NATIONAL INDEX

OF

AGRICULTURAL
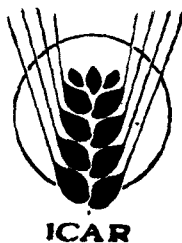
FIELD

EXPERIMENTS

VOL. 5 PART 3

KERALA

1960 - 65

ICAR

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.

B. K. SONI

Deputy Director General (AS)

NEW DELHI,

January 1, 1973.

Indian Council of Agricultural Research

PREFACE

The present set of volumes forms 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 volumes 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 contains 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 1965, the results of individual experiments have been presented

The work under the scheme was carried out at the Institute of Agricultural Research Statistics. Collection of data from different research stations, their scrutiny and preliminary analysis were carried out in successive periods under the charges of Shri T.P. Abraham, Assistant Statistical Adviser, now Joint Director, Central Statistical Organisation ; Dr. B.N. Tyagi, Senior Statistician, now Joint Director of Agriculture (Statistics), Uttar Pradesh and Shri M.G. Sardana, Senior Statistician, now Officer-on-Special Duty, Central Statististical Organisation. Shri O.P. Kathuria, Junior Statistician, now Statistician in Indian Agricultural Research Institute was also associated.

Preparation of material for inclusion in the third series of compendia volumes and their printing was carried out under the guidance of Shri K.S. Krishnan, Senior Statistician. Shri R.K. Khosla and Shri P.N. Soni, Junior Statisticians, were responsible for the actual working of the scheme till October 1973 and thereafter respectively.

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. The tabulation of the large volume of data involved was facilitated by the assistance rendered by the staff of the computer centre located at the Institute. S/Shri P.P. Rao, M.P. Saksena, M.L. Sahni, S.L. Garg, R.K. Jain, H.C. Jain, G.V.S.R. Krishna, J.K Kapoor, D.P. Singh, Mahender Singh, Kuldip Singh and S.S. Kutaula, statistical staff of the Institute deserve special mention for the careful andpainstaking work in the analysis of data, combination of results of similar experiments and proof reading of the compendia volumes.

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,

January 1, 1974

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	1.	Shri P. Govinda Rao, Head of the Agri. Res. Instt.
		2.	Shri G. V. S. R. Krishna	2.	Shri S. Vittal Rao, H. Q. Dy. Director (Research)
		3.	Shri P. R. Yeri		
2.	Assam (Shillong)	1.	Shri A. Sinha	1.	Shri U. C. Borah, Research Officer (Stat.)
		2.	Shri K. D. Saha		
3.	Bihar (Sabour)	1.	Shri R. K. Jain	1.	Shri G. P. Singh, Statistician
		2.	Shri S. M. G. Saran		
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	1.	Shri A. G. Khare, Dy. Director of Agriculture (Stat.)
		2.	Shri S. S. Kutaula		
7.	Maharashtra (Poona)	1.	Shri P. R. Yeri	1.	Shri V. G. Sharma, Sr. Statistician
		2.	Shri B. Ramakrishnan	2.	Shri G. C. Shaligram, Dy. Statistician
				3.	Shri D. T. Sawant, Asstt. Statistician
8	Mysore (Bangalore)	1.	Shri K. A. Balakrishnan	1.	Dr. N. P. Patil, Director of Research
		2.	Shri P. T. N. Nambiar		
9.	Orissa (Bhubaneswar)	1.	Shri Rama Rao Patil	1.	Shri B. Mishra, Dy. Director of Agri. (Hq.)
				2.	Shri A. Mishra, Chief Statistician

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

ABBREVIATIONS COMMON TO EXPERIMENTS ON ANNUAL AND PERENNIAL CROPS AND EXPERIMENTS ON CULTIVATORS' 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 cultivators' fields, whether under an Indian Council of Agricultural Research scheme or by the State Government, the abbreviation (c. f.) is given along with the site or centre as, for example, Cuttack (c. f.).

Type :—Abbreviations used against this item are one, or more than one, of the following :
C— Cultural ; D—Control of Diseases and Pests ; I—Irrigational ; M—Manurial ; R—Rotational ; V—Varietal and X—Mixed cropping 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 topographphy 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 cultivators' 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 cultivators' 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 occurances 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 occurances such as heavy rains, frost, storm, drought, etc. (viii) Any other important information.

C. For experiments on cultivators' 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 occurances such as heavy rains, drought, etc. (viii) Any other important information.

GLOSSARY OF VERNACULAR NAMES OF CROPS

Sl. No.	Name of Crop	Botanical Name	Assamese	Bengali	Oriya	Telugu	Tamil	Malayalam	Kannada	Marathi	Gujarati	Hindi	Punjabi
1	Paddy	*Oryza sativa* L.	Dhan	Dhan	Dhano	Vadlu, Biyyamu	Nel	Nellu	Bhatta	Bhat	Dangar	Dhan, Chawal	Chaul, Dhan
2	Red gram	*Cajanus cajan Milsp Cajanus indicus sprengl*	Arhar	Arhar	Harad	Kandulu	Thuvaral	Thuvara Payaru	Thogari	Tur	Tuver	Arhar	Harhar Arhar
3	Black gram	*Phoseaolus mungo Var. radiatus Linn*	Matimah	Mashkalai	Biri	Minumulu	Uzhundu	Uzhunnu	Uddu	Udid	Adad Udad	Urd	Mash, Urd
4	Cowpea	*Vigna Catiang walp, Vigna sinensis Savi*	Lasaramah	Barbati	Baragadi	Bobbarlu	Thatapay-aru	Mambayar	Alasande	Chavli	Chola, Choli	Lobia	Lobia
5	Bhindi	*Hibiscus esculentus ; Abelmoschus esculentus Moench*	Bhendi	Dhenrosh	Vendi	Benda	Bendai kai	Venda	Bende kayi	Bhendi	Bhida ; Bhinda	Bhindi	Bhindi ; Tori
6	Sweet Potato	*Ipomoea batatas Lam*	Mitha aloo	Mistihalu	Kanda-mula	Chilagada-dumpa	Seeni Kilangu	Cheeni Kizangu	Genasu	Ratalu	Shakaria	Shakar-Kandi	Shakar-kandi
7	Tapioca	*Manihot utilissima ; Manihot esculenta Crantz*	Simolu Aloo	Shimulalu	—	Karra Pendalamu	Maravalli Kizhangu, Kuchi Kizhangu	Mara-cheeni	Maragen-asu	Tapioca	—	Tapioca	Tapioca
8	Sugarcane	*Saccharum officinarum* L.	Kuhiar	Akh	—	Cheruku	Karumbu	Karimbu	Kabbu	Oos	Sherdi	Ganna ; Kamad ; Naishakar	Kamad ; Ganna ; Eakh
9	Tobacco	*Nicotiana tobacum* L.	Dhopat	Tamak	Uanpatra	Pogaku	Pugayilai	Pukayila	Hoge soppu	Tambaku	Tamaku	Tambaku	Tamaku, Tambaku
10	Groundnut	*Arachis hypogaea* L.	China Badam	Cheena badam	China-badam	Nelashanga, Verusenaga	Nilakadalai	Nilakka-dala	Kadale kayi	Bhuimug	Bhoising ; Magafali	Mungph ali	Mungfali
11	Gingelly (Sesamum)	*Sesamum indicum* L. *Sesamum orientale* L.	Til	Til	Rasi	Nuvvulu	Ellu	Ellu	Yellu	Til, Tili	Tal	Til	Til
12	Pepper	*Piper nigrum* L.	Jaluk	Golmarich	Golmarich	Miriyalu	Milagh	Kuru mulaku	Kare menasu	Miri	Mari	Kali mirach	Kali mirach
13	Ginger	*Zingiber Officinale Rosc.*	Ada	Ada	Ada	Allam	Inji	Inchi	Shunti ; Alla	Ale	Adu	Adrakh	Adrak

Sl. No.	Name of Crop	Botanical Name	Assamese	Bengali	Oriya	Telugu	Tamil	Malayalam	Kannada	Marathi	Gujarati	Hindi	Punjabi
14	Vanilla	—	Vanilla	Vanilla	Vanilla	Vanilla	Vanilla	Vanilia	Vanilla	Vanilla	Vanilla	Vanilla	Vanilla
15	Vettiver	—	—	—	—	Vettiveru	Vettiver	Vettiver	Vettiver	—	—	—	—
16	Eucalyptus	—	Eucalyp-tus	Eucalyp-tus	Eucalyp-tus	Eucalyp-tus	Eucalyp-tus	Eucalyp-tus	Eucalyp-tus	Eucalyp-tus	Eucalyp-tus	Eucalyp-tus	Eucalyp-tus
17	Banana	*Musa paradisiaca* L.	Kol	Paka kala	Kadali	Arati	Vazhaipa-zam	Vazha	Bale	Kale	Kela	Kela	Kela
18	Pineapple	*Ananas sativa* Sechtt. ; *Ananas comosus* Merr.	Matikathal	Anarash	Sapuri, Saphrd. Panasa	Anasa	Annasi palam	Kaitha chakka	Ananas	Ananas	Anenas	Ananas	Ananas
19	Coffee	*Coffeaarabical*	Coffe	Kafi	Kofi	Coffee	Kappi	Coffe	Kafi	Kafi	Kafi	Coffee	Kofi
20	Rubber	*Hevea braziliensis*	Rubber	Rabar	Rubber	Rubbaru	Rubber	Rubber	Rabbaru	Rabar	Rabbar	Rubber	—
21	Coconut	*Cocos nucifera* L.	Narikol	Narikel	Nadia	Tenkaya ; Kobbari	Thengai	Thengu	Thengina kayi	Naral	Nalieri	Narial	Naryal, Narel

(xiv)

CONTENTS

KERALA

(Salient features of experimentation)

The general information regarding the agro-climatic regions, extent of irrigation. normal cropping pattern etc. of the state of Kerala is available in the volumes of the first and second series of the N.I.F.E. already published for the periods of 1948—53 and 1954—59 respectively.

This volume includes the results of 612 experiments conducted during the period 1960-65, as against 402 experiments for the period 1954-59 and 238 for the period 1948-53. Besides, results of experiments conducted under the All India Co-ordinated Agronomic Experiments scheme of I.C.A.R. are also included in the present compendium. The consolidated results of experiments conducted for more than one year and concluded during the period 1960-65, numbering 246 and forming 93 groups, have been presented with crop-wise type-wise distribution in Table 1 below :

TABLE : 1

(Distribution of groups of experiments concluded during the period 1960-65 crop-wise and type-wise)

Type \ Crop	M	MV	C	CV	CM	D	Total
Paddy	49(128)	6(15)	11(33)	1(3)	2(4)	7(19)	76(202)
Sweet Potato	1(3)	—	—	—	—	—	1(3)
Tapioca	—	—	—	—	3(7)	—	3(7)
Sugarcane	2(5)	—	—	—	—	—	2(5)
Tobacco	3(8)	—	1(2)	—	—	—	4(10)
Ginger	2(5)	—	2(5)	—	1(3)	2(6)	7(19)
TOTAL	57(149)	6(15)	14(40)	1(3)	6(14)	9(25)	93(246)

N.B. : Figures in brackets indicate total number of experiments in the groups.

The results of experiments conducted for only one year during the period under report and also those of the experiments which were continued beyond 1965, numbering 158 and 208 respectively, have also been presented. The distribution of all the experiments according to crop and type of treatments is given in Table 2 below :

TABLE : 2

(Distribution of experiments crop-wise and type-wise)

Type \ Crop	M	MV	C	CV	CM	I	IC	IM	ICM	D	X	Total
Paddy	227	34	48	4	11	10	—	9	1	41	—	385
Pulses	—	—	3	—	—	—	—	—	—	—	—	3
Vegetables	3	—	4	—	7	—	—	—	—	2	—	16
Sugarcane	7	—	—	—	—	—	—	—	—	—	—	7
Tobacco	8	—	2	—	3	—	—	—	—	—	—	13
Groundnut	2	—	3	—	—	—	—	—	—	—	—	5
Gingelly	1	—	3	—	—	—	—	—	—	—	—	4
Spices	16	—	33	1	3	—	—	—	—	6	—	59
Lemongrass	4	—	11	—	1	—	—	—	—	—	—	16
Venilla	2	—	9	—	—	—	4	—	—	—	—	15
Vettiver	3	—	7	—	—	—	—	—	—	—	—	10
Banana	10	—	3	—	3	—	—	—	—	—	—	16
Pineapple	4	—	—	—	2	—	—	—	—	—	—	6
Eucalyptus	2	—	3	—	—	—	—	—	—	—	—	5
Coffee	10	—	2	—	—	—	—	—	—	—	—	12
Rubber	14	—	—	—	—	—	—	—	—	—	—	14
Coconut	18	—	7	—	—	—	—	—	—	—	—	25
X-type	—	—	—	—	—	—	—	—	—	—	1	1
TOTAL	331	34	138	5	30	10	4	9	1	49	1	612

Out of the total experiments reported for the period 1960-65, 63% were conducted on Paddy crop, about 17% on spices like Pepper and Ginger and medicinal plants like Eucalyptus, Vanilla and Vettiver, about 12% on perennial crops like Banana, Coffee, Rubber and Coconut and remaining on cash, vegetable and pulse crops.

Manurial and manurial-cum-varietal experiments accounted for about 59·6% of the total number of experiments while cultural and cultural-cum-varietal trials accounted for about 23·4% Experiments with irrigational treatments and those with pesticides and fungicides accounted for about 4% and 8% respectively.

The salient features of experimentation on the important crops are as follows :

Paddy :—Paddy is the most important crop of the state. It covered about 45% of the total cropped area of the state (i.e. 1121 thousand hectares out of 2489 thousand hectares of total cropped area). Out of total of 612 experiments conducted as many as 385 were on paddy. Of these 59% were of purely manurial type.

About 65% of experiments on paddy were conducted under rainfed conditions. Varieties like PTB-20. PTB-2, PTB-23 and VR-19 were mostly used under rainfed conditions while PTB-32, PTB-10 and PTB-12 were the important varieties used under irrigated conditions.

Randomised Block Design was commonly adopted for experimentation. Out of 285 experiments laid out in R.B.D., 56 contained 2 or more factors among the treatments. Split-plot design and confounded designs were adopted in the case of 61 and 36 experiments respectively.

44 of the experiments laid out in different designs had 2 to 3 replicates while 244 had 4 to 5 replications. The experiments with 6 to 8 replications numbered 97. The size of net-plot varied from 6 Sq. meters to 81 Sq. meters. Several experiments with N, P_2O_5 and K_2O fertilizers have been conducted and the levels of N tried ranged upto 67 Kg/ha. while those of P_2O_5 and K_2O extended upto 50 Kg/ha. Results of experiments conducted to find out the effect of split application of N, various sources of N, P_2O_5 and K_2O, different levels of lime for correcting the acidity in the soils, micronutrients, several bulky organic manures etc. have been included in this volume.

Besides the above, results of experiments with different cultural practices like interculturing, methods of sowing/planting, plant spacings, seed rates, irrigational practices and of those to control the pests and diseases, have been included in the present volume.

Spices :—Pepper and Ginger are the main spice crops on which 59 experiments have been reported. In all 22 experiments were reported on Pepper crop. Of these as many as 19 were with cultural treatments such as number of diggings round the vines, pruning of vines, number of vines per standard etc. Experiments were conducted both under irrigated and rainfed conditions. All the 17 experiments reported on Ginger crop were conducted under rainfed conditions. Most of these were of manurial type and cultural type.

Fruit crops : –47 experiments were reported on fruit crops like Banana (16), Pineapple (6) and Coconut (25). About 67% of the experiments were of manurial type, 21% of cultural type and the remaining of cultural-cum-manurial type.

Levels of N and P_2O_5 tried in different experiments on Banana extended upto 72 Kg/ha. while that of K_2O ranged upto 142 Kg/ha. Maximum levels of N, P_2O_5 and K_2O tried in the experiments were 160, 80 and 320 Kg/ha. respectively on Pineapple, and 0·5 Kg/tree 0·38 Kg/tree and 1·4 Kg/tree respectively on Coconut. Results of experiments with different dates of planting, spacings between and within plants, size of suckers on Banana and those with varying number of diggings, intercultivation operations etc. in case of Coconut are included in the present volume.

PARTICULARS OF RESEARCH STATIONS AND SOIL ANALYSIS

1. Central Horticultural Research Station/Agricultural Research Station, Ambalavayal.

A. General information :

(i) In S. Wynad taluka of Calicut district, 100 km. from Calicut Rly. Stn. with Lat.-11·4°N, Long.-76·3° E./Alt.-1005 m. The farm is of 112 ha. in extent of which nearly 22 ha. is plain ground. The remaining area is covered by 4 small hills of 91 m. to 122 m. height. (ii) It represents hilly tract and it is rich in humus. (iii) Established in 1947. (iv) Perennial crops. (v) Research work on fruits, spices and essential oils is being undertaken.

B. Normal Rainfall :

Jan.		Feb.		March		April		May		June		
1	2	1	2	1	2	1	2	1	2	1	2	
0.2	0.3	0.4	2.8	2.0	2.4	4.5	6.5	5.5	12.9	12.0	15.1	

July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
47.8	25.5	24.9	17.2	9.8	8.4	7.6	19.0	5.6	1.7	3.3	0.6	236.0

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

C. Irrigation and Drainage Facilities :

(i) No irrigation facilities are available. (ii) There is no problem of drainage. There is only lack of water.

D. Soil type and Soil analysis :

(i) Depth—1·22 m. to 1·83 m. ; Colour—Light red ; Structure—Laterite. (ii) Chemical analysis : N.A. (iii) Mechanical analysis : Clay—16·0% ; Fine sand—50·0% ; Silt—8·9% ; and coarse sand—25·1%.

E. No. of Experiments :

Paddy—5, Ginger—4, Vanila—15, Banana—1, Eucalyptus—5 : Total-30.

2. Agronomic Research Station, Chalakudi.

A. General Information :

(i) In Mukundapuram taluka of Trichur district. The field is situated about 4 km. from Chalakudy Rly. Stn. on the Chalakudy-Sholayar route and about 1½ km. away and interior to the above route. The area is predominantly sandy loam and in some pockets it has red lateritic soil. (ii) It represents plain tract. (iii) Established in May, 1962. (iv) Paddy—paddy—pulses of green manure. (v) Agronomic research in irrigated areas.

B. Normal Rainfall :

Jan.	Feb.	March	April	May	June	
2·0	—	—	7·1	32·9	96·0	

July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
105·3	24·0	23·9	42·8	27·4	1·3	362·7

(The period on which the figures are based, is June, 1961 to May 1967).

Plantation crops : Experiments on plantation crops included Rubber and Coffee crops numbering 14 and 12 respectively. Most of these experiments were of manurial type.

The levels of N tried in the experiments on Coffee varied from 45 to 220 Kg/ha. while those of P_2O_5 and K_2O ranged from 30 to 150 Kg/ha. and 40 to 220 Kg/ha. respectively.

In the case of experiments conducted on Rubber, levels of N ranged from 0 to 67 Kg/ha. and those of P_2O_5 and K_2O from 0 to 89 Kg/ha.

C. Irrigation and Drainage Facilities :

(i) (a) and (b) : Irrigation with Chalakudy irrigation project from the inception of the station. (ii) Proper drainage system exists.

D. Soil type and Soil analysis :

(i) Depth—Shallow ; Colour—Ash colour ; Sructure—coarse. (ii) Chemical analysis and (iii) Mechanical analysis : N.A.

E. No. of Experiments :

Paddy—8 ; Total=8.

3. Agronomic Research Station, Coyalmannam.

A. General Information :

(i) In Alathur taluka of Palghat district. The experimental area is situated in more or less uniform and level area with facilities for controlling the inflow and outflow of water. (ii) Sandy loam tract of Palghat district.   (iii) Established in 1963.   (iv) Paddy—Paddy. (v) Research includes studies on water requirement of paddy, increased fertilizer application, cropping pattern for the area and yardsticks for estimating increased production due to improved agricultural practices.

B. Normal Rainfall :

Jan.	Feb.	March	April	May	June	
—	–	3.2	12.0	8.1	27.6	
July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
32.1	47.2	34.7	42.4	31.9	7.5	246.7

(Av. monthly rainfall in cm. based on the data for the period 1964-66)

C. Irrigation and Drainage Facilities :

(i) (a) Irrigation facilities are available. (b) N.A.   (ii) No proper drainage system exists.

D. Soil type and Soil analysis :

(i) Depth—Shallow : Colour—Brown. (ii) Chemical analysis in % : Moisture—0.78 ; Total N—0.0734 ; Acid soluble silica—2.7 ; Total P_2O_5—0.068 ; Total K_2O—0.221 ; Total CaO—0.0668 : Fe_2O_3 —8.0 and Organic carbon—0.427 ; pH.—5.2. (iii) Mechanical analysis in % : Coarse sand—37.80 ; Fine sand—35.80 ; Silt—6.0 and Clay—12.0%.

E. No. of Experiments :

Paddy—12 : Total=12.

4. Integrated Seed Development Farm/Oilseed Research Station, Eruthempathy.

A. General Information :

(i) In Palghat district, nearest Rly. Stn. is Palghat situated at an altitude 274 m. The general topography of the experimental area is plain. (ii) N.A. (iii) Established in 1964. (iv) Groundnut, Cotton, Sugarcane, Paddy. (v) Nil.

B. Normal Rainfall :

Information—N.A.

C. Irrigation and Drainage Facilities :

(i) (a) Irrigation facilities are available but not adequate. (b) By tanks, 4 in number. (ii) No, but the necessity is limited to an area of 5 ha. only.

D. Soil type and Soil analysis :

(i) Red loam and Black cotton soil. (ii) Chemical analysis in % ; Organic carbon 7·35 ; P_2O_5—1·2 to 17·8 (Low) ; K_2O—9·6 to 14·4 (Medium) and pH.—7·0 to 10. (iii) Mechanical analysis : N.A.

E. No of Experiments :

Gingelly—2, Groundnut—5 ; Total=7.

5. Coffee Demonstration Farm, Kalpetta.

A. General Information :

(i) Kozhikode district, nereast Rly. Stn. is Kozhikode with Lat. between 11°30′ N —11°35′ N/Long. between 76°E-76°-5′ E. (ii) It represents typical Coffee tract. (iii) Established in 1958. (iv) Planted with Coffee Arabica and Robusta. (v) Field trials on promising Coffee varieties and agronomic and plant protection practices.

B. Normal Rainfall :

Total Annual rainfall : 250 cm. to 330 cm. Details-N.A.

C. Irrigation and Drainage Facilities :

(i) No irrigation facilities. (ii) Soils are well drained.

D. Soil type and Soil analysis :

(i) Soil type—Lateritic with loam ; Depth—6·1 to 7·6 m. (ii) Chemical analysis :—Available N—Medium ; P_2O_5—Low ; K_2O—Medium. (iii) Mechanical analysis :—N.A.

E. No. of Experiments :

Coffee—10 ; Total=10.

6. Tobacco Research Station, Kanhangad.

A. General Information :

(i) In Hosdurg taluka of Cannanore district, with Lat.-12·5°N/Long.-76°E/Alt.-Sea level. The topography of the experimental area is plain. (ii) It represents sea coastal tract. (iii) Established in 1959. (iv) May to Sept.—Paddy crop ; Nov. to March—Tobacco crop. (v) The cultural, manurial and varietal types of experimental research were done.

B. Normal Rainfall :

Total annual rainfall is about 305 cm.

C. Irrigation and Drainage Facilities :

(i) Ponds are dug out and hand pot watering done. (ii) No drainage system.

D. Soil type and Soil analysis :

(i) Depth—2·44 to 3·05 m. ; Colour—White ; Structure—Sandy. (ii) Chemical analysis : N.A. (iii) Mechanical analysis : Top soil—Coarse sand 64% ; Fine sand 28% ; Silt—4%, Clay 4%. Sub-soil—Coarse sand 75% ; Fine sand 19% ; Silt 1% : Clay 6%.

E. No. of Experiments :

Tobacco—13 ; Total=13.

7. Regional Rice Research Station, Kayamkulam.

A. General Information :

(i) In Karthikappally taluka of Alleppey district, 1 Km. from Kayamkulam Rly. Stn. with Lat.-9·8°N/Long.-76·3°E/Alt.-3 m. Levelled topography. (ii) It represents tract of sandy and sandy loam soils. (iii) Year of establishment N.A. (iv) Two paddy crops and one sesamum. (v) Breeding work on rice, manurial trials and pesticidal trials.

B. Normal Rainfall :

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
—	—	—	1.7	41.6	44.4	20.9	30.2	20.2	9.2	13.8	22.8	204.8

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

C. Irrigation and Drainage Facilities :

(i) Irrigational facilities—N.A. (ii) A canal exists, but it dose not provide adequate drainage facility.

D. Soil type and Soil analysis :

(i) Broad soil type : Sandy loam. (ii) Chemical analysis : Available Nitrogen 0·1% (low), Available Phosphorus ·20% (medium) ; Available Potash ·80% (low) ; pH. Value 5·9 (normal) ; Total soluble salts 0·2% (normal). (iii) Mechanical analysis : N.A.

E. No. of experiments :

Paddy—83 ; Total=83.

8. Oil Seeds Research Station, Kayamkulam.

A. General Information :

(i) and (ii) Same as Regional Rice Research Station, Kayamkulam. (iii) Established in 1957. (iv) Paddy—paddy—sesamum. (v) Breeding of improved varieties for higher yield, resistant to diseases and pests and organic experiments to find out the most economic cultural and manurial practices.

B. Normal Rainfall and C. Irrigation and Drainage Facilities :

Same as Regional Rice Research Station, Kayamkulam.

D. Soil type and Soil analysis :

(i) Soil types—Sandy loam, (ii) Chemical analysis : Available N 0·10% (low), Available P_2O_5 0·20% (medium), Available K_2O—0·80% (low), pH. 5·0 (normal). (iii) Mechanical analysis : N.A.

E. No. of Experiments :

Gingelly—2 ; Total=2.

9. Rice Research Station, Kottarakara.

A. General Information :

(i) In Kottarakara taluka of Quilon district. 3 km. from South Kottarakara Rly. Sly. with Lat.-8° 12′ N./Long-77° E./Alt.-45 m. Terraced land. (ii) Middle Laterite Region tract. (iii) Established in 1959. (iv) Double cropping. (a) April-May to July-August (Autumn). (b) August-Sept. to November-December, (Winter). (v) Research and Multiplication of improved varieties.

B. Normal Rainfall :

Information—N.A.

C. *Irrigation and Drainage Facilities :*

   (i) Irrigation facilities—N.A.   (ii) There is proper drainage system.

D. *Soil type and Soil analysis :*

   (i) Depth—1·83 m., Colour-Red lateritic, Structure-Loam.   (ii) Chemical analysis and (iii) Mechanical analysis : Information—N.A.

E. *No. of Experiments :*

   Paddy—24 ; Total=24.

10. Rubber Research Institute of India, Kottayam.

A. *General Information :*

		Malankara estate Malankara	Manikkal Estate Mundakkayam	Pudukad Estate Palapilly	Vaikundam Estate Kulasekharam
(i)	District	Idikki	Kottayam	Trichur	Kanyakumari (Tamil Nadu)
	Nearest Railway Station	Alwaye	Kottayam	Pudukad	Trivandrum
	Topography	Moderately undulating	Undulating	Moderately undulating	Undulating

   (ii) Type of tract (Kottayam, Ernakulam and Trichur Part) Kanyakumari Tract.

   (iii) Established in   1956   1956   1956   1956

   (iv) Cropping pottern   (Rubber Plantation)

   (v) Programme of research.   To study the optimum levels of Nitrogen, Phosphorus and Potassium for Rubber (Hevea brasiliensis).

   Observations :—Latex yield, annual girth increment and bark renewal.

B. *Normal Rainfall :*

   (Av. annual   282. 3 cm.   221.0 cm.   247.7 cm.   171.9 cm.
   rainfall)

C. *Irrigation and Drainage Facilities :*

   (i) and (ii) N.A.   (Rubber is grown purely as a rainfed crop)

D. *Soil type and soil analysis .*

(i)	Broad soil type	Laterite loam	Laterite soil	Laterite clay	Lateritic gravelley loam

   (ii) Chemical analysis :

	Malankara	Manikkal	Pudukad	Vaikundam
Nitrogen—	0.162%	0.148%	N.A.	0·111%
Phosphorus—	0.13 mg./ 100 gm. soil	2·33 mg./ 100 gm .soil	2.30 mg./ 100 gm. soil	0.73 mg./100gm. soil
Potassium—	15.75 mg.	10.22 mg.	4.71 mg.	14.00 mg.

   (iii) Mechanical analysis : N.A.

E. *Number of Experiments :*

   Rubber—14 ; Total=14.

11. Regional Coconut Research Station, Kumarakom.

A. *General Information* :

(i) In Kottayam taluka of Kottayam district, 110 Km. from Kottayam Rly. Stn. Consists of lands alternated by channels. (ii) It represents the backwater area of Kuttanad. (iii) Established in 1958. (iv) Perennial coconut palms alone were cultivated on single row lands and double row lands. (v) Research on the Agronomical and other aspects of cultivation of coconut palms.

B. *Normal Rainfall* :

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
2.7	—	4.5	4.5	39.0	47.5	28.9	24.2	17.4	4.0	9.0	18.8	200.5

(Av. monthly rainfall in cm. based on the data for the year 1965)

C. *Irrigation and Drainage Facilities* :

(i) No irrigations are done as the water level is only 0.6 m to 0.9 m. below soil level.

(ii) Channels act as drainage.

D. *Soil type and Soil analysis* :

(i) Broad Soil type : Clayey, Depth—1.2 m., Colour—Black,

(ii) Chemical analysis : pH.—5.2, Loss on ignition—0.2%, CaO.—0.009%, P_2O_5—0.009%, K_2O—0.004%.

(iii) Machanical analysis : N.A.

E. *No. of Experiments* :

Coconut—18 ; Total=18.

12. Banana Research Station, Mannuthy/Banana & Pineapple Research Station, Kannara/Banana Research Station. Trichur.

A. *General Information* :

(i) In Trichur taluka of Trichur district, 22.7 Km. from Trichur Rly. Stn. with Lat.—10° N./Long.-76° E./Alt.-90 m. The topography of the experimental area is slightly sloping terraced land. (ii) Irrigated law land tract. (iii) Established in 1962. (iv) Experiments on Banana and Pineapple repeated in site. (v) To evolve improved varieties and fix up improved cultural and manurial practices for banana and pineapple.

B. *Normal Rainfall* :

Jan.		Feb.		March		April		May		June		July	
1	2	1	2	1	2	1	2	1	2	1	2	1	2
—	—	—	—	0.4	0.2	1.1	1.7	1.9	6.3	9.8	3.8	10.7	7.8

Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	
7.0	5.4	5.5	4·2	2.5	6.0	2.4	0.8	1.3	0.4	79.9

(Av. fortnightly rainfall in cm. based on the data for the period 1964-65).

C. *Irrigation and Drainage Facilities* :

(i) Lift irrigation from river. (ii) Drainage provided.

D. *Soil type and Soil analysis* :

(i) Soil type-Black loam, Colour-Gray, Structure-Loamy.

(ii) Chemical analysis :

	Organic Carbon %	Av. P_2O_5 in Kg/ha.	Av. K_2O in Kg/ha.	pH.
Top soil	0.38	20	72	5.7
Subsoil	25	24	72	6.2

(ii) Machanical analysis : N.A.

E. *No. of Experiments* :

Pineapple—6, Banana—15 ; Total=21.

13. Regional Rice Research Station, Mannuthy.

A. General Information :

(i) In Trichur taluka of Trichur district with Lat.-10.5° N./Long.-76.2°E./Alt.-20.5 m. The lands are situated at slightly higher level than the usual double crop lands. Two crops are being raised at present with the help of irrigation from the Peechi irrigation system. (ii) It represents central portion of the middle lateritic belt. (iii) Established in 1957. (iv) The normal cropping pattern consists of raising a medium duration first crop which is usually sown by broadcast followed by a transplanted medium duration second crop. Season :—First crop :—April-August ; IInd crop :—Sept.-January. (v) To evolve improved varieties of rice suitable for cultivation in the central portion of the middle lateritic region of Kerala with special reference to high yield, resistance to lodging and pests and diseases. (2) To fix up optimum manurial and cultural schedules for the rice crop of this tract.

B. Normal Rainfall :

Jan.		Feb.		March		April		May		June		July	
1	2	1	2	1	2	1	2	1	2	1	2	1	2
—	0.3	0.7	1.6	0.2	1.9	1.9	3.3	9.1	25.6	31.3	24.9	46.6	39.1

Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	
28.1	15.8	15.0	12.1	16.5	18.1	9.3	2.6	3.9	0.3	308.2

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

C. Irrigation and Drainage Facilities·:

(i) (a) & (b) Irrigation water is available from Peechi. Irrigation system from July to Dec. ; Since 1954. (ii) Yes. (Floods occur sometimes during the south-west monsoon season.)

D. Soil type and Soil analysis :

(i) Broad soil type : N.A.. Depth-30 to 45 cm., Colour-Reddish brown. (ii) Chemical analysis : Available N-0.65% (medium), available P_2O_5-29.0 Kg./ha. (medium), available K_2O-41.6 Kg./ha. (Low), pH. 5.3, T.S.S. conductivity mm. hos./cm. 0.2 (Normal). (iii) Mechanical analysis : (Analysed in 1964 at the depth of 22 cm.). Coarse sand-41.7%, Find sand-12.2%, Silt-5.2%, Clay-40.1%.

E. No. of Experiments :

Paddy—83 ; Total=83.

14. Tuber Research Station, Mannuthy.

A. General Information :

(i) and (ii) Same as Regional Rice Research Station, Mannuthy. (iii) Year of establishment, N.A. ; since 1963 under I C.A.R. (iv) Sweet Potato and Tapioca are the main crops. (v) Agronomic experiments on tuber crops.

B. Normal Rainfall and C. Irrigation and Drainage Facilities :

Same as Regional Rice Station, Mannuthy.

D. Soil type and Soil analysis :

Information—N.A.

E. No. of Experiments :

Sweet Potato—7, Tapioca—2 ; Total=9.

15. Regional Rice Research Station, Moncompu.

A. General Information :

(i) In Kuttanad taluka of Alleppey district, 16 Km. from Changanachery Rly. Stn. with Lat-90° N./Long.-76° E./Alt.-1·8 m.It is Coastal area and the fields are in uniformly levelled condition. (ii) Low lying paddy area of Kuttanad tract. (iii) Established in 1940. (iv) One

crop of paddy raised during the second crop season (Aug.-Sept. to Feb.-March). (v) Evolving varieties suitable to the tract (Breeding) and finding out solutions to the various problems related to Rice culture of the tract. (Agronomical, Entomological and Pathological).

B. *Normal Rainfall :*

Jan.		Feb		March		April		May		June	
1	2	1	2	1	2	1	2	1	2	1	2
1·5	0·3	1·8	2·5	0·6	2·2	3·8	5·9	6·7	20·1	28·2	19·3

July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
40·3	25·2	23·4	13·9	20·4	15·3	13·8	14·6	10·5	3·1	4·3	0·1	277 8

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

C. *Irrigation and Drainage Facilities :*

(i) (a) and (b) Irrigrtion is made possible by canals. (ii) There is a proper drainage system.

D. *Soil type and Soil analysis :*

(i) Broad soil types : Alluvial clay soil., Depth—Deep, Colour—Greyish Black, Structure—Continuous structure. (ii) Chemical analysis : Organic Carbon-0·97%, available P_2O_5-2·2 Kg/ha., available K_2O-44·8 Kg/ha., pH.-4·5. (iii) Mechanical analysis : Clay 57·8%, Silt-22·0%, Fine sand-17·4%, Sand-2·5%.

E. *No. of Experiments :*

Paddy—22 ; Total=22.

16. Regional Coconut Research Station, Neyyattinkara.

A. *General Information :*

(i) In Neyyattinkara taluka of Trivandrum district, 18 Km. from Trivandrum Central Rly. Stn. with Lat.-Between 8° and 9° N./Long-77° E./Alt.-92 M. The entire area is not in one level, therefore the area is terraced. The soil is deep red loam. Water table is very low. (ii) Deep red loamy soil tract. (iii) Established in 1963. (iv) The crop of the station is coconut only and the normal cropping pattern consists of giving a general digging of the soil once in a year with the onset of the south-west monsoon. The application of fertilizers is generally in circular trenches taken round the tree about 1·5 m. from the base of the tree which is also done along with digging. (v) The programme of work in the station consists of conducting manurial and cultural and inter-cropping experiments to solve problems confronting the coconut cultivation of region.

B. *Normal Rainfall :*

188 cm. in 1971. Details-N.A.

C. *Irrigation and Drainage Facilities :*

(i) No irrigation facilities are available at present. (ii) As the entire area has been well terraced and divided into plots and no rain water from outside the area is divided into the plots, no separate drainage system is required.

D. *Soil type and Soil analysis* :

(i) Broad soil types—Loamy ; Depth—1·5 m., Colour—Red. (ii) Chemical analysis.

Laboratory number.	Organic Carbon %	Available P$_2$O$_5$	Available K$_2$O	pH	TSS	Bag No.
	L	L	L	N	N	I B I
5906	0·17	4	20	5·9	0·1	I B I A Block
5907	L	L	L	N	N	
	0·23	4	20	5·9	0·1	2 B 2 ,,
5908	L	L	L	N	N	
	0·23	4	12	5·7	0·1	3 B 4 ,,
5909	L	L	L	N	N	
	0·20	6	Tr.	5·8	0·1	4 B 4 ,,
5910	L	L	L	N	N	
	0·31	6	20	5·8	0·1	5 B 5 ,,
5911	L	L	L	N	N	
	0·22	10	16	5·9	0·1	6 B 6 ,,
5912	L	L	L	N	N	
	0·22	6	24	5·9	0·1	7 B 1 B Block.
5913	L	L	L	N	N	
	0·20	6	Tr.	5·9	0·1	8 B 2 ,,
5914	L	L	L	N	N	
	0·22	10	25	5·9	0·1	9 R 3 ,,

Rating of Organic Carbon relates to Nitrogen. L=low ; M=Medium ; N=Normal, Tr.=Traces.

(iii) Mechanical analysis : N.A.

No. of Experiments :

Coconut—3 ; Total=3.

17. Lemongrass Research Station, Odakkali.

A. *General Information* :

(i) In Kunnathumad taluka of Ernakulam dist., 27 Km. from Alwaye Rly .Stn. at an altitude of 66 m. The station is situated on the Alwaye—Hunnar Road. Almost all the area is cultivable except a few rocky patches. The land is not levelled.   (ii) The station is in the middle tract of Kerala state in between the coastal area and the hilly tract.   (iii) Established in 1951.   (iv) Usually there is no rotation of crops.   (v) Programme of research is to existing cultivated variety by replacing it with high yielding and also exploring the possibilities of raising other essential oil crops like Citranella, Eucalyptus, Mantha, vettiver etc.

B. *Normal Rainfall* :

Jan.		Feb.		March		April		May		June		July	
1	2	1	2	1	– 2	1	2	1	2	1	2	1	2
1·3	—	0·3	2·3	0·7	0·7	7·1	7·3	12·3	23·9	21·9	26·3	48·1	27·0

Aug.		Sept		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	
27·7	18·2	14·9	19·5	17·0	30·6	9·6	1·3	7·8	1·2	333·3

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

C. *Irrigation and Drainage Facilities* :

(i) (a) & (b) : Irrigation is done from well from 1962. (ii) Yes ; proper drainage system exists.

D. *Soil type and Soil analysis* :

(i) Broad soil types : Depth– 0·91 to 1·83 m. ; Colour—Red ; Structure—Loam. (ii) Chemical analysis : Organic carbon—0·50 ; Available P$_2$O$_5$—trace ; Available K$_2$O—13·4 Kg/ha. ; pH.—5·1 ; Total soluble salts—0·1. (iii) Mechanical analysis : N.A.

E. *No. of Experiments* :

Lemon grass—16, Vettiver—8 ; Total=24.

18. Central Rice Research Station/Agricultural Research Station, Pattambi.

A. General Information :

(i) In Ottappalam taluka of Palghat district, 1 Km. from Pattambi Rly. Stn. with Lat.-10°-4′ N./Long.—76°-12′ E./Alt. 25·4 m. The experimental area comprised of Palliyal lands where only one crop of paddy is cultivated, double crop paddy lands where two crops of paddy are raised and in some areas a third crop over and above the two crops is raised (ii) It represents Lateritic loam tract. (iii) Established in 1927. (iv) In Palliyal lands only one crop of paddy is raised in the rainy season from June to Sept. This is followed by a green manure crop. In the double crop lands, two crops of paddy are raised. A portion of the land will be put under pulses after the harvest of second crop. In a small area a third crop of paddy is also raised from Feb. to April (v) (a) To evolve improved varieties of paddy suitable for all tracts of Kerala with special reference to high yield, response to high manuring, resistance to pests, diseases and lodging. (b) Agronomic trials to fix up optimum manurial and cultural schedules. (c) Plant protection trials to control various diseases, pests and weeds in paddy crop.

B. Normal Rainfall :

Jan.		Feb.		March		April		May		June	
1	2	1	2	1	2	1	2	1	2	1	2
—	––	0.1	1.4	0.1	2.5	2.6	5.0	6.7	24.5	27.9	27.8

July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
44.5	31.3	28.1	15.2	12,5	14.9	9.3	16.3	9.0	3.1	3.5	1.3	287.6

(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 available to a limited extent from tanks for the third crop. Irrigation facilities available from the beginning of the farm in 1927. (ii) There is proper drainage system.

D. Soil type and Soil analysis :

(i) Depth —Shallow soils, Colour—Red, Structure—Lateritic loam. (ii) Chemical analysis :

	Wet Land %	Dry Land %		Wet Land %	Dry Land %
Moisture	2.32	2.17	K_2O	0.210	0.292
Organic matter	10.06	9.35	Phosphoric acid	0.269	0.407
Sand	57.40	58.40	Sulphuric acid	0.046	0.050
Iron Oxide	11.52	10.73	N	0.120	0.198
Alumina	16.78	18.57	Available K_2O	0.0062	0.0113
Lime	0.081	0.018	Available P_2O_5	0.0036	0.0114
Magnesia	0.068	0.085	pH. value	7.4	7.5

(iii) Mechanical analysis :

Moisture	2.33	2.17	Silt—	7.6	7.34
Fine gravel and sand	11.07	10.48	Fine silt—	20.32	21.08
Coarse sand	18.44	13 25	Clay—	22.40	29.80

E. No. of Experiments :

Paddy—121 ; Total=121.

19. Agricultural Research Station, Pillicode.

A. General Information:

(i) In Hosdrug taluka of Cannanore district, 2.4 Km. from Nileshwar Rly. Stn. with Lat.-11° 15′ N./Long.-75° 10′ E./Alt. 8.23 m. Well laidout levelled plots with even fertility gradient. The plots boundering the eastern portion is inunduated during south-west monsoon, which is drained out by a net work of drainage channels. (ii) Red sandy loam in the coastal tract of Northern Kerala (Malabar area). (iii) Established in 1916. (iv) Coconut-subsidiary crops raised annually in non experimental plots. (v) Coconut improvement by breeding and selection and formulation of improved agronomic practices for coconut cultivation by field experiments.

B. Normal Rainfall :

	Jan.		Feb.		March		April		May		June	
	1	1	1	2	1	2	1	2	1	2	1	2
	0.8	0.2	—	0.1	0.6	0.6	1.1	2.1	3.3	34.6	42.0	45.6

July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
54.6	59.4	40 1	29.1	15.4	18.1	7.9	14.4	6.9	1.5	6.2	0.5	374.8

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

C. Irrigation and Drainage Facilities :

(i) (a) and (b) Facilities exist to irrigate a portion of the farm. (ii) Open drains.

D. Soil type and Soil analysis :

(i) Depth—3.5 to 4 m., Colour—Red, Structure—Loose porous soil. (ii) Chemical analysis : Moisture : 0.6% to 1.11% ; Loss on ignition : 1.74% to 3.00% ; Insolubles : 80.1% to 98.1% ; Lime : 0.02% to 0.06% : Potash : 0.12% to 0.75% ; Total P_2O_5 : 0.43% to 0.92% ; total Nitrogen : 0.029% to 0.049% : pH. : 5.5 to 6.4. (iii) Mechanical analysis : N.A.

E. No. of Experiments :

Coconut—4 ; Total=4.

20 Pulse Research Station, Sasthamcottah.

A. General Information to D. Soil type and Soil analysis :

Information : N.A.

E. No. of Experiments :

Red gram—1, Black gram—1, Cow pea—1, Mixed Cropping—1 : Total=4.

21. Agricultural Research Station, Taliparamba.

A. General Information :

(i) In Taliparamba taluka of Cannanore district, 17 Km. from Pappinisseri Rly. Stn. with Lat.—12.2° N./Long.—74.50° E./Alt.—45 M. The experimental area is undulated and situated in slightly slopy areas in some cases and levelled land in other cases. Where the land is slopy, terracing of the land has been done. (ii) Red laterite tract of the sub-mountain region of

Canannore district and is representative of the conditions of West Coast. (iii) Established in 1905. (iv) Perennial crops like Mango, Jack, Coconut, Pepper, Cocoa, Nutmeg, Calve. Cinnanu etc. and seasonal crops like Pineapple, Banana, Chillies, vegetables,Paddy, Gingelly, Horsegram etc. are grown. Paddy is grown during the South-West monsoon season. Chillies and vegetables are grown both in the South-West monsoon season and as irrigated crop in summer season as well. (v) Research work on the following aspects of fruit crops are undertaken. (1) Root-stock trials on mango. (2) Hybridization work on Mango and selection of hybrids. (3) Jack root stock trial. (4) Sapota rootstock trials.

B. Normal Rainfall :

Jan.		Feb.		March		April		May		June	
1	2	1	2	1	2	1	2	1	2	1	2
0.2	0.1	—	0.1	0.1	0.1	2.1	2.4	8.7	29.5	33.3	31.2

July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
56.6	51.2	42.6	29.9	11.6	18.9	8.7	13.7	8.2	1.4	3.3	0.7	354.6

(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 for wet land from the inception of the farm from a river. The young plants and nurseries are irrigated by means of wells. (ii) There are drainage channels provided in the areas where ever necessary.

D. Soil type and Soil analysis :

(i) Depth—1.8 to 2.7 m., Colour—Red, Structure—Gravelly in most areas and sandy loam in wet land. (ii) Chemical analysis and (iii) Mechanical analysis : N.A

E. No. of Experiments :

Paddy—1 : Total=1.

22, Pepper Research Station, Taliparamba.

A. General Information :

(i) In Taleparamba taluka of Cannanore district, 23 Km. from Pappinissery Rly. Stn. with Lat.—12.2˚ N./Long.—between 74.5˚ E. and 77˚-22′ E./Alt.—30.5m. The topography is lateritic hill tops with undulating slopes. (ii) Partially hilly. (iii) Established in Dec., 1949. (iv) Only the perennial crop Pepper is cultivated in the station. The rooted cuttings of pepper vine are planted to the standards of Ery-thrina Indica. After a period of three years growth the planted cuttings may start to bear fruit. The longivity of the vine may extend from 15 to 30 years. (v) The scheme is proposed to investigate the botanical and agronomical aspects of the pepper crop with a view to improve its cultivation in Kerala State.

B. Normal Rainfall :

Same as Agriculture Research Station, Taliparamba.

C. Irrigation and Drainage Facilities :

(i) (a) and (b) : No irrigation facilities are available. Pepper is a rainfed crop. (ii) Proper drainage system exists.

D. *Soil type and Soil analysis* :

(i) Broad soil types : Laterite ; Depth—61 cm. to 122 cm. ; Colour—Red ; Structure—Well drained sandy loam. (ii) Chemical analysis : Total Calcium CaO. 0.145%, Total Potash (K_2O) 3.392%, Available K_2O 0.0145%, Total Phosphoric acid (P_2O_5) 0.215%, Available P_2O_5 0.0145%. N 0.321%. (iii) Mechanical analysis : Moisture 6.23%, Clay 68.16%, Silt 6.29%, Fine sand 7.99%, Coarse sand 12.71%, Loss on ignition 20.82.

E. *No. of Experiments* :

Pepper—9 ; Total=9.

23. Sugarcane Research Station, Thiruvalla.

A. *General Information* :

(i) In Alleppey district, 8 Km. from Tiruvalla Rly. Stn. with Lat.—9° N./Long.—76° E./ Alt.-3 m. The general topography of the experimental area is even. (ii) It represents Laterite loam tract. (iii) Established in 1956. (iv) Sugarcane after sugarcane (two cane crops—fallow—sugarcane).

B. *Normal Rainfall* :

Jan.		Feb.		March		April		May		June	
1	2	1	2	1	2	1	2	1	2	1	2
2.1	0.5	2.7	4.2	1.5	4.7	7.0	8.3	11.0	23.6	25.6	19.0

July		Aug.		Sept.		Oct.		Nov.		Dec.		Total
1	2	1	2	1	2	1	2	1	2	1	2	
39.5	27.0	32.5	17.4	20.3	13.4	13.5	18.8	15.7	5.9	0.6	—	315.1

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

C. *Irrigation and Drainage Facilities* :

(i) (a) Irrigation during summer months since 1956. (b) Electric pump set for pumping water from river Manimala. (ii) No proper drainage system.

D. *Soil type and Soil analysis* :

(i) Soil type—Laterite Loam, Colour—Reddish Brown, Depth—Deep. (ii) Chemical analysis : Total N 0.126%, P_2O_5 0.163%, K_2O 0.163%, Humus 0.38%, CaO 0.42%, pH. 6.4. (iii) Mechanical analysis : N.A.

E. *No. of Experiments* :

Sugarcane—7 ; Total=7.

24. Tapioca Research Station, Thiruvala.

A. *General Information* :

(i) Same as Sugarcane Research Station, Thiruvala. (ii) and (iii) N.A. (iv) Tapioca is the main crop. (v) Agronomic experiments on Tapioca.

B. *Normal Rainfall* :

Same as Sugarcane Research Station, Thiruvala,

C. *Irrigation and Drainage Facilities and* D. *Soil type and Soil analysis* :

Information : N.A.

E. *No. of Experiments* :

Tapioca—3 ; Total=3

25. Vettiver Sub-Station, Thiruvambadi,

A. *General Information* to D. *Soil type and Soil analysis* :
Information—N.A.

E. *No of Experiments* :
Vettiver—1 ; Total=1.

26. Pepper Research Station/Ginger Research Station, Thodupuzha.

A. *General Information* :

(i) In Thodupuzha taluka of Ernakulam district, 68 Km. from Alwaye Rly. Stn. with Lat.—10° N./Long.—77°E./Alt.—152.4 m. The topography is undulaing with grater portion facing south. The farm is situated on the southern slope of a hill. (ii) Hilly tract. (iii) Established in 1957. (iv) Pepper and Oil palm are perennials while Ginger is annual. (v) Botonical and Agronomic experiments on Pepper, Ginger and Oil plam.

B. *Normal Rainfall* :

Jan.	Feb.	March	April	May	June
2.2	4·3	10·6	21·0	36·0	58·9

July	Ang.	Sept.	Oct.	Nov.	Dee,	Total
87.6	61·4	50·0	48·2	20·4	6·7	363·1

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

C. *Irrigation and Drainage Facilities* :

(i) Nil. (ii) No. proper drainage system.

D. *Soil type and soil analysis* :

(i) Board soil types—Lateritic ; Depth—Varying from place to place; Colour—Red and dark ; Structure—Granular. (ii) Chemical analysis : Organic Carbon —·95 to 1·65, Available P_2O_4—2 Kg/ha. Available K_2O —28 to 48 Kg/ha; pH.—5·2 to 5·4. (iii) Mechanical analysis : N.A.

E. *No. of Experiments* :
Ginger—33, Pepper—13; Total=46.

27. Tapioca Research Station, Trivandrum.

A. *General Information* :

(i) Trivandrum district. Lat. 8° 30′ N/Long—77° E/Alt.—53·3 m· Land levelled to different terraces of width 18 to 21 m. (ii) Laterite tract. (iii) Established in 1944. (iv) Tapioca cultural and manurial aspects and chemical analysis of tapioca tubers.

B. *Normal Rainfall* :

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
2·0	1·6	3·9	11·6	22·3	11·8	20·0	12·1	11·5	27·2	17·8	6·3	144·8

(Av. monthly rainfall in cm, the period on which the data based, is not available).

C. Irrigation and Drainge Facilities :

(i) (a) Facilities not available (b) Drainage is not necessary.

D. Soil type and Soil analysis :

(i) Sandy soil to a depth of 91 to 153 cm, of pale red to reddish brown colour and loose gravelly structure. (ii) Chemical analysis (in %) : Moisture —2·84 ; Insoluble minerals—71·34 ; Total N—0·094; Total P_2O_5 —0·47; Total K_2O—0·069; CaO—0·043; Available P_2O_4—0·0003; Available K_2O—0·0004; pH.—7·0. (iii) Mechanical analysis : Sand—33·79%; Find sand— 19·97%; Clay—33·95%; Silt—8·65%; Moisture—3·06 %.

E. No. of Experiments :

Tapioca—2 ; Total==2.

28. Agricultural College & Research Institute, Vellayani.

A. General Information :

(i) In Trivandrum taluka of Trivandrum district, 13 km. from Trivandrum Central Rly. Stn. with Lat.—8° 22′ N/ Long, — 76° 57′ E./Alt.—29·9 M.   The farm is situated on a hillock surrounded on 3 sides by the Vellayani fresh water lake. (ii) Middle tract. (iii) Established in 1955. (iv) Major crop in the farm include perennial trees like Coconut, Arecanut, Jack, Rubber, Mango, fruit plants such as Sapota, Guava, Banana, Lemons, Pine-apple, , tuber crops like Tapioca, Yams, Sweets Potato.   Annuals like Cowpea, Groundnut, vegetables, and Paddy. Paddy is mainly cultivated as a third season crop in the *kayal* lands.   (v) The farm does not have any research programme. Research work is undertaken by the various divisions by the Heads of divisions concerned.

B. Normal Rainfall :

Jan.		Feb.		March		April		May		June	
1	2	1	2	1	2	1	2	1	2	1	2
2·5	1·6	0·4	2·4	0·8	0·1	3·0	7·9	9·4	18·0	18·1	16·2

July		Aug.		Sept.		Oct-		Nov.		Dec,		Total.
1	2	1	2	1	2	1	2	1	2	1	2	
11.1	10.8	10.7	5·6	7·2	5·2	5·6	19·9	10·3	6·0	1·7	5·0	179·2

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

C. Irrigation and Drainage Facilities :

(i) Proper irrigation facilities are not available at persent. However, work on rehabilitating the irrigation system is in progress. (ii) The lands have proper drainage facilities.

D. Soil type and Soil analysis :

(i) Broad Soil type—Red loam and laterite soil, Depth—Varies from 0·9 to 9·0 m., Colour —Red., Structure —Loam as well as gravelly. (ii) Chemical analysis : and (iii) Mechanical analysis : N.A.

E. No. of Experiments :

Paddy—25, Bhindi—2 ; Total=27.

EXPERIMENTAL DATA

29. Rice Research Station, Vythila

A. General Information :

(i) In Ernakulam district, nearest Rly. Stn. Ernakulam. The experimental area is submerged under water. (ii) Coastal area tract. (iii) Established in 1959. (iv) Paddy (Pokkali) one crop. (v) Research on Paddy (Pokkali).

B. Normal Rainfall :

Average monthly rainfall is 13·7 cm. (Average based on 1971-72 rainfall data).

C. Irrigation and Drainage facilities :

(i) Nil. (ii) Not adequate.

D. Soil type and Soil analysis :

(ii) Chemical analysis :—Organic Carbon 0.20 % to 1. 40 % ; Available P_2O_5 Traces to 4.4 Kg/ha. ; Available K_2O—880 Kg/ha. (iii) Mechanical analysis :—N.A.

E. No. of Experiments :

Paddy—1 ; Total=1.

Crop :- Paddy (*Kharif*).

Ref :- K. 60(2).

Site :- Central Hort. Res. Stn., Ambalavayal.

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 3363 Kg/ha. of G.M.+112 Kg/ha. of A/S. (ii) Sandy loam. (iii) N.A./5 to 7.7.1960. (iv) (a) 6 ploughings and levellings. (b) Transplanting. (c) 75 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) Nil. (vi) W.N.D-2 (late). (vii) Unirrigated. (viii) 2 weedings. (ix) 168 cm. (x) 5 to 7.12.1960.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S : $N_0=0$, $N_1=33.6$ and $N_2=67.2$ 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) 3 levels of K_2O as Mur. Pot. : $K_0=0$; $K_1=16.8$ and $K_2=33.6$ Kg/ha.
Complete dose of P_2O_5, K_2O and half dose of N applied at the time of planting, half dose of N one month after planting.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) and (b) 6.4 m.×5.1 m. (v) Nil. (vi) Yes.

4. GENERAL ;

(i) Good. (ii) Case worm attack noticed. B.H.C. 10% was dusted. (iii) Yield of grain. (iv) (a) 1960—62 (Treatments modified in 1961). (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 3049 Kg/ha. (ii) 333.6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	K_0	K_1	K_2	P_0	P_1	P_2	Mean
N_0	3114	2872	2929	2791	3021	3102	2972
N_1	3068	3091	2975	2860	3091	3183	3045
N_2	3114	3137	3137	3206	3010	3171	3129
Mean	3098	3033	3014	2952	3041	3152	3049
P_0	3160	2998	2699				
P_1	2987	3952	3183				
P_2	3148	3148	3160				

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) 2242 Kg/ha. of G.L. and 112 Kg/ha. of C/A/N for 61(1) ; 5604 Kg/ha. of G.L. +112 Kg/ha. of Super+56 Kg/ha. of A/S for 62(81). (ii) Sandy loam. (iii) N.A./24.6.1961 ; N.A./22.6.1962. (iv) (a) Ploughings and levelling. (b) Transplanting. (c) 75 Kg/ha. (d) 25 cm.×15 cm. (e) 2 to 3. (v) 4483 Kg/ha. of G.L. for 61(1) ; 5604 Kg/ha. of G.L. for 62(81). (vi) W.N.D.—2 (late) for 61(1) ; N.A. for 62(81). (vii) Unirrigated. (viii) 2 weedings. (ix) 236 cm. for 61(1); 312·3 cm. for 62(81). (x) 27.11.1961 ; 25.11.1962.

2. TREATMENTS :

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

(1) 3 levels of N : N_1=16·8 ; N_2=33·6 and N_3=50·4 Kg/ha. as A/S.
(2) 3 levels of P_2O_5 : P_1=16·8 ; P_2=33·6 and P_3=50·4 Kg/ha. as Super.
(3) 3 levels of K_2O : K_1=16·8 ; K_2=33·6 and K_3=50·4 Kg/ha. as Mur. Pot.

Full dose of P_2O_5 and K_2O and half dose of N applied at planting. Half dose of N applied one month before flowering.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) 6·4 m.×3·1 m. for 61(1) ; 6·1 m.×3·1 m. for 62(81). (b) 6·3 m.×2·9 m. for 61(1) ; 5·8 m.×2·7 m. for 62(81). (v) 8 cm.×8 cm. for 61(1) ; 15 cm.×15 cm. for 62(81). (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960—1962 (Treatments modified in 1961). (b) No. (c) Results of combined analysis for 1961 and 62 are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 3395 Kg/ha. (ii) 387·4 Kg/ha. (based on 174 d.f. made up of various components of Treatments×years interaction and pooled error). (iii) Main effect of P alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	K_1	K_2	K_3	N_1	N_2	N_3	Mean
P_1	3306	3273	3253	3304	3274	3254	3277
P_2	3498	3405	3458	3312	3406	3644	3454
P_3	3423	3385	3553	3486	3443	3432	3454
Mean	3409	3354	3421	3367	3374	3443	3395
N_1	3351	3379	3372				
N_2	3418	3281	3424				
N_3	3459	3403	3468				

C.D. for P marginal means=126·6 Kg/ha.

Crop :- Paddy (*Kharif*). **Ref :- K. 60(1).**

Site :- Central Hort. Res. Stn., Ambalavayal. **Type :- 'M'.**

Object :—To study the effect of different phosphatic fertilizers on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 3363 Kg/ha. of G.L.+112 Kg/ha. of N as A/S/N. (ii) Sandy loam. (iii) N.A./ 13 to 15.6.1960. (iv) (a) 6 ploughings and levelling. (b) Transplanting. (c) 75 Kg/ha. (d) 15 cm.×15 cm. (e) 2. (v) Nil. (vi) W.N : D—1 (late). (vii) Irrigated. (viii) 1 weeding. (ix) 161·7 cm. (x) 3 and 4.11.1960.

2. TREATMENTS :

16 manurial treatments : M_0=Control (no manure), M_1=G.L. at 8406 Kg/ha., M_2=Lime at 3363 Kg/ha., M_3=Super at 50·4 Kg/ha. of P_2O_5, M_4=Hyper phos. at 50·4 Kg/ha. of P_2O_5, M_5=B.M. at 50·4 Kg/ha. of P_2O_5, M_6=G.L. at 8406 Kg/ha.+Super at 50·4 Kg/ha. of P_2O_5, M_7=G.L. at 8406 Kg/ha. +Hyper phos. at 50·4 Kg/ha. of P_2O_5, M_8=G.L. at 8406 Kg/ha. +B.M. at 50·4 Kg/ha. of P_2O_5, M_9=Lime at 3363 Kg/ha.+Super at 50·4 Kg/ha. of P_2O_5, M_{10}=Lime at 3363 Kg/ha.+ Hyper phos. at 50·4 Kg/ha. of P_2O_5, M_{11}=Lime at 3363 Kg/ha.+B.M. at 50·4 Kg/ha. of P_2O_5, M_{12}=G.L. at 8406 Kg/ha.+lime at 3363 Kg/ha.+Super at 50·4 Kg/ha. of P_2O_5, M_{14}= G.L. at 8406 Kg/ha.+lime at 3363 Kg/ha.+Hyper phos. at 50·4 Kg/ha. of P_2O_5 and M_{15}=G.L. at 8406 Kg/ha.+lime at 3363 Kg/ha.+B.M. at 50·4 Kg/ha. of P_2O_5 applied at planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) 4·3 m. × 4·3 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Ricebug attack on a mild form was observed. BHC was dusted. (iii) Yield of grain. (iv) (a) 1958 to 60. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3956 Kg/ha. (ii) 364·4 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	M_7
Av. yield	3830	3394	3861	4266	3986	3736	3986	3986

Treatment	M_8	M_9	M_{10}	M_{11}	M_{12}	M_{13}	M_{14}	M_{15}
Av. yield	3923	3954	4110	4017	3986	4172	3986	4110

Crop :- Paddy (*Rabi*).　　　　　　　　　　**Ref :- K. 62(111).**

Site :- Central Hort. Res. Stn., Ambalavayal.　　　**Type :- 'M'.**

Object :—To find out the effect of phosphate manufactured by different processes on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 5604 Kg/ha. of G.L.+112 Kg/ha. of A/S. (ii) Sandy loam. (iii) N.A./19.1.1963. (iv) (a) 6 ploughings. (b) Transplanting. (c) 75 Kg/ha. (d) 25 cm.× 15 cm. (e) 2. (v) 5604 Kg/ha. of G.L. (vi) N.A. (vii) Unirrigated. (viii) 1 weeding was given with Japanese rotary hoe. (ix) 36 cm. (x) 17.5.1963.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 3 types of fertilizers : P_1=Super, P_2=O.D.D.A. and P_3=P.E.C.
(2) 3 levels of fertilizers : L_1=13·5 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 placement : M_1=Broadcast, M_2=6·4 cm. below the seed and M_3=Pellet application.

Fertilizers applied at planting. Pellet application was done 2 weeks after planting, N applied as A/S, whenever Super is used as P_2O_5 in the treatments.

3. DESIGN :

(i) Fact. in R.B.D. (ii) 27. (b) N.A. (iii) 2. (iv) 8·5 m.× 2·4 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962 only (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 1975 Kg/ha. (ii)) 456·8 Kg/ha. (iii) Main effect of L is highly significant and that of P is significant.
(iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	M_1	M_2	M_3	Mean
L_1	1634	1906	1542	1666	1626	1790	1694
L_2	2290	2415	2070	2367	2335	2074	2258
L_3	1910	2334	1670	2094	2110	1710	1971
Mean	1945	2218	1761	2042	2023	1858	1975
M_1	2106	2371	1650				
M_2	2082	2290	1698				
M_3	1646	1994	1934				

C.D. for L or P marginal means=313·0 Kg/ha.

Crop :- Paddy (*Rabi*).

Ref :- K. 62(48), 63(75).

Site :- Reg. Rice Res. Stn., Kayamkulam.

Type :- 'M'.

Object :— To find out the suitability of growing a green manure crop along with Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy for 62 (48) ; Nil for 63 (75). (c) 4483 Kg/ha. of C.M.+112 Kg/ha. of Super+112 Kg/ha. of A/S+56 Kg/ha. of Mur. Pot. for 62 (48) ; Nil for other. (ii) Sandy loam. (iii) 18.4.62 ; 8.4.63. (iv) (a) 2 ploughings and 1 levelling for 62 (48) ; 3 ploughings, 2 horrowings and planting for 63 (75). (b) Line sowing for 62 (48) and dibbling for other. (c) 75 Kg/ha. (d) 15 cm.×15 cm. (e) 10. (v) 112 Kg/ha. of Super+56 Kg/ha. of Mur. Pot.+56 Kg/ha. of A/S for 62 (48) ; 120 Kg/ha. of Super for other. (vi) PTB-31 (early) for 62 (48) ; PTB—23 for other. (vii) Unirrigated. (viii) 2 intercultivations and 2 weedings for 62 (48). N.A. for other. (ix) N.A. (x) 6.8.62 ; 28.7.63.

2. TREATMENTS :

5 treatments : T_1=Paddy alone, T_2=Four rows of Sesbania on the borders, T_3=Two rows of Dhaincha on the borders and T_5=Two rows of Dhaincha on the borders.

G.M. applied to the next Paddy crop.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×9·1 m. for 62 (48) ; 9·1 m.×6·1 m. for other. (b) 9·1 m.×9·1 m. for 62 (48) ; 9·1 m.×6·1 m. for other. (v) Nil for 62 (48), 63 (75). (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962-63. (b) No. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 1269 Kg/ha. (ii) 643·8 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	T_4	T_5
Av. yield	1634	1212	1584	909	1007

Crop :- Paddy (*Kharif*).　　　　　　　**Ref :- K. 64(100), 65(12).**

Site :- Rice Res. Stn., Kayamkulam.　　　　**Type :- 'M'.**

Object :— To find out the suitability of growing a G.M. crop along it with paddy for utilisingy it for the second crop.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Paddy. (c) 4942 Kg/ha. of G.M.+30 Kg/ha. of P_2O_5 as Super+15 Kg/ha. of K_2O as Pot. Sul.+30 Kg/ha. of N as A/S for 64 (100) and 50 Kg/ha. of N+36 Kg/ha. of N as P_2O_5 and K_2O for 65(12). (ii) Sandy loam, (iii) 13.4.64 ; 27.4.65. (iv) (a) 4 ploughings, levelling and harrowing for 64 (100) (b) Behind the plough. (c) N.A. (d) 15 c.n.×15 cm. (e) N.A. (v) 124 Kg/ha.of A/S+62 Kg/ha. of Mur. pot.+124 Kg/ha. of Super. (vi) PTB—23. (vii) Unirrigated. (viii) N.A. (ix) 121 cm., 108 cm. (x) N.A. for 64 (100) and 8.8.65 for 65 (12).

2. **TREATMENTS :**

   3 treatments : T_1=Paddy alone, T_2=Paddy with 4 rows of *Sesbania* on the borders and T_3=Paddy with 2 rows of *Sesbania* on the borders.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 9·1 m.×6·1·m. (v) Nil. (vi) Yes.

4. **GENERAL :**

   (i) Normal. (ii) Nil. (iii) Paddy yield. (iv) N.A. (c) Results of combined analysis are persented under—5. Results. (v) and (vi) N.A. (vii) Error variances are homogeneous ond Treatments×years interaction is present.

5. **RESULTS :**

   (i) 1832 Kg/ha. (ii) 541·0 Rg/ha. (based on 2 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	2083	1609	1803

Crop :- Paddy (*Kharif*).　　　　　　**Ref :- K. 61(3), 62(47), 63(74).**

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

Object : —To determine the optimum dose of lime for Paddy.

1. **BASAL CGNDITIONS :**

   (i) (a) Paddy-Paddy-Sesmum for 61 (3) ; Nil for others (b) Sesamum for 61 (3) ; Paddy for others. (c) N.A. for 61 (3), 63 (74) ; 4483 Kg/ha. of C.M.+112 Kg/ha. of Super+112 Kg/ha. of A/S+56 Kg/ha. of Mur. Pot. for 62 (47). (ii) Sandy loam. (iii) 10.4.61 ; 17.4.62 ; 8.4.63. (iv) 4 ploughings 2 harrowings for 61 (3) ; ploughings and harrowings for 62 (47) ; 3 ploughings, 2 harrowings, 1 ploughing for 63 (74). (b) Dibblings. (c) 75 Kg/ha. for 61 (3), 62 (47) ; 100 Kg/ha. for 63 (74). (d) 15 cm.×15 cm. (c) 7. (v) 4483 Kg/ha. of C.M.+168 Kg/ha. of Super+56 Kg/ha. of each of A/S and Mur. Pot. for 61 (3) ; 168 Kg/ha. of Super+56 Kg/ha. of Mur. Pot. and 56 Kg/ha. of A/S for 62 (47) ; 120 Kg/ha. of Super for 63 (74). (vi) PTB-23 for 61 (3), 63(74) ; PTB-31 for 62 (47). (vii) Unirrigated. (viii) 2 intercultivations, 2 weedings for 61 (3), 62 (47) ; N.A. for 63 (74). (ix) N.A. (x) 5.8.61 ; 4.8.62 ; 3.8.63.

2. **TREATMENTS :**

   5 levels of lime : L_0 =0, L_1=560, L_2=1121, L_3=1631 and L_4=2802 Kg/ha.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6·7 m.×3·1 m. for 61 (3) ; 6·1 m.×3·1 m. for 62 (47) and 63 (74). (b) 6·1 m.×2·4 m. for 61 (3) ; 6·1 m.×3·1 m. for 62 (47) and 63 (74). (v) 30 cm.×30 cm. for 61(3) ; Nil for others. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil for 61 (3), 62 (47) ; Mole cricket attack which in controlled by B.H.C. 10% spraying. (iii) Yield of grain and straw. (iv) (a) 1961-63. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Error variances are heterogeneous and Treatments × years interaction is absent. The results of individual years are presented under 5-Results.

5. RESULTS:

61(3)

(i) 2617 Kg/ha. (ii) 520·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	L_0	L_1	L_2	L_3	L_4
Av. yield	2750	2517	2425	2669	2723

62(47)

(i) 2289 Kg/ha. (ii) 245·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	L_0	L_1	L_2	L_3	L_4
Av. yield	2084	2320	2228	2271	2544

63(74)

(i) 1526 Kg/ha. (ii) 219·6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	L_0	L_1	L_2	L_3	L_4
Av. yield	1525	1582	1561	1340	1624

Crop :- Paddy *(Rabi).*   **Ref :- K. 61(4), 63(89).**

Site :- Rice Res. Stn., Kayamkulam.   **Type :- 'M'.**

Object :—To find out the optimum dose of lime for Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy—Sesamum. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 1.7.61/3.9.61 ; N.A./26.8.63. (iv) (a) 4 ploughings and 2 puddlings. (b) Transplanting. (c) 50 Kg/ha. for 61(4) and 75 Kg/ha. for 63(89). (d) 23 cm. × 15 cm. (e) 3. (v) 4483 Kg/ha. of C.M.+168 Kg/ha. of Super+56 Kg/ha. of A/S+56 Kg/ha. of Mur. Pot. for 61(4). 5000 Kg/ha. of C.M.+125 Kg/ha. of Super+60 Kg/ha. of Mur. Pot. for 63(89). (vi) U.R.—19 (late). (vii) Unirrigated. (viii) 2 weedings for 61(4). N.A. for 63(89). (ix) 90 cm. ; 99 cm. (x) 15.1.62 ; 6.1.64.

2. TREATMENTS :

5 levels of lime : L_0=0, L_1=560, L_2=1121, L_3=1681 and L_4=2802 Kg/ha.
Lime applied to soil one week before planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 6·1 m. × 3·1 m. (b) 5·5 m. × 2·4 m. (v) 30 cm. × 30 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Negligible. (iii) Yield of grain and straw. (iv) (a) 1961—63 (62 N.A.). (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 :

(i) 3593 Kg/ha. (ii) 260·8 Kg/ha. (based on 36 d.f. made up of Treatments × years interaction and pooled error.) (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	L_0	L_1	L_2	L_3	L_4
Av. yield	3414	3646	3640	3542	3721

Crop :- Paddy (*Kharif*).

Site :- Reg. Rice Res. Stn., Kayamkulam.

Ref :- K. 60(4), 61(6).

Type :- 'M'.

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

1. **BASAL CONDITIONS :**

(i) (a) Nil for 60(4) ; Paddy—Paddy—Sesamum for other. (b) Paddy for 60(4) ; Sesamum for other. (c) 4483 Kg/ha. of C.M.+56 Kg/ha. of A/S+63 Kg/ha. of Mur. Pot. for 60(4) ; N.A. for other. (ii) Sandy loam. (iii) 12.4.60 ; 12.4.61. (iv) (a) Ploughing for 60(4) ; 4 ploughings and 2 harrowings for other. (b) Dibbling. (c) 75 Kg/ha. (d) 15 cm.×15 cm. (e) 7. (v) 168 Kg/ha. of B.M.+224 Kg/ha. of wood ash for 60(4) ; $33·6$ Kg/ha. of P_2O_5 as Super+33·6 Kg/ha. of K_2O as Mur. Pot. for other. (vi) *Kochuvithu* (early). (vii) Un-irrigated. (viii) 2 intercultivations and 2 weedings. (ix) 148 cm. ; N.A. (x) 18.7.60 ; 24.7.61.

2. **TREATMENTS :**

4 levels of N : $N_0=0$, $N_1=16·8$, $N_2=33·6$ and $N_3=50·4$ Kg/ha.

N applied as A/S and C.M. through soil in 2 : 1 ratio half dose of N given as basal dressing and half one month after sowing.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4 for 60(4) ; 6 for 61(6). (iv) (a) 7·5 m.×5·9 m. for 60(4) ; 7·5 m.× 5·9 m. for 61(6). (b) 7·5 m.×5·9 m. for 60(4) ; 7·0 m.×5·5 m. for 61(6). (v) Nil for 60(4) ; 24 cm. along length for 61(6). (vi) Yes.

4. **GENERAL :**

(i) Normal for 60(4) ; Satisfactory for other. (ii) Nil. (iii) Tiller counts. height measurement and yield of grain. (iv) (a) 1958—61. (b) No. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is present. Expts. No. 58(5) and 59(7) have also been included while giving combined results.

5. **RESULTS :**

(i) 1405 Kg/ha. (ii) 228·1 Kg/ha. (based on 9 d.f. made up of Treatments×years interaction). (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	N_0	N_1	N_2	N_3
Av. yield	1286	1334	1484	1518

C.D.=155·6 Kg/ha.

Crop :- Paddy (*Kharif*).

Site :- Reg. Rice Res. Stn., Kayamkulam.

Ref :- K. 61(21), 62(45), 63(73).

Type :- 'M'.

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

1. **BASAL CONDITIONS :**

(i) (a) Paddy—Paddy—Sesamum for 61(21) ; Nil for others. (b) Sesamum for 61(21) ; Paddy for others. (c) N.A. for 61(21), 63(73) ; 4483 Kg/ha. of C.M.+112 Kg/ha. Super+112 Kg/ha. of A/S+56 Kg/ha. of Mur. Pot. for 62(45). (ii) Sandy loam. (iii) 11.4.61 ; 17.4.62 ; 9.4.63. (iv) (a) 4 ploughings, 2 harrowings for 61(21) ; Ploughing and levelling for 62(45) : 1 ploughing with iron plough, 2 ploughings with local plough, 1 planking, 2 harrowings for 63(73). (b) Dibbling. (c) 75 Kg/ha. (d) 15 cm.×15 cm. (e) 10. (v) 168 Kg/ha. of Super+56 Kg/ha. of Mur. Pot. for 61(21) ; 168 Kg/ha. of Super for 62(45) ; 120 Kg/ha. of Super for 63(73). (vi) P.T.B.—23 (early) for 61(21) and 63(73) ; P.T.B.—31 for 62(45). (vii) Unirrigated. (viii) 2 intercultivations for 61(21) ; 2 intercultivations and 2 weedings for 62(45) ; N.A. for other. (ix) N.A. (x) 8.8.61 ; 4.8.62 ; 25.7.63.

2. TREATMENTS :

All combinations of (1) and (2)

    (1) 2 levels of N : $N_1 = 36.6$ and $N_2 = 50.4$ Kg/ha.

    (2) 4 sources of N : $S_1 = A/S$, $S_2 = C.M.$. $S_3 = A/S$ and C.M. in 2 : 1 ratio and $S_4 = A/S$ and C.M. in 1 : 2 ratio.

N applied through soil, half as basal dressing and half one month after sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4 for 61(21), 3 for others. (iv) (a) 6.7 m. × 3.1 m. for 61(21) ; 4.6 m. × 4.3 m. for 62(45) ; (b) 6.1 m. × 2.4 m. for 61(21) ; 4.6 m. × 4.3 m. for 62(45) ; and (a) and (b) 6.1 m. × 3.7 m. for 63(73). (v) 30 cm. × 30 cm. for 61(21) ; Nil for others. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil for 61(21), 62(45) ; Attack of Helminthosporium for 63(73) and Fytolan sprayed. (iii) Yield of grain. (iv) (a) 1961—63. (b) No. (c) Results of combined analysis given under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

5. RESULTS :

(i) 2429 Kg/ha. (ii) 370.9 Kg/ha. (based on 63 d.f. made up of various components of Treatments × years interaction and pooled error). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	S_1	S_2	S_3	S_4	Mean
N_1	2493	2401	2363	2263	2380
N_2	2402	2491	2459	2563	2479
Mean	2448	2446	2411	2413	2429

———

Crop :- Paddy (*Kharif*).   **Ref :- K. 64(102), 65(13).**

Site :- Rice Res. Stn., Kayamkulam.   **Type :- 'M'.**

Object :—To find out the comparative efficiency of different sources of N for the first crop Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Second crop Paddy. (c) 4942 Kg/ha. of G.M.+124 Kg/ha. of Super+62 Kg/ha. of Mur. Pot.+124 Kg/ha. of A/S. (ii) Sandy loam. (iii) 13.4.64, 27.4.65. (iv) (a) 4 ploughings, levelling and harrowing. (b) Dibbling. (c) N.A. (d) 15 cm. × 15 cm. (e) N.A. (v) 124 Kg/ha. of Super+62 Kg/ha. of Mur. Pot. (vi) P.T.B.—23. (vii) Unirrigated. (viii) Intercultures. (ix) N.A. (x) 3.8.64 ; 11.8.65.

