7 cm./tree. (iii) Treatment differences are not significant. (iv) Av. scion girth  
 in cm./tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. scion girth	11.6	12.7	14.2	13.2	13.5	14.1	13.0	12.0

## Stock girth

(i) 16.2 cm./tree. (ii) 2.2 cm./tree. (iii) Treatment differences are not significant. (iv) Av. stock girth  
 in cm./tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. stock girth	15.0	15.8	17.8	16.1	16.5	16.9	15.8	15.4

## 63(119)

## Height

(i) 150.3 cm./tree. (ii) 20.2 cm./tree. (iii) Treatment differences are not significant. (iv) Av. height in cm./tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. height	136.2	151.7	160.6	155.0	158.6	150.2	148.3	141.7

## Scion girth

(i) 20.6 cm./tree. (ii) 2.2 cm./tree. (iii) Treatment differences are not significant. (iv) Av. scion girth in cm./tree

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. scion girth	18.5	20.5	22.7	21.2	21.6	20.8	19.8	20.1

## Stock girth

(i) 23.1 cm./tree. (ii) 2.5 cm./tree. (iii) Treatment differences are not significant. (iv) Av. stock girth in cm./tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. stock girth	20.9	22.8	25.2	23.3	24.3	23.2	23.2	21.6

## 64(104)

## Height

(i) 188.1 cm./tree. (ii) 22.9 cm./tree. (iii) Treatment differences are not significant. (iv) Av. height in cm./tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. height	168.9	195.8	193.1	193.8	196.5	193.1	184.1	179.2

## Scion girth

(i) 29.4 cm./tree. (ii) 3.31 cm./tree. (iii) Treatment differences are not significant. (iv) Av. scion girth in cm./tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. yield	27.1	29.5	31.6	30.6	31.3	29.7	27.5	28.0

## Stock girth

(i) 32.6 cm./tree. (ii) 4.0 cm./tree. (iii) Treatment differences are not significant. (iv) Av. stock girth in cm./tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. stock girth	29.5	32.8	34.5	34.2	34.1	33.0	31.9	30.9

## 65(90)

## Volume in cubic metres

(i) 24.8 cu. metres/tree. (ii) 6.34 cu. metres/tree. (iii) Treatment differences are not significant. (iv) Mean volume in cu. metres/tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Mean volume	19.1	31.4	27.5	24.5	26.6	26.3	20.6	22.4

## Scion girth

(i) 39.8 cm./tree. (ii) 4.68 cm./tree. (iii) Treatment differences are not significant. (iv) Av. scion girth in cm./tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Mean girth	38.6	43.1	41.3	39.2	38.8	41.7	36.9	38.9

**Stock girth**

(i) 46.9 cm./tree. (ii) 5.08 cm./tree. (iii) Treatment differences are not significant. (iv) Mean girth in cm./tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Mean girth	42.8	53.8	46.1	47.6	44.2	47.8	48.0	44.9

**Crop :- Mosambi.**

**Ref :- Mh. 62(136), 63(177), 64(149).**

**Site :- Govt. Fruit Exptl. Farm, Poona. Type :- 'CV'.**

**Object :-** To investigate into the cause of die back disease and to find out remedies against it.

**1. BASAL CONDITIONS :**

(i) Nilwa Jowar for fodder, no manuring. (ii) Medium black. (iii) Transplanting seedlings. (iv) As per treatments. (v) 3, 4, 7.59; transplanted with 6'10 m. x 6'10 m. (vi) 2 years. (vii) At the time of planting pits of sizes 30 cm. x 30 cm. x 30 cm. were dug and were filled with dry leaves with 4.5 Ka., B.M. at 2.3 Kg. and F.Y.M. with 9.1 Kg. (viii) and (ix) Nil. (x) Irrigated. (xi) 59.9 cm.; 61.5 cm.; 67.1 cm. (xii) November to January.

**2. TREATMENTS :**

**Main-plot treatments :**

14 root stocks : V<sub>1</sub>=Rangpur lime, V<sub>2</sub>=Jamberi Bombay, V<sub>3</sub>=Karna khatta, V<sub>4</sub>=Solmya Dong, V<sub>5</sub>=Billi Ki chilli, V<sub>6</sub>=Sour orange, V<sub>7</sub>=Pani jamir, V<sub>8</sub>=Bengal citron, V<sub>9</sub>=Ada Jamir, V<sub>10</sub>=Jamberi Kodur, V<sub>11</sub>=Atlantic, V<sub>12</sub>=Herale, V<sub>13</sub>=Whenny grape fruit and V<sub>14</sub>=Mosambi.

**Sub-plot treatments :**

3 scion : S<sub>1</sub>=Deesa, S<sub>2</sub>=Nucellar and S<sub>3</sub>=Ganeshkhind.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 14 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 2. (v) Yes.

**4. GENERAL :**

(i) Good. (ii) Nil. (iii) Height and girth measurements. (iv) 1962—contd. (v) to (vii) Nil. (viii) Girth height observations for 65—N.A.

**5. RESULTS :**

**62(136)**

**Girth measurements**

(i) 5.7 cm./tree. (ii) (a) 1.71 cm./tree. (b) 1.43 cm./tree. (iii) Main effects of V and S are highly significant. (iv) Mean girth in cm./tree.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>
S <sub>1</sub>	6.1	7.4	7.2	7.7	6.8	2.9	4.6
S <sub>2</sub>	7.9	7.2	7.6	7.4	7.6	6.1	5.2
S <sub>3</sub>	6.6	7.4	4.5	9.0	7.1	4.3	2.9
Mean	6.9	7.3	6.4	8.0	7.2	4.4	4.2

  

V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	V <sub>11</sub>	V <sub>12</sub>	V <sub>13</sub>	V <sub>14</sub>	Mean
3.0	6.5	7.7	3.6	2.7	3.1	6.6	5.4
6.1	6.6	7.9	5.5	4.5	5.6	6.0	6.5
2.7	4.6	7.7	3.1	2.1	2.4	6.5	5.1
3.9	5.9	7.8	4.1	3.2	3.7	6.4	5.7

C.D. for V marginal means=1.4 cm./tree.  
C.D. for S marginal means=0.5 cm./tree.

**Height measurements**

(i) 209.5 cm./tree. (ii) (a) 60.0 cm./tree. (b) 53.8 cm./tree. (iii) Main effects of V and S are highly significant. (iv) Mean height in cm./tree.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>
S <sub>1</sub>	211.2	276.2	253.1	278.7	249.4	135.6	175.6
S <sub>2</sub>	272.5	285.0	290.6	293.1	280.6	213.1	210.6
S <sub>3</sub>	233.1	255.0	153.1	299.4	243.7	156.2	104.4
Mean	238.9	272.1	232.3	290.4	257.9	168.3	163.5

  

V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	V <sub>11</sub>	V <sub>12</sub>	V <sub>13</sub>	V <sub>14</sub>	Mean
129.4	224.4	265.0	150.0	100.0	125.0	232.5	200.4
230.0	279.6	285.0	207.5	207.5	205.6	232.5	249.5
100.6	177.5	240.0	123.1	83.7	103.7	223.1	178.7
153.3	227.2	263.3	160.2	130.4	146.4	229.4	209.5

C.D. for V marginal means = 49.5 cm./tree.

C.D. for S marginal means = 19.9 cm./tree.

63(177)

**Girth measurements**

(i) 24.9 cm./tree. (ii) (a) 5.8 cm./tree. (b) 5.6 cm./tree. (iii) Main effects of V, S and interaction V × S are highly significant. (iv) Mean girth in cm./tree.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>
S <sub>1</sub>	28.8	34.1	31.0	34.7	31.9	1.2	25.0
S <sub>2</sub>	38.4	38.1	32.4	35.4	33.1	19.6	22.5
S <sub>3</sub>	29.5	34.4	22.6	34.9	36.0	8.7	12.7
Mean	32.2	35.5	28.7	35.0	33.7	9.9	20.0

  

V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	V <sub>11</sub>	V <sub>12</sub>	V <sub>13</sub>	V <sub>14</sub>	Mean
14.7	28.7	35.5	18.4	0.0	6.7	33.5	23.2
21.7	31.2	41.4	26.7	14.9	15.0	31.5	28.7
13.0	24.4	35.0	13.2	4.9	18.5	31.7	22.8
16.5	28.1	37.3	19.4	6.6	13.4	32.2	24.9

C.D. for V marginal means = 4.8 cm./tree.

C.D. for S marginal means = 2.1 cm./tree.

C.D. for S means at the same level of V = 7.7 cm./tree.

C.D. for V means at the same level of S = 7.9 cm./tree.

**Height measurements**

(i) 235.7 cm./tree. (ii) (a) 46.6 cm./tree. (b) 54.9 cm./tree. (iii) Main effects of V and S are highly significant. Interaction V × S is significant. (iv) Mean height in cm./tree.



	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>
S <sub>1</sub>	247.5	307.9	286.0	313.0	293.6	18.5	239.2
S <sub>2</sub>	374.4	368.0	326.1	366.6	333.6	211.2	253.7
S <sub>3</sub>	273.7	321.7	214.9	295.6	323.0	92.7	126.7
Mean	298.5	332.5	275.7	325.1	316.7	107.5	206.6

V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	V <sub>11</sub>	V <sub>12</sub>	V <sub>13</sub>	V <sub>14</sub>	Mean
150.9	261.0	293.0	170.6	0.00	63.7	310.5	211.1
210.0	344.2	350.5	230.4	166.9	166.7	293.0	285.4
138.5	225.5	304.9	129.7	51.5	186.7	266.9	210.9
166.4	276.9	316.1	176.9	72.8	139.1	290.1	235.8

C.D. for V marginal means = 38.5 cm./tree.

C.D. for S marginal means = 20.3 cm./tree.

C.D. for S means at the same level of V = 76.0 cm./tree.

C.D. for V means at the same level of S = 73.4 cm./tree.

64(149)

#### Girth measurements

- (i) 29.2 cm./tree. (ii) (a) 6.7 cm./tree (b) 6.7 cm./tree. (iii) Main effects of V and S are highly significant. (iv) Mean girth in cm./tree.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>
S <sub>1</sub>	34.5	30.5	34.5	42.9	33.2	1.7	33.1
S <sub>2</sub>	39.1	44.7	41.7	47.4	41.2	24.2	35.6
S <sub>3</sub>	39.6	40.7	23.9	40.4	40.9	12.1	16.1
Mean	37.7	41.7	33.4	43.5	38.4	12.7	28.3

V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	V <sub>11</sub>	V <sub>12</sub>	V <sub>13</sub>	V <sub>14</sub>	Mean
17.6	33.2	39.9	18.5	0.0	7.7	40.2	26.9
27.5	40.1	46.9	29.6	15.7	15.6	39.0	34.9
13.9	29.4	40.5	15.7	2.2	10.5	36.1	25.9
19.7	34.2	42.4	21.3	6.00	11.3	38.4	29.2

C.D. for V marginal means = 5.5 cm./tree.

C.D. for S marginal means = 2.5 cm./tree.

#### Height measurements

- (i) 244.6 cm./tree. (ii) (a) 53.4 cm./tree (b) 60.9 cm./tree. (iii) Main effects of V and S are highly significant. (iv) Mean height in cm./tree.

	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>
S <sub>1</sub>	283.0	300.5	302.7	325.0	307.0	19.5	250.4
S <sub>2</sub>	331.1	409.9	341.6	391.7	350.5	199.2	309.2
S <sub>3</sub>	326.9	305.9	214.9	303.6	330.5	97.5	134.7
Mean	313.7	338.7	286.4	340.1	329.3	105.4	231.5

V <sub>8</sub>	V <sub>9</sub>	V <sub>10</sub>	V <sub>11</sub>	V <sub>12</sub>	V <sub>13</sub>	V <sub>14</sub>	Mean
154.6	274.2	301.9	178.0	0.0	70.0	321.7	220.6
235.5	343.6	379.2	236.0	171.2	143.2	313.0	296.8
123.7	312.2	301.7	152.9	15.0	128.7	281.0	216.4
171.3	310.0	327.6	188.9	62.1	114.0	305.2	244.6

C.D. for V marginal means=44.1 cm./tree.

C.D. for S marginal means=22.6 cm./tree.

**Crop :- Banana.**

**Ref :- Mh. 62(90), 63(134), 64(257).**

**Site :- Banana Res. Stn., Savada.**

**Type :- 'M'.**

**Object:—**To study the effect of time of application of Nitrogenous fertilizers at different phases of growth on the yield of Banana.

#### 1. BASAL CONDITIONS:

(i) N.A. (ii) Medium black. (iii) Vegetative (suckers). (iv) Basirai. (v) 15.7.51; furrow method with 152 cm. x 152 cm. (vi) —. (vii) 6.8 Kg/plant of F.Y.M. (viii) Earthing and weeding. (ix) Nil. (x) Irrigated. (xi) N.A. (xii) July 62 to Feb., 63; July to March for others.

#### 2. TREATMENTS:

6 manurial treatments T<sub>1</sub>=Full dose of N at 560.4 Kg/ha., T<sub>2</sub>=T<sub>1</sub>+560.4 Kg/ha. of K<sub>2</sub>O at planting, T<sub>3</sub>=T<sub>1</sub>+560.4 Kg/ha. of K<sub>2</sub>O at the beginning of phase C, T<sub>4</sub>=280 Kg/ha. of N at phase A+186.1 Kg/ha. of N at the beginning of phase B+94.1 Kg/ha. of N at the beginning of phase C, T<sub>5</sub>=280 Kg/ha. of N at phase A+186.1 Kg/ha. of N at the beginning of phase B+94.1 Kg/ha. of N at the beginning of phase C+560.4 Kg/ha. of K<sub>2</sub>O at planting and T<sub>6</sub>=280 Kg/ha. of N at phase A+186.1 Kg/ha. of N at the beginning of phase B+94.1 Kg/ha. of N at the beginning of phase C+560.4 Kg/ha. of K<sub>2</sub>O at the beginning of C.

#### 3. DESIGN:

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a)— (b) 3. (v) Yes.

#### 4. GENERAL:

(i) No. ma'. (ii) Nil. (iii) Weight of bunches. (iv) 1962 to 64. (v) No. (vi) to (viii) Nil.

#### 5. RESULTS:

62(90)

(i) 16.5 Kg/plant. (ii) 1.57 Kg/plant. (iii) Treatment differences are not significant. (iv) Av. yield of banana in Kg/plant.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>
Av. weight	15.9	17.8	16.0	16.1	16.9	16.2

63(134)

(i) 21.5 Kg/plant. (ii) 1.67 Kg/plant. (iii) Treatment differences are not significant. (iv) Av. weight of banana in Kg/plant.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>
Av. weight	20.2	21.9	21.9	21.4	23.6	20.2

64(257)

(i) 11.7 Kg/plant. (ii) 2.23 Kg/plant. (iii) Treatment differences are not significant. (iv) Av. weight of banana in Kg/plant.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>
Av. weight	10.1	13.3	11.1	10.2	13.2	12.3

**Crop :- Banana.**

**Site :- Fruit Experimental Station, Poona.**

**Ref :- Mh. 63(182).**

**Type :- 'CM'.**

Object :—To find out the optimum requirement of N, P, K and F.Y.M. with different spacings.

#### 1. BASAL CONDITIONS :

(i) Fallow. (ii) Medium black (iii) By suckers. (iv) Basarai. (v) 4.7.63 spacing as per treatments. (vi) N.A. (vii) Nil. (viii) Weeding Desuckering. (ix) Nil. (x) Irrigated 8—12 days interval. (xi) 128.6 cm. (xii) 20.8, 64 to 29.3, 65.

#### 2. TREATMENTS :

##### Main-plot treatments :

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

- (1) 2 levels of F.Y.M. : F<sub>1</sub>=50 and F<sub>2</sub>=100 C.L./ha.
- (2) 2 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub>=0 and P<sub>1</sub>=560 Kg/ha.
- (3) 2 levels of K<sub>2</sub>O as Mur. Pot. : K<sub>0</sub>=0 and K<sub>1</sub>=560 Kg/ha.
- (4) 2 spacings: S<sub>1</sub>=122 cm. × 122 cm. and S<sub>2</sub>=183 cm. × 183 cm.

##### Sub-plot treatments :

5 levels of N as A/3 : N<sub>0</sub>=0, N<sub>1</sub>=233, N<sub>2</sub>=843, N<sub>3</sub>=1400 and N<sub>4</sub>=1960 Kg/ha.

#### 3. DESIGN :

(i) Split-plot confd. (ABCD is confounded in main plot). (ii) (a) 2 blocks/replication ; 8 main-plots/block 5 sub-plot/main-plot. (b) 73.20 m. × 29.28 m. (iii) Two. (iv) (a) 3.66 m. × 3.66 m. (b) 6 plants/plot for S<sub>1</sub> and 4 plants/plot for S<sub>2</sub>. (v) 133 cm. × 183 cm. (vi) Yes.

#### 4. GENERAL :

(i) Good. (ii) Nil. (iii) No. of fingers, no. of hands, no. of bunds. (iv) (a) and (b) Nil. (v) Savda. (vi) and (vii) Nil.

#### 5. RESULTS :

(i) 14.9 Kg/plant. (ii) (a) 6.51 Kg/plant. (b) 4.59 Kg/plant. (iii) Main effect a of F alone is significant. (iv) Av. yield of banana fruits Kg/plant.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	P <sub>0</sub>	P <sub>1</sub>	K <sub>0</sub>	K <sub>1</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
F <sub>1</sub>	8.1	9.3	9.3	9.5	8.0	8.0	9.6	9.6	8.0	9.5	8.2	8.8
F <sub>2</sub>	22.8	21.4	17.8	22.1	21.1	21.0	21.1	20.7	21.4	19.5	22.6	21.1
Mean	15.4	15.4	13.5	15.8	14.5	14.5	15.4	15.2	14.7	14.5	15.4	14.9
S <sub>1</sub>	14.5	15.5	13.6	14.9	14.0	47.7	14.3	15.2	13.8			
S <sub>2</sub>	16.4	15.3	13.5	16.7	15.1	14.3	16.4	15.2	15.6			
K <sub>0</sub>	15.6	14.5	15.6	15.2	14.9	15.2	15.2					
K <sub>1</sub>	15.3	16.2	11.5	16.4	14.7	13.9	15.5					
P <sub>0</sub>	16.4	14.3	13.0	15.2	13.8							
P <sub>1</sub>	14.5	16.4	14.1	16.5	15.3							

C.D. for F marginal means=3.01 Kg/plant.

**Crop :- Banana.**

**Ref :- Mh. 61(118), 62(107).**

**Site :- Banana Res. Stn., Savda.**

**Type :- 'GM'.**

Object : To determine the optimum spacing adopted and to fix up the requirement of F.Y.M. and N,P, K fertilizers for Banana.

**1. BASAL CONDITIONS :**

(i) N.A. (ii) Medium black. (iii) Vegetative. (iv) Bisarai. (v) 17.61 and furrow method for 61 and 18 6.62 for 62 (vi) N.A. (vii) Nil. (viii) Weeding. (ix) Nil. (x) Irrigated. (xi) N.A. (xii) July 62 and Feb. 63 for 61 ; July, 63 and Feb., 64 for 62.

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

Same as in Expt. No. 63 (182) on Banana conducted at Poona and presented on page No. 543

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Height, girth and yield. (iv) 1961-63. (v) Poona. (vi) to (viii) Nil.

**5. RESULTS :**

61(118)

(i) 15.9 Kg/plant. (ii) (a) 4.62 Kg/plant. (b) 1.25 Kg/plant. (iii) Main effects of S and N are Significant. (iv) Av. yield of Banna in Kg/plant.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	P <sub>0</sub>	P <sub>1</sub>	K <sub>0</sub>	K <sub>1</sub>	S <sub>2</sub>	Mean	
F <sub>1</sub>	15.5	16.3	16.4	15.5	15.4	15.3	16.3	15.3	16.4	12.6	18.9	15.8
F <sub>2</sub>	17.2	15.6	15.8	15.9	15.5	15.9	16.1	15.8	16.1	12.7	19.1	16.0
Mean	16.3	15.9	16.1	15.7	15.4	15.6	16.2	15.6	16.2	12.8	19.0	15.9
S <sub>1</sub>	13.0	12.8	12.7	12.4	13.1	12.6	13.0	11.8	13.8			
S <sub>2</sub>	19.6	18.5	19.5	19.0	17.7	18.6	19.4	19.4	18.6			
K <sub>0</sub>	16.2	15.6	15.0	15.8	15.4	15.6	15.6					
K <sub>1</sub>	16.4	16.2	17.2	15.6	15.5	15.5	16.8					
P <sub>0</sub>	15.4	15.5	16.2	14.9	16.0							
P <sub>1</sub>	17.2	16.3	16.0	16.5	14.8							

C.D. for S marginal means=1.56 Kg/plant

C.D. for N marginal means=0.61 Kg/plant

62(107)

(i) 14.4 Kg/plant. (ii) (a) 5.91 Kg/plant. (b) 1.77 Kg/plant. (iii) Main effects of S, N and interaction S×F are highly significant. (iv) Av. yield of banana in Kg/plant.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	P <sub>0</sub>	P <sub>1</sub>	K <sub>0</sub>	K <sub>1</sub>	S <sub>1</sub>	S <sub>2</sub>	Mean
F <sub>1</sub>	14.1	14.7	13.6	13.9	12.5	14.3	13.3	13.6	14.0	10.9	16.7	13.8
F <sub>2</sub>	16.1	16.0	15.6	13.5	13.6	15.8	14.1	14.6	15.3	11.4	18.5	15.0
Mean	15.1	15.3	14.6	13.7	13.1	15.0	13.7	14.1	14.7	11.1	17.6	14.4
S <sub>1</sub>	10.5	12.3	11.6	10.7	10.6	12.8	9.4	10.4	11.7			
S <sub>2</sub>	19.7	18.3	17.7	16.7	15.6	17.2	18.0	17.8	17.7			
K <sub>0</sub>	14.3	14.5	14.8	13.7	13.2	14.9	13.3					
K <sub>1</sub>	15.9	16.1	14.4	13.7	13.0	15.1	14.1					
P <sub>0</sub>	16.7	16.1	14.8	14.2	13.2							
P <sub>1</sub>	13.5	14.5	14.4	13.2	13.0							

C.D. for S marginal means=2.01 Kg/plant.

C.D. for N marginal means=0.87 Kg/plant.

C.D. for body of S×F table=2.83 Kg/plant.

**Crop :- Grape.**

**Ref :- Mh. 65(92).**

**Site :- Fruit Res. Stn., Aurangabad.**

**Type :- 'P'.**

**Object :-** To find out the optimum interval of irrigation and effect of mulch in respect of growth, yield and quality of Grape.

**1. BASAL CONDITIONS :**

(i) Wheat and fodder crops were grown in this area. (ii) Medium black Soil. (iii) Rooted plants obtained from cutting. (iv) Anab-e-shahi (v) 4.2.61, 3.66 m.×7.31 m. (vi) 4 month old. (vii) N.A. (viii) As per treatments. (ix) Nil. (x) Irrigated. (xi) N.A. (xii) Feb., March 66.

**2. TREATMENTS :**

Treatments	Irrigation intervals in diff. season (in days)			
	Oct.-Jan.	Feb.-Mar.	Apr.-June	July-Sept.
T <sub>1</sub> =Low interval of Irrigation	10	6	4	15
T <sub>2</sub> =Medium interval with mulch	14	13	8	20
T <sub>3</sub> =Medium interval without mulch	14	10	8	20
T <sub>4</sub> =Longer interval of irrigation with mulch	18	14	12	25
T <sub>5</sub> =Longer interval irrigation without mulch	18	14	12	25

**3. DESIGN :**

(i) R.B.D (ii) 5. (b) N.A. (iii) 4. (iv) (a) 3.66 m.×14.63 m. (b) 2. (v) Yes. (vi) Yes.

**4. GENERAL :**

(i) Good. (ii) Anthracnose, Powdery mildew, Downey, mildew diseases, Thrips, Jassids, Flea beetles insects. Bordeaux mixture, Common Cosn, D.D.T. and Dimcron were used as control measures. (iii) No. of branches, No. of bunches, weight of bunches etc. (iv) (a) 1964 contd. (b) Nil. (v) to (vii) Nil.

## 5. RESULTS :

## 1. Girth

(i) 21.38 cm/tree. (ii) 1.24 cm/tree. (iii) Treatment differences are not significant. (iv) Mean girth in cm/tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>
Mean girth	21.50	21.80	20.90	20.60	22.13

## 2. Yield

(i) 38.1 Kg/tree. (ii) 7.23 Kg/tree. (iii) Treatment differences are significant. (iv) Av. yield in Kg/tree..

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>
Av. yield	32.1	46.6	29.5	56.2	26.3

C.D.=11.1 Kg/tree.

**Crop :- Cashewnut.**

**Ref :- Mh. 63(98), 64(89),  
65(192).**

**Site :- Regional Cashewnut Res. Stn., Vengurla. Type :- 'C'.**

Object :- To study the performance of Cashewnut seed lings with air layers and Inarch grafts.

## 1. BASAL CONDITIONS :

(i) Fallow. (ii) Laterite. (iii) As per treatments. (iv) Ansoor-I. (v) Planted in 59, 9.14 m. x 9.14m. spacings. (vi) One year. (vii) to (ix) Nil. (x) Unirrigated. (xi) N.A. for 63 and 64 ; 28.7 cm. (xii) N.A. for 63, 64 ; 1st March to 10th May, 66.

## 2. TREATMENTS :

3 cultural treatments : T<sub>1</sub>=Seed lings, T<sub>2</sub>=Air layers and. T<sub>3</sub>=Inarch grafts.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 2. (v) Nil.

## 4. GENERAL :

(i) Normal. (ii) Nil for 63 and 64 ; stock of teamosquits, D.D.T. sprayed (iii) Height and girth measurements. (iv) 1963—contd. (v) to (vii) Nil.

## 5. RESULTS :

63(98)

## Height

(i) 203 cm/tree. (ii) 19.9 cm/tree. (iii) Treatment differences are significant. (iv) Mean height in cm/tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. height	238	196	174

C.D.=34.5 cm/tree

## Girth

(i) 31.5 cm/tree. (ii) 1.6 cm/tree. (iii) Treatment differences are highly significant. (iv) Mean girth in cm/tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Mean girth	34.6	33.6	26.4

C.D.=2.8 cm/tree

64(89)

**Height**

(i) 229 cm/tree. (ii) 24.0 cm/tree. (iii) Treatment differences are significant. (iv) Av. height in cm/tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. height	266	229	202

C.D.=41.5 cm/tree

**Girth**

(i) 37.9 cm/tree. (ii) 2.0 cm/tree. (iii) Treatment differences are significant. (iv) Av. girth in cm/tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. girth	41.0	39.4	33.4

C.D.=3.4 cm/tree

65(192)

**Volume**

(i) 40.8 cubic metres/tree. (ii) 8.3 cubic metres/tree. (iii) Treatment differences are not significant. (iv) Mean volume in cubic metres/tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Mean volume	50.8	37.1	34.6

**Girth**

(i) 40.1 cm/tree. (ii) 1.6 cm/tree. (iii) Treatment differences are highly significant. (iv) Mean girth in cm/tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Mean girth	43.5	40.7	36.2

C.D.=2.8 cm/tree.

**Yield**

(i) 177 gm/tree. (ii) 103.1 gm/tree. (iii) Treatment differences are significant. (iv) Av. yield in gm/tree.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. yield	87	373	70

C.D.=178.4 gm/tree

**Crop :- Cashewnut.****Ref :- Mh. 62(76), 63(117),  
64(102)****Site :- Regional Cashewnut Res. Stn., Vengurla. Type :- 'CM'.**

Object:—To study the effect of cultural and manurial treatments on the field of Cashewnut (on plane ground).

**1. BASAL CONDITIONS :**

(i) Fallow. (ii) Laterite. (iii) Planted seeds. (iv) Kerala Elite. (v) Planted in August, 59, spacings as per treatments. (vi) N.A. (vii) to (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) During April and May.

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

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

(1) 3 spacings : S<sub>1</sub>=7.32m. × 4.88 m., S<sub>2</sub>=7.32 m. × 7.32 m. and S<sub>3</sub>=7.32 m. × 9.75 m(2) 3 levels of N : N<sub>0</sub>=0, N<sub>1</sub>=11.2 and N<sub>2</sub>=22.4 kg/ha.(3) 3 levels of F.Y.M. : F<sub>0</sub>=0, F<sub>1</sub>=2802 and F<sub>2</sub>=5604 kg/ha.**Sub-plot treatments :**2 cultural treatments : D<sub>0</sub>=No mulching and D<sub>1</sub>=Mulching.

## 3. DESIGN :

- (i) Split-plot confd. (ii) (a) 9 main-plots/block, 3 blocks/replication and 2 Sub-plots/main-plot. (b) N.A.  
 (iii) 1. (iv) (a) N.A. (b) 6, 8, 12 in wide, medium and low spacing respectively. (v) One. (vi) Yes.

## 4. GENERAL :

- (i) Normal. (ii) Nil. (iii) Height, girth and spread of trees. (iv) 1962—Contd. (v) to (viii) Nil.

## 5. RESULTS :

62(76)

## Height

- (i) 220 cm/tree. (ii) (a) 14.8 cm/tree. (b) 34.3 cm/tree. (iii) Main effect of N, F and interaction S×N and S×F are highly significant. (iv) Mean height in cm.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	Mean
D <sub>0</sub>	218	210	228	216	198	241	183	229	243	218
D <sub>1</sub>	216	223	227	207	223	237	179	225	262	222
Mean	217	216	227	212	210	239	181	227	252	220
F <sub>0</sub>	168	196	179	166	174	204				
F <sub>1</sub>	241	202	238	220	213	248				
F <sub>2</sub>	242	250	265	249	244	265				
N <sub>0</sub>	243	197	195							
N <sub>1</sub>	194	209	228							
N <sub>2</sub>	215	243	259							

C.D. for N or F marginal mean = 12.1 cm/tree

C.D. for body of S×N or S×F table = 20.9 cm/tree

## Girth

- (i) 26 cm/tree. (ii) (a) 4.42 cm/tree. (b) 3.52 cm/tree. (iii) Main effect of F is highly significant and that of N is significant. (iv) Mean girth in cm/tree.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	Mean
D <sub>0</sub>	26	25	28	24	26	28	20	29	29	26
D <sub>1</sub>	24	26	28	22	28	28	19	28	31	26
Mean	25	25	28	23	27	28	20	29	30	26
F <sub>0</sub>	18	21	20	16	20	23				
F <sub>1</sub>	28	25	33	27	30	29				
F <sub>2</sub>	28	30	31	28	30	32				
N <sub>0</sub>	24	22	24							
N <sub>1</sub>	25	25	30							
N <sub>2</sub>	25	30	30							

C.D. for F or N marginal mean = 3.6 cm/tree

## Spread

- (i) 229 cm/tree. (ii) (a) 52.3 cm/tree. (b) 29.7 cm/tree. (iii) Main effect of F is highly significant. Interaction S×N is significant. (iv) Mean spread in cm/tree.



	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	Mean
D <sub>0</sub>	201	229	236	220	210	235	169	244	252	222
D <sub>1</sub>	212	246	253	205	238	268	171	250	289	237
Mean	206	237	244	212	224	251	170	247	271	229
F <sub>0</sub>	135	190	186	140	170	200				
F <sub>1</sub>	237	241	254	245	238	258				
F <sub>2</sub>	248	281	284	252	264	296				
N <sub>0</sub>	216	209	212							
N <sub>1</sub>	195	231	247							
N <sub>2</sub>	208	272	274							

C.D. for F marginal means = 42.7 cm/tree

C.D. for body of S × N table = 74.0 cm/tree

63(117)

Height

(i) 255 cm/tree. (ii) (a) 34.3 cm/tree. (b) 41.5 cm/tree. (iii) Main effect F is highly significant and that of N is significant. (iv) Mean height in cm/tree.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	Mean
D <sub>0</sub>	237	263	269	255	233	282	217	266	285	256
D <sub>1</sub>	244	258	263	235	245	285	196	268	302	255
Mean	240	261	266	245	239	282	206	267	293	255
F <sub>0</sub>	183	224	214	191	202	227				
F <sub>1</sub>	270	246	286	272	241	288				
F <sub>2</sub>	270	313	299	272	274	335				
N <sub>0</sub>	254	240	241							
N <sub>1</sub>	227	234	256							
N <sub>2</sub>	241	307	301							

C.D. for F or N marginal means = 28.0 cm/tree

Girth

(i) 33 cm/tree. (ii) (a) 6.8 cm/tree. (b) 4.8 cm/tree. (iii) Main effect of F is highly significant. (iv) Mean girth in cm/tree

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	Mean
D <sub>0</sub>	30	34	34	31	30	37	25	35	38	33
D <sub>1</sub>	30	34	34	29	32	37	22	36	40	33
Mean	30	34	34	30	31	37	24	36	39	33
F <sub>0</sub>	21	25	25	22	23	26				
F <sub>1</sub>	34	34	39	35	35	38				
F <sub>2</sub>	34	43	39	34	36	47				
N <sub>0</sub>	30	29	32							
N <sub>1</sub>	30	30	33							
N <sub>2</sub>	29	43	38							

C.D. for F marginal means = 5.5 cm/tree

**Spread**

(i) 272 cm/tree. (ii) (a) 38.0 cm/tree. (b) 41.4 cm/tree. (iii) Main effect F is highly significant. Main effects of S, N, interactions S×N, D×S are significant. (iv) Mean spread in cm/tree.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	Mean
D <sub>0</sub>	247	271	276	367	257	282	210	272	313	265
D <sub>1</sub>	249	256	332	249	280	309	219	314	304	279
Mean	248	263	304	358	268	296	214	293	308	272
F <sub>0</sub>	161	227	256	184	200	260				
F <sub>1</sub>	295	276	310	261	306	313				
F <sub>2</sub>	290	288	347	312	300	314				
N <sub>0</sub>	271	233	253							
N <sub>1</sub>	231	260	315							
N <sub>2</sub>	243	296	345							

C.D. for S or N marginal means = 31.0 cm/tree  
 C.D. for body of S×N table = 53.6 cm/tree  
 C.D. for D means at the same level of S = 44.9 cm/tree  
 C.D. for S means at the same level of D = 62.9 cm/tree

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**Girth**

(i) 37 cm/tree. (ii) (a) 11.4 cm/tree. (b) 5.1 cm/tree. (iii) Interaction D×S alone is significant. (iv) Mean height in cm/tree.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	Mean
D <sub>0</sub>	35	34	42	33	36	41	34	37	39	37
D <sub>1</sub>	33	41	39	35	37	42	35	36	43	38
Mean	34	38	40	34	36	42	34	36	41	37
F <sub>0</sub>	34	33	36	33	36	34				
F <sub>1</sub>	29	39	43	36	32	42				
F <sub>2</sub>	40	41	42	33	42	49				
N <sub>0</sub>	34	33	35							
N <sub>1</sub>	29	41	40							
N <sub>2</sub>	39	39	46							

C.D. for D means at the same level of S = 5.5 cm/tree  
 C.D. for S means at the same level of D = 14.0 cm/tree

**Volume**

(i) 28 cubic metres/tree. (ii) (a) 11.8 cubic metres/tree. (b) 9.2 cubic metres/tree. (iii) Main effect of F is highly significant and that of S is significant. (iv) Mean volume in cubic metres/tree.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	Mean
D <sub>0</sub>	19	25	34	24	22	31	13	31	33	26
D <sub>1</sub>	22	31	39	25	27	39	15	37	39	30
Mean	20	28	36	24	25	35	14	34	36	28
F <sub>0</sub>	9	16	18	11	13	18				
F <sub>1</sub>	26	29	46	32	29	40				
F <sub>2</sub>	26	38	45	31	32	47				
N <sub>0</sub>	23	21	29							
N <sub>1</sub>	19	22	33							
N <sub>2</sub>	19	40	47							

**Crop :- Cashewnut.**

**Ref :- Mh. 62(69), 63(99),  
64(90), 65(234).**

**Site :- Regional Cashewnut Res. Stn., Vangurla Type :- 'CM'.**

**Object :-** To study the effect of cultural and manurial treatments on the yield of Cashewnut grown on hill slope.

**1. BASAL CONDITIONS**

(i) Fallow. (ii) Laterite. (iii) By seeds. (iv) Ansoor. (v) July, 58, As per treatments. (vi) —. (vii) to (ix) Nil. (x) Unirrigated. (xi) 28.4 cm. for 65 ; N.A. for others. (xii) April, May for 62 to 64 ; 1st March to 10th March, 66 for 65.