2. TREATMENTS :

5 sources to supply 44.8 Kg/ha. of N : $S_0 = 0$, $S_1 = A/S$, $S_2 = A/N$, $S_3 = C/A/N$ and $S_4 = Urea$.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 13.7 m. × 4.6 m. (iii) 4. (iv) (a) and (b) 4.6 m. × 4.6 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Yes. (iii) Yield of grain. (iv) to (vii) N.A.

5. RESULTS :

64(102)

(i) 1282 Kg/ha. (ii) 217.4 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	S_0	S_1	S_2	S_3	S_4
Av. yield	899	1545	1076	1334	1558

C.D.=334·9 Kg/ha.

65(13)

(i) 2036 Kg/ha. (ii) 251·2 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	S_4
Av. yield	1686	2224	1949	2093	2224

Crop :- Paddy (*Rabi*).   **Ref :- K. 62(114), 63(77), 64(70).**

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

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

1. **BASAL CONDITIONS:**

(i) (a) Paddy-Paddy-Sesamum for 62(114), 63(77) ; Paddy-Paddy for 64(70). (b) Paddy. (c) N.A. for 62(114) ; As per treatments for others. (ii) Sandy loam. (iii) N.A./Aug., 62 ; N.A./28.8.63 ; N.A./31.8.64. (iv) (a) 2 tractor ploughings, 2 country ploughings for 62(114); 4 to 6 ploughings for others. (b) Transplanting. (c) 50 Kg/ha. for 62 (114), 64(70) ; 75 Kg/ha. for 63(77). (d) 23 cm.×15 cm. for 62(114), 64(70) ; 15 cm.×15 cm. for 63(77). (e) 2 for 62(114) ; 7 for 63(77) ; 3 for 64(70). (v) 140 Kg/ha. of Super for 62(114) ; 125 Kg/ha. of Super for 63(77) ; 5000 Kg/ha. of C.M.+125 Kg/ha. of Super+60 Kg/ha. of Mur. Pot. for 64(70). (vi) UR-19. (vii) Unirrigated. (viii) 2 hand weedings for 62(114) ; N.A. for 63(77) 2 interculturings with Japanese hoe and 1 hand weeding for 64(70). (ix) 90 cm ; 99 cm. ; 98 cm (x) January, 63 ; 2.1.64 ; 14.1.65.

2. **TREATMENTS :**

5 sources of N at 44·8 Kg/ha. : S_0=Control (no application), S_1=A/S, S_2=A/S/N, S_3=C/A/N and S_4=Urea.

N applied through soil. half dose as basal dressing and half one month after planting.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 4·6 m.×4·6 m. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 62 to 64. (b) Yes. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

5. **RESULTS :**

(i) 2818 Kg/ha. (ii) 206·5 Kg/ha. [based on 44 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	S_0	S_1	S_2	S_3	S_4
Av. yield	2483	2978	2875	2798	2954

C.D.=170·0 Kg/ha.

Crop :- Paddy (*Rabi*).   **Ref :- K. 61(22), 62(113).**

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

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

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy-Sesamum. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 1.7.61/5.9.61 ; N.A./Aug., 62. (iv) (a) 4 ploughings and 2 puddlings. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm.×15 cm. (e) 3. (v) 168 Kg/ha. of Super+56 Kg/ha. of Mur. Pot. (vi) UR-19(late). (vii) Unirrigated. (viii) 2 weedings. (ix) 90 cm.; N.A. (x) 11.1.62 ; January, 63.

2. TREATMENTS :

All combinations of (1).and (2)
(1) 2 levels of N : $N_1=33\cdot6$ and $N_2=50\cdot4$ Kg/ha.
(2) 4 sources of N : $S_1=$A/S, $S_2=$C.M., $S_3=$A/S and C.M. in 2 : 1 ratio, $S_4=$A/S and C.M. in 1 : 2 ratio.

N applied through soil, half as basal dressing and half one month after sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4 for 61(22) and 3 for 62(113). (iv) (a) 4·6 m.×4·6 m. for 61(22) ; N.A. for 62(113). (b) 4·0 m.×4·0 m. for 61(22) ; 6·1 m.×3·7 m. for 62(113). (v) 30 cm.×30 cm. for 61(22) ; N.A. for 62(113). (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1961-62. (b) No. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments× years interaction is absent.

5. RESULTS :

(i) 3473 Kg/ha. (ii) 295·8 Kg/ha. [based on 42 d.f. made up of various components of Treatments×years interaction and pooled error]. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in Kg/ha.

	S_1	S_2	S_3	S_4	Mean
N_1	3210	3439	3436	3458	3386
N_2	3716	3502	3515	3511	3561
Mean	3463	3470	3476	3484	3473

C.D. for N marginal means=159·6 Kg/ha.

Crop :- Paddy (*Rabi*).   **Ref :- K. 61(7), 62(70), 63(80).**

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

Object :—To find out the efficiency of Nitrophosphate complex fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy-Sesamum. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 1.7.61/9.9.61 ; N.A./8 9.62 ; N.A./28.8.63. (iv) (a) 4 ploughings and 1 to 2 puddlings. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm.× 15 cm. (e) 2 to 3. (v) Nil. (vi) UR-19(late). (vii) Unirrigated. (viii) 2 weedings. (ix) 90 cm. ; N.A. ; 99 cm. (x) 16.1.62 ; 15.1.63 ; 2.1.64.

2. TREATMENTS :

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

(1) 3 types of fertilizers : P_1=Super, P_2=ODDA and P_3=PEC.

(2) 3 levels of fertilizers : L_1=13·5 Kg/ha. of N+11·8 Kg/ha. of P_2O_5, L_2=26·9 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 cm. below seed and M_3=Pellet application.
N applied as A/S when Super is applied in treatments. A/S and Super applied at planting and other treatments one month after planting.

3. DESIGN :

(i) Fact. in R.B D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) 6·1 m.×2·7 m. (b) 5·5 m.×2·1 m. for 61(71), 6·1 m.×2·7 m. for 62(70) ; 5·9 m.×2·6 m. for 63(80). (v) 30 cm.×30 cm. for 61(7) ; Nil for 62(70) ; 12 cm.×8 cm. for 63(80). (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil for 61(7) ; Cupravit sprayed for 62(70) ; Mild attack of stem borer controlled by spraying Endrin for 63(80). (iii) Yield of grain. (iv) (a) 1961-63. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Since the error variances are heterogeneous and Treatments×years interaction is absent, the individual results have been presented under 5. Results.

5. RESULTS :

61(7)

(i) 3708 Kg/ha. (ii) 584·7 Kg/ha. (iii) Main effects of L and M are significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	L_1	L_2	L_3	Mean
M_1	3577	3286	3448	3380	3206	3725	3437
M_2	3848	3622	3722	3685	3241	4267	3731
M_3	4267	3602	3995	3602	4042	4220	3955
Mean	3897	3503	3722	3556	3496	4071	3708
L_1	3642	3360	3665				
L_2	3705	3467	3317				
L_3	4345	3683	4183				

C.D. for L or M marginal means=400·7 Kg/ha.

62(70)

(i) 2718 Kg/ha. (ii) 400·4 Kg/ha. (iii) Main effect of L alone is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	L_1	L_2	L_3	Mean
M_1	2852	2708	2516	2575	2638	2862	2692
M_2	2625	2739	2688	2555	2606	2891	2684
M_3	2944	2616	2777	2410	2963	2964	2779
Mean	2807	2688	2660	2513	2736	2906	2718
L_1	2393	2622	2526				
L_2	2889	2745	2573				
L_3	3139	2696	2882				

C.D. for L marginal means=274·5 Kg/ha.

63(80)

(i) 1768 Kg/ha. (ii) 228·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P₁	P₂	P₃	L₁	L₂	L₃	Mean
M₁	1636	1866	1686	1724	1686	1778	1729
M₂	1648	1892	1881	1771	1708	1941	1807
M₃	1909	1670	1721	1683	1730	1887	1767
Mean	1731	1809	1763	1726	1708	1869	1768
L₁	1706	1749	1723				
L₂	1637	1732	1755				
L₃	1849	1947	1810				

Crop :- Paddy (*Rabi*).

Site :- Reg. Rice. Res. Stn., Kayamkulam.

Ref :- K. 62(50).

Type :- 'M'.

Object :— To study the residual effect of nitrophosphate complex fertilizers applied to previous paddy crop on succeeding crop of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) Sandy loam. (iii) 10.4.62/N.A. (iv) (a) Ploughing. (b) Dibbling. (c) 75 Kg/ha. (d) 15 cm.×15 cm. (e) 10. (v) 2242 Kg/ha. of C.M.+56 Kg/ha. of Mur. Pot. (vi) PTB-31 (early). (vii) Unirrigated. (viii) 2 intercultivations and 2 weedings. (ix) N.A. (x) 2.8.62.

2. TREATMENTS :

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

(1) 3 types of fertilizers : P₁=Super, P₂=ODDA and P₃=PEC.
(2) 3 levels of fertilizers: L₁ =13·5 Kg/ha. of N+11·8 Kg/ha. of P₂O₅, L₂=26·9 Kg/ha. of N+23·5 Kg/ha. of P₂O₅ and L₃=53·8 Kg/ha. of N+47·1 Kg/ha. of P₂O₅.
(3) 3 methods of application : M₁=Broadcast, M₂=6 cm. below seed and M₃=Pellet application.

N applied as A/S wherever Super is used as P₂O₅ in the treatments. A/S and super applied at planting and other treatments one month after planting.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) and (b) 6·1 m.×2·7 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962-N.A. (b) Yes. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 1823 Kg/ha. (ii) 222·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3		L_1	L_2	L_3	Mean
M_1	1745	1921	1864		1756	1897	1877	1843
M_2	1670	1809	1972		1676	1964	1811	1817
M_3	1755	1868	1812		1944	1770	1721	1812
Mean	1723	1866	1883		1792	1877	1803	1824
L_1	1748	1867	1762					
L_2	1754	1890	1987					
L_3	1668	1841	1899					

Crop :- Paddy (*Rabi*).   **Ref :- K. 61(20).**

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

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

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy—Sesamum. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 1.7.61/8.9.61. (iv) (a) 4 ploughings and 2 puddlings. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm. $\times$ 15 cm. (e) 3. (v) 90 Kg/ha. of Mur. Pot. + 168 Kg/ha. of A/S. (vi) UR—18 (late). (vii) Unirrigated. (viii) 2 weedings. (ix) 90 cm. (x) 16.1 62.

2. TREATMENTS :

7 manurial treatments : M_0 = 280 Kg/ha. of Super, M_1 = 280 Kg/ha. of lime, M_3 = 149 Kg/ha. of Rock Phos., M_4 = M_1 + M_2, M_5 = 195 Kg/ha. of Super + Rock Phos. in 1 : 1 ratio and M_6 = 560 Kg/ha. of Super $\times$ Ash in 1 : 1 ratio.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 6·1 m. $\times$ 3·8 m. (b) 5·6 m. $\times$ 3·4 m. (v) One row alround. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 only. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 3838 Kg/ha. (ii) 184·4 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	3754	3924	3660	3792	3874	3851	4007

Crop :- Paddy (*Rabi*).   **Ref :- K. 65(50).**

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

Object :—To find out the comparative merits of the phosphatic fertilizers.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 40 Kg/ha. of N + 40 Kg/ha. of K_2O + 40 Kg/ha. of P_2O_5. (ii) Sandy loam. (iii) N.A./28.8.65. (iv) (a) 6 ploughings. (b) Transplanting. (c) to (e) N.A. (v) 40 Kg/ha. of N + 40 Kg/ha. of K_2O + P_2O_5 as per treatments. (vi) P.T.B.—4 (late). (vii) Unirrigated. (viii) 2 hand weedings and 1 interculturing with Japanese hoe. (ix) 95·5 cm. (x) 20.1.66.

2. TREATMENTS :

All combinations of (1) and (2) with controls (5 plots)]
    (1) 2 levels of P_2O_5 : P_1=30 and P_2=6·0 Kg/ha. of P_2O_6.
    (2) 8 forms of P_2O_6 : F_1=Super, F_3=Rock Phosphate, F_3=Fused Magnesium Phosphate. F_4=Deflorinated Rock Phosphate, F_6=Multi Phosphate, F_6=Hyper Phosphate, F_7= Nitro Phosphate, F_8=Basic Slag.

3. DESIGN :

    (i) Fact. in R.B.D.   (ii) (a) 21.   (b) 126 m.×7 m.   (iii) 5.   (iv) 7 m.×6 m.   (v) Nil.   (vi) Yes.

4. GENERAL :

    (i) Satisfactory.   (ii) Two sprayings with Endrin and Bordeaux Mixture were given.   (iii) Yield of grain. (iv) (a) 1964—65 (modified in 65).   (b) Yes.   (c) N.A.   (v) to (vii) N.A.

5. RESULTS :

    (i) 2232 Kg/ha.   (ii) 346·6 Kg/ha.   (iii) None of the effects is significant.   (iv) Av. yield of Paddy in Kg/ha.

Control mean=2221 Kg/ha.

	F_1	F	F_3	F_4	F_6	F_6	F_7	F_8	
P_1	2424	2395	2327	2181	2119	2014	1962	2376	2226
P_2	2200	2238	2448	2219	2181	2005	2309	2361	2246
Mean	2312	2317	2388	2200	2150	2020	2135	2368	2235

— — —

Crop :- Paddy (*Rabi*).   **Ref :- K. 64(65).**

Site :- Reg. Res. Stn. Kayamkulam.   **Type :- 'M'.**

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

1. BASAL CONDITIONS :

    (i) (a) Paddy—Paddy. (b) Paddy. (c) 33·6 Kg/ha. of N as A/S+33·6 Kg/ha. of P_2O_6 as Super+33·6 Kg/ha. of K_2O as Mur. Pot. (ii) Sandy loam. (iii) N.A./8.9.64. (iv) (a) 4 puddlings and 1 planking. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm.×15 cm. (e) 3. (v) 4942 Kg/ha. of C.M.+44·8 Kg/ha. of N as urea +33·6 Kg/ha. of K_2O as Mur. Pot. (vi) PTB -4 (late). (vii) Unirrigated. (viii) 1 weeding by Rotary Weeder and 1 hand weeding. (ix) 98·0 cm. (x) 23.1.65.

2. TREATMENTS :

All combinations of (1) and (2) with control (2 plots)
    (1) 2 levels of P_2O_5 : P_1=33·6 and P_2=67·2 Kg/ha.
    (2) 6 sources of P_2O_6 : S_1=Super, S_2=Rock Phos., S_3=Hyper Phos., S_4=Nitro Phos., S_5=Fused Magnesium Phos. and S_6=Basic Slag.
Treatments were applied at planting.

3. DESIGN :

    (i) Fact. in R.B.D.   (ii) (a) 14.   (b) N.A.   (iii) 4.   (iv) (a) 8 m.×8 m.   (v) Nil.   (vi) Yes.

4. GENERAL :

    (i) Normal.   (ii) Nil.   (iii) Grain yield.   (iv) (a) 1964 —only.   (b) and (c) N.A.   (v) to (vii) N.A.

5. RESULTS :

    (i) 2426 Kg/ha.   (ii) 363·9 Kg/ha.   (iii) None of the effects is significant.   (iv) Av. yield of grain in Kg/ha.

Control=2204 Kg/ha.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean
P_1	2566	2434	2340	2277	2309	2379	2384
P_2	2574	2516	2582	2508	2574	2496	2542
Mean	2570	2475	2641	2393	2442	2438	2463

————

Crop :- Paddy *(Kharif)*. **Ref :- K. 61(18), 64(46), 63(72), 64(109).**

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

Object :— To find out the optimum time of application of A/S for Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy— Sesamum for 61(18) ; Nil for 64(46) and 63(72) ; N.A. for 64(109). (b) Sesamum for 61(18), Paddy for 62(46), 63(72) and 64(109). (c) N.A. for 61(18) and 63(72); 4483Kg/ha. of C.M.+112 Kg/ha. of each A/S and Super and 56Kg/ha.of Mur.Pot. for 62(46); 4942Kg/ha. of C.M.+124Kg/ha. each of A/S and Super and 62 Kg/ha. of Mur. Pot. for 64(109). (ii) Sandy loam. (iii) 11.4.1961; 17.4.1962 ; 9.4.1963; 28.4.1964. (iv) (a) 4 ploughings, 2 harrowings for 61(18) ; Ploughing and planking for 62(46); 3 ploughings, 2 harrowings and planking for 63(72) ; 4 ploughings, harrowing and planking for 64(109). (b) Dibbling. (c) 75 Kg/ha. (d) 15 cm.×15 cm. (e) 10. (v) 168 Kg/ha. of Super+56 Kg/ha. of Mur. Pot. for 61(18) and 62(46); 120 Kg/ha. of Super for 63(72) ; 124 Kg/ha. of Super+62 Kg/ha. of Mur. Pot. for 64(109). (vi) PTB –23. (vii) Un-irrigated. (viii) 2 intercultivations and 2 weedings. (ix) N.A. for 61(18), 62(46) and 63(72); 121 cm. for 64(109). (x) 5.8.1961 ; 4.8.1962 ; 25.7.1963 ; 4.8.1964.

2. TREATMENTS:

6 times of application of N : M_0=Control (no application), M_1= Full dose as basal dressing, M_2=3/4 as basal and $\frac{1}{4}$ as top dressing, M_3=$\frac{1}{2}$ as basal and $\frac{1}{2}$ as top dressing, M_4=$\frac{1}{4}$ as basal and 3/4 as top dressing and M_5=Full dose as top dressing.

N at 44·8 Kg/ha. applied as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 6·7×3·1 m. for 61(18) ; 6·1 m.×3·7 m. for others. (b) 6·1 m. ×2·4 m. for 61(18) ; 6·1 m.×3·7 m. for others. (v) 30 cm.×30 cm. for 61(18) ; Nil for others. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil for 61(18), 62(46) and 64(109) but 2 sprayings of Endrex mixed with Fytolan as a prophylactic measure done for 64(109) ; Helminthosporium attack controlled by Fytolan spraying for 63(72). (iii) Yield of grain. (iv) (a) 1961—64. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Since error variances are heterogeneous and Treatments×years interaction is absent, results of individual years are presented below.

5. RESULTS :

61(18)

(i) 3276 Kg/ha. (ii) 280·4 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	3309	3374	3347	3305	3274	3049

62(46)

(i) 2015 Kg/ha. (ii) 281·5 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	2179	1795	2027	2199	1902	1989

63(72)

(i) 1757 Kg/ha. (ii) 436·3 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	1653	1742	1791	1881	1790	1683

64(109)

(i) 1996 Kg/ha. (ii) 632·1 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	1626	2074	2080	1659	2708	1828

Crop :- Paddy (*Rabi*).　　　　　　　**Ref :- K. 61(19), 62(112), 63(48), 64(63).**

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

Object :— To find out the optimum time of application af A/S for Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy-Sesamum. (b) Paddy. (c) N.A. for 61 (19) and 63(84) ; 36·6 Kg/ha. each of N as A/S and P_2O_5 as Super and K_2O as Mur. Pot. was applied for 64 (63). (ii) Sandy loam. (iii) 1.7.61/4.9.61; N.A./ Aug.6 2; N.A./28.8.63; N.A./2 9.64. (iv) (a) 4 ploughings and 2 puddlings for 61 (19) and 62 (112); 4 ploughings for 63 (84) ; 6 puddlings and ploughing for 64 (63). (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm. × 15 cm. (e) 3. (v) 5604 Kg/ha. of C.M.+168 Kg/ha. of Super+56 Kg/ha. of Mur. Pot. for 61 (19) and 62 (112); 135 Kg/ha. of Super+60 Kg/ha. of Mur. Pot. for 63 (84) ; Nil for 64 (63). (vi) U.R.-19. (vii) Unirrigated. (viii) 2 weedings for 61 (19), 62 (112) and 64 (63) ; N.A. for 63 (84). (ix) 93 cm.; 90 cm.; 99·4 cm.; 98 cm. (x) 12.1.62 ; Jan., 63 ; 20.1.64 ; 15.1.65.

2. TREATMENTS :

6 times of application of N : 　M_0=Control, M_1=Full dose as basal dressing. M_2= 3/4 as basal+¼ as top dressing, M_3=½ as basal+½ as top dressing, M_4=¼ as basal+3/4 as top dressing and M_5=Full dose as top dressing.

N at 44·8 Kg/ha. applied as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 6·1 m. × 3·1 m. for 61 (19) ; 6·1 m. × 3 7 m. for 62 (112), 63 (84) and 64 (63). (b) 5·5 m.m. × 2·4 m. for 61 (19); 6·1 m. × 3·7 for 62 (112) and 64 (63) and 6·0 m. × 3·5m. for 63 (84). (v) 30 cm. × 30 cm. for 61 (19) ; Nil for 62 (112) and 64 (63) ; 4 cm. × 8 cm. for 63 (84). (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 196-64. (b) No. (c) Results of combined analysis given under 5 Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction in present.

5. RESULTS :

(i) 3101 Kg/ha. (ii) 327·1 Kg/ha. (based on 15 d.f. made up of Treatments × 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
Av. yield	2934	2941	3175	3181	3252	3121

Crop :- Paddy (*Rabi*).

Ref :- K. 60(3).

Site :- Reg. Rice Res. Stn. Kayamkulam.

Type :- 'M'.

Object :— To study the effect of different levels of N, P and K on Paddy crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) 5604 Kg/ha. of C.M.+168 Kg/ha. of Bone meal+168 Kg/ha. N as Urea. (ii) Sandy loam. (iii) 24.6.60/13.8.60, (iv) (a) 2 ploughings puddling and levelling. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm.×13 cm. (e) 3. (v) 4483 Kg/ha. of C.M. (vi) UR-19 (late). (vii) Unirrigated. (viii) 2 hand weedings and intercultivation. (ix) 80 cm. (x) 5.1.61.

2. **TREATMENTS :**

All combinations of (1), (2) and (3).
(1) 2 levels of N as A/S : N_1=33.6 and N_2=67.2 Kg/ha.
(2) 3 leves of P_2O_5 as Super : P_0=0, P_1=16.8 and P_2=33.6 Kg/ha.
(3) 3 levels of K_2O as Mur. Pot. : K_0=0, K_1=16.8 and K_2=33.6 Kg/ha.
Fertilizers applied to soil at planting.

3. **DESIGN :**

(i) 3^2×2 partially confd. (ii) (a) 6 plots/block and 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 9.6 m ×4.9 m. (b) 9.1 m.×4.6 m. (v) 23 cm.×15 cm. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) Helminthorposium attack ; Cupravit sprayed. (iii) Grain and straw yield (iv) (a) 1959-NA. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

(i) 2667 Kg/ha. (ii) 204.7 Kg/ha. (iii) None 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	Mean
N_1	2636	2636	2586	2597	2608	2651	2619
N_2	2746	2674	2733	2675	2735	2737	2716
Mean	2688	2655	2660	2636	2671	2694	2667
K_0	2595	2703	2611				
K_1	2639	2672	2705				
K_2	2830	2591	2664				

————

Crop :- Paddy (*First crop*).

Ref :- K. 64(95).

Site :- Reg. Rice Res. Stn., Kayamkulam.

Type :- 'M'.

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

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) Sandy loam. (iii) 28.4.64. (iv) (a) 6 ploughings, puddling and planting. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm.×13 cm. (e) 3. (v) Nil. (vi) PTB-23 (early). (vii) Unirrigated. (viii) 2 weedings. (ix) 38 cm. (x) 5.8.64.

2. TREATMENTS :

    7 manurial treatments : $M_1=44.8$ Kg/ha. of N as C.M., $M_2=44.8$ Kg/ha. of N as A/S, $M_3=M_2+33.6$ Kg/ha. of P_2O_5, $M_4=M_2+33.6$ Kg/ha. of K_2O, $M_5=33.6$ Kg/ha. of $P_2O_5+33.6$ Kg/ha. of K_2O, $M_6=M_3+M_5$, $M_7=33.6$ Kg/ha. of N as A/S-11.2 Kg/ha. of N as C.M.$+33.6$ Kg/ha. of $P_2O_5+33.6$ Kg/ha. of K_2O.

P_2O_5 as Super, K_2O as Mur.Pot., C.M. and half the quantity of A/S applied as basal and the other half dose of A/S one month after sowing.

3. DESIGN :

    (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 8 m.×5 m. (vi) Nil. (vi) Yes.

4. GENERAL:

    (i) Satisfactory. (ii) Endex was sprayed 2 times. Fiytolan was sprayed twice. (iii) Yield of grain and straw. (iv) (a) 1964-N.A. (b) Yes. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

    (i) 1757 Kg/ha. (ii) 252.3 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	M_6	M_7
Av. yield	1663	1238	1231	1988	1338	2213	2631

C.D.$=374.8$ Kg/ha.

Crop :- Paddy *(Rabi).*   **Ref :- K. 64(67). 65(64).**

Site :- Rice Res. Stn., Kayamkulam.   **Type :- 'M'.**

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

1. BASAL CONDITIONS :

    (i) (a) N.A. (b) Paddy. (c) As per treatments. (ii) Sandy loam. (iii) 1.9.64 ; 30.8.65. (iv) (a) 6 ploughings, puddling and 1 planking. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm.×15 cm. (e) 3. (v) As per expetimental schedule. (vi) U.R.-19. (vii) Unirrigated. Two rounds of hand weeding interculturing with Japanese hoe one round. (ix) 98.0 cm. for 64 (67) 95.0 for 65. (x) 15.1.65, 12.1.66.

2. TREATMENTS :

    All combinations of (1), (2), (3) and (4).
        (1) 2 sources of N : $S_1=40$ Kg/ha. as A/S and $S_2=30$ Kg/ha. as A/S$+10$ Kg/ha. as C:M.
        (2) 2 levels of P_2O_5 as S/P : $P_1=20$ and $P_2=40$ Kg/ha.
        (3) 2 levels of K_2O as Mur. Pot. : $K_1=20$ Kg/ha. and $K_2=40$ Kg/ha.
        (4) 2 levels of lime : $L_0=0$ and $L_1=300$ Kg/ha.

3. DESIGN :

    (i) 2^4 fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) and (b) 6.1 m.×4.6 m. (v) Nil. (vi) Yes.

4. GENERAL :

    (i) Satisfactory. (ii) Bliton and Endrin were sprayed as prophylatic measure against disease and pests. (iv) (a) N.A. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) The expt. is contd. beyond 1965. Hence the results of individual years are given below.

5. RESULTS :

64(67)

    (i) 3062 Kg/ha. (ii) 244.0 Kg/ha. (iii) Main effects of S, P and K are highly significant. (iv) Table of means and differential response in Kg/ha.

Factor	Mean response	Differential response							
		S		P		K		L	
		S_1	S_2	P_1	P_2	K_1	K_2	L_0	L_1
S	171·6	—	—	193·0	150·2	186·0	157·2	188·5	154·7
P	238·9	260·3	217·5	—	—	182·0	295·8	238·0	239·8
K	303·9	289·5	318·3	247·0	360·8	—	—	350·0	257·8
L	54·9	71·8	38·0	54·0	55·8	101·0	8·8	—	—

C.D. of S, P or K mean response=122·9 Kg/ha.

65(64)

(i) 2536 Kg/ha. (ii) 329·6 Kg/ha. (iii) Main effects of S and L are significant. (iv) Table of mean and differential response.

Factor	Mean response	Differential response							
		S		P		K		L	
		S_1	S_2	P_1	P_2	K_1	K_2	L_0	L_1
S	658·2	—	—	742·3	574·1	652·6	668·3	668·3	650·3
P	102·0	186·1	18·0	—	—	100·4	103·2	109·9	94·2
K	34·8	29·2	40·4	33·6	35·9	—	—	24·7	44·8
L	182·7	190·6	174·9	190·6	174·9	172·7	192·8	—	—

C.D. of S or L mean response=166·0 Kg/ha.

Crop :- Paddy (*Kharif*).   **Ref :- K. 65(53).**

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

Object :—To compare acid soluble Phosphate with Super Phosphate.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) As per treatments. (ii) Sandy loam. (iii) 1.5.65/N.A. (iv) (a) to (e) N.A. (v) As per treatments. (vi) P.T.B.—23. (vii) Unirrigated. (viii) 2 intercultures and 2 hand weedings. (ix) 108 cm. (x) 11.8.65.

2. TREATMENTS :

All combinations of (1) and (2) with control (5 plots)

(1) 2 levels of P_2O_5 : P_1 =30 and P_2=60 Kg/ha.

(2) 8 forms of P_2O_5 : F_1=Super, F_2=Rock phosphate, F_3=Fused Magnesium Phosphate, F_4=Deflorinated Rock Phosphate, F_5=Multi-Phosphate, F_6=Hyper Phosphate, F_7=Nitro-Phosphate and F_8=Basic slag.

3. DESIGN :

(i) Fact. in R.B D. (ii) (a) 21. (b) N.A. (iii) 5. (iv) (a) and (b) 7 m.×6 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of Paddy. (iv) (a) 1965—contd. (b) and (c) N.A. (v) to (vii) N.A.

5. **RESULTS :**

(i) 1866 Kg/ha. (ii) 268·6 Kg/ha. (iii) Main effect of F is significant. (iv) Av. yield of grain in Kg/ha.

Control=1857 Kg/na.

	F_1	F_2	F_3	F_4	F_5	F_6	F_7	F_8	Mean
P_1	1938	2038	1757	1900	1724	1700	1576	1881	1814
P_2	1991	1962	2048	1710	1986	1843	1833	2005	1922
Mean	1964	2000	1902	1805	1855	1771	1705	1943	1868

C.D. for F marginal means=239·2 Kg/ha.

Crop :- Paddy (*Rabi*).

Site :- Reg. Rice Res. Stn., Kayamkulam.

Ref :- K. 61(10).

Type :- 'M'.

Object :—To study the effect of different levels of N, P and on Paddy crop.

1. **BASAL CONDITIONS :**

(i) (a) Paddy—Paddy—Sesamum. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 1.7.61/8.9.61. (iv) (a) 4 ploughings and 2 puddlings. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm.×15 cm. (e) 3. (v) 4483 Kg/ha. of C.M. (vi) U.R.—19 (late). (vii) Unirrigated. (viii) 2 weedings. (ix) 90 cm. (x) 12.1.62.

2. **TREATMENTS :**

All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S : N_1=16·8, N_2=33·6 and N_3=50·4 Kg/ha.
(2) 3 levels of P_2O_5 as Super : P_1=16·8, P_2=33·6 and P_3=50·4 Kg/ha.
(3) 3 levels of K_2O as Mur. Pot. : K_1=16·8, K_2=33·6 and K_3=50·4 Kg/ha.
Treatments applied to soil at planting.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) 6·1 m.×2·7 m. (b) 5·5 m.×2·1 m. (v) 30 cm. ×30 cm. (vi) Yes.

4. **GENERAL**

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1961—N.A. (b) and (c) Nil. (v) to (vii) N.A.

5. **RESULTS :**

(i) 4976 Kg/ha. (ii) 503·0 Kg/ha. (iii) Main effect of P is highly significant and that of N is significant. (iv) Av. grain yield in Kg/ha.

	P_1	P_2	P_3	K_1	K_2	K_3	Mean
N_1	4679	4970	4757	4601	4784	5021	4802
N_2	4934	5277	4828	4946	5170	4923	5013
N_3	5063	5374	4902	5240	5013	5086	5113
Mean	4892	5207	4829	4929	4989	5010	4976
K_1	4944	5200	4645				
K_2	4917	5266	4785				
K_3	4815	5155	5057				

C.D. of N or P marginal means=235·9 Kg/ha.

Crop :- Paddy (*Kharif*). **Ref :- K. 65(101).**

Site :- Rice Res. Stn., Kayamkulam. **Type :- 'M'.**

Object :—To find out the effect of continuous application of N, P and K on the soil fertility and yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 29.4.65. (iv) (a) 6 ploughings and 2 levellings. (b) to (e) N.A. (v) Entire P_2O_5 and K_2O and half the quantity of N applied as basal dressing. (vi) P.T.B.— 23. (vii) Unirrigated. (viii) 2 interculturings and 2 weedings. (ix) 108·4 cm. (x) 6.8.65.

2. TREATMENTS :

7 manurial treatments : T_1=40 Kg/ha. of N as C.M., T_2=40 Kg/ha. of N as A/S, T_3=40 Kg/ha. of N as A/S+30 Kg/ha. of P_2O_5 as S/P, T_4=40 Kg/ha. of N as A/S+30 Kg/ha. of K_2O as Mur. of Pot., T_5=40 Kg/ha. of P_2O_5 as S/P+30 Kg/ha. of K_2O as Mur. Pot., T_6= 40 Kg/ha. of N as A/S+30 Kg/ha. of P_2O_5 as S/P+30 Kg/ha. of K_2O as Mur. Pot. and T_7=40 Kg/ha. of N (30 Kg. as A/S+10 Kg/ha. of N as C.M.)+30 Kg/ha. of P_2O_5+30 Kg/ha. of K_2O.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 8 m.×5 m. (v) No. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Incidence of Blight was noticed in plots applied with A/S alone which later spred to all plots. Blitox sprayed. (iii) Yield of Paddy. (iv) (a) 1965—contd. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 1205 Kg/ha. (ii) 128·8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. yield	1550	569	656	1325	975	1550	1812

C.D.=191·4 Kg/ha.

Crop :- Paddy (*Rabi*). **Ref :- K. 64(58).**

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

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

1. BASAL CONDITIONS :

(i) (a) Nil . (b) Paddy. (c) As per treatments. (ii) Sandy loam. (iii) 5.9.64. (iv) (a) 6 ploughings, puddlings and planking. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm.×15 cm. (e) 3. (v) Nil. (vii) P.T.B —4 (Medium). (vii) Unirrigated. (viii) Weedings. (ix) 98 cm. (x) 21.1.65.

2. TREATMENTS : and 3. DESIGN :

Same as in Expt. No. 64(95) on page 17.

4. GENERAL :

(i) Satisfactory. (ii) Blitox and Endrin were sprayed against diseases and pests. (iii) Yield of grain. (iv) (a) 1964—contd. (1965 data N.A.) (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 2229 Kg/ha. (ii) 204·6 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	M_6	M_7
Av. yield	2231	2031	2081	2163	1969	2406	2719

C.D. $= 304\cdot0$

Crop :- Paddy (*Rabi*).　　　　　　　　　　　　　**Ref :- K. 65(102).**

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

Object :—To find out the effect of continuous application of N both as organic and inorganic along with phosphatic acid and potash as the soil fertility and yield of Paddy.

1. BASAL CONDITIONS :

    (i) (a) Paddy—Paddy. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) N.A./25.8.65 (iv) (a) 6 ploughings and 2 levellings. (b) to (e) N.A. (v) As per treatments. (vi) P.T.B.—134 (late). (vii) Unirrigated. (viii) 2 hand weedings and 1 interculturing with Japanese hoe. (ix) 95·5 cm. (x) 19.1.66.

2. TREATMENTS :

    7 manurial treatments : M_1=40 Kg/ha. of N as C.M., M_2=40 Kg/ha. of N as A/S, M_3=M_2+30 Kg/ha. of P_2O_5 as Super, M_4=M_3+30 Kg/ha. of K_2O as Mur. Pot., M_5=40 Kg/ha. of P_2O_5 as Super+30 Kg/ha. of K_2O as Mur. Pot., M_6=M_5+30 Kg/ha. of K_2O as Mur. Pot. and M_7=30 Kg/ha. of N as A/S+10 Kg/ha. of N as C.M.+30 Kg/ha. of P_2O_5 as Super+30 Kg/ha. of K_2O as Mur. Pot.

    Entire dose of C.M., Super and Mur. Pot. and ½ dose of A/S applied as basal and ½ A/S as top dressing.

3. DESIGN :

    (i) R.B.D. (ii) (a) 7. (b) 35 m.×8 m. (iii) 4. (iv) (a) and (b) 8 m.×5 m. (v) Nil. (vi) Yes.

4. GENERAL :

    (i) Satisfactory. (ii) Incidence of blight was noticed. Bordeaux mixture was sprayed. (iii) Yield of grain. (iv) (a) 1965—N.A. (b) Yes. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:

    (i) 1802 Kg/ha. (ii) 344·5 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	M_6	M_7
Av. yield	2228	1175	1531	1044	1868	2094	2612

C.D. $= 511\cdot8$ Kg/ha.

Crop :- Paddy (*Rabi*).　　　　　　　　　　　　　**Ref :- K. 64(99).**

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

Object :—To find out the effect of soil application of minor elements on Paddy.

1. BASAL CONDITIONS :

    (i) (a) N.A. (b) Paddy. (c) 4940 Kg/ha. of C.M.+124 Kg/ha. of A/S+124 Kg/ha. of Super+62 Kg/ha. of Mur. Pot. (ii) Sandy loam. (iii) 28.4.64. (iv) (a) 4 ploughings, levelling and harrowing. (b) Behind the plough. (c) 75 Kg/ha. (d) 15 cm.×15 cm. (e) 7. (v) 124 Kg/ha. of Super+124 Kg/ha. of A/S+62 Kg/ha. Mur. Pot. (vi) P.T.B.—23 (early). (vii) Unirrigated. (viii) 2 interculturings and weeding. (ix) 121 cm. (x) 5.8.64.

2. TREATMENTS :

4 micronutrient treatments : T_0=Control (no application), T_1=11·2 Kg/ha. of Mn. Sul, T_2=5·6 Kg/ha. of Fe. Sul. and T_3=2·2 Kg/ha. of Molybdic acid.

Micronutrients sprayed 5 days before sowing the seeds and incorporated in the soil.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 8 m. × 5 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Endrex and Fytolan were sprayed as precautionary measure. (iii) Yield of grain. (iv) (a) 1964—contd. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 2427 Kg/ha. (ii) 244·8 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
Av. yield	2552	2417	2406	2333

Crop :- Paddy (*Rabi*).　　　　　　　　　　**Ref :- K. 64(69).**

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

Object :—To find out the effect of soil application of minor elements on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 33·6 Kg/ha. of N as A/S+33·6 Kg/ha. of P_2O_5 as Super+33·6 Kg/ha. of K_2O as Mur. Pot. (ii) Sandy loam. (iii) 5.9.64. (iv) (a) 6 ploughings. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm. × 15 cm. (e) 3. (v) 5000 Kg/ha. of C.M.+125 Kg/ha. of Super+60 Kg/ha. of Mur. Pot.+50 Kg/ha. of Urea. (vi) P.T.B.—4 (Medium). (vii) Unirrigated. (viii) Weedings. (ix) 98·0 cm. (x) 21.1.65.

2. TREATMENTS :

4 micro-nutrient treatments : T_0=Control (no application), T_1=11·2 Kg/ha. of Mn. Sul. T_2=5·6 Kg/ha. of Fe. Sul. and T_3=2·2 Kg/ha. of Molybdic acid.

Micronutrients sprayed 5 days before sowing the seeds and incorporated in the soil.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 8 m. × 5 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Blitox and Endrin were sprayed against diseases and pests respectively. (iii) Yield of grain. (iv) (a) 1964—only. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 2261 Kg/ha. (ii) 141·6 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
Av. yield	2313	2296	2167	2267

Crop :- Paddy (*Kharif*).　　　　　　　　　**Ref :- K. 65(47).**

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

Object :—To find out the effect of soil application of minor elements on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 28.4.65. (iv) (a) Ploughing. (b) Dibbling. (c) to (e) N.A. (v) $33 \cdot 6$ Kg/ha. each of N_1, P_2O_5 and K_2O. (vi) P.T.B.—23. (vii) Unirrigated. (viii) 2 intercuture and 2 hand weeding. (ix) 108 cm. (x) 4.8.65.

2. TREATMENTS :

8 micronutrient treatments: T_0=Control, T_1=10 Kg/ha. of Mn as Mn.Sul. T_2=5 Kg/ha. of Fe as Fe.Sul. T_3= 2 Kg/ha. of Mo as Sod. Molybdate, T_4=50 Kg/ha. of Silican as Sod. Silicate, T_5=100 Kg/ha. of Mg. as Mg.Sul. T_6=10 Kg/ha. of B as Borax and T_7=25Kg/ha. of Cu as Cu.Sul.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 8 m.×5 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of Paddy. (iv) (a) 1965 — N.A. (b) Yes. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 976 Kg/ha. (ii) $133 \cdot 9$ Kg/ha. (iii) Treatment differences are 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
Av. yield	813	1037	1056	950	1162	875	969	944

C.D.=$196 \cdot 9$ Kg/ha.

———

Crop :- Paddy.

Site :- Reg. Rice. Res. Stn., Kayamkulam.

Ref :- K. 65(51).

Type :- 'M'.

Object :—To study the effect of soil application of minor elements on Rice.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 30 Kg/ha. of N+30 Kg/ha. of P_2O_5+30 Kg/ha. of K_2O. (ii) Sandy loam. (iii) N.A./24.8.65. (iv) (a) 6 rounds of ploughing. (b) Transplanting. (c) and (e) N.A. (v) 40 Kg/ha. of A/S+30 Kg/ha. of P_2O_5 as Super phose +30 Kg/ha. of Mur. Pot. (vi) PTB—4 (late). (vii) Unirrigated. (viii) 2 hand weedings and 1 interculturing. (ix) 955 lines. (x) 19.1.66.

2. TREATMENTS :

8 micronutrient treatments: T_0=Control (No micronutrient), T_1=Mn as Mn.Sul. at 10 Kg/ha., T_2= Fe as Fe.Sul. at 5 Kg/ha., T_3=Molybdenium as Sod. molybdate 2 Kg/ha., T_4=ilicate as Sod. Silicate at as 50 Kg/ha., T_5=Mg as Mg. Sul. at 100 Kg/ha., T_6=Boron as Borax at 10 Kg/ha. and T_7=Copper as Copper sulphate at 25 Kg/ha.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) 32 m.×6 m. (iii) 4. (iv) 6 m.×4 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Endrin and Bordeaux mixture sprayed twice. (iii) Yield of Paddy. (iv) (a) 1965—N.A. (b) and (c) N.A. (c) Yes. (v) to (vii) N.A.

5. RESULTS :

(i) 2061. (ii) $249 \cdot 8$. (iii) Treatment difference 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	T_7
Av. yield	2042	2031	2198	2073	2260	1916	2094	1875

———

Crop :- Paddy (*Rabi*).

Ref :- K. 61(11).

Site :- Reg. Rice Res. Stn., Kayamkulam,

Type :- 'M'.

Object :—To find out the efficiency of Eupatorium manure as a complete fertilizer for Paddy.

1. BASAL CONDITIONS :

(i) Paddy—Paddy - Sesamum. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 1.7.61/9.9.61. (iv) (a) 4 ploughings and 2 puddlings. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm.×23 cm. (e) 3. (v) Nil. (vi) UR—19(late). (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 18.1.62.

2. TREATMENTS :

3 manurial treatments : M_0=Control (no manure), M_1=22·4 Kg/ha. of N as A/S+22·4 Kg/ha. of P_2O_5 as Super+22·4 Kg/ha, of K_4O as Mur. Pot., and M_2=560 Kg/ha. of Eupatorium manure.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A (iii) 7. (iv) (a) 3·7 m.×2·3 m. (b) 3·2 m.×1·8 m. (v) 23 cm.×23 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961—only. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

(i) 3977 Kg/ha. (ii) 506·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M_0	M_1	M_2
Av. yield	3849	3854	4227

Crop :- Paddy (*Rabi*).

Ref :- K. 64(72).

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

Type :- 'M'.

Object :—To find out the suitability of growing a G.M. crop along with first crop Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 33·6 Kg/ha. of N as A/S+33·6 Kg/ha. of P_2O_5 as Super+33·6 Kg/ha. of K_2O Mur. Pot. (ii) Sandy loam. (iii) N.A./28.8.64. (iv) (a) 6 ploughings and 1 planking. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm.×15 cm. (e) 3. (v) 5000 Kg/ha. of C.M.+125 Kg/ha. of Super+60 Kg/ha. of Mur. Pot. +50 Kg/ha. of Urea (vi) UR—19 (late). (vii) Unirrigated. (viii) 2 interculturings with Japanese hce and 1 hand weeding. (ix) 98·0 cm. (x) 14.1.65.

2. TREATMENTS:

3 manurial treatments : T_0=No sesbania grown with paddy in previous season, T_1=4 rows of sesbania grown with previous paddy crop on borders and T_2=Two rows of sesbania grown with previous paddy crop on borders.
Sesbania as G.M. ploughed in the same plots in which it was grown.

3. DESIGN:

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) 9·1 m.×6·1 m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964 only. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

(i) 2683 Kg/ha. (ii) 304·9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg /ha.

Treatment	T_0	T_1	T_2
Av. yield	2209	2903	2936

C.D.$=392.3$ Kg/ha.

Crop :- Paddy (*Rabi*).   **Ref :- K. 61(64).**

Site :- Rice Res. Stn., Kottarakara.   **Type :- 'M'.**

Object :—To find out the effect of nitrophosphate complex fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) N.A. (ii) Clayey loam of laterite origin. (iii) 2.9.1961/30.9.1961. (iv) (a) 1 digging, 4 ploughings with country plough, 2 plankings and levelling. (b) Transplanting. (c) 40 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) 5604 Kg/ha. of C.M. (vi) PTB—20 (medium). (vii) Irrigated. (viii) 2 hand weedings and 1 weeding with Japanese weeder. (ix) N.A. (x) 19.1.1962.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 types of phosphatic fertilizers : P_1=Single Super, P_2=ODDA—Nitrophos (20–20—0) and P_3=PEC Nitrophos (16—14—0).

(2) 3 levels of fertilizers : L_1=13.5 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.

N applied as A/S whenever Super is used. Treatments applied as basal dressing at planting.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) 7.9 m.×5.1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. Crop lodged on 7.1.1962. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 to 1954 (Treatments modified in 1962). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3901 Kg/ha. (ii) 401.8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	L_1	L_2	L_3	Mean
P_1	3787	4007	4051	3948
P_2	3457	4011	3673	3714
P_3	3821	4109	4197	4042
Mean	3688	4042	3974	3901

Crop :- Paddy (*Rabi*).   **Ref :- K. 62(40), 63(105), 64(76).**

Site :- Rice Res. Stn., Kottarkara.   **Type :- 'M'.**

Object :—To study the effect of different methods of application of nitrophosphate complex fertilisers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) 4942 Kg/ha. of C.M. for 63 (105) ; N.A. for others. (ii) Laterite and porous. (iii) 3.9.62/12.10.62, 18.9.63/31.10.63 and 18.9.64/28 10.64 respectively. (iv) (a) 3 diggings and levellin. (b) Transplanting. (c) 40 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) Nil. (vi) PTB-20. (vi) Unirrigated. (viii) 1 hand weeding. (ix) N.A. (x) 23.1.63 ; 25.1.64 ; 11.2.65.

2. TREATMENTS :

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

(1) 3 types of fertilisers : P_1=Super; **P_2=. DDA Nitrophos (20-20-0)** and P_3=PEC Nitrophos. (16-14-0)

(2) 3 levels of fertilisers : L_1=13·5 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=6·4 cm. below seed and M_3=Pellet application.

N applied as A/S, P_2O_5 as Super. Treatments applied as basal dressing at planting.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/ block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) and (b) 6·1 m. × 2·7 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Stem borer attack. Endrin sprayed in 63 (105) ; Nil for others. (iii) Yield of grain. (iv) (a) 1961-64 (Treatments modified in 1962). (b) No. (c) Results of combined analysis are presented under 5-Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous Treatments×years interaction is present.

5. RESULTS :

(i) 2431 Kg/ha. (ii) 533·4 Kg/ha. (based on 28 d.f. made up of various components of treatments with years (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	M_1	M_2	M_3	Mean
L_1	2408	2288	2472	2449	2311	2408	2389
L_2	2551	2471	2521	2588	2648	2307	2514
L_3	2254	2504	2407	2398	2373	2394	2388
Mean	2404	2421	2467	2478	2444	2370	2431
M_1	2460	2436	2539				
M_2	2380	2530	2422				
M_3	2373	2297	2439				

Crop :- Paddy *(Rabi).* **Ref :- K. 63(104), 64(77).**

Site :- Rice Res. Stn., Kottarakara. **Type :- 'M'.**

Object :— To study the residual effects of different methods of application of nitro-phosphate complex fertilizers applied to previous paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) As per treatments. (ii) Laterite. (iii) 7.10.63 and 5.9.64. (iv) (a) 3 *mammuthi* digging, and 1 levelling. (b) Transplanting. (c) 40 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) N.A. (vi) PTB-20. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 20.2.64 and 11.2.65.

2. TREATMENTS :

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

(1) 3 types of fertilizer : P_1=Single super, P_2=ODDA (20-20-0) and P_3=PEC (16-14-0).

(2) 3 levels of manure : L_1=12 Kg/ha. of N+10·5 Kg/ha. of P, L_2=24 Kg/ha. of N+21 Kg/ha. of P and L_3=48 Kg/ha. of N+42 Kg/ha. P.

(3) 3 methods of application : M_1=Broadcasting, M_2=8 cm. below seed and M_3=Pellets.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) and (b) 4·6 m.×3·7 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal for 63 (104); Good for 64 (77). (ii) Nil. (iii) Yield of grain. (iv) (a) 1962-contd (data for 1965 N.A.) (b) Yes. (c) N.A. (v) and (vi) N.A. (vii) Expt. contd. beyond 1965. Hence results of individual years are presented below.

4. RESULTS :

63(104)

(i) 1148·9 Kg/ha. (ii) 215·0 Kg/ha. (iii) Effects due to interaction N×M are highly significant. (iv) Av. yield of grain in Kg/ha.

	N_1	N_2	N_3	M_1	M_2	M_3	Mean
P_1	1181	1091	1086	1042	1256	1061	1120
P_2	1261	1116	1186	1071	1181	1311	1188
P_3	1051	1101	1266	1216	1141	1061	1140
Mean	1164	1103	1179	1110	1193	1144	1149
M_1	1176	1146	1007				
M_2	1201	1211	1166				
M_3	1116	952	1365				

C.D. for the body of N × M table =255·2 Kg/ha.

64(77)

(i) 2899 Kg/ha. (ii) 327·6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	N_1	N_2	N_3	M_1	M_2	M_3	Mean
P_1	2900	3000	2840	2791	2900	3050	2914
P_2	2701	2930	3030	3010	2940	2711	2887
P_3	2721	2960	3010	2761	2900	3030	2897
Mean	2774	2963	2960	2854	2914	2930	2899
M_1	2741	2980	2840				
M_2	2791	2980	2970				
M_3	2791	2980	3070				

Crop :- Paddy (*First crop*).   **Ref :- K. 64(86).**

Site :- Rice Res. Stn., Kottarakara.   **Type :- 'M'.**

Object :— To study the effect of different methods of application of different nitro-phosphate complex fertilizers on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) N.A. (ii) Laterite loam. (iii) 15.5.64/20.6.64. (iv) (a) 3 *mammnthi* digging and 1 levelling. (b) Transplanting. (c) 40 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) Nil. (vi) PTB-24 (medium). (vii) Unirrigated. (viii) 2 hand weedings. (ix) N.A. (x) 17.9.64.

2. **TREATMENTS**

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

(1) 3 types of fertilizers : P_1=Super, P_2=GDDA (20-20-0) and P_3=PEC (16-14-0).

(2) 3 levels of fertilizers : L_1=13·4 Kg/ha. of N+11·8 Kg/ha. of P, L_2=26·9 Kg/ha. of N+23·5 Kg/ha. of P and L_3=53·8 Kg/ha. of N+47·1 Kg/ha. of P.

(3) 3 methods of application : M_1=Broadcast, M_2=6·3 cm. below seed and M_3=Pellets application.

3. **DESIGN :**

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) and (b) 6·1 m. × 2·7 m. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Normal, slight lodging at harvest. (ii) 2 spraying with Endrin against hispa and case worm. (iii) Grain yield. (iv) (a) 1964 only. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

(i) 1461 Kg/ha. (ii) 355·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	M_1	M_2	M_3	Mean
L_1	1490	1515	1326	1375	1415	1540	1444
L_2	1495	1420	1585	1550	1465	1485	1500
L_3	1365	1470	1480	1500	1370	1445	1438
Mean	1450	1468	1464	1475	1417	1490	1461
M_1	1550	1415	1460				
M_2	1355	1470	1425				
M_3	1445	1520	1506				

Crop :- Paddy (*Kharif*).

Site :- Rice Res. Stn., Kottarakara.

Ref :- K. 65(61).

Type :- 'M'.

Object :— To find out the optimum dose of N, P and K for Paddy crop.

1. **BASAL CONDITIONS :**

(i) (a) No. (b) Paddy. (c) N.A. (ii) Clayey loam. (iii) 16.5.65/28.6.65. (iv) (a) to (e) N.A. (v) As per treatments, 3/5th of N as basal and 2/5th of N as top dressing one month before flowering. (vi) Nil. (vii) Unirrigated. (viii) N.A. (ix) 99 cm. (x) 22.9.65.

2. **TREATMENTS :**

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

(1) 3 levels of N : N_1=30, N_2=40 and N_3=50 Kg/ha.

(2) 2 levels of P : P_1=15 and P_2=30 Kg/ha.

(3) 2 levels of K : K_1=15 and K_2=30 Kg/ha.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 4·9 m. × 4·3 m. (b) 4·7 m. × 4·1 m. (v) 8 cm. × 8 cm. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) No. (iii) Yield of grain. (iv) (a) 1965-contd. (b) Yes. (c) N.A. (v) to (vii) N.A.

5 RESULTS :

(i) 1756 Kg/ha. (ii) 282.7 Kg/ha. (iii) Main effects of N and P are significant. (iv) Av. yield grain in Kg/ha.

	N_1	N_2	N_3	K_1	K_2	Mean
P_1	1383	1830	1662	1715	1534	1625
P_2	1743	1991	1925	1874	1898	1886
Mean	1563	1911	1794	1795	1716	1756
K_1	1510	1946	1930			
K_2	1616	1875	1658			

C.D. for N marginal means=203.5 Kg/ha.
C.D. for P marginal means=166.2 Kg/ha.

———

Crop :- Paddy (*Rabi*).

Site :- Rice Res. Stn., Kottarakara.

Ref :- K. 65(60).

Type :- 'M'.

Object :—To find out the optimum manurial dose for Paddy in the tract.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Lateritic. (iii) 28.8.65/2.10.65. (iv) and (v) N A. (vi) PTB-20 (medium). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 28.1.66.

2. TREATMENTS :

All combinations of (1), (2) and (3)
　　(1) 3 levels of N : $N_1=30$, $N_2=40$, $N_3=50$ Kg/ha.
　　(2) 2 levels of P_2O_5 : $P_1=15$, $P_2=15$ Kg/ha.
　　(3) 2 levels of K_2O : $K_1=15$, $K_2=30$ Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) 4.7 m × 4.1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Stem borer attack controlled by 0.1% Endrin. (iii) Tiller counts, height of the plant and grain yield. (iv) (a) 1963-64. (b) Yes. (c) N.A. (v) to (vii) N A.

5. RESULTS :

(i) 4167 Kg/ha. (ii) 215.8 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in Kg/ha.

	N_1	N_2	N_3	K_1	K_2	Mean
P_1	3893	4266	4194	4104	4131	4118
P_2	4050	4259	4337	4222	4208	4215
Mean	3972	4262	4266	4163	4170	4167
K_1	4011	4320	4159			
K_2	3933	4204	4372			

C.D. for N marginal means=155.7 Kg/ha.

———

Crop :- Paddy (*Rabi*).   **Ref :- K. 63(102).**

Site :- Rice Res. Stn., Kottarakara.   **Type :- 'M'.**

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

1. **BASAL CONDITIONS :**

(i) (a) Paddy-Paddy. (b) Paddy. (c) 4942 Kg/ha. of C.M. (ii) Lateritic. (iii) 7.10.63/14.11.63 (iv) (a) 3 *mammuthi* diggings and levelling. (b) Transplanting. (c) 40 Kg/ha. (d) 15 cm.×15 cm. (e) 2. (v) Nil. (vi) PTB-20 (medium). (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 20.2.64.

2. **TREATMENTS :**

(1) 3 levels of N : $N_1=33\cdot6$, $N_2=44\cdot8$ and $N_3=56\cdot0$ Kg/ha. .
(2) 2 levels of P_2O_5 : $P_1=16\cdot8$ and $P_2=33\cdot6$ Kg/ha.
(3) 2 levels of K_2O : $K_1=16\cdot8$ and $K_2=33\cdot6$ Kg/ha.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) 4 6 m.×4 0 m. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) Stem borer attack, Endrin applied. (iii) Yield of grain. (iv) (a) 1963-66 (treatments modified in 1964). (b) Yes. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**

(i) 1883 Kg/ha. (ii) 197·1 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in Kg/ha.

	N_1	N_2	N_3	K_1	K_2	Mean
P_1	1722	1973	1887	1934	1787	1861
P_2	1860	1980	1877	1872	1940	1906
Mean	1791	1976	1882	1903	1864	1883
K_1	1811	1998	1901			
K_2	1771	1956	1863			

C.D. for N marginal means=140·8 Kg/ha.

Crop :- Paddy (*Rabi*).   **Ref :- K. 64(74).**

Site :- Rice Res. Stn. Kottarakara.   **Type :- 'M'.**

O bject :—To study the effect of different levels of N, P and K on the yield of Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Paddy-Paddy. (b) Paddy. (c) As per treatments. (ii) Lateritic and porous. (iii) 18.9.64/27.10.64. (iv) (a) 3 *mammuthi* diggings and 1 levelling. (b) Transplanting. (c) 40 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) Nil. (vi) PTB—20 (medium). (vii) Unirrigated. (viii) Hand weedings. (ix) N.A. (x) 10 2 65.

2. **TREATMENTS :**

All combinations of (1), (2) and (3)
(1) 3 levels of N : $N_1=33\cdot6$, $N_2=44\cdot8$ and $N_3=56\ 0$ Kg/ha.
(2) 2 levels of P_2O_5 : $P_1=16\cdot8$ and $P_2=33\cdot6$ Kg/ha.
(3) 2 levels of K_2O : $K_0=0$ and $K_1=16\cdot8$ Kg/ha.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 12. (b) 53·0 m.×4·6 m. (iii) 4 (iv) 4·6 m.×4·0 m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963—66 (modified in 64). (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 3265 Kg/ha. (ii) 425·4 Kg/ha. (iii) Effect due to Interaction $N \times K$ is significant. (iv) Av. yield of grain in Kg/ha.

	N_1	N_2	N_3	K_0	K_1	Mean
P_1	3046	3436	3381	3330	3245	3288
P_2	3180	3257	3288	3245	3238	3242
Mean	3113	3346	3335	3288	3242	3265
K_0	2904	3484	3474			
K_1	3322	3208	3195			

C.D. for the body of $N \times K$ table=431·8 Kg/ha.

Crop :- Paddy (*Kharif*).

Site :- Rice. Res. Stn., Kottarakara.

Ref :- K. 63(98).

Type :- 'M'.

Object :—To find out the optimum dose and method of application of Nitrophosphate Complex fertiliser on Paddy.

1. BASAL CONDITIONS:

(i) (a) Paddy-Paddy. (b) Paddy. (c) N.A. (ii) Lateritic and porous. (iii) 9.6.63/13.7.63. (iv) (a) 1 ploughing by wooden plough and 3 diggings. (b) Transplanting. (c) 40 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) 4942 Kg/ha. of C.M.+161 Kg/ha. of Super+62 Kg/ha. of Mur. Pot.+111 Kg/ha. of A/S. (vi) PTB-24(125 days). (vii) Unirrigated. (viii) and (ix) N.A. (x) 10.10.63.

2. TREATMENTS:

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

(1) 3 types of fertilisers : P_1=Super, P_2=ODDA Nitrophos (20-20-0) and P_3=PEC Nitrophos (16-14-0).

(2) 3 levels of fertilisers : L_1=13·5 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=6·4 cm. below seed and M_3=Pellets application.

N applied as A/S, P_2O_5 as Super. Treatments were applied as basal dressing at planting.

3. DESIGN:

(i) 3^3 confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) 16·7 sq. m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Mild attack of paddy hispa. Dusting with B.H.C. 10% at 25 Kg/ha. (iii) Yield of grain. (iv) (a) 1962—64. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 1448 Kg/ha. (ii) 214·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	M_1	M_2	M_3	Mean
L_1	1335	1486	1552	1345	1476	1552	1458
L_2	1465	1386	1394	1417	1394	1434	1415
L_3	1395	1424	1599	1501	1523	1394	1473
Mean	1398	1432	1515	1421	1464	1460	1448
M_1	1405	1456	1403				
M_2	1467	1382	1544				
M_3	1323	1459	1598				

Crop :- Paddy (*Kharif*). **Ref :- K. 63(99), 65(19)·**

Site :- Rice Res. Stn., Kottarakara. **Type :- 'M'.**

Object :—To find out the optimum time of application of A/S on Paddy.

1. **BASAL CONDITIONS :**

   (i) (a) Paddy—Paddy. (b) Paddy. (c) N.A. (ii) Lateritic. (iii) 9.6.63/20.7.63 ; 16.5.65/26.6.65. (iv) (a) 2 ploughings by wooden plough. (b) Transplanting. (c) 40 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) 4942 Kg/ha. of C.M.+161 Kg/ha. of Super+62 Kg/ha. of Mur. Pot. (vi) P.T.B.—24 (125 days). (vii) Unirrigated. (viii) N.A. (ix) N.A. for 63 ; 99 1 cm. for 65. (x) N.A. ; 22.9.65

2. **TREATMENTS :**

   6 split-applications of 19 8 Kg/ha. of N as A/S : T_0=Control (No N), T_1=Full dose as basal dressing, T_2= 3/4 dose as basal and ¼ as top dressing, T_3=½ dose as basal and ½ as top dressing, T_4=¼ as basal and 3/4 as top dressing and T_5=Full dose as top dressing.

   N broadcasted at planting and top dressing one month before flowering.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 32·54 sq. m. (v) Nil. (vi) Yes.

4. **GENERAL :**

   (i) N.A. ; slightly lodged during 64. (ii) Mild attack of Rice hispa. Dusting with B.H.C. 10% at 25 Kg/ha. (iii) Yield of grain. (iv) (a) 1963—66 (Expt. for 64—N.A). (b) Yes. (c) Nil. (v) N.A. (vi) Nil. (vii) As the Expt. is contd. beyond 1965, results of individual years are given below.

5. **RESULTS :**

63(99)

   (i) 957 Kg/ha. (ii) 268·0 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
Av. yield	984	682	1219	851	893	1110

65(19)

   (i) 1639 Kg/ha. (ii) 325·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. grain yield in Kg/ha.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. yield	1546	1922	1789	1884	1580	1415

Crop :- Paddy (*Second Crop*). **Ref :- K. 63(103), 64(75).**

Site :- Rice Res. Stn., Kattarakara. **Type :- 'M'.**

Object : To find out the optimum time of application of A/S on Paddy.

1. **BASAL CONDITIONS :**

   (i) (a) Paddy—Paddy. (b) Paddy. (c) 4942 Kg/ha. of C.M.+161 Kg/ha. of Super+62 Kg/ha. of Mur. Pot. for 63 ; As per treatments for 64. (ii) Lateritic and porous. (iii) 9.10.63/14.11.63 ; 11.9.64/22.10.64. (iv) (a) 3 mammuthi diggings and 1 levelling. (b) Transplanting. (c) 40 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) 4942 Kg/ha. of C.M.+161 Kg/ha. of Super+62 Kg/ha. of Mur. Pot. (vi) P.T.B.—20 (medium). (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 17.2.64 ; 8.2.65.

2. **TREATMENTS :**

   6 split-applications of 19 8 Kg/ha. of N as A/S : T_0=Control, T_1=Full dose as basal dressing, T_2=¾ dose as basal dressing, ¼ as top dressing, T_3=½ dose as basal+½ as top dressing, T_4=¼ as basal+¾ as top dressing and T_5=Full dose as top dressing.

   N broadcast at planting and top dressing done one month before flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 32·5 sq. m. for 63 ; (a) 7·8 m.×4·4 m. and (b) 7·6 m.×4·3 m. for 64. (v) Nil for 63 ; 8 cm.×8 cm. for 64. (vi) Yes.

4. GENERAL :

(l) Satisfactory. (ii) Mild attack of Rice hispa for 63, dusting with B.H.C. 10% at 25 Kg/ha. ; Nil for 64. (iii) Yield of grain. (iv) (a) 1963—66 (expt. for 65—N.A). (b) Yes. (c) Nil. (v) N.A. (vi) Nil. (vii) Expt. is continued beyond 1965. Therefore results of individual years are presented below.

5. RESULTS :

63(103)

(i) 2125 Kg/ha. (ii) 379·6 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
Av. yield	1999	2214	2076	2307	2007	2145

64(75)

(i) 3023 Kg/ha. (ii) 481·3 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
Av. yield	3091	2922	2952	2837	3337	2999

Crop - Paddy (*Kharif*). Ref :- **K. 63(97)**.

Site :- Rice Res. Stn., Kottarakara. Type :- '**M**'.

Object :—To find out the optimum level of lime for Paddy.

1. BASAL CONDITIONS .

(i) (a) Paddy—Paddy. (b) Paddy. (c) N.A. (ii) Lateritic and porous. (iii) 9.6.63/20.7.63. (iv) (a) Ploughing by wooden plough, 3 diggings and levelling. (b) N.A. (c) 40 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) 4942 Kg/ha. of C.M.+161 Kg/ha. of Super+62 Kg/ha. of Mur. Pot.+111 Kg/ha. of A/S. (vi) P.T.B.—24 (medium). (vii) Unirrigated. (viii) and (ix) N.A. (x) 5.10.63.

2. TREATMENTS :

5 levels of lime : $L_0 = 0$, $L_1 = 284$, $L_2 = 568$, $L_3 = 741$ and $L_4 = 1112$ Kg/ha.
Lime applied as basal dressing.

3. DESIGN ;

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 23·16 sq. m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (b) Minor attack of Rice hispa. Dusting with B.H.C. 10% 25 Kg/ha. (iii) Yield of grain. (iv) (a) 1963—65 (modified in 65). (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2074 Kg/ha. (ii) 175·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	L_0	L_1	L_2	L_3	L_4
Av. yield	2025	2034	2175	2106	2031

Crop :- Paddy (*Kharif*).   **Ref :- K. 65(63).**

Site :- Rice Res. Stn., Kottarakara.   **Type :- 'M'.**

Object :—To assess the quantity of lime required for Paddy crop in the tract.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) C.M. at 4942 Kg/ha., S/P. at 161 Kg/ha. and Mur. Pot. at 62 Kg/ha. (ii) Clayey loam. (iii) 16.5.65. (iv) (a) Digging 3 times and levelling 2 times. (b) to (e) N.A. (v) Basal application of C.M. at 4942 Kg/ha., Super at 161 Kg/ha. and Mur. Pot. at 62 Kg/ha. Top dressing of A/S at 50·4 Kg/ha. one month before flowering. (vi) P.T.B.—24 (medium duration). (vii) Unirrigated. (viii) Hand weeding and intercultivation with Rotary Weeder. (ix) 99 cm. (x) 17.6.65.

2. TREATMENTS :

5 levels of lime : $L_0 = 0$, $L_1 = 115$, $L_2 = 230$, $L_3 = 300$ and $L_4 = 450$ Kg/ha.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 8·0 m × 3·3 m. (b) 7·9 m. × 3·2 m. (v) 8 cm. × 8 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) No. (iii) Tiller counts, height of plants, general performance of crop, straw weight and yield of grain. (iv) (a) 1963—65. (b) Yes. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 2571 Kg/ha. (ii) 217·3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	L_0	L_1	L_2	L_3	L_4
Av. yield	2544	2523	2536	2604	2649

———

Crop :- Paddy (*Rabi*).   **Ref :- K. 63(101), 64(73).**

Site :- Rice Res. Stn., Kottarakara.   **Type :- 'M'.**

Object :—To find out the optimum level of lime for Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 4942 Kg/ha. of C.M. (ii) Lateritic and porous. (iii) 10.9.1963/ 30.10.63 ; 5.9.64/13.10.64. (iv) (a) 3 *mammuthy* diggings. (b) Transplanting. (c) 40 Kg/ha. (d) 25 cm. × 15 cm. (e) 2. (v) 4942 Kg/ha. of C.M.+161 Kg/ha. of Super+62 Kg/ha. of Mur. Pot.+111 Kg/ha. of A/S. (vi) PTB—20. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 22.1.64 ; 1.2.65.

2. TREATMENTS :

Same as in Expt. no. 63(97) on page 34.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) 23·16 Sq. m. (v) Nil. (vi) Yes.

5. GENERAL :

(i) Normal, slight lodging. (ii) Stem borer attack. Endrin sprayed. (iii) Yield of grain. (iv) (a) 1963—66 (65—N.A). (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

63(101)

(i) 2041 Kg/ha. (ii) 190·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	L_0	L_1	L_2	L_3	L_4
Av. yield	1912	2072	2104	2088	2031

64(73)

(i) 3270 Kg/ha. (ii) 270·5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	L_0	L_1	L_2	L_3	L_4
Av. yield	3122	3315	3251	3272	3391

Crop :- Paddy (*Rabi*). **Ref :- K. 64(9), 65(42).**

Site :- Rice Res. Stn., Mannuthy. **Type :- 'M'.**

Object :— To find out the effect of dry leaf and G.L. application on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5604 Kg/ha. of C.M.+33·6 Kg/ha. of P_2O_6+33·6 Kg/ha. of K_2O. (ii) Lateritic. (iii) 3.9.64 ; 30.8.65. (iv) (a) 6 ploughings, puddling and levelling. (b) Transplanting. (c) 34 to 45 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) 5604 Kg/ha. of C.M.+22·4 Kg/ha. of N+33·6 Kg/ha. of P_2O_6+33·6 Kg/ha. of K_2O for 64(9) and 5000 Kg/ha. of C.M.+30 Kg/ha. of N+30 Kg/ha. of P_2O_5+30 Kg/ha. K_2O for 65(42). (vi) PTB−12 (Medium). (vii) Irrigated. (viii) N.A. (ix) 299 cm. ; 203 cm. (x) 8.2.65 ; 21.1.66.

2. TREATMENTS :

4 manurial treatments : M_0=Control (no manure), M_1=500 Kg/ha. of G.L., M_2=500 Kg/ha. of Dry leaf and M_3=500 Kg/ha. of Dry leaf applied after powdering the leaf.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 9 m.×3 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Sprayed Endrin against stem borer and Cupravit sprayed against stock borer. (iii) Tiller counts, height measurements and yield of grain and straw. (iv) to (vi) N.A. (vii) Error variances are homogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 2614 Kg/ha. (ii) 242·6 Kg/ha. (based on 3 d.f. made up of Treatments×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
Av. yield	2512	2693	2676	2576

Crop :- Paddy (*Kharif*).   **Ref :- K. 64(2), 65(41).**

Site :- Rice Res. Stn., Mannuthy.   **Type :- 'M'.**

Object :—To find out the effect of soil appication of micronutrients for increasing yield of Paddy.

1. BASAL CONDITIONS :

   (i) (a) Paddy—Paddy. (b) Paddy. (c) 3363 Kg/ha. of G.L.+44·8 Kg/ha. of N+33·6 Kg/ha. of P_2O_5+33·6 Kg/ha. of K_2O. (ii) Lateritic. (iii) 11.6.64/15.7.64 ; 1.6.65/7.7.65. (iv) (a) 6 ploughings. (b) Transplanting. (c) 34 to 45 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) 44·8 Kg/ha. of N+33·6 Kg/ha. of P_2O_5+33·6 Kg/ha. of K_2O. (vi) P.T.B.—32. (vii) Irrigated. (viii) 2 weedings. (ix) 195 cm., 145 cm. (x) 20.10.64, 2.10.65.

2. TREATMENTS :

   8 micronutrient treatments : T_0=Control, T_1=10 Kg/ha. of Mn. Sul., T_2=5 Kg/ha. of Fe. Sul., T_3=2 Kg/ha. of Molybdic acid, T_4=50 Kg/ha. of Sod. Silicate, T_5=100 Kg/ha. of Mg. Carbonate, T_6=10 Kg/ha. of Borax dissolved in warm water, T_7= 25 Kg/ha. of Cu. Sul. dissolved in warm water.

3. DESIGN :

   (i) R.B.D. (ii) (a) 8. (b) 27·5 m.×9·0 m. (ii) 4. (iv) (a) 3·0×9·0 m. (b) 2·8 m.×8·9 m. (v) One row alround. (vi) Yes.

4. GENERAL :

   (i) Satisfactory. (ii) Endrin sprayed against stem borer. (iii) Grain yield. (iv) (a) 1964—65. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Error variances are heterogeneous and Treatments×years interaction is absent. Hence the results of individual years are given below.

5. RESULTS :

64(2)

   (i) 3094 Kg/ha. (ii) 294·2 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	M_7
Av. yield	2763	3308	3030	3205	2958	3236	2999	3256

65(41)

   (i) 2175 Kg/ha. (ii) 146·1 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	M_7
Av. yield	2195	2300	2255	2150	2130	2150	2215	2005

Crop :- Paddy (*Rabi*).   **Ref :- K. 65(39).**

Site :- Rice Res. Stn., Mannuthy.   **Type :- 'M'.**

Object :—To find out the effect of soil application of micronutrients for increasing yield of Rice.

1. BASAL CONDITIONS:

   (i) (a) N.A. (b) Paddy. (c) 40 Kg/ha. of N as A/S +30 Kg/ha. of P_2O_5 and K_2O. (ii) Lateritic. (iii) 30.8.1965/19.10.1965. (iv) (a) 6 ploughings, 1 hand weeding. (b) to (e) N.A. (v) 20 Kg/ha. of N as A/S and 30 Kg/ha. each of P_2O_5 and K_2O. (vi) PTB—12 (Medium). (vii) Irrigated. (viii) Hand weeding once, working rotary weeder. (ix) 38 cm. (x) 17.1.1966.

2. TREATMENTS:

   8 micronutrient treatments : T_0=Control (no micronutrient), T_1=10 Kg/ha. of Mn.Sul., T_2=5 Kg/ha. of Fe. Sul., T_3=2 Kg/ha. of Molybdic acid, T_4=50 Kg/ha. of Sod. Silicate. T_5=100 Kg/ha. of Mg.Carbonate, T_6=10 Kg/ha. of Borax and T_7=25 Kg/ha. of Cu.Sul.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) 18·8 m. × 14·3 m. (iii) 4. (iv) (a) 3·0 m. × 9.0 m. (b) 2·9 m. × 8·8 m. (v) 8 cm. × 8 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Case worm, Gall fly and stem borer was attacked and controlled by spraying Endrin 0·1%. Helminthosparium was noticed and sprayed Blitox. (iii) Grain and straw yield recorded. (iv) (a) 1965—66. (b) Yes. (c) N.A. (v) Rice Res. Stn., Kayamkulam. (vi) and (vii) N.A.

5. RESULTS :

(i) 2541 Kg/ha. (ii) 197·7 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	T_7
Av. yield	2616	2637	2446	2576	2516	2561	2541	2431

Crop :- Paddy (*Kharif*).   **Ref :- K. 62(88), 63(122), 64(16).**

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

Object ;—To study the effect of sowing G.M. crops with Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-paddy. (b) Paddy. (c) 2242 Kg/ha. of C.M. + 168 Kg/ha. of Super + 56 Kg/ha. of Mur. Pot. + 112 Kg/ha. of A/S for 62(88) ; 5604 Kg/ha. of C.M. + 33·6 Kg/ha. of each of P_2O_5 and K_2O for 63(122) ; N.A. for 64(16). (ii) Laterite. (iii) 3.5.62 ; 13.5.63 ; 28.4.64. (iv) (a) 6 ploughings. (b) Broadcast. (c) 67 Kg/ha. for 62(88) ; 90 Kg/ha. for others. (d) and (e) N.A. (v) 2242 Kg/ha. of C.M. + 168 Kg/ha. of Super + 56 Kg/ha. of Mur. Pot. for 62(88) ; 5604 Kg/ha. of C.M. + 33·6 Kg/ha. of each of P_2O_5 and K_2O for 63(122) ; 3000 Kg/ha. of C.M. + 40 Kg/ha. of N + 30 Kg/ha. of P_2O_5 + 30 Kg/ha. of K_2O_5 for 64(16). (vi) PTB-32 (medium). (vii) Unirrigated for 62(88). 63(122) and irrigated for 64(16). (viii) 2 hand weedings. (ix) 237 cm. ; 252 cm. ; 195 cm. (x) 20.9.62 ; 21.9.63 ; 18.9.64.

2. TREATMENTS :

5 treatments : T_1 = Paddy alone, T_2 = Sesbania sown on border, T_3 = Sesabania sown by broadcast, T_4 = *Dhaincha* sown on border, T_5 = *Dhaincha* sown by broadcast.

Sesbania and *Dhaincha* are used as G.M. for this Paddy crop. The green material is pulled out and transplanted in situ when there is standing water in the plot about 40 to 45 days after sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 7·6 m. × 4·6 m. for 62(88), 63(122), 64(16). (b) 7·5 m. × 4·3 m. for 62(88), 63(122) ; 7·6 m. × 4·6 m. for 64(16). (v) 8 cm. × 12 cm. for 62(88), 63(122) ; Nil for other. (vi) Yes.

4. GENERAL :

(i) Satisfactory, but the crop lodged after the flowering was completed in 64(16) only. (ii) Rice bug and grass hopper attack in 62(88) controlled by dusting B.H.C. 10% ; case worm and leaf roller attack in 63(122) controlled by spraying Endrin ; BHC dusted against rice bug in 64(16). (iii) Grain yield. (iv) (a) 1962-64. (b) No. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is present.

5. RESULTS :

(i) 2982 Kg/ha. (ii) 556·6 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	2893	2989	3015	3230	2785

Crop :- Paddy (*Kharif*).   **Ref :- K. 61(25), 62(82), 63(126).**

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

Object : – To find out the optimum time of application of A/S to transplanted Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 5604 Kg/ha. of C.M. for 61(25) ; 2242 Kg/ha. of C.M.+112 Kg/ha. of Super+56 Kg/ha. of Mur. Pot. for 62(82) ; 5604 Kg/ha. of C.M.+33.6 Kg/ha. of each of K_2O and P_2O_5 for 63(126). (ii) Laterite. (iii) 18.5.1961/16.6 1961 ; 16.5.1962/N.A. ; 25.5.1963/6.7.1963. (iv) (a) 6 ploughings for 61(25) ; 6 ploughings and puddlings for others. (b) Transplanting. (c) 34 to 45 Kg/ha. (d) 25 cm. × 15 cm. (e) 3. (v) Same as in (i) (c) above. (vi) P.T.B.—32 (medium). (vii) Unirriged for 61(25) ; Irrigated for others. (viii) 2 weedings for 61(25) ; 2 hand weedings and intercultivation for others. (ix) N.A. ; 237 cm. ; 252 cm. (x) 21.9.1961 ; 5.10.1962 ; 27.9.1963.

2. TREATMENTS:

6 split—application of 44.8 Kg/ha. of N as A/S : M_0=Control (no N), M_1=Full dose as basal dressing, M_2=Half as basal dressing and half one month before flowering. M_3=3/4 as basal dressing and $\frac{1}{4}$ one month before flowering, M_4=$\frac{1}{4}$ as basal dressing and 3/4 one month before flowering and M_5=Full dose as top dressing.

N broadcast as basal and top dressed one month before flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 6.1 m.×7.6 m. for 61(25) ; 4.6 m.×7.6 m. for 62(82), 63(126). (b) 5.8 m.×7.5 m. for 61(25) ; 4.3 m.×7.5 m. for 62(82), 63(126). (v) One row alround the plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Gall fly, case worm, stem borer attack controlled by spraying Endrin. (iii) Yield of grain. (iv) (a) 1961—63. (b) No. (c) Nil. (v) (a) Pattambi and Kayamkulam. (b) Nil. (vi) Nil. (vii) Since the error variances are heterogeneous and Treatments×years interaction is absent individual years results are presented below.

5. RESULTS :

61(25)

(i) 1295 Kg/ha. (ii) 112.8 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	1352	1287	1267	1313	1299	1254

62(82)

(i) 1923 Kg/ha. (ii) 113.4 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	1725	1934	1965	1998	2023	1894

C.D.=178.4 Kg/ha.

63(126)

(i) 2071 Kg/ha. (ii) 240.0 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
Av. yield	1900	2078	2225	1884	2016	2326

Crop :- Paddy (*Rabi*).   **Ref :- K. 61(26), 62(83), 63(127).**

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

Object : To find out the optimum time of application of A/S to transplanted Paddy crop.

1. BASAL CONDITIONS:

(i) (a) Paddy—Paddy. (b) Paddy. (c) 5604 Kg/ha. of C.M. for 61(26) ; 2242 Kg/ha. of C.M.+112 Kg/ha. of Super+56 Kg/ha. of Mur. Pot. for 62(83) ; 5604 Kg/ha. of C.M.+33·6 Kg/ha. of each of P_2O_5 and K_4O for 63(127). (ii) Laterite. (iii) 4.9.1961/5.10.1961 ; 5.9.1962/21.1.1963 ; 5.9.1963/6.10.1963. (iv) (a) 6 ploughings for 61(26) ; 6 ploughings and 1 to 6 puddlings for 62(83), 63(127). (b) Transplanting. (c) 34 to 45 Kg/ha. (d) 25 cm.×15 cm. (e) 3. (v) Same as in (i) (c) above. (vi) PTB—10 for 61(26) ; PTB—12 for others. (vii) Irrigated. (viii) 2 weedings for 61(26) ; 1 to 2 hand weedings and 1 interculture for 62(83), 63(127). (ix) 49 cm. ; 63 cm. ; 252 cm. (x) 6.12.1961 ; 21.1.1963 ; 4.1.1964.

2. TREATMENTS :

Same as in expt. no. 61(27), 62(86), 63(125) given below.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 6·1 m.×7·6 m. for 61(26) ; 4·6 m.×7·6 m. for others. (b) 5·8 m.×7·5 m. for 61(26) ; 4·3 m.×7·5 m. for others. (v) One row alround. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of gall fly, case worm, stem borer which is controlled by spraying Endrex for 61(26) and Endrin for others. (iii) Yield of grain. (iv) (a) 1961—63. (b) No. (c) Results of combined analysis are given under 5. Results. (v) (a) Pattambi and Kayamkulam. (b) Nil. (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction in present.

5. RESULTS :

(i) 1659 Kg/ha. (ii) 184·2 Kg/ha. (based on 10 d.f. made up of of Treatments×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
Av. yield	1494	1607	1705	1715	1676	1758

———

Crop :- Paddy (*Kharif*).   **Ref :- K. 61(27), 62(86), 63(125).**

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

Ob ect :—To find out the optimum time of application of A/S to dry sown Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 5604 Kg/ha. of C.M. for 61(27) ; 2242 Kg/ha. of C.M.+112 Kg/ha of Super+56 Kg/ha. of Mur. Pot. for 62(86) ; 5604 Kg/ha. of C.M.+33·6 Kg/ha. of each of P_2O_5 and K_2O for 63(125). (ii) Laterite. (iii) 20.5.1961 ; 1.5.1962 ; 12.5.1963. (iv) (a) 6 ploughings. (b) Broadcast. (c) 90 Kg/ha. (d) and (e) N.A. (v) 560 Kg/ha. of C.M. for 61(27) ; 2242 Kg/ha. of C.M.+112 Kg/ha. of Super+56 Kg/ha. of Mur. Pot. for 62(86) ; 5604 Kg/ha. of C.M.+33·6 Kg/ha. of each of P_2O_5 and K_2O for 63(125). (vi) P.T.B.—32 (medium). (vii) Unirrigated for 61(27), 63(125) ; Irrigated for 62(86). (viii) 2 weedings for 61(27), 63(125) ; 2 hand weedings and 2 hoeings by Japanese hoe for 62(86). (ix) N.A. for 61(27) ; 237 cm. ; 252 cm. (x) 7.9.1961 ; 14.9.1962 ; 17.9.1963.

2. TREAMENTS :

6 split—applications of 44·8 Kg/ha. of N as A/S : M_0=Control (no application), M_1=Full dose as basal dressing, M_2=Half as basal dressing and half one month before flowering, M_3=3/4 as basal dressing and ¼ one month before flowering, M_4=¼ as basal dressing and 3/4 one month before flowering and M_5= Full dose as top dressing.

N broadcast as basal and top dressed one month before flowering.

3. DESIGN:

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 6.1 m. $\times 7.6$ m. for 61(27) ; 4.6 m. $\times 7.6$ m. for 62(86); 4 6 m. $\times 7.6$ m. 63(125). (b) 5.8 m. $\times 7.5$ m. for 61(27) ; 4.3 m. $\times 7.5$ m. for 62(86); 4.6 m. $\times 7.6$ m. for 63(125). (v) 8 cm. $\times 7$ cm. ; 12 cm. $\times 7$ cm. ; Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory but the crop lodged after flowering in 62(86) only. (ii) Gall fly and case worm attack controlled by spraying Endrin for 61(27) and 63(125); Rice bug attack in 62(86) controlled by dusting B.H.C. 10% (iii) Yield of grain. (iv) (a) 1961—63. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) (a) Kayamkulam and Pattambi. (b) Nil. (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 2055 Kg/ha. (ii) 284.5 Kg/ha. (based on 10 d.f. made up of Treatments×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
Av. yield	1950	2089	1981	2048	2083	2181

———

Crop :- Paddy (*Kharif*). **Ref :- K. 61(34), 62(95), 63(118).**

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

Object :—To study the effect of different levels of N, P and K alone in combination on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 5604 Kg/ha. of C.M. for 61(34) and 63(118); 2242 Kg/ha. of G.L. for 62(95). (ii) Laterite. (iii) 18.5.1961/21.6.1961; 24.5.1962/7.7.1962 ; 10.6.1963/18, 19.7.63. (iv) (a) 4 ploughings for 61(34) ; 6 ploughings, 1 levelling for 62(95); 6 ploughings and 6 puddlings for 63(118). (b) Transplanting. (c) 34 to 45 Kg/ha. (d) 25 cm. $\times 15$ cm. (e) 3. (v) Same as in (i) (c) above. (vi) PTB—32 (medium). (vii) Unirrigated for 61(34) ; Irrigated for others. (viii) N.A. for 61(34) ; 1 hand weeding and intercultivation for 62(95) ; Working Japanese hoe and hand weeding for 63(118). (ix) N.A. ; 204 cm. ; 252 cm. (x) 28.9.1961 ; 30.9.1962 ; 11, 12 10.1963.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S : $N_1 = 16.8$, $N_2 = 33.6$ and $M_3 = 50.4$ Kg/ha.
(2) 3 levels of P_2O_5 as Super : $P_1 = 16.8$, $P_2 = 33.6$ and $P_3 = 50.4$ Kg/ha.
(3) levels of K_2O as Mur. Pot. : $K_1 = 16.8$, $K_2 = 33.6$ and $K_3 = 50.4$ Kg/ha.
Half dose of N and full dose of P_2O_5 and K_2O applied as basal dressing. Rest half dose of N was applied as top dressing one month before flowering.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) 3.0 m. $\times 6.1$ m. (b) 2.8 m. $\times 5.9$ m. (v) 12 cm. $\times$ 8 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory but lodging was noticed during the post-flowering stage for 62(95).(ii) At tack of case worm and gall fly for 61(34) and 62(95) were controlled by spraying Endrex; case worm, leaf roller and stem borer attack for 63(118) were controlled by spraying Endrin. (iii) Yield of grain. (iv) (a) 1961—63. (b) No. (c) Nil. (v) (a) Pattambi, Kayamkulam and Moncompu. (b) Nil. (vi) Nil. (vii) Since the error variances are heterogeneous and Treatments×years interaction is absent, individual years results are presented below.

5. RESULTS :

61(34)

(i) 2150 Kg/ha. (ii) 240.0 Kg/ha. (iii) Main effect of N is highly significant and that of K is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	K_1	K_2	K_3	Mean
N_1	1932	1921	2051	2000	2012	1892	1968
N_2	2171	2066	2185	2319	2123	1980	2141
N_3	2325	2276	2424	2330	2364	2330	2342
Mean	2142	2088	2220	2216	2166	2067	2150
K_1	2191	2188	2270				
K_2	2128	2137	2234				
K_3	2108	1938	2157				

C.D. for N or K marginal means $=112\cdot8$ Kg/ha.

62(95)

(i) 1737 Kg/ha. (ii) 233·8 Kg/ha. (iii) Main effect of N and interaction P×K are significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	K_1	K_2	K_3	Mean
N_1	1706	1601	1648	1724	1483	1749	1652
N_2	1789	1754	1709	1714	1799	1739	1751
N_3	1744	1832	1847	1794	1829	1800	1808
Mean	1746	1729	1735	1744	1704	1763	1737
K_1	1679	1734	1818				
K_2	1643	1746	1722				
K_3	1917	1707	1664				

C.D. for N marginal means $=110\cdot0$ Kg/ha.
C.D. for the body of P×K table $=190\cdot4$ Kg/ha.

63(118)

(i) 2209 Kg/ha. (ii) 383·2 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_3	P_3	K_1	K_2	K_3	Mean
N_1	1932	2128	2012	2048	1997	2027	2024
N_2	2323	2153	2153	2263	2213	2153	2210
N_3	2369	2529	2278	2328	2333	2515	2392
Mean	2208	2270	2148	2213	2181	2232	2209
K_1	2253	2253	2133				
K_2	2123	2343	2077				
K_3	2248	2214	2233				

C.D. for N marginal means $=180\cdot2$ Kg/ha.

Crop :- Paddy (*Rabi*). **Ref :- K. 61(24), 62(96), 63(119).**

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

Object :—To study the effect of different levels of N, P and K alone and in combination on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 5604 Kg/ha. of C.M. for 61(24) and 63(119) ; 2242 Kg/ha. of G.L. for 62(96). (ii) Laterite. (iii) 20.9.61/12.10.61 ; 29.8.62/20.10.62 ; 25.9.63/25.10.63. (iv) (a) 4 ploughings for 61(24); 6 ploughings and levelling for 62(96) ; 6 ploughings and 6 puddlings for 63(119). (b) Transplanting. (c) 34 to 45 Kg/ha. (d) 25 cm.×15 cm. (e) 2 to 3. (v) Same is in (i) (c) above. (vi) P.T.B.—10 (early) for 61(24) and 63(119) ; P.T.B.—12 for 62(96). (vii) Irrigated. (viii) 1 hand weeding and working Japanese hoe once. (ix) 49 cm.; 63 cm.; 50 cm. (x) 27.12.61; 6.1.63; 20.12.63.

2. TREATMTNTS:

Same as in expt. No. 61(24), 62(95), 63(118) first crop on page 41.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4 for 61(24) and 62(96); 3 for 63(119). (iv) (a) 3·0 m.×6·1 m. (b) 2·8 m.×5·9 m. (v) 12 cm.×8 cm. (vi) Yes.

4. GENERAL :

(i) Good for 61(24) and 62(96) but lodging occured during post-flowering stgae for 62(96); Poor for 63(119) ; case worm and gall fly attack in 61(24) controlled by spraying Endrex ; Leaf roller and stem borer attack for 62(96) ; case worm, leaf roller and stem borer attack for 63(119) controlled by Endrin spray. (iii) Yield of grain. (iv) (a) 1961—63. (b) N.A. (c) Results of combined analysis given under 5. Results. (v) Pattambi. Kayamkulam and Kottarakora. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1642 Kg/ha. (ii) 147·8 Kg/ha. (based on 36 d.f. made up of interactions of various components of treatments with years). (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	K_1	K_2	K_3	Mean
N_1	1507	1503	1588	1572	1526	1500	1533
N_2	1602	1707	1700	1709	1702	1597	1669
N_3	1798	1607	1765	1734	1707	1730	1723
Mean	1636	1606	1684	1672	1645	1609	1642
K_1	1671	1634	1709				
K_2	1622	1601	1712				
K_3	1614	1582	1631				

C.D. for N marginal means = 81·7 Kg/ha.

Crop :- Paddy (*Kharif*). **Ref :- K. 64(14), 65(30).**

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

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 40 Kg/ha. of N+30 Kg/ha. of P_2O_5+30 Kg/ha. of K_2O. (ii) Laterite. (iii) 11.6.64/16.7.64; 14.5.65/18.6.65. (iv) (a) 6 ploughings, Puddling and levelling. (b) Transplanting. (c) 34 to 45 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) Nil. (vi) P.T.B.—32 (Medium). (vii) Irrigated. (viii) 2 weedings. (ix) 300 cm., 145 cm.; (x) 2.10.64.

2. TREATMENTS :

7 manurial treatments : T_1=40 Kg/ha. of N as A/S, T_2=40 Kg/ha. of N as G.L., T_3=T_1+30 Kg/ha. of P_2O_5 as Super, T_4=T_1+30 Kg/ha. of K_2O as Mur. Pot., T_5=30 Kg/ha. of P_2O_5 as Super+30 Kg/ha. of K_2O as Mur. Pot., T_6=T_1+T_5 and T_7=20 Kg/ha. of N as A/S+20 Kg/ha. of N as G.L.+T_5.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 6.0 m.×3.0 m. (b) 5.5 m.×2.7 m. (v) 25 cm.×15 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Endrin sprayed against stem borer and Cupravit against stack burn disease. (iii) Yield of grain. (iv) (a) 1964—contd. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

64(14)

(i) 2855 Kg/ha. (ii) 302.2 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. yield	3030	3013	3249	3199	1431	3030	3030

C.D.=449.0 Kg/ha.

65(2)

(i) 2581 Kg/ha. (ii) 220.1 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. yield	2579	2874	2843	2760	1565	2669	2775

C.D.=327.0 Kg/ha.

————

Crop :- Paddy (*Kharif*).   **Ref :- K. 62(93), 63(112), 64(18).**

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

Object :—To study the effect of different methods of application of Nitrophosphate complex fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy–Paddy. (b) Paddy. (c) As per treatments+2242 Kg/ha. of C.M. for 62(93); As per treatments+5604 Kg/ha. of C.M. for 63(112) ; As per treatments for 64(18). (ii) Laterite soil. (iii) 16.5.62/N.A.; 25.5.63/3, 4.7.63 ; 22.5.64/3,7.64. (iv) (a) 6 ploughings. (b) Transplanting (c) 34 to 45 Kg/ha. (d) 25 cm. ×15 cm. (e) 3. (v) 2242 Kg/ha. of C.M. for 62(93) ; 5604 Kg/ha. of C.M. for 63(112) ; Nil for 64(18). (vi) P.T.B.—32 (medium). (vii) Irrigated. (viii) 2 hand weedings and working Japanese hoe for 62(93) ; 2 inter-cultivations and weedings for 63(112) ; weeding for other. (ix) 237 cm.; 252 cm.; 241 cm. (x) 24, 25.9.62 23, 26.9.63 ; 29.9.64.

2. TREATMENTS :

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

(1) 3 types of phosphates : P_1=Super, P_2=Nitrophos produced by O.D.D.A. process and P_3=Nitrophos produced by PEC process.

(2) 3 levels of fertilizers : L_1=13·5 Kg/ha. of N+11·8 Kg/ha. of P_2O_5, L_2=26·9 Kg/ha. of N+23·8 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=6·4 cm. below surface and M_3=Pellet application.

N applied as A/S whenever Super is used. Half the quantity of nitrogenous fertilizers applied as top dressing one month prior to flowering. All other manures applied as basal dressing.

3. DESIGN :

(i) 3^3 partially confd. (ii) (a) 9 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 3·8 m.×12·2 m. for 62(93), 63(112) and 64(18). (b) 3·7 m.×12·0 m. for 62(93) and 63(112) ; 3·5 m.×11·7 m. for 64(18). (v) 8 cm.×12 cm. for 62(93) and 63(112) ; 15 cm.×25 cm. for 64(18). (vi) Yes.

4. GENERAL :

(i) Satisfactory but crop lodged after flowering for 64(18). (ii) Gall fly, rice bug, stem borer attack for 62(93); case worm, leaf roller, stem borer attack for 63(112), controlled by spraying Endrin ; Nil for 64(18). (iii) Yield of grain. (iv) (a) 1962—64. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Since error variances are heterogeneous and Treatments×years interaction is absent, individual years results are presented below.

5. RESULTS :

62(93)

(i) 2438 Kg/ha. (ii) 414·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	M_1	M_2	M_3	Mean
L_1	2481	2446	2408	2538	2368	2429	2445
L_2	2515	2446	2406	2416	2441	2511	2456
L_3	2624	2319	2298	2477	2357	2407	2414
Mean	2540	2404	2371	2477	2389	2449	2438
M_1	2574	2380	2477				
M_2	2451	2391	2324				
M_3	2595	2441	2311				

63(112)

(i) 2405 Kg/ha. (ii) 357·3 Kg/ha. (iii) Main effect of P alone is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	M_1	M_2	M_3	Mean
L_1	2454	2481	2103	2195	2328	2515	2346
L_2	2471	2468	2296	2294	2365	2576	2412
L_3	2729	2403	2239	2630	2347	2393	2457
Mean	2551	2451	2213	2373	2347	2495	2405
M_1	2470	2441	2208				
M_2	2534	2332	2174				
M_3	2650	2579	2256				

C.D. for P marginal means=244·8 Kg/ha.

64(18)

(i) 2368 Kg/ha. (ii) 226·6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	M_1	M_2	M_3	Mean
L_1	2324	2470	2242	2474	2242	2320	2345
L_2	2417	2385	2482	2311	2446	2527	2428
L_3	2413	2401	2181	2332	2373	2291	2332
Mean	2385	2419	2302	2372	2354	2379	2368
M_1	2397	2417	2303				
M_2	2340	2356	2364				
M_3	2417	2483	2238				

Crop :- Paddy (*Rabi*).

Site :- Reg. Rice Res. Stn., Mannuthy.

Ref :- K. 61(33), 62(94), 63(113).

Type :- 'M'.

Object :—To study the effect of different methods of application of Nitrophosphate complex fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 5604 Kg/ha. of C.M.+112 Kg/ha. of A/S+112 Kg/ha. of Super+ 56 Kg/ha. of Pot. Sul. for 61(33) ; As per treatments+2242 Kg ha. of C.M. for 62(94); As per treatments+ 5604 Kg/ha. of C.M. for 63(113). (ii) Laterite. (iii) 28.9.61/1, 2.10.61 ; 5.9.62/N.A. ; 5.9.63/3, 4.10.63. (iv) (a) 6 ploughings. (b) Transplanting. (c) 25 to 35 Kg/ha. for 61(33); 34 to 45 Kg/ha. for others. (d) 25 cm. ×15 cm. (e) 3. (v) 5604 Kg/ha. of C.M. for 61(33) and 63(313) ; 2242 Kg/ha. of C.M. for 62(94). (vi) P.T.B.—10 (early) for 61(33) ; P.T.B.—12 (medium) for others. (vii) Irrigated. (viii) N.A. for 61(33) ; 2 hand weedings and working Japanese hoe once for 62(94) ; 2 intercultivations and 1 hand weeding for 63(113). (ix) 49 cm.; 63 cm.; 25 cm. (x) 17.1.62 ; 18.1.62; 1, 2.1.64.

2. TREATMENTS :

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

(1) 3 types of fertilizers : P_1=Super, P_2=Nitrophos. produced by O.D.D.A. process and P_3=Nitro phos. produced by P.E.C. process.

(2) 3 levels of fertilizers : L_1=13·5 Kg/ha. of N+11·8 Kg/ha. of P_2O_5, L_2=26·9 Kg/ha. of N+23·8 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=6·4 cm. below seed and M_1=Pellets application.
N applied as A/S whenever Super is used. Half the quantity of nitrogeneous fertilizers applied as top dressing one month prior to flowering. All others manures applied as basal dressing.

3. DESIGN :

(i) 3^3 partially confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 3·8 m.×12·2 m. (b) 3·7 m.×12·0 m. (v) 8 cm.×12 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Case worm, gall fly and stem borer attack controlled by spraying Endrin twice. (iii) Yield of grain. (iv) (a) 1961—63. (b) Yes. (c) Results of combined analysis given under 5. Results. (v) Pattambi, Ambalavayal and Kayamkulam. (b) Nil. (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 1966 Kg/ha. (ii) 193·6 Kg/ha. (based on 114 d.f. made up of pooled error and interactions of various components of treatment with years). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	L_1	L_2	L_3	Mean
M_1	1986	1977	2005	1910	2055	2002	1989
M_2	1950	1911	1967	1873	1969	1987	1943
M_3	1957	1998	1940	2003	1950	1943	1965
Mean	1964	1962	1971	1929	1991	1977	1966
L_1	1950	1907	1929				
L_2	1948	2015	2011				
L_3	1995	1964	1973				

Crop :- Paddy (*Kharif*).   **Ref :- K. 61 (29), 62(84), 63(120).**

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

Object :— To find out the efficacy of reinforced cattle manure with P on paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) 5604 Kg/ha. of C.M. for 61 (29) ; 2242 Kg/ha. of C.M. for 62 (84) ; 33·6 Kg/ha. of each of N as A/S and K_2O as Mur. Pot. applied for 63 (120). (ii) Laterite. (iii) 18.5.61/27, 28.6.61 ; 24.5.62/N.A. ; 10.6.63/20.7.63. (iv) (a) 6 ploughings for 61(29), 62 (84) ; 6 ploughings and 6 puddlings for 63 (120). (b) Transplanting. (c) 34 to 45 Kg/ha. (d) 25 cm. × 15 cm. (e) 3. (v) 5604 Kg/ha. of C.M.+112 Kg/ha. of Super÷56 Kg/ha. of Mur. Pot. for 61 (29) ; 2242 Kg/ha. of C.M. for 62 (84) ; 33·6 Kg/ha. of N as A/S + 33·6 Kg/ha. of K_2O as Mur. Pot. for 63(29). (vi) PTB-32 (medium). (vii) Unirrigated for 61 (29) ; Irrigated for others. (viii) Nil for 61 (29) ; 2 hand weedings and working Japanese hoe once for 62 (84) ; Working intercultivation, once hand weeding. (iv) N.A. ; 237 cm. ; 252 cm. (x) 3.10.61 ; 10, 11.10.62 ; 14.10.63.

2. TREATMENTS :

4 manurial treatments : M_1=112 Q/ha. of C.M., M_2=M_1+50·4 Kg/ha. of P_2O_5 as Super, M_3=112 Q/ha. of reinforced C.M. and M_4=50·4 Kg/ha. of P_2O_5 as Super.

Manures applied as basal dressing by broadcast.

3. DESIGN :

(i) R.B.D (ii) (a) 4. (b) 18·9 m.×40·2 m. (iii) 6. (iv) (a) 5·2 m.×9·1 m. (b) 5·0 m.×8·9 m. (v) 8 cm. × 8 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Case worm, gall-fly and stem borer attack for 61 (29), Endrex sprayed twice ; Gallfly, case warm, rice bug and stem borer attack controlled by spraying. Endrin sprayed for 62 (84) and 63(120). (iv) (a) 1961-63. (b) No. (c)Results of combined analysis given under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 1900 Kg/ha. (ii) 169·9 Kg/ha. (based on 51 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	M_1	M_2	M_3	M_4
Av. yield	2011	1947	1838	1805

C.D.=113·7 Kg/ha.

Crop :- Paddy (*Rabi*).   **Ref :- K. 61(30), 62(85), 63(121).**

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

Object :— To fihd out the efficacy of reinforced cattle manure with P on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) 5604 Kg/ha. of C.M. for 61 (30) ; 2242 Kg/ha of C.M. for 62 (85) ; 33·6 Kg/ha. of N as A/S+33·6 Kg/ha. of K_2O as Mur. Pot. for 62 (121). (ii) Laterite. (iii) N.A.; 5.9.62 ; 25.9.63/25.10.63. (iv) (a) 6 ploughings for 61 (30), 62 (85) ; 6 ploughings and 6 puddlings. (b) Transplanting. (c) 34 to 45 Kg/ha. (d) 25 cm. ×15 cm. (e) 3. (v) 5604 Kg/ha. of C.M.+112 Kg/ha. of A/S+56 Kg/ha. of K_2O for 61 (30) ; 2242 Kg/ha. of C.M. for 62 (85) ; 33·6 Kg/ha. of N as A/S+33·6 Kg/ha. of K_2O as Mur. Pot. for 63(121). (vi) PTB-10 (early) for 61 (30), 63(121); PTB-12 for 62(85). (vii) Irrigated. (viii) Nil for 61 (30) ; 2 hand weedings and working Japanese hoe once for 62 (85) ; One hand weeding and working intercultivation once for 63(121). (ix) 49 cm. 63 cm.; 50 cm. (x) N.A.; 8th Jan.,63 ; 20.12.63.

2. TREATMENTS :

4 manurial treatments : M_1=112 Q/ha. of C.M., M_2=M_1+50·4 Kg/ha. of P_2O_5 as Super, M_3=112 Q/ha. of reinforced C.M. and M_4=50·4 Kg/ha. of P_2O_5 as Super.
    Manures applied as basal dressing by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 18·9 m.×40·2 m. (iii) 6 for 61 (30), 62 (85) ; 5 for 63 (121). (iv) (a) 5·2 m.× 9·1 m. (b) 5·0 m.×8·9 m. (v) 8 cm.×12 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory for 61 (30), 62 (85) ; poor for 63 (121). (ii) Case worm, gall fly and stem borer attack for 61 (30), Endrex sprayed twice ; Gall fly, case worm, rice bug stem borer attack controlled by spraying Endrine for others. (iii) Yield of grain. (iv) (a) 1961-63. (b) No. (c) Results of combined analysis given under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 1082 Kg/ha. (ii) 151·6 Kg/ha. (based on 48 d.f. made up of pooled error and Treatments×years inter-action). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M_1	M_2	M_3	M_4
Av. yield	1140	1144	1073	969

C.D.=105 0 Kg/ha.

———

Crop :- Paddy (*Rabi*).   **Ref :- K. 64(10), 65(31).**

Site :- Rice Res. Stn , Mannuthy.   **Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) 5604 Kg/ha. of C.M.+33 6 Kg/ha. of N+33·6 Kg/ha. of P_2O_5+33·6 Kg/ha. of K_2O for 64 (10). (ii) Lateritic. (iii) 4.9.64, 19.8.65. (iv) (a) 6 ploughings, puddling and levelling. (b) Transplanting. (c) 34 to 45 Kg/ha. (d) 25 cm. ×15 cm. (e) 2. (v) 30 Kg/ha. of N+30 Kg/ha. of K_2O+ 5000 Kg/ha. of C.M. (vi) PTB-12 (medium). (vii) Irrigated. (viii) Weeding. (ix) 300 cm. for 64 (10) and 203 cm. for 65(31). (x) 6.2.65 ; 20.1.66.

2. TREATMENTS :

All combinations of (1) and (2)+control (5 plots).
    (1) 2 levels of P_2O_5 : P_1=30 and P_2=60 Kg/ha.
    (2) 8 sources of P_2O_5 : S_1=Super, S_2=Rock Phos., S_3=Fused Magnesium Phos., S_4=De-florinated Phos, S_5=Multi Phos., S_6=Hyper Phos., S_7=Nitro Phos., and S_8=Thormus Basic Slag.

49

3. DESIGN :

(i) Fact in R.B.D. (ii) 21. (b) N.A. (iii) 5. (iv) (a) and (b) 5 m.×6 m. (v) Nil. (vii) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Sprayed Endrin against stem borer. (iv) (a) 1964-contd. (b) N.A. (c) Nil. (v) and (vi) N.A. (vii) Expt. contd. befored 1965. Hence the results of individual years are given below.

5. RESULTS :

64(10)

(i) 1664 Kg/ha. (ii) 234·0 Kg/ha. (iii) Main effect of S alone is significant. (iv) Av. yield of grain in Kg/ha.

	S₁	S₂	S₃	S₄	S₅	S₆	S₇	S₈	Mean
P₁	1723	1567	1820	1537	1560	1743	1883	1557	1674
P₂	1737	1520	1840	1707	1460	1723	1757	1590	1667
Mean	1730	1544	1830	1622	1510	1733	1820	1574	1670

C.D. for S marginal means=207·2 Kg/ha.

65(31)

(i) 2992 Kg/ha. (ii) 367·9 Kg/ha. (iii) No effect is significant. (iv) Av. yield of grain in Kg/ha.

	S₁	S₂	S₃	S₄	S₅	S₆	S₇	S₈	Mean
P₁	3087	3054	2930	2873	2949	3025	2697	3077	2962
P₂	3305	3396	2764	3087	2773	3025	2792	3030	3022
Mean	3197	3225	2847	2980	2861	3025	2744	3054	2992

Crop :- Paddy (*Kharif*). **Ref :- K. 64(4), 65(23).**

Site :- Rice Res. Stn., Mannuthy. **Type :- 'M'.**

Object :—To find out the effect of N, P and lime on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) 5604 Kg/ha. of C.M.+33·6 Kg/ha. of P₂O₅+33·6 Kg/ha. of K₂O. (ii) Lateritic. (iii) 11.6.64/14.7.64, 1.6.65/2.7.65. (iv) (a) 6 ploughings and puddling. (b) Transplanting. (c) 34 to 45 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) 5604 Kg/ha. of C.M.+33·6 Kg/ha. of P₂O₅+33·6 Kg/ha. of K₂O. (vi) PTB-32. (vii) Irrigated. (viii) Weedings. (ix) 51 cm., 204 cm. (x) 11.10.64, 5.10.65.

2. TREATMENTS :

All combinations of (1), (2) and (3).
(1) 2 levels of N as A/S : N₁=30 and N₂=40 Kg/ha.
(2) 2 levels of P₃O₅ as Super : P₁=20 and P₂=40 Kg/ha.
(3) 2 levels of lime : L₀=0 and L₁=30 Kg/ha.
Half dose of N and full dose of P₃O₅ and lime as basal dressing at planting. Half dose of N as top dressed one month before flowering.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 9·0 m.×3·8 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Endrin sprayed against stem borer and Copper fungicides against stock borer disease. (iii) Yield of grain. (iv) (a) 1964-65. (b) No. (c) Nil. (v) Nil. (vi) N.A. (vii) Error variances are heterogeneous and Treatments × years interaction is absent. Hence the results of individual years are presented below.

5. RESULTS :

64(4)

(i) 2700 Kg/ha. (ii) 3080 0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	N_1	N_2	L_0	L_1	Mean
P_1	2683	2594	2601	2676	2638
P_2	2883	2641	2783	2741	2762
Mean	2783	2617	2692	2708	2700
L_0	2744	2641			
L_1	2822	2594			

65(23)

(i) 2311 Kg/ha. (ii) 176·5 Kg/ha. (iii) Main effect of N and the interactions $N \times P$ and $N \times L$ are significant. (iv) Av. yield of Paddy in Kg/ha.

	N_1	N_2	L_0	L_1	Mean
P_1	2346	2185	2198	2333	2265
P_2	2500	2215	2323	2383	2357
Mean	2423	2200	2261	2358	2311
L_0	2391	2129			
L_1	2455	2279			

C.D. for N marginal means $= 129\cdot8$ Kg/ha.
C.D. for the body of $N \times P$ or $N \times L$ table $= 183\cdot5$ Kg/ha.

Crop :- Paddy (*Rabi*). **Ref :- K. 64(5), 65(29).**

Site :- Rice Res. Stn., Mannuthy. **Type :- 'M'.**

Object :—To find out the effect of N, P and lime on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 5604 Kg/ha. of C.M.+33·6 Kg/ha. of P_2O_5 +33·6 Kg/ha. of K_2O. (ii) Lateritic. (ii) 29.8.64/27.10.64 ; 30.8.65/16.10.65. (iv) (a) 6 ploughings and puddling. (b) Transplanting. (c) 34 to 45 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) 5604 Kg/ha. of C.M.+33·6 Kg/ha. of $K_2O+33\cdot6$ Kg/ha. of P_2O_5. (vi) PTB—12. (vii) Irrigated. (viii) Weeding once. (ix) 300 cm. ; 204 cm. (x) 10.2.65 ; 22.1.66.

2. TREATMENTS :

All combinations of (1), and (2) and (3)
  (1) 2 levels of N as A/S : $N_1=30$ and $N_2=40$ Kg/ha.
  (2) 2 levels of P_2O_5 as Super : $P_1=20$ and $P_2=40$ Kg/ha.
  (3) 2 levels of lime : $L_0=0$ and $L_1=30$ Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 9·0 m.×3·8 m. (b) 8·7 m.×3·4 m. (v) Yes. (vi) Yes.

4. GENERAL :

(i) Statisfactory, lodged slightly. (ii) Sprayed Endrin for stem borer and case worm, Sprayed Fytolam for blight. (iii) Yield of grain (iv) (a) 1964—65. (b) Yes. (c) N.A. (v) and (vi) N.A. (vii) Error variances are heterogeneous and Treatments×years interaction is absent. Hence the results are presented for individual years.

5. RESULTS :

64(5)

(i) 2274 Kg/ha. (ii) 156·6 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in Kg/ha.

	N_1	N_2	L_0	L_1	Mean
P_1	2404	2194	2252	2346	2299
P_2	2413	2083	2230	2267	2248
Mean	2408	2139	2241	2306	2274
L_0	2341	2141			
L_1	2476	2137			

C.D. for N marginal means=115·1 Kg/ha.

65(29)

(i) 2545 Kg/ha. (ii) 304·1 Kg/ha. (iii) No effect is significant. (iv) Av. yield of grain in Kg/ha.

	N_1	N_2	L_0	L_1	Mean
P_1	2579	2476	2541	2515	2527
P_2	2740	2386	2492	2635	2563
Mean	2659	2431	2516	2575	2545
L_0	2659	2374			
L_1	2661	2489			

Crop :- Paddy (*Kharif*).   Ref :- K. 64(8), 65(27).

Site :- Rice Res. Stn., Mannuthy.   Type :- 'M'.

Object :—To find out effect of dry leaf and G.L. application on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5604 Kg/ha. of C.M. +33·6 Kg/ha. of P_4O_5 +33·6 Kg/ha. of N+33·6 Kg/ha. of K_2O. (ii) Lateritic. (iii) 30.5.64, 21.5.65. (iv) (a) 6 ploughings puddling+levelling. (b) Transplanting. (c) 34 to 45 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) 5604 Kg/ha. of C.M.+22·4 K;/ha. of N+33·6 Kg/ha. of P_2O_5+33·6 Kg/ha. of K_2O. (vi) PTB—32 (medium). (vii) Irrigated. (viii) Weedings. (ix) 300 cm., 204 cm. (x) 10.10.64, 29.9.65.

2. TREATMENTS :

M_0=0, M_1=5000 Kg/ha. of G.L., M_2=Dry leaf of drying 5000 Kg/ha. of G.L. and M_3=M_2 but powdered.

3. DESIGN :

   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6 (iv) (a) and (b) $9 \cdot 0 \times 5 \cdot 0$ m. (v) Nil. (vi) Yes.

4. GENERAL :

   (i) Satisfactory. (ii) Endrin for stem borer. (iii) Yield of grain and straw. (iv) (a) 1964—65. (b) N.A. (c) Nil. (v) and (vi) N.A. (vii) Error variances are heterogeneous and Treatments×years interaction is absent. Hence the results of individual years are given below.

5. RESULTS :

64(8)

   (i) 1898 Kg/ha. (ii) $116 \cdot 7$ 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	1841	1867	1933	1952

65(27)

   (i) 2506 Kg/ha. (ii) $272 \cdot 8$ 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	2415	2634	2476	2501

————

Crop :- Paddy (*Rabi*).   **Ref :- K. 64(24), 65(44).**

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

Object :—To study the effect of magnesium and Sodium Silicate with and without magnesium carbonate on Paddy.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Paddy. (c) $33 \cdot 6$ Kg/ha. of N as C/A/N$+44 \cdot 8$ Kg/ha. of P_2O_5 as Super $+33 \cdot 6$ Kg/ha. as Mur. of Pot. (ii) Alluvial clay. (iii) 5.10.64/4.11.64 ; 7.10.65/6.11.65. (iv) (a) Digging and levelling. (b) Transplanting. (c) 50 Kg/ha. (d) 15 cm.×15 cm. (e) 2. (v) $33 \cdot 6$ Kg/ha. of N as Urea$+44 \cdot 8$ Kg/ha. of P_2O_5 as Super$+33 \cdot 6$ Kg/ha. of K_2O as Mur. Pot. (vii) Irrigated. (viii) 2 weedings. (ix) 68 cm. ; $42 \cdot 7$ cm. (x) 18.1.65 ; 23.1.66.

2. TREATMENTS :

   8 manurial treatments : M_0=Control, M_1=25 Kg/ha. of Silica as Sod. Silicate, M_2=50 Kg/ha. of Silicate as Sod. Silicate, M_3=25 Kg/ha. of Magnesium as Mg. Corbonate, M_4=M_1+M_3, M_5=M_2+M_3, M_6=25 Kg/ha. of Silicate as Mg. Silicate+M_3 and M_7= 50 Silica as of Mg Suticate+M_3.

Treatments applied as basal dressing.

3. DESIGN :

   (i) R.B.D. (ii) (a) 8. (b) $39 \cdot 0$ m.×$9 \cdot 5$ m. (iii) 4. (iv) (a) $9 \cdot 5$ m.×$4 \cdot 9$ m. (b) $9 \cdot 1$ m.×$4 \cdot 6$ m. (v) One row. (vi) Yes.

4. GENERAL :

   (i) Good. (ii) Slight attack of stem borer. Endrex sprayed. (iii) Yield of grain. (iv) (a) 1964—contd. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

64(24)

   (i) 3232 Kg/ha. (ii) $376 \cdot 2$ 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	M_7
Av. yield	3131	3307	3877	3021	2958	3202	3195	3168

65(44)

(i) 3198 Kg/ha. (ii) 371·7 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	M_7
Av. yield	3310	3511	2999	3404	3259	3189	2919	2992

————

Crop :- Paddy (*Rabi*).　　　　　　　　　　**Ref :- K. 64(25), 65(43).**

Site :- Rice Res. Stn., Moncompu.　　　　**Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 33·6 Kg/ha. of C/A/N+44·8 Kg/ha. of P_2O_5 as Hyper Phos.+33·6 Kg/ha. of K_2O as Mur. of Pot. (ii) Alluvial clay. (iii) 9.10.64/5.11.64 ; 6.10.65/N.A. (iv) (a) Digging and levelling. (b) Transplanting. (c) 50 Kg/ha. (d) 15 cm.×15 cm. (e) 2. (v) 44·8 Kg/ha. of P_2O_5 as Hyper Phos.+33·6 Kg/ha. of K_2O as Mur. Pot. before planting. (vi) P.T.B. 10 (early). (vii) Irrigated. (viii) 2 hand weedings. (ix) 68 cm. ; 42·4 cm. (x) 20.1.65 ; 22.12.65.

2. TREATMENTS :

6 sources of 44·8 Kg/ha. of N : S_0=Control (No N), S_1=A/S, S_2=C/A/N, S_3=Urea, S_4=A/S+Calcium equal to the quantity in C/A/N in S_2 and S_5=Urea+Calcium equal in the quantity in C/A/N in S_2.

N broadcast in two doses. Half dose as basal dressing and half 30 days after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 6·4 m.×4·9 m. (b) 6·1 m.×4·6 m. (v) 15 cm. × 15 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Sprayed Endrex. (iii) Yield of grain. (iv) (a) 1964—contd. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Expt. continued beyond 1965. Hence the results of individual years are presented under 5. Results.

5. RESULTS :

64(25)

(i) 3042 Kg/ha. (ii) 137·7 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	S_4	S_5
Av. yield	2766	3333	3218	3104	2939	2889

65(43)

(i) 3662 Kg/ha. (ii) 223·4 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	S_0	S_1	S_2	S_3	S_4	S_5
Av. yield	3660	3975	3371	3925	3811	3630

C.D.=336·6 Kg/ha.

————

Crop :- Paddy *(Rabi).*   **Ref :- K. 64(23), 65(22).**

Site :- Rice Res. Stn., Moncompu.   **Type :- 'M'.**

Object :—To test the efficiency of laccadive soil as a Phosphatic fertilizer on Paddy.

1. BASAL CONDITIONS:

   (i) (a) Nil. (b) Paddy. (c) 33·6 Kg/ha. of N as C/A/N+44·8 Kg/ha. of P_2O_5 as Hyper Phos.+33·6 Kg/ha. of K_2O as Mur. of Pot. (ii) Alluvial Clay. (iii) 13.11.64 ; 14.10.65. (iv) (a) Digging and levelling. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm.×15 cm. (e) 2. (v) 33·6 Kg/ha. of N as C/A/N+33·6 Kg/ha. of K_2O as Mur. Pot. (vi) P.T.—134 (late). (vii) Irrigated. (viii) 2 hand weedings. (ix) 68 cm. ; 42 cm. (x) 18.3.65 ; 11.2.66.

2. TREATMENTS :

   3 sources of 44·8 Kg/ha. of P_2O_5 : S_0=Control (no P_2O_5), S_1=Super and S_2=Laccadive soil. P_2O_5 applied broadcast as basal dressing.

3. DESIGN

   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) and (b) 6·1 m.×6·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

   (i) Good. (ii) Stem borer attack. Endrex sprayed as control measure. (iii) Yield of grain (iv) (a) 1964 —65. (b) No. (c) N.A. (v) and (vi) Nil. (vii) Frror variances are homogeneous and Treatments×years interaction is present.

5. RESULTS :

   (i) 3188 Kg/ha. (ii) 417·8 Kg/ha. (based on 2 d.f. made up of Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	S_0	S_1	S_2
Av. yield	3091	3316	3159

Crop :- Paddy *(Punja).*   **Ref :- K. 60(7).**

Site :- Rice Res. Stn., Moncompu.   **Type :- 'M'.**

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

1. BASAL CONDITIONS :

   (i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Clayey loam. (iii) 21.10.60/8.12.60. (iv) (a) 1 ploughing and puddling. (b) Transplanting. (c) 50 Kg/ha. (d) 15 cm.×15 cm. (e) 2. (v) Nil. (vi) Thirinja siella (medium). (vii) Irrigated. (viii) 1 hand weeding and working of Japanese hoe once. (ix) 40 cm. (x) 15.3.61.

2. TREATMENTS :

   All combinations of (1), (2) and (3)
   (1) 3 levels of P_2O_5 as Hyper phos. : P_0=0, P_1=16·8 and P_2=33·6 Kg/ha.
   (2) 3 levels of K_2O as Mur. Pot. : K_0=0, K_1=16·8 and K_2=33·6 Kg/ha.
   (3) 2 levels of N as C/A/N : N_1=33·6 and N_2=67·2 Kg/ha.
   Whole P_2O_5, half dose of N and half dose of K_2O broadcast as basal dressing. Half dose of N and half dose of K_2O broadcast 25 days after planting.

3. DESIGN :

   (i) 3^2×2 confd. (ii) 6 plots/block and 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 5·1 m.×9·5 m. (b) 4·6 m.×9·1 m. (v) 27 cm.×30 cm. (vi) Yes.

4. GENERAL :

   (i) Good. Lodged on 1.3.61. (ii) Stem borer was noticed. 0·02% Endrex was sprayed. (iii) Yield of grain. (iv) (a) 1959—60. (b) Yes. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 3270 Kg/ha. (ii) 313·7 Kg/ha. (iii) Only N effect is highly significant. (iv) Av. yield of grain in Kg/ha.

	K₀	K₁	K₂	P₀	P₁	P₂	Mean
N₁	3128	3137	3164	3210	3046	3173	3143
N₂	3336	3401	3454	3454	3382	3355	3397
Mean	3232	3269	3309	3332	3214	3264	3270
P₀	3322	3315	3359				
P₁	3167	3188	3287				
P₂	3207	3304	3281				

C.D. for N marginal means=147·9 Kg/ha.

Crop :- Paddy (*Rabi*).

Site :- Rice Res. Stn., Moncompu.

Ref :- K. 61(35), 62(39).

Type :- 'M'.

Object :—To study the effect of Nitrophosphate complex fertilizers produced by different methods on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 185 Kg/ha. of C/A/N+124 Kg/ha. of Hyper Phos.+62 Kg/ha. of Mur. Pot. for 61(35) ; N.A. for other. (ii) Clayey loam. (iii) 18.10.61/20.11.61 ; 9.11.62/5.12.62. (iv) (a) 1 digging and levelling. (b) Transplanting. (c) 50 Kg/ha. (d) 15 cm.×15 cm. for 61(35) ; 23 cm.×15 cm. for other. (e) 2. (v) N.A. (vi) P.T.B.—10 (early). (vii) Irrigated. (viii) 2 weedings. (ix) 30 cm.; 67 cm. (x) 19.2.62 ! 23.2.63.

2. TREATMENTS :

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

(1) 3 types of fertilizers : P₁=Super, P₂=Nitro phosphate produced by O.D.D.A. (20—20—0) and P₃= Nitrophosphate produced by P.E.C. (16—14—0).

(2) 3 levels of fertilizers : L₁=13·5 Kg/ha. of N+11·8 Kg/ha. of P₂O₅, L₂=26·9 Kg/ha. of N+23·5 Kg/ha. of P₂O₅ and L₃=53·8 Kg/ha. of N+47·1 Kg/ha. of P₂O₅.

(3) 3 methods of application : M₁=Broadcast, M₂=6·4 cm. below seed and M₃=Pellet application. Fertilizers applied as basal dressing N applied as C/A/N with P₁.

3. DESIGN :

(i) 3³ confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 8·8 m.×3·7 m. for 61(35) ; 10·7 m.×3·0 m. for other. (b) 8·5 m.×3·2 m. for 61(35) ; 10·5 m.×2·7 m. for other. (v) 15 cm.× 23 cm. for 61(35) ; 8 cm.×12 cm. for other. (vi) Yes.

4. GENERAL :

(i) Good but crop lodged in 62(39). (ii) Attack of stem borer for both but 0 05%. Endrin sprayed for 61(35) and Endrex sprayed. (iii) Ear bearing tillers and yield of grain. (iv) (a) 1961—62. (b) No. (c) Results of combined analysis given under 5. Results. (v) Pattambi, Mannuthy, Kayamkulam and Kottarakara. (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

RESULTS :

(i) 2104 Kg/ha. (ii) 344·7 Kg/ha. (based on 62 d.f. made up of pooled error and interactions of various components of Treatments×years). (iii) Main effect of 'L' alone is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	L_1	L_2	L_3	Mean
M_1	2211	2150	2123	2022	2122	2340	2161
M_2	2344	1959	2071	2066	1998	2311	2125
M_3	2018	2022	2038	1944	1930	2204	2026
Mean	2191	2044	2077	2011	2017	2285	2104
L_1	1903	2014	2115				
L_2	2074	1946	2030				
L_3	2096	2172	2087				

C.D. for 'L' marginal means=229·1 Kg/ha.

Crop :- Paddy (*Rabi*).

Ref :- K. 62(38).

Site :- Rice Res. Stn., Moncompu.

Type :- 'M'.

Object :—To study the residual effect of Nitrophospate complex fertilizer produced by different methods on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Clayey loam. (iii) 6.10.62/8.11.62. (iv) (a) Digging with spade and levelling. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm.×15 cm. (e) 2. (v) Nil. (vi) P.T.B.—10 (early). (vii) Irrigated. (viii) 2 weedings. (ix) 67 cm. (x) 23.1.63.

2. TREATMENTS

All combinations of (1), (2) and (3)
(1) 3 types of fertilizers : P_1=Single Super, P_2=Nitrophosphate produced by O.D.D.A and P_3=Nitrophos. produced by P.E.C.
(2) 3 levels of fertilisers : L_1=13·5 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 placement : M_1=Broadcast, M_2=6·4 cm. below seed and M_3=Pellet application.

Fertilizer applied as basal dressing N as C/A/N with P_1.
Treatments were applied to the preceding crop.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 8·8 m.×3·7 m. (b) 8·7 m.×3·4 m. (v) 1 row alround. (vi) Yes.

4. GENERAL :

(i) Normal, crop lodged. (ii) Slight attack of stem borer was noticed. Controlled by spraying Endrex. (iii) Yield of grain. (iv) (a) 1961—62 (Residual effect in 1962 only). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2096 Kg/ha. (ii) 533·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	L_1	L_2	L_3	Mean
M_1	1995	2293	2057	2141	1864	2340	2115
M_2	1989	1921	2063	1850	2120	2001	1991
M_3	2085	2248	2210	2435	2184	1926	2181
Mean	2023	2154	2110	2142	2056	2089	2096
L_1	2121	1925	2380				
L_2	1735	2309	2124				
L_3	2213	2228	1826				

— — — -

Crop :- Paddy (*Rabi*).   **Ref :- K. 60(8)**

Site :- Rice Res. Stn., Moncompu.   **Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 112 Kg/ha. of C/A/N+26 Kg/ha. of Hyper Phos. (ii) Claying loam. (iii) 30.11.60/30.12.60. (iv) (a) 1 digging and levelling. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm.×15 cm. (e) 2. (v) 2 Kg/ha. of A/S+22·4 Kg/ha of K_2O as Mur. Pot. (vi) P.T.B.—10 (early) (vii) Irrigated. (viii) 2 weedings. (ix) 40 cm. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 levels of lime : L_0=0 and L_1=1121 Kg/ha of slaked lime.

Sub-plot treatments :

4 sources of P_2O_5 at 44·8 Kg/ha. : S_1=Super, Phos., S_2=Hyper Phos., S_3=B.M.and S_4=Rock Phosphate. P_2O_5 and lime broadcasted independenlty as basal dressing before planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 4 sub-plots/main-plot. (b) 24·4 m.×6·1 m. (iii) 6. (iv) (a) 6·1m.×3.1 m. (b) 5·9 m.×2·9 m. (v) 8 cm.×8 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (i) Spraying with 0·03% Endrex to control stem borer. (iii) Yield of grain. (iv) (a) 1960—63 (treatments modified in 1961). (b) and (c) N. A. (v) to (vii) N. A.

5. RESULTS :

(i) 2429 Kg/ha. (ii) (a) 198·9 Kg./ha. (b) 235·8 Kg./ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg./ha.

	S_1	S_2	S_3	S_4	Mean
L_0	2498	2462	2419	2548	2482
L_1	2452	2296	2347	2405	2375
Mean	2475	2379	2383	2477	2429

— — — —

Crop :- Paddy *(Punja).*   **Ref :- K. 61(36), 62(37), 63(107).**

Site :- Rice Res. Stn., Moncompu.   **Type :- 'M'.**

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

1 BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 185 Kg/ha. of C/A/N+124 Kg/ha. of Hyper Phos.+62 Kg/ha. o Mur. Pot. for 61(36) ; N. A for others. (ii) Clayey loam. (iii) 27.10.1961/22.11.1961 ; 14.10.62/9.11.62; 16.11.63/11.2.64. (iv) (a) 1 digging and levelling. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm×14 cm (e) 2. (v) Nil for 61(36) ; 112 Kg/ha. of A/S+22·4 Kg/ha. of K_2O as Mur. Pot. for 62(37), 63(107). (vi) P.T.B.— 10 (early). (vii) Irrigated. (viii) 2 hand weedings and interculture with Japanese weeder ; 2 weedings for 62(37) ; 1 hand weeding for 63(107). (ix) N. A.; 67 cm : 28 cm. (x) 20.2.1962; 22.1.1963; 11.2.1964.

2. TREATMENTS :

Main-ptot treatments :
    2 levels of lime : $L_0=0$ and $L_1=1121$ Kg/ha. of slaked lime.
Sub-plot treatments :
    5 sources of P_2O_5 at 44·8 Kg/ha. : S_0=Control (no P_2O_5), S_1=Super Phos., S_2=Hyper Phos, S_3=Rock Phos. and S_4=B.M.

P_2O_5 and lime applied as basal dressing before planting.

3. DESIGN :

(i) Split-plot. (ii) 2 (a) main plots/replication ; 5 sub-plots/main plots. (b) N.A. (iii) 6. (iv) (a) 4·9 m. ×3·7 m. (b) 4·6 m.×3·2 m. for 61(36) ; 4·7 m.× 3·4 m for 62(37), 63(107). (v) 15 cm.× 23 cm. for 61(36); 8 cm.× 12 cm. for others. (vi) Yes.

4. GENERAL :

(i) Normal but crop lodged in 61(36), 62 (37) ; satisfactory in 63(107). (ii) Slight attack of stem borer but Endrin sprayed for 61(36), 63(107) and Endrex for 62(37). (iii) Yield of grain. (iv) (a) 1960—63 (treatments modified in 61). (b) N. A. (c) Nil. (v) (a) Pattambi. (b) Nil. (vi) Nil. (vii) Sub-plot error variances are heterogeneous, therefore results of individual years are presented below.

5. RESULTS :

61(36) :
(i) 1805 Kg/ha. (ii) (a) 382·2 Kg/ha. (b) 365·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	S_0	S_1	S_2	S_3	S_4	Mean
L_0	1695	1779	1817	1843	1460	1719
L_1	1746	1970	2080	1894	1763	1891
Mean	1721	1875	1949	1869	1612	1805

62 (37)
(i) 2067 Kg/ha. (ii) (a) 490·9 Kg/ha. (b) 234·1 Kg/ha. (iii) Main effect of S alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	S_0	S_1	S_2	S_3	S_4	Mean
L_0	1855	2271	2202	2330	2022	2136
L_1	1819	2284	1814	2008	2063	1998
Mean	1837	2278	2008	2169	2043	2067

C. D. for S marginal means=193·2 Kg/ha.

63(107)

(i) 2423 Kg/ha. (ii) (a) 491·2 Kg/ha. (b) 350·5 Kg/ha. (iii) Main effect of S alone is significant. (iii) Av. yield of grain in Kg/ha.

	S_0	S_1	S_2	S_3	S_4	Mean
L_0	2139	2518	2657	2626	2486	2485
L_1	2108	2604	2399	2224	2466	2360
Mean	2124	2561	2528	2425	2476	2423

C. D. for S marginal means=289·2 Kg/ha.

———

Crop :- Paddy (*Rabi*).   **Ref. :- K. 64(26).**

Site :- Rice Res. Stn., Moncompu.   **Type :- ·M'.**

Object :— To study the effect of different levels of N, P and lime alone and in combination on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 33·6 Kg/ha. of N as C/A/N+44·8 Kg/ha. of P_2O_5 as Super+33·6 Kg/ha. of K_2O as Mur. Pot. (iii) Alluvial clay. (iii) 1.10.64/12.11.64. (iv) (a) Digging and levelling. (b) Transplanting. (c) 50 Kg/ha. (d) 23 cm×15 cm. (e) 2. (v) 33·6 Kg/ha. of K_2O as Mur. Pot. (vi) P. T.O.—4 (late) (vii) Irrigated. (viii) 2 weedings. (ix) 68 cm. (x) 17.3.65.

2. TREATMENTS :

All combinations of (1), (2) and (3)
   (1) 2 levels of N as A/S : N_1=33·6 and N_2=50·4 Kg/ha.
   (2) 2 levels of P_2O_5 as Super : P_1=44·8 Kg/ha., P_2=67·2 Kg/ha.
   (3) 3 levels of lime: L_0=0, L_1=336, L_2=672 Kg/ha.
Lime broadcasted as basal dressing a week before planting. Full does of P_2O_5 and half of N broadcasted as basal dressing before planting. Half dose of N applied 35 day after planting.

3. DESIGN :

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

4. GENERAL :

(i) Good. (ii) Slight attack of stem borer controlled by spraying Endrex. (iii) Yield of grain. (iv) (a) 1964 only. (b) and (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i)) 2892 Kg/ha. (ii) 302·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	L_0	L_1	L_2	P_1	P_2	Mean
N_1	2846	2864	2936	2858	2905	2882
N_2	3036	2800	2870	2938	2867	2902
Mean	2941	2832	2903	2898	2886	2892
P_1	2895	2877	2923			
P_2	2987	2787	2883			

———

Crop :- Paddy (*Punja*).

Ref :- K. 64(91).

Site :- Rice Res. Stn,. Moncompu.

Type :- 'M'.

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

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) 33·6 Kg/ha. of N as C/A/N+44·8 Kg/ha of P_2O_5 as Hyper Phosphate+33·6 Kg/ha. of K_2O as Mur. Pot. (ii) Alluvial clay. (iii) N.A./10.11.64. (iv) (a) Digging and levelling. (b) Transplating. (c) 50 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) 38 Kg/ha. of N as C/A/N+33.6 Kg/ha. of K_2O as Mur. Pot. (vi) P.T.B—4 (late). (vii) Irrigated. (viii) 2 weedings. (ix) 68 cm. (x) 5.3.65.

2. **TREATMENTS :**

All combinations of (1) and (2)+control (5 plots).

   (1) 2 levels of P_2O_5 : P_1=33·6 and P_2=67·2 Kg/ha.
   (2) 8 sources of P_2O_5: S_1=Single Super Phosphate, S_2=Rock Phosphate, S_3=Fused Magnesium Phosphate, S_4=Deflourinated Phosphate, S_5=Multi Phosphate, S_6=Hyper Phosphate, S_7=Nitro Phosphate and S_8=Basic Slag.

P_2O_5 broadcasted as basal dressing.

3. **DESIGN :**

(i) R. B. D. (ii) (a) 21. (b) N. A. (iii) 5. (iv) (a) 7·6 m.×7·3 m. (b) 7·2 m·×7·0 m. (v) 20 cm.×15 cm. (vi) Yes.

4. **GENERAL :**

(i) Good. (ii) Slight attack of stem borer. Endrex was sprayed twice. (iii) Grain yield. (iv) (a) 1964—only. (b) and (c) N. A. (v) N. A. (vi) and (vii) Nil,

5. **RESULTS :**

(i) 3399 Kg/ha. (ii) 416·2 Kg/ha. (iii) Main effect of P and 'control vs others' are highly significant. Main effect of S and interaction P×S are significant. (iv) Av. yield of grain in Kg/ha.

Control=3081 Kg/ha.

	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	Mean
P_1	3544	2792	3412	3587	3431	3369	2856	3223	3277
P_2	3743	3998	3855	3621	3501	3555	3267	4217	3720
Mean	3634	3395	3634	3604	3466	3462	3062	3720	3498

C. D. for P marginal means   =131·6 Kg/ha.
C. D. for S marginal means   =263·2 Kg/ha
C. D. for the body of P×S table   =372·1 Kg./ha.
C. D. for control vs others   =166·4 Kg/ha.

———

Crop :- Paddy (*Kharif*).

Ref :- K. 60(20).

Site :- Cent. Rice Res. Stn., Pattambi.

Type :- 'M'.

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

1. **BASAL CONDITIONS :**

(i) (a) Paddy-Paddy. (b) Paddy. (c) As per treatment. (ii) Shallow lateritic. (iii) 1.6.1960/2.7.1960. (iv) (a) 6 puddlings and 4 levellings. (b) Transplanting. (c) N.A. (d) 15 cm.×25 cm. (e) 2. (v) 5604 Kg/ha. of G.L.+22·4 Kg/ha of P_2O_5 as Super+22.4 Kg/ha of K_2O as Pot. Sul. (vi) P T B-2 (medium). (vii) Unirrigated. (viii) N.A. (ix) 217 cm. (x) 14.10.1960.

2. TREATMENT :

All combinations of (1) and (2)

(1) 6 times of application of 44·8 Kg/ha of N : T_1=Befrore planting ; T_2=2 weeks after planting. T_3=4 weeks after planting, T_4=Half dose as basal dressing+half two weeks after planting. T_5=Half dose as basal dressing+half four weeks after planting and T_6=Half dose two weeks after planting+half dose four weeks after planting.

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

3. DESIGN :

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

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1958-1960. (b) Yes. (c) Nil. (v) to. (vii) N.A.

5. RESULTS :

(i) 2955 Kg/ha. (ii) 150·4 Kg/ha. (iii) Main effect of T alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	T_1	T_2	T_3	T_4	T_5	T_6	Mean
S_1	2932	3059	2914	2921	3110	2754	2948
S_2	2853	2896	3164	3008	3121	2732	2962
Mean	2892	2978	3039	2965	3115	2743	2955

C.D. for T marginal means=153·1 Kg/ha

Crop :- Paddy (*Rabi*). **Ref :- K. 60(9).**

Site :- Cent. Rice. Res. Stn., Pattambi. **Type :- 'M'.**

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

1. BASAL CONDITIONS:

(i) (a) Paddy-Paddy. (b) Paddy. (c) As per treatments. (ii) Shallow lateritic. (iii) 1.10.1950/7.11.1950 (iv) (a) 6 puddlings and 4 levellings. (b) Transplanting. (c) N.A. (d) 25 m.×25 c.m. (e) N.A. (v) 5604 Kg/ha of G.L+22·4 Kg/ha of P_2O_5 as Super +22·4 Kg/ha of K_2O as Pot. Sul. (vi) PTB-20 (medium) (vii) Unirrigated. (viii) V.A. (ix) 133 cms. (x) 14.2.1961.

2. TREATMENTS : to 4. GENERAL :

Same as in expt. No 60(20) on page 60.

5. RESULTS.

(i) 1816 Kg/ha. (ii) 165·8 Kg/ha, (iii) Main effect of S is highly significant. (iv) Av. yield of grain in Kg/ha.

	T_1	T_2	T_3	T_4	T_5	T_6	Mean
S_1	1675	1824	1693	1708	1726	1802	1738
S_2	2027	1846	1711	1897	2085	1798	1894
Mean	1851	1835	1702	1803	1906	1800	1816

C.D. for S marginal means=97·4 Kg/ha.

Crop :- Paddy (*Kharif*).   **Ref :- K. 60(15).**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

Object :—To find out the comparative efficacy of A/S and acid urea at different doses for Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Shallow lateritic. (iii) 7.5.1960/17.6.1960. (iv) (a) 6 ploughings and levelling. (b) Transplanting. (c) N.A. (d) 25 cm. × 15 cm. (e) 2. (v) 5604 Kg/ha. of G.L. as basal dressing. (vi) PTB—2 (medium). (vii) Unirrigated. (viii) N.A. (ix) 217 cm. (x) 12.10.1960.

2. TREATMENTS :

All combinations of (1) and (2)

    (1) 3 levels of N as Urea : $U_1 = 33.6$, $U_2 = 67.3$ and $U_3 = 100.9$ Kg/ha.

    (2) 4 levels of N as A/S : $S_0 = 0$, $S_1 = 33.6$, $S_2 = 67.3$ and $S_3 = 100.9$ Kg/ha.

All manures applied in two equal doeses as basal at planting and top dressing one month after planting.

3. DESIGN :

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

4. GENERAL :

(i) Normal. (ii) Endrin sprayed against stem borer infection. (iii) Yield of grain. (iv) (a) 1957—60. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 3066 Kg/ha. (ii) 283·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	S_0	S_1	S_2	S_3	Mean
U_1	2895	2953	3194	3102	3036
U_2	3136	2503	3117	3170	2982
U_3	3155	3296	3162	3113	3181
Mean	3062	2917	3158	3128	3066

Crop :- Paddy (*Rabi*).   **Ref :- K. 60(16).**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

Object :—To find out the comparative efficacy of A/S and Urea at different doses for Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Shallow lateritic. (iii) 13.9.1960/24.10.1960. (iv) (a) 6 ploughings and levellings. (b) Transplanting. (c) N.A. (d) 25 cm. × 15 cm. (e) 2. (v) 4483 Kg/ha. of G.L. as basal dressing. (vi) PTB—20 (medium). (vii) Unirrigated. (viii) N.A. (ix) 133 cm. (x) 28.1.1961.

2. TREATMENTS : to 4. GENERAL :

Same as in expt. no. 60(15) as above.

5. RESULTS :

(i) 3472 Kg/ha. (ii) 361·8 Kg/ha. (iii) Main effect of S is significant. (iv) Av. yield of grain in Kg/ha.

	S_0	S_1	S_2	S_3	Mean
U_1	2854	3517	3738	3575	3421
U_2	3372	3474	3738	3716	3575
U_3	3006	3551	3795	3330	3420
Mean	3077	3514	3757	3540	3472

C.D. for S marginal means $= 300.7$ Kg/ha.

Crop :- Paddy (*Kharif*).

Site :- Central Rice Res. Stn., Pattambi.

Ref :- K. 60(19).

Type :- 'M'.

Object :—To assess the advantages of G.M. and G.L. manuring over the local method of manuring to Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 4483 Kg/ha. of G.L.+112 Kg/ha. of A/S. (ii) Shallow lateritic. (iii) 19.4.1960. (iv) (a) 6 puddlings and 4 levellings. (b) Broadcast. (c) to (e) N.A (v) 1121 Kg/ha. of wood ash as basal dressing. (vi) PTB—25 (medium). (vii) Unirrigated. (viii) 1 weeding. (ix) 309 cm. (x) 18.8.1960.

2. TREATMENTS :

4 manurial treatments : M_1=Control (local method), M_2=*Dhaincha* broadcast with Paddy and trampling in *dhaincha*, M_3=Applying Glyricidia leaves brought from outside equal to *dhaincha* in M_2 at the time of paddy broadcast and M_4=2802 Kg/ha. of Glyricidia leaves applied before paddy broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 7.6 m.$\times 4.6$ m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958—1960. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 949 Kg/ha. (ii) 82.2 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
Av. yield	968	916	982	928

Crop :- Paddy (*Kharif*).

Site :- Central Rice Res. Stn., Pattambi.

Ref :- K. 61(60), 62(79),63(161), 64(34).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Shallow laterite. (iii) 30.4.1961/8.6.1961 ; 8.5.1962/7.6.1962 ; 13.5.63/22.6.63 and 16.5.1946/14.6.1964. (iv) (a) 2—10 ploughings, levelling. 2 diggings and puddling with spades. (b) Transplanting (d) 25 cm.$\times$25 cm. (e) 2. (v) 4483 Kg/ha. of G.L. for 61(60) and 62(79) N.A. ; Nil for 64(34). (vi) PTB—2 (medium). (vii) Unirrigated. (viii) 1—2 weedings and gap filling. (ix) 384 cm. for 61(60) ; 229 cm. N.A. 210 cm. (x) 29.9.1961 ; 1.10.1962 ; 4.10.63 ; 7.10.1964.

2. TREATMENTS :

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

    (1) 3 levels of N as A/S : $N_1 = 16\cdot8$, $N_2 = 33\cdot6$ cm., $N_3 = 50\cdot4$ Kg/ha.

    (2) 3 levels of P_2O_5 as Super : $P_1 = 16\cdot8$, $P_2 = 33\cdot6$ and $P_3 = 50\cdot4$ Kg/ha.

    (3) 3 levels of K_2O as Mur. Pot. : $K_1 = 16\cdot8$, $K_2 = 33\cdot6$ and $K_3 = 50\cdot4$ Kg/ha.

Half of N, full dose of P_2O_5 and K_2O as basal dressing. Half dose of N one month before flowering. Treatments applied to previous paddy crop for 64(34).

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) and (b) $7\cdot6$ m.$\times4\cdot6$ m. (v) Nil.

4. GENERAL :

(i) Normal. (ii) N.A. for 61(60) ; silver shoot attack, no control measures for 62(79) ; Slight attack of gall fly, no control measures taken for 63(161) and 64(34). (iii) Yield of grain. (iv) (a) 1961—64. (b) Yes. (v) N.A. (vi) Nil. (vii) Combined results of expt. no. 61(60), 62(79) and 63(161) have been given whereas individual results of expt. no. 64(34) is presented below, because residual effect is studied on this expt. Error variances are homogeneous and Treatments$\times$years interaction in absent.

5. RESULTS :

Pooled Results

(i) 2612 Kg/ha. (ii) 160·6 Kg/ha. (based on 260 d.f. made up of interactions of various components of Treatments$\times$years and pooled error). (iii) Main effect of N is significant. (iv) Av. yield of grain in Kg/ha.

	N_1	N_2	N_3	K_1	K_2	K_3	Mean
P_1	2580	2585	2574	2586	2574	2579	2580
P_2	2692	2613	2558	2624	2655	2584	2621
P_3	2660	2646	2597	2668	2616	2618	2634
Mean	2644	2615	2576	2626	2615	2594	2612
K_1	2613	2648	2617				
K_2	2688	2600	2556				
K_3	2630	2596	2556				

C.D. for N marginal means = 52 5 Kg/ha.

64(34)

(i) 2833 Kg/ha. (ii) 178·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	N_1	N_2	N_3	K_1	K_2	K_3	Mean
P_1	2818	2854	2808	2886	2751	2864	2827
P_2	2906	2839	2854	2822	2931	2846	2866
P_3	2821	2803	2791	2809	2857	2749	2805
Mean	2848	2832	2818	2832	2846	2820	2833
K_1	2873	2794	2829				
K_2	2899	2807	2833				
K_3	2773	2895	2791				

Crop :- Paddy (*Kharif*). **Ref :- K. 61(135), 62(127), 63(162).**

Site :- Central Rice Res. Stn., Pattambi. **Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Lateritic loam. (iii) 7.9.61/12.10.61 ; 5.9.62/8.10.62 ; 6.9.63/10.10.63. (iv) (a) Digging and levelling. (b) Transplanting. (c) N.A. (d) 25 cm. between lines. (e) 2. (v) 10,000 Kg/ha. of G.L. (vi) PTB—20. (vii) Partly irrigated. (viii) 2 weedings. (ix) N.A. (x) 18.1.62 ; 15.1.63 ; 18.1.64.

2. TREATMENTS :

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

(1) 3 levels of N : $N_1 = 16 \cdot 8$, $N_4 = 33 \cdot 6$ and $N_3 = 50 \cdot 4$ Kg/ha.
(2) 3 levels of P_2O_5 : $P_1 = 16 \cdot 8$, $P_2 = 33 \cdot 6$ and $P_3 = 50 \cdot 4$ Kg/ha.
(3) 3 levels of K_2O : $K_1 = 16 \cdot 8$, $K_2 = 33 \cdot 6$ and $K_3 = 50 \cdot 4$ Kg/ha..

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) and (b) 7·6 m. × 4·6 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Lodged after flowering. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961—1963. (b) Yes. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent. Hence the results are presented for individual years.

5. RESULTS :

61(135)

(i) 3215 Kg/ha. (ii) 156·9 Kg/ha. (iii) Main effect of N is highly significant and P × K interaction is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	K_1	K_2	K_3	Mean
N_1	3052	3015	3083	3056	3028	3066	3050
N_2	3258	3282	3303	3246	3245	3352	3281
N_3	3224	3384	3334	3310	3306	3326	3314
Mean	3178	3227	3240	3204	3193	3248	3215
K_1	3232	3122	3258				
K_2	3146	3242	3191				
K_3	3156	3317	3271				

C.D. for N marginal means = 74·0 Kg/ha.

C.D. for body of P × K table = 128·1 Kg/ha.

62(127)

(i) 3575 Kg/ha. (ii) 239·2 Kg/ha. (ii) Main effect of N is highly significant and that of K is significant. (iv) Av. yield of grain in Kg/ha.

	P₁	P₂	P₃	K₁	K₂	K₃	Mean
N₁	3361	3415	3526	3486	3473	3343	3434
N₂	3561	3566	3523	3640	3596	3414	3550
N₃	3632	3855	3736	3743	3758	3722	3741
Mean	3518	3612	3595	3623	3609	3493	3575
K₁	3479	3755	3635				
K₂	3602	3620	3605				
K₃	3473	3461	3545				

C.D. for N or K marginal means$=112.8$ Kg/a.

63(162)

(i) 3411 Kg/ha. (ii) 225.7 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

	P₁	P₂	P₃	K₁	K₂	K₃	Mean
N₁	3079	3148	3172	3174	3150	3075	3133
N₂	3355	3452	3474	3327	3381	3573	3427
N₃	3574	3735	3710	3576	3702	3741	3673
Mean	3336	3445	3452	3359	3411	3463	3411
K₁	3310	3410	3357				
K₂	3326	3434	3473				
K₃	3372	3491	3526				

C.D. for N marginal means$=106.4$ Kg/ha.

Crop :- Paddy (*Kharif*).　　　　　**Ref :- K. 61(48), 62(106), 63(1)**

Site :- Central Rice Res. Stn., Pattambi.　　　　**Type :- 'M'.**

Object :—To find out the relative efficacy of applying mixed fertilizers and straight fertilizers separately for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 5604 Kg/ha. of G.L.+56 Kg/ha. of A/S for 61(48) ; As per treatments for 62(106) ; 5604 Kg/ha. of G.L.+112 Kg/ha. of Super+44.8 Kg/ha. of Mur. Pot+112 Kg/ha. of A/S for 63(1). (ii) Shallow laterite. (iii) 6.6.61/11.7.61 ; 5.5.62/13.6.62 ; 4.6.63/11.7.63. (iv) (a) 8 ploughings and puddling for 61 (48) ; ploughing with country plough and digging, puddling with spade for 62(106) ; Ploughing with country plough and digging with *mammuthy* for 63(1). (b) Transplanting. (c) N.A. (d) 25 cm.×25 cm. (e) 2. (v) 4483 Kg/ha. of G.L. (vi) P.T.B.—2 (medium). (vii) Unirrigated. (viii) 1 hand weeding for 61(48) ; gap filling and 2 hand weedings for 62(106) ; N.A. for 63(1). (ix) 334 cm. ; 229 cm. ; 180 cm. (x) 17.10.61 ; 14.10.62 ; 26.10.63.

2. TREATMENTS :

3 manurial treatments : M_1=44·8 Kg/ha. of N+22.4 Kg/ha. of P_2O_5+22.4 Kg/ha. of K_2O as mixed fertilizers, applied in 2 equal doses –one as basal dressing and other one month before flowering, M_2=22.4 Kg/ha. of N+22.4Kg/ha. of P_2O_5+22.4 Kg/ha. of K_2O as basal dressing+22·4Kg/ha. of N as top dressing one month before flowering and M_3=22.4 Kg/ha. of P_2O_5+22·4 Kg/ha. of K_2O as basal dressing+44·8 Kg/ha. of N as top dressing one month before flowering.

In M_1 the fertilizers were applied as mixed fertilizers and in M_2 and M_3 as straight fertilizers. N as A/S, P_2O_5 as Super and K_2O as Mur. Pot.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 6.1 m×3.1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain for 61(48) and 63(1) and yield of grain, height of plants and tiller counts for 62(106) (iv) (a) 1961–63. (b) Yes. (c) Results of combined analysis given under 5 Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 2691 Kg/ha. (ii) 153·1 Kg/ha. (based on 46 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	M_1	M_2	M_3
Av. yield	2712	2674	2686

Crop :- Paddy (*Rabi*).　　　　　　**Ref :- K. 61(49), 62(115), 63(2).**

Site :- Central Rice Res. Stn., Pattambi.　　　**Type :- 'M'.**

Object :—To find out the relative efficacy of applying mixed fertilizers and straight fertilizers separately for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments for 61(49) and 62(115); 5604 Kg/ha. of G.L.+112 Kg/ha. of Super+44·8Kg/ha. of Mur. Pot.+112 Kg/ha. of A/S. for63(2).(ii) Shallow laterite.(iii) 7.9.61/24.10. 61 ; 1.10.62/9.11.62 ; 23.9.63/7.11.63. (iv) (a) 4 ploughing, 4 puddlings and 2 diggings for 61(49) ; 6 ploughings and levelling for 62(115) ; ploughing with country plough and digging with *mammuthy* for 63(2). (b) Transplanting. (c) N.A. (d) 25 cm.×25 cm. (e) 2. (v) Nil for 61(49) and 62(115); 4483 Kg/ha. of G.L. for 63(2) (vi) P.T.B.—20 (medium). (vii) Unirrigated (viii) 1 hand weeding for 61(49) ; weeding for 62(115) and N.A. for 63(2). (ix) 74 cm ; 122 cm ; 31 cm. (x) 20.1.62 ; 7.2.63 ; 3.2.64.

2. TREATMENTS :

3 manurial treatments : M_1=44·8 Kg/ha. of N+22·4 Kg/ha. of P_2O_5+22·4 Kg/ha. of K_2O, applied in 2 equal doses –one as basal dressing and other one month before flowering, M_2=22·4 Kg/ha. of N+22·4 Kg/ha. of P_2O_5+22·4 Kg/ha. of K_2O as basal dressing+22·4 Kg/ha. of N as top dressing one month before flowering and M_3=22·4 Kg/ha. of P_2O_5+24·4 Kg/ha. of K_2O as basal dressing+44.8 Kg/ha. of N as top dressing one month before flowering.

In M_1 the fertilizers were applied as mixed fertilizers and in M_2 and M_3 as straight fertilizers. N applied as A/S. P_2O_5 as Super and K_2O as Mur. Pot.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 6·1 m.×3·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. for 61(49) and 62(115) ; A mild attack of stem borer was noticed which was controlled by spraying Endrin, twice at weekly interval for 63(2). (iv) (a) Yield of grain. (b) 1961-63. (c) Results of combined analysis given under 5Results. (v) to (vi) N.A. (vii) Error variances are homogeneous and Treatments×years interaction is present.

5. RESULTS:

(i) 2396 Kg/ha. (ii) 299'8 Kg/ha. (based on 4 d.f. made up of Treatments×years interaction). (iii) Treatment differences are not significant. (vi) Av. yield of grain in Kg/ha.

Treatments	M_1	M_2	M_3
Av. yield	2391	2426	2371

Crop :- Paddy (*Kharif*).　　　　　　　　**Ref :- K. 61(51), 62(98), 63(134).**

Site :- Central Rice Res. Stn., Pattambi.　　**Type :- 'M'.**

Object :—To find out the advantages of applying phosphatic fertilizers, lime and ash alone and in combination for Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy for 61(51) ; Nil for others. (b) Paddy. (c) 5604 Kg/ha. of G.L.+112 Kg/ha. of B.M. +56 Kg/ha. of Mur. Pot.+56 Kg/ha. of C/A/N for 61(51) ; As per treatments+6277 Kg/ha. of C.M.+168 Kg/ha. of A/S for 62(98) ; As per treatments for 63(134). (ii) Shallow laterite. (iii) 30.5.61/18.7.61 ; N.A./ 21.6.62 ; 28.5.63/1.7.63. (iv) (a) 8 ploughings, puddlings and levelling by planking for 61(51) ; 6 to 8 ploughings and 1 levelling for 62(98) and 63(134). (b) Transplanting. (c) N.A. (d) 25 cm.×25 cm. (e) 2. (v) 4483 Kg/ha. of G.L. as basal dressing+168 Kg/ha. of A/S as top dressing for 61(51); 4483 Kg/ha. of G.L.+56 Kg/ ha. of Mur. Pot. for 62(98) ; Nil for 63(134). (vi) P.T.B.—26 (medium). (vii) Unirrigated. (viii) Weedings. (ix) 369 cm.; 229 cm.; 127 cm. (x) 23.10.61 ; 1.10.62 ; 19.10.63.