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

Same as in Expt. No. 62(76), 63(117), 64(102) on page No. 547.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Height, girth and spread of trees. (iv) 1962—Contd. (v) N.A. (vi) Nil. (vii) Nil.

**5. RESULTS :**

**62(69)**

**Height**

(i) 264 cm/tree. (ii) (a) 37.4 cm/tree. (b) 47.7 cm/tree. (iii) Main effect of F alone is highly significant. (iv) Mean height in cm/tree.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	D <sub>0</sub>	D <sub>1</sub>	Mean
S <sub>0</sub>	246	261	272	222	284	273	258	261	260
S <sub>1</sub>	235	256	275	232	266	268	252	259	255
S <sub>2</sub>	251	313	264	228	331	270	288	264	276
Mean	244	277	270	227	294	270	266	261	264
D <sub>0</sub>	236	295	267	222	308	269			
D <sub>1</sub>	252	258	274	233	279	271			
F <sub>0</sub>	206	237	239						
F <sub>1</sub>	275	321	284						
F <sub>2</sub>	250	272	288						

C.D. for F marginal means = 30.6 cm/tree

**Girth**

(i) 39 cm/tree. (ii) (a) 2.6 cm/tree. (b) 2.4 cm/tree. (iii) Main effects of F and D are highly significant and that of N is significant. (iv) Mean girth in cm/tree.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	D <sub>0</sub>	D <sub>1</sub>	Mean
S <sub>1</sub>	36	40	40	29	43	43	37	40	38
S <sub>2</sub>	38	38	45	31	45	45	38	43	40
S <sub>3</sub>	38	39	39	31	46	40	38	40	39
Mean	37	39	41	30	45	43	38	41	39
D <sub>0</sub>	36	37	40	29	42	42			
D <sub>1</sub>	39	40	43	32	47	43			
F <sub>0</sub>	27	33	32						
F <sub>1</sub>	43	44	47						
F <sub>2</sub>	42	40	45						

C.D. for F or N marginal means = 2.2 cm/tree

C.D. for D marginal means = 1.4 cm/tree

**Spread**

(i) 350 cm/tree. (ii) (a) 51.3 cm/tree. (b) 28.9 cm/tree. (iii) Main effects of F and D are highly significant. (iv) Mean girth in cm/tree.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	D <sub>0</sub>	D <sub>1</sub>	Mean
S <sub>1</sub>	301	347	354	246	396	358	317	350	333
S <sub>2</sub>	350	364	385	291	411	397	354	378	366
S <sub>3</sub>	332	363	354	268	413	368	329	370	350
Mean	328	358	364	268	407	374	323	366	350
P <sub>1</sub>	312	343	345	253	390	358			
P <sub>2</sub>	343	373	383	284	423	392			
F <sub>0</sub>	224	302	280						
F <sub>1</sub>	393	407	419						
F <sub>2</sub>	366	365	393						

C.D. for F marginal means = 42.3 cm/tree

C.D. for D marginal means = 18.1 cm/tree

66(99)

**Height**

(i) 281 cm/tree. (ii) (a) 25.3 cm/tree. (b) 16.1 cm/tree. (iii) Main effect of F alone is highly significant. (iv) Mean height in cm/tree.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	D <sub>0</sub>	D <sub>1</sub>	Mean
S <sub>1</sub>	279	285	291	246	309	300	281	289	285
S <sub>2</sub>	259	283	303	259	291	294	280	284	282
S <sub>3</sub>	283	303	298	264	311	310	297	293	295
Mean	274	290	297	256	304	301	286	289	287
D <sub>0</sub>	272	294	292	252	302	304			
D <sub>1</sub>	275	288	303	260	306	299			
F <sub>0</sub>	237	267	265						
F <sub>1</sub>	304	304	304						
F <sub>2</sub>	280	301	323						

C.D. for F marginal means = 20.6 cm/tree

Girth

(i) 44 cm/tree. (ii) (a) 0.80 cm/tree. (b) 3.7 cm/tree. (iii) Main effects of S, N, F, and interactions S × N, N × F, S × F are highly significant. (iv) Mean girth in cm/ tree.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	D <sub>0</sub>	D <sub>1</sub>	Mean
S <sub>1</sub>	40	43	42	33	48	45	40	44	42
S <sub>2</sub>	43	43	49	34	51	49	42	47	45
S <sub>3</sub>	43	46	44	35	52	46	44	45	44
Mean	42	44	45	34	50	47	42	45	44
D <sub>0</sub>	41	43	43	33	48	46			
D <sub>1</sub>	43	44	48	36	52	48			
F <sub>0</sub>	31	36	36						
F <sub>1</sub>	49	49	52						
F <sub>2</sub>	45	46	48						

C.D. for S, N or F marginal means = 0.7 cm/tree

C.D. for body of S × N, S × F or N × F table = 1.1 cm/tree

Spread

(i) 391 cm/tree. (ii) (a) 32.1 cm/tree. (b) 37.0 cm/tree. (iii) Main effects of F, N and D are highly significant. (iv) Mean spread in cm/tree.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	D <sub>0</sub>	D <sub>1</sub>	Mean
S <sub>1</sub>	343	385	405	289	429	415	359	397	378
S <sub>2</sub>	392	363	438	305	442	446	372	423	397
S <sub>3</sub>	366	409	417	309	479	405	388	407	398
Mean	367	386	420	301	450	422	373	409	391
D <sub>0</sub>	354	371	393	281	429	408			
D <sub>1</sub>	380	399	447	320	471	436			
F <sub>0</sub>	272	308	322						
F <sub>1</sub>	425	441	484						
F <sub>2</sub>	405	407	453						

C.D. for F or N marginal means = 2.6 cm/tree

C.D. for D marginal means = 2.3 cm/tree

64(90)

## Volume

(i) 60 cubic metres/tree. (ii) (a) 38.8 cubic metres/tree. (b) 25.7 cubic metres/tree. (iii) None of the effects is significant. (iv) Mean volume in cubic metres/tree.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	D <sub>0</sub>	D	Mean
S <sub>1</sub>	48	51	66	52	46	66	51	55	55
S <sub>2</sub>	58	57	70	41	75	69	55	69	62
S <sub>3</sub>	43	84	67	47	63	83	58	71	64
Mean	50	64	68	47	61	73	55	66	60
D <sub>0</sub>	45	55	65	43	54	67			
D <sub>1</sub>	55		71	51	69	79			
F <sub>0</sub>	43	54	43						
F <sub>1</sub>	64	49	72						
F <sub>2</sub>	43	88	89						

## Girth

(i) 47 cm/tree. (ii) (a) 10.1 cm/tree. (b) 4.4 cm/tree. (iii) None of the effects is significant. (iv) Mean girth in cm/tree.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	D <sub>0</sub>	D <sub>1</sub>	Mean
S <sub>1</sub>	42	42	51	46	40	50	45	46	45
S <sub>2</sub>	44	52	50	40	53	53	48	50	49
S <sub>3</sub>	45	51	49	43	53	48	37	49	48
Mean	44	48	50	43	49	50	47	48	47
D <sub>0</sub>	43	49	48	43	47	51			
D <sub>1</sub>	45	48	52	44	51	50			
F <sub>0</sub>	42	46	42						
F <sub>1</sub>	47	46	52						
F <sub>2</sub>	43	53	56						

65(234)

## Girth

(i) 42 cm/tree. (ii) (a) 7.4 cm/tree. (b) 6.1 cm/tree. (iii) Main effect of F alone is highly significant. (iv) Mean girth in cm/tree.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	D <sub>0</sub>	D <sub>1</sub>	Mean
S <sub>1</sub>	37	38	38	28	42	43	36	39	38
S <sub>2</sub>	40	39	48	34	44	49	41	44	42
S <sub>3</sub>	43	46	50	35	53	51	45	47	46
Mean	40	41	45	32	46	48	41	43	42
D <sub>0</sub>	39	38	45	32	45	46			
D <sub>1</sub>	40	43	46	32	48	50			
F <sub>0</sub>	31	32	35						
F <sub>1</sub>	45	45	48						
F <sub>2</sub>	45	46	53						

C.D. for F marginal means=6.0 cm/tree

65(234)

**Volume**

(i) 34 cubic metres/tree. (ii) (a) 13.6 cubic metres/tree. (b) 12.4 cubic metres/tree. (iii) Mean effect of S is significant and that of F is highly significant. (iv) Av. volume in cubic metres/ha.

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	F <sub>0</sub>	F <sub>1</sub>	F <sub>2</sub>	D <sub>0</sub>	D <sub>1</sub>	Mean
S <sub>1</sub>	30	22	22	11	31	32	24	26	25
S <sub>2</sub>	23	27	50	19	33	47	29	37	33
S <sub>3</sub>	38	42	51	21	55	53	41	46	43
Mean	30	30	41	17	40	44	31	36	34
D <sub>0</sub>	29	27	39	16	35	43			
D <sub>1</sub>	32	34	43	19	44	46			
F <sub>0</sub>	13	14	24						
F <sub>1</sub>	38	36	46						
F <sub>2</sub>	39	40	53						

C.D. for S or F marginal means=11.0 Cu. metres/tree.

**Crop :- Jowar, Tur (Kharif)**

**Ref :- Mh. 63(50), 64(41), 65(5).**

**Site :- Agri. Res. Stn., Achalpur.**

**Type :- 'X'.**

**Object :-** To study the effect of row sowing and mixed sowing.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) N.A. ; Cotton ; Cotton. (c) N.A. ; 24.71 C.L./ha. of F.Y.M. + 22.4 kg/ha. of N + 22.4 kg/ha. of P<sub>2</sub>O<sub>5</sub> ; 44.8 kg/ha. of N + 22.4 kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black. (iii) 5.7.63 ; 22.7.64 ; 22.7.65. (iv) (a) Heavy *bakherings* and harrowing. (b) Hand dibbling. (c) 7 kg/ha. (d) 46 cm. x 30 cm. (e) 1 to 2 (v) Nil. (vi) *Jowar*—NJ 156 and *Tur*—Hyderabad. (vii) Unirrigated. (viii) 2 weedings and 1 hoeing ; 2 weedings and 3 hoeings ; 3 hoeings and weedings. (ix) 39 cm. ; 67 cm. ; 52 cm. (x) *Jowar* on 4.12.63 ; 25.12.64 ; 29.11.65 and *Tur* on 9.12.63 ; 21.1.64 ; 8.1.66.

## 2. TREATMENTS :

8 crop mixtures :  $T_1$ =Entire *Jowar*,  $T_2$ =Entire *Tur* 91 cm. spacings,  $T_3$ =*Jowar* and *Tur* in 1:1 row,  $T_4$ =*Jowar* and *Tur* in 2:1 rows,  $T_5$ =*Jowar* and *Tur* in 3:1 rows,  $T_6$ =*Jowar* and *Tur* mixed in 1:1 and then sown,  $T_7$ =*Jowar* and *Tur* mixed in 2:1 and then sown and  $T_8$ =*Jowar* and *Tur* mixed in 3:1 and then sown

## 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  7.32 m. (b) 9.14 m.  $\times$  5.49 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory ; Satisfactory ; Normal. Heavy lodging in last week of October. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-67. (b) No. (c) No. (v) Akola. (vi) Nil ; Nil ; Due to lack of moisture in the soil yield is less. No yield of *Tur* in treatments mixed with *Jowar*. (vii) As the experiment is continued beyond 65, therefore individual year results are presented under 5 Results.

## 5. RESULTS :

63(50)

(i) 506 Rs/ha. (ii) 127.6 Rs/ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$	$T_8$
Av. value	577	509	548	514	534	469	448	446

64(41)

(i) 764 Rs/ha. (ii) 79.7 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$	$T_8$
Av. value	632	630	860	876	785	669	875	787

C.D.=117.2 Rs/ha.

65(5)

(i) 522 Rs/ha. (ii) 206.6 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$	$T_8$
Av. value	671	42	628	517	626	488	590	618

C.D.=303.9 Rs/ha.

Crop :- *Jowar* and *Black Gram*. (*Kharif*).

Ref :- Mh. 63(47), 64(40), 65(4).

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

Type :- 'X'.

Object :- To study the effect of row-sowing and mixed-sowing.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. ; Cotton ; Cotton. (c) N.A. ; 24.7 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$  ; 44.8 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$ . (ii) Medium black. (iii) 5.7.63 ; 22.7.64 ; 2-7.65. (iv) (a) Heavy and light *bakherings* ; Heavy *bakherings* and 2 harrowings ; Harrowings. (b) Dibbling. (c) 7 Kg/ha. (d) 46 cm.  $\times$  30 cm. (e) 1 to 2. (v) Nil. (vi) *Jowar*-NJ 156 ; *Black Gram*. 55. (vii) Unirrigated. (viii) 2 weedings and 1 hoeing ; 2 weedings and 3 hoeings ; 3 weedings and 3 hoeings (ix) 39 cm. ; 56 cm. ; 43 cm. (x) *Black Gram* on 8.9.63 ; Oct., 64 ; 7.10.65 and *Jowar* on 3.12.63 ; 25.12.64 ; 29.11.65.



## 2. TREATMENTS:

8 mixed cropping treatments :  $T_1$ =*Jowar* alone,  $T_2$ =*Udid* alone,  $T_3$ =*Jowar* and *Udid* in 1 : 1 row sowing,  $T_4$ =*Jowar* and *Udid* in 2 : 1 row sowing,  $T_5$ =*Jowar* and *Udid* in 3 : 1 row sowing,  $T_6$ =*Jowar* and *Udid* in 1 : 1 mixed and sown,  $T_7$ =*Jowar* and *Udid* in 2 : 1 mixed and sown and  $T_8$ =*Jowar* and *Udid* in 3 : 1 mixed and sown.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  7.32 m. (b) 9.14 m.  $\times$  5.49 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory 63 and 64 ; Normal and heavy lodging in last week in Oct. (ii) Nil. (iii) Yield of grain and its monetary return. (iv) (a) 1963-67. (b) No. (c) Nil. (v) Akola, Amravati, Buldhana, Dhulia, Jalgaon, Nagpur, Yeotmal. (vi) Nil ; Being a late sowing along with *Jowar*, the *Udid* crop did not fare well ; Due to shortage of soil moisture some plants produced smaller cobs and some plants did not produce at all. (vii) Since the expt. contd. beyond 65, the individual years results are given under 5. Results.

## 5. RESULTS :

63(47)

(i) 582 Rs/ha. (ii) 133.7 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$	$T_8$
Av. Produce	520	317	634	655	596	614	670	652

C.D. for treatment means=153 Rs/ha.

64(40)

(i) 660 Rs/ha. (ii) 126.3 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$	$T_8$
Av. value	655	133	782	806	736	719	774	677

C.D. for treatment means=186 Rs/ha.

65(41)

(i) 630 Rs/ha. (ii) 124.7 Rs/ha. (iii) Treatment difference are significant. (iv) Av. value of produce in Rs/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$	$T_8$
Av. value	602	365	759	619	673	705	656	658

C.D. for treatments means=183 Rs/ha.

**Crop :- Jowar and Moong (Kharif).**

**Ref :- Mh. 63(51), 64(42), 65(3).**

**Site :- Agri. Res. Stn., Achalpur.**

**Type :- 'X'.**

Object :—To study the effect of row sowing and mixed sowing.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. ; Cotton in 64 and 65. (c) N.A. ; 24.7 C.L./ha. of F.Y.M.+22.4 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$  ; 44.8 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Medium black 63, 64 and black cotton soil in 65. (iii) 5.7.63 ; 22.7.64 ; 21.7.65. (iv) (a) Heavy *bakhering* on 30.3.63 and 7.4.64 ; light *bakhering* on 19.6.63 and 3.7.65 ; 2 harrowings in 64 and harrowings in 65. (b) Dibbling by hand. (c) 7 Kg/ha. (d) 46 cm.  $\times$  30 cm. (e) 1 to 2. (v) Nil. (vi) *Jowar*—NJ 156 and *Moong*—Kopergaon. (vii) Unirrigated. (viii) 2 weedings and 2 to 3 hoeings. (ix) 39 cm. ; 67 cm. ; 43 cm. (x) *Jowar* on 3.12.63 ; 25.12.64 ; 29.11.65 and *Moong* on 1.9.63 ; Sept. 64 ; 28.9.65.

## 2. TREATMENTS :

8 mixed cropping treatments :  $T_1$ =*Jowar* alone,  $T_2$ =*Moong* alone,  $T_3$ =*Jowar* and *Moong* in 1 : 1 row sowing,  $T_4$ =*Jowar* and *Moong* in 2 : 1 row sowing,  $T_5$ =*Jowar* and *Moong* in 3 : 1 row sowing,  $T_6$ =*Jowar* and *Moong* in 1 : 1 mixed and then sown.  $T_7$ =*Jowar* and *Moong* in 2 : 1 mixed and then sown and  $T_8$ =*Jowar* and *Moong* in 3 : 1 mixed and then sown.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4, (iv) (a) 10'97 m. × 7'32 m. (b) 9'14 m. × 5'49 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory in 63 and 64; Heavy lodging in last week of Oct. 65. (ii) Nil. (iii) Final height of *Jowar* and grain yield (iv) (a) 1963 to 65. (b) No. (c) Results of the combined analysis are presented under 5. Results. (v) Akola, Badnapur, Buldhana, Dhulia, Nagpur. (vi) *Jowar* crop suffered a lot because of less rains at the time of grain formation; Being sown late along with *Jowar*, the *Moong* crop did not fare well Due to shortage of moisture in the soil, the plants produced smaller cobs. A number of plants did not produce the cobs at all. (vii) Error variances are heterogeneous and Treatment × years interaction is present.

## 5. RESULTS :

Pooled results

(i) 444 Rs/ha. (ii) 210.6 Rs/ha. (based on 14 d.f. made up of T treatment × years interaction). (iii) Treatments differences are highly significant. (iv) Av. valued of produce in Rs/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$	$T_8$
Av. produce	407	118	549	464	472	521	427	598

C.D. = 184 Rs/ha.

Individual results

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$	$T_8$	Sig.	G.M.	S.I. /plot
Year											
1963	429	263	749	547	523	571	459	555	**	512	95.7
1964	525	19	619	601	598	578	492	608	**	505	92.7
1965	267	72	278	241	294	415	331	631	*	316	79.1
Pooled	407	118	549	464	472	521	427	598	**	444	210.6

**Crop :- Jowar, Moong, Udid, Sann, (Kharif). Ref :- Mh. 63(199), 64(168), 65(2).**

**Site : Agri. Res. Stn., Achalpur.**

**Type :- 'X'.**

Object : To study the effect of mixed cropping of legumes and cereals on the yield of *Jowar*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) 22.4 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$ . (ii) Morand II. (iii) 5.7. 63; 22.7. 64; 11.7. 65 (iv) (a) Horrowings. (b) Drilling. (c) *Jowar* at 7 Kg/ha. and others N.A. (d) 46 cm. × 30 cm. (e) 1 to 2 (v) Nil. (vi) *Jowar*-NJ. 156; *Moong*-local; *Sann*-chind wara *Udid* 55. (vii) Unirrigated. (viii) 2 weedings and 1 hoeing. (x) 39 cm.; 67 cm.; 43 cm.; (ix) 4.12. 1963; 25.12. 1964; 22.9.65 to 27.11.65.

## 2. TREATMENTS :

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

(1) 3 leguminous crops mixed with *Jowar* :  $C_1$ =*Sann*,  $C_2$ =*Moong* and  $C_3$ =*Udid*.

(2) 3 methods of application : -  $M_1$ =Allowed to seed,  $M_2$ =Crops uprooted and spread between the rows of *Jowar* at the time of flowering and  $M_3$ =crops uprooted and buried between the rows of *Jowar*.

Leguminous crops and *Jowar* sown in alternate rows.

$T_1$ =*Jowar* alone and  $T_2$ =*Jowar* alone with double spacings.

In 63, extra treatment  $T_2$  was not tried.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 10 in 63 ; 11 in 64 and 65. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  7.32 m. (b) 9.14m.  $\times$  5.49 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-66. (b) No. (c) Nil. (v) Dhulia. (vi) Nil. (vii) As the experiment is continued beyond 65, therefore individual year results are presented under 5. Results.

## 5. RESULTS :

63(163)

(i) 396 Rs/ha. (ii) 150.5 Rs/ha. (iii) None of the effects is significant. (iv) Av. value of produce in Rs/ha.

$T_1=400$

	$C_1$	$C_2$	$C_3$	Mean
$M_1$	206	466	547	406
$M_2$	334	426	421	394
$M_3$	376	433	344	384
Mean	305	442	437	395

64(168)

(i) 684 Rs/ha. (ii) 134.5 Rs/ha. (iii) None of the effects is significant. (iv) Av. value of produce in Rs/ha.

$T_1=563$  and  $T_2=718$

	$C_1$	$C_2$	$C_3$	Mean
$M_1$	608	553	742	634
$M_2$	704	778	702	728
$M_3$	682	672	808	721
Mean	665	668	751	694

65(2)

(i) 643 Rs/ha. (ii) 221.5 Rs/ha. (iii) Main effect of C is highly significant and that of interaction  $C \times M$  is significant. (iv) Av. value of produce in Rs/ha.

T<sub>1</sub>=683 and T<sub>2</sub>=840

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	Mean
M <sub>1</sub>	139	811	845	599
M <sub>2</sub>	467	640	704	604
M <sub>3</sub>	686	631	629	649
Mean	431	694	726	617

C.D. for C marginal means = 184.7 Rs/ha.  
C.D. for the body of C × M table = 319.8 Rs/ha.

**Crop :- Cotton, Groundnut (Kharif).**

**Ref :- Mh. 65(6).**

**Site :- Agri. Res. Stn., Achalpur.**

**Type :- 'X'.**

**Object :-** To study the economic effect of sowing Groundnut and Cotton separately and mixed.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton. (c) 10 CL/ha. of F.Y.M. + 22.4 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Black cotton. (iii) 5.7.65. (iv) (a) Harrowing. (b) Dibbling. (c) Cotton, - 10 Kg/ha., Groundnut - 80 Kg/ha. (d) As per treatments between plants cotton - 30 cm. G. nut 15 cm. (e) 1 2 for cotton. (v) 22.4 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) Cotton = B 147, Groundnut = AK - 12 - 24 (vii) Unirrigated. (viii) 3 weedings and Hoeings. (ix) 43 cm. (x) G. = 18.10.65, Cotton = 17.11.65.

**2. TREATMENTS :**

T<sub>1</sub> = G. nut alone - 30 cm. spacing, T<sub>2</sub> = Cotton alone - 60 cm. spacing., T<sub>3</sub> = G. nut and cotton in 1 : 1 row 30 cm. spacing., T<sub>4</sub> = G. nut and cotton in 2 : 1 rows 30 cm. spacings., T<sub>5</sub> = G. nut and cotton in 3 : 1 row 30 cm. spacing., T<sub>6</sub> = G. nut and cotton in 3 : 1 row 30 cm. spacing.

**3. DESIGN:**

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 9.75 m. × 12.18 m. (b) 7.32 m × 9.75 m. (v) 122 cm. × 122 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Dusted BHC 10% and Sulphur. (iii) Yield of pods kapas, and their monetary return. (iv) (a) 1965 to 67. (b) No. (c) Nil. (v) to (vii) Nil.

**5. RESULTS :**

(i) 1153 Rs/ha. (ii) 2291 Rs/ha. (iii) None of the effects is significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>
Av. value	1121	897	1152	1325	1199	1227

**Crop :- Jowar, Tur (Kharif).**

**Ref :- Mh. 63(256), 65(110).**

**Site :- Agri. Res. Stn., Akota.**

**Type :- 'X'.**

**Object :-** To study the effect of row sowing and mixed sowing.

**1. BASAL CONDITIONS:**

(i) (a) Nil. (b) Cotton (c) 12.35 C.L./ha. of F.Y.M. + 44.8 Kg/ha. of N + 33.6 Kg/ha. of P<sub>2</sub>O<sub>5</sub>; 22.4 Kg/ha. of N + 11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub> (ii) Black cotton soil. (iii) 10.7.63; 11.7.65. (iv) (a) 4 harrowings. (b) Drilling. (c) Jowar - 9 Kg/ha. and Tur - 13 Kg/ha. (d) 46 cm. apart. (e) —. (v) 12.35 C.L./ha. of F.Y.M. (vi) Jowar - Improved Sooner and Tur - N. 148. (vii) Unirrigated. (viii) 2 hoeings and 1 weeding; 2 hoeings and 2 weedings. (ix) 50 cm.; 34 cm. (x) 31.12.63; 7.12.65.

## 2. TREATMENTS and 3. DESIGN:

Same as in Expt. Nos. 63(50), 64(41), 65(5) conducted at Achaipur and presented on page No. 555.

## 4. GENERAL:

(i) Normal. (ii) B.H.C. 10% dusted for Stem borer; Nil. (iii) Yield of grain. (iv) (a) 1963—67 (Expt. in 64 failed). (b) No. (c) Nil. (v) Amravati, Yeotmal. (vi) Nil. (vii) As the experiment is continued beyond 65 therefore results of individual years are presented under 5. Results.

## 5. RESULTS:

## 63(256)

(i) 334 Rs/ha. (ii) 65.3 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	216	425	372	315	302	381	369	529

C.D.=193.5 Rs/ha.

## 65(110)

(i) 917 Rs./ha. (ii) 164.3 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	981	478	1058	1030	1105	972	846	865

C.D.=483.1 Rs/ha.

**Crop :- Jowar, Moong (Kharif).**

**Ref :- Mh. 61(151), 62(147), 63(194),  
64(163), 65(133).**

**Site :- Agri. Res. Stn., Akola.**

**Type :- 'X'.**

**Object :-** To study the symbiotic and rotational effect of Cereals and Legumes in alternate drilling.

## 1. BASAL CONDITIONS:

(i) (a) As per treatments. (b) Gram in 61; *Jowar* and *Moong* for others. (c) 12.35 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> for 61; 12.35 C.L./ha. of F.Y.M. in 62 to 64; Nil in 65. (ii) Black cotton soil. (iii) 5.7.61; 8.7.62; 7.7.63; 16.7.64; 2.7.65. (iv) (a) Ploughing and 4 harrowings; 5 harrowings; 3 harrowings; 2 harrowings; 4 harrowings. (b) Drilling. (c) 9 Kg/ha. (d) 46 cm. × 23 cm. in 61; 46 cm. × 30 cm. in 62 to 64; 46 cm. in 65. (e) 1 to 2 for 61 to 64; Nil for 65. (v) 12.35 C.L./ha. of F.Y.M. broadcast before sowing. (vi) *Jowar*—Improved Saoner, *Moong*—Kopergaon. (vii) Unirrigated. (viii) 4 hoeings and 1 weeding; 3 hoeings and 1 weeding; weeding and 2 hoeings; weeding and hoeing; 2 hoeings 2 weedings. (ix) 74 cm.; 70 cm.; 51 cm.; 74 cm.; 34 cm. (x) *Moong* on 6.9.61; N.A.; 7.9.63; 15.9.64; N.A. and *Jowar* on 29.12.61; N.A.; 21.12.63; 31.12.64; 19.12.65.

## 2. TREATMENTS:

3 mixture treatments: T<sub>1</sub>=Entire *Jowar* every year, T<sub>2</sub>=Entire *Moong* every year and T<sub>3</sub>=*Jowar* and *Moong* in alternate rows—replacing *Moong* in place of *Jowar* and *Jowar* in place of *Moong*.

## 3. DESIGN:

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 12. (iv) (a) 8.23 m. × 9.14 m. (b) 5.49 m. × 7.32 m. (v) 137 cm. × 91 cm. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory; Normal; Lodging was there in *Jowar*, normal; Normal; Normal. (ii) B.H.C. 10% dusted on *Moong* for Aphids; Nil; Mild attack of Stem borer and Milliped; Nil for 64 and 65. (iii) Yield of grain. (iv) (a) 1961—66. (b) Yes. (c) Nil. (v) Digraj. (vi) Nil. (vii) Since expt. contd. beyond 65, the results of individual years are presented under 5. Results.

## 5. RESULTS :

## 61(151)

(i) 859 Rs/ha. (ii) 110.30 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. produce	955	482	1141

C.D. = 93.39 Rs/ha.

## 62(147)

(i) 639 Rs/ha. (ii) 100.8 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. produce	782	139	994

C.D. = 85.35 Rs/ha.

## 63(164)

(i) 570 Rs/ha. (ii) 91.9 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. produce	626	313	772

C.D. = 77.79 Rs/ha.

## 64(163)

(i) 606 Rs/ha. (ii) 161.40 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. produce	679	445	692

C.D. = 136.65 Rs/ha.

## 65(133)

(i) 1602 Rs/ha. (ii) 284.93 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. produce	2074	768	2022

C.D. = 241.25 Rs/ha.

**Crop :- Jowar, Moong (Kharif).**

**Site :- Agri. Res. Stn., Akola.**

**Ref :- Mh. 63(280), 65(154).**

**Type :- 'X'.**

Object :- To study the effect of row sowing and mixed sowing.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut ; Cotton. (c) 12.4 C.L./ha. of F.Y.M. + 11.2 Kg/ha. of N + 33.6 K/ha. of P<sub>2</sub>O<sub>5</sub> ; 22.4 Kg/ha. of N + 11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black. (iii) 10.7.63 ; 11.7.65. (iv) (a) Harrowing. (b) Drilling. (c) Jowar—9 Kg/ha., Moong—17 Kg/ha. (d) 46 cm. (e) —. (v) 12.4 C.L./ha. of F.Y.M. (vi) Jowar—Improved Saoner, Moong—Kopergaon. (vii) Unirrigated. (viii) 2 hoeings and 1 weeding ; 2 hoeings and 2 weedings. (ix) 51 cm. ; 34 cm. (x) Moong on 10.9.63 and 3.10.63 ; October, 65 and Jowar on 26.12.63 ; 7.12.65.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. Nos. 63(51), 64(42), 65(3) conducted at Achalpur and presented on page No.557.

## 4. GENERAL :

(i) Normal. (ii) B.H.C. 10 % for Stem borer ; Nil. (iii) Yield of grain. (iv) (a) 1963—67. (b) No. (c) Nil. (v) Achalpur, Nagpur, Buldhana, and Dhulia. (vi) Nil. (vii) Experiment vitiated in 64. Since expt. is continued beyond 65 hence results of individual years are presented under 5. Results.

## 5. RESULTS :

## 63(280)

(i) 473 Rs/ha. (ii) 55.30 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	436	247	570	568	497	508	502	454

C.D.=81.3 Rs/ha.

## 65(154)

(i) 961 Rs/ha. (ii) 200.90 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	1023	526	1150	1108	1001	1093	923	868

C.D.=295.5 Rs/ha.

**Crop :- Jowar, Moong (Kharif).**

**Ref :- Mh. 63(268), 64(227), 65(143).**

**Site :- Agri. College Farm, Akola.**

**Type :- 'X'.**

Object :—To study the effect of row sowing and mixed sowing.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut ; Cotton ; Jowar. (c) 12.4 C.L./ha. of F.Y.M. + 11.2 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> ; 24.7 C.L./ha. of F.Y.M. + 44.8 Kg/ha. of A/S + 12.5 Kg/ha. of Super ; Nil. (ii) Medium black. (iii) 27.7. 63 ; 22.7. 64 ; 19.7.65. (v) (a) Ploughing and harrowing in 63 and 64 ; harrowings in 65. (b) Drilling (c) Jowar—9 Kg/ha., Moong 17 Kg/ha. (d) 46 cm. (e) —. (v) 24.7 CL/ha. of F.Y.M. + 11.2 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> in 63 ; 11.2 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> in 64 and 65. (vii) Unirrigated. (viii) 2 interculturing ; Weeding. (ix) 33 cm. ; 47 cm. ; 34 cm. (x) Moong on 12.10.63 ; N.A. ; 27.9.65, Jowar on 5.1.64 ; 4.1.65 ; 27.12.65.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt Nos. 63(51), 64(42), 65(3) conducted at Achalpur and presented on page No. 557.

## 4. GENERAL :

(i) Satisfactory ; Normal in 64 and 65. (ii) 10% BHC for Stem borer ; Nil ; Nil. (iii) Yield of grain (iv) (a) 1963—67. (b) No. (c) Nil. (v) Achalpur, Buldhana, Badnapur, Dhulia, Nagpur and Yeotmal. (vi) Nil. (vii) Yield of Moong is less as the sowing was late in 63. Since expt. contd. beyond 65, the results of individual years are presented under 5. Results.

## 5. RESULTS :

## 63 (268)

(i) 565 Rs/ha. (ii) 150.60 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	610	57	730	568	736	525	687	607

C.D.=221.5 Rs/ha.

## 64(227)

(i) 643 Rs/ha. (ii) 234.80 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	519	140	769	772	939	668	628	708

C.D. = 345.3 Rs/ha.

## 65(143)

(i) 722 Rs/ha. (ii) 259.20 Rs/ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	516	388	918	831	688	899	891	649

**Crop. :- Jowar and Udid (Kharif).**

**Ref. :- Mh. 63(278), 64(236), 65(152).**

**Site :- Agri. College Farm, Akola.**

**Type :- 'X'.**

**Object :-** To study the effect of row sowing and mixed sowing.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton ; Jowar. (c) 12.4 C.L./ha. of F.Y.M. ; 49.4 C.L./ha. of F.Y.M. ; N.A. (ii) Medium black. (iii) 28.7.63 ; 20.7.64 ; 19.7.65. (iv) (a) Ploughing and harrowing in 63 and 64 ; Harrowing in 65. (b) Drilling. (c) Jowar—9 Kg/ha., Udid - 17 Kg/ha. (d) 46 cm. (e) —. (v) 11.2 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) Jowar—NJ 156 and Udid No. 110. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) N.A. for 63 and 64 ; 34 cm. in 65. (x) Udid on 15.10.63 ; 16.10.64 ; 5, 14.10.65 and Jowar on 6.1.64 ; 18, 19.1.65 ; 10.12.65.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. Nos. 63(47), 64(40), 65(4) conducted at Achalpur and presented on page No. 556.

## 4. GENERAL :

(i) Normal ; Normal ; Satisfactory. (ii) Nil. (iii) Yield of grain and monetary return per plot. (iv) (a) 1963-67. (b) No. (c) Nil. (v) Achalpur, Amravati, Buldhana, Dhulia, Nagpur, and Yeotmal. (vi) Nil. (vii) Since the expt. continued beyond 65, the results of individual years are presented under 5 Results.