2. TREATMENTS :

7 manurial treatments : M_0=Control, M_1=44'8 Kg/ha. of P_2O_5 as Super, M_2=280 Kg/ha. of lime, M_3=44'8 Kg/ha. of P_2O_5 as Hyper. Phos., M_4=M_1+M_2, M_5=44'8 Kg/ha. of P_2O_5 as Super+ Hyper. Phos. in 1: 1 ratio and M_6=44'8 Kg/ha. of P_2O_5 as Super+Ash in 1 : 1 ratio.

Fertilizers applied as basal dressing.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 9'1 m.×4'3 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1961—63. ·(b) Yes. (c) Results of combined analysis given under 5—Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments ×years interaction is absent.

5. RESULTS :

(i) 2148 Kg/ha. (ii) 200'9 Kg/ha. (based on 66 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	M_0	M_1	M_2	M_3	M_4	M_5	M_6
Av. yield	2083	2184	2085	2194	2174	2071	2245

Crop :- Paddy (*Rabi*).   **Ref :- K. 61(52), 62(116), 63(135).**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

Object :—To find out the advantages of applying phosphatic fertilizers, lime and ash alone and in combination for Paddy.

1. BASAL CONDITIONS

(i) (a) Paddy—Paddy for 61(52); Nil for others. (b) Paddy. (c) As per treatments+4483 Kg/ha. of G.L.+ 168 Kg/ha. of A/S for 61(52) ; As per treatments for others. (ii) Shallow laterite. (iii) 15.9.61/10.11.61 ; 1.9.62/26.10.62 ; 9.9.63/9.11.63. (iv) (a) 4 ploughings, 2 diggings and levelling for 61(52) ; 6 ploughings and levellings for others. (b) Transplanting. (c) N.A. (d) 25cm.× 25 cm. (e) 2. (v) 6277 Kg/ha. of C.M. as basal dressing+168 Kg/ha. of A/S as top dressing for 61(52) ; Nil for others. (vi) P.T.B.—15 (late). (vii) Unirrigated. (viii) Weedings. (ix) 64 cm.; 122 cm.; 108 cm. (x) 19.2.62 ; 15.2.63 ; 27.4.64.

2. TREATMENTS :

7 manurial treatments : M_0=Control, M_1=44·8 Kg/ha. of P_2O_5 as Super, M_2=280 Kg/ha. of lime, M_3=44·8 Kg/ha. of P_2O_5 as Hyper. Phos., M_3=M_1+M_2, M_4=44·8 Kg/ha. of P_2O_5 as Super+ Hyper Phos. in 1: 1 ratio and M_6=44·8 Kg/ha. of P_2O_5 as Super+Ash in 1 : 1 ratio.

Fertilizers applied as basal dressing.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 9·1 m.× 4·3 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1961—63. (b) Yes. (c) Results of combined analysis given under 5—Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

5. RESULTS :

(i) 3609 Kg/ha. (ii) 622·3 Kg/ha. (based on 12 d.f. made up of Treatments×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	3350	3492	3721	3765	3541	3679	3741

Crop :- Paddy (*Kharif*).   **Ref :- K. 61(41), 62(100), 63(133).**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

Object :—To study the effect of different times of application of A/S on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy for 61(41) & 62(100); Nil for 63(133). (b) Paddy. (c) 5604 Kg/ha of G.L.+112 Kg/ha. of B.M.+56 Kg/ha. of Mur. Pot.+56 Kg/ha. of C/A/N for 61(41); 5604 Kg/ha. of each of G.L. and C.M. +56 Kg/ha. of each of A/S and Mur. Pot.+112 Kg/ha. of Super for 62(100) ; N.A. for 63(133). (ii) Shallow laterite. (iii) 29.4.61; 16.4.62; 16.4.63. (iv) (a) 10 ploughings for 61(41) ; 6 to 8 ploughings for 62(100); 6 ploughings and levelling for 63(133). (b) Broadcast. (c) 90 Kg/ha. (d) and (e)—(v) 5604 Kg/ha. of C.M. (vi) P.T.B.—22 (medium). (vii) Unirrigated. (viii) 2 hand weedings. (ix) 366 cm.; 229 cm.; 144 cm. (x) 23.8.61, 12.8.62; 23.8.63.

2. TREATMENTS :

5 split applications of 44·8 Kg/ha. of N as A/S : T_0=Control (No N), T_1=As basal dressing, T_2=As top dressing, T_3=Half as basal and half as top dressing, T_4= ¼ as basal and 3/4 as top dressing and T_5 =3/4 as basal +¼ as top dressing.

Top dressing done one month before flowering.

3. DESIGN :
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 6·1 m.×4·6 m. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1961—63. (b) Yes. (c) Nil. (v) N.A. (vi) Nil. (vii) Since the error variances are heterogeneous and Treatments×years interaction is absent, results of individual years are presented below.

5. RESULTS :

61(41)

   (i) 1516 Kg/ha. (ii) 248·1 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
Av. yield	1465	1386	1541	1599	1477	1625

62(100)

   (i) 2029 Kg/ha. (ii) 262·1 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
Av. yield	1739	1922	2205	2179	2192	1938

63(133)

   (i) 2300 Kg/ha. (ii) 470·6 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
Av. yield	1977	2222	2247	2515	2575	2261

Crop :- Paddy (*Kharif*).   Ref :- K. 61(56), 62(80).

Site :- Central Rice Res. Stn., Pattambi.   Type :- 'M'.

Object :—To find out the efficacy of Eupotorium as a manure for Paddy.

1. BASAL CONDITIONS :
   (i) (a) Nil for 61(56); Paddy—Paddy for 62(80). (b) Paddy. (c) 5604 Kg/ha. of G.L.+112 Kg/ha. of B.M. +56 Kg/ha. of C/A/N for 61(56) ; As per treatments for 62(80). (ii) Shallow laterite. (iii) 6.6.61/10.7.61 ; 5.5.62/13.6.62. (iv) (a) 8 ploughings, puddlings and planking for 61(56) ; ploughing with country plough, digging and puddling with spade for 62(80). (b) Transplanting. (c) N.A. (d) 25 cm.×25 cm. (e) 2. (v) Nil. (vi) P.T,B.—2 (medium). (vii) Unirrigated. (viii) 1 hand weeding for 61(56) ; weeding and gap-filling for 62(80). (ix) 334 cm.; 229 cm. (x) 17.10.61 ; 10.10.62.

2. TREATMENTS :
   3 manurial treatments: M_0=Control (No manure), M_1=22·4 Kg/ha. of N as C/A/N+22·4 Kg/ha. of P_2O_5
   as Super+22·4 Kg/ha. of K_2O as Mur. Pot. and M_2=5604 Kg/ha. of Eupotorium.
   C/A/N applied as top dressing one month before flowering. Super, Mur. Pot. and Eupotorium as basal dressing.

3. DESIGN :
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 6·1 m.×4·6 m. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1961—63 (Expt. failed in 63). (b) Yes. (c) Results of combined analysis given under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 2164 Kg/ha. (ii) 135·5 Kg/ha. (based on 30 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	M_0	M_1	M_2
Av. yield	1992	2367	2133

C D.=97·9 Kg/ha.

———

Crop :- Paddy (*Kharif*). **Ref :- K. 62(107), 63(136), 64(40).**

Site :- Central Rice Res. Stn., Pattambi. **Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy for 62(107) ; Nil for others. (b) Paddy. (c) As per treatments for 62(107), and 64(40) ; N.A. for 63(136). (ii) Shallow laterite. (iii) 23.5.1962/4.7.1962 ; 13.5.63/25.6.63 ; 16.5.64/29.6.64. (iv) (a) Ploughing with country plough, digging and puddling with spades and levelling for 62(107) ; 6 ploughings and levelling for 63(136) ; 1 ploughing and 2 diggings for 64(40). (b) Transplanting. (c) N.A. (d) 25 cm. ×25 cm. (e) 2. (v) 4483 Kg/ha. of G.L. before planting+22·4 Kg/ha. of P_2O_5 as Super+22·4 Kg/ha. of K_2O as Pot. Sul. at planting for 62(107) and 64(40); Nil for 63(136). (vi) PTB—2 (medium). (vii) Unirrigated. (viii) Gap filling and weeding for 62(107); N.A. for 63(136) ; One weeding for 64(40). (ix) 229 cm. ; 127 cm. ; 224 cm. (x) 23.10.1962 ; 20.10.1963 ; 29.10.1964.

2. TREATMENTS :

7 sources of N at 44·8 Kg/ha. : S_1=A/S/N, S_2=A/S, S_3=Urea, S_4=Calcium Nitrate, S_5=C/A/N, S_6=C/N and S_7=A/C.

N applied in 2 equal doses, 45 and 30 days before flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 9·1 m.×3·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. Lodging occurred from 29/30.9.64 in 64(40). (ii) Nil for 62(107) and 63(136) ; Slight attack by gall fly was noticed in 64(40), (iii) Yield of grain, height of plants and tiller counts. (iv) (a) 1962—64. (b) Yes. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments× years interaction is present.

5. RESULTS :

(i) 2219 Kg/ha. (ii) 260·1 Kg/ha. (based on 12 d.f. made up of Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	2285	2225	2362	2070	2258	2177	2155

———

Crop :- Paddy (*Rabi*). **Ref :- K. 61(32).**

Site :- Central Rice Res. Stn., Pattambi. **Type :- 'M'.**

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

1. BASAL CONDITIONS :

   (i) (a) Paddy—Paddy. (b) Paddy. (c) 44·8 Kg/ha. of N+33·6 Kg/ha. of P_2O_5+33·6 Kg/ha. of K_2O. (ii) Shallow laterite. (iii) 22.9.61/8.11.1961. (iv) (a) 6 ploughings and levelling. (b) Transplanting. (c) N.A. (d) 25 cm.×25 cm. (e) 2. (v) Nil. (vi) PTB—20. (vii) Unirrigated. (viii) Weeding. (ix) 143 cm. (x) 9.2.62.

2. TREATMENTS :

   6 sources of N at 44·8 Kg/ha.: S_1=A/S/N, S_2=A/S, S_3=Urea, S_4=Calcium Nitrate S_5=C/A/N and S_6=C/N. N applied in two equal doses, 45 days and 30 days before flowering.

3. DESIGN :

   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 9·1 m.×3·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

   (i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961—only. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS :

   (i) 1258 Kg/ha. (ii) 224·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	1203	1283	1442	1368	1078	1071

Crop :- Paddy (*Kharif*).   **Ref :- K. 60(12).**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

Object :—To assess the efficiency of B.M. as a manure to Paddy.

1. BASAL CONDITIONS:

   (i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Shallow laterite. (iii) 7.5.1960/17.6.1960. (iv) (a) 6 ploughings and levelling. (b) Transplanting. (c) N.A. (d) 25 cm.×25 cm. (e) 2. (v) 5604 Kg/ha. of G.L. as basal dressing. (vi) PTB—2 (medium). (vii) Unirrigated. (viii) 1 weeding. (ix) 217 cm. (x) 13.10.1960.

2. TREATMENTS :

   5 manurial treatments : M_1=168 Kg/ha. of B.M., M_2=G.L. to supply the amount of N as contained in M_1, M_3=A/S to supply the amount of N as contained in M_1, M_4=Super to supply the amount of P_2O_5 as contained in M_1 and M_5=M_3+M_4.

3. DESIGN :

   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 6·1 m.×3·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

   (i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—1960. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

   (i) 2077 Kg/ha. (ii) 280·6 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	2131	2001	2078	2088	2086

Crop :- Paddy *(Rabi).*   **Ref :- K. 60(13).**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

Object :—To assess the efficiency of B.M. as a manure to Paddy.

1. BASAL CONDITIONS:

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Shallow laterite. (iii) 1.10.1960/8.11.1960. (iv) (a) 6 ploughings and levellings. (b) Transplanting, (c) N.A. (d) 25 cm. ×25 cm. (v) 5604 Kg/ha. of G.L. as basal dressing. (vi) PTB—20 (medium). (vii) Unirrigated. (viii) Weeding. (ix) 133 cm. (x) 17.2.1961.

2. TREATMENTS to 4. GENERAL :

Same as in expt. No. 60(12) on page 72.

5. RESULTS :

(i) 1598 Kg/ha. (ii) 151·4 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	1620	1650	1572	1567	1582

—————

Crop :- Paddy *(Kharif).*   **Ref :- K. 62(109), 64 (87).**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

Object :—To study the effect of Nitrophosphate complex fertilizers produced by different processes and applied to previous paddy crop on the succeeding Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy for 62(109) ; N.A. for 64(87). (b) Paddy. (c) N.A. (ii) Shallow laterite. (iii) 15.6.1962/28.7.1962 ; 16.5.1964/1.7.1964. (iv) (a) Ploughing, digging and puddling with spades. (b) Transplanting. (c) N. A. (d) 25 cm.×25 cm. (e) 2. (v) Nil. (vi) P.T.B.—2 (medium). (vii) Unirrigated. (viii) Weeding and gap filling. (ix) 229 cm. ; 240 cm. (x) 30.10.1962; 7.11.1964.

2. TREATMENTS :

All combination of (1), (2) and (3)
(1) 3 types of fertilizer : P_1=Single Super, P_2=Nitro Phos. produced by O.D.D.A. (20—20—0) and P_3=Nitro Phos. produced by P.E.C. (16—14—0).

(2) 3 levels of fertilizer : L_1=13·5 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 cm. below seed at plan ting and M_3=Pellet application 10 days after planting.

The source of N is A/S when applied with P_1. Treatments applied to previous paddy crop.

3. DESIGN:

(i) 3^3 confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N. A. (iii) 2. (iv) (a) and (b) 4·6 m.× 4·6 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1961—1964 (expt. for 1961 and 1963—N.A.) (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 :

(i) 1963 Kg/ha. (ii) 226·5 Kg/ha. (based on 70 d. f. made up of Treatments× years interaction and pooled error). (iii) Main effect of P is highly significant and that of L is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	M_1	M_2	M_3	Mean
L_1	1948	1848	1853	1871	1839	1938	1883
L_2	2089	1915	1943	1853	2031	2063	1982
L_3	2153	1984	1934	2022	1980	2070	2024
Mean	2063	1916	1910	1915	1950	2034	1963
M_1	2050	1819	1877				
M_2	2001	1913	1935				
M_3	2139	2015	1917				

C. D. for P or L marginal means $=106.6$ Kg/ha.

———— ——

Crop :- Paddy (*Rabi*).   **Ref :- K. 61(63), 62(120), 63(163).**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

Object :–To find out the efficiency of Nitrophosphate complex fertilizers produced by different processes.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) N.A. (ii) Shallow laterite. (iii) 22.9.61 ; 1.10.62 ; 23.9.63. (iv) (a) 8 ploughings. (b) Transplanting. (c) N.A. (d) N.A. for 61 ; 25 cm. between lines for others. (e) 2. (v) G. L. at 5600 Kg/ha. (vi) P.T.B.—20 (medium). (vii) Unirrigated. (viii) N.A. (ix) 52 cm. for 61(63) ; N. A. for others. (x) 7.2.62; 5.2.63; 31.1.64.

2. TREATMENTS :

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

(1) 3 types of fertilizer : P_1=Single Super, P_2=Nitrophosphate produced by ODDA (20–20—0) and P_3=Nitrophosphate produced by PEC (16—14—0).

(2) 3 levels of fertilizer : L_1=13.5 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+47.2 Kg/ha. of P_2O_5.

(3) 3 methods of application : M_1=Broadcast, M_2=6 cm. below seed at planting and M_3=Pellet application 10 days after planting.

Source of N is A/S wnen applied with P_1.

3. DESIGN :

(i) 3^3 Confd. (ii) (a) 9 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 4.6 m.×4.6 m. for 61 ; 50.6 sq. m. for 62 and 63. (b) 4.6 m.×4.6 m. for 61 ; 40.5 sq.m. for 62 and 63. (v) Nil for 61 ; N.A. for others. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1961– 1963. (b) N.A. (c) —. (v) N.A. (vi) No. (vii) Error variances are heterogeneous and Treatments×years interaction is absent. Therefore, results of individual years are presented.

5. RESULTS :

61(63)

(i) 1475 Kg/ha. (ii) 245.0 Kg/ha. (iii) Main effect of L alone is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	M_1	M_2	M_3	Mean
L_1	1422	1306	1408	1408	1358	1370	1379
L_2	1460	1399	1447	1491	1433	1381	1435
L_3	1686	1499	1652	1503	1657	1677	1612
Mean	1523	1401	1502	1467	1483	1476	1475
M_1	1331	1485	1586				
M_2	1691	1257	1501				
M_3	1546	1462	1420				

C. D. for L marginal means=169·2 Kg/ha.

62(120)

(i) 962·6 Kg/ha. (ii) 85·6 Kg/ha. (iii) Main effects of P and L and interaction P×M are significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	M_1	M_2	M_3	Mean
L_1	974·2	932·1	889·2	974·2	906·9	914·4	931·8
L_2	965·7	954·5	874·2	948·9	934·0	911·6	931·5
L_3	1122·7	1049·8	901·3	1009·6	1047·9	1016·2	1024·6
Mean	1020·9	978·8	888·2	977·6	962·9	947·4	962·6
M_1	1013·4	999·4	920·0				
M_2	1013·4	929·3	876·1				
M_3	965·7	1007·8	868·6				

C.D. for P or L marginal means=59.21 Kg/ha.
C. D. for the body of P×M table=102·5 Kg/ha.

63(163)

(i) 750 Kg/ha. (ii) 112·8 Kg/ha. (iii) Main effect of L alone is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	M_1	M_2	M_3	Mean
L_1	735	708	714	734	731	693	719
L_2	741	731	685	648	759	750	719
L_3	863	859	710	828	805	799	810
Mean	780	766	703	737	765	747	750
M_1	767	760	684				
M_2	805	738	752				
M_3	768	800	674				

C.D. for L marginal means=78·0 Kg/ha.

Crop :- Paddy (*Kharif*).

Site :- Central Rice Res. Stn., Pattambi.

Ref :- K. 62(10), 64(89).

Type :- 'M'.

Object :—To study the residual effect of Nitrophosphate complex fertilizers produced by different processes and applied to previous paddy crop on the succeeding Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy for 62(10) ; N.A. for 64(89). (b) Paddy. (c) As per treatments. (ii) Shallow laterite. (iii) 5.5.62/8.6.62 ; 16.5.64/28.6.64. (iv) (a) 1 ploughing with country plough, 2 diggings and puddling with spades. (b) Transplanting. (c) N.A. (d) 25 cm. × 25 cm. (e) 2. (v) Nil. (vi) P.T.B. —2 (medium) (vii) Unirrigated. (viii) Gap filling and weeding. (ix) 229 cm. : 224 cm. (x) 7.10.62; 28.10.64.

2. TREATMENTS and 3. DESIGN :

Same as in expt. No. 62(109) and 64(87) on page 73.

4. GENERAL:

(i) Satisfactory. (ii) Preventive control measures adopted for 62(10); N.A. for 64(89). (iii) Yield of grain. (iv) (a) 1962—1964. (b) Yes. (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. Combined results of 62 and 64 are given. Expt. for 1963 N.A.

5. RESULTS :

(i) 1948 Kg/ha. (ii) 195·5 Kg/ha. (based on 70 d.f. made up of Treatments × years interaction and pooled error). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	P_1	P_2	P_3	M_1	M_2	M_3	Mean
L_1	1929	1950	1945	1942	1899	1983	1941
L_2	1926	1962	1977	1924	1975	1967	1955
L_3	1930	1942	1975	1924	1973	1949	1949
Mean	1928	1951	1966	1930	1949	1966	1948
M_1	1899	1924	1968				
M_2	1953	1947	1947				
M_3	1933	1983	1983				

Crop :- Paddy (*Kharif*).

Site :- Central Rice Res. Stn., Pattambi.

Ref :- K. 65(18)

Type :- 'M'.

Object :—To find out the effect of continuous application of green leaves and A/S alone and in combination on Paddy.

1. BASAL CONDITIONS :

(i) (a) N. A. (b) Paddy. (c) N. A. (ii) Clay loam. (iii) 3.5.65/22.7.65. (iv) (a) Digging and ploughing. (b) Transplanting. (c) Nil. (d) 20 cm. × 15 cm. (e) 2. (v) Nil. (vi) P.T.B.—2 (late). (vii) Irrigated. (viii) Weeding and gap filling. (ix) 155 cm. (x) 22.10.65.

2. TREATMENTS :

5 manurial treatments : T_1=Green leaf at 5600 Kg/ha. to give 30 Kg/ha. of N, T_2=Green leaf at 11200 Kg/ ha. to give 60 Kg/ha. of N, T_3=T_1+16·8 Kg/ha. of N as A/S, T_4=A/S to supply 36·6 Kg/ha. of N and T_5=A/S to supply 73·2 Kg/ha. of N.

A/S. in all cases to be top dressed one month after planting.

3. **DESIGN** :

(i) R.B.D. (ii) (a) 5. (b) 22·9 m.×6·1 m. (iii) 5. (iv) (a) N.A. (b) 6·1 m.×4·6 m. (v) One row alround is left out as guard row. (vi) Yes.

4. **GENERAL** :

(i) to (iii) N. A. (iv) (a) 1965—contd. (b) Yes. (c) Nil. (v) to (vii) N. A.

5. **RESULTS** :

(i) 2010 Kg/ha. (ii) 187·3 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
Av. yield	1863	2117	1949	2042	2081

Crop :- Paddy (*Rabi*).   **Ref :- K. 61(136), 62(126).**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

Object :—To assess the relative merits of continuous application of different kinds of G.L. as basal dressing.

1. **BASAL CONDITIONS** :

(i) (a) Paddy-–Paddy. (b) Paddy. (c) N.A. for 61 and as per treatments for 62. (ii) Laterite loam. (iii) 22.9.61/3.11.61 ; 1.10.62/8.11.62. (iv) (a) Digging and levelling. (b) to (e) N.A. (v) 22 Kg/ha. of P_2O_5 as Super+22 Kg/ha. of K_2O as Mur. Pot.+22 Kg/ha. of N as A/S. (vi) P.T.B.—20 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 30.1.62 ; 7.2.63.

2. **TREATMENTS** :

7 kinds of G.L. at 4600 Kg/ha. : G_1=*Gliricidia*, G_2=*Indigofera*, G_3=*Mango*, G_4=*Calapagonium*, G_5=*Sesbania*, G_6=*Dhaincha* and G_7=*Vengai*.

3. **DESIGN** :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 9·1 m.×3·1 m. (v) Nil. (vi) Yes.

4. **GENERAL** :

(i) Lodged after flowering. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1961—62. (b) Yes. (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** :

(i) 2445 Kg/ha. (ii) 102·3 Kg/ha. (based on 6 d.f. made up of Treatments×years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	G_1	G_2	G_3	G_4	G_5	G_6	G_7
Av. yield	2333	2681	2318	2473	2383	2362	2562

C.D.=125·2 Kg/ha.

Crop :- Paddy (*Kharif*).   **Ref :- K. 60(10), 61(39), 62(77), 64(44).**

Site :- Central Rice Res. Stn., Pattambi. Type :- 'M'.

Object :—To find out the effect of continuous application of A/S and G.L. alone and in combinations on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Shallow laterite. (iii) 7.5.60/17.6.60 ; 20.5.61/ 27.6.61 ; 5.5.62/8.6.62 ; 16.5.64/28.6.64. (iv) (a) 4 to 8 ploughings, digging, levelling and puddling with spades. (b) Transplanting. (c) N.A. (d) 25 cm.×25 cm. (e) 2. (v) Nil. (vi) P.T.B.—2 (medium). (vii) Unirrigated. (viii) Weeding and gap filling. (ix) 309 cm. ; 404 cm. ; 229 cm. and 237. (x) 11.10.60 ; 6.10.61 ; 3.10.62 and 7.10.64.

2. TREATMENTS:

5 manurial treatments : M_1=5604 Kg/ha. of G.L., M_2=11208 Kg/ha. of G.L., M_3=M_1+16·8 Kg/ha. of N as A/S, M_4=33·6 Kg/ha. of N as A/S and M_5=67·2 Kg/ha. of N as A/S.

A/S applied as top dressing one month before flowering and G.L. as basal dressing.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 6·1 m.×4·6 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Endrin sprayed against stem borer in 60(10) and 64(44). Silver shoots attack observed and control measures adopted in 62(77). (iii) Yield of grain. (iv) (a) 1957—contd. (Expt. failed in 63). (b) Yes. (c) Nil. (v) N.A. (vi) Nil. (vii) Expt. is continued and 1965 expt. is N.A.

5. RESULTS :

60(10)

(i) 2333 Kg/ha. (ii) 174·7 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	2278	2498	2389	2231	2267

61(39)

(i) 1947 Kg/ha. (ii) 221·9 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	1924	1936	1936	1885	2055

62(77)

(i) 2384 Kg/ha. (ii) 152·5 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	2424	2592	2412	2180	2312

C.D.=183·6 Kg/ha.

64(44)

(i) 2341 Kg/ha. (ii) 126·8 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	2356	2506	2422	2177	2242

C.D.=152·7 Kg/ha.

———

Crop :- Paddy (*Rabi*).   **Ref :- K. 60(18).**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

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

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) As per treatments. (ii) Shallow laterite. (iii) 1:10.60/7.11.60. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) 25 cm.×25 cm. (e) 2. (v) N.A. (vi) P.T.B.—20 (medium). (vii) Un-irrigated. (viii) N.A. (ix) 309 cm. (x) 14.2.61.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of G.L. : G_1=2242, G_2=5604 and G_3=8967 Kg/ha.

(2) 3 levels of N as A/S : S_1=67.2, S_2=134.5 and S_3=201.8 Kg/ha.

Green leaf is applied as basal dose and A/S as top dressing one month before flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 7.6 m.×4.6 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—60. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 2391 Kg/ha. (ii) 215.7 Kg/ha. (iii) Only the effect of S is significant. (iv) Av. yield of grain in Kg/ha.

	G_1	G_2	G_3	Mean
S_1	2334	2370	2338	2347
S_2	2464	2498	2615	2526
S_3	2277	2266	2436	2300
Mean	2358	2378	2436	2391

C.D. for S marginal means=181.7 Kg/ha.

Crop :- Paddy (*Kharif*). **Ref :- K. 64(48).**

Site :- Central Rice Res. Stn., Pattambi. **Type :- 'M'.**

Object :– To find out the effect of N, P and lime on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5604 Kg/ha. of G.L.+44.8 Kg/ha. of N as A/S+33.6 Kg/ha. of P_2O_5 as Super+33.6 Kg/ha. of K_2O as Mur. Pot. (ii) Lateritic. (iii) 5.5.64/18.6.64. (iv) (a) 1 ploughing, digging and levelling. (b) Transplanting. (c) N.A. (d) 25 cm.×25 cm. (e) 2. (v) 3363 Kg/ha. of G.L.+33.3 Kg/ha. of K_2O as Mur. Pot. (vi) P.T.B.—9 (medium). (vii) Unirrigated. (viii) 1 weeding. (ix) 237 cm. (x) 3.10.64.

2. TREATMENTS :

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

(1) 2 levels of N as A/S : N_1=44.8 Kg/ha. and N_2=67.3 Kg/ha.

(2) 2 levels of P_2O_5 as Super : P_1=22.4 Kg/ha. and P_2=44.8 Kg/ha.

(3) 2 levels of lime : L_0=0 and L_1=336 Kg/ha.

A/S applied half as basal and half as top dressing, and full P_2O_5 and lime as basal.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) 36.2 m.×9 m. (iii) 4. (iv) (a) and (b) 9 m.×4 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Incidence of gall fly noted. Endrin sprayed once. (iii) Tiller counts, plants height and yield of grain. (iv) (a) 1964—66. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 3708 Kg/ha. (ii) 191.4 Kg/ha. (iii) Main effects of L and P are significant. (iv) Av. yield of grain in Kg/ha.

	L_0	L_1	P_1	P_2	Mean
N_1	3583	3799	3584	3798	3691
N_2	3655	3795	3686	3764	3725
Mean	3619	3797	3635	3781	3708
P_1	3523	3747			
P_2	3715	3847			

C.D. for L or P marginal means=140.7 Kg/ha.

Crop :- Paddy (*Kharif*). Ref :- K. 64(50).

Site :- Central Rice Res. Stn., Pattambi. Type :- 'M'.

Object :—To compare the effect of powdered leaf and dried leaf on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5604 Kg/ha. of G.L.+44.8 Kg/ha. of N as A/S+33.6 Kg/ha. of P_2O_5 as Super +33.6 Kg/ha. of K_2O as Mur. Pot. (ii) Lateritic soil. (iii) 16.5.64/7.7.64. (iv) (a) 7 ploughings, digging and levelling. (b) Transplanting. (c) N.A. (d) 25 cm.×15 cm. (e) 2. (v) 33.6 Kg/ha. of N as A/S+33.6 Kg/ha. of P_2O_5 as Super+33.6 Kg/ha. of K_2O (as P and K applied as basal ; N applied in two doses—$\frac{1}{2}$ as basal and $\frac{1}{2}$ after planting). (vi) PTB—2 (medium). (vii) Unirrigated. (viii) 2 weedings. (ix) 237 cm. (x) 7.11.1964.

2. TREATMENTS :

4 methods of application of 5604 Kg/ha. of G.L. : M_0=Control (no application), M_1=G.L., M_2=G.L. dried before application and M_3=G.L. dried and powdered before application.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 10.8 m.×8.0 m. (iii) 6. (iv) (a) and (b) 8 m.×3 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal, Lodged on 30.9.1964. (ii) Incidence of gall fly was noticed. Endrin sprayed once. (iii) Tiller counts, yield of grain and plant height. (iv) (a) 1964—66. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 2646 Kg/ha. (ii) 303.3 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	2562	2861	2674	2486

Crop :- Paddy (*Kharif*).   **Ref :- K. 64(52).**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

Object :—To find out the effect of micronutrients on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 44.8 Kg/ha. of N+33.6 Kg/ha. of P_2O_5+33.6 Kg/ha of K_2O. (ii) Lateritic soil. (iii) 16.5.1964/9.7.1964. (iv) (a) 7 ploughings and digging. (b) Transplanting. (c) N.A. (d) 25 cm.$\times$25 cm. (e) 2. (v) 33.6 Kg/ha. of N as A/S+33.6 Kg/ha. of P_2O_5 as Super+33.6 Kg/ha. of K_2O as Mur. Pot. (vi) PTB—2 (medium). (vii) Unirrigated. (viii) 2 weedings. (ix) 22.7 cm. (x) 7 11.1964.

2. TREATMENTS :

8 micronutrient treatments : M_0=Control, M_1=11.2 Kg/ha. of Manganese as Mn. Sul., M_2=5.6 Kg/ha. of Iron as Fe. Sul., M_3=2.2 Kg/ha. of Molybdenum as Molybdic acid, M_4= 56 Kg/ha. of Silicon as Sod. Silicate, M_5=112 Kg/ha. of Magnesium carbonate, M_6=11 2 Kg/ha. of Born as Borax and M_7=28 Kg/ha. of Copper as Cu.Sul.

The chemicals are dissolved in water and solution sprayed in soil 5 days before planting.

3. DESIGN :
(i) R.B.D. (ii) (a) 8. (b) 16.8 m.$\times$$9.6$ m. (iii) 4. (iv) (a) and (b) 4.5 m.$\times$$3.8$ m. (v) Nil. (vi) es.

4. GENERAL :

(i) Normal, Lodged on 26.9.1964. (ii) Incidence of gall fly was noticed. Endrin was sprayed twice. (iii) Tiller counts., plant height and yield of grain. (iv) (a) 1964—66. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 2367 Kg/ha. (ii) 185.1 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	M_7
Av. yield	2207	2341	2281	2474	2474	2415	2370	2370

Crop :- Paddy (*Kharif*).   **Ref :- K. 64(32).**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

Object :—To study the comparative merits of compost prepered by different methods and of C.M. stored by different methods on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Shallow laterite. (iii) 8.5.1964/28.6.1964. (iv) (a) 1 ploughing, 1 digging. (b) Transplanting. (c) N.A. (d) 25 cm.$\times$25 cm. (e) 2. (v) 20 Kg/ha. of P_2O_5+20 Kg/ha. of K_2O as Mur. Pot.+20 Kg/ha. of N as A/S. (vi) PTB—26 (medium). (vii) Unirrigated. (viii) 1 weeding. (ix) 209 cm. (x) 28.9.1964.

TREATMENTS :

Main-plot treatments :

2 levels of fertilizers : M_0=0 and M_1=20 Kg/ha. of N as A/S+20 Kg/ha. of P_2O_5 as Super+20 Kg/ha. of K_2O as Mur. Pot.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 4 forms of compost of F.Y.M. : F_1=F.Y.M. stored in by pit system, F_2=F.Y.M. stored at loose bor system, F_3=Compost prepared by Bangalore method and F_4=Compost prepared by Indore method.

(2) 2 levels of compost and F.Y.M. : L_1=125 and L_2=250 Q/ha.
Compost and F.Y.M. are applied at time digging :   N, P_2O_5, K_2O are applied at final puddling.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 8 sub-plots/main-plot. (b) 28·2 m.×14.6 m. (iii) 4. (iv) (a) and (b) 7 m.×3 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Tiller counts and yield of grain. (iv) (a) 1963—65 (Expt. for 1963 failed). (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 2443 Kg/ha. (ii) (a) 223·8 Kg/ha. (b) 293·5 Kg/ha. (iii) Main effect of F alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	F_1	F_2	F_3	F_4	L_1	L_2	Mean
M_0	2517	2517	2037	2351	2302	2409	2356
M_1	2685	2764	2257	2414	2505	2555	2530
Mean	2601	2641	2147	2383	2404	2482	2443
L_1	2549	2606	2238	2222			
L_2	2654	2675	2056	2543			

C.D. for F marginal means = 221·1 Kg/ha.

Crop :- Paddy (*Kharif*).   **Ref :- K. 62(110), 63(147), 64(36).**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

Object :—To compare the relative efficiency of different kinds of phosphatic fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 5604 Kg/ha. of C.M.+112 Kg/ha. of B.M.+56 Kg/ha. of Mur. Pot. +28 Kg/ha. of Urea for 62(110); As per treatments for 63(147) and 64(36). (ii) Shallow laterite. (iii) (a) 23.5.1962/7.7.1962 ; 4.6.1963/12.7.1963 ; 16.5·1964/24.6.1964. (iv) (a) Ploughing with country plough, digging and puddling with spades for 62(110) ; 2 ploughings and 2 diggings for 63(147) and 64(36). (b) Transplanting. (c) N.A. (d) 25 cm.×25 cm. (e) 2. (v) 4483 Kg/ha. of G.L.+22·4 Kg/ha. of K_2O as Mur. Pot. for 62(110) ; 4483 Kg/ha. of G.L.+44·8 Kg/ha. of Mur. Pot.+112 Kg/ha. of A/S as top dressing for other. (vi) PTB—2 (medium). (vii) Unirrigated. (viii) Gap filling and weeding for 62(110) ; Recti fication of bunds before top dressing and 2 weedings for others. (ix) For 62(110) 229 cm. ; 210 cm. for 63(147) and N.A. for 64(36). (x) 25.10.1962 ; 2.11.53 ; 6.10.64.

2. TREATMENTS :

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

(1) 3 levels of P_2O_5 : P_1=16·8. P_2=33·6 and P_3=50·4 Kg/ha.

(2) 4 sources of P_2O_5 : S_1=Hyper Phos., S_2=Super, S_3=B.M. and S_4=Rock Phos. P_2O_5 applied as basal dressing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) and (b) 7·6 m.×3·1 m. for 62(110), 63(147) and 6·1 m.×4·6 m. for other. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961—64 (during 1961 the expt. is conducted in second season). (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 :

(i) 2790 Kg/ha. (ii) 210·6 Kg/ha. (based on 130 d.f. made up of Treatments×years interaction and pooled error). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=2657 Kg/ha.

	S$_1$	S$_2$	S$_3$	S$_4$	Mean
P$_1$	2802	2808	2685	2717	2753
P$_2$	2759	2878	2820	2813	2818
P$_3$	2863	2853	2774	2839	2832
Mean	2808	2847	2760	2789	2801

Crop :- Paddy (*Kharif*). **Ref :- K. 61(53), 62(78), 64(46).**

Site :- Central Rice Res. Stn., Pattambi. **Type :- 'M'.**

Object :—To assess the effect of continuous application of C.M., G.L. and A/S alone and in combination with P and K.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 5604 Kg/ha. of G.L.+112 Kg/ha. of B.M.+56 Kg/ha. of C/A/N for 61(53). As per treatments for 62(78) and 64(46). (ii) Shallow lateritic. (iii) 30.4.61; 5.5.62; 16.5.64. (iv) (a) 8 ploughings. (b) Transplanting. (c) N.A. (d) 25 cm.×25 cm. (e) 2. (v) Nil. (vi) P.T.B.—2 (medium). (vii) Unirrigated. (viii) N.A. (ix) 415 cm.; 229 cm.; 237 cm. (x) 6.10.61; 5.10.62; 7.10.64.

2. TREATMENTS :

8 manurial treatments : M$_1$=C.M. at 8967 Kg/ha., M$_2$=G.L. at 8967 Kg/ha., M$_3$=G.L. at 4483 Kg/ha.+ 4483 Kg/ha. of C.M., M$_4$=A/S at 44·8 Kg/ha. of N, M$_5$=C.M. at 4483 Kg/ha. +A/S at 22·4 Kg/ha. of N+22·4 Kg/ha. of P$_2$O$_5$ as Super+22·4 Kg/ha. of K$_2$O as Pot. Sul., M$_6$=G.L. at 4483 Kg/ha.+22·4 Kg/ha. of N as A/S+22·4 Kg/ha. of P$_2$O$_5$ as Super+22·4 Kg/ha. of K$_2$O as Pot. Sul., M$_7$=G.L. at 2242 Kg/ha.+C.M. at 2242 Kg/ha.+22·4 Kg/ha. of N as A/S+22·4 Kg/ha. of P$_2$O$_5$ as Super+22·4 Kg/ha. of K$_2$O as Pot. Sul., M$_8$=44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of P$_2$O$_5$ as Super+22·4 Kg/ha. of K$_2$O as Pot. Sul.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 4·9 m.×4·6 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A., Pre-control measures adopted. Endrin sprayed twice. (iii) Grain yield. (iv) (a) 1961—64. (Expt. for 1963 N.A.) (b) Yes. (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 present.

5. RESULTS :

(i) 2787 Kg/ha. (ii) 290·1 Kg/ha. (based on 14 d.f. made up of Treatments×years interaction). (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M$_1$	M$_2$	M$_3$	M$_4$	M$_5$	M$_6$	M$_7$	M$_8$
Av. yield	2549	2689	2755	2624	2916	3008	2910	2849

C.D.=254·0 Kg/ha.

Crop :- Paddy (*Kharif*).   **Ref :- K. 61(54).**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

Object :—To assess the continuous application of C.M., G.L. and A/S alone and in combination with P and K on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy– Paddy. (b) Paddy. (c) As per treatments. (ii) Shallow lateritic. (iii) 17.9.61/24.10.61. (iv) (a) 4 ploughings, 2 diggings and levellings. (b) Transplanting. (c) N.A. (d) 25 cm. ×25 cm. (e) 2. (v) Nil. (vi) P T.B.–20 (medium). (vii) Unirrigated. (viii) 1 hand weeding. (ix) 74 cm. (x) 20.1.62.

2. TREATMENTS : to 4. GENERAL :

Same as in Expt. No. 61(53), 62(78), 64(46) on page 83.

5. RESULTS :

(i) 2462 Kg/ha. (ii) 265·0 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	M_6	M_7	M_8
Av. yield	1901	2549	2276	2320	2394	2715	2670	2867

C.D.=389·6 Kg/ha.

Crop :- Paddy (*Kharif*).   **Ref :- K. 60(17).**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

Object :—To study the effect of different levels of A/S and G.L. o⁼ Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Shallow lateritic. (iii) 1.6.60/2.7.60. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) 25 cm.×25 cm. (e) 2. (v) N.A. (vi) P.T.B.—2 (medium). (vii) Unirrigated. (viii) N.A. (ix) 309 cm. (x) 16.10.60.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 levels of G.L. : G_1=2242, G_2=5604 and G_3=8967 Kg/ha.
(2) 3 levels of N as A/S : S_1=67·2, S_2=134·5 and S_3=201·8 Kg/ha.
G.L. is applied as basal dose and A/S as top dressing one month before flowering.

3, DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 7·6 m.×4·6 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—60. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 2909 Kg/ha. (ii) 308·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	G_1	G_2	G_3	Mean
S_1	2746	2747	3005	2833
S_2	2968	2789	2985	2914
S_3	2936	2850	3151	2979
Mean	2883	2795	3047	2909

Crop :- Paddy (*Kharif*).   **Ref :- K. 60(14).**

Site :- Central Rice Res. Stn., Pattambi   **Type :- 'M'.**

Object :—To find out the merit of Sodium chloride as a fertilizer as well as its capacity to suppress weeds in Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Paddy —Paddy. (b) Paddy. (c) As per treatments. (ii) Shallow lateritic. (iii) 10.5.60. (iv) (a) 8 ploughings. (b) Broadcast. (c) 85 Kg/ha. (d) and (e) N.A. (v) 4483 Kg/ha. of G.L.+22·4 Kg/ha. of P_2O_5 as Super + 22·4 Kg/ha. of K_2O as Pot. Sul. (vi) P.T.B.—28 (medium). (vii) Unirrigated. (viii) N.A. (ix) 217 cm. (x) 31.8.60.

2. **TREATMENTS :**

Main-plot treatments :
     3 levels of Sodium Chloride: $M_0 = 0$, $M_1 = 112$ and $M_2 = 224$ Kg/ha.

Sub-plot treatments :
     3 levels of manuring : S_0 = No manure, $S_1 = 112$ Kg/ha. of Super + 56 Kg/ha. of Pot. Sul. and $S_2 = 22·4$ Kg/ha. of Super + 112 Kg/ha. of Pot. Sul,

Sod. Chloride applied 3 weeks before sowing ; Super and Pot. Sul. applied at sowing.

3. **DESIGN :**

(1) Split-plot. (ii) (a) 3 main-plots/replication and 3 sub-plots/main-plots. (b) N.A. (iii) 4. (iv) (a) and (b) 6·1 m.×3·1 m. (v) N.A. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1959—60. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. **RESULTS :**

(i) 655 Kg/ha. (ii) (a) 159·1 Kg/ha. (b) 104·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	S_0	S_1	S_2	Mean
M_0	771	706	683	720
M_1	611	725	607	648
M_2	580	568	645	598
Mean	654	666	645	655

Crop :- Paddy (*Kharif*).   **Ref :- K. 61(58), 62(108)**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

Object :—To assess the relative merits of different kinds of G. L. as basal dressing for Paddy in wet lands.

1. **BASAL CONDITIONS :**

(i) (a) Paddy—Paddy. (b) Paddy. (c) 5604 Kg/ha. of G.L. +112 Kg/ha. of B.M.+56 Kg/ha. of C/A/N. (ii) Shallow laterite. (iii) 30.4 61/9.6.61 ; 15.6.62/23.7.62. (iv) (a) Ploughings, puddlings, plankings and levelling. (b) Transplanting. (c) N.A. (d) 25 cm.×25 cm. (e) 2. (v) 22·4 Kg/ha. of P_2O_5 as Super + 22.4 Kg/ha. of K_2O as Mur. Pot. (vi) P.T.B.—2. (vii) Unirrigated. (viii) 1 to 2 weedings. (ix) 415 cm. and 229 cm. respectively. (x) 4.10.61 and 6.10.62 respectively.

2. **TREATMENTS :**

7 sources of 4483 Kg/ha. of G.L. : S_1 = Glyricidia, S_2 = Indigofera, S_3 = Mango, S_4 = Calapagorium, S_5 = Sesbania, S_6 = *Dhaincha* and S_7 = Vangai.

     G.L. applied as basal dressing.

3. DESIGN :

(i) R. B. D. (ii) (a) 7. (b) N. A. (iii) 4. (iv) (a) and (b) 9·1 m. × 3·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Preventive crop protection measures taken. (iii) Yield of grain. (iv) (a) 1961—1962. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments × Years interaction is absent. Hence individual results are presented under 5. Results.

5. RESULTS :

61(58)

(i) 2718 Kg/ha. (ii) 129·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	2662	2739	2746	2706	2787	2596	2787

62(108)

(i) 1892 Kg/ha. (ii) 275·5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6	S_7
Av. yield	1694	1816	1780	1882	1991	2052	2027

———

Crop :- Paddy *(Rabi).*   **Ref :- K. 60(11) ; 61(40).**

Site :- Central Rice Res. Stn., Pattambi.   **Type :- 'M'.**

Object :—To find out the effect of continuous application of A/S and G.L. alone and in combination on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Shallow laterite. (ii) 13.9.60/25.10.60 ; 7.9.61/ 24.10.61. (iv) (a) 4 ploughings, digging and levelling. (b) Transplanting. (c) N. A. (d) 25 cm. × 25 cm. (e) 2. (v) N. A. (vi) P.T.B.—20 (medium). (vii) Unirrigated. (viii) N. A. for 60(11) ; 1 hand weeding for 61(40). (ix) N. A. for 60(11) ; 74 cm. for 61(40). 28.1.61 ; 23.1.62.

2. TREATMENTS :

5 manurial treatments : $M_1 = 5604$ Kg/ha. of G.L., $M_2 = 11208$ Kg/ha. of G.L., $M_3 = M_1 + 16·8$ Kg/ha. of N as A/S ; $M_4 = 33·6$ Kg/ha. of N as A/S and $M_5 = 67·2$ Kg/ha. of N as A/S.
A/S applied as top dressing one month before flowering and G.L. as basal dressing.

3 DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 6·1 m. × 4·6 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Endrin sprayed against stemborer in 60(11). (iii) Yield of grain. (iv) (a) 1957—61. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Expt. for 57 to 59 have been taken for pooling. Error variances are heterogeneous and Treatments × years interaction is absent. Hence individual results are Presented below.

5. RESULTS :

60(11)

(i) 1912 Kg/ha. (ii) 194·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield grain in Kg/ha.

Treatment	M_1	M_2	M_3	M_4	M_5
Av. yield	1771	1921	1933	1917	2016

61(40)

(i) 1595 Kg/ha. (ii) 260·5 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	1546	1719	1682	1456	1572

———

Crop :- Paddy (*Kharif*)   **Ref :- K. 60(43)**

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

Object :—To study the effect of different levels of K on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 5604 Kg/ha. of G.L.+168 Kg/ha. of Super+168 Kg/ha. of A/S. (ii) Clay loam. (iii) 23.4.60/31.5.60. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) 25 cm.×25 cm. (e) 2. (v) 5604 Kg/ha. of G.L.+168 Kg/ha. of Super+150 Kg/ha. of A/S. (vi) P.T.B.—9 (medium). (vii) Un-irrigated. (viii) Working of rotary hoe twice. (ix) 332 cm. (x) 27.9.60.

2. TREATMENTS :

6 levels of K_2O : K_0=O, K_1=16·8, K_2=28·0, K_3=39·2, K_4=50·4 and K_5=61·6 Kg/ha.

3. DESIGN :

(I) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 7·9 m.×3·1 m. (b) 7·6 m.×2·7 m. (v) 15 cm.×15 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of jassid, rice bugs and cater pillars were noticed. Dusting with B.H.C. (iii) Tiller count and yield of grain. (iv) (a) 1960 only. (b) No. (c) N.A. (v) Nil. (vi) A continuous heavy down pour of rain was unexpectedly recurred during the harvesting time and it hampered the progress of harvesting and thrashing and drying of paddy. (vii) Nil.

5. RESULTS :

(i) 2620 Kg/ha. (ii) 390·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	K_0	K_1	K_2	K_3	K_4	K_5
Av. yield	2676	2731	2734	2550	2622	2405

———

Crop :- Paddy (*Rabi*).   **Ref :- K. 61(66), 62(41)**

Site :- Agri. College & Res. Instt., Vellayani.   **Type :- 'M'.**

Object:—To study the effect of different types of G.L. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy for 61(66) ; Fallow for others. (c) Nil. (ii) (a) Sandy loam. (iii) N.A./12.10.61 ; N.A./N.A. (iv) (a) 6 ploughings, 2 diggings with *mammuthy* for 61(66) ; 4 ploughings. levelling and 2 diggings for 62(41). (b) Transplanting for 61(66) ; Broadcast for other. (c) N.A. for 61(66) ; 90 Kg/ha. for 62(41). (d) 23 cm.×15 cm. ; N.A. (e) 2 ; N.A. (v) 246 Kg/ha. of Super+79 Kg/ha. of Mur. Pot.+492 Kg/ha. of lime as CaO broadcast one day before planting for 61(66) ; 29·6 Kg/ha. of Mur. Pot.+224 Kg/ha. of Super broadcast for other. (vi) Kalavali for 61(66) ; *Kochuvithu* (early) for other. (vii) Irrigated. (viii) 1 weeding and 1 hoeing for 61(66) ; 1 weeding for other. (ix) 34·3 cm. ; 49 cm. (x) N.A. ; 8.2.63.

2. TREATMENTS :

All combinations of (1) and (2)+a control
    (1) 2 types of leaves : L_1=Green leaves at 9844 Kg/ha. and L_2=Dry leaves at 2461 Kg/ha.
    (2) 3 sources of leaves : S_1=Glyricidia, S_2=Indigofora—teysmania and S_3=Eupatorium—odoratum.

The percentage of moisture in green leaves was 75% and hence 2461 Kg/ha. of dry leaves are equivalent to 9844 Kg/ha. of green leaves.

Treatments applied as basal dressing just before the last digging.

3. DESIGN :

(i) Fact in R.B.D. (ii) (a) 7. (b) N.A. for 61(66) ; 32·9 m×10·1 m. for 62(41). (iii) 4. (iv) 4·9 m.×9·5 m. for 61(66) ; 5·2 m.×9·8 m. for 62(41). (b) 4·6 m.×9·1 m. (v) 30 cm.×30 cm. for 61(66) ; 30 cm.×30 cm. for 62(41). (vi) Yes.

4. GENERAL :

(i) Healthy but crop lodged in 2nd week of January for 61(66) ; Poor for other. (ii) Crop affected by leaf roller and caseworm in 61(66), DDT sprayed ; Stemborer attack in other, controlled by spraying Endrin. (iii) Yield of grain. (iv) (a) 1959—62 (levels of leaves changed in 1961). (b) No. (c) Results of combined analysis given under 5. Results (v) (a) and (b) N.A. (vi) and (vii) Error variances are heterogeneous and Treatments×Years interaction is present.

5. RESULTS :

(i) 1906 Kg/ha. (ii) 420·3 Kg/ha. (based on 28·6 d.f. made up of Treatments×years interaction). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=1736 Kg/ha.

	S_1	S_2	S_3	Mean
L_1	2129	1910	1962	2000
L_2	2033	1760	1812	1868
Mean	2081	1835	1887	1934

Crop :- Paddy (*Rabi*).   'Ref :- K. 61(68).

Site :- Agri. College and Res. Instt., Vellayani.   Type :- 'M'.

Object :—To test the effect of fortified compost as against compost with P_2O_5 added separately on Paddy yield.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 16.10.1961. (iv) (a) 6 ploughings, digging and levelling. (b) Transplanting. (c) 34 Kg/ha. (d) 23 cm.×23 cm. (e) 2. (v) Nil. (vi) Kulavali. (vii) Unirrigated. (viii) and (ix) N.A. (x) 8.2.1962.

2. TREATMENTS :

T_1=Ordinary compost, T_2=Compost fortified with Super at 5·7 Kg/pit, T_3=Compost fortified with Super at 11·3 Kg/pit, T_4=Compost fortified with B.M. at 4·5 Kg/pit, T_5=Compost fortified with B.M. at 9·1 Kg/pit, T_6=Compost+Super at 5·7 Kg/pit, T_7=Compost+Super at 11·3 Kg/pit, T_8=Compost+B.M. at 4·5 Kg/pit and T_9=Compost+B.M. at 9·1 Kg/pit.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 8·2 m.×6·4 m. (b) 7·3 m.×5·5 m. (v) 46 cm.×46 cm. (iv) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961—only. (b) and (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1287 Kg/ha. (ii) 300·0 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	T_7	T_8	T_9
Av. yield	1391	1264	1028	1483	1296	1512	1254	999	1360

— ——

Crop :- Paddy (*Rabi*).   **Ref :- K. 62(28).**

Site :- Agri. College and Res. Instt., Vellayani.   **Type :- 'M'.**

Object :—To study the effect of different phosphatic fertilizers on Paddy in Thottapahy area.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 112 Kg/ha. of Hyper Phos.+84 Kg/ha. of C/A/N as top dressing. (ii) Clayey soil. (iii) 1.12.1962. (iv) (a) 2 ploughings. (b) Transplanting. (c) N.A. (d) 23 cm.×15 cm. (e) 2. (v) 22·4 Kg/ha. of N as Urea as top dressing. (vi) T—9. Improved (short duration). (vii) Irrigated. (viii) Weeding and thinning. (ix) 15 cm. (x) 22.2.1963.

2. TREATMENTS:

5 manurial treatments : M_0=Control, M_1=218 Kg/ha. of Lime as CaO, M_2=218 Kg/ha. of Super, M_3=437 Kg/ha. of Super Lime Mixture in 1 : 1 ratio and M_4=M_1+M_2.
Manures broadcast one day before sowing. 44·8 Kg/ha. of P_2O_5 is supplied by the phosphatic fertilizers.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 10·1 m.×6·4 m. (b) 9·1 m.×5·5 m. (v) 0·5 m.×0·5 m. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Folidol and Copper fungicides were sprayed. (iii) Yield of grain. (iv) (a) 1962—only. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 2184 Kg/ha. (ii) 265·3 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
Av. yield	2223	2242	2083	2223	2148

— ———

Crop :- Paddy (*Rabi*).   **Ref :- K. 60(81), 61(75), 62(30).**

Site :- Agri. College and Res. Instt., Vellayani   **Type :- 'M'.**

Object :—To select the best form of lime and its economic dose for Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) 22·4 Kg/ha. of N as A/S+44·8 Kg/ha. of P_2O_5 as Super +22·4 Kg/ha. of K_2O as Mur. Pot. (ii) Sandy clay—very dark. (iii) 29.11.1960 ; 12.10.61 ; 5.12.62. (iv) (a) 3 ploughings. (b) Transplanting. (c) N.A. (d) 23 cm.×15 cm. (e) 2. (v) 280 Kg/ha. of Super+89·7 Kg/ha. of Mur. Pot. broadcast as basal dressing and 134 Kg/ha. of A/S as top dressing one week after planting. (vi) PTB—10 (*Kenjathikhima*) early. (vii) Irrigated. (viii) 3 weedings. (ix) N.A. (x) 15.2.1961 ; 4.1.62 ; 11.2.63.

2. TREATMENTS :

7 manurial treatments : M_0 =Control, M_1 =1121 Kg/ha. of fully burnt Lime (CaO), M_2 =1681 Kg/ha. of half burnt Lime (CaO+CaCO₃), M_3 =2242 Kg/ha. of unburnt Lime (CaCO₃), M_4 =2242 Kg/ha. of fully burnt Lime (CaO), M_5 =3363 Kg/ha. of half burnt Lime (CaO+CaCO₃) and M_6 =4483 Kg/ha of unburnt Lime (CaCO₃).

Lime in powdered form was applied to the soil as basal dressing.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) 64·0 m.×9·1 m. (iii) 4. (iv) (a) 9·1 m.×9·1 m. (b) 9·0 m.×9·0 m. (v) 6 cm. ×6 cm. (vi) Yes.

4 GENERAL :

(i) Good. (ii) BHC 1% sprayed at 16·8 Kg/ha. as preventive measure against blast. (iii) Yield of grain (iv) (a) 1963—only (residual effects studied in 1961—62). (b) Yes. (c) Results of combined analysis are presented under 5. Results. (v) Karapudom and Purakand. (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 2676 Kg/ha. (ii) 287·9 Kg/ha. (based on 12 d.f. made up of Treatments×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	1920	1941	1958	1958	2042	2021	2021

———

Crop :- Paddy (*Rabi*).   **Ref :- K. 62(32).**

Site :- Agri. College and Res. Instt., Vellayani.   **Type :- 'M'.**

Object :—To find out whether Magnesium Salt Manure in combination with Super Phosphate can increase the yield of Paddy in Vellayani Kayalava.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) Clavey soil. (iii) 9.3.1962/N.A. (iv) (a) 2 diggings and levellings. (b) Transplanting. (c) N.A. (d) 23 cm.×15 cm. (e) 2. (v) 28 Kg/ha. of K_2O as Mur. Pot. broadcasted one day before planting. (vi) *Kochuithu* (early). (vii) Irrigated. (viii) 1 hoeing with Japanese hoe and 1 weeding. (ix) 56 cm. (x) 8.5.1962.

2. TREATMENTS :

4 manurial treatments : M_0 =Control, M_1 =22·4 Kg/ha. of N as Urea+22·4 Kg/ha. of P_2O_5 as Super+ 44·8 Kg/ha. of K_2O as Mur. Pot., M_2 = M_1 +106 Kg/ha. of Magnesium Salt and M_3 = M_1 +106 Kg/ha. of Dolomite.

Urea applied as top dressing 18 days after transplanting and other manures applied as basal dressing before transplanting.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 20·4 m.×4·0 m. (iii) 4. (iv) (a) 5·1 m.×5·2 m. (b) 4·6 m.×4·6 m. (v) 30 cm. ×30 cm. (vi) Yes.

4. GENERAL ·

(i) Poor. (ii) Slight attack of stem borer. Endrin was sprayed. (iii) Yield of grain and straw. (iv) (a) 1961—63. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 834 Kg/ha. (ii) 173·5 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M_0	M_1	M_2	M_3
Av. yield	504	869	1009	953

C.D.$=277\cdot5$ Kg/ha.

Crop :- Paddy (*Punja*).   **Ref :- K. 61(128).**

Site :- Agri. College and Res. Instt., Vellayani.   **Type :- 'M'.**

Object :—To study the effect of different phosphatic fertilizers on Paddy in upper Vellayani Kayal area.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Paddy. (c) Nil. (ii) Clay soil. (iii) 15.3.1961. (iv) (a) Diggings with *mammuthy*. (b) Transplanting. (c) N.A. (d) 23 cm. $\times$ 15 cm. (e) 2. (v) Nil. (vi) *Cochuvithu* (short duration). (vii) Unirrigated. (viii) 2 weedings. (ix) 25 cm. (x) 20.5.1961.

2. TREATMENTS :

   7 manurial treatments : $M_1=46$ Kg/ha. of Mur. Pot., $M_2=M_1+231$ Kg/ha. of Super, $M_3=M_1+231$ Kg/ha. of Lime as CaO, $M_4=35$ Kg/ha. of Mur. Pot.$+461$ Kg/ha. of Super Ash Mixture in 1: 1 ratio, $M_5=M_1+461$ Kg/ha. of Super Lime Mixture in 1 ratio, $M_6=M_1+161$ Kg/ha. of Super Rock Mixture in 1 : 1 ratio and $M_7=M_1+123$ Kg/ha. Hyper Phosphate.

   Manures broadcast as basal dressing one day before transplanting.

3. DESIGN :

   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) $7\cdot0$ m. $\times7\cdot0$ m. (b) $6\cdot4$ m. $\times6\cdot4$ m. (v) 30 cm. $\times30$ cm. (vi) Yes.

4. GENERAL :

   (i) Healthy. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961—62. (b) and (c) N.A. (v) Lower Vellayani Kayal area. (vi) and (vii) Nil.

5. RESULTS :

   (i) 1295 Kg/ha. (ii) $227\cdot3$ 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	M_6	M_7
Av. yield	879	1502	915	1415	1683	1393	1276

C.D.$=267\cdot9$ Kg/ha.

Crop :- Paddy (*Rabi*).   **Ref :- K. 61(73), 62(29).**

Site :- Agri. College and Res. Instt., Vellayani.   **Type :- 'M'.**

Object :—To study the effect of different phosphatic fertilizers on Paddy in Munder Vaikom area.

1. BASAL CONDITIONS :

   (i) (a) Nil for 61(73) ; Paddy—Paddy for 62(29). (b) Paddy. (c) 126 Kg/ha. of Hyper Phos.$+112$ Kg/ha. of Paddy Mixture for 61(73) ; As per treatments$+22\cdot4$ Kg/ha. of K_2O as Mur. Pot. for others. (ii) Clayey. soil. (iii) 24.9.1961/N.A. ; 8.10.1962/N.A. (iv) (a) 2 ploughings and 1 digging and levelling. (b) Transplanting. (c) N.A. (d) 23 cm. $\times15$ cm. (e) 2. (v) $22\cdot4$ Kg/ha. of K_2O as Mur. Pot. ; 224 K/ha. of N as Urea as top dressing. (vi) *Kochathikkira* (early). (vii) Irrigated. (viii) Weeding, filling up of gaps and thinning. (ix) 40 cm., 20 cm. ; (x) 29.12.1961 ; 9.1.1963.

2. TREATMENTS :

8 manurial treatments : M_0=Control, M_1=231 Kg/ha. of Super, M_2=231 Kg/ha. of Lime as CaO, M_3=461 Kg/ha. of Super Lime Mixtuse n 1 : 1 ratio, M_4=461 Kg/ha. of Super Ash Mixture in 1 : 1 ratio, M_5=123 Kg/ha. of Rock Phos., M_6=185 Kg/ha. of B.M. and M_7=162 Kg/ha. of Super Rock Mixture in 1 : 1 ratio.

Manures broadcast one day before sowing. 44·8 Kg/ha. of P_2O_5 is supplied by phosphatic fertilizers.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) 28·0 m.×15·2 m. (iii) 6. (iv) (a) 7·0 m.×7·0 m. (b) 6·4 m.×6·4 m. (v) 30 cm. ×30 cm. (vi) Yes.

4. GENERAL :

(i) Poor and crop lodged in few plots in 1st week of December in 61(73) ; Good but crop lodged in mid. December for 62(29). (ii) A prophylatic spraying of copper fungicide was given along with Endrin 15 days after sowing for 61(73) ; Stem borer attack observed in 62(29), copper fungicide was sprayed. (iii) Yield of grain. (iv) (a) 1961—62. (b) Yes. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and interaction is present.

5. RESULTS :

(i) 1293 Kg/ha. (ii) 625·5 Kg/ha. (based on 7 d.f. made up of treatments×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	M_7
Av. yield	1107	1356	1117	1453	1456	1319	1353	1185

———

Crop :- Paddy (*Rabi*).　　　　　　　　　　**Ref :- K. 61(72), 62(42).**

Site :- Agri. College and Res. Instt., Vellayani.　　**Type :- 'M'.**

Object :—To study the effect of different phosphatic fertilizers on Paddy in Vadayar—Vaikom area.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 224 Kg/ha. of Paddy Mixture for 61(72) ; As per treatments+22·4 Kg/ha. of each of K_2O and N as Mur. Pot. and A/S respectively. (ii) Clayey soil. (iii) 2.10.1961/N.A. ; 1.10.1962/N.A. (iv) (a) 2 ploughings. (b) Transplanting. (c) N.A. (d) 23 cm.×15 cm. (e) 2. (v) 22·4 Kg/ha. of K_2O as Mur. Pot. broadcasted before sowing+22·4 Kg/ha. of N as A/S as top dressing. (vi) *Kochathikkira* (short duration). (vii) Irrigated. (viii) 1 weeding for 61(72) ; weeding, thinning and fiilling up of gaps for others. (ix) 40 cm. ; 20 cm. (x) 6.1.1962 ; 6.1.1963.

2. TREATMENTS :

8 manurial treatments : M_0=Control, M_1=231 Kg/ha. of Super, M_2=231 Kg/ha. of Lime as CaO, M_3=461 Kg/ha. of Super Lime Mixture in 1 : 1 ratio, M_4=461 Kg/ha. of Super Ash Mixture in 1 : 1 ratio, M_5=123 Kg/ha. of Rock Phos., M_6=185 Kg/ha. of B.M. and M_7=162 Kg/ha. of Super Rock Mixture in 1 : 1ratio.

Manures broadcast one day before sowing. 44·8 Kg/ha. of P_2O_5 is supplied by the phosphatic fertilizers.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) 28·0 m.×15·2 m. (iii) 6. (iv) (a) 7·0 m.×6·4 m. (b) 6·4 m.×6·4 m. (v) 30 cm. ×30 cm. (vi) Yes.

4. GENERAL :

(i) Good but crop lodged in mid. of December for 61(72) ; Not satisfactory for others. (ii) Blast attack observed for 61(72) but Endrin and copper fungicide were given to both as a preventive measure. (iii) Yield of grain. (iv) (a) 1961—62. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Since the error variances are heterogeneous and Treatments×years interaction is absent, results of individual years are presented under 5. Results.

5. RESULTS :

61(72)

(i) 2682 Kg/ha. (ii) 251·2 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	M_7
Av. yield	2354	2683	2737	2788	2802	2690	2760	2639

62(42)

(i) 2212 Kg/ha. (ii) 464·5 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	M_7
Av. yield	2198	2345	1740	2313	2157	2478	2298	2167

Crop :- Paddy (*Rabi*). **Ref :- K. 61(65).**

Site :- Agri. College and Res. Instt., Vellayani. **Type :- 'M'.**

Object :—To study the effect of different phosphatic fertilizers on Paddy in lower Vellayani Kayal area.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Clay soil. (iii) N.A./18.3.1961. (iv) (a) Levelling and 2 diggings with *mammuthy*. (b) Transplanting. (c) N.A. (d) 23 cm.×15 cm. (e) 2. (v) N.A. (vi) *Kochuvithu* (short duration). (vii) Irrigated. (viii) 2 weedings. (ix) 24 cm. (x) 23.5.1961.

2. TREATMENTS :

7 manurial treatments : M_1=46 Kg/ha. of Mur. Pot., M_2=M_1+231 Kg/ha. of Super, M_3=M_1+231 Kg.ha. of Lime as CaO, M_4=35 Kg/ha. of Mur.Pot.+461 Kg/ha. of Super Ash Mixture in 1 : 1 ratio, M_5=M_1+461 Kg/ha. of Super Lime Mixture in 1 : 1 ratio, M_6=M_1+161 Kg/ha. of Super Rock Mixture in 1 : 1 ratio and M_7=M_1+123 Kg/ha. of Hyper Phosphate.

Manures broadcast as basal dressing one day before transplanting.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 7·0 m.×7·0 m. (b) 6·4 m.×6·4 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Healthy. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1959 to 62. (b) Yes. (c) Nil. (v) Upper Vellayani Kayal area. (vi) and (vii) N.A.

5. RESULTS :

(i) 2369 Kg/ha. (ii) 223·2 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	M_6	M_7
Av. yield	1865	2527	1771	3160	2389	2697	2177

C.D.=263·1 Kg/ha.

Crop :- Paddy (*Rabi*). **Ref :- K. 60(82), 61(74), 62(31).**

Site :- Agri. College and Res. Instt., **Type :- 'M'.**
Vellayani.

Object :—To select the best form of lime and its economic dose for Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. for 60(82) ; Paddy—Paddy for others. (b) Paddy. (c) 22·4 Kg/ha. of N as A/S+44·8 Kg/ha. of P_2O_5 as Super+22 4 Kg/ha. of K_2O as Mur. Pot. for 60(82) ; As per treatments+280 Kg/ha. of Super+ 89·7 Kg/ha. of Mur. Pot.+134 Kg/ha. of A/S for others. (ii) Clayey dark grey. (iii) 1.12.60 ; 16.11.1961 ; Nov. 62. (iv) (a) 3 ploughings and levellings. (b) Transplanting. (c) N.A. (d) 23 cm.×15 cm. (e) 2. (v) 280 Kg/ha. of Super+89·7 Kg/ha. of Mur. Pot. broadcast+134 Kg/ha. of A/S as top dressing after a week of planting for 60(82) and 62(31) ; 280 Kg/ha. of Super+44·8 Kg/ha. of Mur. Pot. broadcast as basal dressing +134 Kg/ha. of A/S as top dressing 10 days after planting for 61(74). (vi) PTB—10 (early). (vii) Irrigated. (viii) 3 to 4 weedings. (ix) N.A. (x) 12.2.1961 ; 6.2.1962 ; Feb. 1963.

2. TREATMENTS :

7 manurial treatments : M_0=Control, M_1=1121 Kg/ha. of fully burnt Lime (CaO), M_2=1681 Kg/ha. of half burnt Lime (CaO+CaCO$_3$) ; M_3=2242 Kg/ha. of unburnt Lime (CaCO$_3$) ; M_4=2242 Kg/ha. of fully burnt Lime (CaO) ; M_5=3363 Kg/ha. of burnt Lime (CaO+CaCO$_3$) and M_6=448·3 Kg/ha. of unburnt Lime (CaCO$_3$).

Lime in powdered form was applied to the soil as basal dressing for 60(82). Lime applied to the previous crop for 61(74). Lime applied to previous crop during 1960 and second residual effect is studied on present Paddy crop for 62(31).

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) 64·0 m.×9·1 m. (iii) 4. (iv) (a) 9·1 m.×9·1 m. (b) 9·0 m.×9·0 m. (v) Nil. (vi) —.

4. GENERAL :

(i) Good. (ii) Endrex sprayed as a preventive measure against swarning catter pillar attack. (iii) Yield of grain. (iv) (a) 1960 only (Residual effects studied in 1961 and 1962). (b) Yes. (v) Karapadom and Purkad. (vi) Nil. (vii) Kasapodon.

5. RESULTS :

60(82)

(i) 3415 Kg/ha. (ii) 148·3 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	2802	4098	3447	2935	4094	3615	2914

C.D.=220·3 Kg/ha.

61(74)

(i) 3104 Kg/ha. (ii) 55·6 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	3054	3180	3068	3026	3166	3124	3110

C.D.=82·6 Kg/ha.

62(31)

(i) 3006 Kg/ha. (ii) 64·3 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	2648	2956	2879	2963	3236	3110	3250

Crop .·· Paddy *(Rabi).*   **Ref :- K. 60(47).**

Site :- Agri. College and Res.Instt., Vellayani.   **Type :- 'M'.**

Object :—To study the effect of different types of green leaves and dry leaves on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 22.10.60. (iv) (a) 6 ploughings with Cooper plough and 2 diggings with *mammuthy.* (b) Transplanting. (c) N.A. (d) 23 cm.×15 cm. (e) 2. (v) 492 Kg/ha. of Super Lime Mixture+79 Kg/ha. of Mur. Pot. broadcast one day before planting. (vi) Cochin—1 (Late). (vii) Unirrigated. (viii) 1 weeding. (ix) 87 cm. (x) 28.1.61.

2. TREATMENTS :

All combinations of (1) and (2)+a control
   (1) 2 types of leaves : L_1=Green leaves at 4920 Kg/ha. and L_2=Dry leaves at 1230 Kg/ha.
   (2) 3 sources of leaves : S_1=*Glyricidia,* S_2=*Indigofera Tiysmemia* and S_3=*Eupatorium Odoratum.*
The percentage of moisture in green leaves was 75% and hence 1230 Kg/ha. of dry leaves are equivalent to 4920 Kg/ha. of green leaves. Treatments applied as basal dressing just before the last digging.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) 40·2 m.×35·1 m. (iii) 4. (iv) (a) 4·9 m.×9·5 m. (b) 4·6 m.×9·1 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Severe affect by *Spudoptera.* (iii) Yield of grain. (iv) (a) 1959-62. (b) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 524 Kg/ha. (ii) 155·1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control =446 Kg/ha.

	S_1	S_2	S_3	Mean
L_1	526	651	550	576
L_2	414	607	475	499
Mean	470	629	513	537

—————

Crop :- Paddy *(Kharif).*   **Ref :- K. 62(33).**

Site. :- Agri. College and Res. Instt., Vellayani.   **Type :- 'M'.**

Object :—To study the effect of different fertilizers on Paddy in lower Vellayani Kayal area.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Clayey soil. (iii) 6.3.62/N.A. (iv) (a) 2 diggings and levellings. (b) Transplanting. (c) N.A. (d) 23 cm.×15 cm. (e) 2. (v) 22·4 Kg/ha. of N as Urea+22·4 Kg/ha. of K_2O as Mur. Pot. (vi) *Kochuvithu* (early). (vii) Irrigated. (viii) Hoeing by Japanese hoe and 1 weeding. (ix) 56 cm. (x) 7.5.62.

2. TREATMENTS :

7 manurial treatmets : M_0=Control, M_1=231 Kg/ha. of Super, M_2=231 Kg/ha. of Lime as Cao, M_3=461 Kg/ha. of Super Ash Mixture in 1 : 1 ratio, M_4=461 Kg/ha. of Super Lime Mixture in 1 : 1 ratio, M_5=461 Kg/ha. of Super Dolomite Mixture in 1 : 1 ratio, and M_6=231 Kg/ha . of Dolomite.
Manures broadcast as basal dressing before transplanting.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 7 0 m.×7·0 m. (b) 6.4 m×6.4 m (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory, crop lodged on 27.4.62. (ii) Slight attack of stem borer was noticed but controlled by spraying Endrin. (iii) Yield of grain. (iv) (a) 1959—1962. (Expt. failed in 1959). (b) Yes. (c) Nil. (v) Upper Vellayani Kayal area (vi) and (vii) Nil.

5. RESULTS :

(i) 1584 Kg/ha. (ii) 229·1 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	1046	1905	934	2111	1915	1905	1270

CD=270·1 Kg/ha.

— — — —

Crop :- Paddy (*Kharif*).

Site :- Agri. College and Res. Instt., Vellayani.

Ref :- K. 62(35).

Type :- 'M'.

Object :—To study the effect of different phosphatic fertilizers on Paddy in upper Villayani Kayal area.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) Nil. (ii) Clayey soil. (iii) 1.3.62. (iv) (a) 2 diggings and levellings. (b) Transplanting. (c) N.A. (d) 23 cm.×15 cm. (e) 2. (v) 22·4 Kg/ha. of K_2O as Mur. Pot.+22·4 Kg/ha. of N as Urea. (vi) *Kochuvithu* (early). (vii) Irrigated. (viii) Hoeing by Japanese hoe and 1 weeding. (ix) 56 cm. (x) 8.5. 62.

2. TREATMENTS :

7 manurial treatments : M_0=Control. M_1=211 Kg/ha. of Super, M_2=188 Kg/ha. of Super+B.M. Mixture in 1 : 1 ratio, M_3=422 Kg/ha. of Super Lime Mixture in 1 : 1 ratio, M_4=422 Kg/ha. of Super Ash Mixture in 1 : 1 ratio, M_5=211 Kg/ha. of Ash and M_6=211 Kg/ha. of Lime.

Treatments applied as basal dressing one day before transplanting.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 5·2 m.×5·2 m. (b) 4·6 m.×4·6. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) There was a slight attack of stem borer and Endrin was sprayed. (iii) Yield of grain. (iv) (a) 1961—1962. (b) No. (c) Nil. (v) Lower Kayal area of Vellayani. (vi) and (vii) Nil.

5. RESULTS :

(i) 925 Kg/ha. (ii) 283·8 Kg/ha. (iii) Treatment differences are 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	673	1009	1009	1149	1289	532	813

C.D.=421·6 Kg/ha.

— — — —

Crop :- Paddy (*Kharif*)   **Ref :- K. 62(27)**

Site :- Agri. College and Res. Instt., Vellayani.   **Type :- 'M'.**

Object :—To study the effect of different phosphatic fertilizers on Paddy in Thottapatty area.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Clayey soil. (iii) 1.12.62/N.A. (iv) (a) 2 ploughings. (b) Transplanting. (c) N.A. (d) 23 cm.$\times$15 cm. (e) 2. (v) 22·4 Kg/ha. of K_2O as Mur. Pot. broadcast one day before sowing+22·4 Kg/ha. of N as Urea top dressing. (vi) T.—9. improved (short duration). (vii) Irrigated. (viii) Weeding and thinning. (ix) 15 cm. (x) 22.2.63.

2. TREATMENTS :

8 manurial treatments : M_0=Control, M_1=218 Kg/ha. of Super, M_2=218 Kg/ha. of Lime as CaO, M_3=437 Kg/ha. of Super Lime Mixture in 1 : 1 ratio, M_4=437Kg/ha, of Super Ash Mixture in 1 : 1 ratio, M_5=116 Kg/ha. of Rock Phos., M_6=141 Kg/ha. of B.M. and M_7= 152 Kg/ha. of Super Rock Mixture in 1 : 1 ratio.

Manures broadcast one day before sowing. 44·8 Kg/ha. of P_2O_5 is supplied by the phosphatic fertilizers.

3. DESIGN :

(a) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 10·1 m$\times$6·4 m. (b) 9·1 m.$\times$5·5 m. (v) 46 cm.$\times$46 cm. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Two sprayings of folidol were given against stemborer attack. Cppper fungicide was sprayed at the earhead stage to prevent the attack of blast. (iii) Yield of grain. (iv) (a) 1962 only. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 2349 Kg/ha. (ii) 226·3 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Av. yield	2298	2298	2214	2354	2634	2578	2438	1975

C.D.=332·8 Kg/ha.

———

Crop. :- Paddy (*Rabi*).   **Ref :- K. 62(34)**

Site :- Agri. College and Res. Instt., Vellayani.   **Type .- 'M'.**

Object :—To compare the performance of Eupatorium manure with N, P and K fertilizers for Paddy in Vellayani Kayal area.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Clayey soil. (iii) 28.2.62. (iv) (a) Digging and levelling. (b) Transplanting. (c) N.A. (d) 23 cm.$\times$15 cm. (e) 2. (v) Nil. (vi) *Kochuvithu* (early). (vii) Irrigated. (viii) Hoeing with Japanese hoe and 1 weeding. (ix) 56 cm. (x) 7.5. 62.

2. TREATMENTS :

3 manurial treatments : M_0=Control, M_1=22.4 Kg/ha. of N as Urea+22·4 Kg/ha. of P_2O_5 as Super+44·8 Kg/ha. of K_2O as Mur. Pot. and M_3=Eupatorium manure processed in the laboratory giving quantities of N, P and K as in M_1.

Manures applied as broadcast one day before transplanting.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 17·7 m.$\times$ 5·5 m. (iii) 4. (iv) (a) 5·2 m.$\times$5·2 m. (b) 4·6 m.$\times$4·6 m. (v) 30 cm. $\times$30 cm. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Slight attack of stemborer which was controlled by spraying Endrin. (iii) Yield of grain. (iv) (a) 1962 only. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 1117 Kg/ha. (ii) 201·3 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M_0	M_1	M_2
Av. yield	841	1220	1289

C.D.=348·2 Kg/ha.