## 5. RESULTS :

## 63(278)

(i) 135 Rs/ha. (ii) 73.70 Rs/ha (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	197	80	144	135	118	145	103	170

## 64(236)

(i) 1334 Rs/ha. (ii) 1391.80 Rs/ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	1408	66	950	1123	1165	3279	1344	1338

## 65(152)

(i) 876 Rs/ha. (ii) 221.70 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	712	495	1179	1003	1006	1188	632	795

C.D. = 325.1 Rs/ha.



**Crop :- Jowar, Udid (Kharif).****Ref :- Mh. 63(279), 65(153).****Site :- Agri. Res. Stn., Akola.****Type :- 'X'.**

Object :—To study the effect of row sowing and mixed sowing.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 12.4 C.L./ha. of F.Y.M. + 44.8 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$ ; 22.4 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$ . (ii) Black soil. (iii) 9.7.63; 11.7.65. (iv) (a) Harrowing (b) Drilling. (c) 9 Kg/ha. for *Jowar* and 17 Kg/ha. for *Udid*. (d) 46 cm. (e) —. (v) 12.4 C.L./ha. of F.Y.M. (vi) *Jowar* —Improved *Saoner* and *Udid* No. 110. (vii) Unirrigated. (viii) 2 hoeings and 2 weedings. (ix) 51 cm.; 34 cm. (x) *Jowar* on 26.12.63; 7.12.65, *Udid* on 21.10.63.

## 2. TREATMENTS and 3 DESIGN :

Same as in Expt. Nos. 63(47), 64(40), 65(4) conducted at Achalpur and presented on page No. 556.

## 4. GENERAL :

(i) Normal. (ii) Stem borer and Millipeds, 10% BHC dusted in 63; Nil in 65. (iii) Yield of grain. (iv) (a) 1963-67. (b) No. (c) N.I. (v) Achalpur, Amravati, Buldhana, Dhulia, Nagpur and Yeotmal. (vi) Nil. (vii) Since the expt. contd. beyond 65, the individual results are given below. Experiment conducted in 64 vitiated.

## 5. RESULTS :

## 63(279)

(i) 663 Rs/ha. (ii) 69.8 Rs/ha. (iii) Treatment differences are highly significant. (iii) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	454	610	718	694	640	774	734	682

C.D. = 102.6 Rs/ha.

## 65(153)

(i) 644 Rs/ha. (ii) 207.7 Rs/ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	586	318	848	794	651	676	572	710

**Crop :- Jowar, Moong, Udid, Sann (Kharif).****Ref :- Mh. 63(271), 65(146).****Site :- Agri. Res. Stn., Akola.****Type :- 'X'.**

Object :—To study the effect of various mixed cropping.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 12.35 C.L./ha. of F.Y.M. + 44.8 Kg/ha. of N + 33.6 Kg/ha. of  $P_2O_5$ ; 22.4 Kg/ha. of N + 11.2 Kg/ha. of  $P_2O_5$ . (ii) Black cotton soil. (iii) 9.7.63; 11.7.65. (iv) (a) Harrowing. (b) Drilling. (c) *Jowar* 9 Kg/ha., *Sann* 78 Kg/ha., *Moong* and *Udid* 16.8 Kg/ha. (d) 46 cm. between rows. (e) —. (v) 5600 Kg/ha. of F.Y.M. (vi) *Jowar*—Imp. *Saoner*; *Sann*—Local; *Moong*—Kopergaon and *Udid*—No. 110. (vii) Unirrigated. (viii) 2 hoeings and 2 weedings. (ix) 51 cm.; 34.5 cm. (x) *Jowar* 26.12.63; 8.12.65, *Moong* 10.9.63; 14.9.65, *Udid* 2.10.63; 24.9.65 and *Sann* 14.11.63; 16.11.65.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. Nos. 63(199), 64(168), 65(2) conducted at Achalpur and presented on page No. 558.

## 4. GENERAL :

(i) Normal. (ii) B.H.C. 10% dusted for stem borer; Nil. (iii) Yield of grain. (iv) (a) 1963 to 67. (b) No. (c) Nil. (v) Dhulia, Buldhana, Yeotmal. (vi) Nil. (vii) Experiment conducted in 64 vitiated. As the experiment is continued beyond 65, therefore results of individual years are given under 5. Results.

## 5. RESULTS :

63(271)

(i) 548 Rs/ha. (ii) 65.7 Rs/ha. (iii) The main effects of C and M, interaction C×M and extra vs. other treatments are highly significant. (iv) Av. value of produce in Rs/ha.

E<sub>1</sub>=443 Rs/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
C <sub>1</sub>	352	415	448	405
C <sub>2</sub>	920	513	512	648
C <sub>3</sub>	912	472	496	627
Mean	728	467	485	560

C.D. for C and M marginal means =55.0 Rs/ha.

C.D. for body of table and E<sub>1</sub> vs. any other treatment means =95.3 Rs/ha.

65(146)

(i) 1014 Rs/ha. (ii) 161.2 Rs/ha. (iii) Main effect of C alone is highly significant. (iv) Av. value of produce in Rs/ha.

E<sub>1</sub>=1017 Rs/ha. ; E<sub>2</sub>=1111 Rs/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
C <sub>1</sub>	642	804	804	750
C <sub>2</sub>	1243	1052	1084	1126
C <sub>3</sub>	1257	1006	1130	1131
Mean	1047	954	1006	1002

C.D. for C marginal means =135.0 Rs/ha.

Crop :- Jowar, Sann, Moong, Udid (*Kharif*). Ref :- Mh. 63(270), 64(229), 65(145).

Site :- Agri. College Farm, Akola.

Type :- 'X'.

Object :- To study the effect of mixed cropping on the yield.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut ; Cotton ; Jowar. (c) 12.35 C.L./ha. of F.Y.M. +11.2 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> ; 21.7 C.L./ha. of F.Y.M. +125.5 Kg/ha. of Super +448.3 Kg/ha. of A/S ; Nil. (ii) Medium black. (iii) 27.7.63 ; 27.7.64 ; 19.7.65. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 17, 9, 78 and 17 Kg/ha. for Moong, Jowar, Sann and Udid, respectively (d) 46 cm. (e) —. (v) 24.7 C.L./ha. of F.Y.M. +11.2 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> ; 11.2 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> ; 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) Jowar NJ 156, Sann local, Moong China, Udid No. 110. (vii) Unirrigated. (viii) Hoeing and weeding. (ix) 32.7 cm. ; 46.7 cm. ; 34.5 cm. (x) Moong and Udid 12.10.63, Jowar 5.1.64 ; 15.1.65 ; 16.12.65.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. Nos. 63(199), 64(168), 65(2) conducted at Achalpur and presented on page No. 558.

## 4. GENERAL :

(i) Normal. (ii) 10% B.H.C. dusted for stem borer. (iii) Yield of grain. (iv) (a) 1963-67. (b) and (c) No. (v) Achalpur, Buldhana, Dhulia and Yeotmal. (vi) Nil. (vii) Since the expt. contd. beyond 65, the individual results are given under 5. Results.

## 5. RESULTS :

63(270)

(i) 369 Rs/ha. (ii) 127.1 Rs/ha. (iii) Extra vs. other treatments effect alone is significant. (iv) Av. value of produce in Rs/ha.

E<sub>1</sub>=238 Rs/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
C <sub>1</sub>	351	397	308	352
C <sub>2</sub>	451	351	324	375
C <sub>3</sub>	485	447	346	426
Mean	429	398	326	384

C.D. for the comparison of extra vs. other treatments=137.4 Rs/ha.

64(229)

(i) 847 Rs/ha. (ii) 146.1 Rs/ha. (iii) None of the effects is significant. (iv) Av. value of produce in Rs/ha.

E<sub>1</sub>=835 Rs/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
C <sub>1</sub>	983	907	705	865
C <sub>2</sub>	841	871	845	852
C <sub>3</sub>	904	824	750	826
Mean	909	867	767	848

65(145)

(i) 1279 Rs/ha. (ii) 301.5 Rs/ha. (iii) None of the effects is significant. (iv) Av. value of produce in Rs/ha.

E<sub>1</sub>=1080 Rs/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
C <sub>1</sub>	983	1205	1256	1148
C <sub>2</sub>	1478	1433	1317	1409
C <sub>3</sub>	1533	1077	1429	1346
Mean	1331	1238	1334	1301

**Crop :- Cotton and Groundnut (Kharif).****Ref :- Mh. 65 (111).****Site :- Agri. Res., Stn., Akola.****Type :- 'X'.**

Object :—To study the effect of mixed cropping of Cotton and Groundnut.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Black cotton soil. (iii) 17.7.65. (iv) (a) 3 harrowings. (b) Dibbling. (c) 11 Kg/ha. for Cotton and 78 Kg/ha. for Groundnut. (d) As per treatments. (e) 1 to 2. (v) Nil. (vi) Cotton=AK-235, G. nut=AK 12-24. (vii) Unirrigated. (viii) 3 hoeings and 2 weedings. (ix) 41 cm. (x) Groundnut on 20.11.65, Cotton on 27.12.65.

## 2. TREATMENTS :

9 mixed cropping treatments :  $T_1$  = Cotton alone with 46 cm. spacings,  $T_2$  = Groundnut] alone with 46 cm. spacings,  $T_3$  = Cotton and Groundnut 1 : 1 row 46 cm. spacings,  $T_4$  = Cotton and G. nut in 1 : 1 row 46 cm. spacings, 2 plants/hill,  $T_5$  = Cotton and G. nut in 2 : 1 rows 46 cm. spacings,  $T_6$  = Cotton and 1 : 2 rows 46 cm. spacing,  $T_7$  = Cotton and G. nut in 1 : 2 rows 46 cm. spacing, 2 plants/hill,  $T_8$  = Cotton and G. nut in 1 : 2 rows, 30 cm. spacings and  $T_9$  = Cotton and G. nut in 1 : 2 rows, 30 cm. spacings and plants/hill.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) 14.33 m.  $\times$  8.23 m. (b) 10.97m.  $\times$  5.49 m. (v) —. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Aphids for which B.H.C. 10% dusted. (iii) (a) Yield of Groundnut pods, *Kapas* and their monetary return. (iv) (a) 1965 to 67. (b) and (c) No. (v) Nanded, Badnapur and Jalgaon. (vi) Nil. (vii) Nil.

## 5. RESULTS :

(i) 644 Rs/ha. (ii) 157.1 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$	$T_8$	$T_9$
Av. produce	962	375	656	634	702	684	659	580	542

C.D. = 272.0 Rs/ha.

**Crop :- Jowar, Tur (Kharif).**

**Ref :- Mh. 64(209), 65(109).**

**Site :- Agri. Res. Stn., Amravati.**

**Type :- 'X'.**

Object :—To study the effect of row sowing and mixed sowing.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Medium black. (iii) 21.7.64 ; 18.7.65. (iv) (a) 1 to 2 harrowings. (b) Drilling. (c) 10 Kg/ha. for both crops. (d) 46 cm. (e) —. (v) 22.4 Kg/ha. of N+22.4 Kg/ha. for  $P_2O_5$ . (vi) *Jowar*—NJ 156, *Tur*—No. 148. (vii) Unirrigated. (viii) Hoeing and weeding ; 2 hoeings and 1 weeding. (ix) 65 cm. ; 46 cm. (x) 22.12.64 ; 25.12.65.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. Nos. 63(50), 64(41), 65(5) conducted at Achalpur and presented on page No. 555.

## 4. GENERAL :

(i) Normal. (ii) Mild attack of Sugary disease, B.H.C. 10% dusted ; Nil. (iii) Yield of grain and monetary return per plot. (b) No. (c) Nil. (v) Achalpur and Akola. (vi) Nil. (vii) As the experiment is continued beyond 65 therefore results of individual years are presented under 5. Results.

## 5. RESULTS :

## 64(209)

(i) 306 Rs/ha. (ii) 60.3 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$	$T_8$
Av. value	191	318	362	269	304	351	327	327

C.D. = 88.7 Rs/ha.

## 65(109)

(i) 211 Rs/ha. (ii) 62.7 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. Value	99	74	367	199	274	220	231	221

C.D.=92.2 Rs/ha.

**Crop :- Jowar, Udid (Kharif),****Ref :- Mh. 63(200), 64(223), 65(128).****Site :- Agri. Res. Stn., Amravati.****Type :- 'X'.**

Object :—To study the effect of row sowing and mixed cowing.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil; 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> in 64 and 65. (ii) Medium black. (iii) 1.8.63; 21.7.64; 16.7.65. (iv) (a) Harrowing. (b) Drilling. (c) Jowar at 4.5 Kg/ha. and Udid at 8 Kg/ha. (d) 46 cm. (e) Nil. (v) Nil; 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> in 64 and 65. (vi) Jowar NJ 156 and Udid No. 55. (vii) Unirrigated. (viii) 3 hoeings and 3 weedings; Hoeing and weeding; 2 hoeings and 2 weedings. (ix) 28 cm.; 66 cm.; 46 cm. (x) Udid on 25.10.63; N.A. for 64 and 65 and Jowar on 6.1.64; 22.12.64; 22.12.65.

## 2. TREATMENTS and 3 DESIGN :

Same as in Expt. Nos. 63(47), 64(47), 65(4) conducted at Achalpur and presented on page No. 556.

## 4. GENERAL :

(i) Normal. (ii) Nil; Mild attack of sugary disease, B.H.C. 10% dusted; Nil. (iii) Yield of grain. (iv) (a) 1963—67. (b) Nil. (c) No. (v) Achalpur, Akola, Buldhana, Dhulia, Nagpur and Yeotmal. (vi) Nil. (vii) Since the expt. contd. beyond 65, the individual results are given below.

## 5. RESULTS :

## 63(200)

(i) 438 Rs/ha. (ii) 121.4 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	542	101	503	399	520	409	491	540

C.D.=178.5 Rs/ha.

## 64(223)

(i) 242 Rs/ha. (ii) 84.8 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	130	126	308	251	330	326	200	268

## 65(128)

C.D.=124.7 Rs/ha.

(i) 207 Rs/ha. (ii) 49.9 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	88	500	203	158	218	198	134	157

C.D.=73.2 Rs/ha.

**Crop :- Jowar, Moong (Kharif).****Ref :- Mh. 64(221).****Site :- Agri. Res. Stn., Amravati.****Type :- 'X'.**

Object :—To study the effect of row sowing and mixed sowing.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black. (iii) 20.7.64. (iv) (a) 2 harrowings. (b) Drilling. (c) 9.9 Kg/ha. Jowar, 17.3 Kg/ha. Moong. (d) 46 cm. (e) —. (v) 22.4 Kg/ha. of N and 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) Jowar NJ 156, Moong Kopergaon. (vii) Unirrigated. (viii) 2 hoeings and 2 weedings. (ix) 66 cm. (x) 22.12.64.

## 2. TREATMENTS :

T<sub>1</sub>=Entire *Jowar*, T<sub>2</sub>=Entire *Moong*, T<sub>3</sub>=*Jowar* and *Moong* in 1 : 1 row, T<sub>4</sub>=*Jowar* and *Moong* in 2 : 1 row, T<sub>5</sub>=*Jowar* and *Moong* in 3 : 1 row, T<sub>6</sub>=*Jowar* and *Moong* in 1 : 1 mixture, T<sub>7</sub>=*Jowar* and *Moong* in 2 : 1 mixture and T<sub>8</sub>=*Jowar* and *Moong* in 3 : 1 mixture.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Sugar disease 10% B.H.C. dusted. (iii) Yield of grain. (iv) (a) 1964 to 66. (b) No. (c) Nil. (v) Achalpur, Akola, Nagpur. (vi) Nil. (vii) Experiment conducted in 65 was vitiated.

## 5. RESULTS :

64(221)

(i) 258 Rs/ha. (ii) 64.68 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	303	13	297	258	280	310	343	259

C.D.=95.1 Rs/ha.

**Crop :- Jowar and Gram (Rabi). Ref :- Mh. 61(182), 62(179), 64(182), 65(115).**

**Site :- Agri. Res. Stn., Badnapur. Type :- 'X'.**

Object :- To study symbiotic and rotational effects of *Jowar* and *Gram* in alternate drilling, shifting *Jowar* in place of *Gram* and vice-versa during the next year.

## 1. BASAL CONDITIONS :

(i) Nil. (b) *Jowar*; *Jowar* and *Gram*; *Cotton*; *Jowar* and *Gram*. (c) 11.2 Kg/ha. of N; 12.35 C.L./ha. of F.Y.M.; 49.4 Kg/ha. of N+24.7 Kg/ha. of P<sub>2</sub>O<sub>5</sub>; Nil. (ii) Black *Cotton* for 61 and 62; Medium black for 64 and 65. (iii) 18.10.61; 3.10.62; 30.10.64; 3.10.65. (iv) (a) Harrowing in 61, 62, 65; ploughing and harrowing in 64. (a) Drilling. (c) *Jowar*—10 Kg/ha., *Gram*—37 Kg/ha. (d) 46 cm. (e) —. (v) 12.35 C.L./ha. of F.Y.M. (vi) *Jowar*=M 35-1, *Gram*=N-31. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 0.5 cm.; 25 cm.; 1 cm.; 3 cm. (x) 15 to 20.3.62; 15 to 29.3.63; 7 to 16.3.65; 10.3.66.

## 2. TREATMENTS :

4 mixed cropping treatments : T<sub>1</sub>=*Jowar* only, T<sub>2</sub>=*Gram* only, T<sub>3</sub>=*Jowar* and *Gram* in alternate drilling consisting of 3 rows and T<sub>4</sub>=*Jowar* and *Gram* mixed and sown in same row.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 21.95 m. × 21.95 m. (iii) 6. (iv) (a) 10.97 m. × 10.97 m. (b) 8.23 m. × 9.14 m. (v) 1.37 m. × 0.91 m. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory; Normal; Germination satisfactory; Normal. (ii) Sulphur dusted; B.H.C. dusted; *Chikite* on *Jowar* observed; Nil. (iii) Yield of grain and their monetary. (iv) (a) 1961 to 65. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Nil. (vi) Expt. vitiated in 63. Error variances are homogeneous, Treatments × years interaction is present.

## 5. RESULTS :

Pooled Results

(i) 566 Rs/ha. (ii) 712.8 Rs/ha. (based on 9 d.f. made up of Treatments × years interaction). (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Av. value	806	354	533	572

## Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	Sig.	G.M.	S.E./plot.
Year							
1961	139	237	189	229	*	199	20.3
1962	444	272	308	258	**	320	53.1
1963	438	437	386	401	N.S.	415	34.2
1964	2211	468	1248	1399	**	1332	35.6
Pooled	806	354	533	572	N.S.	566	712.8

**Crop :- Jowar, Moong (Kharif).**

**Ref :- Mh. 64 (195), 65(53).**

**Site :- Agri. Res. Stn., Badnapur.**

**Type :- 'X'.**

Object :- To study the effect of row sowing and mixed sowing.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) N.A. ; 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium. (iii) 1.04 ; 19.6.65. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 15 Kg/ha. for both the crops. (d) 30 cm. × 15 cm. after thinning. (e) One to two. (v) Nil ; 12.35 C.L./ha. of F.Y.M. (vi) Jowar—PJ 16 K and Moong—China 781. (vii) Unirrigated. (viii) Hoeing and weeding. (ix) 37 cm. ; 57 cm. (x) Moong on 2.9.64 ; September 64, Jowar on 29.11.64 ; 3.12.65.

## 2. TREATMENTS and 3 DESIGN :

Same as in Expt. Nos. 63(51), 64(42), 65(3) conducted at Achalpur and presented on page No. 557.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain, monetary out turn per plot. (iv) (a) 1964-68. (b) and (c) No. (v) Achalpur, Akola, Buldhana, Dhulia, Nagpur, Washim and Yeotmal. (vi) Nil. (vii) Since experiment continued beyond 65, results of individual years are presented under 5. Results.

## 5. RESULTS :

## 64(195)

(i) 556 Rs/ha. (ii) 163.9 Rs/ha. (iii) Treatment differences are not significant. (iii) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	527	516	687	619	459	514	454	672

## 65(53)

(i) 377 Rs/ha. (ii) 24.9 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	239	531	351	363	383	427	376	344

C.D. = 37.0 Rs/ha.

**Crop :- Jowar, Udid, Moong, Sann (Kharif).**

**Ref :- Mh. 64(183), 65(132).**

**Site :- Agri. Res. Stn., Badnapur.**

**Type :- 'X'.**

Object :- To study the effect of mixed cropping on the yield.

## 1. BASAL CONDITIONS :

(i) Nil. (b) *Tur*; Groundnut. (c) Nil; 22.4 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Black cotton soil. (iii) 9.7.64; 20.6.65. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 9 Kg/ha. for *Jowar*, *Moong* and *Udid*, 89 Kg/ha. for *Sann*; 5 Kg/ha. for *Jowar*, 45 Kg/ha. for *Sann* and 7 Kg/ha. for *Udid* and *Moong*. (d) 30 cm. (e) —. (v) Nil. (vi) *Jowar*—PJ 16 K, *Sann*—Local, *Moong*—781 and *Udid*—Sindkheda. (vii) Unirrigated. (viii) Weeding. (ix) 35.4 cm; 50.2 cm. (x) *Moong* 8.9.64, *Sann* 25.11.64; *Udid* 1.10.64 *Jowar*, 29.11.64; 1.12.65.

## 2. TREATMENTS :

All combinations of (1) and (2)+2 extra treatments.

(1) 3 legumeneous crops in mixture with *Jowar* :  $C_1$ =*Sann*,  $C_2$ =*Moong* and  $C_3$ =*Udid*.

(2) 3 methods of application :  $M_1$ =No application,  $M_2$ =crops up rooted and spread between the rows of *Jowar* and  $M_3$ =crops uprooted and buried between the rows of legumeneous crops and *Jowar* sown in alternate rows.

$T_1$ =*Jowar* alone and  $T_2$ =*Jowar* alone with double spacings.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 10.97 m×7.32 m. (b) 9.14 m.×5.49 m. (v) 91 cm.×91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964—66 (b) No. (c) Nil. (v) Akola, Buldhana, Dhulia, Jalgaon and Washim. (vi) Nil. (vii) Expt. contd. beyond 65. Hence results for individual years are presented under 5. Results.

## 5. RESULTS :

64(183)

(i) 222 Rs/ha. (ii) 31.8 Rs/ha. (iii) Main effects of C, M and interaction C×M are highly significant. Extra vs others is highly significant. (iv) Av. value of produce in Rs/ha.

$T_1=329$  and  $T_2=294$ .

	$M_1$	$M_2$	$M_3$	Mean
$C_1$	192	106	106	135
$C_2$	340	144	162	215
$C_3$	451	153	164	256
Mean	328	134	144	202

C.D. for C or M marginal means=26.5 Rs/ha.

C.D. for body of table =45.9 Rs/ha.

C.D. for extra vs others =25.4 Rs/ha.

65(132)

(i) 248 Rs/ha. (ii) 49.3 Rs/ha. (ii) Main effect of M is highly significant. Extra vs others is highly significant. (vi) Av. value of produce in Rs/ha.

$T_1=331$  and  $T_2=289$ .

	$M_1$	$M_2$	$M_3$	Mean
$C_1$	303	220	187	237
$C_2$	305	205	200	237
$C_3$	298	193	193	228
Mean	302	206	193	234

C.D. for M marginal means=41.1 Rs/ha.

C.D. for extra vs others =39.3 Rs/ha.



**Crop :- Wheat & Gram (Rabi).**

**Ref :- Mh. 60(202).**

**Site :- Agri. Res. Stn., Badnapur.**

**Type :- 'X'.**

**Object :-**To study the effect of rotating Wheat and Gram in space and time in maintaining soil fertility of Rabi area.

**1. BASAL CONDITIONS:**

(i) (a) Nil. (b) Gram. (c) Nil. (ii) Black cotton. (iii) 28.10.60. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) Wheat-49 Kg/ha., Gram-37 Kg/ha. (d) As per treatments. (e) -. (v) 12.35 C.L./ha. of F.Y.M. (vi) Wheat,—Hy.—65, Gram—chofa. (vii) Unirrigated. (viii) 3 weedings. (ix) 1 cm. (x) 24.2.61 to 1.3.61.

**2. TREATMENTS :**

All combinations of (1) and (2)

(1) 3 crops mixing :  $C_1$ =Wheat only,  $C_2$ =Gram only and  $C_3$ =Wheat and Gram in alternate drilling consisting of 3 hoes.

(2) 3 spacings :  $S_1$ =30,  $S_2$ =46 and  $S_3$ =61 cm.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 9. (b) 31.09 m. × 21.96 m. (iii) 4. (iv) (a) 10.97 m. × 7.31 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Germination not satisfactory. (ii) Nil. (iii) Yield of wheat grain, gram and their monetary return. (iv) (a) 1960-65 (Design changed in 61). (b) Yes, Exception in 64-65. (c) No. (v) and (vi) Nil. (vii) Design changed from the year 61.

**5. RESULTS :**

(i) 576 Rs/ha. (ii) 172.3 Rs/ha. (iii) Main effect of C is significant, while S is highly significant. (iv) Av. value of produce in Rs/ha.

	$S_1$	$S_2$	$S_3$	Mean
$C_1$	720	575	745	680
$C_2$	667	323	460	483
$C_3$	673	398	619	563
Mean	687	432	608	576

C.D. for of C or S marginal means=145.1 Rs/ha.

**Crop :- Wheat and Gram (Rabi).**

**Ref :- Mh. 61(179), 62(181), 63(227), 64(181), 65(114).**

**Site :- Agri. Res. Stn., Badnapur.**

**Type :- 'X'.**

**Object :-**To study the effect of rotating Wheat and Gram in space and time in maintaining soil fertility of Rabi area.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat and Gram. (c) 12.4 C.L./ha. of F.Y.M. in 61 to 64 ; Nil. (ii) Black cotton. (iii) 22.10.61 ; 11.10.62 ; 7, 8.10.63 ; 8, 9.10.64 ; 5, 6.10.65. (iv) (a) 1 ploughing and 4 harrowings ; Harrowing in 62 and 63 : 1 ploughing and 1 harrowing ; Harrowing (b) Drilling. (c) Wheat—49.4 Kg/ha. and Gram—37.1 Kg/ha. (d) As per treatments. (e) -. (v) 12.35 C.L./ha. of F.Y.M. (vi) Wheat Hy.—65 and Gram—chofa. (vii) Unirrigated. (viii) 3 weedings. (ix) 1 cm. ; 26 cm. ; 2 cm. ; 1 cm. ; 3 cm. (x) 11.3.62 to 22.3.62 ; 2.4.63 ; 24.2.64 to 1.3.64 ; 30.1.65 to 9.2.65 ; Gram 14.2.66 and wheat 1 to 3.3.66.

## 2 TREATMENTS:

## Main-plot treatments:

3 spacings:  $S_1=30$ ,  $S_2=46$  and  $S_3=61$  cm.

## Sub-plot treatments:

3 mixed cropping:  $C_1$ =Wheat only,  $C_2$ =Gram only and  $C_3$ =Wheat and Gram in alternate drillings consisting of 3 rows.

## 3. DESIGN:

(i) Split-plot. (ii) 3 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 10.97 m.  $\times$  7.31 m. (b) 9.14 m.  $\times$  5.49 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL:

(i) Not so good in 61; Satisfactory in 62 to 65. (ii) Nil. (iii) Yield of wheat grain, gram and their monetary results. (iv) (a) 1961 to 65. (b) and (c) No. (v) and (vi) Nil. (vii) Both the error variances are heterogeneous. Hence results for individual years are presented under 5. Results.

## 5. RESULTS:

61(179)

(i) 214 Rs/ha. (ii) (a) 91.78 Rs/ha. (b) 76.96 Rs/ha. (iii) Main effect of S is significant while that of C is highly significant. (iv) Av. value of produce in Rs/ha.

	$S_1$	$S_2$	$S_3$	Mean
$C_1$	217	138	110	158
$C_2$	292	262	252	269
$C_3$	294	178	170	214
Mean	268	193	181	214

C.D. for S marginal means=68.2 Rs/ha.

C.D. for C marginal means=52.4 Rs/ha.

62(81)

(i) 304 Rs/ha. (ii) (a) 58.76 Rs/ha. (b) 62.57 Rs/ha. (iii) Main effect of C is significant. (iv) Av. value of produce in Rs/ha.

	$S_1$	$S_2$	$S_3$	Mean
$C_1$	316	331	360	336
$C_2$	334	263	250	282
$C_3$	335	302	249	295
Mean	328	299	286	304

C.D. for C marginal means=42.6 Rs/ha.

63(227)

(i) 211 Rs/ha. (ii) (a) 40.49 Rs/ha. (b) 47.62 Rs/ha. (iii) Main effect of S is significant while C is highly significant. (iv) Av. value of produce in Rs/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
C <sub>1</sub>	213	145	155	171
C <sub>2</sub>	249	224	280	261
C <sub>3</sub>	224	200	209	211
Mean	229	190	215	211

C.D. for S marginal means=29.8 Rs/ha.

C.D. for C marginal means=32.4 Rs/ha.

64(181)

(i) 411 Rs/ha. (ii) (a) 110.4 Rs/ha. (b) 85.2 Rs/ha. (iii) Main effect of C is highly significant. (iv) Av. value of produce in Rs/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
C <sub>1</sub>	249	344	249	281
C <sub>2</sub>	574	577	550	567
C <sub>3</sub>	395	401	356	384
Mean	406	441	385	411

C.D. for C marginal means=58.0 Rs/ha.

65(114)

(i) 996 Rs/ha. (ii) (a) 45.4 Rs/ha. (b) 52.2 Rs/ha. (iii) All the main effects and interaction are highly significant. (iv) Av. value of produce in Rs/ha.

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
C <sub>1</sub>	584	571	566	574
C <sub>2</sub>	1262	1316	1233	1270
C <sub>3</sub>	1110	1245	1077	1144
Mean	985	1044	959	996

C.D. for S marginal means =33.7 Rs/ha.

C.D. for C marginal means =35.5 Rs/ha.

C.D. for C means at the same level of S=61.5 Rs/ha.

C.D. for S means at the same level of C=87.5 Rs/ha.

**Crop :- Bajri, Moong (Kharif).**

**Ref :- Mh. 64(212), 65(116).**

**Site :- Agri. Res. Stn., Badnapur.**

**Type :- 'X'**

Object :- To study the effect of row sowing and mixed sowing.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. ; 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Light soil ; Medium soil. (iii) 2.7.64 ; 20.7.65. (iv) (a) Ploughing. (b) Drilling. (c) *Bajri* at 12.4 Kg/ha. ; *Moong* at 14.8 Kg/ha. (d) 30 cm. (e) —. (v) Nil ; 12.4 C.L./ha. of F.Y.M. (vi) *Bajri*—Akola, *Moong*—China 781. (vii) Unirrigated. (viii) Hoeing and weeding ; 2 weedings. (ix) 37 cm. ; 47 cm. (x) *Moong* on 3.9.64 and 9.1.65 and *Bajri* on 24, 28.10.64 ; 28.10.65.

## 2. TREATMENTS :

8 mixtures of *Bajri* and *Moong* :  $R_1$ =Entire *Bajri*,  $R_2$ =Entire *Moong*,  $R_3$ =*Bajra* and *Moong* 1 : 1 row,  $R_4$ =*Bajra* and *Moong* 2 : 1 row,  $R_5$ =*Bajri* and *Moong* 3 : 1 row ;  $R_6$ =*Bajri* and *Moong* mixed in 1 : 1 and then sown,  $R_7$ =*Bajri* and *Moong* mixed in 2 : 1 and then sown and  $R_8$ =*Bajri* and *Moong* mixed 3 : 1 and then sown.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  7.32 m. (b) 9.14 m.  $\times$  5.49 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) B.H.C. 5 % dusted for Aphids on *Moong* ; Nil. (iii) Yield of grain and value of the produce. (iv) (a) 1964 to 68. (b) No. (c) Nil. (v) Dhulia. (vi) Nil. (vii) As the experiment is continued beyond 65, individual years results are presented under 5. Results.

## 5. RESULTS :

## 64(212)

(i) 667 Rs/ha. (ii) 104.0 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	735	415	487	719	698	826	735	719

C.D. = 152.8 Rs/ha.

## 65(116)

(i) 520 Rs/ha. (ii) 126.9 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	727	65	496	492	584	652	519	629

C.D. = 186.5 Rs/ha.

**Crop :- Bajri and Groundnut (*Kharif*).**

**Ref :- Mh. 61(183), 62(183), 63(228), 64(210).**

**Site :- Agri. Res. Stn., Badnapur.**

**Type :- 'X'.**

Object :—To study the effect of mixed cropping.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut ; Safflower ; N.A. ; Groundnut. (c) 125 Kg/ha. of Sulphur ; Nil ; N.A. ; Nil. (ii) Black soil ; Deep black soil ; Deep black cotton soil ; Light soil. (iii) 2.8.61 ; 16.7.62 ; 6.7.63 ; 8.7.64. (iv) (a) 3 harrowings ; 1 ploughing and 3 harrowings in 62 and 63 ; ploughing in 64. (b) Drilling. (c) *Bajri* 4.5 to 7 Kg/ha. ; Groundnut 67 to 74 Kg/ha. (d) 30 cm. (e) —. (v) Nil. (vi) *Bajri*—Akola, Groundnut—Spanish improved. (vii) Unirrigated. (viii) Weeding ; Weeding and hoeing in 62 to 64. (ix) 44 cm. ; 48 cm. ; 47 cm. ; 37 cm. (x) 11 to 17.11.61 ; 23. 26.10.62 ; 22.10.63 to 2.11.63 ; Groundnut on 28.10.64 and *Bajri* on 29.10.64.

## 2. TREATMENTS :

7 mixed cropping treatments of *Bajri* and Groundnut with ratios of :  $M_1=1:0$ ,  $M_2=0:1$ ,  $M_3=1:1$ ,  $M_4=1:2$ ,  $M_5=1:3$ ,  $M_6=2:1$  and  $M_7=3:1$ .

## 3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 6.10 m.  $\times$  14.63 m. (b) 3.66 m.  $\times$  12.19 m.

**Crop :- Jowar, Tur.****Ref :- Mh. 63(257), 64(211).****Site :- Agri. Res. Stn., Buldhana.****Type :- 'X'.**

Object :—To study the effect of row sowing and mixed sowing.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton. (c) 22.4 Kg/ha. of N+11.2 Kg/ha. of  $P_2O_5$ . (ii) Medium black. (iii) 17.7.63 ; 11.7.64. (iv) (a) Harrowing. (b) Drilling. (c) 13 Kg/ha. ; 11 Kg/ha. (d) 46 cm. (e) —. (v) 7.6 C.L./ha. of F.Y.M.+22.4 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (vi) *Jowar* —NJ 156, *Tur* No. 148. (vii) Unirrigated. (viii) 2 hoeings and 2 weedings. (ix) 74 cm. ; N.A. (x) *Jowar* on 23.12.63 ; 7.12.64 and *Tur* on 27.1.64 ; 16, 17.1.65

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

Same as in Expt Nos 63(50), 64(41), 62(5) conducted at Achalpur and presented on page No. 555.