—— ·

Crop :- Paddy (*Kharif*).　　　　　　　　**Ref :- K. 60 to 63 (M.A.E.).**

Site :- M.A.E. Centre, Karamanai.　　　　　**Type :- 'M'.**

Object :—Type II :- To find out the direct, residual and cumulative effect of manures on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Laterite. (iii) 2.6.60/3.7.60 ; 29.5.61/27.6.61 ; 6.5.62./5.6.62 ; 52.4.63/23.5.63. (iv) (a) 2 to 5 ploughings, 2 diggings and levellings. (b) Transplanting. (c) 36 Kg/ha. (d) 23 cm.×23 cm. (e) N.A. (v) 56·0 Kg/ha. of F.Y.M. for 60 (M.A.E.) Nil for other years. (vi) P.T.B.—26 for 60. P.T.B.—9 for other years. (vii) Irrigated for 60 to 62. Unirrigated for 63. (viii) 1 to 2 weedings. (ix) 163 cm. ; 196 cm ; 118 cm, N.A. (x) 4.9.60 to 4.10.60 ; 11.10.61 ; 18.9.62 ; 4.9.63

2. TREATMENTS :

All combinations of (1), (2), (3), and (4)
　　　　(1) 3 levels of N as A/S : $N_0=0$, $N_1=33·6$ and $N_2=67·3$ Kg/ha.
　　　　(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=33·6$ and $P_2=67·3$ Kg/ha.
　　　　(3) 3 levels of K_2O as Mur. Pot. : $K_0=0$, $K_1=33·6$ and $K_2=67·3$ Kg/ha.
　　　　(4) 3 levels of F.Y.M : $M_0=0$, $M_1=5600$ and $M_2=11200$ Kg/ha.

P_2O_5, K_2O and F.Y.M. broadcast before planting. N top dressed by broadcast.

3. DESIGN :

(i) 3^4 confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 9·1 m.× 4·5 m. (b) 9·0 m.×4·5 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) Yes. (c) Nil. (v) and (vi) N.A. (vii) Expt. for 1964 and onwards are N.A.

5. RESULTS :

1960

Cumulative Phase

(i) 2229 Kg/ha. (ii) 469·0 Kg/ha. (iii) Main effects of N, P and M are highly significant. Interaction M×N is significant. (iv) Av. yield of grain in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	1383	1817	2684	1706	1992	2186	1752	2287	1844	1961
M_1	1642	2094	2822	1725	2463	2370	2232	2038	2288	2186
M_2	1734	2121	3763	2195	2564	2858	2444	2426	2747	2539
Mean	1586	2011	3090	1875	2340	2471	2143	2250	2293	2229
K_0	1549	2011	2869	1808	2214	2407				
K_1	1651	2112	2987	1817	2343	2590				
K_2	1557	1910	3412	2000	2463	2416				
P_0	1328	1651	2646							
P_1	1854	1937	3229							
P_2	1575	2445	3394							

C.D. for N, P or M marginal means=270·8 Kg/ha.

C.D. for the boby of M × N table   =469 0 Kg/ha.

1960

Residual Phase

(i) 1674 Kg/ha. (ii) 486·8 Kg/ha. (iii) Main effect of N is highly significant. Main effect of P is significant.
(iv) Av. yield of grain in Kg/ha

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	1383	1457	1688	1448	1623	1456	1365	1688	1474	1509
M_1	1494	1743	2177	1383	2121	1911	1992	1651	1772	1805
M_2	1365	1669	2094	1522	1568	2037	1503	1909	1715	1709
Mean	1414	1623	1986	1451	1771	1801	1620	1749	1654	1674
K_0	1402	1697	1761	1466	1752	1642				
K_1	1503	1826	1918	1420	1854	1973				
K_2	1337	1346	2279	1467	1707	1788				
P_0	1199	1356	1798							
P_1	1623	1688	2002							
P_2	1420	1825	2158							

C.D. for N or P marginal means=281·0 Kg/ha.

1960

Direct Phase

(i) 2117 Kg/ha. (ii) 461·0 Kg/ha. (iii) Main effects of N and M and interaction M × K are highly significant. Main effect of P and interaction M × N are significant. (iv) Av. yield of grain in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	1365	1845	2546	1669	1918	2170	1642	2380	1735	1919
M_1	1743	2094	2868	1752	2536	2417	2407	2057	2241	2235
M_2	1817	2121	2652	2333	2527	1731	2269	2453	1869	2197
Mean	1642	2020	2689	1918	2327	2106	2106	2297	1948	2117
K_0	1568	2038	2712	1817	2158	2343				
K_1	1789	2075	3027	2011	2324	2556				
K_2	1569	1947	2328	1926	2499	1419				
P_0	1411	1660	2683							
P_1	1826	2011	3144							
P_2	1689	2389	2240							

C.D. for N, P or M marginal means   =266·0 Kg/ha.

C.D. for the body of M × K or M × N table=461·0 Kg/ha.

1961

Direct Phase

(i) 1902 Kg/ha. (ii) 218·8 Kg/ha. (iii) Main effects of N, P and interaction N × P are highly significant. Main effect of M and interaction P × K are significant. (iv) Av. yield of grain in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	1061	1955	2462	1596	1918	1964	1798	1863	1817	1826
M_1	1273	1918	2444	1761	1826	2047	1909	1928	1797	1878
M_2	1383	2011	2610	1826	2038	2137	1900	2066	2037	2001
Mean	1239	1961	2505	1728	1927	2050	1869	1952	1884	1902
K_0	1190	1937	2480	1817	1854	1936				
K_1	1254	2011	2591	1780	1900	2176				
K_2	1273	1935	2444	1587	2027	2038				
P_0	1199	1798	2187							
P_1	1282	1964	2535							
P_2	1236	2121	2793							

C.D. for N, P or M marginal means   =126·3 Kg/ha.

C.D. for the body of N × P or P × K tables=218·8 K2/ha.

1961

Residual Phase

(i) 1424 Kg/ha. (ii) 311·1 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	978	1402	1651	1217	1227	1589	1402	1374	1356	1344
M_1	1079	1549	1661	1411	1439	1440	1411	1430	1450	1430
M_2	1125	1439	1928	1393	1559	1539	1402	1522	1567	1497
Mean	1061	1463	1747	1340	1408	1523	1405	1442	1424	1424
K_0	1061	1356	1798	1282	1522	1411				
K_1	1033	1494	1799	1448	1264	1614				
K_2	1089	1539	1644	1290	1438	1544				
P_0	1088	1448	1484							
P_1	1033	1347	1844							
P_2	1062	1594	1913							

C.D. for N marginal means $=179 \cdot 6$ Kg/ha.

1961

Cumulative Phase

(i) 1925 Kg/ha. (ii) $189 \cdot 5$ Kg/ha. (iii) Main effects of N, P and interaction $N \times P$ are highly significant. Main effect of M is significant. (iv) Av. yield of grain in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K	Mean
M_0	1079	1964	2472	1596	1928	1990	1798	1872	1844	1838
M_1	1300	2001	2527	1872	1891	2066	1992	1937	1900	1943
M_2	1365	2020	2601	1826	2038	2121	1891	2057	2037	1995
Mean	1248	1995	2533	1765	1952	2059	1894	1955	1927	1925
K_0	1171	1937	2574	1817	1909	1956				
K_1	1300	2011	2554	1771	1918	2176				
K_2	1273	2037	2471	1707	2029	2045				
P_0	1208	1881	2206							
P_1	1300	1964	2592							
P_2	1236	2140	2801							

C.D. for N, P or M marginal means $=109 \cdot 4$ Kg/ha.
C.D. for the body of $N \times P$ table $=189 \cdot 5$ Kg/ha.

1962

Cumulative Phase.

(i) 2006 Kg/ha. (ii) $306 \cdot 4$ Kg/ha. (iii) Main effects of N and P alone are highly significant. (iv) Av. yield of grain in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	1125	2032	2580	1648	2072	2016	1698	2134	1904	1912
M_1	1237	2188	2785	1854	2222	2134	2200	2060	1951	2070
M_2	1287	2103	2717	1957	2006	2144	1894	2106	2106	2035
Mean	1216	2107	2694	1820	2100	2098	1931	2100	1987	2006
K_0	1140	2066	2586	1711	2016	2066				
K_1	1243	2259	2798	1926	2240	2134				
K_2	1265	1997	2698	1823	2044	2094				
P_0	1153	1891	2415							
P_1	1321	2194	2785							
P_2	1175	2237	2882							

C. D. for N or P marginal means=176·9 Kg/ha.

1962

Residual Phase

(i) 1616 Kg/ha. (ii) 438·2 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yeild of grain in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	1053	1530	1888	1274	1623	1573	1337	1639	1496	1491
M_1	1200	1744	2044	1473	1816	1698	1540	1585	1605	1663
M_2	1237	1741	2106	1598	1614	1872	1789	1591	1704	1695
Mean	1163	1672	2013	1448	1684	1715	1641	1605	1602	1616
K_0	1212	1499	2212	1527	1623	1773				
K_1	1193	1881	1742	1435	1717	1664				
K_2	1084	1636	2084	1383	1714	1708				
P_0	1063	1560	1723							
P_1	1249	1676	2128							
P_2	1178	1779	2187							

C.D. for N marginal means =253·0 Kg/ha.

1962

Direct Phase

(i) 2009 Kg/ha. (ii) 370·5 Kg/ha. (iii) Main effects of N and P are highly significant. (iv) Av. yield of grain in Kg/ha.

	N$_0$	N$_1$	N$_2$	P$_0$	P$_1$	P$_2$	K$_0$	K$_1$	K$_2$	Mean
M$_0$	1147	2032	2351	1589	2031	1908	1531	2131	1866	1843
M$_1$	1256	2231	2785	1826	2309	2138	2194	2063	2016	2091
M$_2$	1396	2184	2701	2056	2044	2181	1944	2153	2184	2094
Mean	1266	2149	2612	1824	2128	2076	1890	2116	2022	2009
K$_0$	1190	2063	2416	1698	2050	1921				
K$_1$	1312	2272	2764	1976	2212	2159				
K$_2$	1296	2113	2658	1798	2122	2147				
P$_0$	1234	1885	2353							
P$_1$	1324	2262	2798							
P$_2$	1240	2300	2687							

C.D. for N or P marginal means $= 213\cdot9$ Kg/ha.

1963

Cumulative Phase

(i) 1784 Kg/ha.   (ii) 496·3 Kg/ha.   (iii) Main effect of N is highly significant and main effect of M is significant.   (iv) Av. yield of grain in Kg/ha.

	N$_0$	N$_1$	N$_2$	P$_0$	P$_1$	P$_2$	K$_0$	K$_1$	K$_2$	Mean
M$_0$	1331	1675	1771	1414	1496	1867	1619	1743	1414	1592
M$_1$	1592	1743	2031	1578	2045	1745	1839	1839	1688	1789
M$_2$	1702	2031	2183	1812	2086	2018	1976	1894	2045	1972
Mean	1542	1816	1995	1601	1876	1876	1812	1825	1716	1784
K$_0$	1510	1853	2073	1661	1894	1880				
K$_1$	1715	1771	1990	1647	1880	1949				
K$_2$	1401	1825	1922	1496	1853	1798				
P$_0$	1413	1455	1935							
P$_1$	1702	1894	2032							
P$_2$	1510	2100	2018							

C.D. for N or M marginal means $= 286\cdot5$ Kg/ha.

1963

Residual Phase

(i) 1383 Kg/ha.   (ii) 441·7 Kg/ha.   (iii) None of the effects is significant.   (iv) Av. yield of grain in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	1194	1482	1386	1276	1386	1400	1427	1441	1194	1354
M_1	1372	1235	1263	1359	1194	1317	1276	1317	1276	1290
M_2	1524	1743	1249	1331	1716	1468	1634	1606	1276	1505
Mean	1363	1487	1299	1322	1432	1395	1446	1455	1249	1383
K_0	1331	1606	1400	1180	1565	1592				
K_1	1441	1606	1317	1510	1386	1468				
K_2	1317	1250	1180	1276	1345	1125				
P_0	1262	1276	1428							
P_1	1386	1784	1125							
P_2	1441	1400	1345							

1963

Direct Phase

(i) 1752 Kg/ha. (ii) 392·4 Kg/ha. (iii) Main effects of N and P are highly significant. (iv) Av. yield of grain in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	1592	1633	2059	1537	1770	1976	1921	1770	1592	1761
M_1	1455	1427	1963	1455	1729	1661	1606	1565	1674	1615
M_2	1867	1839	1935	1757	1729	2155	1894	1839	1908	1880
Mean	1638	1633	1986	1583	1743	1931	1807	1725	1725	1752
K_0	1839	1592	1990	1784	1743	1894				
K_1	1578	1633	1963	1537	1702	1935				
K_2	1496	1674	2004	1427	1784	1963				
P_0	1509	1372	1867							
P_1	1578	1647	2004							
P_2	1826	1880	2086							

C.D. for N or P marginal means=226·5 Kg/ha.

Crop :- Paddy (*Rabi*).　　　　　　　　　**Ref :- K. 60 to 63(M.A.E.).**

Site :- M.A.E. Centre, Karamanai.　　　　　　**Tyre :- 'M'.**

Object :—Type II :　To find out the direct, residual and cumulative effect of manures on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Laterite. (iii) N.A./3.10.1960 ; 20.3.61/18.10.61 ; 20.9.62/19.10.62 ; 6.9.63/10.10.63. (iv) (a) 4 ploughings and 2 diggings. (b) Transplanting. (c) 36 Kg/ha. (d) 23 cm.×23 cm. (e) N.A. (v) 56 Q/ha. of F.Y.M. for 60 ; Nil for other years. (vi) PTB—12 for 60 ; PTB—4 for other years. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. ; 40 cm. ; 107 cm. ; 38 cm. (x) 4.1.1961 ; 8.2.62 ; 6.2.63 ; 19.2.64.

2. TREATMENTS and 3. DESIGN :

Same as in expt. No 60(MAE) type II on page 98.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958—contd. (b) Yes. (c) N.A. (v) (a) N.A. (b) Nil. (vi) Dry weather affected the crop in 1961. (vii) Nil.

5. RESULTS :

1960

Cumulative Phase

(i) 2220 Kg/ha. (ii) 302·8 Kg/ha. (iii) Main effects of N, P, K, and interaction N×P are highly significant. Main effect of M is significant. (iv) Av. yield of grain in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	1190	1826	3339	1974	2084	2296	2084	2186	2084	2118
M_1	1328	1974	3256	1909	2352	2298	2029	2094	2435	2186
M_2	1393	2149	3523	1937	2499	2629	2084	2453	2528	2355
Mean	1304	1983	3373	1940	2312	2408	2066	2244	2349	2220
K_0	1208	1891	3099	1817	2186	2195				
K_1	1383	1964	3386	1983	2232	2518				
K_2	1321	2094	3633	2020	2518	2510				
P_0	1162	1835	2823							
P_1	1466	2066	3404							
P_2	1284	2048	3892							

C.D. for N, P, K or M marginal means=174·8 Kg/ha.

C.D. for the body of N×P table　　=302·8 Kg/ha.

1960

Residual Phase

(i) 1978 Kg/ha. (ii) 226·8 Kg/ha. (iii) Main effects of N, P, K and M and interactions N×P and N×K are highly significant. (iv) Av. yield of grain in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	1144	1586	2887	1752	1918	1946	1817	1937	1862	1872
M_1	1264	1835	2868	1789	2150	2028	1798	1992	2177	1989
M_2	1319	1946	2951	1781	2203	2232	1835	2177	2204	2072
Mean	1242	1789	2902	1774	2090	2069	1817	2035	2081	1978
K_0	1144	1762	2545	1632	2011	1808				
K_1	1328	1789	2988	1872	2020	2213				
K_2	1254	1816	3173	1818	2239	2186				
P_0	1144	1706	2472							
P_1	1393	1863	3014							
P_2	1189	1798	3220							

C.D. for N, P, K or M marginal means $= 130\cdot9$ Kg/ha.

C.D. for the body of $N \times P$ or $N \times K$ table $= 226\cdot8$ Kg/ha.

1960

Direct Phase

(i) 2206 Kg/ha. (ii) $300\cdot0$ Kg/ha. (iii) Main effects of N, P, K and interaction $N \times P$ are highly significant. Main effect of M is significant. (iv) Av. yield of grain in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	1199	1845	3339	2001	2094	2289	2103	2177	2104	2128
M_1	1310	1955	3219	1817	2352	2314	2020	2020	2443	2161
M_2	1412	2111	3468	1937	2499	2554	2075	2399	2516	2330
Mean	1307	1970	3342	1918	2315	2386	2066	2199	2354	2206
K_0	1217	1909	3072	1826	2204	2168				
K_1	1365	1918	3314	1909	2232	2456				
K_2	1339	2083	3640	2019	2509	2534				
P_0	1144	1826	2784							
P_1	1485	2066	3394							
P_2	1292	2018	3848							

C.D. for N, P, K or M marginal means $= 173\cdot2$ Kg/ha.

C.D. for the body of $N \times P$ table $= 300\cdot0$ Kg/ha.

1961

Cumulative Phase

(i) 2016 Kg/ha. (ii) $388\cdot5$ Kg/ha. (iii) Main effect of N is highly significant. Main effect of P is significant. (iv) Av. yield of grain in Kg/ha.

	N$_0$	N$_1$	N$_2$	P$_0$	P$_1$	P$_2$	K$_0$	K$_1$	K$_2$	Mean
M$_0$	1070	1835	2693	1743	1881	1974	1872	1928	1798	1866
M$_1$	1300	2038	2758	1891	2057	2148	2029	2094	1973	2032
M$_2$	1401	2020	3026	1946	2241	2260	2204	1974	2269	2149
Mean	1257	1964	2826	1860	2060	2127	2035	1999	2013	2016
K$_0$	1162	2057	2887	1983	2038	2084				
K$_1$	1365	1808	2823	1872	1946	2178				
K$_2$	1244	2027	2769	1725	2195	2120				
P$_0$	1171	1762	2647							
P$_1$	1245	2093	2841							
P$_2$	1355	2037	2990							

C.D for N or P marginal means $= 224\cdot3$ Kg/ha.

1961

Direct Phase

(i) 1948 Kg/ha. (ii) $249\cdot9$ Kg/ha. (iii) Main effect of N is highly significant. Main effect of P and interaction N$\times$P are significant. (iv) Av. yield of grain in Kg/ha.

	N$_0$	N$_1$	N$_2$	P$_0$	P$_1$	P$_2$	K$_0$	K$_1$	K$_2$	Mean
M$_0$	1024	1909	2730	1798	1955	1911	1826	1946	1892	1888
M$_1$	1171	1946	2629	1743	2020	1982	2001	1798	1946	1915
M$_2$	1328	1872	2924	1964	2038	2121	2158	1992	1973	2041
Mean	1174	1909	2761	1835	2004	2005	1995	1912	1937	1948
K$_0$	1245	2011	2729	1983	1982	2020				
K$_1$	1171	1891	2674	1743	1945	2048				
K$_2$	1106	1825	2880	1779	2085	1947				
P$_0$	1227	1771	2507							
P$_1$	1134	2048	2830							
P$_2$	1161	1908	2946							

C.D. for N or P marginal means $= 144\cdot3$ Kg/ha.
C.D. for the body of N$\times$P table $= 249\cdot9$ Kg/ha.

1961

Residual Phase

(i) 1341 Kg/ha. (ii) $349\cdot5$ 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	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	1171	1217	1513	1300	1393	1208	1134	1245	1521	1300
M_1	1015	1273	1586	1310	1208	1355	1235	1374	1264	1291
M_2	1319	1476	1503	1393	1365	1541	1383	1319	1596	1433
Mean	1168	1322	1534	1334	1322	1368	1251	1313	1460	1341
K_0	1042	1190	1521	1300	1162	1291				
K_1	1061	1365	1513	1319	1264	1356				
K_2	1401	1411	1568	1383	1540	1457				
P_0	1116	1282	1604							
P_1	1217	1319	1430							
P_2	1171	1365	1568							

C.D. for N marginal means$=201\cdot9$ Kg/ha.

1962

Cumulative Phase

(i) 1936 Kg/ha. (ii) 206·9 Kg/ha. (iii) Main effects of N, P and interaction $M \times K$ are highly significant. Main effect of M is significant. (iv) Av. yield of grain in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	983	1815	2805	1625	1949	2029	1855	1914	1834	1868
M_1	1141	1843	2771	1740	1883	2132	1970	1743	2042	1918
M_2	1223	1896	2945	1889	2107	2067	1830	2064	2170	2021
Mean	1116	1851	2840	1751	1980	2076	1885	1907	2015	1936
K_0	1058	1824	2774	1653	1949	2054				
K_1	1170	1812	2740	1740	1942	2039				
K_2	1120	1917	3007	1861	2048	2135				
P_0	880	1765	2609							
P_1	1220	1821	2898							
P_2	1248	1967	3014							

C.D. for N, P or M marginal means$=119\cdot4$ Kg/ha.

C.D. for the body of $M \times K$ table $=206\cdot9$ Kg/ha.

1962

Direct Phase

(i) 1515 Kg/ha. (ii) 254·8 Kg/ha. (iii) Main effect of N is highly significant. Interaction $N \times K$ is significant. (iv) Av. yield of grain in Kg/ha.

	N0	N1	N2	P0	P1	P2	K0	K1	K2	Mean
M0	946	1419	2054	1469	1481	1469	1444	1456	1519	1473
M1	971	1295	2213	1441	1431	1606	1428	1432	1619	1493
M2	1232	1466	2042	1569	1541	1631	1506	1656	1578	1580
Mean	1050	1393	2103	1493	1484	1569	1459	1515	1572	1515
K0	934	1455	1989	1429	1443	1506				
K1	1195	1320	2029	1469	1543	1532				
K2	1021	1404	2291	1581	1466	1668				
P0	921	1482	2076							
P1	1133	1291	2029							
P2	1095	1407	2204							

C.D. for N marginal means $=147 \cdot 1$ Kg/ha.
C.D. the for body of $N \times K$ table $= 254 \cdot 8$ Kg/ha.

1962.

Residual Phase

(i) 1910 Kg/ha. (ii) $207 \cdot 4$ Kg/ha. (iii) Main effects of N, P and K are highly significant. Interaction $M \times K$ is significant. (iv) Av. yield of grain in Kg/ha.

	N0	N1	N2	P0	P1	P2	K0	K1	K2	Mean
M0	958	1781	2740	1656	1930	1893	1855	1793	1830	1826
M1	1083	1840	2814	1703	1930	2104	1955	1740	2042	1912
M2	1236	1852	2892	1799	2126	2054	1849	1952	2179	1993
Mean	1092		2815	1719	1995	2017	1886	1828	2017	1910
K0	1070	1809	2780	1656	1980	2023				
K1	1092	1690	2702	1640	1902	1942				
K2	1114	1973	2964	1861	2104	2086				
P0	946	1721	2490							
P1	1179	1868	2939							
P2	1151	1883	3017							

C.D. for N, P or K margieal means $= 119 \cdot 7$ Kg/ha.
C.D. for the body of $M \times K$ table $= 207 \cdot 4$ Kg/ha.

1963

Cumulative Phase

(i) 1325 Kg/ha. (ii) $278 \cdot 6$ Kg/ha. (iii) Main effects of M, N and P are highly significant. Interactions $M \times K$ and $P \times K$ are significant. (iv) Av. yield of grain in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	1139	1263	1345	1015	1331	1400	1427	1125	1194	2249
M_1	1084	1166	1359	960	1414	1235	1345	1043	1221	1203
M_2	1249	1551	1770	1414	1468	1688	1400	1647	1523	1523
Mean	1157	1327	1491	1130	1404	1441	1391	1272	1313	1325
K_0	1193	1332	1647	1167	1537	1468				
K_1	1084	1235	1496	1249	1194	1372				
K_2	1194	1414	1331	974	1482	1482				
P_0	960	1112	1317							
P_1	1207	1455	1551							
P_2	1304	1413	1606							

C.D. for N, P or M marginal means $=160\cdot8$ Kg/ha.
C.D. for the body of $M \times K$ or $P \times K$ table $= 278\cdot6$ Kg/ha.

1963

Direct Phase

(i) 1255 Kg/ha. (ii) 161·4 Kg/ha. (iii) Main effects of N and P and interactions $M \times K$ and $P \times K$ are highly significant. Main effect of M is significant. (iv) Av. yield of grain in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	1043	1249	1331	1057	1276	1290	1331	1249	1043	1208
M_1	1043	1276	1359	1029	1317	1331	1304	1043	1331	1226
M_2	1125	1427	1441	1153	1317	1523	1166	1551	1276	1331
Mean	1070	1317	1377	1080	1303	1381	1267	1281	1217	1255
K_0	1098	1290	1414	974	1455	1372				
K_1	1029	1386	1427	1263	1193	1386				
K_2	1084	1276	1290	1002	1262	1386				
P_0	905	1058	1276							
P_1	1111	1386	1413							
P_2	1194	1508	1441							

C.D. for N, P or M marginal means $=93\cdot2$ Kg/ha.
C.D. for the body of $M \times K$ or $P \times K$ table $= 161\cdot4$ Kg/ha

1963

Residual Phase

(i) 1083 Kg/ha. (ii) 408·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
M_0	1057	1029	919	837	1057	1112	988	1098	919	1002
M_1	974	1139	1139	1015	1112	1125	1139	932	1181	1084
M_2	1221	1057	1028	1098	1263	1125	1098	1180	1208	1162
Mean	1084	1075	1089	983	1144	1121	1075	1070	1103	1083
K_0	1098	1084	1043	960	1111	1153				
K_1	1043	1084	1084	919	1166	1126				
K_2	1112	1056	1140	1070	1155	1084				
P_0	988	1001	960							
P_1	1194	1113	1125							
P_2	1070	1111	1182							

Crop :- Paddy *(Rabi).*

Site :- M.A.E. Centre, Karamanai.

Ref :- K. 62, 63(M.A.E.).

Type :- 'M'.

Object :—Type V (a) : To study the effect of methods of application of N on Paddy.

1. **BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) Nil. (ii) Laterite. (iii) 16.9.62/16.10.62 ; 30.8.63/1.10.63. (iv) (a) 3 ploughings and 2 diggings. (b) Transplanting. (c) 36 Kg/ha. (d) 23 cm.×23 cm. (e) N.A. (v) 33·6 Kg/ha. of P_2O_5 as Super. (vi) PTB—4. (vii) Irrigated. (viii) 2 weedings. (ix) 107 cm. ; 38 cm. (x) 2.2.1963 ; 28.1.64.

2. **TREATMENTS :**

All combinations of (1) and (2)+a control
   (1) 3 levels of N : $N_1=33·6$, $N_2=50·4$ and $N_3=67·2$ Kg/ha.
   (2) 4 methods of application : M_1=Broadcast just before last puddling and imparted in the soil (subsurface application), M_2=Broadcast at planting, M_3=Broadcast ½ at planting+½ about a month after planting and M_4=Application in the form of pellets about three weeks after planting.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×4·6 m. ; 9·1 m.×4·6 m. (b) 8·7 m.×4·1 m. ; 8·2 m.×3·7 m. (v) 23 cm.×23 cm. ; 46 cm.×46 cm. (vi) Yes

4. **GENERAL :**

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1962—63. (b) No. (c) N A. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent. Hence the results of individual years are presented.

1962

(i) 1766 Kg/ha. (ii) 185·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=1538 Kg/ha.

	M_1	M_2	M_3	M_4	Mean
N_1	1713	1744	2109	1427	1748
N_2	1998	1776	1729	1506	1752
N_3	1903	2061	1728	1728	1855
Mean	1871	1860	1855	1554	1785

1963

(i) 2187 Kg/ha. (ii) 245·6 Kg/ha. (iii) Interaction N × M alone is significant. (iv) Av. yield of grain in Kg/ha.

Control = 2117 Kg/ha.

	M_1	M_2	M_3	M_4	Mean
N_1	2159	2076	2367	2076	2169
N_2	2159	2284	2159	2159	2190
N_3	2367	2533	2117	1868	2221
Mean	2228	2297	2214	2034	2193

C.D. for the body of N × M table = 352·4 Kg/ha.

— — — —

Crop :- Paddy (*Kharif*).　　　　　　　　　　　　**Ref .- K. 63(MAE).**

Site :- M.A.E. Centre, Karamanai.　　　　　　　**Type :- 'M'.**

Object :—Type V (a) :　To study the effect of methods of application of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) Nil. (ii) Laterite. (iii) 8.5.63/13.6.63. (iv) (a) 3 ploughings and 2 diggings. (b) Transplanting. (c) 36 Kg/ha. (d) 23 cm. × 23 cm. (e) N.A. (v) 33.6 Kg/ha. of P_2O_5 as Super. (vi) PTB—9. (vii) Irrigated. (viii) 2 hand weedings. (ix) N.A. (x) 18.9.63.

2. TREATMENTS:

Same as in expt. No. 62(MAE) type V (a) (Rabi) on page 111.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) 9·1 m. × 4·6 m. (b) 8·2 m. × 3·7 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1963 only. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 3287 Kg/ha. (ii) 565·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control = 2906 Kg/ha.

	M_1	M_2	M_3	M_4	Mean
N_1	3695	3114	2829	3031	3166
N_2	3405	3197	3612	3156	3342
N_3	3031	3779	3654	3322	3446
Mean	3377	3363	3363	3169	3318

— — — —

Crop :- Paddy (*Kharif*).　　　　　　　　　　**Ref :- K. 60(MAE).**

Site :- M.A.E. Centre, Karamanai.　　　　　**Type :- 'M'.**

Object :—Type V :　To study the effect of different times of application of N on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil.　(b) Paddy.　(c) Nil.　(ii) Laterite.　(iii) 20.6.60/17.7.60.　(iv) (a) 4 wet ploughings and one digging.　(b) Transplanting.　(c) N.A.　(d) 23 cm. × 23 cm.　(e) 2 to 3.　(v) 5604 Kg/ha. of F.Y.M. and 22·4 Kg/ha. of P_2O_5 as Super broadcast before planting.　(vi) P.T.B.—16 medium (125 days duration).　(vii) Irrigated.　(viii) 2 weedings and one digging.　(ix) 122·5 cm.　(x) 25.10.60.

2. TREATMENTS :

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

(1) 2 sources of 44·8 Kg/ha. of N :　S_1=A/S and S_2=Urea.

(2) 7 times of application :　T_1=Full dose before planting, T_2=Full dose at planting, T_3=Full dose at tillering,　T_4=½ before planting+½ at tillering, T_5=½ at planting+½ at tillering, T_6=⅓ before planting+⅓ at tillering+⅓ at flowering and　T_7=⅓ at planting+⅓ at tillering+⅓ at flowering.

3. DESIGN :

(i) R.B.D.　(ii) (a) 15.　(b) N.A.　(iii) 3.　(iv) (a) and (b) N.A.　(v) N.A.　(vi) Yes.

4. GENERAL :

(i) Satisfactory.　(ii) Nil.　(iii) Grain yield.　(iv) (a) 1956—60.　(b) Yes.　(c) Nil.　(v) (a) At many others M.A.F. Centres.　(b) Nil.　(vi) Nil.　(vii) Harvest delayed due to heavy rains at harvest time.

5. RESULTS:

(i) 2880 Kg/ha.　(ii) 416·9 Kg/ha.　(iii) 'Control vs. others' alone is highly significant.　(iv) Av. yield of grain in Kg/ha.

Control=1614 Kg/ha.

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
S_1	2757	3113	2805	2513	3334	2921	3113	2937
S_2	3190	2863	2805	2575	3353	3074	3151	3003
Mean	2973	2988	2805	2544	3343	2997	3137	2970

C.D. for control vs. others=510·2 Kg/ha.

———

Crop :- Paddy (*Rabi*).　　　　　　　　　　**Ref :- K. 60(M.A.E.).**

Site :- M.A.E. Centre, Karamnai.　　　　　**Type :- 'M'.**

Object :—Type VI :　To find out the best method of application of phosphates for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil.　(b) Paddy.　(c) Nil.　(ii) Laterite.　(iii) 25.9.60/20.10.60.　(iv) (a) 4 wet ploughings and 1 digging.　(b) Transplanting.　(c) N.A.　(d) 23 cm. × 23 cm.　(e) 2 to 3.　(v) 5604 Kg/ha. of F.Y.M. broadcast before planting.　(vi) PTB—12 (medium) ; 120 days duration.　(vii) Irrigated.　(viii) 2 weedings.　(ix) 80·7 cm.　(x) 20.1.61.

2. TREATMENTS :

All combinations of (1), (2) and (3)+a control
   (1) 2 sources of P_2O_5 : S_1=Super and S_2=Ammo. Phos.
   (2) 2 levels of P_2O_5 : P_1=22·4 and P_2=44·8 Kg/ha.
   (3) 3 methods of application : M_1=Broadcasting at puddling time, M_2=Dipping the seedling in mud slush.

3. DESIGN :

   (i) R.B.D.   (ii) (a) 13.   (b) N.A.   (iii) 3.   (iv) and (v) N.A.   (vi) Yes.

4. GENERAL :

   (i) Satisfactory.   (ii) Nil.   (iii) Grain and straw yield.   (iv) (a) 1959 -1960.   (b) and (c) No.   (v) (a) N.A.
   (b) Nil.   (vi) and (vii) Nil.

5. RESULTS :

   (i) 2586 Kg/ha.   (ii) 51·9 Kg/ha.   (iii) Main effects of M, P, 'Control vs. others' and interaction $P \times M$ are highly significant.   (iv) Av. yield of grain in Kg/ha.

Control=1979 Kg/ha.

	M_1	M_2	M_3	S_1	S_2	Mean
P_1	2273	2249	2796	2424	2454	2439
P_2	2535	2744	3227	2838	2833	2835
Mean	2404	2496	3012	2631	2644	2637
S_1	2·88	2475	3031			
S_2	2420	2517	2994			

C.D. for P marginal means   =35·6 Kg/ha.
C.D. for M marginal means   =43·8 Kg/ha.
C.D. for body of $P \times M$ table=61·9 Kg/ha.
C.D. for control vs. others   =64·4 Kg/ha.

Crop :- Paddy (*Kharif*).   **Ref :- K. 63(M.A.E).**

Site :- M.A.E. Centre, Karamanai.   **Type :- 'M'.**

Object :—Type X :—To study the effect of N, P and G.M. on Paddy.

1. BASAL CONDITIONS :

   (i) (a) Paddy—G.M.—Paddy.   (b) G.M.   (c) Nil.   (ii) Laterite.   (iii) 8.5.63/10.6.63.   (iv) (a) 2 diggings and 2 tramplings.   (b) Transplanting.   (c) 36 Kg/ha.   (d) 23 cm.×23 cm.   (e) N.A.   (v) Nil.   (vi) P.T.B.—9 (135 days).   (vii) Unirrigated.   (viii) 2 hand weedings.   (ix) N.A.   (x) 22.9.63.

2. TREATNENTS :

All combinations of (1). (2) and (3)+one extra treatment
   (1) 3 levels of G.M. : G_0=No G.M., G_1=G.M. raised and ploughed in situ and G_2=G.M. raised with application of 35 Kg/ha. of P_2O_5 and ploughed in situ.
   (2) 3 levels of N as A/S : N_0=0, N_1=17·5 and N_2=35 Kg/ha.
   (3) 3 levels of P_2O_5 as Super : P_0=0, P_1=35 and P_2=70 Kg/ha.

   Extra treatment :   T=NPK through artificial fertilizers equivalent to those obtained from G.M. P_2O_5 and K_2O applied on 10.6.63 and N on 9.7.63.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 10 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) $12\cdot2$ m. $\times6\cdot9$ m. (b) $11\cdot3$ m. $\times5\cdot9$ m. (v) N.A. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 2747 Kg/ha. (ii) $142\cdot0$ Kg/ha. (iii) Main effects of G and N and interactions $G\times N$, $G\times P$, $N\times P$, $G\times N\times P$ and 'T vs. others' are highly significant. Main effect of P is significant. (iv) Av. yield of grain in Kg/ha.

T=2225 Kg/ha.

	G_0	G_1	G_2	N_0	N_1	N_2	Mean
P_0	2586	2672	2934	2337	2834	3021	2731
P_1	2784	2859	2822	2784	2847	2834	2822
P_2	2610	3145	2834	2461	3033	3095	2863
Mean	2660	2892	2863	2527	2905	2983	2805
N_0	2573	2623	2387				
N_1	2610	3058	3045				
N_2	2797	2996	3157				

C.D. for G, P or N marginal means=$97\cdot2$ Kg/ha.
C.D. for body of any table =$168\cdot2$ Kg/hn.
C.D. for 'T vs. others' =$125\cdot4$ Kg/ha.

Crop :- Paddy (Kharif).

Site :- M.A.E. Centre, Karamanai.

Ref :- K. 63(M.A.E).

Type :- 'M'.

Object :—Type XI :—To study the effect of method of application of micro-nutrients on Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) Nil. (ii) Laterite. (iii) 8.5.63/7.6.63. (iv) (a) 2 diggings and 2 tramplings. (b) Transplanting. (c) 36 Kg/ha. (d) 23 cm. $\times$23 cm. (e) N.A. (v) N.A. (vi) P.T.B.—9 (135 days). (vii) Unirrigated. (viii) 2 hand weedings. (ix) N.A. (x) 20.9.63.

2. TREATMENTS :

All combinations of (1) and (2)+3 extra treatments

(1) 6 sources of micronutrients : S_1=Mn. Sul., S_2=Zn. Sul., S_3=Cu. Sul., S_4=Borax, S_5=Sodium Molybdate and S_6=$S_1+S_2+S_3+S_4+S_5$.

(2) 2 methods of application ; M_1=Soil application and M_2=Foliar application.

Extra treatments : T_0=Control, T_1=35 Kg/ha. each of N, P_2O_5 and K_2O and T_2=Spartin at 395 Kg/ha.

T_1 is also applied to 12 plots receiving micronutrients and to T_2 plot. Optimum dose of each micronutrient for the two methods has been tried. T_1 and T_2 applied to soil.

Micronutrients applied on 20.7.63, spartin on 7.6.63 and NPK on 8.7.63.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×4·6 m. (b) 8·2 m.×3·7 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) to (vii) Nil.

5. RESULTS:

(i) 3701 Kg/ha. (ii) 322·7 Kg/ha. (iii) Interaction S×M and 'T$_1$ vs. T$_2$' are highly significant. Main effect of S is significant. (iv) Av. yield of grain in Kg/ha.

T$_0$=3529 Kg/ha., T$_1$=3612 Kg/ha., T$_2$=4443 Kg/ha.

	S$_1$	S$_2$	S$_3$	S$_4$	S$_5$	S$_6$	Mean
M$_1$	3156	3446	3571	4318	4152	3862	3751
M$_2$	4194	3322	3280	3488	3405	3737	3571
Mean	3675	3384	3426	3903	3779	3799	3661

C.D. for S marginal means=325·8 Kg/ha.
C.D. for body of S×M table=460·8 Kg/ha.
C.D. for T$_1$ vs. T$_2$ =460·8 Kg/ha.

———

Crop :- Paddy (*Rabi*).

Ref :- K. 63(M.A.E).

Site :- M.A.E. Centre, Karamanai.

Type :- 'M'.

Object :—Type XI :—To study the effect of method of application of micro-nutrients on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Black paddy. (c) Nil. (ii) Laterite. (iii) 29.9.63/20.10.63. (iv) (a) 3 ploughings, 2 diggings and 2 tramplings. (b) Transplanting. (c) 36 Kg/ha. (d) 23 cm.×23 cm. (e) N.A. (v) Nil. (vi) P.T.B.—4 (140 days). (vii) Irrigated. (viii) 2 hand weedings. (ix) 38 cm. (x) 14.2.64.

2. TREATMENTS : to 4. GENERAL:

Same as in expt. no. 63(M.A.E.) type XI (*Kharif*) on page 115.
Spartin applied on 20.10.63, NPK on 18.11.63 and micronutrients on 3, 18.12.63.

5. RESULTS:

(i) 2068 Kg/ha. (ii) 252·2 Kg/ha. (iii) Main effect of S alone is highly significant. (iv) Av. yield of grain in Kg/ha.

T$_0$=1993, T$_1$=2159, T$_2$=2159 Kg/ha.

	S$_1$	S$_2$	S$_3$	S$_4$	S$_5$	S$_6$	Mean
M$_1$	2367	2034	2034	2076	2076	1827	2069
M$_2$	2450	1827	2117	1910	1868	2117	2048
Mean	2408	1931	2076	1993	1972	1972	2059

C.D. for S marginal means=254·6 Kg/ha.

———

Crop :- Paddy (*Mundakar*)

Ref :- K. 62, 63, 64 (S.F.T.) for Kozhikode & Palghat, 64, 65 (S.F.T.) for rest.

Site :- (District) : Cannanore, Kottayam, Quilon, Trichur, Trivandrum, Alleppy, Kozhikode, Palghat and Ernakulaum.

Type :- 'M'.

Object :—Type A_1 : To study the response curve of important cereals, oilseeds and cash crops to Nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

   (i) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

   8 manurial treatments :

   N_0=Control (no manure)

   N_1=35 Kg/ha. of N

   N_2=70 Kg/ha. of N

   P_1=35 Kg/ha. of P_2O_5

   N_1P_1=35 Kg/ha. of N+35 Kg/ha. of P_2O_5

   N_2P_1=70 Kg/ha. of N+ 35 Kg/ha. of P_2O_5

   N_2P_2=70 Kg/ha. of N+70 Kg/ha. of P_2O_5

   $N_2P_2K_1$=70 Kg/ha. of N+70 Kg/ha. of P_2O_5+35 Kg/ha of K_2O

   N applied as A/S, P_2O_5 as Super and K_2O as Mur. Pot.

3. DESIGN :

   A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping pattern etc. In each zone one block is selected at random. A block normally consists of a group of 50-100 villages. In each block 36 experiments are conducted in a year of which 11 are of type A_1, 11 of type A_2, 11 of type A_3 and 3 are of type C. The eleven experiments under type A_1, A_2 and A_3 are distributed as 3 on a *Kharif* cereal, 3 on a *rabi* cereal, 3 on a cash crop and 2 on oilseed. All the three type C experiments are conducted on legume crop. For the purpose of conducting the A_1, A_2 and A_3 experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type A_1, A_2 and A_3 are laid out. For conducting the three type C trials three villages are randomly selected in each block.

4. GENERAL :

   (i) to (iii) N.A. (iv) (a) 1962 to 1964 for Kozhikode and Palghat, 1964 to 1966 for the rest. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS :

Kozhikode

62(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	167	258	145	436	583	719	1056	52·0

Control yield=1735 Kg/ha. ; No. of trials=12.

63(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	345	552	373	715	920	1063	1328	94·7

Control yield=2016 Kg/ha. ; No. of trials=18.

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	179	597	327	897	937	1185	1472	62·5

Control yield=1995 Kg/ha. ; No. of trials=12.

Palghat

62(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in K/ha.	213	310	400	409	246	524	480	127·6

Control yield=2166 Kg/ha. ; No. of trials=5.

63(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	421	709	528	919	1208	1286	1684	100·0

Control yield=2011 Kg/ha. ; No. of trials=8.

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	377	485	313	635	759	980	1154	96·8

Control yield=3284 Kg/ha. ; No. of trials=5.

Kottayam

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	398	770	715	1017	1278	1559	1842	83·0

Control yield=1926 Kg/ha.; No. of trials=19.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	389	753	416	785	1100	1674	2040	

Control yield=2291 Kg/ha. ; No. of trials=9.

Quilon

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S E.
Av. response of grain in Kg/ha.	258	325	314	385	477	521	780	34·8

Control yield=2212 Kg/ha. ; No. of trials=20.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	368	349	294	457	548	528	795	41·8

Control yield=2046 Kg/ha. ; No. of trials=15.

Trichur

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	429	561	500	869	1015	1267	1681	98·1

Control yield=1693 Kg/ha. ; No. of trials=16.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	850	1225	1250	1625	1015	1267	1681	98·1

Control yield=2400 Kg/ha. ; No. of trials=4.

Trivandrum

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	235	403	256	508	613	900	1109	71·9

Control yield=2382 Kg/ha. ; No. of trials=19.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	331	644	475	645	999	1286	1534	61·8

Control yield=2751 Kg/ha. ; No. of trials=20.

Alleppy

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	127	361	239	727	879	1057	1407	73·4

Control yield=1812 Kg/ha. ; No. of trials=19.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	342	474	346	811	992	1174	1416	100·4

Control yield=1610 Kg/ha. ; No. of trials=15.

Ernakulam

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	240	404	330	488	660	866	1169	36·1

Control yield=2019 Kg/ha. ; No. of trials=20.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	216	389	210	533	691	939	1195	42·2

Control yield=2171 Kg/ha. ; No. of trials=20.

Cannanore

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	288	503	461	550	687	871	1079	99·1

Control yield=2154 Kg/ha. ; No. of trials=20.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	127	248	169	392	551	818	1064	59·7

Control yield=2060 Kg/ha. ; No. of trials=17.

_____

Crop :- Paddy (_Viruppu_).

Ref :- K. 63, 64 (S.F.T.) for Kozhikode ; 63, 64, 65(S.F.T.) for Palghat ; 65 (S.F.T.) for Cannanore & Alleppy 64, 65(S.F.T.) for other centres.

Site :- (District) : Kozhikode, Palghat, Cannanore, Alleppy, Kottayam, Quilon, Trivandrum and Ernakulam.

Type :- 'M'.

Object :—Type A_1 : To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

   (i) to (vi) N.A.   (vii) Unirrigated.   (viii) to (x) N.A.

2. TREATMENTS :

   8 manurial treatments

   O   =Control (no manure)
   N_1 =35 Kg/ha. of N
   N_2 =70 Kg/ha. of N
   P_1 =35 Kg/ha. of P_2O_5
   N_1P_1 =35 Kg/ha. of N+35 Kg/ha. of P_2O_5
   N_2P_1 =70 Kg/ha. of N+35 Kg/ha. of P_2O_5
   N_2P_2 =70 Kg/ha. of N+70 Kg/ha. of P_2O_5
   $N_2P_2K_1$ =70 Kg/ha. of N+70 Kg/ha. of P_2O_5+35 Kg/ha of K_2O

   N applied as A/S, P_2O_5 as Super and K_2O as Mur. Pot.

3. DESIGN :

   Same as in Type A_1 (_Mundakar_) on page 117.

4. GENERAL:

   (i) to (iii) N.A.   (iv) 1963 to 1964 for Kozhikode, 1963 to 66 for Palghat, 1965 to 66 for Cannanore and Alleppy, 1964 to 66 for others.   (v) to (vii) N.A.

5. RESULTS:

Kozhikode

63(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	240	1034	853	1021	1472	2057	2583	347·1

Control yield=2273 Kg/ha. No. of trials=6.

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E
Av. response of grain in Kg/ha.	236	443	383	620	700	1001	1277	75·3

Control yield=2068 Kg/ha. ; No. of trials=20.

Palghat

63(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. yield of grain in Kg/ha.	268	526	220	704	949	1070	1468	100·2

Control yield=1627 Kg/ha. ; No. of trials=9.

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	344	456	366	480	828	903	1308	117·3

Control yield=2148 Kg/ha. ; No. of trials=16.

65 (S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	676	696	588	1200	1424	1796	2060	386·4

Control yield=3284 Kg/ha. ; No. of trials=5.

Kottayam

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	360	401	503	713	1016	1182	1568	86·5

Control yield=1695 Kg/ha, ; No. of trials=10.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	242	267	253	525	831	934	1304	79·7

Control yield=1953 Kg/ha. ; No. of trials=6.

Quilon

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	226	311	257	363	438	524	686	30·6

Control yield=1760 Kg/ha. ; No. of trials=12.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	257	326	293	397	444	512	738	44·6

Control yield=1871 Kg/ha. ; No. of trials=9.

Trivandrum

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	346	446	340	543	634	806	1016	49·4

Control yield=2084 Kg/ha. ; No. of trials=13.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	266	751	345	811	1129	1465	1788	85·8

Control yield=2657 Kg/ha. ; No. of trials=12.

Alleppy

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	178	488	427	1050	1353	1662	2295	95·9

Control yield=1428 Kg/ha. ; No. of trials=5.

Ernakulam

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	143	341	152	436	588	823	1035	53·0

Control yield=2010 Kg/ha. ; No. of trials=12.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	145	331	262	424	600	810	996	35·5

Control yield and No. of trials—N.A.

Cannanore

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	304	426	389	401	605	821	850	105·1

Control yield=1955 Kg/ha. ; No. of trials=11.

———

Crop :- Paddy (*Munelakam*).

Ref :- K. 64, 65 (S.F.T.) for Trivandrum, Alleppy,Ernakulam, Cannanore, Kottayam, Trichur and Quilon ; 62, 63, 64 (S.F.T.) for Kozhikode and Palghat.

Site :- (District) : Trivandrum, Alleppy Ernakulam, Cannanore, Kottayam, Trichur, Quilon, Kozhikode and Palghat.

Type :- 'M'.

Object :—Type A_2 : To study the response curves of important cereals, cash and oilseed crops to Phosphorus applied singly and in combination with other nutrients.

1. **BASAL CONDITIONS :**
   (i) to (vi) N A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

O = Control (no manure)
N_1 = 35 Kg/ha. of N.
P_1 = 35 Kg/ha. of P_2O_5.
P_2 = 70 Kg/ha. of P_2O_5.
N_1P_1 = 35 Kg/ha. of N+35 Kg/ha. of P_2O_5.
N_1P_2 = 35 Kg/ha. of N+70 Kg/ha. of P_2O_5.
N_2P_2 = 70 Kg/ha. of N+70 Kg/ha. of P_2O_5.
$N_2P_2K_2$ = 70 Kg/ha. of N+70 Kg/ha. of P_2O_5+70 Kg/ha. of K_2O.

N applied as A/S, P_2O_5 as Super and K_2O as Mur. Pot.

3. DESIGN :

Same as the experiment Type A_1 (Mundakar) on page 117.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1964 to 66 for Trivandrum, Alleppy, Ernakulam, Cannanore, Kottayam, Trichur and Quilon ; 1962 to 1964 for Kozhikode and 1962 to 1966 for Palghat (65 N.A.) (c) Nil. (v) to (vii) N.A.

5. RESULTS :

Trivandrum

64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	359	417	625	675	845	1153	1481	78·0

Control yield=2405 Kg/ha. ; No. of trials=22.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	384	429	682	775	1037	1439	1689	98·3

Control yield=2784 Kg/ha. ; No. of trials=20.

Alleppy

64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	256	342	620	772	922	1155	1419	66·3

Control yield=1726 Kg/ha.; No. of trials=19.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	270	336	551	739	950	1204	1515	114·3

Control yield=1688 Kg/ha.; No. of trials=15.

Ernakulam

64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	231	224	404	558	755	953	1205	44·0

Control yield=2038 Kg/ha. ; No. of trials=20.

65(S F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	257	211	363	571	765	912	1316	39·6

Control yield=2081 Kg/ha.; No. of trials=20.

Cannanore
64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	344	282	337	554	628	822	905	111·6

Control yield=2183 Kg/ha. ; No. of trials=19.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	155	57	358	406	561	781	1121	70·9

Control yield=2106 Kg/ha. ; No. of trials=16.

Kottayam
64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	405	605	806	1074	1273	1646	1903	105·2

Control yield=1949 Kg/ha. ; No. of trials=19.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	150	69	249	908	414	1319	1555	322·2

Control yield=2714 Kg/ha. ; No. of trials=10.

Trichur
64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	394	392	697	888	1141	1311	1659	87·8

Control yield=1596 Kg/ha. ; No. of trials=16.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	900	1325	1075	1275	1425	1425	1850	218·5

Control yield=2500 Kg/ha. ; No. of trials=4.

Quilon
64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	327	336	268	414	557	578	738	51·9

Control yield=1776 Kg/ha.; No. of trials=12.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	298	292	384	387	547	503	842	37·8

Control yield=2050 Kg/ha. ; No. of trials=15.

Kozhikode

62(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	163	318	460	559	719	868	1198	42·7

Control yield=1777 Kg/ha. ; No. of trials=12.

63(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	272	371	541	616	650	1037	1387	157·5

Control yield=2121 Kg/ha. ; No. of trials=17.

64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	98	223	539	526	764	1130	1679	51·0

Control yield=2148 Kg/ha. ; No. of trials=24.

Palghat

62(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	242	102	—39	218	253	295	301	99·0

Control yield=2947 Kg/ha. ; No. of trials=6.

63(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	539	594	815	913	1198	1516	1986	124·4

Control yield=2009 Kg/ha. ; No. of trials=9.

64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	289	321	444	511	746	811	1199	80·7

Control yield=2608 Kg/ha. ; No. of trials=27.

Crop :- Paddy (*Viruppu*).

Ref :- **K. 63, 64 (S.F.T.) for Kozhikode; 63, 64, 65(S.F.T.) for Palghat ; 65 for Cannanore and Alleppy and 64, 65 (S.F.T.) for others.**

Site :- (District) :- **Kozhikode,** **Type :- 'M'.**
Palghat, Cannanore, Alleppy,
Kottayam, Trivandrum,
Ernakulam and Quilon

Object :—Type A_2 : To study the response curves of important cereals, oilseeds and cash crops to Phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

   (i) to (vi) N.A.   (vii) Unirrigated.   (viii) to (x) N.A.

2. TREATMENTS :

   8 manurial treatments :

   N_0=Control (no manure).
   N_1=35 Kg/ha. of N.
   P_1=35 Kg/ha. of P_2O_5.
   P_2=70 Kg/ha. of P_2O_5.
   N_1P_1=35 Kg/ha. of N+35 Kg/ha. of P_2O_5.
   N_1P_2=35 Kg/ha. of N+70 Kg/ha. of P_2O_5.
   N_2P_2=70 Kg/ha of N+70 Kg/ha. of P_2O_5.
   $N_2P_2K_2$=70 Kg/ha. of N+70 Kg/ha. of P_2O_5+70 Kg/ha. of K_2O.
   N applied as A/S, P_2O_5 as Super and K_2O as Mur. Pot.

3. DESIGN :

   Same as the expt. type A_1 on Paddy (*Mundakar*) on page 117.

4. GENERAL :

   (i) to (iii) N.A. (iv) (a) 1963 to 64 for Kozhikode ; 1963 to 65 for Palghat ; 1965 for Cannanore and Alleppy; 1964 and 65 for others.   (v) to (vii) N.A.

5. RESULTS :

Kozhikode

63(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	665	317	945	817	1319	1696	2365	178·0

Control yield=2227 Kg/ha. ; No. of trials=6.

64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	162	140	294	470	449	523	962	136·2

Control yield=2826 Kg/ha. ; No. of trials=8.

Palghat

63(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	419	314	582	860	1033	1314	1685	77·0

Control yield=1779 Kg/ha. ; No. of trials=9.

64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	266	207	306	469	667	869	1126	21·6

Control yield=1754 Kg/ha. ; No. of trials=4.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	220	272	180	556	732	1260	1876	150·5

Control yield=3420 Kg/ha.; No. of trials=5.

Cannanore

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	243	260	346	566	573	778	995	98·2

Control yield=2036 Kg/ha. ; No. of trials=12.

Alleppy

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	236	324	661	908	1204	1518	1909	123 0

Control yield=1413 Kg/ha. : No. of trials=6.

Kottayam

64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	431	408	621	781	975	1247	1704	87·9

Control yield=1669 Kg/ha. ; No. of trials=12.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	230	326	486	861	931	1063	1403	141·2

Control yield=1973 Kg/ha. ; No. of trials=6.

Trivandrum

64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	274	227	365	478	557	835	1287	96·5

Control yield=2175 Kg/ha. ; No. of trials=10.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	517	468	669	767	926	1561	1817	92·1

Control yield=2702 Kg/ha. ; No. of trials=12.

Ernakulam

64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	144	90	248	342	471	694	869	43·6

Control yield=2264 Kg/ha ; No. of trials=6.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	200	257	430	497	710	862	1100	64·5

Control yield=2045 Kg/ha. ; No. of trials=12.

Quilon

64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	221	227	262	345	453	562	763	33·4

Control yield=1776 Kg/ha. ; No. of trials=12.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	204	287	379	373	435	488	846	45·0

Control yield=1865 Kg/ha. ; No. of of trials=9.

———

Crop :- Paddy.

Ref :- K 62, 63, 64 (S.F.T.) for Palghat and Kozhikode ; 64, 65 (S.F.T.) for others.

Site .- (District): Ernakulam, Trichur, Trivandrum, Alleppy, Cannanore, Kottayam, Quilon, Kozhikode and Palghat.

Type :- 'M'.

Object :— Type A_1 : To study the response curves of important cereals, cash and oilseed crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS:
   (i) N.A. (ii) Alluvial. (iii) to (vi) Nil. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

   8 manurial treatments :
   O   =Control (no manure).
   N_1 =35 Kg/ha. of N.
   K_1 =35 Kg/ha. of K_2O.
   K_2 =70 Kg/ha. of K_2O.
   N_1K_1 =35 Kg/ha. of N+35 Kg/ha. of K_2O.
   N_1K_2 =35 Kg/ha. of N+70 Kg/ha. of K_2O.
   N_2K_2 =70 Kg/ha. of N+70 Kg/ha. of P_2O_5.
   $N_1P_1K_1$ =35 Kg/ha. of N+35 Kg/ha. of P_2O_5+35 Kg/ha. of K_2O.
   N applied as A/S ; P_2O_5 as Super and K_2O as Mur. Pot.

3. **DESIGN :**

Same as in experiment Type A$_1$ on (*Mundakar*) on page 117.

4. **GENERAL :**

(i) to (iii) N.A. (iv) (a) 1962 to 1964 Palghat and Kozhikode ; 1964 to 1965 for the rest. (b) N.A. (c) Nil.
(v) to (vii) N.A.

5. **RESULTS :**

Ernakulam

64(S.F.T.)

Treatment	N$_1$	K$_1$	K$_2$	N$_1$K$_1$	N$_1$K$_2$	N$_2$K$_2$	N$_1$P$_1$K$_1$	S.E.
Av. response of grain in Kg/ha.	222	348	503	572	712	955	1041	52·0

Control yield = 1990 Kg/ha. ; No. of trials = 20.

65(S.F.T.)

Treatment	N$_1$	K$_1$	K$_2$	N$_1$K$_1$	N$_1$K$_2$	N$_2$K$_2$	N$_1$P$_1$K$_1$	S.E.
Av. response of grain in Kg/ha.	206	275	443	583	767	962	1061	35·1

Control yield = 2088 Kg/ha. ; No. of trials = 20.

Trichur

64(S.F.T.)

Treatment	N$_1$	K$_1$	K$_2$	N$_1$K$_1$	N$_1$K$_2$	N$_2$K$_2$	N$_1$P$_1$K$_1$	S.E.
Av. response of grain in Kg/ha.	424	390	606	828	1015	1175	1390	85·1

Control yield = 1542 Kg/ha. ; No. of trials = 15.

65(S.F.T.)

Treatment	N$_1$	K$_1$	K$_2$	N$_1$K$_1$	N$_1$K$_2$	N$_2$K$_2$	N$_1$P$_1$K$_1$	S.E.
Av. response of grain in Kg/ha.	866	700	866	1266	1333	1633	1666	243·8

Control yield = 2466 Kg/ha.; No. of trials = 3.

Trivandrum

64(S.F.T.)

Treatment	N$_1$	K$_1$	K$_2$	N$_1$K$_1$	N$_1$K$_2$	N$_2$K$_2$	N$_1$P$_1$K$_1$	S.E.
Av. response of grain in Kg/ha.	394	370	555	643	648	1051	1057	60·2

Control yield = 2348 Kg/ha.; No. of trials = 20.

65(S.F.T.)

Treatment	N$_1$	K$_1$	K$_2$	N$_1$K$_1$	N$_1$K$_2$	N$_2$K$_2$	N$_1$P$_1$K$_1$	S.E.
Av. response of grain in Kg/ha.	361	316	494	600	817	1147	1040	62·6

Control yield = 2699 Kg/ha. ; No. of trials = 20.

Alleppy

64(S.F.T.)

Treatment	N$_1$	K$_1$	K$_2$	N$_1$K$_1$	N$_1$K$_2$	N$_2$K$_2$	N$_1$P$_1$K$_1$	S.E.
Av. response of grain in Kg/ha.	282	305	458	752	1001	1046	1200	76·2

Control yield = 1688 Kg/ha. ; No. of trials = 18.

65(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of grain in Kg/ha.	172	287	314	435	611	1000	1160	129·5

Control yield=1763 Kg/ha ; No. of trials=15.

Cannanore

64(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of grain in Kg/ha.	197	186	227	479	609	778	913	93·1

Control yield=1983 Kg/ha. ; No. of trials=19.

65(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_2K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of grain in Kg/ha.	169	163	309	437	618	921	959	60·8

Control yield=1981 Kg/ha. ; No. of trials=16.

Kottayam

64(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of grain in Kg/ha.	385	469	632	877	1132	1558	1557	63·8

Control yield=1767 Kg/ha. ; No. of trials=20.

65(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of grain in Kg/ha.	235	230	411	430	954	1407	1437	154·2

Control yield=2073 Kg/ha. ; No. of trials=10.

Quilon

64(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of grain in Kg/ha.	262	227	273	403	463	523	738	40·6

Control yield=2262 Kg/ha. ; No. of trials=17.

65(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of grain in Kg/ha.	187	219	263	400	455	482	673	43·9

Control yield=1998 Kg/ha. ; No. of trials=12.

Kozhikode

62(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of grain in Kg/ha.	252	278	368	495	638	792	951	35·4

Control yield=1733 Kg/ha. ; No. of trials=12.

63(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of grain in Kg/ha.	252	295	433	583	741	1093	1049	65·7

Control yield=1831 Kg/ha. ; No. of trials=17.

64(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of grain in Kg/ha.	205	406	677	813	971	1320	1421	59·6

Control yield=1939 Kg/ha. ; No. of trials=12.

Palghat

62(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of grain in Kg/ha.	32	—68	—49	74	00	207	210	138·0

Control yield=2129 Kg/ha. ; No. of trials=6.

63(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of grain in Kg/ha.	318	449	673	900	1112	1314	1555	102·3

Control yield=1875 Kg/ha.; No. of trials=9.

64(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of grain in Kg/ha.	331	293	318	476	752	900	1071	94·0

Control yield=2257 Kg/ha.; No. of trials=16.

———

Crop :- Paddy (*Viruppa*).   **Ref :- K. 64, 65 for all District.**

Site :- (District) :- Ernakulam, Kottayam,   **Type :- 'M'.**

Quilon, Trivandrum.

Object :—Type A_3 : To study the response curves of important cereal, oilseed and cash crops to Nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) to (vi) N.A.   (vii) Unirrigated.   (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

N_0=Control (no manure)

N_1=35 Kg/ha. of N.

K_1=35 Kg/ha. of K_2O.

K_2=70 Kg/ha. of K_2O.

N_1K_1=35 Kg/ha. of N+35 Kg/ha. of K_2O.

N_1K_2=35 Kg/ha. of N+70 Kg/ha. of K_2O.

N_2K_2=70 Kg/ha. of N+70 Kg/ha. of K_2O.

$N_1P_1K_1$=35 Kg/ha. of N+35 Kg/ha. of P_2O_5+35 Kg/ha. of K_2O.

N.applied as A/S, P as Super Phosphate and K_2O as Mur. Pot.

3. DESIGN:

Same as in Type A$_1$ (*Mundakar*) on page 117.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1964 to 65 for all Districts. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS :

Ernakulam

64(S.F.T.)

Treatment	N$_1$	K$_1$	K$_2$	N$_1$K$_1$	N$_1$K$_2$	N$_2$K$_2$	N$_1$P$_1$K$_1$	S.E.
Av. response of grain in Kg/ha.	131	273	398	448	618	769	829	41·6

Control yield=2084 Kg/ha.; No. of trials=12.

65(S.F.T.)

Treatment	N$_1$	K$_1$	K$_2$	N$_1$K$_1$	N$_1$K$_2$	N$_2$K$_2$	N$_1$P$_1$K$_1$	S.E.
Av. response of grain in Kg/ha.	157	254	393	434	595	767	875	41·6

Control yield=2052 Kg/ha. ; No. of trials=11.

Kottayam

64(S.F.T.)

Treatment	N$_1$	K$_1$	K$_2$	N$_1$K$_1$	N$_1$K$_2$	N$_2$K$_2$	N$_1$P$_1$K$_1$	S.E.
Av. response of grain in Kg/ha.	279	368	465	770	862	1119	1329	55·2

Control yield=1751 Kg/ha. ; No. of trials=12.

65(S.F.T.)

Treatment	N$_1$	K$_1$	K$_2$	N$_1$K$_1$	N$_1$K$_2$	N$_2$K$_2$	N$_1$P$_1$K$_1$	S.E.
Av. response of grain in Kg/ha.	191	139	242	450	539	620	786	78·2

Control yield=1980 Kg/ha. ; No. of trials=6.

Quilon

64(S.F T.)

Treatment	N$_1$	K$_1$	K$_2$	N$_1$K$_1$	N$_1$K$_2$	N$_2$K$_2$	N$_1$P$_1$K$_1$	S.E.
Av. response of grain in Kg/ha.	226	201	290	332	353	461	608	26·2

Control yield=1729 Kg/ha.; No. of trials=12.

65(S.F.T.)

Treatment	N$_1$	K$_1$	K$_2$	N$_1$K$_1$	N$_1$K$_2$	N$_2$K$_2$	N$_1$P$_1$K$_1$	S.E.
Av. response of grain in Kg/ha.	272	290	310	370	425	516	745	51·0

Control yield=1852 Kg/ha. ; No. of trials=10.

Trivandrum

64(S.F.T.)

Treatment	N$_1$	K$_1$	K$_2$	N$_1$K$_1$	N$_1$K$_2$	N$_2$K$_2$	N$_1$P$_1$K$_1$	S.E.
Av. response of grain in Kg/ha.	392	292	433	580	665	900	947	50·9

Control yield=2237 Kg/ha. ; No. of trials=12.

65(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of grain in Kg/ha.	496	473	857	843	1150	1470	1503	96·9

Control mean=2551 Kg/ha. ; No. of trials=12.

— — —

Crop :- Paddy (*Kharif*).

Site :- Quilon and Trivandrum.

Ref :- K. 60(S.F.T).

Type :- 'M'.

Object :— Type A : To study the response of Paddy to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A.   (ii) Laterite.   (iii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

O   =Control (no manure).

N   =22·4 Kg/ha. of N as A/S.

P   =22·4 Kg/ha. of P_2O_5 as Super.

K   =22·4 Kg/ha. of K_2O as Mur. Pot.

NP   =22·4 Kg/ha. of N as A/S+22·4 Kg/ha. of P_2O_5 as Super.

NK   =22·4 Kg/ha. of N as A/S+22·4 Kg/ha. of K_2O as Mur. Pot.

PK   =22·4 Kg/ha. of P_2O_5 as Super+22·4 Kg/ha. of K_2O as Mur. Pot.

NPK   =22·4 Kg/ha. of N as A/S+22·4 Kg/ha. of P_2O_5 as Super+22·4 Kg/ha. of K_2O as Mur. Pot.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant posted in each zone. The field assistant conducts the trials in one revenue circle or thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crop, 4 on an oilseed crop and 3 on a legumenous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on Type C trials in two out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) 1/93·8 ha. (b) 1/197·7 ha. (iv) Yes.

4. GENERAL:

(i) to (iii) N.A. (iv) (a) 1960 (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS:

Av. response of grain in Kg/ha. (*Kharif*)

District	No. of trials	Control yield	N	P	K	S.E.	NP	NK	PK	NPK	S.E.
Quilon	16	2010	460	370	280	11·0	70	10	40	10	8·0
Trivandrum	16	1860	440	310	·200	19·0	30	—20	10	60	13·0

— — —

Crop :- Paddy (*Rabi.*).   **Ref :- K. 60(S.F.T).**

Site :- Quilon and Trivandrum.   **Type :- 'M'.**

Object :—Type A : To study the response of Paddy to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

   (i) N.A.   (ii) Laterite.   (iii) to (x) N.A.

2. TREATMENTS[to   4. GENERAL :

   Same as in expt. No. 60(S.F.T.) Type A on Paddy (*Kharif*) on page 133.

5. RESULTS :

Av. response of grain in Kg/ha.

District	No. of trials	Control yield	N	P	K	S.E.	PN	NK	PK	NPK	S.E.
Quilon	23	2340	510	420	320	17·0	50	30	70	20	16·0
Trivandrum	23	1980	460	340	200	18·0	90	−30	—20	70	17·0

—— · ——

Crop :- Paddy (*Kharif*).   **Ref :- K. 60(S.F.T.)**

Site :- Quilon and Trivandrum.   **Type :- 'M'.**

Object :—Type A : To investigate the relative efficiency of different nitrogeneous fertilizers applied at different doses.

1. BASAL CONDITIONS :

   (i) N.A.   (ii) Laterite.   (iii) to (x) N.A.

2. TREATMENTS :

   8 manurial treatments :
   O   = Control (no manure).
   N_1 = 44·8 Kg/ha. of N as A/S.
   N_2 = 89·6 Kg/ha. of N as A/S.
   N_1' = 44·8 Kg/ha. of N as Urea.
   N_2' = 89·6 Kg/ha. of N as Urea.
   N_1'' = 44·8 Kg/ha. of N as A/S/N.
   N_2'' = 89·6 Kg/ha. of N as A/S/N.

   At Trivandrum instead of treatments N_1 and N_2 mentioned above treatments $N_1''' = 44·8$ and $N_2''' = 89·6$ Kg/ha. of N as C/A/N have been tried with number of trials equal to 3 as a seperate experiment.

3. DESIGN :

   Same as in Type A (*Kharif*) on page 133.

4. GENERAL :

   (i) to (iii) N.A.   (iv) (a) 1960.   (b) and (c) Nil.   (v) to (vii) N A.

5. RESULTS :

Av. yield of grain in Kg/ha. (Kharif)

District	No. of trials	O	N_1	N_2	N_1'	N_2'	N_1''	N_2''	N_1'''	N_2'''	G.M.	S.E./Mean
Quilon	16	2050	2230	2710	2390	2660	2550	2910	—	—	2514	12·6
Trivandrum	12	1840	2250	2570	2380	2760	2290	2670	—	—	2394	29·7
Trivandrum	3	2080	—	—	2600	2820	2500	2560	2290	2510	2480	35·1

——————

Crop :- Paddy (*Rabi*).　　　　　　　　　**Ref :- K. 60(S.F.T).**

Site :- Quilon and Trivandrum.　　　　**Type :- 'M'.**

Object : Type B : To investigate the relative efficiency of different nitrogeneous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) N.A.　(ii) Laterite.　(iii) to (x) N.A.

2. TREATMENTS : to　4. GENERAL :

Same as in expt. No. 60(S.F.T.) *Kharif* on page 134.

5. RESULTS :

District	No. of trials	O	N_1	N_2	N_1'	N_2'	N_1''	N_2''	G.M.	S.E./Mean
Quilon	24	2380	2820	3150	2880	3230	2980	3390	2976	17.5
Trivandrum	24	1980	2390	2780	2470	2860	2510	2850	2549	29.0

Crop :- Paddy (*Kharif*).　　　　　　　**Ref :- K. 64(93), 65(10).**

Site :- Rice Res. Stn., Kayamkulam.　　**Type :- 'MV'.**

Object : To find out the differential response to manuring of the promising strains.

1. BASAL CONDITIONS :

(i) (a) Nil.　(b) Paddy.　(c) 4942 Kg/ha. of C.M.+124 Kg/ha. of A/S+124 Kg/ha. of S/P and 62 Kg/ha. of Mur. Pot. for 64(93), As per treatments for 65(17). (ii) Sandy loam. (iii) 29.4.64 ; 29.4.65. (iv) (a) 1 ploughing with Iron plough. (b) to (e) N.A. (v) P_2O_5 and K_2O applied as basal dressing. Half of N applied as basal and other half applied as top dressing one month before flowering. (vi) As per treatments. (vii) Unirrigated. (viii) 2 interculturings and 2 weedings. (ix) 120.6 cm.; 108.4 cm. (x) 29.7.64; 6.8.65.

2. TREATMENTS :

Main-plot treatments :

3 levels of N as A/S : N_1=22.4, N_2=44.8 and N_3=67.2 Kg/ha.

Sub-plot treatments :

4 varieties : V_1=P.T.B.--10, V_2=P.T.B.-23, V_3=P.T.B.-31 and V_4=*Kochuvihtu.*

3. DESIGN :

(i) Split-plot.　(ii) (a) 3 main-plots/replication ; 4 sub-plots/main-plot.　(b) N.A.　(iii) 4.　(iv) (a) and (b) 7.0 m.×3.5 m.　(v) N.A.　(vi) Yes.

4. GENERAL :

(i) Normal.　(ii) Nil.　(iii) Yield of grains.　(iv) (a) 1964—65.　(b) Yes.　(c) Nil.　(v) N.A.　(vi) Nil.　(vii) Sub-plot error variances are heterogeneous. Hence the results of individual years are presented under 5. Results.

5. RESULTS :

64(93)

(i) 2183 Kg/ha.　(ii) (a) 480.4 Kg/ha.　(b) 361.1 Kg/ha.　(iii) Main effect of V alone is significant.　(iv) Av. yield of grain in Kg/ha.

	V_1	V_2	V_3	V_4	Mean
N_1	1663	2273	1908	2308	2038
N_2	1974	2245	1949	2463	2158
N_3	2281	2758	2191	2184	2354
Mean	1973	2425	2016	2318	2183

C.D. for V marginal means=299·5 Kg/ha.

65(10)

(i) 2227 Kg/ha. (ii) (a) 110·8 Kg/ha. (b) 197·1 Kg/ha. (iii) Main effects of N and V are significant. (iv) Av. yield of grain in Kg/ha.

	V_1	V_2	V_3	V_4	Mean
N_1	1928	2255	1683	1683	1887
N_2	2316	2469	2265	2071	2280
N_3	2428	2826	2653	2143	2512
Mean	2224	2517	2200	1965	2227

C.D. for N marginal means=95·9 Kg/ha.
C.D. for V marginal means=165·1 Kg/ha.

————

Crop :- Paddy (*Rabi*).   **Ref :- K. 65(56).**

Site :- Rice Res. Stn., Kayamkulam.   **Type :- 'MV'.**

Object :—To find out the effective manurial doses and to compare thePaddy varieties obtained from the cross *Chempa × Pinkco*.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 30 Kg/ha. of N as A/S., 30 Kg/ha. of P_2O_5 as Super, 30 Kg/ha. K_2O as Mur. Pot. and 2000 Kg/ha. of C.M. (ii) Sandy loam. (iii) 25.8.65. (iv) (a) 6 ploughings, 2 levellings. (b) to (e) N.A. (v) As in (i) (c). All the manures except ½ the dose of A/S is applied as basal and ½ of A/S as top dressing. (vi) Nil. (vii) Unirrigated. (viii) 2 hand weedings and 1 interculturing. (ix) 95 cm. (x) 12.1.66.

2. TREATMENTS :

Main-plot treatments :

2 levels of manures : M_1=40 Kg/ha. of N+30 Kg/ha. of P_2O_5+30 Kg/ha. of K_2O, M_2=80 Kg/ha. of N +40 Kg/ha. of P_2O_5+40 Kg/ha. of K_2O.

Sub-plot treatments :

4 varieties : V_1=12, V_2=13, V_3=14 and V_4=U.R.—19.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) and (b) 5 m.×2 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) No serious incidence of pests or disease. Endrin and Bordeaux mixture were sprayed twice. (iii) Yield of grain. (iv) (a) 1965—N.A. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 2662 Kg/ha. (ii) (a) 310 Kg/ha. (b) 399 Kg/ha. (iii) Main effect of 'V' alone is highly significant. (iv) Av. grain yield in Kg/ha

	V_1	V_2	V_3	V_4	Mean
M_1	2680	3200	2500	2400	2695
M_2	2220	3420	2620	2260	2630
Mean	2450	3310	2560	2330	2662

C.D. for V marginal means = 368.2 Kg/ha.

— —

Crop :- Paddy (*Kharif*). **Ref :- K. 65(48).**

Site :- Rice Res. Stn., Kayamkulam. **Type :- 'MV'.**

Object :—To evolve a high yielding short duration strain under two levels of fertility.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Gingelly. (c) N.A. (ii) Sandy loam. (iii) 1.5.65. (iv) (a) to (e) N.A. (v) 13.6 Kg/ha. each of N, P and K were given of which entire P_2O_5 and K_2O were given as basal dressing in the form of Super and Mur. Pot. (vi) As per treatments. (vii) Unirrigated. (viii) 2 interculturings with *attukara* hoe and 2 hand weedings. (ix) 108 cm. (x) 11.8.65.

2. TREATMENTS :

Main-plot treatments :

4 cultures : V_1=Culture No. 1, V_2=No. 113. V_3=No. 184 and V_4=*Kochovithu.*

Sub-plot treatments :

2 levels of manures : M_1=Normal fertility (40 Kg/ha. of N+30 Kg/ha. of P_2O_5+30 Kg/ha. of K_2O) and M_2=High fertility (80 Kg/ha. of N+40 Kg/ha. of P_2O_5+40 Kg/ha. of K_2O).

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) and (b) 5 m.×2 m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Blight incidence was noticed. (iii) Vegetative and productive tiller counts and yield of grain and straw. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) Nil. (vi) and (vii) N.A.

5. RESULTS :

(i) 1818 Kg/ha. (ii) (a) 309 Kg/ha. (b) 231 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	Mean
M_1	1820	1780	1720	1640	1740
M_2	2100	1820	1800	1860	1895
Mean	1960	1800	1760	1750	1818

— —

Crop :- Paddy (*Rabi*).   **Ref :- K. 65(54).**

Site :- Reg. Rice Res. Stn., Kayamkulam.   **Type :- 'MV'.**

Object :—To study the differential responses to manuring of different varieties.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 30 Kg/ha. of N as A/S, 30 Kg/ha. of P_2O_5 as Super, 30 Kg/ha. of K_2O as Mur. Pot., 2000 Kg/ha. of C.M. (ii) Sandy loam. (iii) 1.9.65. (iv) (a) 6 ploughings. (b) to (e) N.A. (v) and (vi) As per treatments. (vii) Unirrigated. (viii) 2 hand weedings and 1 interculturing with Japanese hoe. (ix) 95 cm. (x) 25.1.66.

2. TREATMENTS:

Main-plot treatments :

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

Sub-plot treatments :

    4 varieties : $V_1=P.T.B.—4$, $V_2=P.T.B.—16$, $V_3=P.T.B.—20$ and $V_4=V.R.—19$.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 4 sub-plots/main-plot. (b) $2.8 m. \times 3.5 m$. (iii) 4. (iv) (a) and (b) $7.0 m. \times 3.5 m$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) No serious incidence of pests or disease noticed. Endrin and Bordeaux mixture sprayed twice. (iii) Yield of grain. (iv) (a) 1964—N.A. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 2135 Kg/ha. (ii) (a) 187.8 Kg/ha. (b) 353.9 Kg/ha. (iii) Main effects of N and V are significant. (iv) Av. yield of grain in Kg/ha.

	V_1	V_2	V_3	V_4	Mean
N_1	2000	1765	2367	1888	2005
N_2	2112	2102	2347	2133	2174
N_3	2643	2143	2347	1776	2227
Mean	2252	2003	2354	1932	2135

C.D. for N marginal means = 162.5 Kg/ha.

C.D. for V marginal means = 296.5 Kg/ha.

Crop :- Paddy (*Rabi*).   **Ref :- K. 64(71).**

Site :- Rice Res. Stn., Kayamkulam.   **Type :- 'MV'.**

Object :—To fix up the varietal response to manuring of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy—Sesamum. (b) Paddy. (c) 33.6 Kg/ha. of N as A/S+33.6 Kg/ha. of P_2O_5 as Super +33.6 Kg/ha. of K_2O as Mur. Pot. (ii) Sandy loam. (iii) N.A./29.8.1964. (iv) (a) 6 ploughings and puddling and one planking. (b) to (e) N.A. (v) 5000 Kg/ha. of C.M., 125 Kg/ha. of Super 60 Kg/ha. of Mur. Pot. (vi) As per treatments. (vii) Unirrigated. (viii) 2 intercultures with Japanese hoe and hand weeding. (ix) 98 cm. (x) 20.1.1965.

2. TREATMENTS :

Main-plot treatments :

   3 levels of N as Urea : $N_1 = 22.4$, $N_2 = 44.8$ and $N_3 = 67.3$ Kg/ha.

Sub-plot treatments :

   4 varieties : $V_1 = $ PTB—4, $V_2 = $ PTB—16, $V_3 = $ PTB—20 and $V_4 = $ UR—19.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) 7 m. × 3·5 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964—N.A. (b) Yes. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 2535 Kg/ha. (ii) (a) 250·9 Kg/ha. (b) 268·7 Kg/ha. (iii) Main effect of V alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	V_1	V_2	V_3	V_4	Mean
N_1	2714	1714	3020	2939	2597
N_2	2622	1663	3020	2918	2556
N_3	2510	1551	3326	2418	2451
Mean	2615	1643	3122	2758	2535

C.D. of V marginal means = 225·1 Kg/ha.

———

Crop :- Paddy *(Kharif)*.

Site :- Rice Res. Stn., Kottarakara.

Ref :- K. 65(58).

Type :- 'MV'.

Object :—To evolve an improved strain from *Kuttalam* variety of Paddy.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) 160·6 Kg/ha. of Super and 61 Kg/ha. of Mur. Pot. (ii) Clayey loam. (iii) 16.5.65/23.6.65. (iv) (a) Digging 3 times, levelling 2 times. (b) to (e) N.A. (v) 160·6 Kg/ha. of Mur. Pot. at 61·8 Kg/ha. as top dressing (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and intercultiuring (ix) 99·0 cm. (x) 30.9.65.

2. TREATMENTS :

Main-plot treatments :

   3 levels of manure : $M_1 = 44.8$ Kg/ha. of N, $M_4 = 89.6$ Kg/ha. of N and $M_3 = 134.4$ Kg/ha. of N.

Sub-plot treatments :

   9 cultures : $V_1 = $ Culture no. 329, $V_2 = $ Culture no. 264, $V_3 = $ S.T.D., $V_4 = $ PTB—24, $V_5 = $ Culture no. 152, $V_6 = $ Cuture no. 53, $V_7 = $ Culture no. 29, $V_8 = $ Culture no. 208 and $V_9 = $ Culture no. 193.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plos/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6·3 m. × 2·6 m. (b) 6·1 m. × 2·4 m. (v) 8 cm. × 8 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1965—contd. (b) Yes. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 2511 Kg/ha. (ii) (a) 1005·7 Kg/ha. (b) 514·0 Kg/ha. (iii) Main effect of V alone is highly 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	Mean
M_1	1942	2368	2427	1864	2518	2456	2228	1983	2399	2243
M_2	2027	2502	2399	2027	2527	3210	2031	2552	2372	2405
M_3	2414	3063	2822	2252	3230	3221	3011	2698	3249	2884
Mean	2128	2644	2549	2047	2758	2962	2423	2411	2674	2511

C.D. for V marginal means = 359·8 Kg/ha.

————

Crop :- Paddy (*Rabi*).   **Ref :- K. 65(59).**

Site :- Rice Res. Stn., Kottarakara.   **Type :- 'MV'.**

Object :—To evolve an improved strain of *Cheradi* (Local) variety by pure line selection under different manurial levels.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Lateritic. (iii) 30.8.65/13·10 65. (iv) and (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) Interculture operations and weeding. (ix) N.A. (x) 25.2.1966.

2. TREATMENTS :

Main-plot treatments :

3 levels of N : N_1 = 44·8, N_2 = 89·6 and N_3 = 134·4 Kg/ha.

Sub-plot treatments :

9 strains : S_1 = 29, S_2 = 17, S_3 = 269, S_4 = 34, S_5 = 55, S_6 = 370, S_7 = 328, S_8 = 372 and S_9 = Standard.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6·1 m. × 2·4 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Stem borer attack controlled by spraying 0·05% Endrin. (iii) Grain yield. (iv) (a) 1965—contd. (b) Yes. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 4795 Kg/ha. (ii) (a) 579·2 Kg/ha. (b) 345·6 Kg/ha. (iii) Main effects of N and S are significant. (iv) Av. yield of grain in Kg/ha.

	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9	Mean
N_1	4827	4137	4549	4810	4541	4238	4267	4667	4507	4505
N_2	4953	4709	4692	5306	4760	4869	4760	4440	4297	4754
N_3	5525	4819	5256	5424	5315	4709	5054	5273	4760	5126
Mean	5102	4556	4433	5180	4872	4605	4694	4793	4521	4795

C.D. for N marginal means=334·0 Kg/ha.

C.D. for S marginal means=279·3 Kg/ha.

Crop :- Paddy (*Rabi*). **Ref :- K. 65(65).**

Site :- Rice Res. Stn., Kottarakara. **Type :- 'MV'.**

Object :—To evolve an improved strain of Athuttirazhi (local) varicty by pure line selection under different manurial levels.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) Lateritic. (iii) 30.8.1965/16.10.65. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) Interculture operations and weeding. (ix) N.A. (x) 11.2.1966.

2. TREATMENTS :

Main-plot treatments :

3 levels of N : N_1=44·8, N_2=89·6 and N_3=134·4 Kg/ha.

Sub-plot treatments :

7 varieties : V_1=No. 93, V_2=No. 185, V_3=No. 264, V_4=No. 34, V_5=No. 60, V_6=Athikirazhi standard and V_7=PTB—27.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 23·2 m.×6·1 m. (b) 6·1 m.×3·1 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Unlodged. (ii) Case worm attack controlled by dusting B.H.C. and stem borer attack controlled by 0·05% Endrin. (iii) Grain yield. (iv) (a) 1965—only. (b) Nil. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 3195 Kg/ha. (ii) (a) 653·6 Kg/ha. (b) 461·7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of Paddy in Kg/ha.

	V_1	V_2	V_3	V_4	V_5	V_6	V_7	Mean
N_1	3169	2641	3298	2895	2772	3405	3126	3044
N_2	3216	2968	3117	3295	3085	3355	2974	3144
N_3	3327	3525	3350	3502	3182	3572	3329	3398
Mean	3237	3045	3255	3231	3013	3444	3143	3195

Crop :- Paddy (*Kharif*). **Ref :- K. 65(66)**

Site :- Rice Res. Stn., Kottarakara. **Type :- 'MV'.**

Object :—To evolve an important strain from local Karuthachuttiayan variety under different levels of manuring.

1. **BASAL CONDITIONS :**

(i) (a) No. (b) Paddy. (c) N at 44·8, 89.6 and 134·4 Kg/ha. Super at 160·6 Kg/ha. and 61·8 Kg/ha. of Mur. Pot.(ii) Clayey loam. (iii) 16.5.65/22.6.65. (iv) (a) to (e) N.A. (v) C.M. to give 26·9, 53·8 and 80·6 Kg/ha of N, S/P at 160·60 Kg/ha., Mur. Pot. at 61·8 Kg/ha. applied as basal and N as 17·9, 35·8 and 53·8 Kg/ha. as top dressing. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and interculture. (ix) 99 cm. (x) 6.10.65.

2. **TREATMENTS :**

Main-plot treatments :

3 levels of manure : M_1=Low manure, M_2=Medium manure and M_3=High manure.

Sub-plot treatments :

7 cultures : C_1=Culture No. 289, C_2=P.T.B.—23, C_3=Culture No. 103, C_4=Culture No. 4, C_5=S.T.D. (standard variety) C_6=Culture No. 105 and C_7=Culture No. 54.

3. **DESIGN :**

(i) Split-plot (ii) 3 main ' plots/replication ; 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6·2 cm.× 3·2 cm. (b) 6·1 m.×3·1 m. (v) 7 cm.×7 cm. (vi) Yes.

4. **GENERAL :**

(i) Crop lodged when the ear heads are matured. (ii) No. (iii) Yield of grain ·(iv) (a) 1965—only. (b) Nil. (c) N.A. (v) to (vii) N.A.

5. **RESULTS :**

(i) 2267 Kg/ha. (ii) (a) 393·2. Kg/ha (b) 437·2 Kg/ha. (iii) Main affect of C and M are highly significant. (iv) Av. yield of Paddy in Kg/ha.

	C_1	C_2	C_3	C_4	C_5	C_6	C_7	Mean
M_1	2126	1529	1850	2027	1764	2024	2149	1950
M_2	2284	1434	2708	2258	2110	2088	2451	2190
M_3	2863	1515	2525	3071	2703	2956	2999	2662
Mean	2424	1492	2361	2512	2192	2356	2533	2267

C.D. for M marginal means=257·2 Kg/ha.

C.D. for C marginal means=358·0 Kg/ha.

———

Crop :- Paddy (*Kharif*).   **Ref :- K. 64(3)**

Site :- Rice Res. Stn., Mannuthy.   **Type :- 'MV'.**

Object :—To find out the effect of heavy dose of N on the important local strains.

1. **BASAL CONDITIONS**

(i) (a) Nil. (b) Paddy. (c) G.L. at 3000 Kg/ha.+40 Kg/ha. of N+30 Kg/ha. of P_2O_5+30Kg/ha. of K_2O (ii) Lateritic. (iii) 20.6.64/23.7.64. (iv) (a) 6 ploughings. (b) Transplanting. (c) 25/Kg/ha. (d) 15 cm.× 25 cm. (e) 2. (v) G.L. at 3000 Kg/ha.+P_2O_5 at 30 Kg/ha.+K_2O at 30 Kg/ha. (vi) As per treatments. (vii) Irrigated. (viii) Working intercultivator twice and hand weeding once. (ix) 195 cm. (x) 30.10.64.

2. **TREATMENTS :**

Main-plot treatments :

3 levels of N : N_1=20, N_2=40, N_3=60 Kg/ha.

Sub-plot treatments :

6 varieties : V_1=P.T.B.—8, V_2=P.T.B.—9, V_3=P.T.B.—22, V_4=P.T.B.—23, V_5=P.T.B.—32 and
V_6=P.T.B.—34.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main plots/replication and 6 sub-plots/main plot. (b) 38·5×10·5 m. (iii) 4. (iv)
(a) 6 m.×3 m. (b) 5·8 m×2·9 m. (v) 12 cm.×8 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Gall fly, case worm, stemborer, stickborer and Helminesporium : Endrin and Cupravit
sprayed. (iii) Tiller counts and grain yield. (iv) (a) 1964 only. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 2720 Kg/ha. (ii) (a) 362·5 Kg/ha. (b) 396·8 Kg/ha. (iii) Main effect of V is highly significant and
main effect of N is significant. (iv) Av. yield of grain in Kg/ha.

	V_1	V_2	V_3	V_4	V_5	V_6	Mean
N_1	2853	3661	2700	2822	2853	2662	2925
N_2	2548	2914	2632	3288	2662	2593	2773
N_3	2426	2853	2021	2784	2197	2494	2462
Mean	2609	3143	2451	2965	2571	2583	2720

C.D. for N marginal means=256·0 Kg/ha.
C.D. for V marginal means=326·5 Kg/ha.

Crop :- Paddy (*Rabi*).   **Ref :- K. 65(34).**

Site :- Rice Res. Stn., Mannuthy.   **Type :- 'MV'.**

Object : To find out the effect of different doses of N on the important varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 Kg/ha. of G.L. and N.P.K. as per schedule. (ii) Lateritic. (iii) 24.8.65/
5.10.65. (iv) (a) 6 ploughing, 1 hand weeding and working Rotary Weeder once. (b) to (e) N.A.
(v) 5000 Kg/ha. of G.L. and N as per treatments. and 30 Kg/ha. each of P_2O_5 and K_2O. (vi) As per treat-
ments. (vii) Irrigated. (viii) Hand weeding once with Rotary Weeder. (ix) 39 cm. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 levels of N : N_1=20, N_2=40, and N_3=60 Kg/ha.

Sub-plot treatments :

5 varieties : V_1=P.T.B.—12, V_2=P.T.B.—20, V_3= P.T.B.—27, V_4=P.T.B.—33, and V_5=Cochin—I.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main plots/replication and 5 sub-plots/main-plot. (b) 10·5 m.×32·0 m. (iii) 4.
(iv) (a) 3·0 m.×6·0 m. (b) 2·9 m.× 5·8 m. (v) One row alround. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Gall fly, leaf roller, stemborer and case worm attack, controlled by Endrin 0·1% and
Bliton sprayings. (iii) Grain and straw yield. (iv) (a) 1964—66 (varieties modified every year). (b) Yes.
(c) Nil. (v) Kayamkulam. (vi) and (vii) N.A.

5. RESULTS :

(i) 2816 Kg/ha. (ii) (a) 301·4 Kg/ha. (b) 299·6 Kg/ha. (iii) Main effect of V alone is significant. (iv) Av. yield of grain in Kg/ha.

	V_1	V_2	V_3	V_4	V_5	Mean
N_1	2670	2685	2876	2677	3204	2822
N_2	2876	2609	3005	2746	2822	2812
N_3	3051	2593	2677	2700	3043	2813
Mean	2865	2629	2853	2708	3023	2816

C.D. for V marginal means = 248·3 Kg/ha.

— — —

Crop :- Paddy (*Rabi*).　　　　　　　　　　　　　　**Ref :- K. 65(35).**

Site :- Rice Res. Stn., Mannuthy.　　　　　　　　**Type :- 'MV'.**

Object :—To compare two Taiwanese varieties with local varieties under two levels of Nitrogen.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 Kg/ha. of G.L. 40 Kg/ha. of N, 120 Kg/ha. of P_2O_5 and 30 Kg/ha of K_2O. (ii) Lateritic. (iii) 28.8.65/27.9.65. (iv) (a) 6 ploughings. (b) to (e) N.A. (v) 5000 Kg/ha. of G.M., 80 Kg/ha. of N and 30 Kg/ha. of each of P_2O_5 and K_2O at 30 Kg/ha. applied with the last ploughing. (vi) As per treatments. (vii) Irrigated. (viii) Hand weeding once, intercultiva tor once. (ix) 35 cm. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 levels of N : N_1=40 and N_2=120 Kg/ha.

Sub plot treatments :

4 varieties : V_1=Taiwan—3, V_2=Taichung N—1, V_3=Cochin—I and V_4=P.T.B.—12.

3. DESIGN:

(i) Split-plot. (a) 2 main-plots/replication and 4 sub-plots/main-plots. (b) 6 m. × 24 m. (iii) 4. (iv) (a) 1·5 m. × 6·0 m. (b) 1·3 m × 5·9 m. (v) One row. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Leaf roller and stemborer attack sprayed by Endrin 0·1%. Blight was noticed and controlled by spraying Cupravit. (iii) Grain and straw yield. (iv) (a) 1965—67. (b) Yes. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 3115 Kg/ha. (ii) (a) 549·7 Kg/ha. (b) 399·3 Kg/ha. (iii) Main effect of V alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	V_1	V_2	V_3	V_4	Mean
N_1	3012	2442	4436	2769	3165
N_2	2798	2448	4226	2786	3064
Mean	2905	2445	4331	2778	3115

C.D. for V marginal means = 419·5 Kg./ha.

— — —

Crop :- Paddy (*Kharif*).

Site :- Rice Res. Stn., Mannuthy.

Ref :- K. 65(36).

Type :- 'MV'.

Object :—To compare two Taiwanese varieties with local varieties under two levels of Nitrogen.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) 5000 Kg/ha. of G.M., N at 40 and 120 Kg/ha. and P_2O_5 and K_2O each at 30 Kg/ha. (ii) Lateritic. (iii) N.A. (iv) (a) 6 ploughings. (b) to (e) N.A. (v) G.M. at 5000 Kg., N at 20 and 60 Kg/ha. $+P_2O_5$ and K_2O each at 30 Kg/ha. applied with the last ploughing. (vi) As per treatments. (vii) Irrigated. (viii) Hand weeding once and working intercultivator once. (ix) 145 cm. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 levels of N : N_1=40 and N_2=120 Kg/ha.

Sub-plot treatments :

5 varieties V_1=Tainan 3, V_2=Taichung N—1, V_3=PTB—10, V_4=PTB—2 and V_5=PTB—32.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 5 sub-plots/main-plot. (b) 7·5 m.×28 m. (iii) 4. (iv) (a) 1·5 m.×6·0 m. (b) 1·3 m.×5·9 m. (v) 12 cm.×12 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Leaf roller and stem borer attack controlled by spraying Endrin 0·1%. Blight was noticed which was controlled by spraying Cupravit. (iii) Grain and straw yield. (iv) (a) 1965—67. (b) Yes. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 1115 Kg/ha. (ii) (a) 88·9 Kg/ha. (b) 184·6 Kg/ha. (iii) Main effect of N and V are highly significant. (iv) Av. grain yield is Kg/ha.

	V_1	V_2	V_3	V_4	V_5	Mean
N_1	1556	1538	1162	1043	940	1248
N_2	1354	1504	803	564	684	982
Mean	1455	1521	983	803	812	1115

C.D. for N marginal means=89·4 Kg/ha.

C.D. for V marginal means=190·5 Kg/ha.

———

Crop :- Paddy (*Kharif*).

Site :- Rice Res. Stn., Mannuthy.

Ref :- K, 65(37).

Type :- 'MV'.

Object :—To test the yielding ability of H.R.—98 and to find an optimum manurial dose.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 Kg/ha. of C.M., N at 30, 60 and 90 Kg/ha. $+P_2O_5$ and K_2O at each 30Kg/ha. (ii) Lateritic. (iii) 14.5.65/29.6.65. (iv) (a) 6 ploughings. (b) to (e) N.A. (v) 5000 Kg/ha. of C.M. $+P_2O_5$ and K_2O each at 30 Kg/ha. applied with the last ploughings. (vi) As per treatments. (vii) Irrigated. (viii) Hand weeding once and working intercultivator once. (ix) 145 cm. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 levels of N : $N_1=30$, $N_2=60$ and $N_3=90$ Kg/ha.

Sub-plot treatments :

3 varieties : $V_1=HR-98$, $V_2=PTB-22$ and $V_3=PTB-32$.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot. (b) 9 m.×54 m. (iii) 5. (iv) (a) 1·0 m.×6·0 m. (b) 0·8 m.×5·9 m. (v) One row alround. (vi) Yes.

4. GENERAL :

(i) Satisfactoty. (ii) Gall fly and case worm attack controlled by spraying Endrin. Blight was noticed and controlled by spraying Blitox. (iii) Grain and straw yield (iv) (a) 1964—65. (b) Yes. (c) N.A. (v) to (vii) N.A.

5. RESULTS:

(i) 1557 Kg/ha. (ii) (a) 341·9 Kg/ha. (b) 423·9 Kg/ha. (iii) Main effects of N and V are significant. (iv) Av. grain yield in Kg/ha.

	N_1	N_2	N_3	Mean
V_1	1322	1231	1140	1231
V_2	1800	1573	1550	1641
V_3	2484	1869	1048	1800
Mean	1869	1557	1246	1557

C.D. for N marginal means=287·6 Kg/ha.

C.D. for V marginal means=319·4 Kg/ha.

— — — —

Crop :- Paddy (*Kharif*).　　　　　　　　　　　　　　**Ref :- K. 65(38).**

Site :- Rice Res. Stn., Mannuthy.　　　　　　　　　**Type :- 'MV'.**

Object :—To find out an optimum dose of N for the local strains.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 Kg/ha. of G.L. and N, P and K as per treatments. (ii) Lateritic. (iii) 20.5.1965. (iv) (a) 6 ploughings. (b) to (e) N.A. (v) 5000 Kg/ha. of G.L. and N as per treatments and 30 Kg/ha. each of P_2O_5 and K_2O. (vi) As per treatments. (vii) Irrigated. (viii) Hand weeding once working Rotary Weeder. (ix) 145 cm. (x) Harvested on different dates.

2. TREATMENTS :

Main-plot treatments :

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

Sub-plot treatments :

6 varieties : $V_1=P.T.B.-8$, $V_2=P.T.B.-9$, $V_3=P.T.B.-22$, $V_4=P.T.B.-23$, $V_5=P.T.B.-32$ and $V_6=PTB-34$.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 6 sub-plots/main-plot. (b) 10·5 m.×38·5 m. (iii) 4. (iv) (a) 3·0 m.×6·0 m. (b) 2·9 m.×5·8m. (v) One row alround. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Gall fly, leaf roller stem borer and case worm attack controlled by speading Endrin 0·1% Helminthosporium and stick born were noticed and controlled by spraying Blitox. (iii) Grain and straw yield. (iv) (a) 1964—66. (b) Yes. (c) Nil. (v) Kayamkulam. (vi) and (vii) N.A.

5. RESULTS :

(i) 2195 Kg/ha. (ii) (a) 236·8 Kg/ha. (b) 267·3 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	V_6	Mean
N_1	1849	2220	1876	2006	2108	1503	1927
N_2	2183	2883	2044	2288	2510	1640	2258
N_3	2517	3188	2426	2311	2456	1510	2401
Mean	2183	2764	2115	2202	2358	1551	2195

C.D. for N marginal means=167·2 Kg/ha.

C.D. for V marginal means=219·9 Kg/ha.

————

Crop :- Paddy (*Rabi*).　　　　　　　　　　　　　　**Ref :- K. 65(45).**

Site :- Reg. Rice Res. Stn., Moncompu.　　　　**Type :- 'MV'.**

Object :—To evolve a high yielding strain from the popular local variety.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Alluvial clay. (iii) N.A./30.10.65. (iv) (a) Ploughing, and levelling. (b) Transplanting. (c) to (e) N.A. (v) Ultra Phosphate and Mur. Pot. as basal dressing. (vi) As per treatments. (vii) Irrigated. (viii) Weeding. (ix) 43 cm. (x) 8.2.66.

2. TREATMENTS :

Main-plot treatments :

2 manurial treatments : M_1=Normal manuring and M_2=Heavy manuring.

Sub-plot treatments :

5 varieties : V_1=Athikkira (standard), V_2=Athikkira—2, V_3=Athikkira, V_4=Athikkira—40 and V_5=P.T.B.—20.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 5 sub-plots/main-plot. (b) 6·1 m. × 30·5 m. (iii) 6. (iv) (a) 6·1 m. × 3·0 m. (b) 5·9 m. × 2·9 m. (v) One row alround. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Endrin 0·04% sprayed against the attack of stem borer. (iii) Yield of grain. (iv) (a) 1964—N.A. (b) Yes. (c) N.A. (v) Moncompu and Thakazhi (c.f.). (vi) and (vii) Nil.

5. RESULTS :

(i) 3633 Kg/ha. (ii) (a) 64·9 Kg/ha. (b) 226·2 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	Mean
M_1	3535	3786	3651	3680	3515	3633
M_2	3583	3767	3661	3544	3612	3633
Mean	3559	3777	3656	3612	3564	3633

— — — —

Crop :- Paddy (*Rabi*).

Site :- Rice Res. Stn., Moncompu.

Ref :- K. 64(22).

Type :- 'MV'.

Object :—To study the effect of N, P, K on different cultures of Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) 33·6 Kg/ha. of N as C/A/N+44·8 Kg/ha. of P_2O_5 as Hyper. Phos.+33·6 Kg/ha. of K_2O as Mur. Pot. (ii) Alluvial clay. (iii) 11.9.64/12.10.64. (iv) (a) 4 ploughings and levelling. (b) Transplanting. (c) 45 Kg/ha. in nursery. (d) 15 cm.×15 cm. (e) 2. (v) Lime was applied at 224 Kg/ha. and washing has been done before the operations to reduce the acidity of the soil. (vi) As per treatments. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 20.1.65.

2. TREATMENTS :

Main-plot treatments:

2 manurial treatments : M_1=33·6 Kg/ha. of N+44·8 Kg/ha. of P+22·4 Kg/ha. of K_2O and M_2=67·2 Kg/ha. of N+89·7 Kg/ha. of P+44·8 Kg/ha. of K.

Sub-plot treatments :

5 cultures : V_1=Culture No. 2, V_2=Culture No. 37. V_3=Culture No. 40, V_4=P.T.B.—20 and V_5=Local *Athikkina*.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 5 sub-plots/main-plot. (b) 13·1 m.×10·1 m. (iii) 6. (iv) (a) and (b) 6·1 m.×1·5 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Rain caused damage to the crop in initial stages. (ii) Slight attack of stem-borer ; Endrin sprayed once. (iii) Tiller counts and height of plants at the productive phase and yield of grain. (iv) (a) 1964—N.A. (b) Yes. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 3110 Kg/ha. (ii) (a) 873·2 Kg/ha. (b) 640·0 Kg/ha. (iii) Main effect of V alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	V_1	V_2	V_3	V_4	V_5	Mean
M_1	3739	3681	3439	2436	3007	3260
M_2	3218	3258	3157	2271	2895	2960
Mean	3479	3470	3298	2354	2951	3110

C.D. for V marginal means=527·9 Kg/ha.

— — — —

Crop :- Paddy (*Rabi*).　　　　　　　　　　**Ref :- K. 64(20), 65(16).**

Site :- Rice Res. Stn., Moncompu.　　　　　**Type :- 'MV'.**

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

1. BASAL CONDITIONS :

(i) (a) Nil.　(b) Paddy.　(c) N.A.　(ii) Alluvial clay.　(iii) 19.10.64/20.11.64 ; 28.9.65/30.10.65.　(iv) (a) 6 ploughings and levellings.　(b) Transplanting.　(c) 49 Kg/ha. of nursery.　(d) 15 cm.×15 cm.　(e) 2.　(v) N.A.　(vi) Athikkira (medium).　(vii) Nil.　(viii) 1 hand weeding.　(ix) 43 cm.; N.A.　(x) 20.2.65 ; 5.2.66.

2. TREATMENTS :

Main-plot treatments :

2 levels of manures : $M_1 = 33.6$ Kg/ha. of N+44.8 Kg/ha. of $P_2O_5 + 22.4$ Kg/ha. of K_2O and $M_2 = 2M_1$.

Sub-plot treatments :

5 varieties : $V_1 =$ No. S—2, $V_2 =$ No. S—37, $V_3 =$ No. S—40, $V_4 =$ No. S—20 and $V_5 =$ Athikkira.
Full dose of P_2O_5 and K_2O and $\frac{1}{2}$ dose of N applied as basal dressing other $\frac{1}{2}$ of N applied 30 days after transplanting manures applied by broadcasting.

3. DESIGN :

(i) Split-plot.　(ii) (a) 2 main-plots/replication; 5 sub-plots/main-plot.　(b) 13 m.×10 m.　(iii) 6.　(iv) (a) and (b) 6.0 m.×1.5 m.　(v) Nil.　(vi) Yes.

4. GENERAL:

(i) Good.　(ii) Slight attack of stem borer and Endrin sprayed.　(iii) Yield of grain.　(iv) (a) 1964—65. (b) and (c) N.A.　(v) Kumarakum.　(vi) Nil.　(vii) Error variances are homogeneous and Treatments×years interaction is present in main-plot and absent in sub-plot.

5. RESULTS :

(i) 4648 Kg/ha.　(ii) (a) 2190.3 Kg/ha. (based on 1 d.f. made up of main-plot Treatments×years interaction). (b) 417.4 Kg/ha. (based on 88 d.f. made up of Treatments×years interaction and pooled error).　(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	Mean
M_1	5070	4880	4431	5176	4281	4767
M_2	5047	4445	4275	4625	4254	4529
Mean	5059	4662	4353	4900	4268	4648

C.D. for V marginal means = 239.8 Kg/ha.

— — — —

Crop :- Paddy (*Rabi*).　　　　　　　　　　**Ref :- K. 64(21), 65(15).**

Site :- Rice Res. Stn., Moncompu.　　　　　**Type :- 'MV'.**

Object :—To evolve a high yielding strain for the popular local variety of Athikkira.

1. BASAL CONDITIONS :

(i) (a) Nil.　(b) Paddy.　(c) 33.6 Kg/ha. of N as C/A/N +44.8 Kg/ha. of P_2O_5 as Hyper. Phos.+33.6 Kg/ha. of K_2O as Mur. Pot.　(ii) Alluvial clay.　(iii) 1.10.64 ; 18.10.65.　(iv) (a) 4 ploughings and levellings. (b) Transplanting.　(c) 45 Kg/ha. in nursery.　(d) 15 cm.×15 cm.　(e) 2.　(v) N.A.　(vi) Athikkira. (vii) Irrigated.　(viii) Weedings.　(ix) 68.4 cm.; 42.7 cm.　(x) N.A.; 29.1.66.

2. TREATMENTS :

Main-plot treatments:

2 doses of fertilizers : $M_1 = 33\cdot6$ Kg/ha. of N $+44\cdot8$ Kg/ha. of $P_2O_5 + 22\cdot4$ Kg/ha. of K_2O and $M_2 =$ Twice M_1.

Sub-plot treatments:

5 varieties : $V_1 =$ Athikkira standard, $V_2 =$ Athikkira No. 2, $V_3 =$ Athikkira No. 37, $V_4 =$ Athikkira No. 40 and $V_5 =$ P.T.B.—20.

N as C/A/N, P_2O_5 as Ultra Phos. and K_2O as Mur. Pot.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication; 5 sub-plots/main-plot. (b) 6·1 m.×30·5 m. (iii) 6. (iv) (a) 6·1 m.×3·1 m. (b) 5·9 m.×2·9 m. (v) 8 cm.×8 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Endrin was sprayed. (iii) Yield of grain. (iv) (a) 1964—65. (b) and (c) N.A. (v) Nil. (vi) N.A. (vii) Sub-plot error variances are heterogeneous. Hence the results of individual years are presented under 5. Results.

5. RESULTS :

64(21)

(i) 6051 Kg/ha. (ii) (a) 715·9 Kg/ha. (b) 534·8 Kg/ha. (iii) Main effect of V alone is significant. (iv) Av. yield of grain in Kg/ha.

	V_1	V_2	V_3	V_4	V_5	Mean
M_1	6002	5701	6070	6485	5464	5944
M_2	6351	6026	6194	6403	5809	6158
Mean	6180	5864	6131	6443	5637	6051

C.D. for V marginal means $= 441\cdot2$ Kg/ha.

65(15)

(i) 4674·9 Kg/ha. (ii) (a) 399·2 Kg/ha. (b) 303·1 Kg/ha. (iii) Main effect of V alone is significant. (iv) Av. yield of grain in Kg/ha.

	V_1	V_2	V_3	V_4	V_5	Mean
M_1	4883	4712	4083	5399	4277	4671
M_2	4981	4618	4205	5177	4407	4678
Mean	4932	4665	4144	5288	4342	4674

C.D. for V marginal means $= 250\cdot0$ Kg/ha.

————

Crop :- Paddy (*Kharif*).　　　　　　　　　**Ref :- K. 61(62), 62(76), 63(160).**

Site :- Agri. Res. Stn., Pattambi.　　　**Type :- 'MV'.**

Object :—To study the response to manuring of different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil for 61(62); Paddy—Paddy for 62(76) and 63(160).(b) Paddy. (c) G.L.at 4483Kg/ha. as basal dressing and C/A/N at 56 Kg/ha. as top dressing for 61(62); As per treatments for 62(76); N.A. for 63(160)(ii) Shallow laterite. (iii) 2.6.61/3.7.61 ; 23.5.62/3.7.62, 26.6.63/27.7.63. (iv) (a) 6 to 8 ploughings and puddlings. (b) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 1 to 2 weedings. (ix) 347 cm. for 61(62); 229 cm. for 62(76), N.A., for 63(160). (x) 30.9.61, 12.10.61; 5.10.62; 5.11.63.

2. TREATMENTS :

Main-plot treatments :

3 levels of manures : M_0=No manure, M_1=4483 Kg/ha. of G.L.+22·4 Kg/ha. of N as A/S+22·4 Kg/ha. of P_2O_5 as Super and M_2=2 M_1.

Sub-plot treatments :

3 varieties : V_1=P.T.B.—7, V_2=P.T.B.—10 and V_3=P.T.B.—32.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 7·3 m.×2·4 m. for 61(62); 7·6 m.×2·4 m. for others. (v) No. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1961—63. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Combined results are given below for 1961 and 1962 and individual results for 1963, as the error variances for 63 is different from those of 61 and 62. Both the error variances (for 61 and 62) are homogeneous and Treatments×years interactions are present for main and sub-plots.

5. RESULTS :

(i) 2048 Kg/ha. (ii) (a) 1192·4 Kg/ha. (based on 2 d.f. made up of interaction of treatments with years). (b) 945·0 Kg/ha. (based on 6 d.f. made up of interactions of various components of Treatments×years). (iii) Main effect of V is significant. (iv) Av. yield of grain in Kg/ha.

	M_0	M_1	M_2	Mean
V_1	1873	2604	2781	2419
V_2	1089	1446	1572	1369
V_3	2040	2498	2534	2357
Mean	1667	2183	2296	2048

C.D. for V marginal means=667·6 Kg/ha.

63(160)

(i) 1064 Kg/ha. (ii) (a) 419·0 Kg/ha. (b) 215·3 Kg/ha. (iii) Main effect of M is significant while that of V is highly significant. (iv) Av. yield of grain in Kg/ha.

	M_0	M_1	M_2	Mean
V_1	979	499	694	724
V_2	1460	878	1082	1140
V_3	1827	984	1173	1328
Mean	1422	787	983	1064

C.D. for M marginal means=418·5 Kg/ha.

C.D. for V marginal means=184·6 Kg/ha.

Crop :- Paddy (*Kharif*).

Ref :- 61(37), 62(102), 63(158).

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

Type :- 'MV'.

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

1. BASAL CONDITIONS:

(i) (a) Paddy—Paddy. (b) Paddy. (c) G.L. at 5604 Kg/ha.+B.M. at 112 Kg/ha.+56 Kg/ha. of Mur. Pot. applied as basal dressing for 61(37); As per treatments for 62(102) ; N.A. for 63(158) (ii) Shallow laterite. (iii) 2.6.61/14.7.61 ; 23.5.1962/25.6.62 ; N.A. (iv) (a) 8 ploughings, puddlings, plankings and levellings. (b) Transplanting for 61(37) ;N.A. for others. (c) to (e) N.A.(v) Nil.(vi) As per treatments. (vii) Unirrigated. (viii) Weeding and gap filling. (ix) 361·0 cm ; 228·6 cm. ; N.A. (x) 11.10.61 and 26.10.61 ; 17, 18.10.62 ; N.A.

2. TREATMENTS :

Main-plot treatments :

3 levels of manure: M_0=Control (no manure), M_1=4488 Kg/ha. of G.L.+22 Kg/ha. each of N, P_2O_5 and K_2O as AS, Super and Pot. Sul. respectively and M_2=$2M_1$.

Sub-plot treatments :

9 varieties : V_1=PTB—1, V_2=PTB—2, V_3=PTB—5, V_4=PTB—9, V_5=PTB—22, V_6=PTB—24, V_7=PTB—26, V_8=PTB—31 and V_9=PTB—34.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 9 sub-plots/main-plot. (b)N.A. (iii)4. (iv) (a) 6·1 m.×3·1m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1961—63. (b) Yes. (c) —. (v) N.A. (vi) Nil. (vii) Sub-plot error variances are heterogeneous. Therefore individual results are given in 5. Results.

5. RESULTS:

61(37)

(i) 1772 Kg/ha. (a) 319·8 Kg/ha. (b) 253·6 Kg/ha. (iii) Main effect of V alone is highly 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	Mean
M_0	2678	2548	2075	1613	1057	1663	1324	763	1072	1944
M_1	2952	2716	2287	1995	1308	1682	1598	927	1339	1867
M_2	2907	2441	2155	1816	1339	1640	1659	889	1411	1806
Mean	2846	2568	2172	1808	1235	1662	1527	860	1274	1772

C.D. for V marginal means=206·6 Kg/ha.

62(102)

(i) 2289 Kg/ha. (ii) (a) 630·2 Kg/ha. (b) 354·8 Kg/ha. (iii) Main effect of V alone is highly 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	Mean
M_0	3113	3082	2346	2510	1144	1381	1915	1346	1438	2031
M_1	3174	3246	3284	2849	1545	2014	2205	1461	1896	2408
M_2	3338	2769	2998	3200	1667	1804	2304	1675	2064	2428
Mean	3218	3032	2876	2853	1452	1733	2141	1494	1799	2289

C.D. for V marginal means=289·0 Kg/ha.

63(158)

(i) 2042 Kg/ha. (ii) (a) 487·7 Kg/ha. (b) 427·3 Kg/ha. (iii) Main effect of M is significant while that of V is highly significant. (iv) Av. yield of grain in Kg/ha.

	V₁	V₂	V₃	V₄	V₅	V₆	V₇	V₈	V₉	Mean
M₀	2042	2676	1764	1734	1689	1393	1933	1153	1567	1772
M₁	2398	3282	2556	2108	1668	1834	2079	1468	2001	2155
M₂	2624	2960	2243	1788	2007	2079	2521	1472	2094	2199
Mean	2355	2973	2188	1877	1788	1769	2178	1364	1887	2042

C.D. for M marginal means=281·3 Kg/ha.
C.D. for V marginal means=349·0 Kg/na.

Crop :- Paddy (*Kharif*). **Ref :- K. 62(124).**

Site :- Central Rice Res. Stn., Pattambi. **Type :- 'MV'.**

Object :—To assess the response of different strains to different levels of manuring in double crop Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Laterite loam. (iii) 23.5.62/25.6.62. (iv) (a) Digging and levelling. (b) Nursery sown and seedling planted. (c) —. (d) 25 cm. between lines. (e) 2. (v) and (vi) As per treatments. (vii) Irrigated. (viii) Gap filling and weeding. (ix) N A. (x) 17.10.62.

2. TREATMENTS :

Main-plot treatments :

3 manurial levels : M₀=No manure, M₁=4480 Kg/ha. of G.L.+22·4 Kg/ha. each of N, P and K and M₂=8960 Kg/ha. of G L +44·8 Kg/ha. each of N,P, and K.

Sub-plot treatments :

9 strains of PTB : V₁=1, V₂=2, V₃=5, V₄=9, V₅=22, V₆=24, V₇=26,V₈=31 and V₉=34.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6·1 m. ×3·1 m. (v) One row on each side. (vi) Yes.

4. GENERAL :

(i) Lodged after flowering. (ii) Nil. (iii) Grain yield. (iv) (a) 1962—64 (b) No. (c) —. (v) to (vii) Nil.

5. RESULTS :

(i) 2289 Kg/ha. (ii) (a) 631·0 Kg/ha. (b) 355·2 Kg/ha. (iii) Main effect of V alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	V₁	V₂	V₃	V₄	V₅	V₆	V₇	V₈	V₉	Mean
M₀	3112	3082	2345	2509	1144	1380	1914	1347	1438	2030
M₁	3117	3246	3234	2849	1545	2014	2205	1461	1895	2408
M₂	3368	2769	2998	3200	1666	1804	2303	1674	2063	2428
Mean	3218	3032	2876	2853	1452	1733	2141	1494	1799	2289

C.D. for V marginal means=289·5 Kg/ha.

Crop :- Paddy *(Rabi).*   Ref :- 61(38), 62(125), 63(159).

Site :- Central Rice Res. Stn., Pattambi.   Type :- 'MV'.

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

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Laterite loam. (iii) 25.9.61/11.11.61 ; 1.10.62/9.11.62 ; 10.10 63/12.11.63. (iv) (a) 4 ploughings and two diggings. (b) Transplanting. (c) N.A. (d) 25cm. between lines. (e) 2. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding twice. (ix) 52·4 cm. for 61 ; N.A. for 62 and 63. (x) 2, 21.2.62 ; 16.2.63 ; 26.2.64 to 7.3.64.

2. TREATMENTS :

Main-plot treatments:

3 levels of manures : M_0 =Control, M_1 =4483 Kg/ha. of G.L.+22 Kg/ha. of N, 22 Kg/ha. of P_2O_5 and 22 Kg/ha. of K_2O as A/S, Super and Pot. Sul. respectively, M_2 =Twice M_1.

Sub-plot treatments :

8 varieties : V_1 =PTB- 4, V_2 =PTB—12, V_3 =PTB—16, V_4 =PTB—18, V_5 =PTB—20, V_6 =PTB—21, V_7 =PTB—27 and V_8 =PTB—33.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 6·1 m.×3·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Negligible. (iii) Yield of grain. (iv) (a) 1961 —63. (b) Yes. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent. Results of individual years are presented. Data for 1963 expt. was not available.

5. RESULTS :

61(38)

(i) 1883 Kg/ha. (ii) (a) 268·6 Kg/ha. (b) 304·7 Kg/ha. (iii) Main effect of V and interaction M×V are highly 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	Mean
M_0	2292	2038	2101	1834	1327	1411	996	2067	1758
M_1	2437	1854	3273	1861	1549	1698	1031	1881	1948
M_2	2216	1610	3242	2212	1510	1865	1015	1869	1942
Mean	2315	1834	2872	1969	1462	1658	1014	1939	1883

C.D. for V marginal means   =248·8 Kg/ha.
C.D. for V means at the same level of M=430·9 Kg/ha.
C.D. for M means at the same level of V=430·6 Kg/ha.

62(125)

(i) 2681 Kg/ha. (ii) (a) 420·5 Kg/ha. (b) 391·5 Kg/ha. (iii) Main effects of M and V are highly 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	Mean
M_0	2804	2617	2502	2399	2292	2216	2132	2125	2386
M_1	3147	2907	2998	2899	2754	2800	2651	2334	2811
M_2	3010	3055	2605	3135	2968	3200	2338	2453	2846
Mean	2987	2860	2702	2811	2671	2739	2374	2304	2618

C.D. for M marginal means=257·2 Kg/ha.
C.D. for V marginal means=319·7 Kg/ha.

Crop :- Paddy (*Kharif*).

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

Ref :- K. 60(21).

Type :- 'MV'.

Object :—To assess the response of different strains of Paddy to different levels of manuring.

1. **BASAL CONDITIONS :**

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Shallow laterite. (iii) 1.6.60/1.7.60. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) N.A. (ix) 308 cm. (x) 3.10.60.

2. **TREATMENTS :**

Main-plot treatments:

3 levels of manures: M_1=6725 Kg/ha. of G.L.+4708 Kg/ha. of C.M.+224 Kg/ha. of A/S, M_2=5604 Kg/ha. of G.L.+2354 Kg/ha. of C.M.+112 Kg/ha. of A/S and M_3=1121 Kg/ha. of G.L.+785 Kg/ha. of C.M.+56 Kg/ha. of A/S.

Sub-plot treatments :

11 varieties : V_1=PTB—1, V_2=PTB—2, V_3=PTB—5, V_4=PTB—8, V_5=PTB—9, V_6=PTB—22, V_7=PTB—23, V_8=PTB—24, V_9=PTB—25, V_{10}=PTB—26 and V_{11}=PTB—31.

G.L. and C.M. applied as basal dressing and A/S as top dressing one month after planting.

3. **DESIGN :**

(i) Split-plot. (ii) (a) 3 main-plots/replication and 11 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7·6 m. ×2·4 m. (v) An inter space of 60 cm. is left between plots. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1957—60. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. **RESULTS :**

(i) 2672 Kg/ha. (ii) (a) 368·5 Kg/ha. (b) 296·5 Kg/ha. (iii) Main effects of V and M 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	V_9	V_{10}	V_{11}	Mean
M_1	3025	3639	3308	3659	2533	2403	2644	2655	2727	2918	1698	2837
M_2	2998	3727	3399	2771	2674	2293	2609	2396	2590	2671	1572	2700
M_3	2956	3586	3017	2892	2380	2079	2228	2312	2094	2193	1530	2479
Mean	2993	3651	3241	3107	2529	2258	2494	2454	2470	2594	1600	2672

C.D. for M marginal means=192·2 Kg/ha.

C.D. for V marginal means=240·9 Kg/ha.

— — —

Crop :- Paddy (*Rabi*).

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

Ref :- K. 60(22).

Type :- 'MV'.

Object :—To assess the response of the strains of Paddy to different levels of manuring.

1. **BASAL CONDITIONS :**

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Shallow laterite. (iii) 26.9.60./5.11.60. (iv) and (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) N.A. (ix) 308·7 cm. (x) On different dates according to maturity.

2. TREATMENTS:

Main-plot treatments :

3 levels of manure : M_1=6725 Kg/ha. of G.L.+4708 Kg/ha. of C.M.+224Kg/ha. of A/S, M_2=5604 Kg/ha. of G.L.+2354 Kg/ha. of C.M.+112 Kg/ha. of A/S, M_3=1121 Kg/ha. of G.L.+785 Kg/ha. of C.M.+56 Kg/ha. of A/S.

Sub-plot treatments :

8 varieties : V_1=PTB—4, V_2=PTB—12, V_3=PTB—15, V_4=PTB—18, V_5=PTB—20, V_6=PTB—21, V_7=PTB—27 and V_8=PTB—33.

G.L. and C.M. applied as basal dressing and A/S as top dressing one month after planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 7·6 m.×2·4 m. (v) An inter space of 60 cm. is left between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1957—60. (b) Yes. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 2444 Kg/ha. (ii) (a) 576·4 Kg/ha. (b) 478·4 Kg/ha. (iii) Main effect of V alone is highly 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	Mean
M_1	2591	2422	3235	2166	2835	2453	2769	2568	2630
M_2	5895	1915	3586	2235	2171	2248	2274	2300	2453
M_3	2575	1797	3346	2098	1979	1915	2347	1927	2248
Mean	2687	2045	3389	2166	2328	2205	2463	2265	2444

C.D. for V marginal means=390·6 Kg/ha.

———

Crop :- Paddy.

Site :- Reg. Rice Res. Stn., Kayamkulam.

Ref :- K. 64(61), 65(9).

Type :- 'C'.

Object :—To find out the optimum time and frequency of interculturing the transplanted Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 33·6 Kg/ha. of each of N as A/S, P_2O_5 as Super and K_2O as Mur. Pot. (ii)Sandy loam. (iii) 4.9.64 ; 30.8.65. (iv) (a) 6 ploughings. (b) to (c) N.A. (v) 5000 Kg/ha. of C.M.+125 Kg/ha. of Super+60 Kg/ha. of Mur Pot.+50 Kg/ha. of Urea. Half of Urea as basal dressing and ½ as top dressing. (vi) UR—19. (vii) Unirrigated. (viii) As per treatments. (ix) 98·0 cm. ; 95·5 cm. (x) 5.1.65 ; 12.1.66.

2. TREATMENTS:

8 times of intercultursng : T_0=No interculturing, T_1=15 days, T_2=30 days, T_3=45 days after transplanting T_4=15 and 30 days, T_5=15 and 45 days, T_6=30 and 45 days and T_7=15, 30 and 45 days after transplanting.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) 36·6 m.×6·1 m. for 64(61) ; 32 m.×8 m. for 65(9). (iii) 4. (iv) (a) and (b) 6·1 m.× 4·6 m. for 64 ; 4 m.×8 m. for 65. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Blitox and Endrin sprayed. (iii) Grain yield. (iv) (a) 1964—contd. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

64(61)

(i) 2975 Kg/ha. (ii) 216·0 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
Av. yield	2655	3615	3068	3023	2933	2879	2870	2754

C.D.=317·7 Kg/ha.

65(9)

(i) 2318 Kg/ha. (ii) 240·5 Kg/ha. (iii) Treatment differences are 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
Av. yield	2070	2305	2277	2469	2328	2344	2727	2078

C.D.=353·7 Kg/ha.

———

Crop :- Paddy (*Kharif*).

Site :- Rice Res. Stn., Kayamkulam.

Ref :- K. 61(17), 62(44), 63(71).

Type :- 'C'.

Object :—To find out the best method of sowing and covering seeds.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 4483 Kg/ha. of C.M.+112 Kg/ha. of Super as basal dressing and 112 Kg/ha. of A/S+56 Kg/ha. of Mur. Pot. as top dressing for 62(44) ; N.A. for others. (ii) Sandy loam. (iii) 7.4.61; 17.4.62; 8.4.63. (iv) (a) As per treatments for 62(44); 1 ploughing with iron plough followed by 2 plouhings with local plough for others. (b) As per treatments. (c) N.A. for 62(44); 40 Kg/ha. for others. (d) and (e) N.A. (v) Super at 112 Kg/ha. as basal dressing and 1681 Kg/ha. of C.M.+56 Kg/ha. of A/S+56 Kg/ha. of Mur. Pot. as top dressing for 62(44) ; 120 Kg/ha. of Super broadcast before the final ploughing for others. (vi) P.T.B.- 31 ; P.T.B.—23. (vii) Unirrigated (viii) 2 intercultivations and weedings for 62(44); N.A. for others. (ix) N.A. (x) 31.7.61; 2.8.62; 3.8.63.

2. TREATMENTS:

4 methods of sowing : M_1=Broadcast sowing and covering by 2 ploughings, M_2=Broadcast sowing and covering by one ploughing and planking, M_3=Dibbling behind the country plough and planking and M_4=Sowing with Chinese seed drill and planking.

*Note :—*For 61(17) M_4 was not applied.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8 for 61(17), 6 for others. (iv) (a) and (b) 6·1 m.×3·1 m. for 62(44) and 63(71) ; (a) 11·9 m.×6·7 m. (b) 6·7 m.×3·7 m. for 61(17). (v) Nil. (vi) Yes.

4. GENERAL :

(i) Immediately after flowering treatments M_1. M_2 lodged in all the replications in 62(44); Normal for others. (ii) Nil for 62(44); Helminthosporium attack in other experiments which was controlled by spraying Fytolan. (iii) Yield of grain. (iv) (a) 1961—63 (treatments modified in 62). (b) No. (c) Results of combined analysis for 62 and 63 and individual year results for 61 are given under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 993 Kg/ha. (ii) 512·2 Kg/ha. (based on 3 d.f. made up of Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M_1	M_2	M_3	M_4
Av yield	798	971	1320	882

61(17)

(i) 1173 Kg/ha. (ii) 282·7 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M_1	M_2	M_3
Av. yield	993	1000	1526

C.D.=294·0 Kg/ha.

Crop :- Paddy (*Kharif*). **Ref :- K. 64(98).**

Site :- Rice Res. Stn., Kayamkulam. **Type :- 'C'.**

Object :—To find out the optimum time and number of intercultures for Paddy crop.

1. **BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) 4942 Kg/ha. of C.M.+124 Kg/ha. of Super+62 Kg/ha. of Mur. Pot.+62 Kg/ha. of A/S. (ii) Sandy loam. (iii) 25.4.64. (iv) (a) One ploughing with iron plough, 3 ploughings with country plough, levelling, breaking of clods. (b) Dibbling seeds behind the plough in furrows. (c) to (e) N.A. (v) 25 Kg/ha. of A/S, 25 Kg/ha. of Mur. Pot. and 50 Kg/ha. of Super applied as basal dressing 25 Kg/ha. of A/S top dressed one month after sowing. (vi) PTB—23. (vii) Unirrigated. (viii) Nil. (ix) 120·6 m. (x) 4.8.64.

2. **TREATMENTS :**

8 times of interculture : T_0=No interculture, T_1=15 days, T_2=25 days, T_3=35 days, T_4=15 and 25 days, T_5=15 and 35 days, T_6=25 and 35 days and T_7=15, 25 and 35 days after sowing.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8 m.×4 m. (v) N.A. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Nil but spraying Endrex mixed with Fytolan (twice) was applied as a propholactic measure. (iii) Grain yield. (iv) (a) 1964 only. (b) and (c) Nil. (v) to (vii) Nil.

5. **RESULTS:**

(i) 1938 Kg/ha. (ii) 280·8 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	T_7
Av. yield	1719	1836	1938	2055	2234	1977	1797	1945

Crop :- Paddy (*Rabi*). **Ref :- K. 63(83).**

Site :- Rice Res. Stn., Kayamkulam. **Type :- 'C'.**

Object :—To find out the optimum time and frequency of working rotary cultivator to increase the yield of Paddy.

1. **BASAL CONDITIONS :**

(i) (a) N.A. (b) and (c) Nil. (ii) Sandy loam. (iii) N.A./16.8.63. (iv) (a) 2 ploughings with tractor and 2 with country plough and puddling. (b) Transplanting. (c) to (e) N.A. (v) C.M. 6000 Kg/ha. Super at 125 Kg/ha., Mur. Pot. at 60 Kg/ha. as basal application and A/S at 100 Kg/ha. as top dressing. (vi) UR—19(165 days). (vii) Unirrigated. (viii) N.A. (ix) 99 cm. (x) 2.1.64.

2. TREATMENTS :

6 times of interculture : T_1=15th day, T_2=30th day, T_3=45th day, T_4=15th and 30th day, T_5=15th and 45th day and T_6=30th and 45th day after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 6·1 m.×6·1 m. (b) 5·8 m.×5·9 m. (v) 13 cm.×8 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963 only. (b) and (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2370 Kg/ha. (ii) 140·3 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	2376	2436	2282	2232	2398	2498

———

Crop :- Paddy (*Kharif*).   **Ref :- K. 65(55).**

Site :- Rice Res. Stn., Kayamkulam.   **Type :- 'C'.**

Obje t :—To find out the efficiency of growing different Catch crops during the third crop season and to study their effect on the succeeding Paddy crop.

1. BASAL CONDITIONS :

(i) (a) As per treatments. (b) Catch crops as per treatments. (c) N.A. (iii) Sandy loam. (iii) 29.4.65. (iv) (a) Ploughing and furrow making. (b) Dibbling. (c) to (e) N.A. (v) 13·6 Kg/ha. each of N, P, K as A/S, Super and Mur. Pot. respectively. (vi) PTB—23. (vii) Unirrigated. (viii) Two intercultures and 2 hand-weedings. (ix) 168 cm. (x) 6.8.65.

2. TREATMENTS :

T_0=Fallow, T_1=Sesamum followed by paddy, T_2=Corn-pea followed by paddy, T_3=Horse gram followed by paddy, T_4=Black gram followed by paddy, T_5=Groundnut followed by paddy.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 7 m.×5 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1965—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1774 Kg/ha. (ii) 196·7 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
Av. yield	1929	1636	1707	1700	1843	1829

———

Crop :- Paddy (*Rabi*).   **Ref :- K. 65(49).**

Site :- Reg. Rice Res. Stn., Kayamkulam.   **Type :- 'C'.**

Object :—To find out the efficiency of growing different Catch crops and study their effect on the yield of succeeding crop of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) N,A. (ii) Sandy loam. (iii) N.A. (iv) (a) 6 ploughings, 2 levellings, and inter-culturing with Japanese hoe. (b) to (e) N.A. (v) N.A. (vi) U.R.—19 (late) (vii) Unirrigated. (viii) 2 hand weedings and 1 interculturing. (ix) 95 cm. (x) N.A.

2. TREATMENTS :

5 types of Catch crop : T_0=Fallow, T_1=Sesamum, T_2=Corn pea, T_3=Horse gram, T_4=Black gram and T_5=Groundnut.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 30 m.×7 m. (iii) 4. (iv) (a) and (b) 7 m.×5 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1965—contd. (b) Yes. (c) Nil. (v) to (viii) N.A.

5. RESULTS :

(i) 1760 Kg/ha. (ii) 199·6 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
Av. yield	1829	1664	1900	1714	1700	1750

Crop :- Paddy (*Kharif*).   **Ref :- K. 61(5).**

Site :- Rice Res. Stn., Kayamkulam.   **Type :- 'C'.**

Object :—To ascertain the efficiency of sowing with Chinese seed drill in comparison with local method.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy—Sesamum. (b) Sesamum. (c) N.A. (ii) Sandy loam. (iii) 26.4.61/20.5.61 (iv) (a) 4 ploughings and 2 harrowings. (b) to (e) As per treatments. (v) 6277 Kg/ha. of C.M.+112 Kg/ha. of Supar as basal dresssing and 56 Kg/ha. each of P_2O_5 and K_2O as Super and Mur. Pot. respectively as top dressing. (vi) P.T.B.—10 (early). (vii) Unirrigated. (viii) 2 intercultivations and 2 weedings. (ix) N.A. (x) 10·8·61.

2. TREATMENTS:

4 methods of sowing : M_1=Broadcast, M_2=Dibbling behind country plough (local method), M_3=Transplanting and M_4=Sowing by Chinese seed drill.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 21·0 m×8·4 m. (iii) 6. (iv) (a) and (b) 8·3 m.×4·9 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 only. (b) and (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1760 Kg/ha. (ii) 130·9 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
Av. yield	1988	1978	1176	1899

C.D.=161·0 Kg/ha.

Crop :- Paddy (*Kharif*).

Site :- Rice Res. Stn., Kottarakara.

Ref :- K. 63(100).

Type :- 'C'.

Object :—To find out the optimum time and number of inter-cultivations for transplanted Paddy crop.

1. BASAL CONDITIONS:

(i) (a) Paddy—Fallow—Paddy. (b) Paddy. (c) N.A. (ii) Lateritic and porous. (iii) 9.6.63/10.7.63. (iv) (a) Ploughings by wooden plough and levelling. (b) Transplanting. (c) 34 Kg/ha. (d) 15 cm.×25 cm. (e) 2 (v) C.M. at 4942 Kg/ha.+Super at 161 Kg/ha.+Mur. of Pot. at 62 Kg/ha. as basal dressing and A/S at 111 Kg/ha. as top dressing one month before flowering. (vi) P.T.B.—24 (125 days). (vii) Unirrigated. (viii) As per treatments. (ix) N.A. (x) 3.10.63.

2. TREATMENTS :

6 times of working Japanese weeder : T_1=15 days, T_2=30 days, T_3=45 days, T_4=15 days and 30 days, T_5=15 days and 45 days, T_6=30 days and 45 days after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 1/250 ha. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Minor attack of Rice hispa ; dusting with B.H.C. 10% at 25 Kg/ha. (iii) Yield of grain. (iv) (a) 1963—only. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS:

(i) 1697 Kg/ha. (ii) 652·2 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	2067	2026	1596	1670	1165	1655

———

Crop :- Paddy (*Rabi*).

Site :- Rice Res. Stn., Kottarakara.

Ref :- K. 63(106), 64(78), 65(14).

Type :- 'C'.

Object :—To find out the optimum time and number of intercultures for Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow—Paddy. (b) Paddy. (c) 4942 Kg/ha. of C.M. for 63(106) ;N.A. for others. (ii) Lateritic. (iii) 18.9.63 ; 11.9.64 and 28.8.65. (iv) (a) 5 ploughings, 2 levellings and 1 digging. (b) Transplanting. (c) 34 Kg/ha. (d) 15 cm.×25 cm. (e) 2. (v) 4942 Kg/ha. of C.M.+161 Kg/ha. of Super+62 Kg/ha. of Mur. Pot. (vi) P.T.B.—20. (vii) Unirrigated. (viii) As per treatments. (ix) N.A. (x) 22.1.64. 5.2.65 and 28.1.66.

2. TREATMENTS :

7 times of working Japanese weeder: T_1=15 days, T_2=30 days, T_3=45 days, T_4=15 days and 30 days, T_5=15 days and 45 days, T_6=30 days and 45 days and T_7=15 days and 30 days and 45 days after transplanting.

3. DESIGN:

(i) R.B.D, (ii) (a) 7. (b) 20·1 m×24·1 m. for 63(106) ; 23·0 m.×9·3 m. for 64(78), 65(14). (iii) 4. (iv) (a) and (b) 7·6 m.×4·3 m. for 63(106). 9·3 m×3·2 m. for others. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Slightly lodged. (ii) N.A. (iii) Grain yield. (iv) (a) 1963–contd. (b) N.A. (c) Nil. (v) and (vi) N.A. (vii) Expt. Continued. beyond 1965. Hence the results of individual years are presented.

5. RESULTS :

63(106)

(i) 2003 Kg/ha. (ii) 328·2 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	T_7
Av. yield	2115	1964	2268	2051	1817	2086	1724

64(78)

(i) 3311 Kg/ha. (ii) 334·4 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	T_7
Av. yield	3543	3188	3104	3029	3469	3235	3610

65(14)

(i) 4074 Kg/ha. (ii) 414·2 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	T_7
Av. yield	3875	4054	4261	4413	4009	4207	3696

——————

Crop :- Paddy (*Kharif*).   **Ref :- K. 61(28), 62(89), 63(124).**

Site :- Rice Res. Stn., Mannuthy.   **Type :- 'C'.**

Object :—To find out the efficacy of different methods of covering broadcast Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy for 61(28) ; N.A. for 62(89) ; Nil for 63(124). (b) Paddy. (c) 5604 Kg/ha. of C.M. +Super at 112 Kg/ha.+Mur. Pot. at 56 Kg/ha. +A/S at 112 Kg/ha. for 61(28) ; C.M. at 2242 Kg/ha.+ Super at 112 Kg/ha.+Mur. Pot. at 56 Kg/ha. for 62(89) ; 5604 Kg/ha. of C.M.+34 Kg/ha. of P_2O_5 as Super +34 Kg/ha. of K_2O as Mur. Pot. for 63(124)· (ii) Laterite. (iii) 28 4.61 ; 3.5.62 ; 12.5.63 (iv) (a) 6 ploughings. (b) Broadcast for 61(28), 63(124) ; As per treatments. (c) 112 Kg/ha. ; 34 to 45 Kg/ha. ; 90 Kg/ha. for 62(89). (d) N.A. ; 15 cm.×25 cm. ; N.A. (e) N.A. for 61(28) and 63(124) ; 3 for 62(89). (v) For 61(28) and 62(89) same as in (i) (c) above ; 2242 Kg/ha. of powdered C.M.+112 Kg/ha. of A/S+168 Kg/ha. of Super+67 Kg/ha. of Mur. Pot. for 63(124). (vi) PTB—32. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. ; 237 cm. ; 252 cm. (x) 5.9.61 ; 18, 19.9.62 ; 17.9.63.

2. TREATMENTS:

3 methods of covering seeds : M_1=Ploughing twice, M_2=Ploughing and planking and M_3=Dibbling of seeds in plough furrows and planking.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 9·1 m.×14·9 m. for 61(28), 62(89) ; 14·9 m.×15·8 m. for 63(124). (iii) 8. (iv) (a)4·6 m.×9·1 m. for 61(28), 62(89) ; 4·6 m.×7·6 m. for 63(124). (b) 4·4 m.×9·0 m. for 61(28), 62(89) ; 4·6 m.×7·6 m. for 63(124). (v) 7 cm.×7 cm. for 61(28), 62(89) ; Nil for 63(124). (vii) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Case worm and gall fly attack for 61(28) and Endrin sprayed ; Rice bug attack in 62(89) controlled by dusting B.H.C 10% ; Case worm and gall fly controlled by spraying Endrin in 63(89). (iii) No. of productive tillers and grain yield. (iv) (a) 1961—63. (b) Yes. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 2129 Kg/ha. (ii) 245·2 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	M_1	M_2	M_3
Av. yield	2199	2211	1977

——————

Crop :- Paddy (*Kharif*).   **Ref :- K. 63(114), 64(11), 65(25).**

Site :- Rice Res. Stn., Mannuthy.   **Type :- 'C'.**

Object :—To find out the optimum number and time of working intercultivator for Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5604 Kg/ha. of C.M.+A/S at 112 Kg/ha.+Super at 179 Kg/ha.+Mur. Pot. at 67 Kg/ha. for 63(114) ; 3000 Kg/ha. of G.L.+30 Kg/ha. of each of N, P_4O_5 and K_2O for 64(11) ; 5000 Kg/ha. of G.M.+40 Kg/ha. of N+30 Kg/ha. of each of P_4O_5 and K_4O for 65(25) (ii) Laterite. (iii) 10.6.63/11.7.63 ; 22.5.64/4.7.64 ; N.A. (iv) (a) 6 ploughings and puddlings for 63(114) ; 6 ploughings puddling and levelling for 64(11) ; 6 ploughings for 65(25). (c) Transplanting. (c) 25 Kg/ha. for 63(114), 64(11) ; N.A. for 65(25). (d) 15 cm.×25 cm. 63(114), 64(11) ; N.A. for 65(25). (e) 2 for 63(114), 64(11) ; N.A. for 65(25). (v) 5604 Kg/ha. of C.M.+168 Kg/ha. of Super in 2 doses and 67 Kg/ha. of Mur. Pot. for 63(114) ; 3000 Kg/ha. of G.L.+30 Kg/ha. of each of N, P_2O_5, K_4O for 64(11) ; 5000 Kg/ha. of G.L.+20 Kg/ha. of N +30 Kg/ha. of each of P_2O_5 and K_2O applied at last ploughing for 65(25). (vi) PTB—32 (medium). (vii) Irrigated. (viii) Interculturing as per treatments. (ix) 252 cm. ; 250 cm. ; 145 cm. (x) 3.10.63 ; 1.10.64 ; N.A.

2. TREATMENTS :

7 times of working intercultivator : T_1=15 days, T_2=30 days, T_3=45 days, T_4=15 and 30 days, T_5=15 and 45 days, T_6=30 and 45 days and T_7=15, 30 and 45 days after planting.

3. DESIGN :

(i) R.B D. (ii) (a) 7. (b) 5·7 m.×18·9 m. for 63(114) ; 9·8 m.×17·6 m. for 64(11) ; N.A. for 65(25). (iii) 4. (iv) (a) 2·5 m.×9·1 m. for 63(114) ; 2·5 m.×9·8 m. for 64(11) ; 2·5 m.×9·1 m. for 65(25). 2·4 m.×9·1 m. for 65(25). (b) 2·9 m.×9·0 m. for 63(114) ; 2·2 m.×9·2 m. for 64(11) ; (v) 16 cm.×6 cm. for 63(114) ; 15 cm.×26 cm. for 64(11) ; 8 cm.×3 cm. for 65(25). (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Case worm, gall fly, stem borer attack controlled by spraying Endrin 63(114) ; Stem borer and stalk borer attack for 64(11) and Cupravit, Endrin sprayed Leaf roller, rice bug and blight attack in 65(25) controlled by Cupravit and Endrin 0·1%. (iii) Grain and straw yield. (iv) (a) 1963—65. (b) Yes. (c) Nil. (v) and (vi) —. (vii) Since the error variances are heterogeneous and Treatments×years interaction is absent. Therefore the results of individual years are presented under 5. Results.

5. RESULTS :

63(114)

(i) 2172 Kg/ha. (ii) 306·9 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	T_7
Av. yield	2433	1982	2031	2274	2055	2153	2274

64(11)

(i) 1895 Kg/ha. (ii) 118·5 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	T_7
Av. yield	1849	1909	1823	1946	1909	1909	1921

65(25)

(i) 3436 Kg/ha. (ii) 213·3 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	T_7
Av. yield	3474	3474	3445	3428	3323	3468	3439

Crop :- Paddy (*Rabi*).

Ref :- K. 63(115), 64(12), 65(26).

Site :- Rice Res. Stn., Mannuthy.

Type :- 'C'.

Object :—To find out optimum number and time of working intercultivator for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5604 Kg/ha. of C.M.+112 Kg/ha. of A/S+179 Kg/ha. of Super+67 Kg/ha. of Mur. Pot. for 63(115) ; 3000 Kg/ha. of G.L.+30 Kg/ha. of each of N, P_2O_5 and K_2O for 64(12) ; 5000 Kg/ha. of G.L.+40 Kg/ha. of N+30 Kg/ha. of P_2O_5+30 Kg/ha. of P_2O_5 for 65(26). (ii) Laterite. (iii) 10.9.63/ 11.10.63 ; 4.9.64/8.10.64 ; 19.8.65/2.10.65. (iv) (a) 6 ploughings and puddlings for 63(115) ; 6 ploughings, puddling and levelling for 64(12) ; 9 ploughings for 65(26). (b) Transplanting. (c) 25 Kg/ha. for 63(115) and 64(12); N.A. for 65(26). (d) 15 cm.×25cm. for 63(115), 64(12); N.A. for 65(26). (e) 2 for 63(115), 64(12); N.A. for 65(26). (v) 5604 Kg/ha. of C.M.+168 Kg/ha. of A/S in 2 equal doses. 168 Kg/ha. of Super+67 Kg/ha. of Mur. Pot. for 63(115) ; 3000 Kg/ha. of G.L.+30 Kg/ha. of each of N, P_2O_5, K_2O for 64(12) ; 5000 Kg/ha. of G.M.+30 Kg/ha. of each of P_2O_5 and K_2O, 20 Kg/ha. of N for 65(26). (vi) PTB—12 (medium). (vii) Irrigated. (viii) Interculturings as per treatments. (ix) 252 cm. ; 300 cm. ; 35 cm. (x) 8.1.64 ; 25.1.65 23.1.66.

2. TREATMENTS :

7 times of working intercultivator : T_1=15 days, T_2=30 days, T_3=45 days, T_4=15 and 30 days, T_5=15 and 45 days, T_6=30 and 45 days. and T_7=15, 30 and 45 days after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) 5·7 m.×18·9 m. for 63(115) ; 9·8 m.×17·6 m. for 64(12) ; N.A. for 65(9). (iii) 4. (iv) (a) 2·5 m.×9·1 m. for 63(115) ; 2·5 m.×9·8 m. for 64(12) ; 2·5 m.×9·1 m. for 65(9). (b) 2·9 m.× 9·0 m. for 63(115) ; 2·2 m.×9·2 m. for 64(12) ; 2·4 m.×9·1 m. for 65(9). (v) 16 cm.×6 cm. for 63(115) ; 15 cm.×26 cm. for 64(12) ; 8 cm.×3 cm. for 65(26). (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Case worm, gall fly, stem borer controlled by spraying Endrin for 63(115). (iii) Tiller counts, height and yield of grain. (iv) (a) 1963—65. (b) Yes. (c) Nil. (v) (a) Kayamkulam. (b) Nil. (vi) Nil. (vii) Since the error variances are heterogeneous and Treatments×years interaction is absent. Therefore results of individual years are presented under 5. Results.

5. RESULTS :

63(115)

(i) 2172 Kg/ha. (ii) 175·5 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	T_7
Av. yield	2250	2116	2226	2031	2274	2226	2080

64(12)

(i) 3147 Kg/ha. (ii) 139·1 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	T_7
Av. yield	3206	3194	3181	3108	3212	3004	3126

65(26)

(i) 2784 Kg/ha. (ii) 377·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in ha.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6	T_7
Av. yield	2613	2787	3026	2706	2863	2712	2782

Crop :- Paddy (*Kharif*). **Ref :- 62(91), 63(116).**

Site :- Rice Res. Stn., Mannuthy. **Type :- 'C'.**

Object :—To test the efficacy of Japanese weeder produced by the various firms.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) 2242 Kg/ha. of C.M. for 62(91) ; 5604 Kg/ha. of C.M.+112 Kg/ha. of A/S+ 168 Kg/ha. of Super+67 Kg/ha. of Mur. Pot. for 63(116). (ii) Laterite. (iii) 24.5.62/10.7.62 ; 10.6.63/10.7.63 respectively. (iv) (a) 6 ploughings and puddlings. (b) Transplanting. (c) 34 to 45 Kg/ha. for 62(91) ; 25 Kg/ha. for 63(116). (d) 25 cm. × 15 cm. (e) 2. (v) G L. at 4483 Kg/ha. for 62(91) ; 5604 Kg/ha. of C.M. and 34 Kg/ha. each of N, P_2O_5 and K_2O as A/S, Super and Mur. Pot. respectively. (vi) PTB—32 (medium). (vii) Irrigated. (viii) Working with Japanese hoe once ; hand weeding once for 63(116). (ix) 237 cm. and 252 cm. respectively. (x) 4.10.62 and 5.10-63 respectively.

2. TREATMENTS :

8 weeding treatments : W_0=No weeding (control), W_1=Working Kumbakonam weeder, W_2=Working Swasthik weeder, W_3=Working American spring weeder, W_4=Working Curl-holmer weeder, W_5=Working D.H. weeder, W_6=Working Bihrra weeder and W_7=Hand weeding.

All are Japanese type weeders. Weeding done 20 and 40 days after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) 12·0 m. × 18·9 m. for 62(91) and 23·5 m. × 18·9 m. for 63(116). (iii) 4. (iv) (a) 2·5 m. × 9·1 m. (b) 2·3 m. × 9·0 m. (v) 12 cm. × 8 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Gall fly, case worm, stem borer etc., controlled by spraying endrin. (iii) No. of productive tillers/hill and grain yield. (iv) (a) 1962—63. (b) N.A. (c) Nil. (v) and (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 :

62(91)

(i) 2070 Kg/ha. (ii) 169·5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	W_0	W_1	W_2	W_3	W_4	W_5	W_6	W_7
Av. yield	2080	1989	2165	2043	2122	2062	2128	1970

63(116)

(i) 1972 Kg/ha. (ii) 383·8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	W_0	W_1	W_2	W_3	W_4	W_5	W_6	W_7
Av. yield	1934	2055	1837	1849	2068	1861	1910	2262

Crop :- Paddy (*Rabi*). **Ref :- K. 62(92), 63(117).**

Site :- Rice Res. Stn., Mannuthy. **Type :- 'C'.**

Object :—To test the efficacy of Japanese weeder produced by various firms.

1. BASAL CONDITIONS :

(i) (a) NA. (b) Paddy. (c) C.M. at 2242 Kg/ha. for 62(92) ; 5604 Kg/ha. of C.M.+112 Kg/ha. of A/S+ 168 Kg/ha. of Super+67 Kg/ha. of Mur. Pot. (ii) Laterite. (iii) 5.9.62/N.A. ; 5.9.63/10.10.63. (iv) (a) 6 ploughings and puddlings. (b) Transplanting. (c) 34 to 45 Kg/ha. for 62(92), 25 Kg/ha. for 63(117) (d) 15 cm.×25 cm. (e) 2. (v) G.L. at 4483 Kg/ha. for 62(92), 5604 Kg/ha. of C.M.+34 Kg/ha. each of N, P_2O_5 and K_2O as A/S, Super and Mur. Pot. respectively. (vi) P.T.B.—12 (medium). (vii) Irrigated. (viii) Working Japanese hoe once and hand weeding once. (ix) 63 cm. ; 252 cm. (x) 8.1.63 ; 5.1.64.

2. TREATMENTS :

8 weeding treatments : W_0=No weeding (control) ; W_1=Working Kumbakonam weeder, W_2=Working Swasthik weeder, W_3=Working American spring weeder, W_4=Working Curl-holmer weeder, W_5=Working D.H. weeder, W_6=Working Bihrra weeder and W_7=Hand weeding.

All are Japanese type weeders. Weeding done 20 and 40 days after planting.

3. DESIGN:

(i) R.B.D. (ii) (a) 8. (b) 12·0 m.×18·9 m. for 62(92) ; 23·5 m.×18·9 m. for 63(117). (iii) 4. (iv) (a) 2·5 m× 9·1 m. (b) 2·3 m.×8·9 m. (v) 12 cm.× 8 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Case worm, gall fly and stemborer and Endrin sprayed. (iii) No. of productive tillers/ hill and grain yield. (iv) (a) 1962—1963. (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 :

(i) 2472 Kg/ha. (ii) 230·0 Kg/ha. (based on 49 d.f. made up of Treatments×years interaction and pooled error). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	W_0	W_1	W_2	W_3	W_4	W_5	W_6	W_7
Av. yield	2469	2548	2384	2305	2518	2360	2646	2548

Crop :- Paddy (*Rabi*).

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

Ref :- K. 61(50).

Type :- 'C'.

Object :—To findout the optimum number and time of working the intercultivation for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) 5604 Kg/ha. of G.L.+68 Kg/ha, of Mur. Pot. as basal dressing and 112 Kg/ha. of A/S as top dressing. (ii) Shallow, lateritic, consisting of clay and sand with limited quantity of sill. (iii) 22.9.61/4.11.61 (iv) (a) 8 ploughings and puddlings and levelling by planking. (b) to (e) N.A. (v) C.M. at 56 Kg/ha. as basal dressing and 112 Kg/ha. of A/S as top dressing. (vi) P.T.B.—20 (medium). (vii) Un-irrigated. (viii) As per treatments. (ix) 52·4 cm. (x) 7.2.62.

2. TREATMENTS :

5 times of interculture : T_0=Control (no interculture), T_1=15 days, T_2=15 days and 30 days, T_3=15 days, 30 days and 45 days and T_4=15, 22, 29, 36 and 43 days after planting.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 7·6 m.×3·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) and (iii) N.A. (iv) (a) 1961—only. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 1875 Kg/ha. (ii) 96'5 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
Av. yield	1828	1913	1883	1880	1871

Crop :- Paddy (Rabi).   **Ref :- K. 59(201); 60(24), 61(42), 62(122), 63(154).**

Site :- Agri. Res. Stn., Pattambi. Type :- 'C'.

Object :—To compare the efficacy and economy of different methods of planting.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5604 Kg/ha. of G.L.+ 112 Kg/ha. of A/S for 60(24); 5604 Kg/ha. of G.L.+112 Kg/ha. of B.M.+68 Kg/ha. of Mur. Pot.+68 Kg/ha. of C/A/N for 61(42); N.A. for others. (ii) Shallow laterite. (iii) 19.5.59/2.11.59 ; 16.9.60/4.11.60 ; 15.9.61/10.11.61 ; 8.9.62/27.10.62 ; 9.9.63/5.11.63. (iv) (a) 6 puddlings and 4 levellings for 60(24); 8 ploughings for 61(42) ; N.A. for others. (b) As per treatments. (c) N.A. (d) As per treatments. (e) 2. (v) 5604 Kg/ha.of G.L. for 60(24) ; 5604 Kg/ha. of G.L. as basal dressing+112 Kg/ha. of A/S as top dressing three weeks after planting for 61(42) ; N.A. for others. (vi) P.T.B.—15 (medium) for 60(24) ; P.T.B.—26 (medium) for others. (vii) Unirrigated. (viii) One to two weedings. (ix) 309 cm. ; 64 cm. ; N.A. for others. (x) 20.2.60; 20.2.61 ; 19.2.62 ; 14.2.63 ; 27.2.64.