**4. GENERAL :**

(i) Normal. (ii) Stem borer in *Jowar*, Pod borer in *Tur* in 63 ; Stem borer in *Jowar* in 64. (iii) Yield of grain. (iv) (a) 1963—64. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Achalpur, Akola, Amravati, Yeotmal. (vi) Nil. (vii) Error variances are homogeneous and Treatments  $\times$  years interaction is present.

**5. RESULTS :**

Pooled results

(i) 781 Rs/ha. (ii) 341.3 Rs/ha. (based on 7 d.f. made up of Treatments  $\times$  years interaction). (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	802	623	845	822	773	772	740	871

Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	Sig.	G.M.	S.E./plot
year											
1963	931	517	635	730	682	864	824	908	N.S.	761	177.6
1964	673	729	1055	914	864	681	655	839	N.S.	801	109.9
Pooled	802	623	845	822	773	772	740	871	N.S.	781	341.3

**Crop :- Jowar, Udid (*Kharif*).****Ref :- Mh. 63(264), 64(222), 65(127).****Site :- Agri. Res. Stn., Buldhana.****Type :- 'X'.**Object :—To study the effect of row sowing and mixed sowing on the yield of *Jowar* and *Udid*.**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton. (c) 24.7 C.L./ha. of F.Y.M.+11.2 Kg/ha. of  $P_2O_5$ +22.4 Kg/ha. of N ; 22.4 Kg/ha. of N+11.2 Kg/ha. of  $P_2O_5$  ; N.A. (ii) Medium black. (iii) 17.7.63 ; 11.7.64 ; 24.7.65. (iv) (a) Harrowing and ploughing. (b) Drilling. (c) *Jowar* 13.4 Kg/ha, *Udid*—17.9 Kg/ha (d) 46 cm. (e) —. (v) 7.6 C.L./ha. of F.Y.M.+22.4 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$  ; 7.6 C.L./ha. of F.Y.M.+11.2 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$  ; 12.4 C.L./ha. of F.Y.M.+22.4 Kg/ha. of N+11.2 Kg/ha. of  $P_2O_5$ . (vi) *Jowar* NJ—156, *Udid* No. 55. (vii) Unirrigated. (viii) 1 weeding and 3 hoeings. (ix) 74 cm. ; 53 cm. ; 44 cm. (x) *Jowar* on 23.12.63 ; 7.12.64 and 2.12.65, *Udid* on 14.10.63 ; 5.10.64 ; 7.9.65.

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

Same as in Expt. Nos. 63(47), 64(40), 65(4) conducted at Achalpur and presented on page. No. 556.

## 4. GENERAL:

(i) Normal ; Satisfactory ; Normal ; Normal. (ii) Nil. (iii) Yield of grain and pods. (iv) (a) 1961 to 64. (b) No. (c) Results of the combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is present.

## 5. RESULTS :

## Pooled results

(i) 824 Rs/ha. (ii) 387.7 Rs/ha. (based on 18 d.f. made up of Treatments  $\times$  years interaction). (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>
Av. value	633	750	855	928	997	839	765

## Individual results

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	Sig.	G.M.	S.E /plot
Year										
1961	305	166	370	348	306	320	283	**	300	61.1
1962	1555	1559	2134	2367	2562	2086	1970	**	2033	160.2
1963	270	575	331	467	501	341	271	**	394	60.7
1964	403	699	586	532	618	610	542	**	570	79.1
Pooled	633	750	855	928	997	839	766	N.S.	824	387.7

**Crop :- Cotton, Groundnut (*Kharif*).**

**Ref :- Mb. 65(113).**

**Site :- Agri. Res. Stn., Badnapur.**

**Type :- 'X'.**

Object :- To study the effect of mixed sowing of Groundnut and Cotton crops.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) 12.4 C.L./ha. of F.Y.M. (ii) N.A. (iii) 8.7.65. (iv) (a) Harrowing. (b) Drilling. (c) 11 Kg/ha. for Cotton and 90 Kg/ha. for Groundnut. (d) and (e) As per treatments. (v) 22.4 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) Cotton—1422 and Groundnut SB—XI. (vii) Unirrigated. (viii) Hoeing and weeding. (ix) 47 cm. (x) Groundnut on 27.11.65 and Cotton on 27.11.65 to 11.2.66.

## 2. TREATMENTS

Same as in Expt. No. 65(111) conducted at Akola and presented on page No. 567.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) 12.80 m.  $\times$  8.23 m. (b) 10.97 m.  $\times$  5.49 m. (v) 91 cm.  $\times$  136 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Mild attack of Aphids on Groundnut and mild attack of Jassids on Cotton. Edrin sprayed. (iii) Yield groundnut pods, *kapas* and their monetary return. (iv) (a) 1965 to 67. (b) No. (c) Nil. (v) Akola, Jalgaon and Nanded. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 895 Rs/ha. (ii) 241.3 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. produce	447	1001	1266	727	682	894	1005	1074	962

C.D. = 417.6 Rs/ha.

## 4. GENERAL :

(i) Normal ; Normal ; Satisfactory. (ii) Slight attack of Stem borer in *Jowar* in 63 ; Nil for others. (iii) Yield of grain. (iv) (a) 1963 to 65. (b) No. (c) Nil. (v) Achalpur, Akola, Dhulia, Nagpur, Yeotmal. (vi) Nil ; Nil ; No rain after 5.9.65. (vii) Error variances are heterogeneous and interaction is absent, hence individual results are given under 5. Results.

## 5. RESULTS:

63(264)

(i) 352 Rs/ha (ii) 105.3 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	350	311	351	368	266	457	372	341

64(222)

(i) 1436 Rs/ha. (ii) 243.8 Rs/ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	1236	1036	1722	1620	1420	1599	1480	1378

C.D.=358.6 Rs/ha.

65(127)

(i) 330 Rs/ha (ii) 232 Rs/ha (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	194	267	430	361	303	392	343	348

C.D.=137.1 Rs/ha.

**Crop :- Jowar and Moong (Kharif).****Ref :- Mh. 63(263), 64(220), 65(126).****Site :- Agri. Res. Stn., Buldhana.****Type :- 'X'.**

Object :- To study the effect of row sowing and mixed sowing.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 22.4 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black in 63 and 64 ; Medium heavy type soil. (iii) 17.7.63 ; 11.7.64 ; 24.7.65. (iv) (a) Harrowing. (b) Drilling. (c) *Jowar*—13 Kg/ha and *Moong*—17 Kg/ha. (d) 46 cm. (e) —. (v) 7.4 C.I./ha. of F.Y.M.+22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> ; 11.2 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub> ; 22.4 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) *Jowar*—NJ 156 and *Moong*—Kopergaon. (vii) Unirrigated. (viii) 2 to 3 hoeings and 1 to 2 weedings. (ix) 74 cm. ; 53 cm. ; 44 cm. (x) *Jowar* on 23.12.63 ; 7.12.64 ; 2.11.65, *Moong* on 13.9.63 ; 18.9.64 ; 17.9.65.

## 2. TREATMENTS and 3. DESIGN:

Same as in Expt. Nos. 63(51), 64(42), 65(3) conducted at Achalpur and presented on page No. 557.

## 4. GENERAL :

(i) Normal ; Normal, Satisfactory. (ii) Nil ; Nil ; B.H.C. dusted. (iii) Yield of grain. (iv) (a) 1963—65. (b) No. (c) Results of combined analysis are given under 5. Results. (v) Achalpur, Akola, Badnapur, Dhulia, Jalgaon, Nagpur, Washim and Yeotmal. (vi) N.A. ; N.A. ; No rain after 5.9.65. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

## 5. RESULTS :

## Pooled results

(i) 650 Rs/ha. (ii) 224.5 Rs/ha. (based on 14 d.f. make up of Treatments  $\times$  years interaction). (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	596	411	800	675	636	706	695	677

C.D.=196.6 Rs/ha.

## Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	Sig.	G.M.	S.E./plot
Year											
1963	559	116	441	441	508	454	496	448	**	438	63.0
1964	1019	930	1466	1118	1022	1339	1274	1174	*	1168	170.1
1965	211	188	492	466	378	324	315	368	*	343	117.2
Pooled	596	411	800	675	636	706	695	677	*	650	224.5

Crop :- Jowar, Moong, Udid, Sann. (Kharif).

Ref :- Mh. 63(200), 64(217),  
65(123).

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

Type :- 'X'.

Object :- To study the effect of mixed cropping on the yield of Jowar.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 24.7 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of N + 11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black. (iii) 10.7.63; 10.7.64; 24.7.65. (iv) (a) Harrowing. (b) Drilling. (c) 13, 20, 17 and 18 Kg/ha. for Jowar, Sann, Moong and Udid respectively. (d) 46 cm. (e) —. (v) 7.4 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> for 63 and 64; 12.4 Kg/ha. of N + 24.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub> for 65. (vi) Jowar-NJ 156, Sann-Jabalpur, Moong-Kopergaon and Udid—No. 55. (vii) Unirrigated. (viii) 2 hoeings and weeding (ix) 74 cm.; 53 cm.; 44 cm. (x) Jowar on 24.12.63; 7.12.64; 2.11.65, Moong on 1.9.63; 18.9.64; 17.9.65, Udid on 14.10.63; 28.9.64; 8.9.65 and Sann on 13.2.63; 12.11.64; 30.10.65.

## 2. TREATMENTS :

All combinations of (1) and (2) + one extra treatment

(1) 3 different mixed croppings : C<sub>1</sub>=Jowar and Sann in 1 : 1 row, C<sub>2</sub>=Jowar and Moong in 1 : 1 row and C<sub>3</sub>=Jowar and Udid in 1 : 1 row.

(2) 3 different ways of harvesting legume crops : M<sub>1</sub>=Allowed to seed, M<sub>2</sub>=Crops uprooted and spread in between rows and M<sub>3</sub>=Crops uprooted and buried in between rows.

Extra treatment E<sub>1</sub>=Entire Jowar. In 64 and 65 two more treatments were added, E<sub>2</sub>=Jowar with double spacing and E<sub>3</sub>=Jowar with single spacing.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10 for 63; 12 for 64 and 65. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  7.32 m. (b) 9.14 m  $\times$  5.49 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Stem borer in Jowar for 63; Nil for others. (iii) Yield of grain. (iv) (a) 1963—67 (conducted in 66). (b) No. (c) Nil. (v) Akola and Dhulia. (vi) Nil. (vii) Since expt. is contd. beyond 65, so individual results have been presented under 5. Results.



## 5. RESULTS:

63(200)

(i) 384 Rs/ha. (ii) 75.3 Rs/ha. (iii) Interaction  $C \times M$  is highly significant. (iv) Av. value of produce in Rs/ha.

 $E_1 = 388$  Rs/ha.

	$M_1$	$M_2$	$M_3$	Mean
$C_1$	257	422	449	376
$C_2$	419	359	356	378
$C_3$	516	335	345	399
Mean	397	372	383	384

C.D. for body of the table = 109.2 Rs/ha.

64(217)

(i) 854 Rs/ha. (ii) 125.4 Rs/ha. (iii) Main effect of  $M$  is highly significant. Extra vs. others is highly significant. (iv) Av. value of produce in Rs/ha.

 $E_1 = 623$ ,  $E_2 = 777$  and  $E_3 = 750$  Rs/ha.

	$M_1$	$M_2$	$M_3$	Mean
$C_1$	979	917	930	942
$C_2$	1118	800	794	904
$C_3$	1060	751	752	854
Mean	1052	823	825	900

C.D. for  $M$  marginal means = 108.0 Rs/ha.

C.D. for extra vs. others = 85.1 Rs/ha.

65(123)

(i) 109 Rs/ha. (ii) 16.2 Rs/ha. (iii) Main effects of  $M$  and  $C$  are highly significant. Interaction  $C \times M$  is highly significant. Extra vs. others and extra treatments among themselves are significant. (iv) Av. value of produce in Rs/ha.

 $E_1 = 191$ ,  $E_2 = 85$  and  $E_3 = 169$  Rs/ha.

	$M_1$	$M_2$	$M_3$	Mean
$C_1$	57	70	79	69
$C_2$	186	70	76	111
$C_3$	183	70	76	110
Mean	142	70	77	96

C.D. for  $C$  or  $M$  marginal means = 13.5 Rs/ha.C.D. for body of  $C \times M$  table = 23.3 Rs/ha.

C.D. for extra vs. others = 11.0 Rs/ha.

**Crop :- Bajri and Tur (Kharif).**

**Ref :- Mh. 64(253), 65(95).**

**Site :- Agri. Res. Stn., Chas.**

**Type :- 'X'.**

Object :- To study the effect of row sowing and mixed sowing of Legumes.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Nil ; *Bajri*. (c) Nil ; 12.34 C.L./ha. of F.Y.M. (ii) Medium black ; Medium light. (iii) 5.8.64 ; 27.7.65. (iv) (a) One harrowing ; 2 ploughings and 1 harrowing. (b) Drilling. (c) *Bajri*—3.7 Kg/ha., *Tur*—11.1 Kg/ha. ; 9.9 Kg/ha. (d) *Bajri* 30 cm. between rows and *Tur* 61 cm. between rows. (e) —. (v) Nil. (vi) *Bajri*—28—15—1, *Tur* N—84 for 64 and T—85 for 65. (vii) Unirrigated. (viii) One weeding ; Hoeing. (ix) N.A. ; 39 cm. (x) *Bajri* on 21.11.64 ; 9.11.65 and *Tur* on 29.1.65 ; 26.1.66.

**2. TREATMENTS :**

8 mixed cropping treatments : T<sub>1</sub>=Entire *Bajri*, T<sub>2</sub>=Entire *Tur*, T<sub>3</sub>=*Bajri* and *Tur* in 1 : 1 row proportion T<sub>4</sub>=*Bajri* and *Tur* in 2 : 1 row proportion, T<sub>5</sub>=*Bajri* and *Tur* in 3 : 1 row proportion, T<sub>6</sub>=*Bajri* and *Tur* in 1 : 1 mixture proportion, T<sub>7</sub>=*Bajri* and *Tur* in 2 : 1 mixture proportion and T<sub>8</sub>=*Bajri* and *Tur* in 3 : 1 mixture proportion.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory ; Normal. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1964 to 66. (b) No. (c) Nil. (v) Dhulia and Jeur. (vi) Nil. (vii) Since the experiment is continued beyond 65, the results of individual years are presented under 5. Results.

**5. RESULTS :**

**64(253)**

(i) 241 Rs/ha. (ii) 50.4 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	154	191	252	267	222	249	277	316

C.D. = 74.1 Rs/ha.

**65(95)**

(i) 277 Rs/ha. (ii) 95.0 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	253	89	315	320	325	257	431	225

C.D. = 139.6 Rs/ha.

**Crop :- Bajri and Moong (Kharif).**

**Ref :- Mh. 65(96).**

**Site :- Agri. Res. Stn., Chas.**

**Type :- 'X'.**

Object :- To study the effect of row sowing against mixed sowing on the component crops.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Groundnut. (c) 12.35 C.L./ha. of F.Y.M. (ii) Medium black. (iii) 23.7.65. (iv) (a) One harrowing. (b) Drilling. (c) *Bajri*—4 Kg/ha., *Moong*—10 Kg/ha. (d) 30 cm. (e) —. (v) Nil. (vi) *Bajri* 28—15—1, *Moong*—china. (vii) Unirrigated. (viii) Hoeing. (ix) 49 cm. (x) *Moong* on 30.9.65, *Bajri* on 9.11.65.

## 2 TREATMENTS and 3. DESIGN :

Same as in Expt. Nos. 64(212), 65(116) conducted at Badnapur and presented on page No. 575.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) and (b) No. (c) Nil. (v) Badnapur. (vi) No. (vii) Nil.

## 5. RESULTS :

(i) 210 Rs/ha. (ii) 69.3 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	239	36	167	229	230	204	263	312

C.D. = 101.9 Rs/ha.

**Crop :- Bajri, Groundnut (Kharif).**

**Ref :- Mh. 61(206), 62(200), 63(247),  
64(201), 65(93).**

**Site :- Agri. Res. Stn., Chas.**

**Type :- 'X'.**

**Object :-** To study the effect of growing *Bajri* and Groundnut in alternate strips.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Bajri* and *Tur*; *Bajri* and Groundnut in 62 to 64 and (*Rabi*) *Jowar* in 65. (c) Nil. (ii) Medium in 61 to 64; Light in 65. (iii) 24.6.61; 8.7.62; 1.7.63; 23.7.64; 19.7.65. (iv) (a) Ploughing in 61 to 64; 2 ploughings and 2 harrowings in 62, 63; 1 harrowing in 65. (b) Drilling; (c) *Bajri*—3.4 Kg/ha., Groundnut 89.6 Kg/ha. (d) 30 cm. (e) N.A. (v) Nil. (vi) *Bajri*—28—15—1 and Groundnut—Spanish peanut (vii) Unirrigated. (viii) Interculturing in 61, 62 and 64; Weeding 63; interculturing and hoeing in 65. (ix) 31 cm.; 33 cm.; 21 cm.; 48 cm.; 39 cm. (x) Groundnut—25.9.61; 19.10.62; 1.11.63; 22.11.64; 11.11.65 and *Bajri* on 25.9.61; 3, 4.11.62; 19.11.63; 3.12.64; 9.11.65.

## 2. TREATMENTS :

3 mixed cropping treatments : M<sub>1</sub>=*Bajri* alone, M<sub>2</sub>=Groundnut alone and M<sub>3</sub>=*Bajri* and Groundnut in alternate strips.

*Bajri* and Groundnut will be inter changed in the succeeding year in M<sub>3</sub>.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 12. (iv) (a) 11.58 m. × 7.32 m. (b) 9.14 m. × 4.88 m. (v) 122 cm. × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal in all year except in 64 when growth was stunted. (ii) Nil; Bhitu Beetles; Bhitu Beetes and Aphids B.H.C. 10 % applied for Aphids; *Bajri* crop was affected by Blighter Beetles, B.H.C. 10 % was sprayed. (iii) Plant count, yield etc. and monetary return. (iv) (a) 1961 to 65. (b) Only during 62 to 64. (c) Results of combined analysis are given under 5. Results. (v) Jeur and Sholapur. (vi) Due to dry spell yields were reduced in 61. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

## 5. RESULTS :

Pooled results

(i) 373 Rs/ha. (ii) 360.2 Rs/ha. (based on 8 d.f. made up of Treatments × years interaction). (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>
Av. value	176	550	393

C.D. = 151.6 Kg/ha.

Treatment	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Sig.	G.M.	S.E./plot
Year						
1961	147	558	328	**	344	121.9
1962	175	375	284	**	278	46.6
1963	42	210	182	**	145	40.7
1964	242	657	501	**	467	71.6
1965	274	948	668	**	630	183.2
Pooled	176	550	393	**	373	360.2

**Crop :- Jowar—Tur (Kharif).**

**Ref :- Mh. 63(27), 64(21), 65(11).**

**Site :- Agri. College Farm, Dhulia.**

**Type :- 'X'.**

Object :—To study the effect of mixed cropping of *Jowar* and *Tur*.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Kharif Jowar*; Cotton; Cotton. (c) N.A.; N.A.; 33.6 Kg/ha. of N. (ii) Medium black (iii) 4.7.63; 2.7.64; 17.7.65. (iv) (a) 2 harrowings. (b) Drillings. (c) N.A. (d) 45 cm.; 91 cm. (e) —. (v) Nil. (vi) *Jowar—Local and Tur—T.—84*. (vii) Unirrigated. (viii) 2 weedings and 1 to 3 hoeings. (ix) 37 cm.; 53 cm. and 40 cm. (x) *Jowar* on 15.11.63.; 9.11.64.; 6.11.65 and *Tur* on 15.11.63, 9.11.64 and 9.12.65.

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

Same as in Expt. Nos. 63(50), 64(41), 65(5) conducted at Achalpur and presented on page No. 555.

**4. GENERAL :**

(i) Satisfactory; Good; Normal. (ii) Nil in 63, 64; Endrin sprayed for Stem borer. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 66. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) As the experiment is continued beyond 65 results of individual years are presented under 5. Results.

**5. RESULTS :**

**63(27)**

(i) 153 Rs/ha. (ii) 39.9 Rs/ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	178	194	146	149	154	144	128	131

**64(21)**

(i) 821 Rs/ha. (ii) 195.3 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	602	443	990	1027	855	986	871	795

C.D. = 287.2 Rs/ha.

**65(11)**

(i) 358 Rs/ha. (ii) 80.5 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	458	18	317	486	433	453	303	400

C.D. = 118.3 Rs/ha.

**Crop :- Jowar, Moong (Kharif).**

**Ref :- Mh. 63(23), 64(17), 65(9).**

**Site :- Agri. College Farm, Dhulia.**

**Type :- 'X'.**

Object :—To study the effect of row sowing and mixed sowing on the yield of *Jowar* and *Moong*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) (*Kharif*) *Jowar* ; Cotton ; Cotton. (c) Nil ; Nil ; 33.6 Kg/ha. of N. (ii) Medium black. (iii) 5.7.63 ; 3.7.64 ; 18.7.65. (iv) (a) Harrowing. (b) Drilling. (c) N.A. (d) 46 cm. (e) —. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) 2 weedings, 3 hoeings ; 2 weedings, 1 hoeing ; Weeding and hoeing. (ix) 37 cm. ; 53 cm. ; 33 cm. (x) Both on 14.11.63 ; 9.11.64 ; *Moong* on 16.9.65 and *Jowar* on 3.11.65.

2. TREATMENTS and 3. DESIGN :

Same as in Expt. Nos. 63(51), 64(42), 65(3) conducted at Achalpur and presented on page No. 557.

4. GENERAL :

(i) Normal. (ii) Nil in 63, 64 ; Endrin sprayed for Stem borer in 65. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 65. (b) No. (c) Results of combined analysis are given under 5. Results. (v) Achalpur, Akola, Buldhana, Nagpur. (vi) Nil. (vii) As there was no rain after August 65, the crop suffered due to lack of moisture. Error variances are heterogeneous and Treatments  $\times$  years interaction is present.

5. RESULTS :

Pooled results

(i) 596 Rs/ha. (ii) 241.7 Rs/ha. (based on 14 d.f. made up of Treatments  $\times$  years interaction). (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	4.5	538	655	614	586	688	675	597

Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	Sig.	C.M.	S.E./plot
Year											
1963	171	215	214	185	185	254	240	211	N.S.	211	49.8
1964	618	632	1072	980	915	1161	1083	1037	N.S.	937	211.3
1965	455	768	668	676	659	649	701	543	N.S.	640	147.2
Pooled	415	538	655	614	586	688	675	597	N.S.	596	241.7

**Crop :- Jowar and Udid (Kharif).**

**Ref :- Mh. 63(25), 64(19), 65(10).**

**Site :- Agri. College Farm, Dhulia.**

**Type :- 'X'.**

Object :—To study the effect of row sowing and mixed sowing on the yield of *Jowar* and *Udid*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar* ; Cotton ; Cotton. (c) N.A. ; N.A. ; 33.6 Kg/ha. of N. (ii) N.A. (iii) 5.7.63 ; 2.7.64 ; 18.7.65. (iv) (a) 2 to 3 harrowings. (b) Drilling. (c) N.A. (d) 46 cm. (e) —. (v) Nil. (vi) *Jowar*-Rankel, *Udid*—Sinkheda. (vii) Unirrigated. (viii) 2 weedings and 1 to 3 hoeings. (ix) 37 cm. ; 53 cm. ; 33 cm. (x) 10.11.63 ; 11.11.64 ; *Udid* 29.9.65 and *Jowar* 5.11.65.

2. TREATMENTS :

Same as in Expt. Nos. 63(47), 64(40), 65(4) conducted at Achalpur and presented on page No. 556.

## 4. GENERAL :

(i) Good ; Good ; Normal. (ii) Nil in 63, 64 ; Endrin sprayed for Stem borer in 65. (iii) Yield of grain and monetary return. (iv) (a) 1963—65. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Achalpur, Akola, Buldhana, Jalgaon, Nagpur and Washim. (vi) Nil ; Nil ; No rain after August 65. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is present.

## 5. RESULTS :

(i) 595 Rs/ha. (ii) 281.7 Kg/ha. (based on 14 d.f. made up of Treatments  $\times$  years interaction). (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	331	509	691	606	555	793	648	626

C.D. = 246.6 Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	Sig.	G.M.	S.E./plot
Year											
1963	181	327	330	289	286	437	325	317	**	312	63.8
1964	367	656	1204	472	814	1187	1085	1032	**	915	177.4
1965	446	544	538	559	565	756	534	530	N.S.	559	143.6
Pooled	331	509	691	606	555	793	648	626	**	595	281.4

**Crop :- Jowar and Udid (Kharif).**

**Ref :- Mh. 63(193), 64(162), 65(131).**

**Site :- Agri. Res. Stn., Dhulia.**

**Type :- 'X'.**

**Object :-** To study the symbiotic and rotational effect of *Jowar* and *Udid* in alternate drilling and shifting *Jowar* in place of *Udid* and vice-versa.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Medium black. (iii) 18.7.63 ; 9.7.64 ; 21.7.65. (iv) (a) 1 ploughing and 1 harrowing. (b) Drilling. (c) 10 Kg/ha. (d) 46 cm.  $\times$  15 to 23 cm. (e) —. (v) 12.35 C.L./ha. of F.Y.M. (vi) *Jowar* K. 2—2—2—10 and *Udid* D—6—7. (vii) Unirrigated. (viii) Two interculturations and two weedings. (ix) 50 cm. ; 58 cm. ; 33 cm. (x) *Udid* on 14, 28.9.63 ; 22.9.64 ; Sept., 65 and *Jowar* on 24.10.63 ; 15.11.64 ; 9.11.65.

## 2. TREATMENTS :

6 mixed cropping treatments ; T<sub>1</sub> = *Jowar* and *Udid* in alternate drilling, T<sub>2</sub> = Entire *Jowar* followed by *Jowar*, T<sub>3</sub> = Entire *Udid* followed by *Udid*, T<sub>4</sub> = Entire *Jowar* followed by *Udid*, T<sub>5</sub> = Entire *Udid* followed by *Jowar* and T<sub>6</sub> = *Jowar* and *Udid* mixed sowing.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 18.29 m.  $\times$  24.69 m. (iii) 6. (iv) (a) 8.23 m.  $\times$  9.14 m. (b) 5.49 m.  $\times$  7.32 m. (v) 137 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Endrin sprayed for Stem borer attack in *Jowar* in 63 and 64 ; Endrin sprayed in 65. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 65. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Nil. (vi) No. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is present.

## 5. RESULTS :

Pooled results

(i) 453 Rs/ha. (ii) 392.5 Rs/ha. (based on 10 d.f. made up of Treatments  $\times$  years interaction). (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>
Av. produce	536	369	415	417	434	545

Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	Sig.	G.M.	S.E./plot
Year 1963	402	277	501	452	259	361	**	375	88.7
1964	503	464	156	433	257	521	**	389	161.2
1965	703	366	588	366	786	752	*	594	195.9
Pooled	536	369	415	417	434	545	N.S.	453	392.5

**Crop :- Jowar, Moong, Udid and Sann (Kharif).****Ref :- Mh. 63(21), 64(15), 65(8).****Site :- Agri. College Farm, Dhulia.****Type :- 'X'.**

Object :- To study the effect of mixed cropping of pulses and cereals.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton. (c) 33.6 Kg/ha. of N. (ii) Medium black. (iii) 4.7.63 ; 2.7.64 ; 17.7.65. (iv) (a) 2 harrowings. (b) Drilling. (c) N.A. (d) 46 cm. and 91 cm. for T<sub>2</sub>. (e) —. (v) Nil. (vi) Jowar Satpani, Udid-Sindkheda, Moong-China, Sann-local. (vii) Unirrigated. (viii) 2 weedings and one hoeing. (ix) 30 cm. ; 53 cm. ; 53 cm. (x) Jowar 31.11.63 ; 11.11.64 ; 6.11.65 ; Sann 27.11.63 ; 26.11.64 ; 7.12.65 ; Moong 10.9.60 ; 3.9.64 ; 10.9.65 and Udid 25.9.63, 3.9.64 ; 29.9.65.

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

Same as in Expt. Nos. 63(19), 64(16), 65(2) conducted at Achalpur and presented on page No. 558.

**4. GENERAL :**

(i) Normal. (ii) Endrin sprayed. (iii) Yield of grain and monetary return. (iv) (a) 1963 contd. (modified in 64). (b) N. (c) Nil. (v) Achalpur. (vi) Nil. (vii) Expt. contd. beyond 65, hence the results of individual years are presented under 5. Results.

**5. RESULTS:****63(21)**

(i) 226 Rs/ha. (ii) 71.76 Rs/ha. (iii) Main effects of C and M are significant. (iv) Av. value of produce in Rs/ha.

T<sub>0</sub> = 177 Rs/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
C <sub>1</sub>	174	225	166	181
C <sub>2</sub>	314	199	210	238
C <sub>3</sub>	362	229	215	269
Mean	280	218	177	232

C.D. for C or M marginal means = 60.1 Rs/ha.

**64(15)**

(i) 824 Rs/ha. (ii) 135.4 Rs/ha. (iii) Extra vs. others is highly significant. (iv) Av. value of produce in Rs/ha.

$T_1=405$  Rs/ha. and  $T_2=470$  Rs/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
C <sub>1</sub>	920	911	818	883
C <sub>2</sub>	829	935	835	866
C <sub>3</sub>	1105	928	908	980
Mean	951	925	854	910

C.D. for extra vs. others=126.2 Rs/ha.

65(8)

(i) 448 Rs/ha. (ii) 127.1 Rs/ha. (iii) Main effects of C and M are highly significant. (iv) Av. value of produce in Rs/ha.

$T_1=429$  and  $T_2=433$  Rs/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
C <sub>1</sub>	308	230	291	276
C <sub>2</sub>	702	413	588	567
C <sub>3</sub>	704	456	380	513
Mean	571	366	419	452

C.D. for C or M marginal means=105.9 Rs/ha.

**Crop :- Bajri-Tur (Kharif).**

**Ref :- Mh. 63(26), 64(20), 65(14).**

**Site :- Agri. College Farm, Dhulia.**

**Type :- 'X'.**

**Object :-** To study the effect of row sowing and mixed sowing.

1. **BASAL CONDITIONS:**

(i) (a) Nil. (b) Cotton. (c) N.A. in 63 and 64 ; 33.6 Kg/ha. of N in 65. (ii) Medium black soil. (iii) 17.7.63 ; 10.7.64 ; 18.7.65. (iv) (a) Harrowing. (b) Drilling. (c) N.A. (d) 61 cm. in T<sub>2</sub>, 30 cm. for others. (e) —. (v) Nil. (vi) *Bajri* 28—15, *Tur* N—84 (vii) Unirrigated. (viii) 1 weeding and 2 hoeings 63 ; 2 weedings and 1 hoeing in 64, 65. (xi) 30 cm. ; 53 cm. ; 33 cm. (x) 16 10.63 ; 13.10 64 ; *Bajri* 7.10.65 and *Tur* 9.12.65.

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

Same as in Expt. Nos. 64(253), 65(55) conducted at Chas and presented on page No. 582.

4. **GENERAL :**

(i) Normal (ii) Endrin sprayed in 63, 64 ; Nil. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 65. (b) No. (c) Results of combined analysis are given under 5. Results. (v) Chas. (vi) Nil ; Nil ; Practically no rains after August 65. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

5. **RESULTS :**

Pooled results

(i) 536 Rs/ha. (ii) 276.5 Rs/ha. (based on 14 d.f. made up of Treatments × years interaction). (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatments	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	514	216	557	603	566	620	621	589

C.D.=242.1 Rs/ha.



Individual results in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	Sig.	G.M.	
Year											
1963	149	227	230	234	240	230	245	229	**	223	24.9
1964	504	273	694	696	696	727	674	705	**	621	89.7
1965	889	146	749	878	764	903	944	832	**	763	129.1
Pooled	514	216	557	603	566	620	621	589	*	536	276.5

**Crop :- Bajri-Moong (Kharif).****Ref :- Mh. 63(22), 64(16), 65(13).****Site :- Agri. College Farm, Dhulia.****Type :- 'X'.**

Object:—To study the effect of row sowing and mixed sowing.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*; Cotton; Cotton. (c) N.A.; N.A.; 33.6 Kg/ha. of N. (ii) Medium black. (iii) 18.7.63; 9.7.64; 18.7.65. (iv) (a) 2 harrowings. (b) Drilling. (c) N.A. (d) 30 cm. (e) —. (v) Nil. (vi) *Bajri*—28—15, *Moong*—chinamug. (vii) Unirrigated. (viii) One weeding and 2 hoeings. (ix) 28 cm.; 72 cm.; 28 cm. (x) 15.10.63; 13.10.64; *Moong*—18.9.65 and *Bajra* 7.10.65.

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

Same as in Expt. Nos. 64(212), 65(116) conducted at Badnapur and presented on page No. 575.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain and monetary return. (iv) 1963 to 65. (b) No. (c) Results of combined analysis are given under 5. Results. (v) Badnapur. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × year interaction is present.

**5. RESULTS :**

Pooled results

(i) 530 Rs/ha. (ii) 201.6 Rs/ha. (based on 14 d. f. made up of Treatments × years interaction). (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	570	394	583	551	490	571	534	544

Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	Sig.	G.M.	S.E./plot
Year											
1963	143	72	159	156	152	174	190	164	**	151	29.9
1964	574	648	601	639	544	610	591	568	N.S.	597	109.6
1965	903	661	987	860	772	929	820	899	**	840	122.4
Pooled	570	394	583	551	490	571	534	544	N.S.	530	201.6

**Crop :- Bajri and Udid (Kharif).****Ref :- Mh. 63(24), 64(18), 65(15).****Site :- Agri. College Farm, Dhulia.****Type :- 'X'.**

Object :—To study the effect of row sowing and mixed sowing.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*; Cotton in 64, 65. (c) N.A. in 63, 64; 33.6 Kg/ha. of N. (ii) Medium black soil. (iii) 18.7.63; 9.7.64; 18.7.65. (iv) (a) 2 harrowings. (b) Drilling. (c) N.A. (d) 30 cm. (e) —. (v) Nil. (vi) *Bajra*—28-15, Black gram—Sindkheda. (vii) Unirrigated. (viii) 1 weeding, 2 hoeings; 2 weedings and 1 hoeing; 1 hoeing and 1 weeding. (ix) 28 cm.; 53 cm.; 33 cm. (x) Both on 15.10.63; 12.10.64; *Udid* 30.9.65 and *Bajri* 7.10.65.

**2. TREATMENTS :**

8 mixed cropping treatments:  $T_1$ =*Bajri* alone,  $T_2$ =Black gram alone,  $T_3$ =*Bajri* and Black gram in 1 : 1 row sowing,  $T_4$ =*Bajri* and Black gram in 2 : 2 row sowing,  $T_5$ =*Bajri* and Black gram in 3 : 1 row sowing,  $T_6$ =*Bajri* and Black gram in 1 : 1 mixed and sown,  $T_7$ =*Bajri* and Black gram in 2 : 2 mixed and sown and  $T_8$ =*Bajri* and Black gram in 3 : 1 mixed and sown.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 m. × 91 m. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 65. (b) No. (c) Results of combined analysis are given under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

**5. RESULTS :**

Pooled results

(i) 515 Rs/ha. (ii) 233.4 Rs/ha. (based on 14 d. f. made up of Treatments × years interaction). (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$	$T_8$
Av. value	475	396	540	569	534	592	502	510

Individual results in Rs/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_6$	$T_7$	$T_8$	Sig.	G.M.	S.E./plot
Year											
1963	156	132	199	188	178	202	200	181	**	180	23.9
1964	495	749	680	687	625	705	600	624	*	646	87.7
1965	772	308	812	833	797	870	706	724	*	728	131.7
Pooled	475	396	540	569	534	592	502	510	N.S.	515	233.4

**Crop :- Bajri, Udid, Moong and Sann (Kharif).****Ref :- Mh. 63(20).****Site :- Agri. College Farm, Dhulia.****Type :- 'X'.**

Object :—To study the effect of mixed cropping.

**1. BASAL CONDITIONS**

(i) (a) Nil. (b) *Jowar*. (c) N.A. (ii) Medium black. (iii) 17.7.63. (iv) (a) Harrowing. (b) Drilling. (c) N.A. (d) 30 cm. (e) —. (v) Nil. (vi) *Bajri*—28-15, *Sann*-local, *Udid*-Sindkheda, *Moong*-China. (vii) Unirrigated. (viii) One weeding and 2 hoeings. (ix) 30 cm. (x) *Bajri* 15.10.63, *Sann* 7.11.63, *Moong* 10.9.63 and *Udid* 25.9.63.

## 2. TREATMENTS :

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

(1) 3 legumeneous crops :  $C_1$ =Sann,  $C_2$ =Moong and  $C_3$ =Udid.

(2) 3 methods of application :  $M_1$ =Control,  $M_2$ =Crops uprooted and spread between the rows of Bajri and  $M_3$ =Crops uprooted and buried between the rows of Bajri.

Legumeneous crops and Bajri sown in alternate rows and Bajri alone in control plot ( $T_0$ ).

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) No. (b) N.A. (iii) 4. (iv) (a) 10.97 m.×7.32 m. (b) 9.14 m.×5.49 m. (b) 91 cm.×91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1963 contd. (modified in 64). (b) No. (c) Nil. (v) Achalpur. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 130 Rs/ha. (ii) 29.90 Rs/ha. (iii) Main effect of M is highly significant. (iv) Av. value of produce in Rs/ha.

$T_0$ =143 Rs/ha.

	$M_1$	$M_2$	$M_3$	Mean
$C_1$	138	117	90	115
$C_2$	152	130	105	129
$C_3$	198	125	103	142
Mean	163	124	99	129

C.D. for C or M marginal means =25.02 Rs/ha.

C.D. for body of the table or to means=43.34 Rs/ha.

**Crop :- Bajri, Udid, Moong and Sann (Kharif).**

**Site :- Agri. College Farm, Dhulia.**

**Ref :- Mh. 64(14), 65(12).**

**Type :- 'X'.**

Object :—To study the effect of mixed cropping experiment.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) Medium black. (iii) 10.7.64 ; 18.7.65. (iv) (a) 2 harrowings. (b) Drilling. (c) N.A. (d) 30 cm. and 60 cm. in  $T_2$ . (e) —. (v) Nil. (vi) Bajri—28-15, Sann—local, Udid Sindkheda, Moong—China. (vii) Unirrigated. (viii) Two weedings and one hoeing. (ix) 53 cm. (x) Bajri 12.10.64 ; 7.10.65, Sann 25.11.64 ; 9.12.65, Moong 11.9.64 ; 18.9.65 and Udid 24.9.64 ; 30.9.65.

## 2. TREATMENTS :

All combinations of (1) and (2)+2 extra treatments

(1) 3 legumeneous crops :  $C_1$ =Sann,  $C_2$ =Moong and  $C_3$ =Udid.

(2) 3 methods of application :  $M_1$ =No application,  $M_2$ =Crops uprooted and spread between the rows of Bajri and  $M_3$ =Crops uprooted and buried between the rows of Bajri.

Legumeneous crops and Bajri sown in alternate rows.

$T_1$ =Bajri alone and  $T_2$ =Bajri alone with double spacings.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1963—contd. (modified in 64). (b) No. (c) Nil. (v) N.A. (vi) (a) Nil. (b) Nil. (vii) Expt. contd. beyond 65. The results of individual years are presented under 5. Results.

## 5. RESULTS :

64(14)

(i) 546 Rs/ha. (ii) 75.8 Rs/ha. (iii) Interaction C × M is significant. (iv) Av. value of produce in Rs/ha.

$T_1=400$  Rs/ha. and  $T_2=569$  Rs/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
C <sub>1</sub>	544	560	452	519
C <sub>2</sub>	513	535	596	548
C <sub>3</sub>	659	547	551	586
Mean	572	547	553	551

C.D. for body of table = 109.4 Rs/ha.

65(12)

(i) 576 Rs/ha. (ii) 123.8 Rs/ha. (iii) Main effect of C and extra vs. others are highly significant. (iv) Av. value of produce in Rs/ha.

$T_1=721$  Rs/ha. and  $T_2=686$  Rs/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
C <sub>1</sub>	280	216	216	247
C <sub>2</sub>	681	662	631	68
C <sub>3</sub>	864	734	622	740
Mean	608	547	490	548

C.D. for C marginal means = 103.2 Rs/ha.

C.D. for extra vs. others = 84.2 Rs/ha.

**Crop :- Jowar and Moong (Kharif).**

**Ref :- Mh. 61(198), 62(196), 63(235).**

**Site :- Agri. Res. Sta., Digraj.**

**Type :- 'X'.**

Object :- To study the symbiotic and rotational effect of cereals and pulses in alternate drilling.

## 1. BASAL CONDITIONS:

(i) (a) As per treatments. (b) *Kharif Jowar*. (c) 12.4 C.L./ha. of F.Y.M. + 11 Kg/ha. of N ; 22.4 C.L./ha. of F.Y.M. (ii) N.A. (iii) 29.9.61 ; 9.7.62 ; 29.6.63. (iv) (a) 5 to 6 harrowing ; 5 to 6 harrowings ; 3 to 4 harrowings. (b) Drilling. (c) 11.2 Kg/ha. for *Jowar* and 22.4 Kg/ha. for *Moong*. (d) 46 cm. (e) —. (v) 12.35 C.L./ha. of F.Y.M. (vi) *Jowar*—Mondapur and *Moong*—781. (vii) Unirrigated. (viii) 2 to 3 interculturations. (ix) 46 cm. ; 48 cm. ; 47 cm. (x) *Moong* on 7.9.61 ; 21.9.62 ; 7.9.63 and *Jowar* on 14.1.62 ; 20.12.62 ; 31.12.63.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. Nos. 61(151), 65(133) conducted at Akola and presented on page No. 561.

## 4. GENERAL:

(i) Normal. (ii) Stem borer B.H.C. 50 % @ 11.2 to 16.8 Kg/ha. ; Stem borer and leaf eating caterpillar Aldrex applied 2 times ; Stem borer and leaf eating caterpillar 10 % B.H.C. dusted in 63. (iii) Yield of grain and monetary return. (iv) (a) 1961 to 63. (b) Nil. (c) Results of combined analysis are given in 5. Results. (v) Akola. (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is present.

## 5. RESULTS :

Pooled results

(i) 391 Rs/ha. (ii) 872.0 Rs/ha. (based on 4 d.f. made up of Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. value	581	101	491

Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	Sig.	G.M.	S.E./plot
Year						
1961	188	126	280	**	198	14.3
1962	1118	94	801	**	671	33.1
1963	293	66	294	**	218	57.8
Pooled	581	101	491	N.S.	391	872.0

**Crop :- Jowar, Groundnut (Kharif).**

**Ref :- Mh. 64(193), 65(35).**

**Site :- Agri. Res. Stn., Digraj.**

**Type :- 'X'.**

**Object :-** To study the optimum proportion of mixed crops.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A. ; *Jowar (Kharif)*. (c) N.A. ; 12.35 C.L./ha. of F.Y.M. (ii) Medium black. (iii) 26.7.64 ; 24.7.65. (iv) (a) 3 to 4 harrowings ; Ploughing and 2 harrowings. (b) Dibbling. (c) Groundnut—74 Kg/ha. ; *Jowar*—15 Kg/ha. (d) 46 cm.×30 cm. (e) 1 to 2. (v) Nil. (vi) *Jowar*—Shenoli—4—2 and Groundnut Kopergaon—1. (vii) Unirrigated. (viii) 3 interculturings ; Hoeing and weeding. (ix) 58 cm. ; 48 cm. (x) 29.12.64 ; 25.12.65.

## 2. TREATMENTS :

8 mixed cropping treatments : T<sub>1</sub>=Entire *Jowar*, T<sub>2</sub>=Entire Groundnut, T<sub>3</sub>=*Jowar* and Groundnut in 6 : 2 rows, T<sub>4</sub>=*Jowar* and Groundnut in 4 : 2 rows, T<sub>5</sub>=*Jowar* and Groundnut in 2 : 2 rows. ; T<sub>6</sub>=*Jowar* and Groundnut in 2 : 4 rows, T<sub>7</sub>=*Jowar* and Groundnut in 2 : 6 rows and T<sub>8</sub>=*Jowar* and Groundnut in 2 : 6 rows (Local cultivation practices).

## 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 7.92 m.×12.80 m. (b) 6.10 m.×10.97 m. (v) 91 cm.×91 cm. ; 18 cm.×91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) *Tikka* observed ; 10 % B.H.C. and Sulphur at 17 Kg/ha. dusted in 65. (iii) Yield of grain and pods. Monetary return. (iv) (a) 1964 to 67. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Since the experiment is continued beyond 65, results of individual years are presented under 5. Results.

## 5. RESULTS :

64(193)

(i) 320 Rs/ha. (ii) (a) 51.8 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment:	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	155	468	255	244	312	330	460	339

C.D. = 76.1 Rs/ha.

65(35)

(i) 1615 Rs/ha. (ii) 200.7 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	1003	2297	1166	1165	1394	1883	2042	1967

C.D. = 295.0 Rs/ha.

Crop :- Jowar and Tur (*Kharif*).

Ref :- Mh. 63(265), 64(224), 65(135).

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

Type :- 'X'.

Object :- To study the effect of row sowing against mixed sowing on component crops.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat ; *Jowar* ; Sesamum. (c) 12.4 C.L./ha. of F.Y.M. (ii) N.A. (iii) 15.7.63 ; 2.7.64 ; 19.7.65. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 7 Kg/ha. (both). (d) Rows 46 cm. apart. (e) —. (v) Nil. (vi) *Jowar*—BS—12—2—11, *Tur*—Local. (vii) Unirrigated. (viii) 2 hoeings. (ix) 51 cm. ; 64 cm. ; 52 cm. (x) *Jowar*—6.12.63 ; 14.12.64 ; 29.12.65 and *Tur* on 3.3.64 ; 2.2.65 ; 16.3.66.

## 2. TREATMENTS :

Same as in Expt. Nos. 63(50), 64(41), 65(5) conducted at Achalpur and presented on page No. 555

## 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 10.06 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 46 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil in 63, 64 ; Caterpillar on *Tur* in 65, B.H.C. 10 % dusted. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 66. (b) No. (c) Nil. (v) Achalpur, Akola, Badnapur. (vi) Nil. (vii) As the experiment is continued beyond 65, results of individual years are presented under 5. Results.

## 5. RESULTS :

63(265)

(i) 611 Rs/ha. (ii) 87.2 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	144	915	792	652	646	685	649	408

C.D. = 128.2 Rs/ha.

64(224)

(i) 712 Rs/ha. (ii) 124.1 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	339	1252	721	744	576	666	629	738

C.D. = 182.4 Rs/ha.

65(135)

(i) 757 Rs/ha. (ii) 192.5 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	670	644	726	635	707	824	740	1108

C.D. = 282.9 Rs/ha.

Crop :- Jowar, Udid (*Kharif*).

Ref :- Mh. 63(213), 64 (171), 65(65).

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

Type :- 'X'.

Object :- To study the effect of row sowing and mixed sowing on the yield of *Jowar* and *Udid*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Safflower ; *Jowar* and *Udid* ; Sesamum. (c) 12.35 C.L./ha. of F.Y.M. (ii) Black cotton soil. (iii) 14.7.63 ; 2.7.64 ; 19.7.65. (iv) (a) Harrowings. (b) Drilling. (c) *Jowar*—7 Kg/ha., *Udid*—11 to 17 Kg/ha.. (d) 46 cm. (e) 1 to 2. (v) 12.35 C.L./ha. of F.Y.M. (vi) *Jowar*BS—12-2-11, *Udid* Sindkheda. (vii) Unirrigated. (viii) 2 hoeings ; 3 hoeings 3 weedings ; Hoeing and weeding. (ix) 57 cm. ; 84 cm. ; 51 cm. (x) *Jowar* 20.12.63 ; 9.12.64 ; 29.12.65 ; and *Udid* 24.9.63 ; 5.10.64 ; 30.9.65.

## 2. TREATMENTS and 3 DESIGN :

Same as in Expt. Nos. 63(47), 64(40), 65 (4) conducted at Achalpur and presented on page No. 556.

## 4. GENERAL :

(i) Normal ; Germination not satisfactory due to want of moisture. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 65. (b) Nil. (c) Results of combined analysis are presented under 5. Results. (v) Achalpur, Dhulia. (vi) No. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

## 5. RESULTS :

## Pooled results

(i) 698 Rs/ha. (ii) 267.0 Rs/ha. (based on 14 d.f. made up of Treatments × years interaction). (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	523	390	841	711	810	789	762	756

C.D. = 233.9 Rs/ha.

## Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	Sig.	G.M.	S.E./plot
Year											
1963	169	358	416	394	355	501	481	420	**	387	83.5
1964	667	306	1187	905	1133	924	952	976	**	881	153.5
1965	733	507	921	835	943	941	853	872	N.S.	826	86.7
Pooled	523	390	841	711	810	789	762	756	**	698	267.0

**Crop :- Jowar and Moong (Kharif).**

**Ref :- Mh. 63(250), 64(204), 65(97).**

**Site :- Agri. Res. Stn., Jalgaon.**

**Type :- 'X'.**

**Object :-**To study the effect of row sowing against mixed sowing on component crops.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Grain and Safflower ; *Jowar* and *Moong* ; Sesamum. (c) 12.4 C.L./ha. of F.Y.M. in 63, 64 ; Nil in 65. (ii) N.A. (iii) 14.7.63. ; 2.7.64 and 19.7.65. (iv) (a) Ploughing and harrowing. (b) Drilling (c) *Jowar* 6.7 Kg/ha., *Moong* 11.2 Kg/ha. (d) Rows 46 cm. apart. (e) —. (v) Nil. (vi) *Jowar*—BS 12-2-11, *Moong*—China 781. (vii) Unirrigated. (viii) Weeding and hoeing ; Hoeing ; 3 weedings and 3 hoeings. (ix) 51 cm. ; 64 cm. ; 51 cm. (x) *Jowar* 21.12.63 ; 9.12.64 ; 24.12.65 and *Moong* 23.9.63 ; 18.9.64 ; 21.9.65.

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

Same as in Expt. Nos. 63(51), 64 (42), 65(3) conducted at Achalpur and presented on page No. 557.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 65. (b) No. (c) Results of combined analysis are given under 5. Results. (v) Nil. (vi) No. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is present.

**5. RESULTS :**

**Pooled results**

(i) 822 Rs/ha. (ii) 246.5 Rs/ha. (based on 14 d.f. made up of Treatments  $\times$  years interaction). (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	579	539	909	890	885	866	957	949

C.D. = 215.7 Rs/ha.

**Individual results**

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	Sig.	G.M.	S.E./plot
Year											
1963	292	266	536	498	439	423	569	433	**	432	66.1
1964	572	362	1024	1102	1027	1031	1189	1009	**	914	144.3
1965	874	989	1166	1069	1188	1143	1114	1104	**	1081	79.0
Pooled	579	539	909	890	885	866	957	949	**	822	246.5

**Crop :- Jowar, Moong, Udid, Sann (Kharif).**

**Ref :- Mh. 63(214),**

**Site :- Agri. Res. Stn., Jalgaon.**

**Type :- 'X'.**

**Object :-**To study the effect of mixed cropping on the yield of Cereals and Pulses.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat. (c) 12.35 C.L./ha. of F.Y.M. (ii) (a) Black cotton soil. (b) N.A. (iii) 15.7.63. (iv) (a) Harrowing. (b) Drilling. (c) *Jowar*-7 Kg/ha., *Moong* and *Udid* at 11 Kg/ha., *Sann*-112 Kg/ha. (d) 46 cm. (e) 1-2. (v) Nil. (vi) *Jowar*-B.S. 12-2-11, *Udid*-*Sinkheda*, *Moong*-781, *Sann*-local. (vii) Unirrigated (viii) 2 Hoeings. (ix) 57 cm. (x) *Sann* 12.11.63, *Moong* 23.9.63, *Udid* 24.9.63, *Jowar* 20.12.63.



## 2. TREATMENTS :

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

(1) 3 legumeneous crops :  $C_1$ =Sann,  $C_2$ =Moong and  $C_3$ =Udid.

(2) 3 methods of application :  $M_1$ =No application,  $M_2$ =crops uprooted and spread between the rows of *Jowar* at the time of flowering and  $M_3$ =crops uprooted and buried between the rows of *Jowar*.

Legumeneous crops and *Jowar* sown in alternate rows and *Jowar* alone in control plot ( $T_0$ ).

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  7.32 m. (b) 9.14 m.  $\times$  5.49 m. (v) 91 cm.  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Germination unsatisfactory for want of moisture. (ii) Severe attack of Stem borer. (iii) Yield of grain and monetary return. (iv) (a) 1963-65 (modified in 64). (b) No. (c) Nil. (v) (a) Achalpur, Akola, Dhulia. (b) Nil. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 150 Rs/ha. (ii) 26.7 Rs/ha. (iii) All treatment effects are highly significant. (iv) Av. value of produce in Rs/ha.

$T_0$ =94 Rs/ha.

	$C_1$	$C_2$	$C_3$	Mean
$M_1$	241	240	368	283
$M_2$	100	89	92	94
$M_3$	100	83	90	91
Mean	147	137	183	156

C.D. of C or M marginal means =22.4 Rs/ha.

C.D. for body of table or  $T_0$  mean=38.7 Rs/ha.

**Crop :- Jowar, Moong, Udid, Sann (Kharif).**

**Ref :- Mh. 64(172), 65(64).**

**Site :- Agri. Res. Stn., Jalgaon.**

**Type :- 'X'.**

**Object :-** To study the effect of mixed cropping on the yield of Cereals and Pulses.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) As per treatments. (c) 12.35 C.L./ha. of F.Y.M. (ii) Black cotton soil. (iii) 4.7.64 ; 20.7.65. (iv) (a) Harrowing. (b) Drilling. (c) *Jowar*—7 Kg/ha., *Moong* and *Udid*—11 Kg/ha., *Sann*—112 Kg/ha. (d) 46 cm. (e) 1 to 2. (v) Nil. (vi) *Jowar* BS 12-2-11, *Udid*—Sindkheda, *Moong*—China 781 and *Sann*-local. (vii) Unirrigated. (viii) 2 hoeings. (ix) 84 cm. ; 51 cm. (x) *Moong* on 27.8.64 ; 23.9.65, *Udid* on 10.10.64 ; 9.10.65, *Jowar* on 13.12.64 ; 28.12.65, *Sann* N.A.

## 2. TREATMENTS:

All combinations of (1) and (2)+2 extra treatments

(1) 3 legumeneous crops :  $C_1$ =Sann,  $C_2$ =Moong and  $C_3$ =Udid.

(2) 3 methods of application :  $M_1$ =No application,  $M_2$ =Crops uprooted and spread between the rows of *Jowar* at the time of flowering and  $M_3$ =Crops uprooted and buried between the rows of *Jowar*.

Legumeneous crops and *Jowar* sown in alternate rows.

$T_1$ =*Jowar* alone and  $T_2$ =*Jowar* alone with double spacings.

## 3. DESIGN :

(i) Fact, in R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 65 (treatments changed in 64). (b) No. (c) Nil. (v) Achalpur, Dhulia. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent. Hence results of individual years are presented under 5. Results.

## 5. RESULTS :

64(172)

(i) 1142 Rs/ha. (ii) 223.4 Rs/ha. (iii) Extra vs. others effect is highly significant. Main effect of M is significant. (iv) Av. value of produce in Rs/ha.

$$T_1=730 \text{ and } T_2=993 \text{ Rs/ha.}$$

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	Mean
M <sub>1</sub>	1040	1441	1450	1310
M <sub>2</sub>	1076	1064	1027	1056
M <sub>3</sub>	1164	1096	1475	1245
Mean	1093	1200	1317	1204

C.D. for M marginal means = 186.1 Rs/ha.

C.D. for 'Control vs. others' = 178.3 Rs/ha.

65(64)

(i) 654 Rs/ha. (ii) 109.8 Rs/ha. (iii) Main effects of C, M and interaction C × M are highly significant. (iv) Av. value of produce in Rs/ha.

$$T_1=530 \text{ and } T_2=655 \text{ Rs/ha.}$$

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	Mean
M <sub>1</sub>	438	1131	844	804
M <sub>2</sub>	562	568	553	561
M <sub>3</sub>	668	598	645	637
Mean	556	766	681	668

C.D. for C or M marginal means = 91.5 Rs/ha.

C.D. for body of C × M table = 158.5 Rs/ha.

**Crop :- Cotton and Groundnut (Kharif).**

**Ref :- Mh. 65(63).**

**Site :- Agri. Res. Stn., Jalgaon.**

**Type :- 'X'.**

**Object :-** To study the effect of mixed sowing of Groundnut and Cotton crops.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 12.35 C.L./ha. of P.Y.M. + 22.4 Kg/ha. of N. (ii) Black cotton (iii) 17.7.65. (iv) (a) 1 ploughing, 2 harrowings. (b) Dibbling. (c) to (e) As per treatments. (v) 22.4 Kg/ha. of N and 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) Cotton — YI and Groundnut — SB — XI. (vii) Unirrigated. (viii) 2 hoeings and 3 weedings. (ix) 50 cm. (x) Cotton on 26.11.65 to 28.12.65, Groundnut on 6, 10.11.65.

## 2. TREATMENTS :

Same as in Expt. No. 65(111) conducted at Akola and presented on page No. 567.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) 12'80 m. × 8'23 m. (b) 10'97 m. × 5'49 m. (v) 91 cm. × 136 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Dusted B.H.C. 10 % @ 22.4 Kg/ha. against Aphids. Dusted Sulphur @ 16.8 Kg/ha. against *Tikka*. Endrin sprayed to control Jassids and Urnips. (iii) Yield of Groundnut pods, *kapas* and their monetary return. (iv) (a) 1965 to 67. (b) No. (c) Nil. (v) Akola, Badnapur and Nanded. (vi) No. (vii) Nil.

## 5. RESULTS :

(i) 555 Rs./ha. (ii) 88.02 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. produce	1095	297	590	583	661	546	511	371	341

C.D.=152.4 Rs/ha.

**Crop :- Bajri and Tur (Kharif).**

**Ref :- Mh. 64(254), 65(99).**

**Site :- Agri. Res. Stn., Jeur.**

**Type :- 'X'.**

Object :—To study the effect of row sowing and mixed sowing of Legumes.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) Nil. (ii) Medium black ; Medium deep. (iii) 28.7.64 ; 24.7.65. (iv) (a) 1 ploughing ; 1 to 2 harrowings. (b) Drilling. (c) *Bajri* at 2.5 Kg/ha. and *Tur* 12.4 Kg/ha. (d) Rows of *Bajri* 30 cm. and *Tur* 61 cm. (e) --. (v) Nil. (vi) *Bajri* 28—15—1 and *Tur* N—84. (vii) Un-irrigated. (viii) One weeding ; Hand weedings. (ix) N.A. ; 28 cm. (x) *Bajri* 31.10.64 ; 30.10.65, *Tur* on 23.1.65 ; 10.2.66.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. Nos. 64(253), 65(95) conducted at Chas and presented on page No. 582.

## 4. GENERAL :

(i) Satisfactory ; Normal. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1964 to 66. (b) No. (c) Nil. (v) Chas, Dhulia. (vi) Nil. (vii) As the experiment is continued beyond 65, results of individual years are presented under 5. Results.

## 5. RESULTS :

## 64(254)

(i) 363 Rs/ha. (ii) 148.4 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	166	308	543	262	485	372	303	462

C.D.=218.1 Rs/ha.

## 65(99)

(i) 651 Rs/ha. (ii) 140.9 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	733	69	635	859	859	639	724	695

C.D.=207.0 Rs/ha.

**Crop :- Bajri and Groundnut (Kharif).****Ref :- Mh. 61(98), 62(84), 63(125),  
64(105), 65(98).****Site :- Agri. Res. Stn., Jeur.****Type :- 'X'.**Object :—To study the effect of growing *Bajri* and *Groundnut* in alternate rows.**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Bajri* and *Groundnut*. (c) Nil. (ii) N.A. (iii) 10.6.61 ; 15.6.62 ; 29.6.63, 26.7.64 ; 26.7.65. (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling. (c) 2 Kg/ha. and 90 Kg/ha. (d) 30 cm. (e) N.A. (v) Nil. (vi) *Bajri* Akola in 61 and 28--15--1 in other years., *Groundnut* K-4-11. (vii) Un-irrigated. (viii) Interculturing. (ix) N.A. 61 to 64 ; 33 cm. in 65. (x) *Bajri* on 13.10.61 ; 23.10.62 ; 10.10.63 ; 29.10.64 ; 30.10.65 and *Groundnut* on 6.12.61 ; 14.11.62 ; 16.11.63 ; 2.1.65 ; 28.11.65.

**2. TREATMENTS :**

3 mixed cropping treatments:  $T_1$ =*Bajri* alone,  $T_2$ =*Groundnut* alone and  $T_3$ =*Bajri* and *Groundnut* in alternate rows.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 12. (iv) (a) 11.58 m.  $\times$  7.32 m. (b) 9.45 m.  $\times$  4.88 m. (v) 106 cm.  $\times$  122 cm. (vi) Yes.

**4. GENERAL :**

(i) Satisfactory. (ii) Attack of Blister beetle D.D.T. and Gammaxene moisture applied. (iii) Yield of grain, plant count and monetary return. (iv) (a) 1961 to 65. (b) Yes. (c) Results of combined analysis are presented under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is present.

**5. RESULTS :**

## Pooled results

(i) 410 Rs/ha. (ii) 959.0 Rs/ha. (based on 8 d.f. made up of Treatments  $\times$  years interaction). (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	$T_1$	$T_2$	$T_3$
Av. value	140	611	479

## Individual results.

Treatment	$T_1$	$T_2$	$T_3$	Sig.	G.M.	S.E./plot
Year						
1961	87	500	382	**	323	58.1
1962	85	1489	913	**	829	127.2
1963	202	460	452	**	371	86.8
1964	108	444	431	**	328	71.6
1965	217	163	218	*	199	14.9
Pooled	140	611	479	N.S.	410	959.0

**Crop :- Jowar and Gram (Rabi).****Ref :- Mh. 61(209), 62(203), 63(252).****Site :- Agri. Res. Stn., Mohol.****Type :- 'X'.**Object :—To study the symbiotic and rotational effects to *Jowar* and *Gram* in alternate drillings shifting *Jowar* to the place of *Gram* in rotation.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. ; As per treatments. (c) Nil. (ii) Medium light. (iii) 25.10.61 ; 17.10.62 ; 24.9.63. (iv) (a) 1 harrowing ; 4 harrowings ; 4 harrowings. (b) Drilling. (c) *Jowar* 4.5 Kg/ha., *Gram* 33.6 Kg/ha. (d) *Jowar* rows—45 cm. apart, *Gram* rows—30 cm. apart. (e) —. (v) Nil. (vi) *Jowar* M—35—1 and *Gram* N—31. (vii) Unirrigated. (viii) 1 hoeing and 1 weeding. (ix) 7 cm. ; 6 cm. ; 6 cm. (x) 19.2.62 ; 8.2.63 (*Gram*), 27.2.63 (*Jowar*) ; 3.2.64.

## 2. TREATMENTS :

4 mixed crop treatments :  $T_1$  = *Jowar* alone,  $T_2$  = *Gram* alone,  $T_3$  = *Jowar* and *Gram* in alternate completes, each complete consisting of three rows (in succeeding year *Jowar* will be shifted to *Gram* complete and vice versa, and  $T_4$  = *Jowar*) and *Gram* mixed in 1 : 1 proportion and drilled.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 10.97 m. × 10.97 m. (b) 8.23 m. × 9.14 m. (v) 46 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain and their monetary return. (iv) (a) 1961 to 63. (b) Yes. (c) Results of the combined analysis are presented under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is present.

## 5. RESULTS :

## Pooled results

(i) 290 Rs/ha. (ii) 216.4 Rs/ha. (based on 6 d.f. made up of Treatments × years interaction). (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	$T_1$	$T_2$	$T_3$	$T_4$
Av. value	267	296	287	309

## Individual results

Treatment	$T_1$	$T_2$	$T_3$	$T_4$	Sig.	G.M.	S.E./plot
Year							
1961	133	302	232	248	*	229	14.4
1962	204	338	302	312	N.S.	289	32.6
1963	464	248	327	367	*	351	31.5
Pooled	267	296	287	309	N.S.	290	216.4

**Crop :- *Jowar, Tur (Kharif).***

**Ref :- Mh. 63(254), 64(207), 65(107).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'X'.**

**Object :- To study the effect of row sowing and mixed sowing of Cereals and Pulses.**

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) Black cotton soil. (iii) 28.7.63 ; 17.7.64 ; 20.7.65. (iv) (a) Harrowing. (b) Drilling. (c) *Jowar* —9 Kg/ha., *Tur* —13.4 Kg/ha. (d) 46 cm. (e) N.A. (v) 24.7 C.L./ha. of T.C. (vi) *Jowar* NB—156, *Tur* —No 148. (vii) Unirrigated. (viii) 2 hoeings and 2 weedings ; 3 weedings and 3 hoeings ; 3 weedings and 2 hoeings. (ix) 68 cm. ; 89 cm. ; 52 cm. (x) 1.1.64 ; 18.12.64 ; 2, 3.12.65.

## 2. TREATMENTS :

8 mixed cropping treatments :  $T_1$  = *Jowar* alone,  $T_2$  = *Tur* alone,  $T_3$  = *Jowar* and *Tur* in 1 : 1 row,  $T_4$  = *Jowar* and *Tur* in 2 : 1 rows,  $T_5$  = *Jowar* and *Tur* in 3 : 1 rows,  $T_6$  = *Jowar* and *Tur* mixed in 1 : 1 ratio and then sown,  $T_7$  = *Jowar* and *Tur* mixed in 2 : 1 ratio then sown and  $T_8$  = *Jowar* and *Tur* mixed in 3 : 1 ratio and then sown.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal ; Satisfactory ; Good. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 65. (b) No. (c) Results of combined analysis are given under 5. Results. (v) Achalpur, Akola, Dhulia. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

## 5. RESULTS :

Pooled results

(i) 994 Rs/ha. (ii) 107.2 Rs/ha. (based on 14 d.f. made up of Treatments × years interaction) (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	623	1334	1138	1028	918	979	1034	900

C.D. = 93.9 Rs/ha.

Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	Sig.	G.M.	S.E./plot
Year 1963	202	1321	1178	929	710	1143	1027	827	**	917	188.4
1964	527	1112	827	840	651	779	784	635	**	769	132.2
1965	1140	1570	1408	1314	1393	1016	1292	1238	N.S.	1296	281.3
Pooled	623	1334	1138	1028	918	979	1034	900	**	994	107.2

**Crop :- Jowar and Udid (Kharif).**

**Ref :- Mh. 63(241), 64(196), 65(73).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'X'.**

**Object :-** To study the effect of row sowing and mixed sowing on the yield of *Jowar* and *Udid*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton ; Cotton ; N.A. (c) N.A. ; 22.4 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> ; N.A. (ii) Medium black. (iii) 20.7.63 ; 18.7.64 ; 20.7.65. (iv) (a) Harrowing. (b) Drilling. (c) 10 Kg/ha. both crops. (d) 46 cm. (e) —. (v) Nil. (vi) *Jowar* NJ-156 and *Udid* No 53. (vii) Unirrigated. (viii) 2 hoeings and 2 weedings. (ix) 68 cm. ; 76 cm. ; N.A. (x) 6.1.64 ; 25, 26.1.65 ; First week of Jan., 66.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. Nos. 63(47), 64(40), 65(4) conducted at Achalpur and presented on page No. 556.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 65. (b) No. (c) Nil. (v) Achalpur, Buldhana Dhulia, Jalgaon, Washim. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent, hence results for individual years are presented under 5. Results.

## 5. RESULTS :

63(241)

(i) 694 Rs/ha. (ii) 258.8 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	897	78	671	789	792	823	629	871

C.D. = 380.6 Rs/ha.

64(196)

(i) 440 Rs. (ii) 114.0 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	478	59	343	647	487	569	373	567

C.D. = 167.7 Rs/ha.

65(73)

(i) 822 Rs/ha. (ii) 317.3 Rs/ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	928	543	1015	645	968	904	613	961

**Crop :- Jowar, Moong (Kharif).****Ref :- Mh. 63(249), 64(203), 65(79).****Site :- Agri. College Farm, Nagpur.****Type :- 'X'.**

Object:—To study the effect of row sowing and mixed sowing.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton. (c) N.A. ; 24.7 C.L./ha. of F.Y.M. + 22.4 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> ; Nil. (ii) Black soil. (iii) 19.7.63 ; 18.7.64 ; 19.7.65. (iv) (a) Harrowing ; Harrowing ; 2 harrowing. (b) Drilling. (c) Jowar—9 Kg/ha., Moong—11.2 Kg/ha. (d) 46 cm. (e) —. (v) 24.7 C.L./ha. of T.C. ; Nil. ; Nil. (vi) Jowar—NJ 156 and Moong—Kopergaon. (vii) Unirrigated. (viii) 2 hoeings and 2 weedings ; 3 hoeings and 3 weedings ; 2 hoeings and 3 weedings. (ix) 68 cm. ; 39 cm. ; 52 cm. (x) 5.1.64 ; 23. 24.12.64 ; 9.12.65.

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

Same as in Expt. Nos. 63(51), 64(42), 65(3) conducted at Achalpur and presented on page No. 557.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 65. (b) No. (c) Results of combined analysis are given under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

**5. RESULTS :**

Pooled results

(i) 667 Rs/ha. (ii) 253.3 Rs/ha. (based on 14 d.f. made up of Treatments × years interaction). (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	705	210	832	763	770	801	659	598

C.D. = 221.7 Rs/ha.

Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	Sig.	G.M.	S.E./plot.
Year 1963	941	333	1013	1037	949	1087	1025	749	*	892	228.0
1964	272	79	397	259	256	327	209	253	*	256	87.6
1965	901	218	1086	992	1105	988	745	791	*	853	275.0
Pooled	705	210	832	763	770	801	659	598	**	667	253.8

**Crop :- Jowar, Moong and Udid (Kharif).**

**Ref :- Mh. 62(184).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'X'.**

**Object:—**To study the effect of row sowing and mixed sowing of Cereals and Pulses.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Jowar*. (c) N.A. (ii) Black cotton soil. (iii) 30.7.62. (iv) (a) Harrowing. (b) Drilling. (c) *Jowar* 11.2 Kg/ha., *Moong* and *Udid* 11.2 Kg/ha. (d) 46 cm. × 23 cm. (e) —. (v) Nil. (vi) *Jowar* Imp. saover. (vii) Unirrigated. (viii) 1 weeding and 2 hoeings. (ix) 73 cm. (x) 10, 11.1.63.