2. TREATMENTS :

3 methods of planting : M_1=Bulk planting, M_2=Planting in lines at 25 cm. spacing and M_3=Planting in double rows at 15 cm.×15 cm. spacing.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A (iii) 8. (iv) (a) and (b) 6·1 m.×1·5 m. (v) No. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1958—1963. (b) No. (c) Results of combined analysis are given under 5. Results. (v) and (vi) Nil. (vii) Expt. No. 58(174) is also included while giving the combined results. Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 3674 Kg/ha. (ii) 211·5 Kg/ha. (based on 94 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	M_1	M_2	M_3
Av. yield	3648	3615	3668

Crop :- Paddy (Kharif).   **Ref :- K. 59(200), 60(23), 62(75), 63(153).**

Site :- Agri. Res. Stn., Pattambi.   **Type :- 'C'.**

Object :—To compare the efficacy and economy of different methods of planting.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5604 Kg/ha. of G.L.+112 Kg/ha. of A/S for 60(23) ; 12 C.L. Kg/ha. of C.M. for 62(75) ; N.A. for others. (ii) Shallow laterite. (iii) 18.5.59/30.6.59 ; 23.5.60/22.6.60 ; 8.5.62/21.6.62 ; 28.5.63/2.7.63. (iv) (a) 6 puddlings and 4 levellings ; 1 ploughing with country plough. (b) As per treatments. (c)N.A. (d) As per treatments. (e) 2. (v) 5604 Kg/ha. of (G.L. for 60(23); 4483 Kg/ha .of G.L.+112 Kg/ha. of B.M.+68 Kg/ha. of Mur. Pot. (G.L. applied before ploughing ; B.M. and Mur. Pot. before final ploughing). (vi)P.T.B.—26 (medium). (vii) Unirrigated. (viii) 1 to 2. weedings. (ix) N.A. ; 309 cm. ; 229 cm. ; N.A. (x) 3.9.59 ; 9.10.60 ; 28.9.62 ; 7.10.63.

2. TREATMENTS:

    3 methods of planting : M_1=Bulk planting, M_2=planting in lines at 25 cm. spacing and M_3=Planting in double rows at 15 cm.×15 cm. spacing.

3. DESIGN:

    (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 6·1 m·×1·5 m. (v) No. (vi) Yes.

4. GENERAL :

    (i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1958—1963 (Expt. for 1961—N.A.) (b) No. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Expt., No. 58(173) is also included while giving the combined results. Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

    (i) 2912 Kg/ha. (ii) 165·7 Kg/ha. (based on 78 d.f. made up of pooled error and Treatments×years inter-action). (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M_1	M_2	M_3
Av. yield	2937	2830	2970

C.D.=82·8 Kg./ha.

———

Crop :- Paddy (*Kharif .*)   **Ref :- K. 61(43), 62(99), 63(155).**

Site :- Agri. Res. Stn., Pattambi.   **Type :- 'C'.**

Object :—To find out the effect of planking in uplands after broadcast of Paddy.

1. BASAL CONDITIONS :

    (i) (a) No. (b) Paddy. (c) 126 Q/ha. F.Y.M. as basal dressing for 61(43); N.A. for others. (ii) Laterite loam. (iii) 19.5.61 ; 3.5.62 ; 25.5.63. (iv) (a) 6 to 10 ploughings. (b) As per treatments. (c) to (e) N.A. (v) 126 Q/ha. of F.Y.M. for 61 (43) ; 560 Kg/ha. of A/S for 62(99) ; N.A. for 63. (vi) [P.T.B.—28 (medium) (vii) Unirrigated. (viii) 2 weedings. (ix) 359 cm. ; 229 cm. ; N.A. (x) 6.9.61 ; 3.9.62 ; 20.9.63.

2. TREATMENTS :

    3 methods of planting : M_1=Covering seeds by country plough twice, M_2=Covering seeds by country plough twice and planking once and M_3=Dibbling and planking once.

3. DESIGN :

    (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 3·1 m.×3·7 m. (v) An outerspace of 61 cm. left in between plots. (vi) Yes.

4. GENERAL :

    (i) Normal in 61(43) and unsatisfactory in 62(99) and 63(155) (ii) Preventive sprayings with insecticides in 62(99); Nil in others. (iii) Tiller counts and grain yield. (iv) (a) 1961—1963. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent. Results of individual years are presented under 5. Results.

5. RESULTS :

61(43)

    (i) 551 Kg/ha. (ii) 127·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M_1	M_2	M_3
Av. yield	570	551	532

62(99)

(i) 206 Kg/ha.(ii) 37·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M_1	M_2	M_3
Av. yield	197	219	203

63(155)

(i) 251 Kg/ha. (ii) 106·5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M_1	M_2	M_3
Av. yield	257	286	209

Crop :- Paddy (*Rabi*).　　　　　　　　　　**Ref :- K. 62(123), 63(157).**

Site :- Central Rice Res. Stn., Pattambi.　　**Type :- 'C'.**

Object :—To find out the optimum number and time of working intercultivators for Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Paddy—Paddy. (b) Paddy (c) N.A. for 62 and as per treatments for 63. (ii) Laterite loam. (iii) 1.10.62/1.11.62 ; 23.9.63/26.10.63. (iv) (a) Digging and levelling. (b) Transplanting. (c) N.A. (d) 25 cm. between lines. (e) 2. (v) 5600 Kg/ha. of G.L. (vi) P.T.B.—20 (medium). (vii) Irrigated. (viii) Gap filling 15 days after planting. (ix) N.A. (x) 2.2.63 ; 30 1.64.

2. **TREATMENTS :**

5 interculture operations : C_0=No interculturing, C_1=Once after 15 days of planting, C_2=Twice 15 and 30 days after planting, C_3=Thrice 15, 30 and 45 days after planting and C_4=Five times, 15, 22, 29, 36 and 43 days after planting.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 7m.×3 m. (b) 6·5 m.×2·5 m. (v) 25 cm. on all sides. (vi) Yes.

4. **GENERAL :**

(i) Lodged after flowering. (ii) N.A. (iii) Yield of grain. (iv) 1962—63. (b) Yes. (c) Results of combined analysis given under 5. Results. (v) and (vi) N.A. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

5. **RESULTS :**

(i) 2741 Kg/ha. (ii) 351·1 Kg/ha. (based on 28 d.f. made up of pooled error and Treatments × years interacraction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	C_0	C_1	C_2	C_3	C_4
Av. yield	2741	2912	2790	2569	2711

Crop :- Paddy (*Kharif*).　　　　　　　　**Ref :- K. 62(104),63(151).**

Site :- Central Rice Res. Stn., Pattambi.　　**Type :- 'C'.**

Object :—To find out the efficacy of different intercultivators.

1. **BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) N.A. (c) Shallow laterite. (iii) 23.5.62/23.6.62 ; 4.6.63/4.7.63. (iv) (a) Ploughing with country plough and levelling. (b) Transplanting. (c) N.A. (d) 25 cm between lines. (e) 2. (v) 12·4 C.L./ha. of C.M. (vi) P.T.B.—2 (medium). (vii) Unirrigated. (viii) Weeding twice. (ix) 229 cm. (x) 18.10.62 ; 17.10.63.

2. TREATMENTS :

6 types of intercultivators for interculturing : C_0=Control (no interculturing), C_1=Akshot cultivator, C_2=Carlohomes and Co. cultivators, C_3=Rotary cultivator, C_4=Touret Gune cultivators and C_5=Swasthic cultivator.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 6·1 m.× 3·0 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain, height measurements and tiller counts. (iv) (a) 1962—63. (b)Yes. (c) Results of combined analysis are given under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS:

(i) 3056 Kg/ha. (ii) 193·1 Kg/ha. (based on 35 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_0	C_1	C_2	C_3	C_4	C_5
Av. yield	3133	3133	3113	2969	2915	3074

Crop :- Paddy (*Rabi*). **Ref :- K. 63(152).**

Site :- Central Rice Res. Stn., Pattambi. **Type :- 'C'.**

Object :—To find out the efficiency of different intercultivators.

1. BASAL CONDITIONS:

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Laterite loam. (iii) 23.9.63/29.10.63 (iv) (a) Digging and levelling. (b) Nursery raised and seedling planted. (c) N.A. (d) 25 cm. (e) 2. (v) 12·4 C.L./ha. of C.M. (vi) M.B.—20 (medium). (vii) Irrigated. (viii) Gap filling 15 days after planting. (ix) N.A. (x) 30.1.64.

2. TREATMENTS :

6 types of intercultivators : C_0=Control (no interculturing), C_1=Akshot cultivator, C_2=Carlohomes and Co. cultivators, C_3=Rotary cultivator, C_4=Touret Gune cultivator and C_5= Swasthic cultivator.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) Nil. (iii) 4. (iv) (a) and (b) 6 m.× 3 m. (v) one row on each side. (vi) Yes.

4. GENERAL :

(i) Lodged after flowering. (ii) Negligible. (iii) Grain yield. (iv) (a) 1963 only. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 2324 Kg/ha. (ii) 96·4 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	C_4	C_5
Av. yield	2247	2324	2349	2339	2257	2429

Crop :- Paddy (*1st crop*). **Ref :- K. 62(105), 63(156), 64(38).**

Site .- Agri. Res. Stn., Pattambi. **Type :- 'C'.**

Object : To find out the optimum number and time of working of intercultivator for Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil ; Paddy –Paddy for 63(156). (b) Paddy. (c) 12'4 C.L./ha. of C.M. (ii) Shallow laterite. (iii) 23.5'62/23.6.62; 4.6.63/4.7.631 ; 6.5.64/1.7.64. (iv) (a) 8 ploughings and levellings. (b) As per treatments. (c) to (e) N.A. (v) C.M. at 12'4 C.L./ha. as basal dressing and 112 Kg/ha. of A/S as top dressing. (vi) P.T.B.—2. (vii) Unirrigated. (viii) Gap-filling, and interculturing as per treatments. (ix) 229 cm.; 224 cm. ; N.A. (x) 18.10.62 ; 18.10.63 ; 29.10.64.

2. TREATMENTS :

5 times of interculturing : T_0=Control (no interculturing),T_1=15 days, T_2=15 days and 30 days; T_3=15 days, 30 days and 45 days and T_4=15 days, 22 days, 29 days, 36 days and 43 days after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 7'6 m×3'0 m. (v) No. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Slight attack of gall-fly noticed in 64(38) and no control measures taken. Nil for others. (iii) Grain yield. (iv) (a) 1961—1964. (b) Yes. (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:

(i) 2477 Kg/ha. (ii) 156'4 Kg/ha. (based on 44 d.f. made up of Treatments×years interaction and pooled error). (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	2562	2517	2428	2455	2421

Crop :- Paddy (*Kharif*). **Ref :- K. 62(36).**

Site :- Rice Res. Stn., Vythila. **Type :- 'C'.**

Object : —To find out the efficiency of local practice of Pokkali cultivation.

1. BASAL CONDITIONS:

(i) (a) No. (b) Paddy. (c) Nil. (ii) Clay loam. (iii) 2.7.62/29.8,62. (iv) (a) to (e) N.A. (v) Nil. (vi) *Cheruviripu* (medium). (vii) Unirrigated. (viii) 1 weeding (ix) 102 cm. (x) 29.11.62.

2. TREATMENTS :

T_1=Dismentling the mounds, washing the soil and planting the seedlings, T_2=Pulling out the seedlings from mounds, washing them and planting, T_3=Seedlings from nurseries, raised outside the field and planting and T_4=Local method of cutting and dismantling the seedlings.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 37'5 m.×4'7 m. (iii) 6. (iv) 9'4 m.×4'7 m. (b) 9'1 m.×4'6 m. (v) One row alround. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Slight attack of case worm, controlled by spraying Endrin. (iii) No. of production of tillers, height of plants a week before harvest and dry yield of grain and straw. (iv) (a) 1962 only. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 606 Kg/ha. (ii) 60·8 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T_1	T_2	T_3	T_4
Av. yield	658	646	574	546

C.D.=74·8 Kg/ha.

Crop .- Paddy (*Rabi*).

Ref :- K. 61(9), 62(71), 63(86).

Site :- Rice Res. Stn., Kayamkulam.

Type :- ·CV'.

Object :—To find out the optimum spacing for different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy—Sesamum. (b) Paddy. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 1.7.61/19, 20.8.61 ; 15.7.62/30.8.62 ; N.A./27.8.63. (iv) (a) 4 ploughings and 2 puddlings for 61(9) ; 4 ploughings with country plough, 2 with iron plough, puddling and levelling for 62(71) ; 2 tractor ploughings for 63(86). (b) Transplanting. (e) N.A. (d) As per treatments.(e) N.A. for 61(9) and 63(86); 2 for 62(71). (v) C.M. at 2242 Kg/ha.+112 Kg/ha.of Super as basal dressing+A/S at 56 Kg/ha.+Mur.Pot. at 56 Kg/ha. as top dressing for 61(9) ; 4000 Kg/ha. of C.M. as basal dressing, 40 Kg/ha. of A/S+25 Kg/ha. of Mur. Pot. as top dressing for 62(71) ; C.M. at 5000 Kg/ha.+Super at 125 Kg/ha.+Mur. Pot. at 60 Kg/ha. as basal and A/S at 100 Kg/ha. as top dressing for 63(86). (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings for 61(9) ; 1 inter-culturing and 2 weedings for 62(71) ; N.A. for 63(86). (ix) 90 cm. ; N.A. ; 99 cm. (x) 5, 15.1.62 ; 21.1.63. ; 12.1.64.

2. TREATMENTS :

Main-plot treatments :

4 late varieties : V_1=P.T.B.—4, V_2=P.T.B.—16, V_3=P.T.B.—20 and V_4=U.R.—19.

Sub-plot treatments :

6 sprayings : S_1=10 cm.×15 cm., S_2=15 cm.×15 cm., S_3=15 cm.×23 cm., S_4=23 cm.×23, S_6=23 cm. ×30 cm. and S_6=30 cm.×30 cm.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 6 sub-plots/main-plot. (b) 24·2 m.×16·00 m. for 61(9) ; N.A. for others. (ii) 4. (iv) (a) and (b) 3·7 m×3·7 m. for 61(9) ; 5·5 m.×2·7 m. for 62(71) and 63(86). (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil for 61(9) and 63(86); Helminthosporium attack noticed in 62(71), Cupravit sprayed. (iii) Height, tiller counts and yield of grain. (iv) (a) 1961—63. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Since the sub-plot error variances are heterogeneous, results of individual years are presented under 5. Results.

5. RESULTS :

61(9)

(i) 2636 Kg/ha. (ii) (a) 689·2 Kg/ha. (b) 588·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean
V_1	2409	2870	2751	2510	2642	2508	2615
V_2	2685	2327	2923	2900	2076	2730	2607
V_3	2229	2519	3111	2388	2872	2921	2673
V_4	2474	2607	2676	2977	2893	2270	2650
Mean	2449	2581	2865	2694	2621	2607	2636

62(71)

(i) 1045 Kg/ha. (ii) (a) 352·0 Kg/ha. (b) 264·2 **Kg/ha.** (iii) Main effect of V is highly significant. (iv) Av. yield of grain in Kg/ha.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean
V_1	1281	1343	1220	1203	1164	1126	1223
V_2	1026	921	992	889	846	855	922
V_3	1079	1139	1126	1082	1034	1032	1082
V_4	1072	1099	866	974	910	804	954
Mean	1114	1126	1051	1037	988	954	1045

C.D. for V marginal means=229·8 Kg/ha.

63(86)

(i) 2352 Kg/ha. (ii) (a) 678·6 Kg/ha. (b) 261·9 Kg/ha. (iii) Main effects of V and S are highly significant. (iv) Av. yield of grain in Kg/ha.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean
V_1	2718	2617	2641	2590	2455	2339	2560
V_2	1769	1858	1764	1901	1776	1722	1798
V_3	2469	2732	2631	2436	2199	2209	2446
V_4	2664	2955	2600	2479	2329	2605	2605
Mean	2405	2540	2409	2352	2190	2219	2352

C.D. for V marginal means=443·1 Kg/ha.
C.D. for S marginal means =185·2 Kg/ha.

— — —

Crop :- Paddy (*Kharif*).   **Ref :- K. 61(18).**

Site :- Rice Res. Stn., Kayamkulam.   **Type 'CV'.**

Object :—To find out the optimum number of seedlings per hole for Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy- Sesamum. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 1.7.61/17, 18.8.61 (iv) (a) 4 ploughings and 2 puddlings (b) to (d) N.A. (e) As per treatments. (v) C.M. at 2242 Kg/ha.+Super at 112 Kg/ha. as basal dressing. A/S at 56 Kg/ha.+Mur. Pot. at 56 Kg/ha. as top dressing. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings. (ix) 90 cm. (x) 15.1.62.

Main-plot treatments :
    4 varieties: V_1=P.T.B.—4 ; V_2=P.T.B,—16, V_3=P.T.B.—20 and V_4=4 R—19.

Sub-plot treatments:
    3 Number of seedlings/hole : S_1=2 ; S_2=4 and S_3=6.

3. DESIGN :

Split-plot. (ii) (a) 4 main plots/block and 3 sub-plots/main-plot. (b) 19·2 m.×13.6 m. (iii) 5. (iv) (a) and (b) 6·1 m.×3·5 m. (v) Nil.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Tiller counts taken two months after planting, yield of grain. (iv) to (vii) N.A.

5. RESULTS :

(i) 2967 Kg/ha. (ii) (a) 282·4 Kg/ha. (b) 272·7 Kg/ha. (iii) Main effect of V alone is significant. (iv) Av. yield of grain in Kg/ha.

	V_1	V_2	V_3	V_4	Mean
S_1	3303	3032	2828	2656	2955
S_2	3080	3092	3100	2714	2996
S_3	3136	2951	2890	2818	2949
Mean	3173	3025	2939	2729	2967

C.D. for V marginal means=224·7 Kg/ha.

Crop :- Paddy (*Rabi*).

Site :- Rice Res. Stn., Mannuthy.

Ref :- K. 65(40).

Type :- 'CM'.

Object :—To find out the best combination of spacing with levels of N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) 5000 Kg/ha. of G.L. and N, P, K as per treatments. (ii) Lateritic. 2.9.65/21.10.65. (iv) (a) 6 ploughings. (b) to (e) N.A. (v) 5000 Kg/ha. of G.L. and N, P and K as per treaments. (vi) PTB—12 (medium). (vii) Irrigated. (viii) 1 hand weeding. (ix) 38 cm. (x) 26.1.66.

2. TREATMENTS :

Main-plot treatments :

N_1=20, N_2=40 and N_3=60 Kg/ha.

Sub-plot treatments :

6 spacings : S_1=15 cm. × 10 cm., S_2=15 cm. × 15 cm., S_3=20 cm. × 10 cm., S_4=20 cm. × 15 cm., S_5= 25 cm. × 10 cm. and S_6=25 cm. × 15 cm.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 6 sub-plots/main-plot. (b) 19·5 m. × 38·5 m. (iii) 4. (iv) (a) 6 m. × 6 m. (b) Varies according to spacings. (v) One row alround. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Case worm, gall fly and stem borer attack—spraying. Endrin, Helminthosporium was noticed and controlled by spraying Blitox. (iii) Grain yield. (iv) (a) 1965—67. (b) Yes. (c) N.A. (v) Kayamkulam. (vi) and (vii) N.A.

5. RESULTS :

(i) 2126 Kg/ha. (ii) (a) 432·8 Kg/ha. (b) 277·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean
N_1	1962	2104	2198	2100	2024	2021	2066
N_2	1993	2083	2274	2236	2208	2253	2174
N_3	2049	2260	2014	2396	1878	2208	2134
Mean	2001	2149	2162	2244	2037	2161	2126

Crop :- Paddy (*Kharif*) .   **Ref :- K. 60(5), 61(31).**

Site :- Rice Res. Stn., Mannuthy.   **Type :- 'CM'.**

Object :—To find out the best age of seedlings at planting and the effect of heavy manuring in the nursery on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) 126 Q/ha. of C.M.+112 Kg/ha. of A/S for 60(5) ; 5604 Kg/ha. of C.M. for 61(31). (ii) Laterite. (iii) 3, 7 and 11.6.60/2.7.60 for 60(5) ; N.A. for 61(31). (iv) (a) 6 ploughings and levellings. (b) Transplanting. (c) N.A. (d) 15 cm.×25 cm. (e) N.A. (v) 126 Q/ha. of C.M.+56 Kg/ha. of A/S as basal dressing. 56 Kg/ha. of A/S as top dressing after planting for 60(5) ; 5604 Kg/ha. of C.M.+ 112 Kg/ha. of A/S+112 Kg/ha. of Super+56 Kg/ha. of Pot. Ash. (vi) PTB—32 (medium). (vii) Unirrigated. (viii) 2 tractor cultivations and 2 weedings. (ix) N.A. (x) 28.10.60 ; N.A.

2. TREATMENTS :

Main-plot treatments :

2 levels of manures : M_0=No manure and M_1=Heavy manuring of nursery with 10 C.L. of F.Y.M+45 Kg/ha. of A/S.

Sub-plot treatments :

3 ages of seedlings : S_1=20, S_2=25 and S_3=30 days.

3 DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6·1 m.× 1·5 m. (b) 5·8 m.×1·3 m. (v) 13 cm.×13 cm. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil for 60(5) ; case worm, gall fly and stem borer were noticed. Endrex sprayed for 61(31). (iii) Grain yield. (iv) (a) 1960—61. (b) No. (c) —. (v) and (vi) Nil. (viii) Main and sub-plot error variances are homogeneous and Treatments×years interaction is absent in both.

5. RESULTS :

(i) 1732 Kg/ha. (ii) (a) 199·1 Kg/ha. (based on 7 d.f. made up of Treatments×years interaction and pooled error). (b) 290·3 Kg/ha. (based on 28 d.f. made up of various components of Treatments×years interaction and pooled error). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	S_1	S_2	S_3	Mean
M_1	1773	1716	1580	1690
M_2	1918	1772	1634	1775
Mean	1846	1744	1607	1732

—————

Crop :- Paddy (*Rabi*).   **Ref :- K. 60(6), 61(32).**

Site :- Rice Res. Stn., Mannuthy.   **Type :- 'CM'.**

Object :—To find out the best age of seedlings for transplanting and also to know whether heavy manuuring to the nursery would affect the yield.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) 126 Q/ha. of C.M.+112 Kg/ha. of A/S for 60(6) ; 56 Q/ha. of C.M. for 61(32). (ii) Loamy and gravelly for 60(6) and laterite for 61(32). (iii) N.A. (iv) (a) 6 ploughings. (b) Transplanting. (c) N.A. (d) 15 cm.×25 cm. (e) N.A. (v) 126 Q/ha. of C.M.+56 Kg/ha. of A/S as basal dressing 56 Kg/ha of A/S as top dressing one month after planting for 60(6) ; 5604 Kg/ha. of C.M.+112 Kg/ha. of A/S+112 Kg/ha. of Super+56 Kg/ha. of Potash for 61(31). (vi) PTB—27 (medium) ; PTB—10 (Short). (vii) Irrigated. (viii) 2 intercultivations with Japanese cultivator. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 levels of manures : $M_0=0$ and $M_1=24\cdot7$ C.L. of F.Y.M. or 5604 Kg/ha. of G.L.$+$112 Kg/ha. of A/S.

Sub-plot treatments :

3 ages of seedlings : $S_1=20$, $S_2=25$ and $S_3=30$ days.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $6\cdot1$ m.$\times$ $1\cdot5$ m. (b) $5\cdot9$ m.$\times1\cdot3$ m. (v) 13 cm.$\times13$ cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Stem borer and Paddy borer attacks were noticed. (iii) Grain yield. (iv) (a) 1960—61. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Sub-plot variances are heterogeneous. Therefore results of individual years are presented under 5. Results.

5. RESULTS :

60(6)

(i) 2859 Kg/ha. (ii) (a) $152\cdot1$ Kg/ha. (b) $263\cdot9$ Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	S_1	S_2	S_3	Mean
M_0	2958	2677	3135	2923
M_1	2903	2634	2846	2794
Mean	2930	2655	2991	2859

61(32)

(i) 1461 Kg/ha. (ii) (a) $218\cdot1$ Kg/ha. (b) $122\cdot5$ Kg/ha. (iii) Main effect of S is significant. (iv) Av. yield of grain in Kg/ha.

	S_1	S_2	S_3	Mean
M_0	1521	1521	1282	1442
M_1	1504	1574	1362	1480
Mean	1512	1548	1322	1461

C.D. for S marginal means$=133\cdot4$ Kg/ha.

— — —

Crop :- Paddy (*Kharif*).   **Ref :- K. 64(1), 65(24).**

Site :- Rice Res. Stn., Mannuthy.   **Type :- 'CM'.**

Object :—To find out the best combination of spacing with different levels of N for Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) G.L. at 3000 Kg/ha. (ii) Lateritic. (iii) 20.6.64/17.7.64 ; 9.6.65/13.7.65. (iv) (a) 6 ploughings. (b) to (e) N.A. (v) 3000 Kg/ha. of G.L.$+$30 Kg/ha. of P_2O_5+30 Kg/ha. of K_2O. (vi)PTB—32 (medium). (vii) Irrigated. (viii) Hand weeding. (ix) 195 cm.; 145 cm. (x) 30.10.64 ; 8.10.65

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 18. (b) 31˙8 m.×28˙2 m. (iii) 4. (iv) (a) 10˙2 m.×4˙2 m. (b) 9 m.×3 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory, crop lodged on 20.8.64. (ii) Nil. (iii) Grain yield. (iv) (a) 1964—only. (b) and (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2198 Kg/ha. (ii) 156˙5 Kg/ha. (iii) Main effects of N, S and R are significant. (iv) Mean yield of grain in Kg/ha.

	S_1	S_2	S_3	R_1	R_2	Mean
N_1	2063	2133	2168	2077	2166	2121
N_2	2115	2337	2265	2129	2348	2239
N_3	2166	2254	2282	2044	2424	2234
Mean	2115	2241	2238	2083	2313	2198
R_1	1965	2061	2225			
R_2	2264	2422	2252			

C.D. for N or S marginal means=91˙3 Kg/ha.
C.D. for R marginal means =74˙5 Kg/ha.

———

Crop :- Paddy (*Rabi*).   **Ref :- K. 60(45).**

Site :- Agri. College and Res. Instt., Vellayani.   **Type :- 'CM'.**

Object :—To find out a modified and economical Japanese method of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) Cow dung and G.L. dose N.A. (ii) N.A. (iii) 15.10.60. (iv) (a) 6 ploughings, 2 diggings, levelling and 2 puddlings. (b) Transplanting. (c) 28 Kg/ha. (d) 48 cm.×25 cm. (e) 3. (v) Compost at 251 Q/ha. (vi) Co−1 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 52˙8 cm. (x) 31.1.61.

2. TREATMENTS :

5 methods of cultivation : M_1=Japanese method (56 Q/ha. of G.L.+125˙5 Q/ha. of Compost+225 Kg/ha. of each of A/S and Super), M_2=Local metood (125 Q/ha. of Compost and 98˙8 Q/ha. of ash), M_3=Modified Japanese method I (22˙4 Q/ha. of G.L + 125˙5 Q/ha. of Compost, 56˙0 Kg/ha. of A/S+56˙0 Kg/ha. of Super) ; M_4= Modified Japanese method II (33˙6 Q/ha. of green leaf+125˙5 Q/ ha. of Compost+112˙1 Kg/ha. of A/S+112˙1 Kg/ha. of Super) and M_5=Modified Japanese method III (44˙8 Q/ha. of green leaf+125˙5 Q/ha. of Compost+168˙1 Kg/ha. of A/S+168˙1 Kg/ha. of Super). The Compost and green leaf applied before ploughing and the fertilzers were applied in 2 doses, ½ at planting and ½ one month after planting as top dressing.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 38˙4 m.×13˙7 m. (iii) 6. (iv) (a) 6˙1 m.×13˙7 m. (b) 5˙6 m.×13˙3 m. (v) 23 cm.×23 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of rice case worm was noticed. (iii) Dusted Gamaxin on 19.11.60. (iv) (a) 1958—60 (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 1252 Kg/ha. (ii) 209·7 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	1426	910	1315	1375	1234

C.D.=252·6 Kg/ha.

———

Crop :- Paddy (*Kharif*).　　　　　　　　**Ref :- K. 61 to 63 (M.A.E.).**

Site :- M.A.E. Centre, Karamanai.　　　　**Type :- 'CM'.**

Object :— Type VII : To study the efffect of manures and cultural practices on Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) Nil. (ii) Laterite. (iii) As per treatments. (iv) (a) 4 ploughings, 1 digging and 1 trampling. (b) Transplanting. (c) 36 Kg/ha. (d) and (e) As per treatments. (v) 5504 Kg/ha. of F.Y.M. (vi) PTB—9. (vii) Irrigated. (viii) 2 weedings. (ix) 196 cm., 119 cm.; N.A. (x) 29.9.61, 16, 28.10.61 ; 29.8.62, 10, 27.9.62 ; 27.8.63 ; 12.9.63 and 27.10.63.

2. TREATMENTS :

Main-plot treatments :

　　All combinations of (1), (2) and (3)
　　　　(1) 3 dates of planting : D_1=15 days before normal, D_2=Normal and D_3=15 days after normal.
　　　　(2) 3 spacings : S_1=15 cm.×15 cm., S_2=20 cm.×20 cm. and S_3=25 cm.×25 cm.
　　　　(3) 3 rates of planting : R_1=2, R_2=4 and R_3=6 seedlings/ha.

Sub-plot treatments :

　　All combinations of (1) and (2)
　　　　(1) 2 levels of N : N_0=0 and N_1=44·8 Kg/ha.
　　　　(2) 2 levels of P_2O_5 : P_0=0 and P_1=44·8 Kg/ha.
　　Dates for 61 are D_1=18.5.61/16.6.61 ; D_2=3.6.61/1.7.61 and D_3=18.6.61/17.7.61.
　　Dates for 62 are D_1=15.5.62 N.A., D_2=31.5.62/N.A. ; D_3=15.6.62/N.A.
　　Dates for 63 are D_1=15.4.63/15.5.63 ; D_2=30.4.63/30.5.63 and D_3=15.5.63/15.6.63.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 blocks/replication ; 9 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 9·1 m.×4·5 m. for 61 ; 9·1 m.×4·6 m. for 62 and 63. (b) 9·0 m.×4·5 m. for 61 ; S_1=8·8 m.×4·3 m., S_2=8·7 m.×4·2 m. and S_3=8·6 m.×4·1 m. for 62 ; S_1=8·5 m.×4·0 m., S_2=8·3 m.×3·8 m. and S_3=8·1 m. ×3·6 for 63. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961—63. (b) No. (c) Nil. (v) N.A. (vi) Heavy rainfall in 1961. (vii) Sub-plot error variances are heterogeneous. Hence results of individual years are presented below.

5. RESULTS :

1961

(i) 1622 Kg/ha. (ii) (a) 225·4 Kg/ha. (b) 143·5 Kg/ha. (iii) Main effects of N and P and interaction N×P are highly significant. Main efffect of D and interaction D×N are significant. (iv) Av. yield of grain in Kg/ha.

	R₁	R₂	R₃	N₀	N₁	P₀	P₁	S₁ S₂ S₃	Mean
D₁	1494	1743	1591	1245	1977	1448	1774	1632 1503 1698	1611
D₂	1771	1632	1808	1356	2118	1531	1943	1660 1734 1817	1737
D₃	1411	1614	1531	1240	1798	1393	1645	1605 1522 1430	1519
Mean	1559	1663	1645	1280	1964	1457	1787	1632 1586 1648	1622
S₁	1577	1660	1659	1300	1964	1503	1761		
S₂	1448	1697	1614	1273	1899	1402	1770		
S₃	1652	1632	1660	1267	2029	1466	1830		
P₀	1356	1513	1503	1079	1835				
P₁	1762	1813	1786	1481	2093				
N₀	1245	1310	1286						
N₁	1873	2016	2004						

C.D. for D marginal means $= 129 \cdot 9$ Kg/ha.
C.D. for N or P marginal means $= 58 \cdot 0$ Kg/ha.
C.D. for N means at the same level of $D = 100 \cdot 4$ Kg/ha.
C.D. for D means at the same level of $N = 147 \cdot 9$ Kg/ha.
C.D. for body of $N \times P$ table $= 82 \cdot 0$ Kg/ha.

1962

(i) 2465 Kg/ha. (ii) (a) $513 \cdot 7$ Kg/ha. (b) $273 \cdot 7$ Kg/ha. (iii) Main effects of N, P and interaction $N \times P$ are highly significant. Main effects of D, S and interaction $S \times P$ are significant. (iv) Av. yield of grain in Kg/ha.

	R₁	R₂	R₃	N₀	N₁	P₀	P₁	S₁ S₂ S₃	Mean
D₁	2681	2603	2838	2149	3265	2569	2845	2285 2974 2863	2707
D₂	2296	2415	2684	2005	2926	2287	2643	2122 2720 2553	2465
D₃	2042	2310	2317	1830	2616	2118	2329	2115 2478 2077	2223
Mean	2340	2443	2613	1995	2936	2325	2606	2174 2724 2498	2465
S₁	1972	2014	2535	1722	2626	2123	2225		
S₂	2647	2764	2761	2284	3164	2498	2950		
S₃	2400	2551	2543	1979	3017	2354	2642		
P₀	2244	2283	2448	1781	2870				
P₁	2486	2603	2778	2209	3002				
N₀	1814	2018	2153						
N₁	2866	2868	3073						

C.D. for D or S marginal means $= 295 \cdot 8$ Kg/ha.
C.D. for N or P marginal means $= 110 \cdot 7$ Kg/ha.
C.D. for P means at the same level of $S = 191 \cdot 7$ Kg/ha.
C.D. for S means at the same level of $P = 324 \cdot 8$ Kg/ha.
C.D. for body of $N \times P$ table $= 156 \cdot 5$ Kg/ha.

1963

(i) 2162 Kg/ha. (ii) (a) 864·9 Kg/ha. (b) 607·0 Kg/ha. (iii) Main effect of N alone is significant, (iv) Av. yield of grain in Kg/ha.

	R_1	R_2	R_3	N_0	N_1	P_0	P_1	S_1	S_2	S_3	Mean
D_1	2076	1605	2367	1587	2445	1974	2057	2076	1993	1979	2016
D_2	2242	1799	2187	1817	2334	1984	2168	2200	1951	2076	2076
D_3	2519	2200	2463	2021	2768	2427	2362	2906	2740	1536	2394
Mean	2279	1868	2339	1808	2516	2128	2196	2394	2228	1864	2162
S_1	2588	2367	2228	2076	2713	2297	2491				
S_2	2007	1896	2782	1965	2491	2196	2260				
S_3	2242	1342	2007	1384	2343	1891	1836				
P_0	2214	1762	2408	1741	2516						
P_1	2343	1974	2270	1876	2516						
N_0	1771	1568	2085								
N_2	2786	2168	2593								

C.D. for N marginal means = 245·4 Kg/ha.

Crop :- Paddy (*Kharif*).   **Ref :- 64(29), 65(3).**

Site :- Agronomic Res. Stn., Chalakudi.   **Type :- 'P'.**

Object :—To find out the optimum water requirement of Paddy crop at different stages of growth.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Pulse crop. (c) Nil. (ii) Sandy loam. (iii) 21.5.64/16.6.64 ; 15.5.65/17.6.65. (iv) (a) Ploughing. (b) Transplanting. (c) N.A. (d) 20 cm.×20 cm. (e) N.A. (v) G.L. at 25 Q/ha., 60 Kg/ha. of N+30 Kg/ha. of P_2O_5+30 Kg/ha. of K_2O. (vi) PTB—32. (vii) Irrigated. (viii) Weeding and hoeing. (ix) N.A. (x) 1.10.64, 27.9.65.

2. TREATMENTS :

All combinations of (1), (2) and (3)
   (1) 3 levels of irrigation from transplanting to tillering : $A_0=0$, $A_1=2·5$ and $A_2=5·0$ cm. of standing water.
   (2) 3 levels of irrigation from tillering to flowering : $B_0=0$, $B_1=2·5$ and $B_2=5·0$ cm. of standing water.
   (3) 3 levels of irrigation from flowering to maturity : $C_0=0$, $C_1=2·5$ and $C_2=5·0$ cm. of standing water.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 75 sq. m. (b) 65 sq. m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964—contd. (b) Yes. (c) Nil. (v) and (vi) N.A. (vii) Expt. continued beyond 65, hence the individual results are given below.

5. RESULTS :

64(29)

(i) 1398 Kg/ha. (ii) 143·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	A_0	A_1	A_2		C_0	C_1	C_2	Mean
B_0	1460	1427	1363		1444	1376	1430	1417
B_1	1417	1403	1349		1341	1417	1411	1390
B_2	1333	1422	1406		1352	1430	1379	1387
Mean	1403	1418	1373		1379	1408	1407	1398
C_0	1379	1398	1360					
C_1	1435	1422	1366					
C_2	1395	1433	1393					

65(3)

(i) 1720 Kg/ha. (ii) 236·0 Kg/ha. (iii) Main effect of B is significant. (iv) Av. yield of grain in Kg/ha.

	A_0	A_1	A_2		B_0	B_1	B_2	Mean
B_0	1704	1702	1772		1770	1768	1640	1726
B_1	1697	1524	1613		1575	1522	1737	1611
B_2	1739	1830	1897		1823	1772	1870	1822
Mean	1713	1685	1761		1723	1688	1749	1720
C_0	1721	1797	1651					
C_1	1719	1640	1704					
C_2	1699	1620	1928					

C.D. for B marginal means = 161·8 Kg/ha.

Crop :- Paddy (*Rabi*).   **Ref :- K. 64(30), 65(2).**

Site :- Agronomic Res. Stn., Chalakudi.   **Type :- 'I'.**

Object :—To find out the optimum water requirement of Paddy crop at different stages of growth.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) N.P.K. at 67·2, 33·6, 33·6 Kg/ha. respectively. (ii) Sandy loam. (iii) 13·9·64/7·10·64 ; 4·9·65/13·10·65. (iv) (a) Ploughing. (b) Transplanting. (c) N.A. (d) 20 cm.× 20 cm. (e) N.A. (v) G.L. at 25 Q/ha. and N.P.K. at 60, 30, 30 Kg/ha. respectively. (vi) P·T.B.—4. (vii) Irrigated. (viii) Weeding and hoeing. (ix) N.A. (x) 12.2.65 ; 4.2.66.

2. TREATMENTS :

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

(1) 3 levels of irrigation from transplanting to tillering : A_0=0, A_1=2·5 and A_2=5·0 cm. of standing water.

(2) 3 levels of irrigation from tillering to flowering : B_0=0, B_1=2·5 and B_2=5·0 cm. of standing water.

(3) 3 levels of irrigation from flowering to maturity : C_0=0, C_1=2·5 and C_2=5·0 cm. of standing water.

3. DESIGN :

(i) 3^3 Confd. fact. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) 5·8 m.×27 m. (iii) 2. (iv) (a) and (b) 8·9 m.× 8·5 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Endrin sprayed. (iii) Yield of grain. (iv) (a) 1964—contd. (b) N.A. (c) Nil. (v) and (vi) N.A. (vii) The expt. is continued beyond 1965, hence the individual results are given below.

5. RESULTS :

64(30)

(i) 2925 Kg/ha. (ii) 192·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	A_0	A_1	A_2	C_0	C_1	C_2	Mean
B_0	2841	2944	2954	2970	2828	2941	2913
B_1	3011	2734	3086	2882	2973	2976	2944
B_2	2890	2884	2981	2930	2858	2968	2918
Mean	2914	2854	3007	2927	2886	2961	2925
C_0	2946	2804	3032				
C_1	2868	2798	2992				
C_2	2927	2960	2997				

65(2)

(i) 2345 Kg/ha. (ii) 169·7 Kg/ha. (iii) Main effect of A is significant. (iv) Av. yield of grain in Kg/ha.

	A_0	A_1	A_2	C_0	C_1	C_2	Mean
B_0	2173	2366	2315	2295	2300	2260	2285
B_1	2324	2470	2391	2329	2395	2461	2395
B_2	2267	2337	2461	2353	2351	2362	2355
Mean	2255	2391	2389	2326	2349	2361	2345
C_0	2222	2349	2406				
C_1	2187	2457	2402				
C_2	2355	2368	2360				

C.D. for A marginal means = 116·30 Kg/ha.

———

Crop :- **Paddy** *(Rabi)*.   Ref :- **K. 63(110), 64(80), 65(8).**

Site :- **Agronomic Res. Stn., Coyalmannam.**   Type :- **'I'.**

Object :—To find out the optimum quantity of water required for Paddy during different seasons and stages of growth.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. for 63(110) ; 6000 Kg/ha. of C.M.+33·6 Kg/ha. of P_2O_5+33·6 Kg/ha. of K_2O+44·8 Kg/ha. of N for others. (ii) Sandy loam. (iii) N.A./16.10.63 ; 28.8.64/14.10.64 ; 21.9.65/21.10.65 (iv) (a) 6 ploughings. (b) Transplanting. (c) N.A. (d) 25·4 cm.×25·4 cm. (e) 3. (v) 4000 Kg/ha. of C.M., 30 Kg/ha. each of P_2O_5 and K_2O. (vi) CO—25 (improved). (vii) Irrigated. (viii) N.A. (ix) 26·6 cm. for 63 (110) ; N.A. for others. (x) 8.2.64. ; 6.3.65 ; 17.2.66.

2. TREATMENTS :

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

(1) 3 levels of irrigation from planting to tillering : $A_0 = 0$, $A_1 = 2\cdot 5$, $A_1 = 5\cdot 0$ cm. standing water.

(2) 3 levels of irrigation from tillering to flowering : $B_0 = 0$, $B_1 = 2\cdot 5$, $B_2 = 5\cdot 0$ cm. standing water.

(3) 3 levels of irrigation from flowering to maturity : $C_0 = 0$, $C_1 = 2\cdot 5$, $C_2 = 5\cdot 0$ cm. standing water.

3. DESIGNS :

(i) 3^3 Confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) and (b) 75 sq.m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Control measures taken. (iii) Grain yield. (iv) (a) 1963—Contd. (b) and (c) N.A. (v) and (vi) N.A. (vii) The experiment is continued beyond 65, hence the individual results are given below.

5. RESULTS :

63(110)

(i) 3668 Kg/ha. (ii) 305·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of paddy in Kg/ha.

	A_0	A_1	A_2	C_0	C_1	C_2	Mean
B_0	3618	3613	3598	3513	3669	3647	3610
B_1	3571	3709	3682	3802	3669	3491	3654
B_2	3580	3793	3851	3767	3580	3879	3741
Mean	3590	3705	3710	3694	3639	3672	3668
C_0	3567	3664	3851				
C_1	3496	3791	3631				
C_2	3707	3660	3649				

64(80)

(i) 4260 Kg/ha. (ii) 751·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of paddy in Kg/ha.

	A_0	A_1	A_2	C_0	C_1	C_2	Mean
B_0	4064	4307	4456	4118	4542	4167	4276
B_1	4204	4576	4322	4418	4484	4500	4367
B_2	4080	4102	4229	4278	3791	4342	4137
Mean	4116	4328	4336	4271	4273	4236	4260
C_0	4187	4127	4500				
C_1	4058	4544	4216				
C_2	4104	4313	4291				

65(8)

(i) 2551 Kg/ha. (ii) 646·9 Kg/ha. (iii) Main effect of A is significant. (iv) Av. yield of paddy in Kg/ha.

	A_0	A_1	A_2	C_0	C_1	C_2	Mean
B_0	2180	2531	2773	2389	2396	2700	2495
B_1	2233	2793	2782	2580	2820	2409	2603
B_2	2100	2700	2862	2493	2429	2740	2554
Mean	2171	2675	2806	2487	2548	2616	2551
C_0	1911	2704	2847				
C_1	2271	2600	2773				
C_2	2331	2720	2798				

C.D. for A marginal means = 443.3 Kg/ha.

———

Crop :- Paddy (*Kharif*).　　　　　　**Ref :- K. 63(109), 64(79), 65(7).**

Site :- Agronomic Res. Stn., Coyalmannam. Type :- 'P'.

Ocject :—To find out the optimum quantity of water required for Paddy during different seasons and stages of growth.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) N.A./12.6.63 ; 5.5.64/29.6. 64 ; 5.5.64/11.6.65 (iv) (a) 8 ploughings (b) Transplanting. (c) N.A (d) 25·4 cm.×25·4 cm. (e) 3. (v) 4000 Kg/ha. of C.M., 20 Kg/ha. of each of P_2O_5 and K_2O were applied. (vi) P.T.B. –26 (improved). (vii) Irrigate . (viii) N.A. (ix) 167·8 cm. for 63(109) ; N.A. for others. (x) 30.9.63; 8.10.64; 30.9.65.

2. TREATMENTS :

Same as in Expt. No. 63(110), 64(80), 65(24) on page 183.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) and (b) 75 sq.m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Control measures taken. (iii) Paddy yield. (iv) to (vi) N.A. (vii) The experiment is continued beyond 1965. Hence the individual results are given below.

5. RESULTS

63(109)

(i) 3172 Kg/ha. (ii) 350·7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of Paddy in Kg/ha.

	A_0	A_1	A_2	C_0	C_1	C_2	Mean
B_0	3049	3187	2969	3104	3091	3009	3068
B_1	3060	3382	3364	3387	3107	3313	3269
B_2	3362	3156	3018	3191	3282	3062	3179
Mean	3157	3241	3117	3227	3160	312	3172
C_0	3393	3364	2924				
C_1	3156	3193	3131				
C_2	2922	3167	3296				

64(79)

(i) 2031 Kg/ha.   (ii) 76·2 Kg/ha.   (iii) Main effect of A is significant.   (iv) Av. yield of Paddy in Kg/ha.

	A_0	A_1	A_2	C_0	C_1	C_2	Mean
B_0	2011	2111	2011	2033	2022	2078	2044
B_1	1978	2067	2056	2044	2011	2044	2033
B_2	2022	2056	1967	2000	2000	2044	2015
Mean	2004	2078	2011	2026	2011	2056	2031
C_0	2022	2044	2011				
C_1	1978	2100	1956				
C_2	2011	2089	2067				

C.D. for A marginal means=52·7 Kg/ha.

65(23)

(i) 3434 Kg/ha.   (ii) 283·4 Kg/ha.   (iii) The main effect of C and interaction A×B are significant.   (iv) **Av.** yield of Paddy in Kg/ha.

	A_0	A_1	A_2	C_0	C_1	C_2	Mean
B_0	3413	3396	3542	3307	3627	3449	3450
B_1	3402	3373	3167	3187	3520	3236	3314
B_2	3500	3629	3487	3476	3562	3578	3539
Mean	3439	3460	3399	3323	3569	3410	3434
C_0	3276	3244	3449				
C_1	3500	3709	3500				
C_2	3540	3444	3247				

C.D. for C marginal means   =195·0 Kg/ha.

C.D. for the means in the body of A×B   table =337·7 Kg/ha.

———

Crop :- Paddy (*Kharif*).

Site :- Agronomic Res. Stn., Chalakudi.

Ref :- K. 64(27), 65(4).

Type 'IM'.

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

1. **BASAL CONDITIONS :**

(i) (a)Paddy—Paddy—Groundnut. (b) Groundnut. (c) Nil. (ii) Sandy loam. (iii) 22.5.64/18.6.64 ; 15.5.65/ 13.6.65. (iv) (a) Ploughing. (b) Transplanting. (c) N.A. (d) 20 cm.×20 cm. (e) N.A. (v) N.A. (vi) P.T.B.—32. (vii) Irrigated. (viii) Hand weeding, Japanese hoe and interculturing. (ix) N.A. (x) 2.10.64; 25.9.65.

2. **TREATMENTS**

Main-plot treatments :

4 levels of irrigation : $I_0=0$, $I_1=2$, $I_2=4$ and $I_3=6$ cm. of standing water.

Sub-plot treatments :

3 level of N : $N_1=100$, $N_2=150$ and $N_3=200$ Kg ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main plots/replication ; 3 sub-plots/main plot. (b) N.A. (iii) 4. (iv) (a) and (b) 7·5 m. ×7·5 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of dry paddy. (iv) (a) 1964—Contd. (b) Yes. (c) Nil. (v) Coyalmannam. (vi) and (vii) N.A.

5. RESULTS :

64(27)

(i) 1527 Kg/ha. (ii) (a) 91·7 Kg/ha. (b) 104·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	I_0	I_1	I_2	I_3	Mean
N_1	1489	1495	1539	1520	1511
N_2	1590	1527	1438	1501	1514
N_3	1533	1552	1578	1559	1556
Mean	1537	1525	1518	1527	1527

65(34)

(i) 1963 Kg/ha. (ii) (a) 257·0 Kg/ha. (b) 368·8 Kg/ha, (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	I_0	I_1	I_2	I_3	Mean
N_1	1886	1715	1831	1881	1828
N_2	2289	1771	1841	1856	1939
N_3	2153	1957	2113	2258	2120
Mean	2109	1814	1928	1999	1963

Crop :- Paddy (*Rabi*).   **Ref :- K. 64(28), 65(1).**

Site :- Agronomic Res. Stn., Chalakudi.   **Type :- 'IM'.**

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

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy—Groundnut. (b) Groundnut. (c) Nil. (ii) Sandy loam. (iii) 14.9.64/10.10.64 ; 4.9.65/12.10.65. (iv) (a) Ploughing. (b) Transplanting. (c) N. A. (d) 20 cm.×20 cm. (e) N.A. (v) N.A. (vi) P.T.B.—4 (medium). (vii) Irrigated. (viii) Hand weeding. (ix) N.A. ; 51 cm. (x) 10.2.65 ; 3.2.66.

2. TREATMENTS and 3. DESIGNS :

Same as in expt. No. 64(27), 65(4) on page 186.

' GENERAL :

(i) Satisfactory. (ii) Attack of stem borer was controlled by spraying Endrin. (iii) Grain yield. (iv) (a) 1964—Contd. (b) Yes. (c) N.A. (v) Agronomic Res. Stn., Coyalmannam. (vi) and (vii) Nil.

5. RESULTS :

6 (28)

(i) 2837 Kg/ha. (ii) (a) 351·7 Kg/ha. (b) 305·3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	I_0	I_1	I_2	I_3	Mean
N_1	2665	2837	2888	2704	2774
N_2	2723	2920	2824	3022	2872
N_3	2614	3072	2735	3034	2864
Mean	2667	2943	2816	2920	2837

65(29)

(i) 2317 Kg/ha. (ii) (a) 69·0 Kg/ha. (b) 83·6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	I_0	I_1	I_2	I_3	Mean
N_1	2253	1997	2118	2243	2153
N_2	2309	2485	2123	2480	2349
N_3	2510	2525	2460	2304	2450
Mean	2357	2336	2233	2342	2317

Crop :- Paddy (*Kharif*).

Site :- Agronomic Res. stn., Coyalmannam.

Ref :- K. 64(81), 65(5).

Type :- ['IM'.

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lbs of C.M. ; 30 : 30 : 30 : N., P., K. (ii) Sandy loam. (iii) 5.5.64/ 28.6.64 ; 27.5.65/24.6.65. (iv) (a) to (e) N.A. (v) 5000 lbs. of C. M., 30 lbs P and 30 lbs K (vi)P.T.B.—26 (medium). (vii) Irrigated. (viii) Weeding and hoeing. (ix) N.A. (x) 2.10.64; 14.10.65.

2. TREATMENTS :

Same as in expt. No. 63(111), 64(82), 65(6) on page 189.

2. DESIGN :

(i) Split-plot. (ii) (a) and (b) 4 main plots/replication ; 3 sub-plots/main plot. (iii) 4. (iv) (a) and (b) 50 sq. m. (v) 2. (vi) Yes.

4. GENERAL :

(i) Lodged. (ii) Nil. (iii) Grain yield. (iv) (a) 1964-Contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

64(81)

(i) 2090 Kg/ha. (ii) (a) 164·2 Kg/ha. (b) 227·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain Kg/ha.

	I_0	I_1	I_2	I_3	Mean
N_1	2o50	1940	1975	1990	1989
N_2	2100	2080	2110	2170	2115
N_3	2210	2250	2150	2055	2166
Mean	2120	2090	2078	2072	2090

65(5)

(i) 2566 Kg/ha. (ii) (a) 392·1 Kg/ha. (b) 358·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	I_0	I_1	I_2	I_3	Mean
N_1	2505	2665	2395	2535	2525
N_2	2480	2750	2210	2665	2526
N_3	2765	2635	2505	2685	2647
Mean	2583	2683	2370	2628	2566

Crop :- Paddy (*Rabi*).   **Ref :- K. 63(111), 64(82), 65(6).**

Site :- Agronomic Res. Stn., Coyalmannam.   **Type :- 'IM'.**

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

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) N.A. for 63(111); 28.8.64/21.10.64 ; 21.9.65/23.10.65. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) 25 cm.×25 cm. (e) 3. (v) 5000 Kg/ha. of G.M.+30 Kg/ha. each of P_2O_5 and K_2O applied as basal dose. (vi) Co-25 (improved). (vii) Irrigated. (viii) N.A. (ix) 27 cm. for 63(111) ; N.A. for 64(82) ; 19 cm. for 65(36). (x) N.A. for 63 ; 8.2.65 ; 28.2.66.

2. TREATMENTS :

Main-plor treatments :
    4 levels of irrigation : I_0=0, I_1=2 cm., I_2=4 cm, and I_3=6 cm. of standing water.

Sub-plot treatments :
    3 levels of N : N_1=40, N_2=60 and N_3=80 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 50 sq. m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Control measures taken. (iii) Grain yield. (iv) (a) and (b) N.A. (c) Nil. (v) and (vi) Nil. (vii) As the expt. is contd. beyond 1965, the results of individual years are given under 5. Results.

5. RESULTS :
63(111)

(i) 3151 Kg/ha. (ii) (a) 267·3 Kg/ha. (b) 337·1 Kg/ha. (iii) Main effect of N alone is significant. (iv) yield of grain in Kg/ha.

	I_0	I_1	I_2	I_3	Mean
N_1	3020	2905	2975	3090	2998
N_2	3150	3035	3000	3285	3117
N_3	3215	3385	3295	3460	3339
Mean	3128	3108	3090	3278	3151

C.D. for N marginal means=246·0 Kg/ha.

64(82)

(i) 3892 Kg/ha. (ii) (a) 458·9 Kg/ha. (b) 364·8 Kg/ha. (iii) Main effect of I alone is significant. (iv) Av. yield of grain in Kg/ha.

	I_0	I_1	I_2	I_3	Mean
N_1	3425	4065	4035	4130	3914
N_2	3650	3895	4030	4405	3995
N_3	3380	3895	3785	4005	3766
Mean	3485	3952	3950	4180	3892

C.D. for I marginal means=423·8 Kg/ha.

65(6)

(i) 2043 Kg/ha. (ii) (a) 332·9 Kg/ha. (b) 318·0 Kg/ha. (ii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	I_0	1_1	I_2	I_3	Mean
N_1	1750	2205	2150	2145	2063
N_2	1755	1945	1970	1970	1910
N_3	1930	2075	2295	2330	2158
Mean	1812	2075	2138	2148	2043

Crop :- Paddy (*Kharif*).   **Ref :- K. 65(46).**

Site :- Agronomic Res. Stn., Coyalmannam.   **Type :- 'ICM'.**

Object :—Fixation of yard stick to determine the increase in production of Paddy due to improved agricultural practice.

1. **BASAL CONDITIONS :**

(i) (a) Paddy—Paddy. (b) Paddy. (c) N, P and K each at 30 Kg/ha. as A/S, Super and Mur. Pot. respectively+6000 Kg/ha. of F.Y.M. (ii) Sandy loam mixed with gravel. (iii) 5.5.65/15.6.65. (iv) (a) to (e) N.A. (v) N.A. (vi) P.T.B.—26 (medium). (vii) Irrigated. (viii) N.A. (ix) 85·0 cm. (x) 11 and 21.10.65.

2. TREATMENTS :

Main-plot treatments :

2 levels of irrigation : $I_0 = 0$ cm. (field capacity) at all the stages of growth, $I_1 = 2.5$ cm. in first stage, 5 cm. in second stage and zero cm. in third stage of growth of paddy.

Sub-plot treatments :

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

(1) 2 levels of fertilizers : $F_1 =$ local practices (6000 Kg/ha. of FYM), $F_2 = F_1 + 34$ Kg/ha. of each of N, P and K.

(2) 2 types of seeds : $S_1 =$ Local seed and $S_2 =$ Improved seed.

(3) 2 types of cultural practices : $C_1 =$ Local practices (Bulk planting and hand weeding), $C_2 =$ Improved cultural practices (seed dressing, line planting, 3 seedlings/hole and chemical means of plant protection).

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main plots/replication and 8 sub-plots/main plot. (b) N.A. (iii) 4. (iv) (a) and (b) 1/250th ha. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Lodged on 21.10.65. (ii) Nil. (iii) Tiller counts, height measurements and yield of grain. (iv) (a) 1965—Contd. (b) Yes. (c) Nil. (v) Agronomic Res. Stn., Chalakudi, Pariyaram. (vi) and (vii) N.A.

5. RESULTS :

(i) 2449 Kg/ha. (ii) (a) 293.6 Kg/ha. (b) 398.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

	F_1	F_2	C_1	C_2	S_1	S_2	Mean
I_0	2364	2308	2369	2303	2423	2248	2336
I_1	2659	2466	2680	2445	2622	2503	2563
Mean	2512	2387	2525	2374	2523	2376	2450
S_1	2555	2491	2588	2458			
S_2	2469	2283	2461	2291			
C_1	2550	2498					
C_2	2473	2275					

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

Site :- Rice Res. Stn., Kayamkulam. **Type :- 'D'.**

Object :—To assess the efficiency of different insecticides in controlling the mole cricket.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sesamum. (c) N.A. (ii) Sandy loam. (iii) 1.5.65. (iv) (a) to (e) N.A. (v) 13.6 Kg/ha. each of N, P and K. as A/S, Super Phosphate and Muriate of Potash. (vi) P.T.B.—23. (vii) Unirrigated. (viii) Two interculturing and two hand weedings. (ix) 108 cm. (x) 8.8.65.

2. TREATMENTS :

4 insecticidal treatments : $T_0 =$ Control, $T_1 =$ Aldrex at 28 Kg/ha., $T_2 =$ BHC at 28 Kg/ha. and $T_3 =$ Heptachlor at 28 Kg/ha.

Chemicals are applied before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 2 m. $\times$ 2 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1965—Contd. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 2212·5 Kg/ha. (ii) 471·8 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
Av. yield	1800	2400	2350	2300

— — —

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

Site :- Rice Res. Stn., Kayamkalam.   **Type :- 'D'.**

Object:—To try the foliar application of Urea alone and in combination with Endrin and Boardeaux Mixture.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 20·4 Kg/ha. of N, 136 Kg/ha. each of P_2O_5 and K_2O. (ii) Sandy loam. (iii) 29.4.65. (iv) (a) to (e) N.A. (v) 25 Kg/ha. of Mur. Pot. and 75 Kg/ha. of Super. (vi) P.T.B.—23. (vii) Unirrigated. (viii) Two interculturings and two hand weedings. (ix) 188 cm. (x) 11.8.65.

2. TREATMENTS :

13 foliar spray treatments : T_0=Control (no spraying), T_1=9 Kg/ha. of urea in 40 gallons of water sprayed one month after sowing, T_2=9Kg/ha. of Urea in 40 gallon of water sprayed two months after sowing, T_3=T_1 and T_2, T_4=10 ozs. of Endrin in 40 gallons of water one month after sowing, T_5=10 ozs. of Endrin in 40 gallons of water two months after sowing, T_6=T_4 and T_5, T_7=Brodeaux Mixture 1% sprayed one month after sowing, T_8=Brodeaux Mixture 1% sprayed two months after sowing, T_9=T_7 and T_8, T_{10}=Mixture of Urea, Endrin and Bordeaux Mixture sprayed one month after sowing, T_{11}=Mixture of Urea, Endrin and Bordeaux Mixture sprayed two months after sowing and T_{12}=T_{10} and T_{11}.

3. DESIGN :

(i) R.B D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) and (b) 7·0 m.× 3·5 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (ii) Yield of grain. (iii) 1965—contd. (b) and (c)N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 1970·9 Kg/ha. (ii) 296·5 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	1888	2112	2000	2061	1755	1949	1878

	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
	2020	1888	2034	2153	1908	1980

— — — —

Crop :- Paddy (*Rabi*).   **Ref :- K. 63(82), 64(62).**

Site :- Rice Res. Stn., Kayamkulam.   **Type :- 'D'.**

Object :—To study the effect of different insecticides to control stem borer pest of Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) N.A. for 63(82), 34 Kg/ha. each of N, P and K as A/S, Super and Mur. Pot. respectively for 64(62). (ii) Sandy loam. (iii) N.A./16.8.63 ; N.A./29.8.64. (v) (a) 4 to 6 ploughings and puddlings. (b) Planting 6 weeks old seedlings. (c) and (d) N.A. (e) 2. (v) C.M. at 6000 Kg/ha. +Super at 125 Kg/ha.+Mur Pot. at 60 Kg/ha as basal dressing and A/S at 100 Kg/ha. as top dressing for 63(82). 5003 Kg/ha. of C.M.+125 Kg/ha. of Super+60 Kg/ha. of Mur. Pot.+50 Kg/ha. of Urea for 64(62). (vi) U.R.-19. (vii) Unirrigated. (viii) 2 weedings and 2 interculturings. (ix) 99 cm., 98 cm. (x) 4.1.64; 14.1.65.

2. **TREATMENTS :**

5 Insecticides : I_0=No insecticides (control), I_1=Telodrin at 1·5 Kg/ha. in 560 litres of water, I_2=Basudin at 1·1 Kg/ha. in 467 litres of water, I_3=Folidol at 0·3 Kg/ha. in 467 litres of water, and I_4=Endrin at 0·6 Kg/ha in 467 litres of water.

3. **DESIGN:**

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 6·1 m·×3·7 m. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Blitox sprayed uniformly against disease in 64(62). (iii) Yield of grain. (iv) (a) 1962—1964. (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 :**

(i) 2989 Kg/ha. (ii) 320·1 Kg/ha. (based on 28 d. f. made up of Treatments×years interaction and pooled error). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	I_0	I_1	I_2	I_3	I_4
Av. Yield	2982	2977	2887	2952	3148

Crop :- Paddy (*Kharif*).

Site :- Rice Res. Stn., Kayamkulam.

Ref :- K. 62(49).

Type :- 'D'.

Object :—To find out the effect of treating the seeds in Sodium Bicarbonate solution.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) 4483 Kg/ha. of C.M. as basal dressing+56 Kg/ha. of A/S+56 Kg/ha. of Mur. Pot, as top dressing. (ii) Sandy loam. (iii) 18.4.62. (iv) (a) N.A. (b) Dibbling the seeds in furrows. (c) to (e) N.A. (v) 112 Kg/ha. of Super as basal dressing and 1618 Kg/ha. of C.M.+56 Kg/ha. of A/S+ 56 Kg/ha. of Mur Pot. as top dressing. (vi) P.T.B.—31 (Early). (vii) Unirrigated. (viii) 2 interculturings and 1 weedings. (ix) N.A. (x) 10.8.62.

2. **TREATMENTS :**

6 concentrations of solution : S_0=No soaking, S_1=Soaking in water, S_2=3%, S_3=5%, S_4=7% and S_5=9%.

3. **DESIGN :**

(i) R.B.D. (ii) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 6·7 m.×2·4 m. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1962—only. (b) and (c) N.A. (v) to (vii) N.A.

5. **RESULTS :**

(i) 718 Kg/ha. (ii) 112·0 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	S_4	S_5
Av. yield	715	741	759	707	733	650

Crop :- Paddy (*Rabi*).

Ref :- K. 61(16).

Site :- Rice Res. Stn., Kayamkulam.

Type :- 'D'.

Object :—To find out the effect of treating seeds in Sodium Bicarbonate solution on the yield of Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Paddy—Paddy—Sesamum. (b) Paddy. (c) Nil. (ii) Sandy loam. (ii) 2.3.61/5.9.61. (iv) (a) 4 ploughings and 2 puddlings. (b) to (e) N.A. (v) 22·4 Kg/ha. of C.M.+112 Kg/ha. of Super as basal dressing. 56 Kg/ha. of A/S+56 Kg/ha. of Mur. Pot. as top dressing. (vi) U.R.—19 (late). (vii) Unirrigated. (viii) 2 weedings. (ix) 90 cm. (x) 18.1.62.

2. **TREATMENTS :**

5 solutions of Sodium Bicarbonate for soaking seeds : S_0=Soaking in water, S_1=3%, S_2=5%, S_3=7% and S_4=9%.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 5. (b) 14·8 m.×3·8 m. (iii) 5. (iv) (a) and (b) 3·8 m.×2·4 m. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961—only. (b) and (c) N.A. (v) to (vii) N.A.

5. **RESULTS :**

(i) 3156 Kg/ha. (ii) 273·2 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	S_4
Av. yield	3236	3199	3018	3160	3165

Crop :- Paddy (*Kharif*).

Ref :- K. 61(15).

Site :- Rice Res. Stn., Kayamkulam.

Type :- 'D'.

Object : —To find out the effect of treating seeds in Sodium Bicarbonate solution on the yield of Paddy.

1. **BASAL CONDITIONS :**

(i) (a) Paddy—Paddy - Sesamum. (b) Sesamum. (c) Nil. (ii) Sandy loam. (iii) 24.4.61/N.A. (iv) (a) 4 ploughings and 2 puddlings. (b) to (e) N.A. (v) 6277 Kg/ha. of C.M.+112 Kg/ha. of Super as basal dressing and 56 Kg/ha. of A/S+56 Kg/ha. of Mur. Pot. as top dressing. (vi) P.T.B.—10 (early). (vii) Unirrigated. (viii) 2 intercultivations and 2 ploughings. (iz) N.A. (x) 10.8.61.

2. **TREATMENTS :**

5 concentrations of Sodium Bicarbonate solution for soaking the seeds : C_0=0, C_1=3%, C_2=5%, C_3=7% and C_4=9%.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 5. (b) 18·6 m.×3·1 m. (iii) 5. (iv) (a) and (b) 3·4 m.×3·1 m. (v) Nil. (iv) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of dry paddy. (iv) to (vii) N.A.

5. **RESULTS :**

(i) 1833 Kg/ha. (ii) 120·9 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	C_0	C_1	C_2	C_3	C_4
Av. yield	1842	1820	1709	1992	1798

C.D.=162·1 Kg/ha.

Crop :- Paddy (*Kharif*).   **Ref :- K. 63(76), 64(97), 65(17).**

Site :- Rice Res. Stn., Kayamkulam.   **Type :- 'D'.**

Object :—To find out the efficiency of different weedicides over the local practice of hand weeding.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. for 63(76) and 65(17) ; C.M. at 4942 Kg/ha.+A/S at 124 Kg/ha.+Super at 124 Kg/ha.+Mur. Pot. at 62 Kg/ha. for 64(97). (ii) Sandy loam. (iii) 8.4.53/N.A., 25.4.64/N.A. and 59.4.65/ N.A. (iv) (a) 3 to 4 ploughings, planking, harrowing and breaking of clods. (b) Dry sowning for 63(76) ; N.A. for others (c) 99 Kg/ha. (d) and (e) N.A. (v) Super at 120 Kg/ha. for 63(76) ; A/S at 62 Kg/ha. +Super at 124 Kg/ha.+Mur. Pot. at 62 Kg/ha. applied at the time of last ploughing for 64(97). 34 Kg/ha. each of N, P and K as A/S, Super and Mur. Pot. respectively for 65(17). (vi) P.T.B.—23. (vii) Unirrigated. (viii) 1 hoeing in 64(97). (ix) N.A; 121 cm. ; 109 cm. (x) 3.8.63 ; 4.8.64 ; 6.8.65.

2. TREATMENTS :

4 weed control treatments : W_0=Control (no weeding), W_1=M.C.P.A. at 2·82 litres in 1123 litres of water/ ha., W_2=2—4 D at 2·25 Kg/ha. in 1123 litres of water and W_3=Hand weeding.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 6·1 m.×3·1. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Helminthosporium attacked; Fytolan sprayed in 63(76); Endrin mixed with Fytolan sprayed in 64(97); Nil in 65(17). (iii) Weed counts and yield of grain. (iv) (a) 1962 -1965 (1962—N.A.) (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 :

(i) 1900 Kg/ha. (ii) 199·3 Kg/ha. (based on 42 d.f. made up of Treatments ×years interaction and pooled error). (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	W_0	W_1	W_2	W_3
Av. yield	1781	1961	1870	1988

C.D.=146·9 Kg/ha.

Crop :- Paddy (*Rabi*).   **Ref :- K. 63(79), 64(60).**

Site :- Rice Res. Stn., Kayamkulam.   **Type :- 'D'.**

Object :—To find out the efficacy of different weedicides.

1. BASAL CONDITIONS :

(i)(a) Paddy—Paddy—Sesamum. (b) Paddy. (c) N.A. for 63(79) ; 34 Kg/ha. of N as A/S+34 Kg/ha. of P_2O_5 as Super +34 Kg/ha. of K_2O as Mur. Pot. (ii) Sandy loam. (iii) Nil. (iv) (a) 4 ploughings for 63(79) ; 6 puddlings and 1 planking for 64(60). (b) Transplanted. (c) N.A. (d) 23 cm.×15 cm. (e) 2. (v) 5000 Kg/ha. of C.M.+125 Kg/ha. of Super+60 Kg/ha. of Mur. Pot. as basal dressing and A/S at 100 Kg/ha. as top dressing for 63(79) ; C.M. at 5000 Kg/ha.+Super at 125 Kg/ha.+Mur. Pot. at 60 Kg/ha.+50 Kg/ha. of Urea, ½ as basal and other half as top dressing for 64 (60). (vi) U.R.—19 (late) (vii) Unirrigated. (viii) N.A. for 63(79); 2 weedings for 64(60). (ix) 99 cm. ; 98 cm. (x) 4.1.64 ; 15.1.65.

2. TREATMENTS and 3. DESIGN :

Same as in Expt. No 63(76), 64(97) and 65(17) given as above.

4. GENERAL :

(i) Satisfactory. (ii) Negligible-prophylatic measures taken for 63(79). Nil for 64(60) ; (iii) Yield of grain. (iv) (a) 1963—1964. (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 :

(i) 3043 Kg/ha. (ii) 324·2 Kg/ha. (based on 27 d.f. made up of Treatment×years interaction and pooled error). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	W_0	W_1	W_2	W_3
Av. yield	2976	3008	3038	3151

Crop :- Paddy (*Kharif*).   **Ref :- K. 64(6).**

Site :- Rice Res. Stn., Mannuthy.   **Type :- 'D'.**

Object :—To find the effect of combined use of fertilizers, insecticides and fungicides on Paddy crops.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) 5604 Kg/ha. of C.M.+34 Kg/ha. each of N, P and K. (ii) Laterite. (iii) 22.6.64/6.7.74. (iv) (a) 6 ploughings, puddlings and levellings (b) Transplanting. (c) to (e) N.A. (v) 5604 Kg/ha of C.M.+22 Kg/ha of N+3 Kg/ha. of P_2O_5+3 Kg/ha. of K_2O. (vi) P.T.B.—32 (medium). (vii) Irrigated. (viii) Weeding. (ix) 300 cm. (x) 7.10.64.

2. TREATMENTS :

All combinations of (1) and (2) with a control :
   (1) 4 chemical sprayings : C_1=Urea at 9·0 Kg/ha., C_2=Endrin at 0·7 Kg/ha., C_3=Cupravit at 1·12 Kg/ha., C_4=C_1+C_2+C_3 in equal proportion.
   (2) 3 times of application : T_1=One month, T_2=Two months, T_3=T_1+T_2.
   plus one control : T_0=No spraying.
The above quantities of chemicals were mixed in 450 litres of water and sprayed.

3. DESIGN :

(i) Fact in R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) and (b) 10 m.×3 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Stem borer and stack borer. (iii) Yield of grain. (iv) (a) 1964—only. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 2049 Kg/ha. (ii) 286·3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Control=2125 Kg/ha.

	C_1	C_2	C_3	C_4	Mean
T_1	1967	1975	1867	2083	1973
T_2	1958	1933	2275	2058	2056
T_3	2158	2150	1892	2192	2098
Mean	2028	2019	2011	2111	2042

Crop :- Paddy (*Rabi*).   **Ref :- K. 64(7).**

Site :- Rice Res. Stn., Mannuthy.   **Type :- 'D'.**

Object : To find the effect of combined use of fertilizers, insecticides and fungicides on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) C.M. at 5604 Kg/ha.+34 Kg/ha. each of N, P and K. (ii) Laterite. (iii) 4.9.64/14.10.64 ; 22.5.65/6.7.64. (iv) (a) 6 ploughings, puddlings and levelling. (b) Transplanting. (c) to (e) N.A. (v) 5604 Kg/ha. of C.M.+22 Kg/ha. of N+3 Kg/ha. each of P_2O_5 and K_2O. (vi) P.T.B. −12 (medium) ; P.T.B.—32 (medium). (vii) Irrigated. (viii) Weeding. (ix) 300 cm. (x) 29.1.65 ; 7.10 64

2. TREATMENTS to 4. GENERAL :

Same as in expt. No. 64(6) on page 196.

5. RESULTS :

(i) 1331 Kg/ha. (ii) 140·5 Kg/ha. (iii) Treatment differencees are not significant. (iv) Av. yield of grain in Kg/ha.

Control mean=1283 Kg/ha.

	C_1	C_2	C_3	C_4	Mean
T_1	1250	1379	1529	1362	1380
T_2	1233	1229	1225	1346	1258
T_3	1321	1412	1300	1433	1366
Mean	1268	1340	1351	1380	1335

Crop :- Paddy (*Rabi*).   Ref :- K. 62(90), 63(123).

Site :- Rice Res. Stn., Plannuthy.   Type :- 'D'.

Object : To test the efficacy of Telodrin in controlling stemborer pest of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) C.M. at 2242 Kg/ha. for 62(90) ; 5604 Kg/ha. of C.M.+34 Kg/ha. of P_2O_5+34 Kg/ha. of K_2O for 63(123). (ii) Laterite. (iii) 11.10.62/N.A.; 8.9.63/7.10.63. (iv) (a) 6 ploughings. (b) N.A. (c) 34 to 45 Kg/ha. (d) 15 cm.×25 cm. (e) 2 to 3. (v) C.M at 2242 Kg/ha+Super at 112 Kg/ha. +Mur. Pot. at 56 Kg/ha. as basal dressing for 62(90). 5604 Kg/ha. of C.M.+34 Kg/ha. each of P_2O_5 and K_2O as basal dressing for 63 (123) (vi) P.T.B.—10 (early). (vii) Irrigated.(viii) 2 weedings. (ix) 63 cm ; 25 cm. (x) 14.1.63 : 20.12.63.

2. TREATMENTS :

5 Insecticides : I_0=No insecticide (control); I_1=Endrin 0·50% I_2=Endrin 0·10%, I_3=1.4 Kg/ha. of Telodrin and I_4=2·8 Kg/ha. of Telodrin.
Insecticides sprayed one week before transplanting.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 17·7 m.×7·6m. (iii) 4. (iv) (a) 3·1 m. ×7·6 m. (b) 2·8 m. × 7·5 m. (v) 12 cm. ×12 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of case worm and stemborer. Chemicals sprayed as per treatments. (iii) Tiller counts and grain yield. (iv) (a) 1962—1964(1964—N.A.) (b) Yes. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are hetrogeneous and Treatments× years interaction is present.

5. RESULTS :

(i) 1002 Kg/ha. (ii) 108·1 Kg/ha. (based on 4 d.f. made up of Treatments×years intreaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	I_0	I_1	I_2	I_3	I_4
Av. yield	929	1024	1018	968	1072

Crop :- Paddy (*Rabi*).

Site :- Rice Res. Stn., Mannuthy.

Ref :- K. 65(33).

Type :- 'D'.

Object :—To find out the efficiency of various insecticides in controlling stemborer pest of Paddy.

1. **BASAL CONDITIONS :**

(i) (a) N.A. (b) Paddy. (c) 50.0 Kg/ha. of G.L. and N, P and K at 40, 40 and 30 Kg/ha. respectively. (ii) Lateritic. (iii) 2.9.65/22.10.65. (iv) (a) Ploughing six times. (b) Transplanting. (c) to (e) N.A. (v) 5000 Kg/ha. of G.L. and N, P and K at 20, 30 and 30 Kg/ha. respectively. (vi) P.T.B.—12 (medium). (vii) Irrigated. (viii) Hand weeding once. (ix) 38 cm. (x) 25.1.66.

2. **TREATMENTS :**

5 insecticidal treatments : T_0=Control, T_1=Endrin 0.08%, T_2=Folidol 0.08%, T_3=Telodin 0.08% and T_4=Ekatox 0.08%.

Seedlings were dippled at planting time in the insectides and sprayed once in two months after the planting.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 5. (b) 5.6 m.×10.5 m. (iii) 5. (iv) (a) 2.1 m.×5.6 m. (b) 2.0 m.×5.4 m. (v) One row. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Case worm, Gall fly and stem borer were attacked and controlled by spraying Endrin. Helminthosporium was noticed and Blitox was sprayed. (iii) Grain yield. (iv) (a) 65—contd. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. **RESULTS :**

(i) 5204 Kg/ha. (ii) 632 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
Av. yield	5204	4872	5090	5195	4777

Crop :- Paddy (*Rabi*).

Site :- Rice Res. Stn., Mannuthy.

Ref :- K. 65(32).

Type :- 'D'.

Object :—To find out the effect of combined use of fertilizers and combatible in secticides and fungicides.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) C.M. 5000 Kg/ha. +30 Kg/ha. of N+30 Kg/ha. of P_2O_5+30 Kg/ha. of K_2O broadcasted. (ii) Lateritic. (iii) 19.8.65/30.10.65. (iv) (a) 6 ploughings, puddlings and levellings. (b) Transplanting. (c) to (e) N.A. (v) G.M. 5000 Kg/ha.+30 Kg/ha. of N+30 Kg/ha. of K_2O broadcast.[(vi)—(vii) Irrigated. (viii) Weeding. (ix) 203 cm. (x) 17.1.66.

2. **TREATMENTS :**

13 spraying treatments : T_0=No spraying, T_1=Urea at 3.6 Kg. in 40 gallons of water/Hect. Sprayed one month after planting, T_2=Urea at 3.6 Kg. in 40 gallons of water/Hect. sprayed two months after planting, T_3=Urea at 3.6 Kg. in 40 gallons of water/Hect. sprayed one and two months after planting, T_4=Endrin at .28 Kg. in 40 gallons of water/Hect. one month after planting, T_5=Endrin at .28 Kg/ha. in 40 gallons of water/Hect. two month after planting, T_6=Endrin at .28 Kg. in 40 gallons of water/Hect. one and two months after planting, T_7=Cupravit at .45 Kg. in 40 gallons of water/Hect. one month after planting, T_8=Cupravit at

·45 Kg. in 40 gallons of water/Hect. two months after planting, T_9=Cupravit at ·45 Kg. in 40 gallons of water/Hect. one and two months after planting, T_{10}=Mixture of above three in same proportion one month after planting, T_{11}=Mixture of above three in same proportion one month after planting and T_{12}=Mixture of above three in same proportion one and two months after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) 117 m.×26 m (iii) 4. (iv) 9 m.×2 m. (b) 8·6 m.×1·7 m. (v) Yes. (vi) Yes.