**2. TREATMENTS :**

T<sub>1</sub>=*Jowar* alone, T<sub>2</sub>=*Udid* alone, T<sub>3</sub>=*Moong* alone, T<sub>4</sub>=*Jowar* to *Udid* in 3 : 1 row ratio, T<sub>5</sub>=*Jowar* to *Udid* in 1 : 1 row ratio, T<sub>6</sub>=*Jowar* to *Udid* in 1 : 3 row ratio, T<sub>7</sub>=*Jowar* to *Moong* in 3 : 1 row ratio, T<sub>8</sub>=*Jowar* to *Moong* in 1 : 1 row ratio and T<sub>9</sub>=*Jowar* to *Moong* in 1 : 3 row ratio.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 13.72 m. × 3.66 m. (b) 12.80 m. × 2.74 m. (v) 46 cm. around. (vi) Yes.

**4. GENERAL :**

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

**5. RESULTS :**

(i) 265 Rs/ha. (ii) 67.6 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>
Av. produce	225	218	38	384	333	272	322	347	250

C.D.=98.7 Rs/ha.

**Crop :- Jowar, Moong, Udid and Sann (Kharif).**

**Ref :- Mh. 63(262), 64(219),  
65(125).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'X'.**

**Object:—**To study the effect of legume crops mixed with Cereals on the yield of Cereal.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton ; Linseed ; *Jowar*. (c) N.A. ; Nil in 64, 65. (ii) Black soil. (iii) 18.7.63 ; 16.7.64 ; 26.7.65. (iv) (a) Harrowing. (b) Drilling. (c) 9, 67, 9 and 9 Kg/ha. for *Jowar*, *Sann*, *Moong* and *Udid* respectively. (d) 46 cm. (e) —. (v) Nil. (vi) *Jowar*—NJ—156, *Moong*—Kopergaon, *Udid*—No.-55, *Sann*—local. (vii) Unirrigated. (viii) 2 hoeings and 2 weedings in 63 ; 3 hoeings and 3 weedings in 64 and 65. (ix) N.A. (x) 27.12.63 ; 2.1.65 ; 4.12.65.

**2. TREATMENTS :**

All combinations of (1) and (2)+2 extra treatments

(1) 3 different mixed croppings : C<sub>1</sub>=*Jowar* and *Sann* in 1 : 1 row, C<sub>2</sub>=*Jowar* and *Moong* in 1 : 1 row  
C<sub>3</sub>=*Jowar* and *Udid* in row.

(2) 3 different ways of legume crops harvesting : M<sub>1</sub>=Allowed to seed, M<sub>2</sub>=Crop uprooted and spread in between rows and M<sub>3</sub>=Crops uprooted and buried in between row.

Extra treatments are E<sub>1</sub>=Entire *Jowar* and E<sub>2</sub>=Entire *Jowar* (duble spacing).

E<sub>2</sub> was not tried during the year 63.

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 10 in 63 ; 11 in 64 and 65. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 cm. × 91 cm. (vi) Yes.



## 4. GENERAL :

(i) Normal. (ii) Nil; B.H.C. at 10% dusted. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 66. (b) and (c) No. (v) Dhulia, Akola, Buldhana, Washim, Jalgaon, Achalpur and Badnapur (vi) Nil. (vii) As the experiment is continued beyond 65, the results of individual years are given under 5. Results

## 5. RESULTS :

## 63(262)

(i) 971 Rs/ha. (ii) 121.3 Rs/ha. (iii) Main effect of C and interaction C×M are highly significant. (iv) Av. value of produce in Rs/ha.

$E_1=888$  Rs/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
C <sub>1</sub>	484	845	673	667
C <sub>2</sub>	1232	1085	1006	1108
C <sub>3</sub>	1264	1112	1118	1165
Mean	993	1014	932	980

C.D. for C marginal means = 101.3 Rs/ha.

C.D. for body of C×M table = 175.4 Rs/ha.

## 64(219)

(i) 422 Rs/ha. (ii) 158 Rs/ha. (iii) Extra vs. other treatments effect is significant. (iv) Av. value of produce in Rs/ha.

$E_1=193$ ,  $E_2=399$  Rs/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
C <sub>1</sub>	280	431	632	448
C <sub>2</sub>	454	512	437	468
C <sub>3</sub>	516	353	440	436
Mean	417	432	503	451

C.D. for 'extra vs. others' = 325 Rs/ha.

## 65(125)

(i) 808 Rs/ha. (ii) 247.4 Rs/ha. (iii) None of the effects is significant. (iv) Av. value of produce in Rs/ha.

$E_1=622$ ,  $E_2=851$  Rs/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
C <sub>1</sub>	715	964	726	802
C <sub>2</sub>	985	797	854	879
C <sub>3</sub>	1116	618	643	792
Mean	939	793	741	821

**Crop :- Wheat and Gram (Rabi).**

**Ref :- Mh. 61(181), 62(180).**

**Site :- Agri. College Farm, Nagpur.**

**Type :- 'X'.**

**Object :-** To study the effect of mixed sowing of Wheat and Gram.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) and (c) N.A. (ii) Black cotton soil. (iii) 5, 6.11.61 ; 23.10.62. (iv) (a) Harrowing. (b) Drilling. (c) Wheat 49 Kg/ha. and Gram 37 Kg/ha. (d) 30 cm. (e) —. (v) Nil. (vi) Wheat—Hy 65, Gram—Dacca. (vii) Unirrigated. (viii) Weeding. (ix) 4 cm. ; 17 cm. (x) 15.3.62 ; 1st week of March 63.

**2. TREATMENTS :**

5 mixed cropping treatments : T<sub>1</sub>=Wheat alone, T<sub>2</sub>=Gram alone, T<sub>3</sub>=1 row of Wheat and 1 row of Gram, T<sub>4</sub>=2 rows of Wheat and 1 row of Gram, T<sub>5</sub>=3 rows of Wheat and 1 row of Gram.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 18.30 m. × 8.54 m. (b) 17.07 m. × 7.32 m. (v) 61 cm. × 61 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of wheat grain, gram and their monetary return. (iv) (a) 1961 to 62. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is present.

**5. RESULTS :**

Pooled results

(i) 732 Rs/ha. (ii) 375.3 Rs/ha. (based on 4 d.f. made up of Treatments × years interaction). (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>
Av. value	726	542	774	830	790

Individual results.

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	Sig.	G.M.	S.E./plot
Year 1961	599	552	472	522	579	N.S.	545	118.9
1962	852	532	1075	1137	1000	*	919	160.7
Pooled	726	542	774	830	790	N.S.	732	375.3

**Crop :- Cotton, Groundnut (Kharif).**

**Ref :- Mh. 65(112).**

**Site :- Cotton Res. Stn., Nanded.**

**Type :- 'X'.**

**Object :-** To study the effect of mixed sowing of Groundnut and Cotton crops.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Jowar. (c) 25 Kg/ha. of N. (ii) Black cotton. (iii) 6.7.65. (iv) (a) 3 harrowings. (b) Drilling. (c) N.A. (d) and (e) As per treatments. (v) 5 C.L. /ha. of F.Y.M. + 22.4 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) Cotton—Gao—46, Groundnut—Kop.-1. (vii) Unirrigated. (viii) 4 hoeings and 2 weedings. (ix) N.A. (x) Cotton 22.11.65 to 4.1.66, Groundnut 19.11.65.

**2. TREATMENTS :**

Same as in Expt. No. 65(111) conducted at Akola and presented on page No. 567.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 12.80 m. × 8.23 m. (b) 10.97 m. × 5.49 m. (v) 91 cm. × 136 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of Groundnut pods, *kapas* and their monetary return. (iv) (a) 1965 to 67. (b) No. (c) Nil. (v) Akola, Badnapur and Jaigaon. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 346 Rs/ha. (ii) 91.5 Rs/ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	340	283	423	439	415	280	303	285

**Crop :- Bajri, Tur (*Kharif*).**

**Ref :- Mh. 63(253), 64(206).**

**Site :- Agri. Res. Stn., Niphad.**

**Type :- 'X'.**

Object :- To study the effect of row sowing and mixed sowing.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat ; Wheat and Gram. (c) Nil. (ii) N.A. (iii) 2.8.63 ; 28.7.64. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) *Bajri* - 6.7 Kg/ha., *Tur* - 13.4 Kg/ha. (d) 30 cm. (e) -. (v) Nil. (vi) *Bajri* 28-15-1, *Tur* N-84. (vii) Unirrigated. (viii) Interculturing. (ix) 36 cm. ; 30 cm. (x) *Bajri* 13.11.63 ; 8.11.64, *Tur* 18.3.64 ; 1.2.65.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. Nos. 64(253), 65(95) conducted at Chas and presented on page No. 582.

## 4. GENERAL :

(i) Normal. (ii) Slight attack of leaf borer on *Tur* in 63 ; Nil. (iii) (a) Yield of grain and monetary return. (iv) (a) 1963 to 64. (b) No. (c) Results of combined analysis are given under 5. Results. (v) Chas, Dhulia, Jeur. (vi) Due to rains at flowering time *Bajri* polleus were washed away in 63. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is present.

## 5. RESULTS :

Pooled results

(i) 246 Rs/ha. (ii) 142.4 Rs/ha. (based on 7 d.f. made up of Treatments  $\times$  years interaction). (v) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	108	274	268	276	269	244	268	261

Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	Sig.	G.M.	S.E./plot
Year											
1963	86	408	354	355	350	320	348	335	**	319	49.7
1964	131	109	182	197	189	168	188	186	*	169	30.5
Pooled	108	274	268	276	269	244	268	261	N.S.	246	142.4

**Crop :- Bajri, Moong, Udid and Sann (Kharif). Ref :- Mh. 63(284), 64 (242), 65 (184),**

**Site :- Agri. Res. Stn., Niphad.**

**Type :- 'X'.**

**Object :-**To study the effect of different mixed croppings on the yield of Bajri.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Wheat ; Wheat and Gram in 64 and 65. (c) Nil. (ii) N.A. (iii) 1.8.63 ; 1.8.64 and 21.7.65. (iv) (a) Harrowings. (b) Drilling. (c) 7, 6, 7, 9, 9 Kg/ha. for *Bajri*, *Sann*, *Moong*, and *Udid* respectively. (d) 30 cm. (e) Nil. (vi) *Bajri* N—28.15.1, *Sann*, *Moong* and *Udid* (local). (vii) Un-irrigated. (viii) Interculturing. (ix) 33 cm. ; 21 cm. ; 24 cm. (x) 8.11.63 ; 28.10.64 and 7.1.65 (*Sann*).

**2. TREATMENTS :**

All combinations of (1) and (2)+an extra treatment.

(1) 2 legumeneous crops :  $C_1 = \text{Sann}$ ,  $C_2 = \text{Moong}$  and  $C_3 = \text{Udid}$ .

(2) 3 methods of application :  $M_1 = \text{No application}$ ,  $M_2 = \text{Crops uprooted and spread between the rows of Bajri}$  and  $M_3 = \text{Crops uprooted and buried between the rows of Bajri}$ .

2 Legumeneous crops and *Bajri* sown in alternate rows,  $T_1 = \text{Bajri alone}$

In 64 and 65 Expt. tried with two extra treatments  $T_1 = \text{Bajri alone}$  and  $T_2 = \text{Bajri alone with double spacings}$ .

**3. DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 10 in 63 ; 11 in 64, 65. (b) N.A. (iii) 4. (iv) (a) 10.97×7.32 m. (b) 9.14 m. × 5.49 m. (v) 91 m. × 91 m. (vi) Yes.

**4. GENERAL :**

(i) Poor. (ii) *Sann* damaged due to Talya disease in 63. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 65. (modified in 64). (b) No. (c) Results of combined analysis given under 5. results. (v) Nil. (vi) Nil. (vii) Expt. for 64 and 65 are pooled. Error Variances are heterogeneous and Treatments × years interaction is present.

**5. RESULTS :**

63(284)

(i) 124 Rs/ha. (ii) 24.3 Rs/ha. (iii) None of the effects is significant. (vi) Av. value of produce in Rs/ha.

$T_1 = 117 \text{ Rs/ha.}$

	$M_1$	$M_2$	$M_3$	Mean
$C_1$	150	105	130	128
$C_2$	130	137	127	131
$C_3$	107	110	133	117
Mean	129	117	130	125

Pooled

(i) 203 Rs/ha. (ii) 83.0 Rs/ha. (based on 10 d.f. made up of interaction of Treatments × years). (iii) None of the effects is significant. (iv) Av. value of produce in Rs/ha.

$T_1 = 192 \text{ Rs/ha. } T_2 = 248 \text{ Rs/ha.}$

	$C_1$	$C_2$	$C_3$	Mean
$M_1$	153	189	248	197
$M_2$	170	206	202	193
$M_3$	170	234	219	208
Mean	164	210	223	199

## Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	Sig.	G.M.	S.E/plot
Year						
1962	184	164	314	**	221	59.8
1963	274	79	184	**	179	87.5
Pooled	229	121	249	**	200	287.8

**Crop :- Jowar and Udid (Kharif).**

**Ref :- Mh. 63(187).**

**Site :- Agri. College Farm, Parbhani.**

**Type :- 'X'.**

Object :—To study the effect of row sowing and mixed sowing of Jowar and Udid.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>+28.0 Kg/ha. of K<sub>2</sub>O. (ii) Medium black. (iii) 30.6.63. (iv) (a) 3 harrowings. (b) Drilling. (c) 9 Kg/ha. (d) 46 cm (e) —. (v) Nil. (vi) PJ 4K and Sindkheda. (vii) Unirrigated. (viii) 2 weedings. (ix) 133 cm. (x) Jowar on 13.12.63 and Udid on 16.19.9.63 and 1, 2, 10.63.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. Nos 63(47), 64(40), 65, 4) conducted at Achalpur and presented on page No. 556.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) No. (b) and (c) Nil. (v) Achalpur, Akola, Dhulia, Nagpur and Yeotmal. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 534 Rs/ha. (ii) 99.7 Rs/ha. (iii) Treatment differences are highly significant. (ia) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	552	233	549	650	584	572	605	531

C.D=146.6 Rs/ha.

**Crop :- Jowar, Udid, Moong and Sann (Kharif)**

**Ref :- Mh. 63(188).**

**Site :- Agri. College Farm, Parbhani.**

**Type :- 'X'.**

Object :—To study the effect of mixed cropping of Cereals and Legumes.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Manured quantity N.A. (ii) Black cotton soil. (iii) 29.6.63. (iv) (a) 3 harrowings. (b) Drilling. (c) 9 Kg/ha. (d) 46 cm. (e) —. (v) Nil. (vi) PJ 4K-Jowar, Sindkheda-Udid, 781-Moong, local-Sann. (vii) Unirrigated. (viii) 2 weedings. (ix) 133 cm. (x) Jowar 12.12.63, Udid 19.9.63, Moong 11.9.63.

## 2. TREATMENTS :

Same as in Expt. Nos. 63(199), 64(168), 65(2) Achalpur and presented on page No. 538.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 10.97 m.×7.32 m. (b) 9.14 m.×5.49 m. (v) 91 cm.×91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) No. (b) and (c) Nil. (v) Dhulia. (vi) and (vii) Nil.

## 5. RESULTS :

(i) 484 Rs/ha. (ii) 157.5 Rs/ha. (iii) None of the effects is significant. (iv) Av. value of produce in Rs/ha.

$$T_1 = 405 \text{ Rs/ha.}$$

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
C <sub>1</sub>	304	529	488	440
C <sub>2</sub>	517	532	510	520
C <sub>3</sub>	622	456	483	520
Mean	481	505	494	493

**Crop :- Bajri, Moong (Kharif).**

**Ref :- Mh. 64(153), 65(80).**

**Site :- Agri. College Farm, Poona.**

**Type :- 'X'.**

Object :- To study the effect of row sowing and mixed sowing of Cereals and Legumes.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A.; Gram. (c) N.A. (ii) Light soil (iii) 16.7.64; 4.8.65. (iv) (a) Harrowing; Ploughing and harrowing. (b) Drilling. (c) Bajri—6.7 Kg/ha. and Moong—22.4 Kg/ha. (d) 30 cm. (e) Nil. (v) Nil. (vi) Bajri 28—15, Moong—China. (vii) Unirrigated. (viii) Weeding. (ix) N.A. (x) Bajri—17.10.64; 21.10.65, Moong—19.9.64; 21.10.65.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. Nos. 64(212), 65(116) conducted at Badnapur and presented on page No. 575.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 65 (Expt. for 63 N.A.) (b) No. (c) Results of combined analysis are given under 5. Results. (v) Badnapur. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent.

## 5. RESULTS :

## 64(153)

(i) 1647 Rs/ha. (ii) 305.4 Rs/ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	1337	1796	1767	1722	1578	1541	1741	1694

## 65(80)

(i) 453 Rs/ha. (ii) 172.6 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. produce	258	166	403	547	504	583	557	605

$$C.D. = 253.9 \text{ Rs/ha.}$$

63(186)

(i) 293 Rs/ha. (ii) 24.9 Rs/ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. value	289	176	384

64(154)

(i) 483 Rs/ha. (ii) 77.7 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. value	408	586	456

C.D. = 97.89 Rs/ha.

65(178)

(i) 699 Rs/ha. (ii) 27.0 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. value	608	754	734

C.D. = 85.01 Rs/ha.

**Crop :- Jowar and Moong (Kharif).**

**Ref :- Mb. 62(141), 63(185).**

**Site :- Agri. College Farm, Parbhani.**

**Type :- 'X'.**

Object :—To study the effect of symbiotic and rotational effect of Cereals and Pulses in alternate drilling.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) Medium black. (iii) 11.7.62. ; 1.7.63. (iv) (a) 3 harrowings. (b) Drilling. (c) 9 Kg/ha. for *Jowar* and 13.2 Kg/ha. for *Moong*. (d) 46 cm. (e) N.A. (v) 12.5 C.L./ha. of F.Y.M. spread on 22.6.62 and 18.8.63. (vi) *Jowar*— PJ 4K and *Moong*— 781. (vii) Unirrigated. (viii) 2 weedings and 2 hoeings ; 2 weedings and interculturing (ix) 83 cm. ; 133 cm. (x) *Moong* on 20.9.62 ; 4.9.63 and *Jowar* on 1st week of Dec., 62 ; 14.12.63.

#### 2. TREATMENTS :

3 mixed cropping treatments : T<sub>1</sub> = Entire *Jowar*, T<sub>2</sub> = Entire *Moong* and T<sub>3</sub> = *Jowar* and *Moong* in alternate row (each 3 rows).

#### 3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 12. (iv) (a) 8.23 m. × 9.14 m. (b) 5.48 m. × 7.32 m. (v) 137 cm. × 91 cm. (vi) Yes.

#### 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1962 to 63. (b) No. (c) Results of the combined analysis are presented under 5. Results. (v) Akola, Badnapur and Dhulia. (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is present.

#### 5. RESULTS :

Pooled results

(i) 200 Rs/ha. (ii) 287.8 Rs/ha. (based on 2 d.f. made up of Treatments × years interaction)- (iii) Treatment differences are highly significant (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. value	229	121	249

C.D. = 43.7 Rs/ha.

## Individual results

Treatment	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	Sig.	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Sig.	T <sub>1</sub>	T <sub>2</sub>
Year 1964	81	84	92	N.S.	97	85	75	**	93	91
1965	247	335	354	*	296	301	340	N.S.	293	404
Pooled	164	210	223	N.S.	197	193	208	N.S.	193	248

Sig.	G.M.	S.E./plot
N.S.	87	15.0
N.S.	319	75.4
N.S.	203	83.0

Crop :- Jowar and Gram (*Rabi*)Ref :- Mh. 62(142), 63(186), 64(154),  
65(178).

Site :- Agri. College Farm, Parbhani.

Type :- 'X'.

Object :- To study the effect of growing *Jowar* and Gram sown separately and mixed.

## 1. BASAL CONDITIONS :

(i) (a) Nil; (b) *Jowar*; *Jowar* and Gram for 63, 64 and 65. (c) 56 Kg/ha. of N+56 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black. (iii) 16.10.62; 3.10.63; 10.10.64; 9.10.65. (iv) (a) 6 harrowings; 5 harrowings; 8 harrowings; 5 harrowings. (b) Drilling. (c) *Jowar* 9 Kg/ha. and Gram 45 Kg/ha. (d) 46 cm. (e) —. (v) 12.35 C.L./ha. of F.Y.M. broadcast on 16.10.62 and in 65.; 7.5 C.L./ha. of F.Y.M. broadcast on 2.10.63 and in 64. (vi) *Jowar*—PJ 4 R and Gram—N.31. (vii) Unirrigated. (viii) Weeding and hoeing in 62 and 63; 2 hoeings in 64; Gap filling, 1 weeding and 2 hoeings in 65. (ix) 10 cm.; 23 cm.; 25 cm.; 4 cm. (x) *Jowar* on 20.2.63; 26.2.64; 16, 17.2.65; 14.2.66 and Gram on N.A.; 30.1.64; 16.2.65 and 12.2.66.

## 3. TREATMENTS :

3 mixed cropping treatments: T<sub>1</sub>=Entire *Jowar*, T<sub>2</sub>=Entire gram and T<sub>3</sub>=Alternate Drilling of *Jowar* and Gram (each 3 rows).

## 3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 10.97 m. × 10.97 m. (b) 8.23 m. × 9.14 m. (v) 137 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory; Normal; Normal; Satisfactory. (ii) Nil in 62 to 64; attack of Blitax in 65. (iii) Yield of grain and its monetary return. (iv) (a) 1962 to 66. (b) Yes. (c) Nil. (v) Not known. (vi) Nil. (vii) Since the expt. contd. beyond 65, the results of individual years are given below under 5. Results.

## 5. RESULTS :

## Individual results :

62(142)

(i) 626 Rs/ha. (ii) 14.7 Rs/ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. value	697	531	652



**Crop :- Bajri, Tur (Kharif).****Ref :- Mh. 61(101), 62(88), 63 (129).****Site :- Agri. Res. Stn., Sholapur.****Type :- 'X'.**

**Object :-** To study the relative merits of C/A/N with and without F.Y.M. on the mixed sowing of *Bajri* and *Tur*.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) *Bajri*, *Tur* : N.A. ; Groundnut. (c) Nil ; N.A. ; Nil. (ii) Light soil. (iii) 5.7.61 ; 6.7.62 ; 29.6.63. (iv) (a) Harrowing twice. (b) Drilling the mixture. (c) *Bajri* at 5 Kg/ha., *Tur* at 62 Kg/ha. (d) 30 cm.  $\times$  10 cm. (e) —. (v) Nil. (vi) *Bajri*—Akola, *Tur*—T 84. (vii) Unirrigated. (viii) 2 interculturations ; Nil ; one weeding. (ix) *Bajri* on 27.9.61 ; 31.10.62 ; 27.10.63, *Tur* on 28.12.61 ; 15.1.63 ; 27.11.63.

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

All combinations of (1) and (2)

(1) 3 levels of N :  $N_0=0$ ,  $N_1=22.4$  and  $N_2=44.8$  Kg/ha.

(2) 3 sources of N :  $S_1=A.S$ ,  $S_2=C/A/N$  and  $S_3=Urea$ .

**Sub-plot treatments :**

2 levels of F.Y.M. :  $F_0=0$  and  $F_1=5604$  Kg/ha.

**3. DESIGN :**

(i) Split-plot. (ii) (a) 9 main-plots, replication, 2 sub-plots/main plot. (b) N.A. (iii) 4 (iv) (a) 6.40 m  $\times$  10.97 m. (b) 4.57 m  $\times$  9.14 m. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Plant count, height and yield of grain and monetary return. (iv) (a) 1961 to 63. (b) and (c) No. (v) No. (vi) N.A. (vii) Both the error variances are heterogeneous, hence results of individual years are presented under 5. Results.

**5. RESULTS :****61(101)**

(i) 318 Kg/ha. (ii) (a) 77.0 Rs/ha. (b) 56.0 Rs/ha. (iii) Control vs N means, main effect of F and interaction  $S \times F$  are highly significant. Interaction  $N \times F$  is significant. (iv) Av. value of produce in Rs/ha.

$N_0F_0=215$ ,  $N_0F_1=278$  Rs/ha.

	$N_1$	$N_2$	$F_0$	$F_1$	Mean
$S_1$	370	380	338	412	375
$S_2$	321	373	360	334	347
$S_3$	307	369	276	400	338
Mean	333	374	325	382	354
$F_0$	286	364			
$F_1$	380	384			

C.D. for F marginal means = 33.2 Rs/ha.

C.D. for control vs N means = 56.1 Rs/ha.

C.D. for F means at the same level of S = 67.5 Rs/ha.

C.D. for S means at the same level of F = 69.3 Rs/ha.

C.D. for F means at the same level of N = 47.0 Rs/ha.

C.D. for N means at the same level of F = 56.5 Rs/ha.

**62(88)**

(i) 507 Rs/ha. (ii) (a) 115.8 Rs/ha. (b) 109.3 Rs/ha. (iii) None of the effects is significant. (iv) Av. value of produce in Rs/ha.

$N_0F_0=441$ ,  $N_0F_1=553$  Rs/ha.

	$N_1$	$N_2$	$F_0$	$F_1$	Mean
$S_1$	484	483	461	505	483
$S_2$	481	555	505	532	518
$S_3$	511	560	553	518	536
Mean	492	533	506	518	512
$F_0$	486	527			
$F_1$	499	538			

63(129)

(i) 342 Rs/ha. (ii) (a) 71.8 Rs/ha. (b) 78.9 Rs/ha. (iii) Main effect of F is highly significant. Control vs. N effect is significant. (iv) Av. value of produce in Rs/ha.

$N_0F_0=295$ ,  $N_0F_1=335$  Rs/ha.

	$N_1$	$N_2$	$F_0$	$F_1$	Mean
$S_1$	340	371	309	402	355
$S_2$	367	348	315	400	358
$S_3$	347	347	302	404	353
Mean	351	359	309	402	355
$F_0$	312	305			
$F_1$	390	414			

C.D. for F marginal means =46.8 Rs/ha.  
C.D. for control vs. N means=52.4 Rs/ha.

**Crop :- Bajri and Tur (Kharif).**

**Ref :- Mh. 63 (299), 64(262), 65(150).**

**Site :- Agri. Res. Stn., Sholapur.**

**Type :- 'X'.**

Object :- To study the effect of row sowing and mixed sowing of Legumes and Cereals.

#### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. for 63 and 64 ; Groundnut in 65. (c) N.A. for 63 and 64 ; 24.7 Kg/ha. of N+24.7 Kg/ha. of  $P_2O_5$ . (ii) N.A. (iii) 29.6.63 ; 23.8.64 ; 6.7.65. (iv) (a) 2 Harrowings ; 2 harrowings ; 1 ploughing and 1 harrowing. (b) Drilling. (c) 4.48 Kg/ha. for Bajri and 11.2 Kg/ha. for Tur. (d) Between rows 30.48 cm. (v) Nil ; Nil ; 24.7 Kg/ha. N+24.7 Kg/ha.  $P_2O_5$ . (vi) Bajri—28-15-1 and Tur—N—84. (vii) Un-irrigated. (viii) 1 to 2 weedings. (ix) 19.8 cm. ; N.A. ; N.A. (x) Bajri 20.10.63 ; 13.11.64 ; 11.10.65 and Tur 27.12.63 ; 18.2.65 ; 18.12.65.

#### 2. TREATMENTS :

$T_1$ =Entire Bajri,  $T_2$ =Entire Tur,  $T_3$ =Bajri and Tur (1 : 1 row),  $T_4$ =Bajri and Tur (2 : 1 row),  $T_5$ =Bajri and Tur (3 : 1 row),  $T_6$ =Bajri and Tur (1 : 1 Mixed),  $T_7$ =Bajri and Tur (2 : 1 Mixed) and  $T_8$ =Bajri and Tur (3 : 1 Mixed).

## 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) 21.94 m. × 29.25 m. (iii) 4. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 5.48 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Effected germination due to heavy rain in 63; Fair in 64 and 65. (ii) Bajri had attack of Forgot and Tur had attack of Podborer in 63 and 64; Nil in 65. (iii) Yield of grain and their monetary return. (iv) 1963-65. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Chas and Jeur. (vi) Error variances are heterogeneous and Treatments × years interaction is present.

## 5. RESULTS :

## Pooled results

(i) 452.60 Rs/ha. (ii) 473.4 Rs/ha. (based on 14 d.f. made up of Treatment × years interaction). (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. yield	516.13	124.30	498.36	559.43	566.43	472.86	413.80	469.50

## Individual Results :

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	Sig.	G.M.	S.E./plot
Year											
1963	54.62	73.82	128.68	114.75	96.63	115.57	106.98	81.94	N.S.	96.37	35.39
1964	109.03	208.47	259.09	325.19	263.71	235.58	169.23	134.04	N.S.	219.29	93.19
1965	1384.8	90.6	1109.3	1238.3	1339.0	1067.4	965.2	1142.6	**	1042.2	187.8
Pooled	516.13	124.30	498.36	559.43	566.43	472.86	413.10	469.50	N.S.	452.60	473.4

**Crop :- Bajri and Groundnut (Kharif).**

**Ref :- Mh. 60(170).**

**Site :- Agri. Res. Stn., Sholapur.**

**Type :- 'X'.**

Object: — To study the effect of mixed cropping of Cereals and Legumes.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Jowar. (c) N.A. (ii) Medium light. (iii) 18, 19.7.60. (iv) (a) 2 harrowings. (b) Drilling. (c) 7 Kg/ha. for Bajri, 90 Kg/ha. for Groundnut. (d) 30 cm. × 8 to 10 cm. for Bajri, 30 cm. × 10 to 15 cm. for Groundnut. (e) —. (v) Nil. (vi) Bajri—Akola and Groundnut—Spanish Peanut. (vii) Unirrigated. (viii) 1 interculturing and 2 weedings. (ix) 37 cm. (x) Bajri 3.11.60, Groundnut 25.11.60

## 2. TREATMENTS :

7 Ratios of mixed cropping of Bajri and Groundnut : R<sub>1</sub>=1 : 0, R<sub>2</sub>=0 : 1, R<sub>3</sub>=1 : 1, R<sub>4</sub>=1 : 2, R<sub>5</sub>=1 : 3, R<sub>6</sub>=2 : 1 and R<sub>7</sub>=3 : 1.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 10.97 m. × 9.14 m. (b) 9.14 m. × 7.32 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Germination count, height, yield of grain and monetary return. (iv) (a) to (c) No. (v) to (vii) Nil.

## 5. RESULTS:

(i) 210 Rs./ha. (ii) 44.1 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	R <sub>6</sub>	R <sub>7</sub>
Av. value	116	252	240	238	219	215	191

C.D.=52.0 Rs/ha.

**Crop :- Bajri and Groundnut (Kharif). Ref :- Mh. 61(100), 62(87), 63(128), 64(107), 65(104).**

**Site :- Agri. Res. Stn. Sholapur. Type :- 'X'.**

Object :—To study the effect of mixed cropping under manurial conditions.

## 1. BASAL CONDITIONS:

(i) (a) Nil. (b) *Bajri*—*Tur*; *Bajri* and Groundnut in 62 to 64; N.A. (c) N.A.; As per treatments in 62 to 64; N.A. (ii) Medium light. (iii) 26.6.61; 11.7.62; 1.7.63; 25, 27.8.64; 1 to 4.7.65. (iv) (a) 1 ploughing and 2 harrowings; 2 harrowings; 3 harrowings; 1 ploughing and 2 harrowings. (b) Drilling. (c) *Bajri*—7 Kg/ha., Groundnut—90 Kg/ha. in 61 to 64; *Bajri*—5 Kg/ha. and Groundnut 86 Kg/ha. (d) *Bajri*—30 cm.×8 to 10 cm., Groundnut 30 cm.×10 to 15 cm. (e) —. (v) Nil. (vi) *Bajri*—Akola 61 to 64; 28—15—1 and Groundnut Sp. Peanut 61 to 64; Spanish improved. (vii) Unirrigated. (viii) 1 interculturing and 1 weeding; 2 interculturings in 62 and 63; Interculturing and weeding; 2 weedings and gap fillings. (ix) 26 cm.; 51 cm.; 55 cm.; N.A.; 31 cm. (x) *Bajri* on 2.10.61; 12.10.62; 25.10.63; N.A.; 11 to 13.10.65 and Groundnut on N.A.; 19.11.62; 1.11.63; 5.12.64 and 28.10.65.

## 2. TREATMENTS:

**Main-plot treatments:**

All combinations of (1) and (2).

(1) 2 levels of P<sub>2</sub>O<sub>5</sub>: P<sub>0</sub>=0 and P<sub>1</sub>=22.4 Kg/ha.

(2) 3 levels of N: N<sub>0</sub>=0, N<sub>1</sub>=11.2 and N<sub>2</sub>=22.4 Kg/ha.

**Sub-plot treatments:**

7 ratios of *Bajri*: Groundnut mixture: R<sub>1</sub>=1:0, R<sub>2</sub>=0:1, R<sub>3</sub>=1:1, R<sub>4</sub>=1:2, R<sub>5</sub>=1:3, R<sub>6</sub>=2:1 and R<sub>7</sub>=3:1.

## 3. DESIGN:

(i) Split-plot. (ii) (a) 6 main-plots/replication, 7 sub-plots/main-plot. (b) N.A. (ii) 4. (iv) (a) 6.10 m. × 12.19 m. (b) 3.66 m. × 9.75 m. (v) 122 cm. × 122 cm. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory; Normal; Normal; Normal; Fair. (ii) Engot on *Bajri*; Nil; Nil; Nil; Slight attack of *Tikka*. (iii) Germination count, height, yield of grain and monetary return. (iv) (a) 1961—contd. (b) Yes. (c) Nil. (v) No. (vi) Nil. (vii) As the experiment is continued beyond 65, results of individual years are presented under 5 Results.

## 5. RESULTS:

**61(100)**

(i) 346 Rs/ha. (ii) (a) 134.6 Rs/ha. (b) 78.5 Rs/ha. (iii) Main effect of R alone is highly significant. (iv) Av. value of produce in Rs/ha.

	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	R <sub>6</sub>	R <sub>7</sub>	P <sub>0</sub>	P <sub>1</sub>	Mean
N <sub>0</sub>	73	412	401	328	393	330	299	322	317	319
N <sub>1</sub>	118	353	414	398	452	435	365	328	396	362
N <sub>2</sub>	128	388	404	442	426	357	357	374	341	357
Mean	106	384	406	389	424	374	340	341	351	346
P <sub>0</sub>	99	384	403	355	405	373	371			
P <sub>1</sub>	114	385	410	424	442	375	310			

C.D. for R marginal means = 48.3 Rs/ha.

62(87)

(i) 373 Rs/ha. (ii) (a) 88.9 Rs/ha. (b) 83.5 Rs/ha. (iii) Main effect of N is significant. Main effect of R is highly significant while interaction N×P and N×R are significant. (iv) Av. value of produce in Rs/ha.

	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	R <sub>6</sub>	R <sub>7</sub>	P <sub>0</sub>	P <sub>1</sub>	Mean
N <sub>0</sub>	115	508	394	342	426	390	337	365	353	359
N <sub>1</sub>	108	444	328	427	379	386	434	376	340	358
N <sub>2</sub>	135	508	452	368	450	402	498	364	440	402
Mean	119	487	391	379	418	393	423	368	378	373
P <sub>0</sub>	112	492	371	394	405	409	390			
P <sub>1</sub>	127	476	411	364	431	377	456			

C.D. for N marginal means = 35.8 Rs/ha.  
 C.D. for R marginal means = 48.0 Rs/ha.  
 C.D. for body of N×P table = 50.6 Rs/ha.  
 C.D. for R means at the same levels of N = 83.1 Rs/ha.  
 C.D. for N means at the same level of R = 84.8 Rs/ha.

63(128)

(i) 388 Rs/ha. (ii) (a) 129.8 Rs/ha. (b) 141.6 Rs/ha. (iii) Main effects of P and R are highly significant. (iv) Av. value of produce in Rs/ha.

	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	R <sub>6</sub>	R <sub>7</sub>	P <sub>0</sub>	P <sub>1</sub>	Mean
N <sub>0</sub>	80	566	377	492	489	272	343	327	421	374
N <sub>1</sub>	91	402	348	475	494	370	324	300	415	358
N <sub>2</sub>	131	664	393	502	509	386	360	395	447	421
Mean	101	544	373	490	497	343	342	341	428	384
P <sub>0</sub>	87	425	357	453	445	281	337			
P <sub>1</sub>	114	663	389	526	550	405	348			

C.D. for P marginal means = 42.7 Rs/ha.  
 C.D. for R marginal means = 81.3 Rs/ha.

64(107).

(i) 118 Rs/ha. (ii) (a) 55.5 Rs/ha. (b) 51.0 Rs/ha. (iii) Main effect of R is highly significant. (iv) Av. value of produce in Rs/ha.

	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	R <sub>6</sub>	R <sub>7</sub>	P <sub>0</sub>	P <sub>1</sub>	Mean
N <sub>0</sub>	50	158	110	142	138	104	84	123	102	112
N <sub>1</sub>	52	164	158	120	173	97	82	112	130	121
N <sub>2</sub>	50	147	159	165	150	98	82	120	123	122
Mean	51	156	142	142	154	100	83	118	118	118
P <sub>0</sub>	54	162	127	134	159	101	90			
P <sub>1</sub>	47	150	158	151	141	98	75			

C.D. for R marginal means = 29.3 Rs/ha.

65(104)

(i) 715 Rs/ha. (ii) (a) 227.6 Rs/ha. (b) 144.5 Rs/ha. (iii) Main effect of P is significant. Main effect of R is highly significant. (iv) Av. value of produce in Rs/ha.

	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	R <sub>6</sub>	R <sub>7</sub>	P <sub>0</sub>	P <sub>1</sub>	Mean
N <sub>0</sub>	304	583	715	763	779	707	642	585	699	642
N <sub>1</sub>	506	606	815	859	904	811	690	725	758	742
N <sub>2</sub>	647	586	826	866	916	704	775	734	786	760
Mean	486	592	786	829	866	741	702	681	748	715
P <sub>0</sub>	457	571	763	747	842	706	684			
P <sub>1</sub>	515	612	808	911	891	775	720			

C.D. for P marginal means = 74.8 Rs/ha.

C.D. for R marginal means = 83.0 Rs/ha.

**Crop :- Bajri and Groundnut (Kharif).**

**Ref :- Mh. 61(102), 62(89), 63(130).**

**64(108), 65(103).**

**Site :- Agri. Res. Stn., Sholapur.**

**Type :- 'X'.**

Object: —To study the effect of growing *Bajri* and Groundnut in alternate strips.

#### 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Groundnut, *Tur*; *Bajri* and Groundnut. for 62 to 64; N.A. (c) Nil. (ii) Light soil (iii) 4.7.61; 7.7.62; 8.7.63; 25.8.64; 2.7.65. (iv) (a) 2 harrowings; 1 ploughing and 2 harrowings. (b) Drill ing. (c) *Bajri* 4 Kg/ha.; Groundnut 90 Kg/ha. (d) 30 cm. (e) —. (v) Nil. (vi) *Bajri*-Akola and Groundnut K-4-11. (vii) Unirrigated. (viii) 1 interculturing and 1 weeding; 2 interculturings and 1 weeding; 1 weeding; N.A. for 64 and 65. (ix) 26 cm.; 51 cm.; 55 cm.; N.A.; 30.5 cm. (x) *Bajri* 2.10.61, 19.10.62; 26.10.63; 17.11.64; 16.10.65 and Groundnut 13.11.61; 17.12.62; 9.12.63; 10.12.64; 7.11.65.

#### 2. TREATMENTS:

3 mixed cropping treatments: T<sub>1</sub>=*Bajri* alone, T<sub>2</sub>=Groundnut alone and T<sub>3</sub>=*Bajri* and Groundnut in alternate strips.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 12. (iv) (a) 7.32 m. × 11.58 m. (b) 4.88 m. × 9.14 m. (v) 122 cm. × 122 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Blister beetles in 61 to 63; Ergot in *Bajri* and leaf spot in 64; 10 % B.H.C. at 16.8 Kg/ha. for leaf minor on Groundnut. (iii) Plant count, yield of grain and monetary return. (iv) (a) 1961 to 65. (b) Yes. (c) Results of combined analysis are given under 5. Results. (v) Jeur, Chas. (vi) No. (vii) Due to drought conditions yield was less in 61 error variances are homogeneous and Treatments × years interaction is present.

## 5. RESULTS :

## Pooled results

(i) 482 Rs/ha. (ii) 431.4 Rs/ha. (based on 8 d.f. made up of Treatments × years interaction). (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. value	204	626	547

C.D. = 181.6 Rs/ha.

## Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	Sig.	G.M.	S.E./plot
Year						
1961	59	780	516	**	451	109.0
1962	133	899	602	**	545	97.6
1963	166	701	437	**	435	77.7
1964	128	245	223	**	198	81.4
1965	535	857	960	**	783	127.8
Pooled	204	626	547	**	482	431.4

**Crop :- Bajri and Tur (Kharif).**

**Ref :- Mh. 63(144), 64(112), 65(47).**

**Site :- Bajri Res. Sub-Stn., Vaijapur.**

**Type :- 'X'.**

**Object :-** To study the effect of row sowing and mixed sowing of *Bajra* and *Tur*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Bajra*. (c) 12.35 C.L./ha. of F.Y.M. (ii) Medium black soil. (iii) 21.7.63; 20.7.64; 2.8.65. (iv) (a) Ploughing twice with contury plough and 1 harrowing; tractor ploughing and 2 harrowings; ploughing and harrowing. (b) Drilling. (c) *Bajra* 4 Kg/ha. and *Tur* 7 Kg/ha. (d) 30 cm. for *Bajra* and 61 cm. for *Tur*. (e) -. (v) 12.35 C.L./ha. of F.Y.M. (vi) *Bajra*-N-28-15-1 and *Tur*-C-11. (vii) Unirrigated. (viii) 1 to 2 hoeings and 2 to 3 weedings. (ix) 54 cm.; 45 cm.; 46 cm. (x) 1.11.63; 30.10.64; N.A. for *Bajri* and 2.2.64; N.A.; 1st. week of Jan. 64 for *Tur*.

## 2. TREATMENTS and 3. DESIGN :

Same as in Expt. Nos. 64(253), 65(95) conducted at Chas and presented on page No. 582.

## 4. GENERAL :

(i) Normal. (ii) Dusted B.H.C. 5 % for *Tur*, pod borer in 63, 64; Nil in 65. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 67. (b) No. (c) Nil. (v) and (vi) No. (vii) As the experiment is continued beyond 65, results of individual years are presented under 5. Results.

## 5. RESULTS :

63(144)

(i) 114 Rs/ha. (ii) 36.5 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	56	86	99	157	123	143	144	101

C.D. = 53.7 Rs/ha.

64(112)

(i) 399 Rs/ha. (ii) 107.2 Rs/ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	298	277	413	471	470	457	470	338

65(47)

(i) 225 Rs/ha. (ii) 79.1 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	188	132	195	210	183	265	264	360

C.D. = 116.3 Rs/ha.

**Crop :- Bajra and Matki (Kharif). Ref :- Mh. 62(138), 63(132), 64(110), 65(45).**

**Site :- Bajra Res. Sub-Stn., Vaijapur. Type :- 'X'.**

**Object :-** To study the effect of sowing of *Bajra* and *Matki* in alternate drilling.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar* ; As per treatments for other years. (c) Nil ; As mentioned in (v). (ii) Medium black soil. (iii) 2.8.62 ; 18.7.63 ; 28.7.64 ; 29.7.65. (iv) (a) Ploughing and *bakhering*. (b) Drilling. (c) *Bajra* 7.5 Kg/ha. ; 4 Kg/ha. ; 4 Kg/ha. ; 7.5 Kg/ha. and for *Matki* 15 Kg/ha. ; 12 Kg/ha. ; 12 Kg/ha. ; 20 Kg/ha. (d) 46 cm. ; 30 cm. for *Bajra* and 46 cm. for *Matki* ; 46 cm. ; 30 cm. × 46 cm. (e) —. (v) 12.5 C.L./ha. of compost ; Nil. ; Nil ; 12.5 C.L./ha. of F.Y.M. (vi) *Bajri* —28—15—1 and *Matki*—Local. (vii) Un-irrigated. (viii) 1 weeding and 1 hoeing. (ix) 75 cm. ; 54 cm. ; 45 cm. ; 46 cm. (x) *Bajri* on 16.11.62 ; 10.11.63 ; 11.11.64 ; N.A. and *Matki* on 16.11.63 ; 25.12.63 ; N.A. ; 15.1.66.

## 2. TREATMENTS :

3 mixed cropping treatments : T<sub>1</sub>=Entire *Bajra*, T<sub>2</sub>=Entire *Matki* and T<sub>3</sub>=Alternate drilling of *Bajra* and *Matki*.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) 24.38 m. × 15.24 m. (b) 24.38 m. × 13.41 m. (v) 91 cm. × 91 cm. (vi) Yes.

## 4. GENERAL :

(i) Average ; Satisfactory ; Normal ; Normal. (ii) Nil. (iii) Yield of grain, fodder and monetary return (iv) (a) 1962 to 67. (b) Yes. (c) No. (v) to (vi) No. (vii) As Expt. continued beyond 65, results of individual years have been presented under 5, Results.

## 5. RESULTS :

62(138)

(i) 48.8 Rs/ha. (ii) 11.68 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.



Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. value	72.3	13.8	60.2

C.D.=17.03 Rs/ha.

**63(132)**

(i) 134.0 Rs./ha. (ii) 34.43 Rs/ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. value	141.5	103.2	157.4

**64(110)**

(i) 249.3 Rs/ha. (ii) 87.36 Rs/ha. (iii) Treatment differences are not significant (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. value	297.8	154.2	295.7

**65(45)**

(i) 169.9 Rs/ha. (ii) 79.97 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. value	278.1	17.4	214.2

C.D.=116.63 Rs/ha.

**Crop :- Bajra and Kulthi (Kharif). Ref :- Mh. 62(137), 63(133), 64(111), 65(46).**

**Site :- Bajra Res. Sub-Stn., Type 'X'.**

**Vaijapur.**

**Object :—**To study the effect of sowing of Bajra and Kulthi in alternate drilling and shifting Bajra in place of Kulthi next year.

**1. BASAL CONDITIONS :**

(i) (a) Bajra, *Kulthi*. (b) Jowar for 62 ; As per treatments for others. (c) N.A. for 62 ; As mentioned in (v) for others. (ii) Medium black soil (iii) 2.8.62 ; 19.7.63 ; 28.7.64 ; 30.7.65. (iv) (a) Ploughings and harrowings. (b) Drilling. (c) Bajra 7.3 Kg/ha ; 4 Kg/ha. for 63 and 64 ; 3.4 Kg/ha., *Kulthi* 20 Kg/ha. ; 12 Kg/ha. for 63 and 64 ; 9 Kg/ha. (d) 46 cm. (e) Nil. (v) 12.5 C.L./ha. of compost ; Nil ; Nil ; 5 C.L./ha. of F.Y.M. (vi) Bajra N-28-15-1 and *Kulthi* K-33. (vii) Unirrigated. (viii) Hoeing and weeding. (ix) 75 cm. ; 54 cm. ; 45 cm. ; 46 cm. (x) Bajra 15.11.62 ; 9.11.63 ; 12.11.64 ; 18.1.66, *Kulthi*, 20.12.62 ; 13.12.63 ; N.A. ; N.A.

**2. TREATMENTS :**

T<sub>1</sub>=Bajra, T<sub>2</sub>=*Kulthi* and T<sub>3</sub>=Alternate drilling of Bajra and *Kulthi*.

**3. DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) 24.38 m. × 15.24 m. (b) 24.38 m. × 13.41 m. (v) 91 cm. (vi) Yes.

**4. GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1962 to 66. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) As the experiment is continued beyond 65, results of individual years are presented under 5. Results.

**5. RESULTS :**

**62(137)**

(i) 105 Rs/ha. (ii) 16.5 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. value	74	134	108

C.D.=24.1 Rs/ha.

63(133)

(i) 145 Rs/ha. (ii) 24.6 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. value	111	172	152

C.D.=35.9 Rs/ha.

64(111)

(i) 286 Rs/ha. (ii) 76.4 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. value	407	112	338

C.D.=111.4 Rs/ha.

65(46)

(i) 212 Rs/ha. (ii) 59.9 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Av. value	311	51	274

C.D.=87.3 Rs/ha.

**Crop :- Jowar, Moong (Kharif).**

**Ref :- Mh. 63(245), 64(199), 65(77).**

**Site :- Agri. Res. Stn., Washim.**

**Type :- 'X'.**

**Object :-** To study the effect of row sowing and mixed sowing on the yield outturn of Cereals and Pulses

#### 1. BASAL CONDITIONS

(i) (a) Nil. (b) and (c) N.A. (ii) Black soil. (iii) 14.7.63 ; 30.6.64 ; 2.7.65. (iv) (a) 3 harrowings ; 1 ploughing and 2 harrowings ; harrowing (b) Drilling. (c) 9.8 Kg/ha. for each crop. (d) 30 cm. (e) —. (v) 22.4 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub> ; 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> ; Nil. (vi) Jowar PS-13, Moong—Kopergaon. (vii) Unirrigated (viii) Hoeing and weeding for 63 and 65 ; 2 hoeings for 64. (ix) 92 cm. ; 67 cm. ; N.A. (x) 18.9.63 ; 21.12.64 ; N.A.

#### 2. TREATMENTS and 3. DESIGN :

Same as in Expt. Nos. 63(51), 64(42), 65(3), conducted at Achalpur, presented on page No. 561.

#### 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 65. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Badnapur, Dhulia and Achalpur. (vi) Continuous rains in the last week of July and throughout August affected the yield. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

## 5. RESULTS :

Pooled results.

(i) 1056 Rs/ha. (ii) 104.8 Rs/ha. (based on 14 d.f. made up of Treatments  $\times$  years interaction). (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. yield	937	389	1242	1194	1163	1287	1086	1152

C.D. = 91.8 Rs/ha.

Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	Sig.	G.M.	S.E./plot
Year											
1963	481	100	583	579	579	552	555	578	**	501	100.8
1964	943	582	1489	1254	1214	1325	1157	1225	**	1148	141.3
1965	1386	485	1654	1751	1696	1985	1549	1652	**	1519	207.1
Pooled	937	383	1242	1194	1163	1287	1085	1152	**	1056	104.8

**Crop :- Jowar, Udid (Kharif).****Ref :- Mh. 63(246), 64(200), 65(78).****Site :- Agri. Res. Stn., Washim.****Type :- 'X'.**Object :—To study the effect of row sowing and mixed sowing on the yield of *Jowar* and *Udid*.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Black soil. (iii) 14.7.63 ; 3.7.64 ; 2.7.65. (iv) (a) 3 harrowings ; ploughing and harrowing in 64 and 65. (b) Drilling. (c) 9.9 Kg/ha.. (d) 46 cm. (e) —. (v) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) *Jowar* PS-13, *Udid*—No—110. (vii) Unirrigated. (viii) Hoeing and weeding. (ix) N.A. (x) 8.10.63 ; 21.12.64 ; N.A.

## 2. TREATMENTS and 3. DESIGN:

Same as in Expt. Nos. 63(47), 64(40), 65(4) conducted at Achalpur and presented on page No. 556.

## 4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 65. (b) and (c) No. (v) Achalpur, Dhulia and Nagpur. (vi) Nil. (vii) Error variances are heterogeneous and Treatments  $\times$  years interaction is absent. Hence results of individual years are presented under 5. Results.

## 5. RESULTS :

63(246)

(i) 648.7 Rs/ha. (ii) 57.0 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	590	303	672	777	720	722	722	685

C.D. = 83.8 Rs/ha.

64(200)

(i) 1170 Rs/ha. (ii) 190.6 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	1007	735	1407	1319	1050	1407	1233	1200

C.D. = 280.3 Rs/ha.

65(78)

(i) 1499 Rs/ha. (ii) 215.6 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	1318	845	1648	1578	1495	1724	1775	1610

C.D. = 317.1 Rs/ha.

**Crop :- Jowar, Moong, Udid  
and Sann (Kharif).**

**Ref :- Mh. 63(261), 64(218), 65(124).**

**Site :- Agri. Res. Stn., Washim.**

**Type :- 'X'.**

Object :—To study the effect of mixed cropping.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) N.A. (c) N.A. (ii) Black soil. (iii) 13.7.63 ; 3.7.64 ; 4.7.65. (iv) (a) 3 harrowings ; 1 ploughing and 3 harrowings ; harrowing. (b) Drillings. (c) 9 Kg/ha. for Jowar, Moong and Udid and 6-7 Kg/ha. for Sann. (d) 46 cm. (e) —. (v) 22.4 Kg/ha. of N+11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (vi) Jowar-P.S. 13, Sann-local, Moong-Kopergaon and Udid-No. 55. (vii) Un-irrigated. (viii) 3 hoeings and 2 weedings. (ix) N.A. (x) 2.1.64 ; 19.12.64 ; 9.12.65.

2. **TREATMENTS :**

Same as in Expt. Nos. 63(199), 64(168), 65(2) conducted at Achalpur and presented on page No. 538.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 10 ; 11 for 64 and 65. (b) N.A. (iii) 4. (iv) (a) 10.97 m. × 7.32 m. (b) 9.14 m. × 4.57 m. (v) 91 cm × 91 cm. (vi) Yes.

4. **GENERAL :**

(i) Normal ; Satisfactory ; Normal. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 66 (modified in 64). (b) No. (c) Nil. (v) Akola, Buldhana and Dhulia. (vi) Nil. (vii) As expt. is continued beyond 65, the results of individual years have been presented under 5. Results.

5. **RESULTS :**

63(261)

(i) 352 Rs/ha. (ii) 90.4 Rs/ha. (iii) Main effects of C and interaction C×M are highly significant. (iv) Av. value of produce in Rs/ha.

T<sub>1</sub> = 350 Rs/ha

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
C <sub>1</sub>	48	332	311	230
C <sub>2</sub>	496	393	383	424
C <sub>3</sub>	474	393	339	402
Mean	339	372	344	352

C.D. for C marginal means = 75.7 Rs/ha.

C.D. for body of the C × M table = 131.1 Rs/ha.

64(211)

(i) 901 Rs/ha. (ii) 144.1 Rs/ha. (iii) Main effect of M is highly significant. (iv) Av. value of produce in Rs/ha.

$T_1=902$  Rs/ha.,  $T_2=753$  Rs/ha.

	$M_1$	$M_2$	$M_3$	Mean
$C_1$	935	849	1022	935
$C_2$	994	795	888	892
$C_3$	958	750	1058	922
Mean	963	798	989	916

C.D. for M marginal means = 120.1 Rs/ha.

65(124)

(i) 1133 Rs/ha. (ii) 1840 Rs/ha. (iii) Interaction  $C \times M$  is highly significant. (iv) Av. value of produce in Rs/ha.

$T_1=1124$  Rs/ha.,  $T_2=1278$  Rs/ha.

	$M_1$	$M_2$	$M_3$	Mean
$C_1$	769	1247	1050	1022
$C_2$	1301	1073	1057	1144
$C_3$	1366	1044	1156	1189
Mean	1145	1121	1088	1118

C.D. for body of  $C \times M$  table = 265.7 Rs/ha

**Crop :- Jowar, Tur (Kharif).**

**Ref :- Mh. 63(255), 64(208), 65(108).**

**Site :- Agri. Res. Stn., Yeotmal.**

**Type :- 'X'.**

Object :—To study the effect of row sowing and mixed sowing of Cereals and Pulses.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton. (c) 22.4 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$ . (ii) Medium soil. (iii) 16.7.63 ; 23.7.64 ; 6.7.65. (iv) (a) Harrowing ; Harrowing ; Ploughing and harrowings. (b) Drilling. (c) Jowar—6.7 Kg/ha. and Tur—9 Kg/ha. (d) 46 cm. (e) —. (v) Nil ; 12.4 C.L./ha. of F.Y.M. + 11.2 Kg/ha. of N + 22.4 Kg/ha. of  $P_2O_5$ . (vi) Jowar—N.J. 156 and Tur—No. 148. (vii) Unirrigated. (viii) 1 to 3 hoeings and 2 weedings. (ix) 76 cm ; 96 cm ; 59 cm. (x) Jowar on 19.12.63 ; N.A. ; 20.12.65. and Tur on 8.1.64 ; 4.1.65 ; 20.12.65.

2. **TREATMENTS and 3 DESIGN :**

Same as in Expt. Nos. 63(50), 64(41), 65(5) conducted at Achalpur and presented on page No. 555.

4. **GENERAL :**

(i) Normal ; Satisfactory ; Normal. (ii) Nil ; B.H.C. 5% dusted. Endrin sprayed ; Endrin sprayed for Jowar stem borer. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 67. (b) No. (c) Nil. (v) Achalpur, Amravati. Buldhana and Dhulia. (vi) Nil. (vii) As the experiment is continued beyond 65, results of individual years have been presented under 5. Results.

5. **RESULTS :**

63(255)

(i) 542 Rs/ha. (ii) 164.3 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	313	961	685	547	512	564	376	379

C.D. = 241.7 Rs/ha.

64(208)

(i) 600 Rs/ha. (ii) 123.5 Rs/ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	514	613	677	560	632	552	548	704

65(108)

(i) 387 Rs/ha. (ii) 113.0 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	499	67	474	431	482	543	327	275

C.D. = 166.2 Rs/ha.

**Crop :- Jowar, Udid (Kharif).****Ref :- Mh. 63(266), 64(225), 65(141).****Site :- Agri. Res. Stn., Yeotmal.****Type :- 'X'.**

Object :- To study the effect of row sowing and mixed sowing of Cereals and Pulses.

## 1. BASAL CONDITIONS:

(i) (a) Nil, (t) Cotton (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>, (ii) Medium soil. (iii) 15.7.63 ; 18.7.64; 7.7.65. (iv) (a) 2 harrowings ; Ploughing and harrowing ; Harrowing. (b) Drilling. (c) 10 Kg/ha. for each crop in 63 ; 10 Kg/ha. for Jowar and 20 Kg/ha. for Udid in 64 and 65. (d) 46 cm. (e) —. (v) Nil. (vi) Jowar NJ 156, Udid No. 55. (vii) Unirrigated. (viii) 3 hoeings ; 3 hoeings and 2 weedings ; Hoeing and weeding, (ix) 76 cm. ; 93 cm. ; 59 cm. (x) 19.12.63 ; 22.12.64 ; 20.12.65.

## 2. TREATMENTS and 3. DESIGN:

Same as in Expt. Nos 63(47), 64(40), 65(4) conducted at Achalpur and presented on page No. 556.

## 4. GENERAL :

(i) Germination not satisfactory ; Normal ; Satisfactory. (ii) Nil ; 5% B.H.C. dusted and Endrin sprayed ; Jowar stem borer, Endrin sprayed. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 67. (b) No. (c) Nil. (v) Achalpur, Dhulia, Nagpur, Amravati and Akola. (vi) No. (vii) Since the expt. is contd. beyond 65, the results of individual years have been given under 5. Results.

## 5. RESULTS :

63(266)

(i) 133 Rs/ha. (ii) 77.1 Rs/ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	114	162	144	142	126	143	63	172

64(225)

(i) 953 Rs/ha. (ii) 221.4 Rs/ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	577	858	984	918	885	1078	1193	1135

65(141)

(i) 1238 Rs/ha. (ii) 116.2 Rs/ha. (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	1023	1164	1401	1283	1256	1396	1131	1251

C.D.=170.9 Rs/ha.

**Crop :- Jowar, Moong (Kharif).****Ref :- Mh. 63(267), 64(226), 65(142).****Site :- Agri. Res. Stn., Yeotmal.****Type :- 'X'.**

Object :—To study the effect of row sowing and mixed sowing.

**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Cotton. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>. (ii) Medium black soil. (iii) 9.7.63 ; 18.7.64 ; 7.7.65. (iv) (a) Harrowing ; Ploughing and harrowing ; Harrowing. (b) Drilling. (c) Jowar—4.5 Kg/ha. and Moong—9 Kg/ha. (d) 46 cm. (e) —. (v) Nil ; 12.35 C.L./ha. of F.Y.M.+11.2 Kg/ha. of N+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> in 64 and 65. (vi) Jowar—N J. 156, Moong—Kopergaon. (vii) Unirrigated. (viii) 3 hoeings and 2 weedings for 63 and 64 ; Hoeings and weedings in 65. (ix) 76 cm. ; 93 cm. ; 59 cm. (x) 19.1.63 ; 22.12.64 ; 20.12.65.

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

Same as in Expt. Nos. 63(51), 64(42), 65(3) conducted at Achalpur and presented on page No. 557.

**4. GENERAL :**

(i) Normal ; Normal ; Satisfactory. (ii) Nil ; 5% B.H.C. dusted and Endria sprayed ; Endrin sprayed for Jowar Stem-borer. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 65. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Achalpur, Akola, Buldhana, Dhulia and Nagpur. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

**5. RESULTS :**

Pooled results

(i) 476 Rs/ha. (ii) 187.9 Rs/ha. (based on 14 d.f. made up of Treatments × years interaction). (iii) Treatment differences are significant. (iv) Av. value of produce in Rs/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. value	471	254	574	538	500	487	501	485

C.D.=164.5 Rs/ha.

Individual results

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	Sig.	G.M.	S.E./plot
Year											
1963	180	204	303	302	265	257	269	232	N.S.	251	67.2
1964	448	45	309	396	390	371	406	403	**	346	67.4
1965	786	513	1109	916	844	834	827	821	**	831	122.0
Pooled	471	254	574	538	500	487	501	485	*	476	187.9

**Crop :- Jowar, Moong, Udid and Sann (Kharif).****Ref :- Mh. 63(269), 64(228), 65(144).****Site :- Agri. Res. Stn., Yeotmal.****Type :- 'X'**

Object :—To study the economics of Jowar mixture with Legumes.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 22.4 Kg/ha. of N+22.4 Kg/ha. of  $P_2O_5$ . (ii) Medium black soil. (iii) 9.7.63 ; 23.7.64 ; 8.7.65. (iv) (a) Harrowing. (b) Dibbling. (c) 9 Kg/ha. for Jowar, 17 Kg/ha. for Moong and Udid, 34 Kg/ha. for Sann. (d) 46 cm.  $\times$  23 cm. (e) 2. (v) Nil. (vi) Jowar-N.J.156, Moong-Kopergaon, Udid-No. 55, Sann-local. (vii) Unirrigated. (viii) 2 hoeings and 2 weedings. (ix) 76 cm. ; 93 cm. ; 59 cm. (x) Jowar 14.1.64 , Sann 18.1.64, Moong 13.9.63 and Udid 13.10.63 ; 4 1.65 ; 20.12.65.

## 2. TREATMENTS :

All combinations of (1) and (2) + one Extra treatment.

(1) 3 different mixed croppings :  $C_1$ =Jowar and Sann in 1:1 row,  $C_2$ =Jowar and Moong in 1:1 row and  $C_3$ =Jowar and Udid in 1:1 row.

(2) 3 different ways of legumes crops harvesting :  $M_1$ =Allowed to seed,  $M_2$ =Crops uprooted and spread in between rows and  $M_3$ =Crops uprooted and buried in between rows.

Extra treatment  $T_1$ =Entire Jowar.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 10.97 m.  $\times$  7.32 m. (b) 9.14 m.  $\times$  5.49 m. (v) 91 cm  $\times$  91 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain and monetary return. (iv) (a) 1963 to 67. (b) No. (c) Nil. (v) Washim, Nagpur, Dhulia, Badnapur and Achalpur. (vi) Nil. (vii) As Experiment is continued beyond 65, results of individual years are presented under 5. Results.

## 5. RESULTS :

63(266)

(i) 290 Rs/ha. (ii) 45 1 Rs/ha. (iii) Interaction  $C \times M$  is significant. (iv) Av. value of produce in Rs/ha.

$T_1=251$  Rs/ha.

	$M_1$	$M_2$	$M_3$	Mean
$C_1$	265	269	334	289
$C_2$	341	253	257	284
$C_3$	281	288	359	309
Mean	296	270	317	294

C.D. for body of table=65.4 Rs/ha.

64(228)

(i) 309 Rs/ha. (ii) 105.4 Rs/ha. (iii) Interaction  $C \times M$  is significant. (iv) Av. value of produce in Rs/ha.

$T_1=320$  Rs/ha.

	$M_1$	$M_2$	$M_3$	Mean
$C_1$	234	279	365	293
$C_2$	285	272	304	287
$C_3$	524	245	265	345
Mean	348	265	311	308

C.D. for body of table=152.9 Rs/ha.

65(144)

(i) 604 Rs/ha. (ii) 139.9 Rs/ha. (iii) Interaction  $C \times M$  is significant. (iv) Av. value of produce in Rs/ha.



T<sub>1</sub>=519 Rs/ha.

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	Mean
C <sub>1</sub>	537	580	661	593
C <sub>2</sub>	596	596	649	614
C <sub>3</sub>	900	516	477	631
Mean	678	564	596	613

C.D. for body of table=203.0 Rs/ha.

**Crop :- Jowar, Cotton, Groundnut (Kharif).****Ref :- Mh. 60(39), 61(188),  
62 (199), 63(240),  
64(194), 65(51).****Site :- Agri. Res. Stn., Akola.****Type :- 'R'.**Object :- To find out the combined effect of rotations with manuring on *Jowar*, Cotton and Groundnut.**1. BASAL CONDITIONS :**

(i) (a) to (c) As per treatments. (ii) Black cotton soil. (iii) Cotton 28.6.60; 8.7.61; 2.7.62; 1, 2.7.63; 13, 14.7.64; 25.6.65, *Jowar*—19.7.60; 16.7.61; 21.7.62; 12.7.63; 14.7.64; 12.7.65, Groundnut—28.6.60; 10.7.61; 9.7.62; 4.7.63; 14.7.64; 17.7.65. (iv) (a) 3 *bakherings*; *Bakhering*; 1 ploughing and 3 *bakherings*; 4 harrowings; 1 ploughing and harrowing; 4 harrowings. (b) Drilling. (c) Cotton and *Jowar* 12–14 Kg/ha., Groundnut 90 Kg/ha. (d) Cotton and *Jowar* 45 cm. × 23 cm., Groundnut 30 cm. × 23 cm. (e) 1 left after thinning. (v) 12.3 C.L./ha. of F.Y.M. and 22 Kg/ha. of N as A/S in 61 and 64. (vi) Cotton AK—235, *Jowar*—Improved Saoner, Groundnut — AK—12—24. (vii) Unirrigated. (viii) 3–4 hoeings and 2–3 weedings. (ix) 62.5 cm.; 74.8 cm.; 79.3 cm.; 50.7 cm.; 74.0 cm.; 136.1 cm. (x) Cotton 4.11.60; 8.12.61 to 4.3.62; 6.2.63; 20.11.63 to 6.1.64; 17.11.64 to 26.12.64; 19.11.65 to 5.12.65, *Jowar* 25.12.60; 1.1.62; 6.2.63; 28.12.63; 26.12.64; 20.11.65, Groundnut 31.10.60; 6, 14.11.61; 6.2.63; 16.11.63; 17.11.64; 19.11.65.

**2. TREATMENTS :**

7 treatments of two and three crops rotations. Each treatment has as many plots in each replication as per the crops in the rotation under study.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>
Plot No.	P <sub>1</sub> P <sub>2</sub>	P <sub>3</sub> P <sub>4</sub> P <sub>5</sub>	P <sub>6</sub> P <sub>7</sub> P <sub>8</sub> P <sub>9</sub>	P <sub>10</sub> P <sub>11</sub> P <sub>12</sub>	P <sub>13</sub> P <sub>14</sub>	P <sub>15</sub>	P <sub>16</sub> P <sub>17</sub> P <sub>18</sub>
Year							
1960	C C	J C G	C G J C	C C J	J C	C	C C G
1961	G C	G J C	C C G J	J C C	C J	C	G C C
1962	C G	C G J	J C C G	C J C	J C	C	C G C
1963	G C	J C G	G J C C	C C J	C J	C	C C G
1964	C G	G J C	C G J C	J C C	J C	C	G C C
1965	G C	C G J	C C G J	C J C	C J	C	C G C

C=Cotton, J=*Jowar* and G=Groundnut**3. DESIGN :**

(i) R.B.D. (ii) (a) 18. (b) 20.12 m. × 196.38 m. (iii) 5. (iv) (a) and (b) 20.12 m. × 10.06 m. (v) No. (vi) Yes (In the first year of expt.).

## 4. GENERAL :

(i) Normal. (ii) Mild attack of Boll worm and Aphids—B.H.C. 10 % was sprayed ; Red sheath attack on *Jowar* ; Stem borer and cotton rot diseases were noticed ; Attack of Stem borer, B.H.C. 10 % dusted ; Slight attack of Sugar—disease ; Nil. (iii) Yield of *Jowar* grain, Groundnut pods and *kapas*. (iv) (a) 1931 continued. (b) Yes. (c) No. (v) to (vii) Nil.

## 5. RESULTS :

60(39)

## COTTON

(i) 608 Kg/ha. (ii) 146.6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	T <sub>1</sub> (P <sub>1</sub> )	T <sub>2</sub> (P <sub>4</sub> )	T <sub>3</sub> (P <sub>6</sub> )	T <sub>4</sub> (P <sub>9</sub> )	T <sub>4</sub> (P <sub>10</sub> )	T <sub>4</sub> (P <sub>11</sub> )
Av. yield	124	840	732	428	587	381
Treatment	T <sub>5</sub> (P <sub>14</sub> )	T <sub>6</sub> (P <sub>15</sub> )	T <sub>7</sub> (P <sub>16</sub> )	T <sub>7</sub> (P <sub>17</sub> )		
Av. yield	496	63.3	552	703		

C.D.=188.1 Kg/ha.

## GROUNDNUT

(i) 1447 Kg/ha. (ii) 196.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	T <sub>1</sub> (P <sub>2</sub> )	T <sub>2</sub> (P <sub>5</sub> )	T <sub>3</sub> (P <sub>7</sub> )	T <sub>7</sub> (P <sub>18</sub> )
Av. yield	1409	1326	1451	1604

## JOWAR

(i) 2041 Kg/ha. (ii) 143.5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>2</sub> (P <sub>3</sub> )	T <sub>3</sub> (P <sub>6</sub> )	T <sub>4</sub> (P <sub>12</sub> )	T <sub>5</sub> (P <sub>13</sub> )
Av. yield	1970	2280	2096	1820

C.D.=197.7 Kg/ha.

61(188)

## COTTON

(i) 244 Kg/ha. (ii) 58.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	T <sub>1</sub> (P <sub>2</sub> )	T <sub>2</sub> (P <sub>5</sub> )	T <sub>3</sub> (P <sub>6</sub> )	T <sub>3</sub> (P <sub>7</sub> )	T <sub>4</sub> (P <sub>11</sub> )	T <sub>4</sub> (P <sub>12</sub> )	T <sub>5</sub> (P <sub>13</sub> )
Av. yield	207	218	262	244	284	295	26x
Treatment	T <sub>6</sub> (P <sub>14</sub> )	T <sub>7</sub> (P <sub>17</sub> )	T <sub>7</sub> (P <sub>18</sub> )				
Av. yield	221	236	207				

## GROUNDNUT

(i) 936 Kg/ha. (ii) 91.1 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of pods in Kg/ha.

Treatment	T <sub>1</sub> (P <sub>1</sub> )	T <sub>2</sub> (P <sub>3</sub> )	T <sub>3</sub> (P <sub>6</sub> )	T <sub>7</sub> (P <sub>16</sub> )
Av. yield	805	1040	979	921

C.D.=122.8 Kg/ha.

## JOWAR

(i) 1715 Kg/ha. (ii) 182.4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>2</sub> (P <sub>4</sub> )	T <sub>3</sub> (P <sub>5</sub> )	T <sub>4</sub> (P <sub>10</sub> )	T <sub>5</sub> (P <sub>14</sub> )
Av. yield	1769	1593	1606	1893

62(199)

## COTTON

(i) 255 Kg/ha. (ii) 83.1 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *Kapas* in Kg/ha.

Treatment	T <sub>1</sub> (P <sub>1</sub> )	T <sub>2</sub> (P <sub>3</sub> )	T <sub>3</sub> (P <sub>7</sub> )	T <sub>4</sub> (P <sub>8</sub> )	T <sub>4</sub> (P <sub>10</sub> )	T <sub>4</sub> (P <sub>13</sub> )	T <sub>5</sub> (P <sub>14</sub> )
Av. yield	228	404	204	303	202	255	334
Treatment	T <sub>6</sub> (P <sub>15</sub> )	T <sub>7</sub> (P <sub>16</sub> )	T <sub>7</sub> (P <sub>18</sub> )				
Av. yield	204	130	289				

C.D. = 106.6 Kg/ha.

## GROUNDNUT

(i) 622 Kg/ha. (ii) 187.1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	T <sub>1</sub> (P <sub>2</sub> )	T <sub>2</sub> (P <sub>4</sub> )	T <sub>3</sub> (P <sub>5</sub> )	T <sub>7</sub> (P <sub>17</sub> )
Av. yield	670	578	586	655

## JOWAR

(i) 1706 Kg/ha. (ii) 244.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>2</sub> (P <sub>4</sub> )	T <sub>3</sub> (P <sub>5</sub> )	T <sub>4</sub> (P <sub>11</sub> )	T <sub>5</sub> (P <sub>13</sub> )
Av. yield	1658	1902	1752	1510

63(210)

## COTTON

(i) 397 Kg/ha. (ii) 129.8 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	T <sub>1</sub> (P <sub>1</sub> )	T <sub>2</sub> (P <sub>4</sub> )	T <sub>3</sub> (P <sub>5</sub> )	T <sub>3</sub> (P <sub>9</sub> )	T <sub>4</sub> (P <sub>10</sub> )	T <sub>4</sub> (P <sub>11</sub> )	T <sub>5</sub> (P <sub>13</sub> )
Av. yield	383	656	447	356	338	324	331
Treatment	T <sub>6</sub> (P <sub>14</sub> )	T <sub>7</sub> (P <sub>16</sub> )	T <sub>7</sub> (P <sub>17</sub> )				
Av. yield	399	449	348				

C.D. = 166.6 Kg/ha.

## GROUNDNUT

(i) 933 Kg/ha. (ii) 168.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	T <sub>1</sub> (P <sub>1</sub> )	T <sub>2</sub> (P <sub>3</sub> )	T <sub>3</sub> (P <sub>6</sub> )	T <sub>7</sub> (P <sub>18</sub> )
Av. yield	857	816	1030	1029

## JOWAR

(i) 1714 Kg/ha. (ii) 170.5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>2</sub> (P <sub>3</sub> )	T <sub>3</sub> (P <sub>7</sub> )	T <sub>4</sub> (P <sub>12</sub> )	T <sub>5</sub> (P <sub>14</sub> )
Av. yield	1417	2079	1774	1584

C.D. = 229.8 Kg/ha.

64(194)

## COTTON

(i) 201 Kg/ha. (ii) 32.9 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	T <sub>1</sub> (P <sub>1</sub> )	T <sub>2</sub> (P <sub>6</sub> )	T <sub>3</sub> (P <sub>6</sub> )	T <sub>3</sub> (P <sub>9</sub> )	T <sub>4</sub> (P <sub>11</sub> )	T <sub>4</sub> (P <sub>12</sub> )	T <sub>5</sub> (P <sub>14</sub> )
Av. yield	209	258	204	157	190	184	213

Treatment	T <sub>6</sub> (P <sub>15</sub> )	T <sub>7</sub> (P <sub>17</sub> )	T <sub>7</sub> (P <sub>18</sub> )
Av. yield	207	221	166

C.D. = 42.2 Kg/ha.

## GROUNDNUT

(i) 610 Kg/ha. (ii) 145.5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	T <sub>1</sub> (P <sub>3</sub> )	T <sub>2</sub> (P <sub>3</sub> )	T <sub>3</sub> (P <sub>7</sub> )	T <sub>7</sub> (P <sub>10</sub> )
Av. yield	481	645	658	657

## JOWAR

(i) 1422 Kg/ha. (ii) 142.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>2</sub> (P <sub>4</sub> )	T <sub>3</sub> (P <sub>3</sub> )	T <sub>4</sub> (P <sub>10</sub> )	T <sub>5</sub> (P <sub>13</sub> )
Av. yield	1387	1510	1451	1341

65(51)

## COTTON

(i) 353 Kg/ha. (ii) 60.6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	T <sub>1</sub> (P <sub>2</sub> )	T <sub>2</sub> (P <sub>3</sub> )	T <sub>3</sub> (P <sub>6</sub> )	T <sub>3</sub> (P <sub>7</sub> )	T <sub>4</sub> (P <sub>10</sub> )	T <sub>4</sub> (P <sub>12</sub> )	T <sub>5</sub> (P <sub>13</sub> )
Av. yield	452	404	327	460	275	258	322

Treatment	T <sub>6</sub> (P <sub>15</sub> )	T <sub>7</sub> (P <sub>16</sub> )	T <sub>7</sub> (P <sub>18</sub> )
Av. yield	255	484	292

C.D. = 77.8 Kg/ha.

## GROUNDNUT

(i) 409 Kg/ha. (ii) 111.8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	T <sub>1</sub> (P <sub>1</sub> )	T <sub>2</sub> (P <sub>4</sub> )	T <sub>3</sub> (P <sub>3</sub> )	T <sub>7</sub> (P <sub>17</sub> )
Av. yield	314	501	453	369

## JOWAR

(i) 784 Kg/ha. (ii) 114.8 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>2</sub> (P <sub>3</sub> )	T <sub>3</sub> (P <sub>9</sub> )	T <sub>4</sub> (P <sub>11</sub> )	T <sub>5</sub> (P <sub>14</sub> )
Av. yield	666	751	883	837

C.D. = 158.2 Kg/ha.

**Crop :- Jowar, Udid, Groundnut and Cotton. (Kharif).**

**Ref :- Mh. 60(194), 61(154), 62(150), 63(222), 64(177), 65(202).**

**Site :- Agri. Res. Stn., Jalgaon.**

**Type :- 'R'.**

**Objec. :-** To find out the best rotation for Cotton and Jowar with and without Legumes.

### 1. BASAL CONDITIONS:

(i) (a) to (c) As per treatments. (ii) Deep black cotton soil. (iii) 27.6.60; 26.6.61; 9.7.62; 1.3.7.63; 27.6.64; 18.7.65. (iv) (a) Harrowing. (b) Drilling. (c) Jowar @ 3.3 Kg/ha., Udid @ 6.7 Kg/ha., Groundnut @ 67.2 Kg/ha. and Cotton @ 11.2 Kg/ha. (d) Cotton and Jowar at 46 cm. between rows, Groundnut at 30 cm. (e) 1 to 2 after thinning. (v) Nil. (vi) Jowar Farm Aispari, Udid-Local, Groundnut - Spanish Peanut, Cotton - Virnar. (vii) Unirrigated (viii) 2 to 3 weeding, 1 3 hoeing. (ix) 77 cm.; 84 cm.; 54 cm.; 51 cm.; N.A.: 41 cm. (x) Jowar: 23.11.60; 5.12.61; 10.10.62; 19.12.63; 6.12.64; 25.12.65, Groundnut: 8.10.60; 23.10.61; 30.11.62; 27.10.63; 21.10.64; 7.11.65, Udid: 17.9.60; 19.9.61; 1.10.62; 3.10.63; 8.10.64; 5.10.65 and Cotton: 4.11.60 to 13.2.60; 13.11.61 to 5.1.62; 5.11.62 to 11.12.62; 13.11.63 to 15.1.64; 30.11.64 to 29.1.65; 25.11.65 to 26.1.66.

### 2. TREATMENTS:

22 treatments of single, double and triple crops rotations.

Year	Treatment and component crop																					
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1960	Cm	C	Cm	Jm	J	Jm	J	Cm	G	C	G	Cm	G	J	G	Jm	G	J	G	Cm	J	Cm
1961	Cm	Cm	C	Jm	Jm	J	Cm	J	C	G	Cm	G	J	G	Jm	G	Cm	Cm	J	J	G	G
1962	Cm	C	Cm	Jm	J	Jm	J	Cm	G	C	G	Cm	G	J	G	Jm	J	G	Cm	G	Cm	J
1963	Cm	Cm	C	Jm	Jm	J	Cm	J	C	G	Cm	G	J	G	Jm	G	G	J	G	Cm	J	Cm
1964	Cm	C	Cm	Jm	J	Jm	J	Cm	G	C	G	Cm	G	J	G	Jm	Cm	Cm	J	J	G	G
1965	Cm	Cm	C	Jm	Jm	J	Cm	J	C	G	Cm	G	J	G	Jm	G	J	G	Cm	G	Cm	J

Note: (1) C=Cotton not manured, Cm=Cotton manure with 5.6 C.L./ha. of F.Y.M., J=(Jowar+Udid) not manured, Jm=(Jowar+Udid) manured with 5.6 C.L./ha. of F.Y.M. and G=Groundnut.

(2) Groundnut plots (whole plot size=18.0 m.×14.40 m.) were divided into two equal parts (each with size 9.10 m.×7.20 m.) and plots with suffix 1 were manured with 112 Kg/ha. of Super and plots with suffix 2 were not manured.

(3) To maintain uniformity all plots were divided into two parts of size 9.10 m.×7.20 m. and suffixed as 1 and 2.

### 3. DESIGN:

(i) R.B.D. (ii) (a) 44. (b) N.A. (iii) 6. (iv) (a) 9.10 m.×7.20 m. (b) 6.60 m.×5.40 m. (v) 125 cm.×90 cm. (vi) Yes.

### 4. GENERAL:

(i) Normal. (ii) Jowar: Short borer; Cater piller, Groundnut Boll worm; Boll worm; BHC and Sulphur dusted, Cotton: Aphids and Erka. (iii) Yield of component crops. (iv) (a) 1951—contd. (b) As per treatments. (c) Nil. (v) to (vii) No.

### 5. RESULTS:

60(194)

#### COTTON

(i) 852 Kg/ha. (ii) 158.1 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of kapas in Kg/ha.

Treatment	A <sub>1</sub>	A <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>	C <sub>1</sub>	C <sub>2</sub>	H <sub>1</sub>	H <sub>2</sub>
Av. yield	665	657	647	575	585	571	917	888
Treatment	J <sub>1</sub>	J <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>
Av. yield	988	975	1225	1163	1081	1184	747	762

C.D.=182.1 Kg/ha.

## JOWAR

(i) 1859 Kg/ha. (ii) 352.2 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of jowar in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	G <sub>1</sub>	G <sub>2</sub>
Av. yield	1972	1893	1474	1556	1964	1952	1939	2024
Treatment	N <sub>1</sub>	N <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	U <sub>1</sub>	U <sub>2</sub>
Av. yield	1880	2106	2224	2275	1792	1787	1387	1520

C.D.=405.6 Kg/ha.

## GROUNDNUT

(i) 1198 Kg/ha. (ii) 143.0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of pods in Kg/ha.

Treatment	I <sub>1</sub>	I <sub>2</sub>	K <sub>1</sub>	K <sub>2</sub>	M <sub>1</sub>	M <sub>2</sub>	O <sub>1</sub>	O <sub>2</sub>
Av. yield	1073	1061	1330	1233	1151	1181	1089	1135
Treatment	Q <sub>1</sub>	Q <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>				
Av. yield	1233	1212	1387	1294				

C.D.=166.3 Kg/ha.

## UDID

(i) 252 Kg/ha. (ii) 66.2 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of udid in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	G <sub>1</sub>	G <sub>2</sub>
Av. yield	210	249	346	306	219	218	335	341
Treatment	N <sub>1</sub>	N <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	U <sub>1</sub>	U <sub>2</sub>
Av. yield	307	292	150	134	263	249	205	204

C.D.=76.2 Kg/ha.

61(154)

## COTTON

(i) 599 Kg/ha. (ii) 100.5 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of kapas in Kg/ha.

Treatment	A <sub>1</sub>	A <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>	C <sub>1</sub>	C <sub>2</sub>	G <sub>1</sub>	G <sub>2</sub>
Av. yield	468	480	579	572	440	413	506	484
Treatment	I <sub>1</sub>	I <sub>2</sub>	K <sub>1</sub>	K <sub>2</sub>	Q <sub>1</sub>	Q <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>
Av. yield	572	512	898	845	924	837	549	508

C.D.=115.8 Kg/ha.

## JOWAR

(i) 1455 Kg/ha. (ii) 185.7 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	H <sub>1</sub>	H <sub>2</sub>
Av. yield	1456	1512	1068	911	1045	1176	1628	1654
Treatment	M <sub>1</sub>	M <sub>2</sub>	O <sub>1</sub>	O <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>
Av. yield	194	1461	1794	1726	1846	1677	1433	1502

C.D.=213.9 Kg/ha.

## GROUNDNUT

(i) 935 Kg/ha. (ii) 132.4 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of pods in Kg/ha.

Treatment	J <sub>1</sub>	J <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>
Av. yield	1035	885	901	926	1032	782	1063	971
Treatment	U <sub>1</sub>	U <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>				
Av. yield	917	960	897	852				

C.D.=154.0 Kg/ha.

## UDID

(i) 419 Kg/ha. (ii) 98.3 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *udid* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	H <sub>1</sub>	H <sub>2</sub>
Av. yield	455	492	279	333	272	335	476	485
Treatment	M <sub>1</sub>	M <sub>2</sub>	O <sub>1</sub>	O <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>
Av. yield	435	325	364	376	461	435	587	599

C.D.=113.2 Kg/ha.

62 1.0)

## COTTON

(i) 783 Kg/ha. (ii) 114.9 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	A <sub>1</sub>	A <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>	C <sub>1</sub>	C <sub>2</sub>	H <sub>1</sub>	H <sub>2</sub>
Av. yield	725	670	600	575	660	587	729	655
Treatment	J <sub>1</sub>	J <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	U <sub>1</sub>	U <sub>2</sub>
Av. yield	924	791	1142	1105	612	632	1053	1071

C.D.=132.3 Kg/ha.

## JOWAR

(i) 1663 Kg/ha. (ii) 305.2 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *jowar* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	G <sub>1</sub>	G <sub>2</sub>
Av. yield	1466	1420	1169	1180	1429	1364	1801	1617
Treatment	N <sub>1</sub>	N <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>	Q <sub>1</sub>	Q <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>
Av. yield	2054	1746	2340	2163	1511	1413	2050	1887

C.D.=351.5 Kg/ha.

## GROUNDNUT

(i) 690 Kg/ha. (ii) 90.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	I <sub>1</sub>	I <sub>2</sub>	K <sub>1</sub>	K <sub>2</sub>	O <sub>1</sub>	O <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>
Av. yield	702	725	779	718	661	618	661	670
Treatment	M <sub>1</sub>	M <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>				
Av. yield	648	650	763	685				

## UDID

(i) 243 Kg/ha. (ii) 53.0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *udid* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	G <sub>1</sub>	G <sub>2</sub>
Av. yield	294	299	190	190	205	229	292	335
Treatment	N <sub>1</sub>	N <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>	Q <sub>1</sub>	Q <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>
Av. yield	186	140	170	206	310	310	260	254

C.D.=61.0 Kg/ha.

63(222)

## COTTON

(i) 585 Kg/ha. (ii) 94.7 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	A <sub>1</sub>	A <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>	C <sub>1</sub>	C <sub>2</sub>	K <sub>1</sub>	K <sub>2</sub>
Av. yield	578	492	431	395	472	532	769	669
Treatment	T <sub>1</sub>	T <sub>2</sub>	G <sub>1</sub>	G <sub>2</sub>	I <sub>1</sub>	I <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>
Av. yield	862	885	521	544	625	607	487	494

C.D.=109.1 Kg/ha.

## JOWAR

(i) 1257 Kg/ha. (ii) 242.6 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *jowar* in Kg/ha.

Treatment	V <sub>1</sub>	V <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	H <sub>1</sub>	H <sub>2</sub>
Av. yield	1436	1361	1771	1742	775	919	1393	1577
Treatment	O <sub>1</sub>	O <sub>2</sub>	D <sub>1</sub>	D <sub>2</sub>	M <sub>1</sub>	M <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>
Av. yield	1533	1624	933	829	1248	1393	838	738

C.D.=279.4 Kg/ha.

## GROUNDNUT

(i) 569 Kg/ha. (ii) 108.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	N <sub>1</sub>	N <sub>2</sub>	J <sub>1</sub>	J <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>
Av. yield	538	451	560	545	635	617
Treatment	P <sub>1</sub>	P <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	Q <sub>1</sub>	Q <sub>2</sub>
Av. yield	609	583	592	560	578	566

## UDJD

(i) 260 Kg/ha. (ii) 86.9 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *udid* in Kg/ha.

Treatment	V <sub>1</sub>	V <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	D <sub>1</sub>	D <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>
Av. yield	376	441	255	278	340	260	297	208
Treatment	M <sub>1</sub>	M <sub>2</sub>	H <sub>1</sub>	H <sub>2</sub>	O <sub>1</sub>	O <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>
Av. yield	154	188	280	252	230	156	207	241

C.D.=100.1 Kg/ha.

64(177)

## COTTON

(i) 399 Kg/ha. (ii) 102.2 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	A <sub>1</sub>	A <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>	C <sub>1</sub>	C <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>
Av. yield	431	306	291	247	406	305	441	396
Treatment	J <sub>1</sub>	J <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	Q <sub>1</sub>	Q <sub>2</sub>	H <sub>1</sub>	H <sub>2</sub>
Av. yield	525	407	384	309	530	513	480	407

C.D.=117.7 Kg/ha.

## JOWAR

(i) 1324 Kg/ha. (ii) 241.7 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *jowar* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	G <sub>1</sub>	G <sub>2</sub>
Av. yield	1390	1357	920	863	1169	1124	1191	1522
Treatment	N <sub>1</sub>	N <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>
Av. yield	1466	1289	1724	1604	1774	1604	1094	1101

C.D.=278.4 Kg/ha.



## GROUNDNUT

(i) 583 Kg/ha. (ii) 101.8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	K <sub>1</sub>	K <sub>2</sub>	O <sub>1</sub>	O <sub>2</sub>	U <sub>1</sub>	U <sub>2</sub>
Av. yield	553	627	612	648	584	573
Treatment	M <sub>1</sub>	M <sub>2</sub>	I <sub>1</sub>	I <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>
Av. yield	539	578	571	593	566	548

## UDID

(i) 255 Kg/ha. (ii) 87.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *udid* in Kg/ha.

Treatment	P <sub>1</sub>	P <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	N <sub>1</sub>	N <sub>2</sub>
Av. yield	267	213	236	290	233	238	301	231
Treatment	T <sub>1</sub>	T <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>	D <sub>1</sub>	D <sub>2</sub>	G <sub>1</sub>	G <sub>2</sub>
Av. yield	294	301	274	236	258	233	236	245

65(202)

## COTTON

(i) 508 Kg/ha. (ii) 62.4 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Treatment	A <sub>1</sub>	A <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>	C <sub>1</sub>	C <sub>2</sub>	G <sub>1</sub>	G <sub>2</sub>
Av. yield	308	333	444	425	395	374	460	492
Treatment	I <sub>1</sub>	I <sub>2</sub>	K <sub>1</sub>	K <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>
Av. yield	609	575	669	695	510	476	705	665

C.D.=71.9 Kg/ha.

## JOWAR

(i) 1134 Kg/ha. (ii) 217.6 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *jowar* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	H <sub>1</sub>	H <sub>2</sub>
Av. yield	1211	1280	1302	1148	908	796	1263	1234
Treatment	M <sub>1</sub>	M <sub>2</sub>	O <sub>1</sub>	O <sub>2</sub>	Q <sub>1</sub>	Q <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>
Av. yield	1195	1227	1373	1261	1016	1103	997	821

C.D.=250.6 Kg/ha.

## GROUNDNUT

(i) 172 Kg/ha. (ii) 47.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

Treatment	J <sub>1</sub>	J <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	N <sub>1</sub>	N <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>
Av. yield	161	159	178	177	184	176	216	180
Treatment	R <sub>1</sub>	R <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>				
Av. yield	178	164	140	149				

## UDID

(i) 174 Kg/ha. (ii) 4.0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *udid* in Kg/ha.

Treatment	D <sub>1</sub>	D <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	H <sub>1</sub>	H <sub>2</sub>
Av. yield	260	178	267	233	172	163	147	145
Treatment	M <sub>1</sub>	M <sub>2</sub>	O <sub>1</sub>	O <sub>2</sub>	Q <sub>1</sub>	Q <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>
Av. yield	93	83	188	95	247	222	145	152

C.D.=73.7 Kg/ha.

**Crop :- Gram-Jowar-  
Linseed-Safflower (Rabi).**

**Ref :- Mh. 60(51), 61(208), 62(202),  
63(251), 64(295), 65(100).**

**Site :- Agri. Res. Stn., Mohol.**

**Type :- 'R'**

Object :- To fix up a suitable crop rotation in Rabi season for the tract.

### 1. BASAL CONDITIONS:

(i) (a) to (c) As per treatments. (ii) Medium black. (iii) 9.10.60 ; 6.10.61 ; 4.10.62 ; 20.9.63 ; 1st week of Oct., 64 ; 7.10.65. (iv) (a) 4-5 harrowings. (b) Drilling. (c) Gram @ 53.6 Kg/ha., Jowar @ 4.5 Kg/ha., Linseed @ 11.2 Kg/ha. and Safflower @ 8-9 Kg/ha. (d) Jowar and Safflower 46 cm between rows, Linseed and Gram 30 cm between rows. (e) . (v) 12 CL/ha. of F.Y.M. broadcasted before sowing during 61, 63 and 65. (vi) Gram-Local, Jowar-M-35-1, Linseed-M-10 and Safflower-N-630. (vii) Unirrigated. (viii) Interculturing, hoeing and weeding. (ix) 5 cm. ; 11 cm. ; 6 cm. ; 6 cm. ; 11 cm. ; 5 cm. (x) 8.2.61 ; 24.2.62 ; 12.2.63 (Gram) and 27.2.63 (other crops) ; 8.2.64 ; II week of Feb., 65 ; 17.2.66 (Gram) and 9.3.66 (other crops).

### 2. TREATMENTS:

16 treatments of two crop - rotations of Gram, Jowar, Linseed and Safflower.

Year	Treatments															
	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>
1960	G	J	L	S	G	J	L	S	G	J	L	S	G	J	L	S
1961	G	G	G	G	J	J	J	J	L	L	L	L	S	S	S	S
1962	G	J	L	S	G	J	L	S	G	J	L	S	G	J	L	S
1963	G	G	G	G	J	J	J	J	L	L	L	L	S	S	S	S
1964	G	J	L	S	G	J	L	S	G	J	L	S	G	J	L	S
1965	G	G	G	G	J	J	J	J	L	L	L	L	S	S	S	S

G= Gram, J=Jowar, L=Linseed and S=Safflower.

### 3. DESIGN:

(i) R E D. (ii) (a) 16. (b) 40.24 m. x 40.24 m. (iii) 2. (iv) (a) and (b) 10.06 m. x 10.06 m. (v) Nil. (vi) Yes.

### 4. GENERAL:

(i) Normal for others and Germination was poor in 65. (ii) Aphids ; Jassids and Sugary disease ; Nil (other years). (iii) Yield of grain and seeds. (iv) (a) 1955-contd. (b) As per treatments. (c) No. (v) to (vi) No. (vii) Linseed and Safflower crops failed in 65.

### 5. RESULTS:

60(51)

#### Gram

(i) 672 Kg/ha. (ii) 119.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>5</sub>	T <sub>9</sub>	T <sub>13</sub>
Av. yield.	644	623	762	654

#### Jowar

(i) 447 Kg/ha. (ii) 208.9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>2</sub>	T <sub>6</sub>	T <sub>10</sub>	T <sub>14</sub>
Av. yield	409	588	192	600

#### Linseed

(i) 326 Kg/ha. (ii) 96.2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	T <sub>3</sub>	T <sub>7</sub>	T <sub>11</sub>	T <sub>15</sub>
Av. yield	353	327	286	338

## Safflower

(i) 238 Kg/ha. (ii) 88.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	T <sub>4</sub>	T <sub>8</sub>	T <sub>12</sub>	T <sub>16</sub>
Av. yield	280	229	198	247

61(208)

## Gram

(i) 646 Kg/ha. (ii) 124.1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Av. yield	604	832	622	527

## Jowar

(i) 515 Kg/ha. (ii) 263.6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. yield	764	303	385	608

## Linseed

(i) 296 Kg/ha. (ii) 79.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	T <sub>9</sub>	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>
Av. yield	371	311	177	326

## Safflower

(i) 123 Kg/ha. (ii) 53.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>
Av. yield	171	100	130	90

62(202)

## Gram

(i) 510 Kg/ha. (ii) 77.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>5</sub>	T <sub>9</sub>	T <sub>13</sub>
Av. yield	435	573	488	545

## Jowar

(i) 292 Kg/ha. (ii) 144.1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>2</sub>	T <sub>6</sub>	T <sub>10</sub>	T <sub>14</sub>
Av. yield	328	414	264	161

## Linseed

(i) 260 Kg/ha. (ii) 72.9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	T <sub>3</sub>	T <sub>7</sub>	T <sub>11</sub>	T <sub>15</sub>
Av. yield	342	228	240	232

## Safflower

(i) 257 Kg/ha. (ii) 80.8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	T <sub>4</sub>	T <sub>8</sub>	T <sub>12</sub>	T <sub>16</sub>
Av. yield	326	241	302	160

63(251)

## Gram

(i) 410 Kg/ha. (ii) 47.2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Av. yield	331	415	376	519

## Jowar

(i) 827 Kg/ha. (ii) 92.5 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>
Av. yield	1101	582	750	875

C.D. = 294.3 Kg/ha.

## Linseed

(i) 299 Kg/ha. (ii) 51.8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	T <sub>9</sub>	T <sub>10</sub>	T <sub>11</sub>	T <sub>12</sub>
Av. yield	358	324	177	337

## Safflower

(i) 127 Kg/ha. (ii) 137.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	T <sub>13</sub>	T <sub>14</sub>	T <sub>15</sub>	T <sub>16</sub>
Av. yield	205	25	228	50

64(205)

## Gram

(i) 388 Kg/ha. (ii) 39.4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>5</sub>	T <sub>9</sub>	T <sub>13</sub>
Av. yield	311	472	410	357

## Jowar

(i) 430 Kg/ha. (ii) 102.5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>2</sub>	T <sub>6</sub>	T <sub>10</sub>	T <sub>14</sub>
Av. yield	580	426	398	316

## Linseed

(i) 170 Kg/ha. (ii) 20.8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	T <sub>3</sub>	T <sub>7</sub>	T <sub>11</sub>	T <sub>15</sub>
Av. yield	219	178	137	143

## Safflower

(i) 173 Kg/ha. (ii) 43.4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	T <sub>4</sub>	T <sub>8</sub>	T <sub>12</sub>	T <sub>16</sub>
Av. yield	164	230	182	115

65(100)

## Gram

(i) 225 Kg/ha. (ii) 19.01 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>4</sub>	T <sub>3</sub>	T <sub>4</sub>
Av. yield	339	252	309	282

## Jowar

(i) 769 Kg/ha. (ii) 75.9 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Av. yield	630	1063	605	778

C.D.=241.5 Kg/ha.

Crop :- Linseed, Wheat (*Rabi*).

Ref :- Mh. 63(165), 64(137), 65(227).

Site :- Agri. College Farm, Nagpur.

Type :- 'R'.

Object :—To study the effect of Linseed crop growing continuous and in rotation on the fertility of the soil.

## 1. BASAL CONDITIONS:

(i) (a) Nil in 63 ; As per treatments. (b) Wheat in 63 ; As per treatments. (c) Nil in 63 ; As per treatments in other years. (ii) Black cotton soil. (iii) Linseed 19.10.63 ; 20.10.64 ; 10.10.65, Wheat 4.11.63 ; 20.10.64 ; 11.10.65. (iv) (a) Ploughing ; Ploughing and 3 harrowings ; Harrowing. (b) Drilling. (c) 16.8 Kg/ha. and 44.8 Kg/ha. for Linseed and Wheat respectively. (d) 30 cm. (e) 3-4. (v) Nil. (vi) Linseed : C-4-29, Wheat : Hy-65. (vii) Unirrigated. (viii) Weeding. (ix) 11.8 cm. ; 3.6 cm. ; 1.8 cm. (x) 21.2.64 ; 15.2.65 ; 28.1.66 to 9.2.66.

## 2. TREATMENTS :

## Crop rotations

Year	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>	T <sub>7</sub>	T <sub>8</sub>	T <sub>9</sub>	T <sub>10</sub>
1963	L	W	Lm	Wm	L	W	Lm	W	L	Wm
1964	L	W	Lm	Wm	W	L	W	Lm	Wm	L
1965	L	W	Lm	Wm	L	W	Lm	W	L	Wm

Note : (1) L =Linseed unmanured, W=Wheat unmanured, Lm=Linseed manured and Wm=Wheat manured.

(2) 22.4 Kg/ha. of N as A/S+22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super was applied to the manurial plots.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) 30 50 m. × 20.72 m. (iii) 6. (iv) (a) 10.36 m. × 6.10 m. (b) 9.14 m. × 4.88 m. (v) 61 cm all round. (vi) Yes.

## 4. GENERAL :

(i) Satisfactory ; Normal ; Satisfactory. (ii) Nil. (iii) Yield of grain and seeds. (iv) (a) 1963—66. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) 1963 being the first year of expt. both the crops were analysed with only two treatments, viz. manured and unmanured. From 64, onwards crop rotations were taken into consideration.

## 5. RESULTS :

63(165)

## Linseed

(i) 375 Kg/ha. (ii) 98.6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>2</sub>
Av. yield	368	381

## Wheat

(i) 630 Kg/ha. (ii) 170.9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>3</sub>	T <sub>4</sub>
Av. yield	634	625

64(137)

## Linseed

(i) 455 Kg/ha. (ii) 87.2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>3</sub>	T <sub>6</sub>	T <sub>8</sub>	T <sub>10</sub>
Av. yield	428	445	499	456	448

## Wheat

(i) 459 Kg/ha. (ii) 82.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T <sub>2</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>7</sub>	T <sub>9</sub>
Av. yield	490	454	409	407	533

65(227)

## Linseed

(i) 181 Kg/ha. (ii) 64.1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seeds in Kg/ha.

Treatment	T <sub>1</sub>	T <sub>3</sub>	T <sub>5</sub>	T <sub>7</sub>	T <sub>9</sub>
Av. yield	166	166	170	225	178

## Wheat

(i) 386 Kg/ha. (ii) 97.2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of wheat grain in Kg/ha.

Treatment	T <sub>2</sub>	T <sub>4</sub>	T <sub>6</sub>	T <sub>8</sub>	T <sub>10</sub>
Av. yield	325	392	441	407	368

**Crop :- Turmeric (Kharif).****Ref :- Mh. 64(64), 65(85).****Site :- Turmeric Res. Stn., Tasgaon.****Type :- 'R'.**

Object :- To evolve a suitable rotation for Turmeric crop.

## 1. BASAL CONDITIONS :

(i) (a) As per treatments. (b) Wheat ; As per treatments. (c) 44.8 Kg/ha. of N + 33.6 Kg/ha. of P<sub>2</sub>O<sub>5</sub> + 22400 Kg/ha. of F.Y.M. (ii) Medium black soil. (iii) 7.6.64 ; 10.5.65. (iv) (a) Ploughing with iron plough, harrowing. (b) Dibbling mother setts on broad ridge. (c) 2000 Kg/ha. (d) 30 cm × 30 cm. (e) One. (v) Nil. (vi) Rajapuri. (vii) Irrigated. (viii) Nil ; Weeding. (x) 75 cm. ; 61 cm. (x) 24.2.65 ; 19.2.66

## 2. TREATMENTS :

Crop-rotation treatments : T<sub>1</sub>=Turmeric-Turmeric, T<sub>2</sub>=Turmeric - Paddy and Gram, T<sub>3</sub>=Paddy and Gram-Turmeric, T<sub>4</sub>=Turmeric-Groundnut and Wheat, T<sub>5</sub>=Groundnut and Wheat-Turmeric, T<sub>6</sub>=Jowar-Turmeric, T<sub>7</sub>=Turmeric-Jowar, T<sub>8</sub>=Chillies-Turmeric and T<sub>9</sub>=Turmeric-Chillies.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 7.62 m × 7.32m. (b) 6.10 m × 6.10 m. (v) 76 cm × 61 cm. (vi) Yes.

## 4. GENERAL :

(i) Nil ; Not satisfactory. (ii) N.A. (iii) Yield of Turmeric. (iv) (a) 1964-67. (b) Yes. (c) Nil. (v) to (vii) No

## 5. RESULTS:

64(64)

## Turmeric

(i) 2279 Kg/ha. (ii) 1010.59 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of Turmeric in Kg/ha.

T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>
2452	2224	2291	2049	2371

## Gram

(i) 1303 Kg/ha.

## Paddy

(i) 710 Kg/ha.

## Wheat

(i) 2723 Kg/ha.

## Groundnut

(i) 1204 Kg/ha.

## Jowar

(i) 4972 Kg/ha.

## Chillies

(i) 881 Kg/ha.

65(85)

## Turmeric

(i) 9802 Kg/ha. (ii) 3001.75 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of Turmeric in Kg/ha.

T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>
6349	8768	12094	8936	12866

## Paddy

(i) 640 Kg/ha.

## Gram

(i) 1948 Kg/ha.

## Groundnut

(i) 4837 Kg/ha.

## Wheat

(i) 3897 Kg/ha.

## Jowar

(i) 8465 Kg/ha.

## Chillies

(i) 1237 Kg/ha.





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