4. GENERAL :

(i) Lodged. (ii) Sprayed Endrin for stem borer, case worm and leaf roller, sprayed Cupravit for blight and fungicides. (iii) Yield of grain. (iv) (a) 1965—contd. (b) Yes. (c) N.A. (v) Central Rice Res. Stn., Pattambi. (vi) and (vii) Nil.

5. RESULTS :

(i) 3112 Kg/ha. (ii) 144·4 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of Paddy in Kg/ha.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	3155	3240	3078	3198	3112	3266	3198

	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
	3198	2958	2933	3206	2975	2941

C.D.=206·4 Kg/ha.

Crop :- Paddy (*Kharif*). **Ref :- K. 65(21).**

Site :- Rice Res. Stn., Mannuthy. **Type :- 'D'.**

Object :—To find out the effect of combined use of fertilizers and combatible insecticides and fungicides on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 Kg/ha. of C.M.+30 Kg. of N+30 Kg/na. of P_2O_5+30 Kg/ha. of K_2O broadcast. (ii) Lateritic. (iii) 13.5.65/22.6.65. (iv) (a) 6 ploughing, puddlings and levelling. (b) Transplanting. (c) to (e) N.A. (v) 5000 Kg/ha. of C.M.+30 Kg. of N+30 Kg/ha. of P_2O_5+30 Kg/ha. of K_2O broadcast. (vi) PTB— (late). (vii) Irrigated. (viii) Weeding. (ix) 203·7 cm. (x) 26.9.65.

2. TREATMENTS and 3. DESIGN :

Same as in expt. No. 65(32) on page 198.

5. RESULTS :

(i) 2979 Kg/ha. (ii) 335·6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of Paddy in Kg/ha.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	2719	3069	2668	2924	3343	3035	3292

	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
	2907	2864	2873	3181	2779	3078

Crop :- Paddy (*Kharif*).　　　　　　　　　　　　**Ref :-** K. 61(44).

Site :- Agri. Res. Stn., Pattambi.　　　　　　　**Type :-** 'D'.

Object :—To find out an effective weedicide for Paddy.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Paddy. (c) F.Y.M. at 126 Q/ha. (ii) Laterite loam. (iii) 17.5.61/N.A. (iv) (a) 10 ploughings. (b) Broadcasting. (c) 72 Kg/ha. (d) 25 cm.×25 cm. (e) 2. (v) F.Y.M. at 126 Q/ha. (vi) PTB—28 (medium). (vii) Unirrigated. (viii) N.A. (ix) 369 cm. (x) 4.9.61.

2. **TREATMENTS :**

   5 weedicides : W_0=Control, W_1=M.C.P.A. at 2·8 litres/ha., W_2=M.C.P.A. at 5·6 litres/ha., W_3=2—4—D at 1·7 Kg/ha. acid equivalent in 455 litres of water and W_4=2—4—D at 2·2 Kg/ha. acid equivalent in 455 litres of water.

   Weedicides applied 45 days after sowing.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 6·1 m .×4·6 m. (v) Nil. (vi) Yes.

4. **GENERAL :**

   (i) Normal. (ii) and (iii) N.A. (iv) (a) 1961 only. (b) and (c) Nil. (v) and (vi) N.A. (viii) Nil.

5. **RESULTS :**

   (i) 672 Kg/ha. (ii) 274·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	W_0	W_1	W_2	W_3	W_4
Av. yield	726	483	832	568	749

———

Crop :- Paddy (*Kharif*).　　　　　　　　　　　　**Ref :-** 64 (56).

Site :- Agri. Res. Stn., Pattambi.　　　　　　　**Type :-** 'D'.

Object :—To find out the effect of different weedicides on the control of weeds in broadcast Paddy.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) Paddy. (c) C.M. at 12 C.L./ha.+56 Kg/ha. of P_2O_5 as Super +34 Kg/ha. of K_2O as Mur. Pot. as basal dressing and 34 Kg/ha. of N as A/S as top dressing. (ii) Lateritic soil. (iii) 16.5.64. (iv) (a) 7 ploughings, digging and levelling. (b) Broadcast. (c) N.A. (d) 25 cm.×25 cm. (e) 2. (v) C.M. at 12 C.L./ha. +56 Kg/ha. of P_2O_5 as Super+34 Kg/ha. of K_2O as Mur. Pot. as basal dressing and 34 Kg/ha. of N as A/S as top dressing. (vi) PTB—23 (medium) (vii) Unirrigated. (viii) Nil. (ix) 236 cm. (x) 13.9.64.

2. **TREATMENTS :**

   Main-plot treatments :

   All combinations of (1) and (2)

   　　(1) 2 levels of E.P.T.C. : E_0=No application and E_1=Pre-sowing application with 2·2 Kg/ha. acid equivalent.
   　　(2) 3 methods of weeding : M_0=Unweeded, M_2=Hand weeded by local method and M_2=3—4 D.P.A. applied at 3·3 Kg/ha. acid equivalent when grass was in 2—4 leaf stage.

   Sub-plot treatments :

   5 levels of weedicides : W_0=No application, W_1=M.C.P.A. at 1·1 Kg/ha., W_2=M.C.P.A. at 2·2 Kg/ha., W_3=M.C.P.P. at 1·2 Kg/ha. and W_4=M.C.P.P. at 2·2 Kg/ha. acid equivalent applied 5 weeks after sowing.

3. **DESIGN :**

   (i) Split-plot. (ii) (a) 6 main-plots/replication, 5 sub-plots/main-plot. (ii) (b) 27·0 m.×32·4 m. (iii) 4. (iv) (a) and (b) 6 m.×4 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Incidence of gall fly was noticed. (iii) Yield of grain. (iv) (a) 1964 only. (b) and (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1116 Kg/ha. (ii) (a) 334·6 Kg/ha. (b) 189·3 Kg/ha. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in Kg/ha.

	W_0	W_1	W_2	W_3	W_4	M_0	M_1	M_2	Mean
E_0	1205	1108	1074	1128	1191	1042	1054	1328	1141
E_1	1140	1092	1084	1075	1063	940	1128	1204	1091
Mean	1173	1100	1079	1102	1127	991	1091	1266	1116
M_0	956	1011	986	1020	983				
M_1	1142	1060	1060	1038	1156				
M_2	1421	1229	1192	1247	1241				

C.D. for M marginal means = 145·1 Kg/ha.

Crop :- Paddy (*Rabi*).   **Ref :- K. 61(67)**.

Site :- Agri. College and Instt., Villayani.   **Type :- 'D'.**

Object :—To study different methods of weed control for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) Loamy. (iii) 30.10.61. (iv) (a) to (e) N.A. (v) F.Y.M. at 5604 Kg/ha. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 24.1.62.

2. TREATMENTS :

6 methods of weed control : M_0 = Unweeded (control), M_1 = Local method of weeding. M_2 = Post emergence application of 2—4—D once, M_3 = M_2 twice, M_4 = M_2 + Cultural method of weeding and M_5 = Cultural method of weeding.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 6·9 m. × 4·6 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Stem borer attack ; BHC applied at 11 Kg/ha. (iii) Weight of grain, straw and weeds. (iv) (a) 1961 only. (b) and (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 857 Kg/ha. (ii) 229·0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. yield	699	772	627	970	1073	1000

C.D. = 272·4 Kg/ha.

Crop :- Paddy *(Rabi).*　　　　　　　　　　　**Ref :- K. 64(103).**

Site :- Agri. College and Res. Instt., Vellayani.　　　**Type :- 'D'.**

Object :—To find out effective methods of weed control in Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Loamy. (iii) N.A./3.12.64. (iv) (a) Ploughing with country plough and levelling. (b) Transplanting. (c) and (e) N.A. (v) G.M. at 5268 Kg/ha. as basal dressing. (vi) PTB—10 (120 days). (vii) Irrigated. (viii) N.A. (ix) 21 cm. (x) 18.2.62.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 4 methods of weed controlling : M_1=Continuous sub-merging till grain filling, M_2=Light irrigation, M_3=Irrigation when cracks developed, M_4=EPTC at 3·4 Kg/ha.

(2) 2 hand weeding treatments : W_0=No weeding and W_1=Hand weeding.

Sub-plot treatments :

4 weedicides : T_0=Control, T_1=2—4 D at 2·2 Kg/ha., T_2=3—4 D at 3·4 Kg/ha., T_3=T_1+T_2.

3. DESIGN :

(i) Split-plot. (ii) (a) 8 main-plotf/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6·1 m.× 5·2 m. (b) 5·5 m.×4·6 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Stem borer attack. (iii) Yield of grain. (iv) (a) 1964—N.A. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 1012 Kg/ha. (ii) (a) 236·5 Kg/ha. (b) 250·2 Kg/ha. (iii) Main effect of M and T are significant. (iv) Av. yield of grain in Kg/ha.

	M_1	M_2	M_3	M_4	T_0	T_1	T_2	T_3	Mean
W_0	1175	927	1096	848	1062	1028	870	1085	1011
W_1	1062	1074	1062	868	983	1085	859	1119	1012
Mean	1119	1001	1079	848	1023	1057	865	1102	1012
T_0	1040	995	995	1062					
T_1	1175	1108	1288	656					
T_2	972	791	882	814					
T_3	1288	1108	1153	859					

C.D. for M marginal means=123·0 Kg/ha.

C.D. for T marginal means=124·5 Kg/ha.

――――――

Crop :- Paddy *((Rabi).*　　　　　　　**Ref :- K. 60(31), 60(32), 60(33), 60(34).**

Site :- Agri. Res. Stn., Pattambi.　　　**Type :- 'D'.**

Object :—To find out the incidence of pests when seedlings are dipped in solutions of insecticides.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) G.L. at 4483 Kg/ha. as basal dressing, A/S at 112 Kg/ha. as top dressing one month after planting. (ii) Shallow laterite. (iii) 29.9.60/9.11.60, 16.9.60/4.11.60, 1.10.60/1.11.60 and 16.9.60/20.10.60 respectively. (iv) (a) 6 puddlings and 4 levellings. (b) Transplanting. (c) N.A. (d) 25 cm.× 15 cm. (e) 2. (v) G.L. at 5604 Kg/ha. as basal dressing+A/S at 112 Kg/ha. one month after planting (vi) PTB—12, PTB—15, PTB—20 and PTB—21 respectively. (vii) Unirrigated. (viii) N.A. (ix) 309 cm. (x) 8.2.61; 21.1.61; 16.2.61 and 1.2.61 respectively.

2. TREATMENTS :

4 insecticides : I_0=Control, I_1=Endrin at 0·028 Kg. in 28·4 litres, I_2=Folidol at 0·028 Kg. in 56.8 litres and I_3=D.D.T. 550 at 0·454 Kg. in 113·7 litres.

Seedlings kept dipped in the solution for one hour.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 15·2 m.×1·5 m. (b) 15·2 m.×0·9 m. (v) 30 cm. on either side.

4. GENERAL :

(i) Normal. (ii) Seedlings are dipped in different insecticides as per schedule. (iii) Pest counts and grain yield. (iv) (a) 1959—60. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expts. for 1960 on four different varieteis are only available. Pooled results for them are given below. Error variances are homogeneous and Treatments×varieties interaction is present.

5. RESULTS :

(i) 2994 Kg/ha. (ii) 153·5 Kg/ha. (based on 9 d.f. made up of Treatments × varieties interaction). (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	2914	3033	3038	2992

— — —

Crop :- Paddy (*Kharif*).   **Ref :- K. 60(37), 60(38), 60(39).**

Site :- Agri. Res. Stn., Pattambi.   **Type :- 'D'.**

Object ;—To compare the efficacy of Basudin 20 E.C. with other insecticides like Folidol and Endrin for Paddy.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) G.L. at 4483 Kg/ha. as basal dressing+A/S at 112 Kg/ha. as top dressing one month after planting. (ii) Shallow laterite. (iii) 28.4.60/4.6.60; 12.5.60/26.6.60; 23.5.60/26.6.60. (iv) (a) 6 ploughings and 4 levellings. (b) Transplanting. (c) N.A. (d) 25 cm.×25 cm. (e) 2. (v) G.L. at 5604 Kg/ha. as basal dressing + A/S at 112 Kg/ha. one month after planting. (vi) PTB—2 (medium), PTB—8 (medium), PTB—26 (medium) respectively. (vii) Unirrigated. (viii) N.A. (ix) 309 cm. (x) 3.10.60 ; 26.9.60 ; 10.10.60.

2. TREATMENTS :

4 insecticides : I_0=Control, I_1=Basudin 20 E.C. 1·12 Kg. in 561 litres/ha. of water, I_2=Folidol at 0·1 Kg. in 140 litres/ha. of water and I_3=Endrin at 0·07 Kg. in 70 litres/ha. of water.

Insecticides applied two weeks after planting and three weeks after 1st spray.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 15·2 m.×1·5 m. (b) 15·2 m.×0·9 m. (v) 30 cm. on either side.

4. GENERAL :

(i) Normal. (ii) Insecticides sprayed as per schedule. (iii) Pest counts and grain yield. (iv) (a) 1960 only. (b) No (c) Nil. (v) and (vi) Nil. (vii) Expts. conducted on different varieties during 1960. Error variances are heterogeneous and Treatments×varieties interaction is absent. Individual results are given under 5. Results.

5. RESULTS :

60(37)

(i) 2716 Kg/ha. (ii) 168·7 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	2684	2732	2860	2588

60(38)

(i) 2260 Kg/ha. (ii) 288·4 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	2183	2216	2185	2457

60(39)

(i) 2307 Kg/ha. (ii) 121·4 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	2213	2285	2345	2385

———

Crop :- Paddy (*Kharif*).   **Ref :- K. 60(27), 60(28), 60(29), 60(30).**

Site :- Agri. Res. Stn., Pattambi.   **Type :- 'D'.**

Object : —To find out the incidence of pests when seedlings are dipped in solution of insecticides.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) G.L. at 4483 Kg/ha. as basal dressing+A/S at 112 Kg/ha. as top dressing one month after planting. (ii) Shallow laterite. (iii) 7.5.60/11.6.60; 1.6.60/29.6.60; 29.4.60/7.6.60 and 23.5.60/23.6.60 respectively. (iv) (a) 6 puddlings and 4 levellings. (b) Transplanting. (c) N.A. (d) 25 cm.×15 cm. (e) 2. (v) G.L. at 5604 Kg/ha. as basal dressing+A/S at 112 Kg/ha. one month after planting. (vi) PTB—2, PTB—7, PTB—9 and PTB—26 respectively. (vii) Unirrigated. (viii) N.A. (ix) 309 cm. (x) 7.10.60 ; 24.9.60 ; 28.9.60 and 9.10.60 respectively.

2. TREATMENTS :

4 insecticides: I_0=Control, I_1=Endin at 0·028 Kg. in 28·4 litres ; I_2=Folidol at 0·028 Kg. in 56·8 litres and I_3=D.D.T. 550 at 0·454 Kg. in 113·7 litres.

Seedlings kept dipped in the solution for one hour.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 15·2 m.×1·5 m. (b) 15·2 m.×0·9 m. (v) 30 cm.× 30 cm.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Pest counts and grain yield. (iv) (a) 1959—60. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous Treatments×varieties interaction is absent. Individual results are given under 5. Results.

5. RESULTS :

60(27)

(i) 3060 Kg/ha. (ii) 234·8 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	2926	3151	3117	3046

60(28)

(i) 1871 Kg/ha. (ii) 146 0 Kg/ha. (iii) Treatment difference are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	I_0	I_1	I_2	I_3
Av. yield	1810	1861	1901	1912

60(29)

(i) 2197 Kg/ha. (ii) 261·1 Kg/ba. (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	2297	2256	1963	2271

60(30)

(i) 2604 Kg/ha. (ii) 142·8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatmet	I_0	I_1	I_2	I_3
Av. yield	2586	2720	2474	2637

— — — —

Crop :- Paddy (*Rabi*). **Ref :- K. 60(36), 61(47), 63(128).**

Site :- Agri. Res. Stn., Pattambi. **Type :- 'D'.**

Object : - To compare the relative merits of Endrex and Folidol for Paddy crop.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) G.L. at 5604 Kg/ha. as basal dressing and A/S at 112 Kg/ha. as top dressing for 61(47). G.L. at 4942 Kg/ha. of Super at 124 Kg/ha., Mur. Pot. at 62 Kg/ha. of C/A/N at 124 Kg/ha. for 63(128). (ii) Shallow laterite. (iii) 16.9.60/21.10.60 ; 22.9.61/10.11.61 ; 19.11.63/N.A. respectively. (iv) (a) 4 to 8 ploughings, puddlings and levelling. (b) Transplanting. (c) and (d) N.A. (e) 2. (v) G.L. at 5604 Kg/ha. for 60(36). C.M. at 126 Q/ha.+B.M. at 110 Kg/ha.+Mur. Pot. at 56 Kg/ha. as basal dressing and urea 56 Kg/ha. as top dressing for 61(47), G.L. at 153 Q/ha., Super at 305 Kg/ha., Mur. Pot at 153 Kg/ha. and A/S at 305 Kg/ha. for 63(128). (vi) PTB –20 (medium). (vii) Unirrigated. (viii) 1 weeding. (ix) 309 cm.; 52 cm. and 43 cm. respectively. (x) 18.1.61; 9.2.62 and 17.2.64 respectively.

2. **TREATMENTS :**

3 insecticides : I_0 =Control, I_1 =Endrex and I_2 =Folidol.
Insecticides apolied at 0·84 Kg/ha. one week before planting, 1·1 Kg/ha. two weeks after planting and 1·1 Kg/ha. 3 weeks after the second application if necessary.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 15·2 m. ×1·5 m. (b) 15·2 m. ×0·9 m. (v) 30 cm. on either side.

4. **GENERAL :**

(i) Satisfactory. (ii) Insecticides sprayed as per schedule. (iii) Yield of grain and tiller counts. (iv) (a) 1958--63 (62 N.A). (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Expt. No. 58(195) and 59(197) have also been included while giving combined results. Error variances are heterogeneous and Treatments×years interaction is present.

5. **RESULTS :**

(i) 1921 Kg/ha (ii) 76·2 Kg/ha. (based on 8 d.f. made up of Treatments×years interaction). (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatment	T_1	T_2	T_3
Av. yield	1836	1984	1942

C.D.=111·1 Kg/ha.

— — —

Crop :- Paddy (*Rabi*). **Ref:- K. 60(26), 61(46), 63(130).**

Site :- Agri. Res. Stn., Pattambi. **Type :- 'D'.**

Object:—To compare the effect of Aldrex 5% dust and B.H.C. 10% dust on Paddy crop.

1. **BASAL CONDITIONS :**

(i) Nil. (b) Paddy. (c) N.A. for 60(26). G.L. at 5640 Kg/ha. as basal dressing and A/S at 112 Kg/ha. as top dressing for 61(46) G.L. at 4942 Kg/ha.+Super at 124 Kg/ha.+Mur. Pot. at 62 Kg/ha. as basal dresssing and A/S at 62 Kg/ha. as top dressing for 63(130). (ii) Shallow laterite. (iii) 16.9.60/20.10.60; 22.9.61 /10.11.61 and 19.11.63/N.A. respectively. (iv) (a) 4 to 8 ploughings and 6 to 8 puddlings. (b) Transplanting. (c) N.A. (d) 25 cm.×15 cm. (e) 2. (v) G.L. at 5604 Kg/ha. for 60(26). C.M. at 126 Q/ha +B.M. at 112 Kg/ha.+Mur. Pot. at 56 Kg/ha. as basal dressing. Urea at 56 Kg/ha. as top dressing for 61(46) G.L. at 153 Q/ha.+Mur. Pot. at 153 Kg/ha.+Super at 305 Kg/ha. as basal dressing and A/S at 305 Kg/ha. as top dressing for 63(130). (vi) P.T.B.—20. (vii) Unirrigated (viii) One weeding. (ix) 309 cm. ; 58 cm. and 43 cm. respectively. (x) 17.1.61 ; 10.2.62 and 4.2.64 respectively.

2. **TREATMENTS :**

3 Insecticidal treatments : I_0=Control (no insecticide), I_1=Aldrex 5% dust and I_2=B.H.C. 10% dust. 16.8 Kg/ha. of insecticides applied one week before planting, 16.8 Kg/ha. 4 weeks after planting if necessary.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 15·2 m.×1·5 m. (b) 15·2 m.× 0·9 m. (v) 30 cm. on either side. (v) Yes.

4. **GENERAL :**

(i) Normal. (ii) Insecticides sprayed as per schedule. (iii) Tiller counts and grain yield. (iv) (a) 1958—63. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. 58(200) and 59(202) have also been included in the combined analysis.

5. **RESULTS :**

(i) 1949 Kg/ha. (ii) 350·4 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	I_0	I_1	I_2
Av. yield	1961	1965	1922

———

Crop :- Paddy (*Kharif*). **Ref :- K.64(31).**

Site :- Agri. Res. Stn., Pattambi. **Type :- 'D'.**

Object :—To find out an effective insecticide to control the incidence of silver shoot on medium duration Paddy varieties.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) 5000 Kg/ha. of G.L.+33·6 Kg/ha. of N+33·6 Kg/ha. of P_2O_5+33·6 Kg/ha. of K_2O. (ii) Laterite soil. (iii) 15.6.64/18.6.64 (iv) (a) 7 ploughings, digging and levelling. (b) Broadcast. (c) 56 Kg/ha. (d) 25 cm.×25 cm. (e) 2. (v) 5000 Kg/ha. of G.L.+33·6 Kg/ha. of N+33·6 Kg/ha. of P_2O_5 +33·6 Kg/ha. of K_2O. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 236 cm. (x) P.T.B.—26 on 19.10.64 and P.T.B.—2 and 9 on 5.11.64.

2. **TREATMENTS :**

All combinations of (1) and (2)

(1) 3 medium duration varieties : V_1=P.T.B. —2, V_2=P.T.B.—9 and V_3=P.T.B.—26.
(2) 7 insecticides : I_0=Control, I_1=Aldrex 5%dust-dusting, I_2=Parathion ·05% spraying, I_3=Ekatin 0·1% spraying, I_4=Telodrin 28 gm/ha. in 337 litres of water/ha. spraying, I_5=Endrin 0·05% spraying and I_6=Dimecron 0·04% spraying.

Insecticides applied 10 days before pulling out in the nursery 15 days after planting.

3. DESIGN :

    (i) Fact in R.B.D.   (ii) (a) 21.   (b) 31 m. × 22 m.   (iii) 4.   (a) and   (b) 7 m. × 4 m.   (v) Nil.   (vi) Yes.

4. GENERAL :

    (i) Crop lodged.   (ii) Attack of gallfly.   (iii) Yeld of grain.   (iv) (a) 1964—only.   (b) No.   (c) Nil.   (v) to (vii) Nil.

5. RESULTS :

    (i) 1629 Kg/ha.   (ii) 205·2 Kg/ha.   (iii) Main effect of V alone is significant.   (iv) Av. yield of grain in Kg/ha.

	I_0	I_1	I_2	I_3	I_4	I_5	I_6	Mean
V_1	2165	2223	2339	2143	2192	2009	2263	2191
V_2	1000	1312	1134	1268	1112	1250	1246	1189
V_3	1625	1357	1518	1352	1536	1625	1545	1508
Mean	1597	1631	1664	1588	1613	1628	1685	1629

C.D. of V marginal means = 109·52 Kg/ha.

———

Crop :- Red Gram (*Kharif*).   **Ref :- K. 65(96).**

Site :- Pulses Res. Stn., Sasthamcattah.   **Type :- 'C'.**

Object :—To find out the best time of sowing of Redgram.

1. BASAL CONDITIONS :

    (i) and (ii) N.A.   (iii) June, 1965.   (iv) (a) Small ridges are made at a distance of 60 cm.   (b) Dibbling on the ridges.   (c) to (e) N.A. (v) 100 Kg/ha of Super.   (vi) Local.   (vii) Unirrigated.   (viii) Hoeing and weeding twice. (ix) 10·2 cm.   (x) January, 66.

2. TREATMENTS :

    5 dates of sowing : D_1=15.6.65, D_2=25.6.65, D_3=5.7.65, D_4=15.7.65 and D_5=25.7.65.

3. DESIGN :

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

4. GENERAL :

    (i) Not satisfactory.   (ii) Nil.   (iii) Grain yield.   (iv) (a) 1965—N.A.   (b) and (c) N.A.   (v) Nil.   (vi) Dry period predominated.   (vii) Nil.

5. RESULTS :

    (i) 43 Kg/ha.   (ii) 23·6 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
Av. yield	40	57	65	28	27

C.D. = 28·4 Kg/ha.

———

Crop :- Black Gram (*Kharif*).   **Ref :- K. 65(84).**

Site :- Pulse Res. Stn., Sasthamcottah.   **Type :- 'C'.**

Object :—To find out the optimum spacing to get highest yield.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Black Gram. (c) Super at the rate 100 Kg/ha. (ii) Laterite. (iii) 23.6.65. (iv) (a) 2 digging. (b) Dibbling. (c) N.A. (d) As per treatments. (e) N.A. (v) Super at the rate of 100 Kg/ha. as basal dressing. (vi) Medium. (vii) Unirrigated. (viii) 1—2 weeding. (ix) N.A. (x) 12.9.65.

2. **TREATMENTS :**

Same as in expt. No. 65(15) on page 207.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 6. (b) N A. (iii) 5. (iv) (a) 6 m. × 2 m. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Pod worms were noticed in tender pod and controlled by spraying Endrin. (iii) Yield only. (iv) (a) 1964—contd. (b) No. (c) N.A. (v) to (vii) Nil.

5. **RESULTS :**

(i) 73 Kg/ha. (ii) 35·6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	86	88	93	54	78	40

Crop :- Cowpea (*Kharif*).　　　　　　　　　　　　　**Ref :- K. 65(15)·**

Site :- Pulses Res. Stn., Sasthamcottah.　　　　**Type :- 'C'.**

Object :—To find out the optimum spacing to get highest yield.

1. **BASAL CONDITIONS :**

(i) (a) Nil. (b) Cowpea. (c) S/P at the rate of 100 Kg/ha. (ii) Laterite. (iii) 21.6.65. (iv) (a) 2 diggings. (b) Dibbling. (c) N.A. (d) As per treatment. (e) N.A. (v) Super at the rate of 100 Kg/ha. as basal dressing. (vi) Medium. (vii) Unirrigated. (viii) 1—2 weedings. (ix) N.A. (x) 2.9.65.

2. **TREATMENTS :**

6 spacings ; S_1=15×15, S_2=15×20, S_3=15×25, S_4=20×20, S_5=20×25 and S_6=25×25 cm.

3. **DESIGN :**

(i) R.B D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) and (b) 6 m. × 2 m. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) No lodging. (ii) Nil. (iii) Yield only. (iv) (a) 1964—contd. (b) No. (c) N.A. (v) to (vii) Nil.

5. **RESULTS :**

(i) 118 Kg/ha. (ii) 34·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	86	118	138	123	113	129

Crop :- Bhindi.　　　　　　　　　　　　　　　　**Ref :- K. 60(60), 61(88).**

Site :- Agri. College and Res. Instt., Vellayani.　　**Type :- 'D'.**

Object :—To find out effective pesticide to control pests on Bhindi.

1. BASAL CONDITIONS :

(i) (a)to (c) Nil. (ii) Red loam. (iii) 13.7.60 ; 7.8.61. (iv) (a) to (e) N.A. (v) $2 \cdot 3$ Kg/plant of cowdung manure. (vi) Local. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 1.9.60 to 2.10.60 ; N.A.

2. TREATMENTS:

7 insecticidal treatments : T_0=Control (no treatment), T_1=Mechanical, T_2=D.D.T. 2% spray, T_3=Lindane 0·05% spray, T_4=Heptachlor 0·15% spray, T_5=Malathion 0·15% spray and T_6=Diazinon 0·05% spray.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) $16 \cdot 8$ m.$\times 3 \cdot 8$ m. (iii) 5. (iv) (a) $3 \cdot 8$ m.$\times 2 \cdot 3$ m. (b) $2 \cdot 3$ m.$\times 1 \cdot 5$ m. (v) 76 cm. $\times 38$ cm. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Moderate attack of pests for 60(60) ; Infestation by Jassid and Aphids for 61(88). (iii) Yield of *bhindi* and incidence of pests. (iv) (a) 1959 −61 (modified in 60). (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil .

5. RESULTS :

Yield of Bhindi.

60(60)

(i) 7021 Kg/ha. (ii) $1607 \cdot 0$ Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *bhindi* in Kg/ha.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	7157	7250	6802	7430	7735	6085	6688

61(88)

(i) 1795 Kg/ha. (ii) $627 \cdot 2$ Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *bhindi* in Kg/ha.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	1450	1511	2187	1690	1584	2048	2096

Jassids count per plot

61(88)

(i) $360 \cdot 2$. (ii) $135 \cdot 3$. (iii) Treatment differences are not significant. (iv) Av. number of Jassids/plot.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	$559 \cdot 4$	$427 \cdot 3$	$211 \cdot 3$	$408 \cdot 2$	$454 \cdot 8$	$252 \cdot 1$	$208 \cdot 3$

Shoot borer Connt per plot

60(60)

(i) $1 \cdot 9$. (ii) $2 \cdot 0$. (ii) Treatment differences are not significantt (iv) Av. number of aphids/ plot.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. number	$2 \cdot 8$	$3 \cdot 2$	$0 \cdot 8$	$2 \cdot 6$	$0 \cdot 8$	$1 \cdot 8$	$1 \cdot 0$

Aphids count per plot

61(88)

(i) $516 \cdot 3$. (ii) $273 \cdot 6$. (iii) Treatment differences are highly significant. (iv) Av. number of aphids/plot.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. number	$889 \cdot 6$	$585 \cdot 4$	$574 \cdot 6$	$358 \cdot 0$	$841 \cdot 4$	$204 \cdot 2$	$160 \cdot 6$

$$C.D.=357 \cdot 3$$

Aphids count per plot

60(57)

(i) $176 \cdot 2$ aphids/plot. (ii) $368 \cdot 0$ aphids/plot. (iii) Treatment differences are not significant. (iv) Av. number of aphids/plot.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. number	$674 \cdot 0$	$195 \cdot 2$	$222 \cdot 8$	$12 \cdot 2$	$67 \cdot 0$	$26 \cdot 2$	$36 \cdot 2$

Crop :- Sweet Potato (*Kharif*).   **Ref :- K. 60(62), 61(106), 62(23).**

Site :- Tuber Res. Stn., Mannuthy.   **Type :- 'M'.**

Object :—To determine the best combination of N, P and K for Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet potato. (c) As per treatments. (ii) Lateritic and gravelly soil. (iii) 22.6.60 ; 15.7.61 ; 10.7.62. (iv) (a) 2 to 3 ploughings. (b) Ridge planting. (c) N.A. (d) 91 cm.$\times$30 cm. (e) Single cutting 23 cm. long with 3 nodes. (v) 12 to 25 C.L./ha. of Cowdung for 60(62),61(106) and 62(23); 74 to 247 tins/ha. of ash for all. (vi) Hybrid for 63(45) ; Local white (late) for others. (vii) Unirrigated. (viii) Weeding and earthing up. (ix) N.A. (x) 10.12.60 ; 5.12.61 ; 13.12.62.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of P_2O_5 : $P_0=0$, $P_1=56$ and $P_2=112$ Kg/ha.

(2) 3 levels of K_2O as potosh : $K_0=0$, $K_1=90$ and $K_2=179$ Kg/ha.

Sub-plot trertments :

2 levels of N : $N_0=0$ and $N_1=90$ Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 5·5 m. $\times$7·3 m. (b) 3·7 m.$\times$6·7 m. (v) 91 cm.$\times$30 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of tubers. (iv) (a) 1958—62. (b) Yes. (c) Nil. (v) N.A. (vi) Nil. (vii) Sub-plot error variances are heterogeneous. Hence the results of individual years are presented under 5. Results.

5. RESULTS :

60(62)

(i) 4718 Kg/ha. (ii) (a) 1748·0 Kg/ha. (b) 943·7 Kg/ha. (iii) Main effects of N and P are highly significant and inferactions P$\times$K and N$\times$P$\times$K are significant. (iv) Av. yield of tubers in Kg/ha.

	P_0	P_1	P_2	K_0	K_1	K_2	Mean
N_0	2836	4069	4665	3329	4274	3966	3856
N_1	4459	5980	6298	4993	5661	6082	5579
Mean	3648	5024	5481	4161	4968	5024	4718
K_0	2790	5379	4315				
K_1	3514	5425	5964				
K_2	4639	4269	6165				

C.D. for P marginal means   =832·7 Kg/ha.
C.D. for N marginal means   =366·1 Kg/ha.
C.D. for the body of P$\times$K table =1441·7 Kg/ha.

61(106)

(i) 3762 Kg/ha. (ii) (a) 1641 Kg/ha. (b) 785·7 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of tubers in Kg/ha.

	P_0	P_1	P_2	K_0	K_1	K_2	Mean
N_0	3380	2805	3103	2928	2929	3370	3096
N_1	4726	3904	4654	4141	4120	5024	4428
Mean	4053	3355	3879	3534	3554	4197	3762
K_0	3236	3730	3637				
K_1	4022	3159	3483				
K_2	4901	3175	4516				

C.D. for N marginal means=304·8 Kg/ha.

62(23)

(i) 2777 Kg/ha. (ii) (a) 1183·3 Kg/ha. (b) 633·1 Kg/ha. (iii) Main effects of N and K and interaction $N \times K$ are highly significant. (iv) Av. yield of tubers in Kg/ha.

	P_0	P_1	P_3	K_0	K_1	K_2	Mean
N_0	2223	2242	2349	2069	2451	2293	2271
N_1	3123	3258	3467	2876	3276	3696	3283
Mean	2673	2750	2908	2473	2864	2994	2777
K_0	2503	2384	2531				
K_1	2824	2859	2908				
K_2	2691	3006	3286				

C.D. for K marginal means=563·7 Kg/ha.
C.D. for N marginal means=233·7 Kg/ha.
C.D. for K means at the same level of N=637·5 Kg/ha.
C.D. for N means at the same level of K=425·2 Kg/ha.

Crop :- Sweet Potato.

Site :- Palghat.

Ref :- K. 63(S.F.T).

Type :- 'M'.

Object :—Type A_1 : To study the response curve of important cereals, cash and oilseeds crops to Nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :
   (i) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:

   8 manurial treatments :
   N_0=Control (no manure)
   N_1=60 Kg/ha. of N
   N_2=120 Kg/ha. of N
   P_1=35 Kg/ha. of P_2O_5
   N_1P_1=60 Kg/ha. of N+35 Kg/ha of P_2O_5
   N_2P_1=120 Kg/ha. of N+35 Kg/ha. of P_2O_5
   N_2P_2=120 Kg/ha. of N+70 Kg/ha. of P_2O_5

   $N_2P_2K_1$=120 Kg/ha. of N+70 Kg/ha. of P_2O_5+60 Kg/ha. of K_2O.
   N applied as AS, P_2O_5 as Super and K_2O as Mur. Pot.

3. DESIGN :

A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping pattern, etc. In each zone one block is selected at random. A block normally consists of a group of 50-100 villages. In each block 36 experiments are conducted in a year of which 11 are of type A_1, 11 of type A_2, 11 of type A_3 and 3 are of type C. The eleven experiments under type A_1, A_2 and A_3 are distributed as 3 on a *Kharif* cereal, 3 on a *rabi* cereal, 3 on a cash crop and 2 on oilseed. All the three type C experiments are conducted on a legume crop. For the purpose of conducting the A_1, A_2 and A_3 experiments, 11 villages are randomly selected in each block and in each village 3 experiments, one each of type A_1, A_2 and A_3 are laid out. For conducting the three type C trials three villages are randomly selected in each block.

(iii) (a) 1/100 ha. (b) 1/200 ha. (iv) Yes.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1963 for Palghat. (b) and (c) Nil. (v) to (vii) Nil.

5. RESULTS :

Palghat

63(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of tubers in Kg/ha.	784	1034	1205	2075	5877	4388	6431	1143·4

Control yield=4619 Kg/ha. ; No. of trials=3.

———

Crop :- Sweet Potato.   **Ref :- K. 63(S.F.T).**

Site :- Palghat.   **Type :- 'M'.**

Object :—Type A_2 : To study the response curve of important cereals, oil seeds and cash crops to Phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

N_0	=Control (no manure).
N_1	=60 Kg/ha. of N.
P_1	=35 Kg/ha. of P_2O_5.
P_2	=70 Kg/ha. of P_2O_5.
N_1P_1	=60 Kg/ha. of N+35 Kg/ha. of P_2O_5.
N_1P_2	=60 Kg/ha. of N+70 Kg/ha. of P_2O_5.
N_2P_2	=120 Kg/ha. of N+70 Kg/ha. of P_2O_5.

$N_2P_2K_2$=120 Kgha. of N+70 Kgha. of P_2O_5+120 Kgha. of K_2O.

N applied as A/S, P as Super Phosphate and K as Mur. Pot.

3. DESIGN :

Same ae in Type A_1 on page 211.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1963. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS:

Palghat

63(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tuber in Kg/ha.	672	454	296	2299	2108	5093	4750	809·8

Control yield=5423 Kg/ha. ; No. of trials=3.

Crop :- Sweet Potato.   **Ref :- K. 63(S.F.T).**

Site :- Palghat.   **Type :- 'M'.**

Object :—Type A_3 : To study the response curves of important cereals, cash and oilseeds crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS:

   (i) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

   8 manurial treatments :
   N_0 =Control (no manure).
   N_1 =60 Kg/ha. of N.
   K_1 =60 Kg/ha. of K_2O.
   K_2 =120 Kg/ha. of K_2O.
   N_1K_1 =60 Kg/ha. of N+60 Kg/ha. of K_2O.
   N_1K_2 =60 Kg/ha. of N+120 Kg/ha. of K_2O.
   N_2K_2 =120 Kg/ha. of N+120 Kg/ha. of K_2O.
   $N_1P_1K_1$ =60 Kg/ha. of N+60 Kg/ha. of P_2O_5+60 Kg/ha. of K_2O.
   N applied as A/S, P as P_2O_5 and K as K_2O.

3. DESIGN :

   Same as in Type A_1 on page 211.

4. GENERAL :

   (i) to (iii) N.A. (iv) (a) 1963. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS :

Palghat

63(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tubers in Kg/ha.	2121	1917	3301	4223	3927	5065	6721	1214·0

Control yield=10608 Kg/ha. ; No. of trials=3.

Crop :- Sweet Potato.   **Ref :- K. 60(63), 61(105), 62(24), 64(181).**

Site :- Tuber Crop Res. Stn., Mannuthy.   **Type :- 'C'.**

Object :—To determine the optimum spacing and the best method of cultivation of Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet Potato. (c) 5 C.L. of Cowdung+25 tins of ash for 60(63) ; 25 tins of Compost and 25 tins of Ash for 61(105); 124 C.L./ha. of Cowdung+74 tins of Ash for 62(24); 50 tins of Ash applied before taking ridges for 64(181). (ii) Laterite and gravelly soil. (iii) 27.6.60; 21.7.61; 14.7.62; 20.8.64. (iv) (a) Ploughing and digging. (b) As per treatments. (c) N.A. (d) As per treatments. (e) Single cutting 23 cm. long with 3 nodes. (v) 25 tins of Compost and 25 tins of Ash were mixed and applied before making ridges and flat beds for 60(63): 12.4 C L./ha. of Cowdung after tilling+74 tins of Ash at planting for 61(105); 24.7 C.L./ha. of Cowdung and 247 tins/ha. of Ash applied before planting for 62(24); 50 tins of Ash applied before taking ridges for 64(181). (vi) Local white (late). (vii) Unirrigated. (viii) Weeding, interculturing and earthing up carried out one north after planting. (ix) N.A. (x) 12.12.60; 8.12.61; 15.12.62; December 64.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 methods of planting : M_1=On ridges and M_2=On flat beds.
(2) 3 spacings : S_1=0.61 m.×0.15 m.; S_2=0.61 m.×0.30 m. and S_3=0.61 m.×0.46 m.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) S_1=5.5 m.×8.5 m.; S_2=6.1 m.×8.5 m.; S_3=6.4 m.×8.5 m. (b) 5.5 m.×7.3 m. (v) Border rows are discarded.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tuber yield. (iv) (a) 1959—64. (b) Yes. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) N.A. (vii) Expts. No. 58(10), 58(11) are also taken into consideration while giving the pooled results. Error variances are homogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 4331 Kg/ha. (ii) 1973.0 Kg/ha. (based on 25 d f. made up of Treatments×years interaction). (iii) Main effects of M and S are highly significant. (iv) Av. yield of tubers in Kg/ha.

	S_1	S_2	S_3	Mean
M_1	6418	4699	3721	4946
M_2	4641	3479	3027	3716
Mean	5530	4089	3374	4331

C.D. for M marginal means=553.1 Kg/ha.
C D. for S marginal means=677.4 Kg/ha.

———————

Crop :- Tapioca.

Site :- (District) :- Cannanore, Ernakulam, Alleppy, Kozhikode, Kottayam, Quilon and Palghat.

Ref :- K. 63, 64(S.F.T.) for Kozhikode, 63, 64, 65 (S.F.T.) for Palghat and 64, 65(S.F.T.) for the rest.

Type :- 'M'.

Object :—Type A_1 :—To study the response curves of important cereals, cash and oilseed crops to N applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :
   (i) to (vi) N.A.   (vii) Unirrigated.   (viii) to (x) N.A.

2. TREATMENTS :
   8 manurial treatments :

   N_0=Control (no manure)

   N_1=60 Kg/ha. of N

   N_2=120 Kg/ha. of N

   P_1=35 Kg/ha. of P_2O_5

   N_1P_1=60 Kg/ha. of N+35 Kg/ha. of P_2O_5

   N_2P_1=120 Kg/ha. of N+ 35 Kg/ha. of P_2O_5

   N_2P_2=120 Kg/ha. of N+70 Kg/ha. of P_2O_5

   $N_2P_2K_1$=120 Kg/ha. of N+70 Kg/ha. of P_2O_5+60 Kg/ha of K_2O

   N applied as A/S, P_2O_5 as Super and K_2O as Mur. Pot.

3. DESIGN :
   A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping partern etc. In each zone one block is selected at random. A block normally consists of a group of 50-100 villages. In each block 36 experiments are conducted in a year of which 11 are of type A_1, 11 of type A_2, 11 of type A_3 and 3 are of type C. The eleven experiments under type A_1, A_2 and A_3 are distributed as 3 on a *Kharif* cereal, 3 on a *rabi* cereal, 3 on a cash crop and 2 on oil seed. All the three type-C experiments are conducted on a legume crop. For the purpose of conducting the A_1, A_2 and A_3 experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type A_1, A_2 and A_3 are laid out. For conducting the three type-C trials three villages are randomly selected in each block.

4. GENERAL :
   (i) to (iii) N.A.   (iv) (a) 1963 to 64 Kozhikode ; 63 to 66 for Palghat ; 1964 to 66 for the rest.   (b) and (c) N.A.   (v) Nil.   (vi) and (vii) N.A.

5. RESULTS :

Cannanore

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of tubers in Kg/ha.	1370	1730	720	1990	1500	2360	2960	339·0

Control yield=7270 Kg/ha. ; No. of trials=12.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of tubers in Kg/ha.	493	1225	838	1646	2353	2800	3565	288·8

Control yield=8974 Kg/ha. ; No. of trials=12.

Ernakulam

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of tubers in Kg/ha.	1620	2210	2390	3880	5550	6780	8770	372·0

Control yield=22510 Kg/ha.; No. of trials=12.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of tubers in Kg/ha.	3128	4666	3151	6099	7474	8958	11903	459 3

Control yield=22441 Kg/ha. ; No. of trials=12.

Alleppy
64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of tuber in Kg/ha.	1250	2560	4070	6100	7980	9750	12090	1761·0

Control yield=23290 Kg/ha. ; No. of trials=2.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of tuber in Kg/ha.	5126	7093	2913	7893	12340	15699	27433	851·4

Control yield=20033 Kg/ha. ; No. of trials=3.

Kozhikode
63(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of tuber in Kg/ha.	178	1950	1104	622	2576	3029	4284	791·9

Control yield=7471 Kg/ha.; No. of trials=9.

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of tuber in Kg/ha.	1710	2370	2550	2980	4290	5070	6200	451.0

Control yield=8640 Kg/ha. ; No. of trials=12.

Kottayam
64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of tuber in Kg/ha.	4560	5160	4730	6860	8210	9190	12260	876·0

Control yield=18590 Kg/ha.; No. of trials=12.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of tuber in Kg/ha.	2923	5510	1290	6103	7343	9016	11309	421·2

Control yield=25496 Kg/ha. ; No. of trials=6.

Quilon
64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of tuber in Kg/ha.	1150	2780	1300	2160	2610	3570	4500	599·0

Control yield=11070 Kg/ha. ; No. of trials=12.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	N_2P_2K	S.E.
Av. response of tuber in Kg/ha.	1391	2160	1215	2315	3077	3460	4771	261·5

Control yield=7682 Kg/ha. ; No. of trials=9.

Palghat

63(.S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of tubers in Kgha.	1803	2684	2793	3402	5242	6907	7461	446·0

Control yield=7536 Kg/ha. ; No. of trials=9.

64(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of tubers in Kgha.	180	560	620	52	1020	1280	1600	138·0

Control yield=6630 Kg/ha. ; No. of trials=8.

65(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of tubers in Kgha.	4500	7000	6000	10000	14500	20000	24500	2015·5

Control yield=40000 Kg/ha. ; No. of trials=3.

Crop :- Tapioca.

Ref:- K. 63, 64 (S.F.T.) for Kozhikode; 63, 64, 65(S.F.T.) for Palghat ; 1964 (S.F.T.) for Trichur and 64,65(S.F.T.) for others.

Site :- (District) :Cannanore, Kotta- Type :- 'M'. yam, Palghat, Quilon, Trichur, Trivandrm, Alleppy, Ernakulam and Kozhikode.

Object :—Type A_2 : To study the response curve of important cereals, oilseeds and cash crops to Phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

O =Control (no manure)
N_1 =60 Kg/ha. of N.
P_1 =35 Kg/ha. of P_2O_5.
P_2 =70 Kg/ha. of P_2O_5.
N_1P_1 =60 Kg/ha. of N+35 Kg/ha. of P_2O_5.
N_1P_2 =60 Kg/ha. of N+70 Kg/ha. of P_2O_5.
N_2P_2 =120 Kg/ha. of N+70 Kg/ha. of P_2O_5.
$N_2P_2K_2$=120 Kg/ha. of N+70 Kg/ha. of P_2O_5+120 Kg/ha. of K_2O.
N applied as A/S, P_2O_5 as Super and K_2O as Mur. Pot.

3. DESIGN :

Same as in Type A_1 on page 214.

4. GENERAL:

(i) to (iii) N.A. (iv) (a) 1963 to 64 for Kozhikode; 1963 to 65 for Palghat; 1964 for Trichur and 1964 to 1965 for others. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS :

Cannanore

64(S F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	390	1630	1190	1690	1960	4120	5440	893·0

Control yield=8250 Kg/ha.; No. of trials=12.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	755	624	1456	1406	1910	2730	3758 .	312·7

Control yield=9071 Kg/ha. ; No. of trials=11.

Kottayam
64(S.F.T.)

Treatment	N_1	P_2	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	4100	3960	5880	8040	9480	11150	14480	515·0

Control yield=18270 Kg/ha. ; No. of trials=12.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	3649	3496	236	6446	9279	10256	13879	2386·3

Control yield=23363 Kg/ha. ; No. of trials=6.

Palghat
63(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	1807	2528	3518	4737	6090	6973	8096	281·4

Control yield=7281 Kg/ha. ; No. of trials=9.

64(S.F.T.)

Treatment	N_1	F_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	250	360	530	580	800	1190	1520	110·0

Control yield=6830 Kg/ha. ; No. of trials=8.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	5500	4500	11000	13000	23000	28000	36500	2015·5

Control yield=34500 Kg/ha. ; No. of trials=2.

Quilon
64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	2090	1200	1730	2260	2850	3700	4660	439·0

Control yield=11050 Kg/ha. ; No. of trials=12.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	1411	1702	1837	2442	2820	3184	4262	173·6

Control yield=7799 Kg/ha. ; No. of trials=9.

Trichur
64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	3600	3230	4720	5880	7150	4080	14220	669·0

Control yield=20430 Kg/ha.; No. of trials=7.

Trivandrum
64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	990	750	1090	1620	2140	2910	3550	238·0

Control yield=8780 Kg/ha. ; No. of trials=12.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	937	838	1627	2393	3040	3614	4852	243·6

Control yield=9082 Kg/ha. ; No. of trials=11.

Alleppy

64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	910	3550	5580	7060	8970	11360	13670	1551·0

Control yield=25760 Kg/ha. ; No. of trials=2.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	1486	4066	6266	7353	11200	21593	21860	1486·7

Control yield=18306 Kg/ha. ; No. of trials=3.

Trivandrum
64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	1460	1730	3100	4380	5670	7500	9750	388·0

Control yield=21790 Kg/ha. ; No. of trials=12.

65(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	2386	2313	3724	5423	6893	9041	11078	444·5

Control yield=23614 Kg/ha. ; No. of trials=12.

Kozhikode
63(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	1048	993	1690	2584	2041	3519	4477	206·7

Control yield=6700 Kg/ha. ; No. of trials=10.

64(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of tubers in Kg/ha.	1980	2950	3680	3550	4850	5510	6860	280·0

Control yield=9640 Kg/ha. ; No. of trials=11.

Crop :- Tapioca.

Ref :- K. 63, 64 for Kozhikode ; 64 (S.F.T.) for Trichur ; 65 (S.F.T.) for Alleppy and 64, 65 (S.F·T.) for others.

Site :- (District) :   Cannanore, Type :- 'M'.
Kottayam,   Kozhikode,
Palghat, Quilon, Trichur,
Trivandrum,   Ernakulam
and Alleppy.

Object :—Type A_2 :—To study the response curves of important cereals, cash and oilseed crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) to (vi) N.A.   (vii) Unirrigated.   (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :
O   =Control (no manure).
N_1 =60 Kg/ha. of N.
K_1 =60 Kg/ha. of K_2O.
K_2 =120 Kg/ha. of K_2O.
N_1K_1 =60 Kg/ha. of N+60 Kg/ha. of K_2O.
N_1K_2 =60 Kg/ha. of N+120 Kg/ha. of K_2O.
N_2K_2 =120 Kg/ha. of N+120 Kg/ha. of P_2O_5.
$N_1P_1K_1$ =60 Kg/ha. of N+35 Kg/ha. of P_2O_5+60 Kg/ha. of K_2O.
N applied as A/S, P_2O_5 as Super and K_2O as Mur. Pot.

3. DESIGN :

Same as in Type A_1 on page 214.

4. GENERAL :

(i) to (iii) N.A.   (iv) 1963 to 64 for Kozhikode ; 64 for Quilon ; 1965 for Alleppy and 1964 to 65 for others.
(b) and (c) N.A.   (v) to (vii) N.A.

5. RESULTS :

Cannanore

64(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tubers in Kg/ha.	1350	220	2090	1720	2440	3280	3530	424·0

Control yield=7560 Kg/ha. ; No. of trials=12.

65(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tubers in Kg/ha.	599	1412	1925	2211	2811	3192	3407	352·6

Control yield=9022 Kg/ha. ; No. of trials=11.

Kottayam

64(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tubers in Kg/ha.	2990	3200	5260	6620	7870	9360	10760	667·0

Control yield=19070 Kg/ha. ; No. of trials=11.

65(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tubers in Kg/ha.	3646	3719	8226	6839	7746	10529	13589	418·6

Control yield=23333 Kg/ha. ; No. of trials=6.

Kozhikode

63(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tubers in Kg/ha.	494	912	1290	1961	2446	3092	3307	476·9

Control yield=7860 Kg/ha. ; No. of trials=9.

64(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tubers in Kg/ha.	1530	1900	2760	3420	4200	5350	5660	410·0

Control yield=8590 Kg/ha. ; No. of trials=10.

Palghat

64(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tubers in Kg/ha.	370	400	740	830	1110	1760	1830	198·0

Control yield=6580 Kg/ha. ; No. of trials=8.

65(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tubers in Kg/ha.	3500	1000	3700	8000	12500	22500	20000	3217·5

Control yield=30000 Kg/ha.; No. of trials=2.

Quilon

64(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tubers in Kg/ha.	1410	1460	1680	2080	2650	3330	3870	382·0

Control yield=10970 Kg/ha. ; No. of trials=12.

65(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tubers in Kg/ha.	1122	1348	1500	2215	2800	3406	3893	261·9

Control yield=7891 Kg/ha. ; No. of trials=9.

Trichur

64(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tubers in Kg/ha.	3900	4340	6490	7940	10810	11900	14820	1998·0

Control yield=19980 Kg/ha. ; No. of trials=7.

Trivandrum

64(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tubers in Kg/ha.	510	570	880	1300	1530	2010	2390	194·0

Control yield=8860 Kg/ha. ; No. of trials=12.

65(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tuber in Kg/ha.	806	565	1300	1530	1987	2877	3050	215·5

Control yield=9063 Kg/ha. ; No. of trials=12.

Ernakulam

64(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tubers in Kg/ha.	2320	3410	4840	5350	7370	9370	10010	565·0

Control yield=21030 Kg/ha. ; No. of trials=12.

65(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tubers in Kg/ha.	3251	4756	6219	7114	8734	10901	11179	512·7

Control yield=22559 Kg/ha. ; No. of trials=12.

Allepy

65(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1P_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of tubers in Kg/ha.	15786	5040	4726	5926	11140	9366	14886	5200·5

Control yield=19939 Kg/ha. ; No. of trials=3.

Crop :- Tapioca.

Site :- Quilon and Trivandrum.

Ref :- K. 60(S.F.T.)

Type .- 'M'.

Object :—Type A :—To study the response of Paddy to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS :

   (i) N.A. (ii) Laterite. (iii) to (x) N.A.

2. TREATMENTS:

   8 manurial treatments :

   o = Control (no manure).

   n = 44·8 Kg/ha. of N as A/S.

   p = 22·4 Kg/ha. of P_2O_5 as Super.

   k = 22·4 Kg/ha. of K_2O as Mur. Pot.

   np = 44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of P_2O_5 as Super.

   nk = 44·8 Kg/ha. of N as A/S+22·4 Kgha. of K_2O as Mur. Pot.

   pk = 22·4 Kgha. of P_2O_5 as Super+22·4 Kgha. of K_2O as Mur. Pot.

   npk = 22·4 Kgha. of N +22·4 Kgha. of P_2O_5+22·4 Kgha. of K_2O as Mur. Pot.

   N applied as AS, P_2O_5 as Super and K_2O as Mur. Pot.

3. DESIGN :

   (i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant posted in each zone. The field assistant conducts the trials in one revenue circle or thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on *Kharif* cereal, 8 on a *rabi* cereal, 8 on cash crop. 4 on an oilseed crop and 3 on a legumenous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of Type C. Residual effects of Phosphate application are studied on Type C trials in two out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of he 4 zones at the rate of one experiment per village. (iii) (a) 1/98·8 ha. (b) 1/197·7 ha. (iv) Yes.

4. GENERAL :

   (i) to (iii) N.A. (iv) (a) 1960. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS :

Av. response of tubers in Q/ha.

District	No. of trials	Control yield in Q/ha.	Main effects.				Interaction effects.				
			n	p	k	S.E.	np	nk	pk	npk	S.E.
Quilon	16	89·7	10·5	5·6	13·9	0·69	0·6	—0·2	—1·6	1·7	0·76
Trivendrum	16	84·8	11·1	9·8	14·3	0·68	2·1	—2·1	1·8	1·5	0·47

Crop :- Tapioca.

Site :- Quilon and Trivandrum.

Ref :- K. 60(S.F.T).

Type :- 'M'.

Object :—Type B :—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

   (i) N.A. (ii) Laterite. (iii) to (x) N.A.

2. TREATMENTS :

   0 = Control (no manure)

   n_1 = 44·8 Kg/ha. of N as A/S.

   n_2 = 89·6 Kg/ha. of N as A/S.

   n_1' = 44·8 Kg/ha. of N as Urea.

   n_2' = 89·6 Kg/ha. of N as Urea.

   n_1'' = 44·8 Kg/ha. of N as A/S/N.

   n_2'' = 89·6 Kg/ha. of N as A/S/N.

3. DESIGN :

Same as in Type A on page 223.

4. GENERAL :
(i) to (iii) N.A. (iv) (a) 1960. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS :

Av. yield of tubers in Q/ha.

District	No. of trials	0	n_1	n_2	n_1'	n_2'	n_1''	n_2''	G.M.	S.E./mean
Quilon	15	89·2	106·3	116·5	106·5	117·0	106·6	117·7	108·5	2·22
Trivendrum	16	81·2	93·7	103·0	96·7	105·4	97·3	106·3	97·7	0·87

———

Crop :- Tapioca.   **Ref :- K. 60(69), 61(69).**

Site :- Tuber Res. Stn., Mannuthy.   **Type :- 'CM'.**

Object :—To determine the best doses of N, P and K and the best spacing for Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) 12 C.L./ha. of Cowdung+124 tins/ha. of ash+as per treatments. (ii) Nil. (iii) 27.4.60; 15.5 61. (iv) (a) Ploughing. (b) Straight planting on mounds. (c) N.A. (d) As per treatments. (e) 22·9 cm. cutting. (v) 50 tins each of garden compost and ash were mixed and broadcasted after ploughing. (vi) H—105 (9 months) for 60(69); Malayan—4 (9 months) for 61(69). (vii) Unirrigated. (viii) 2—3 weedings, interculturing and earthing up. (ix) N.A. (x) 16.3.61; 3.3.62.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)
    (1) 3 levels of N as A/S : $N_1=56$, $N_2=112$ and $N_3=168$ Kg/ha.
    (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=67$ and $P_2=134$ Kg/ha.
    (3) 3 levels of K_2O as Mur. Pot. : $K_1=90$, $K_2=134$ and $K_3=179$ Kg/ha.
    (4) 3 spacings : $S_1=6$ rows of 12 plants at 61 cm. spacing, $S_2=4$ rows of 8 plants at 91 cm. spacing and
        $S_3=3$ rows of 6 plants at 122 cm. spacing.

P_2O_5 applied 15 days after planting. N 45 days after planting and K_2O during the third month of planting.

3. DESIGN :

(i) 3^4 fact. confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) 16·5 m.×27·4 m. (iii) 1. (iv) (a) 5·5 m. ×9·1 m. (b) 3·7 m.×7·3 m. (v) 0·9 m.×0·9 m. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tuber yield. (iv) (a) 1958—61. (b) Yes. (c) Results of combined analysis are presented under 5. Results. (v) Trivandrum, Thiruvilla. (vi) N.A. (vii) Expts. No. 58(44) and 59(45) are also included in combined analysis. Error variances are homogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 124·4 Q/ha. (ii) 24·7 Q/ha. (based on 60 d.f. made up of Treatments×years interactions). (iii) Main effects of S and N are highly significant. (iv) Av. yield of Tubers in Q/ha.

	N_1	N_2	N_3	P_0	P_1	P_2	K_1	K_2	K_3	Mean
S_1	122·0	134·3	141·8	134·6	123·5	140·0	128·5	139·3	130·3	132·7
S_2	113·6	135·9	134·2	123·1	129·0	131·6	131·7	122·5	129·5	127·9
S_3	104·6	117·1	116·4	112·8	113·2	112·1	111·2	108·1	118·8	112·7
Mean	113·4	129·1	130·8	123·5	121·9	127·9	123·8	123·3	126·2	124·4
K_1	116·4	129·7	125·1	119·2	126·9	125·3				
K_2	111·3	128·1	130·5	121·1	119·2	129·6				
K_3	112·3	129·5	136·8	130·2	119·6	128·8				
P_0	109·3	128·2	133·0							
P_1	113·5	121·5	1·0·7							
P_2	117·4	137·6	128·7							

C.D. for S or N marginal means = 6·7 Q/ha.

Crop :- Tapioca.　　　　　　　　　**Ref :- K. 60(68), 61(70), 63(44).**

Site :- Tapioca Res. Stn., Thiruvalla.　　　**Type :- 'CM'.**

Object :—To study the effect of N, P, K and spacing on Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) Cowdung at 3632 Kg/ha. in dried powdered form and as per treatments. (ii) Laterite. (iii) 7.4.60; 4.4.61 ; 30.3.63. (iv) (a) Digging, making mounds etc. (b) to (e) N.A. (v) 3632 Kg/ha. of Cowdung applied in the form of powder in shallow pits and mounds made over them. (vi) T—37 Nedumangadan (late). (vii) Unirrigated. (viii) 2 interculturings and 2 weedings. (ix) 406 cm. for 60(68); 638 cm. for 61(70); 291 cm. for 63(44). (x) 2.3.61, 2.2.62, 6.2.64.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)
　　(1) 3 levels of N as A/S : $N_1 = 56$, $N_2 = 112$ and $N_3 = 168$ Kg/ha.
　　(2) 3 levels of P_2O_5 as Super : $P_0 = 0$, $P_1 = 67$ and $P_2 = 134$ Kg/ha.
　　(3) 3 levels of K_2O as Mur. Pot. : $K_1 = 90$, $K_2 = 134$ and $K_3 = 179$ Kg/ha.
　　(4) 3 spacings : $S_1 = 0·6$ m. $\times 0·6$ m., $S_2 = 0·9$ m. $\times 0·9$ m. and $S_3 = 1·2$ m. $\times 1·2$ m.

3. DESIGN :

(i) 3^4 fact. confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) 27·4 m. $\times 16·5$ m. (iii) 1. (iv) (a) 9·1 m. $\times 5·5$ m. (b) 7·3 m. $\times 3·7$ m. (v) 0·9 m. $\times 0·9$ m.

4. GENERAL :

(i) Lodging in July due to heavy rains. (ii) Nil. (iii) Tuber yield. (iv) (a) 1959—63 (expt. for 62—N.A). (b) Yes. (c) Results of combined analysis are presented under 5 Results. (v) Trivandram,Mannuthy. (vi) N.A. (vii) Expt. for 59(46) is also taken in the pooled analysis. Error variances are homogeneous and Treatments × years interaction is present.

5. RESULTS :

(i) 169·0 Q/ha. (ii) 25·9 Q/ha. (based on 72 d.f. made up of Treatments × years interactions). (iii) Main effect of P is significant. Main effect of S is highly significant. Interaction N × S is highly significant. Interaction N × K is significant. (iv) Av. yield of tuber in Q/ha.

	N_1	N_2	N_3	S_1	S_2	S_3	K_1	K_2	K_3	Mean
P_0	155·4	173·4	163·9	161·2	171·5	160·3	162·1	167·6	163·0	164·2
P_1	161·7	174·1	171·5	163·1	181·1	163·1	162·4	170·8	174·1	169·1
P_2	176·7	171·0	173·7	165·6	180·5	175·3	170·9	174·3	176·2	173·8
Mean	164·6	172·8	169·7	163·3	177·7	166·1	165·1	170·9	171·1	169·0
K_1	160·4	164·3	170·8	160·4	175·3	159·8				
K_2	163·0	173·9	175·8	164·4	180·4	167·9				
K_3	170·4	180·3	162·4	165·0	177·5	170·7				
S_1	174·7	163·3	151·8							
S_2	168·7	183·4	181·1							
S_3	150·4	171·8	176·2							

C.D. for P or S marginal means $=7·0$ Q/ha.

C.D. for body of $N \times S$ or $N \times K$ table $= 12·2$ Q/ha.

Crop :- Tapioca.

Site :- Tapioca Res. Stn., Trivandrum.

Ref :- K. 60(67), 61(71).

Type :- 'CM'.

Object :—To study the effect of N, P, K and spacing on Tapioca.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Tapioca. (c) Cowdung at 126 Q/ha. applied before first tilling as basal dressing. (ii) (a) Laterite. (b) (iii) 19.4.60 ; 30.5.61. (iv) (a) Tilling. (b) and (c, N.A. (d) As per treatments. (e) N.A. (v) Cowdung at 126 Q/ha. applied at the time of tilling. (vi) M—4 (late). (vii) Irrigated. (viii) N.A. (ix) 171·0 cm. (x) Nil.

2. TREATMENTS:

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

   (1) 3 levels of N as A/S : $N_1=56$, $N_2=112$ and $N_3=168$ Kg/ha.
   (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=67$ and $P_2=134$ Kg/ha.
   (3) 3 levels of K_2O as Mur. Pot. : $K_1=90$, $K_2=134$ and $K_3=179$ Kg/ha.
   (4) 3 spacings : $S_1=0·6$ m. $\times 0·6$ m , $S_2=0·9$ m. $\times 0·9$ m. and $S_3=1·2$ m. $\times 1·2$ m.

3. DESIGN :

   (i) 3^4 fact. confd. (ii) (a) 9 plots/block ; 9 blocks/replication. (b) 27·4 m. $\times 16·5$ m. (iii) 1. (iv) (a) 9·1 m. $\times 5·5$ m. (b) 7·3 m. $\times 3·7$ m. (v) 0·9 m. $\times 0·9$ m. (vi) Yes.

4. GENERAL :

   (i) Lodging in July due to heavy rains. (ii) Nil. (iii) Tuber yield. (iv) (a) 1959—61. (b) Yes. (c) Results of combined analysis are presented under 5. Results. (v) Mannuthy. Thiruvilla. (vi) N.A. (vii) Expt. of 1958 and 1959 are also taken for pooling the results. Error variances are homogeneous and Treatments $\times$ years interaction is present.

5. RESULTS :

   (i) 221·3 Q/ha. (ii) 35·7 Q/ha. (based on 96 d.f. made up of various components of Treatments $\times$ years). (iii) Main effects of S and N are highly significant. Main effect K is significant. (iv) Av. yield of tuber in Q/ha.

	N₁	N₂	N₃	P₀	P₁	P₂	K₁	K₂	K₃	Mean
S₁	225·2	244·0	252·7	237·8	240·0	244·1	235·1	243·1	243·6	240·6
S₂	222·6	246·9	246·1	235·8	239·7	240·1	229·6	243·3	242·8	238·5
S₃	173·7	188·1	191.9	182·5	187·2	184·0	175·6	182·5	195·6	184·5
Mean	207·2	226·3	230·2	218·7	222·3	222·7	213·4	223·0	227·3	221·2
K₁	196·6	223·8	219·9	208·8	215·1	216·4				
K₂	211·2	226·4	231·3	221·0	228·0	219·9				
K₃	213·7	228·8	239·4	226·2	223·9	231·9				
P₀	200·3	226·8	229·0							
P₁	209·1	223·4	234·4							
P₂	212·1	228·8	227·3							

C.D. for S or N or K marginal means$=9·6$ Q/ha.

Crop :- Sugarcane (*Ratoon*) (*Rabi*).   Ref :- K. 60(54).

Site :- Sugarcane Res. Farm, Thiruvalla.   Type :- 'M'.

Object :—To study the best time of application of Potash to Sugarcane.

1. BASAL CONDITIONS:

(i) (a) Plant cane—Ratoon—Paddy. (b) Plant cane. (c) As per treatments. (ii) Loam. (iii) 18.12.59 (Ratoon). (iv) (a) to (e) N.A. (v) Nil. (vi) Co—449 (medium). (vii) Irrigated. (viii) N.A. (ix) 362 cm. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 levels of K_2O : $K_1=112$ Kg/ha. and $K_2=224$ Kg/ha.

Sub-plot treatments :

4 methods of application : $M_1=$Full dose at planting, $M_2=$Half dose at planting and half 4 months after planting, $M_3=¼$ at planting, 3/8 two months after planting and 3/8 four months after planting and $M_4=½$ at planting and ½ at the end of May.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 15·5 m.×13·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of Sugarcane. (iv) (a) 1959—60. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 750·8 Q/ha. (ii) (a) 34·3 Q/ha. (b) 55·2 Q/ha. (iii) Main effects of M alone is significant. (iv) Av. yield of sugarcane in Q/ha.

	M₁	M₂	M₃	M₄	Mean
K₁	759·5	718·3	759·5	692·0	732·3
K₂	752·7	759·7	830·0	734·9	769·3
Mean	756·1	739·0	794·7	713·3	750·8

C.D. for M marginal means $=58·0$ Q/ha.

Crop :- Sugarcane *(Rabi)*.

Ref :- K. 60(46), 61(131).

Site :- Sugarcane Res. Farm, Thiruvilla.

Type :- 'M'.

Object :—To study the effect of N, P, K and lime on growth and quality of Sugarcane.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Sugarcane. (c) C.A.N.—240 Kg/ha. fertilizer mixture—750 Kg/ha. (ii) N.A. (iii) 17.12.60. (iv) (a) Ploughing. (b) Digging. (c) Weeding. (d) Earthing up. (e) Propping. (v) A/S 125 *tonnes* /ha "PIT." method. (vi) Co—449 (medium). (vii) Irrigated. (viii) Digging, and weeding. (ix) N.A. (x) 17.12.61.

2. TREATMENTS :

All combinations of (1) and (2)
   (1) 3 levels of P_2O_5 : $P_0=0$, $P_1=56$ and $P_2=112$ Kg/ha.
   (2) 3 levels of K_2O : $K_0=0$, $K_1=112$ and $K_2=224$ Kg/ha.
Note:—112 Kg/ha. of N applied to all the plots.

3. DESIGN:

(i) Fact in R.B.D. (ii) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 15·5 m.×13·1 m. (v) Nil. (iv) Yes.

4. GENERAL :

(i) Not lodged. (ii) N.A. (iii) Yield. (iv) (a) 1960—61. (b) Yes. (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 :

(i) 9051·1 Q/ha. (ii) 2136·6 Q/ha. (based on 8 d.f. made up of Treatments×years interaction) (iii) Main effect of K alone is significant. (iv) Av. yield of sugarcane in Q/ha.

	K_0	K_1	K_2	Mean
P_0	7042·5	8661·9	9917·3	8538·9
P_1	7067·6	9917·3	10808·6	9264·5
P_2	7469·4	9816·9	10770·9	9352·4
Mean	7193 2	9465·4	10497·3	9051·1

C.D. for K marginal means=2011·4 Q/ha.

Crop :- Sugarcane.

Ref :- K. 59(200), 60(106), 61(140).

Site :- Sugarcane Research Farm (The Travancore Sugars & Chemicals) Tiruvalla.

Type :- 'M'.

Object :—To study the effect of P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane for 59(200) and 60(106) ; Paddy for 61(140). (c) 100 Kg/ha. of C/A/N+Sugarcane fertilizer mixture at 400 Kg/ha. (ii) Loam. (iii) 1.12.59 ; 17.12.60 ; 20.12.61. (iv) (a) Ploughing and digging. (b) to (e) N.A. (v) 247·1 Kg/ha. of N as A/S. (vi) Co-449 (medium). (vii) Irrigated. (viii) Weeding, digging and earthing up once. (ix) 364·6 cm. ; 389·9 cm. ; 354·6 cm. (x) 1.12.60 ; 17.12.61 ; 20.12.62.

2. TREATMENTS :

All combinations of (1) and (2)
    (1) 3 levels of P as Super : $P_0=0$, $P_1=50$ and $P_2=100$ Kg/ha.
    (2) 3 levels of K_2O as Potash : $K_0=0$, $K_1=100$ and $K_2=200$ Kg/ha.
2511 Kg/ha. of lime was applied to Rep. I and III.

3. DESIGN :

(i) Fact in R.B.D. (ii) (a) 36. (b) 118.0 m.×52.4 m. (iii) 4. (iv) (a) and (b) 15.6 m.×13.1 m. (v) Nil.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Yield of Cane. (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×years interaction is present.

5. RESULTS :

(i) 88.8 tonnes/ha. (ii) 14.6 tonnes/ha. (based on 16 d.f. made up of Treatments×years interaction). (iii) No effect is significant. (iv) Av. yield of sugarcane in tonnes/ha.

	P_0	P_1	P_2	Mean
K_0	39.6	38.9	37.8	38.8
K_1	38.8	35.3	31.7	35.2
K_2	37.6	33.1	30.8	33.8
Mean	38.7	35.8	33.4	36.0

———

Crop :- Sugarcane.   **Ref :- K. 60(53).**

Site :- Sugarcane Res. Farm, Thiruvalla.   **Type :- 'M'.**

Object :—To study the effect of lime and different levels of P and K on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Plantcane—Ratoon—Paddy. (b) Paddy. (c) Paddy mixture at 125 Kg/ha. (ii) Loam. (iii) 1 to 3.12.59. (iv) (a) 2 ploughings. (b) In furrows and ridges. (c) to (e) N.A. (v) 112 Kg/ha. of N. (vi) Co —449 (medium). (vii) Irrigated. (viii) Weeding and earthing up. (ix) 362 cm. (x) 15 and 16.12.60.

2. TREATMENTS :

Main-plot treatments :
    2 levels of lime : $L_0=0$ and $L_1=25$ Q/ha.
Sub-plot treatments :
All combinations of (1) and (2)
    (1) 3 levels of P_2O_5 : $P_0=0$, $P_1=56$ and $P_2=112$ Kg/ha.
    (2) 3 levels of K_2O : $K_0=0$, $K_1=112$ and $K_2=224$ Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 9 sub-plots/main-plots. (b) N.A. (iii) 2. (iv) (a) and (b) 15 5 m.×13.1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of Sugarcane. (iv) (a) 1958—1960. (b) No. (c) Nil. (v) to (vii). N.A.

5. RESULTS :

(i) 897·5 Q/ha. (ii) (a) 153·7 Q/ha. (b) 61·9 Q/ha. (iii) Main effect of K alone is highly significant. (iv) Av. yield of sugarcane in Q/ha.

	K_0	K_1	K_2	P_0	P_1	P_2	Mean
L_0	798·6	884·5	941·2	863·7	886·5	874·2	874·8
L_1	787·9	965·9	1006·5	926·7	928·7	904·9	920·1
Mean	793·3	925·2	973·9	895·2	907·6	889·6	897·5
P_0	799 2	937·0	949·3				
P_1	794·1	925·9	1002·7				
P_2	786·6	921·6	969·7				

C.D. for K marginal means=53·85 Q/ha.

———

Crop :- Tobacco (*Rabi*).　　　　　　　　　**Ref :- K. 60(66), 61(89).**

Site :- Tobacco Res. Stn., Kanhangad.　　　**Type :- 'M'.**

Object :—To study the effect of different levels and times of application of N on the yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Paddy. (b) Paddy. (c) Nil. (ii) Sandy soil. (iii) 15.11.60, 6.12.61. (iv) (a) Digging, levelling and forming furrows and ridges. (b) to (e) N.A. (v) 50 C.L /ha. of loose box C.M. (vi) *Paunan*. (vii) Irrigated. (viii) Hoeing, weeding, earthing, tapping and desuckering. (ix) Nil; N.A. (x) 20.2.61 ; 5.3.62.

2. TREATMENTS :

Main-plot treatments :
　3 levels of N as fish manure : N_1=202, N_2=235 and N_3=269 Kg/ha.
Sub-plot treatments :
3 times of application : T_1=Full does at transplanting, T_2=Half does at transplanting+½ after 15 days and T_3=⅓ dose after 15 days+⅓ dose after 30 days+⅓ dose after 45 days of transplanting.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main plots/replication ; 3 sub-plots/main plot. (b) N.A. (iii) 6. (iv) (a) 7·0 m. ×5·2 m. for 60(66) ; 7·9 m.×5·2 m. for 61(89). (b) 6·4 m.×4·6 m. (v) 30 cm.×30 cm. for 60(66) ; 76 cm. ×30 cm. for 61(89).

4. GENERAL :

(i) Normal. (ii) Attack of grass hopper for 60(66) and folidol was sprayed ; Aphid and Mossaic attack for 61(89) for which 0·01% Folidol was sprayed. (iii) Tobacco yield. (iv) (a) 1958—1962. (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 :

(i) 1953 Kg/ha. (ii) (a) 244·5 Kg/ha. (based on 22 d.f. made up of pooled error+Interaction of N×years) (b) 188·2 Kg/ha. (based on 66 d.f. made up of pooled error+Interactions of T and N×T with years). (iii) Main effect of T is highly significant. (iv) Av. yield of cured leaf Kg/ha

	N_1	N_2	N_3	Mean
T_1	1901	1916	2042	1953
T_2	1870	1854	1922	1882
T_3	1940	1983	2152	2025
Mean	1904	1918	2039	1953

C D. for T marginal means=88·6 Kg/ha.

Crop :- Tobacco (*Rabi*).   **Ref :- K. 60(64), 61(90), 62(22).**

Site :- Tobacco Res. Stn., Kanhangad.   **Type :- 'M'.**

Object :—To study the effect of organic and inorganic manures on the yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobocco—Paddy. (b) Paddy. (c) Nil. (ii) Sandy soil. (iii) 20.11.60 ; 13.12.61 ; N.A. (iv) (a) Ploughing, digging and levelling. (b) Planting on ridges. (c) N.A. (d) 150 cm.×76 cm. for 62(22) ; N.A. for others. (e) N.A. (v) 251 Q/ha. of C.M. for 62(22) ; 50 C.L./ha. of cm. for others. (vi) *Pannan*. (vii) Irrigated. (viii) Hoeing, weeding, earthing, topping and desuckering. (ix) Nil ; N.A., Nil. (x) 30.2.61 ; 14.3.62 ; N.A.

2. TREATMENTS :

All combinations of (1) and (2) +a control
   (1) 10 sources of 235 Kg/ha. of N : S_1=Fish manure, S_2=G.L., S_3=C.M., S_4=A/S, S_5=F.M.+G.L., S_6=F.M.+C.M., S_7=F.M.+A/S, S_8=G.M., S_9=G.L.+A/S and S_{10}=C.M.+A/S.
   (2) 2 levels of P_2O_5 as Super : P_0=0 and P_1=56 Kg/ha.
Mixture of N taken in 1 : 1 ratio.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 21. (b) N.A. (iii) 4 for 62(22) ; 6 for others. (iv) (a) 7·0 m.×5·2 m. (b) 6·4 m.×4·6 m. (v) 30 cm.×30 cm. (vi) N.A.

4. GENERAL :

(i) Good for 62(22) ; Satisfactory for others. (ii) Attack of grass hopper for 60(64) ; Attack of aphid and Massaic for 61(90) for which 0·01% Folidol was sprayed ; Slight attack of aphid for 62(22) for which 0·01% Folidol was sprayed. (iii) Yield of Tobacco. (iv) (a) 1958—62. (b) No. (c) Presented under 5. Results. (v) and (vi) Nil. (vii) Results of expt. no. 58(1) have also been included for giving the combined results

5. RESULTS :

(i) 38·6 Q/ha. (ii) 10·9 Q/ha. (60 d.f. made up of various components of Treatments×years interaction). (iii) Main effect of P alone is significant. (iv) Av. yield of tobacco in Q/ha.

Control=42·1

	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9	S_{10}	Mean
P_0	38·3	37·8	38·0	36·4	37·5	40·0	36·7	35·4	36·1	35·7	37·2
P_1	41·1	37·4	38·7	35·9	40·0	41·8	40·9	37·8	41·9	41·0	39·6
Mean	39·7	37·6	38·4	36·2	38·8	40·9	38·8	36·6	39·0	38·4	38·4

C.D. for P marginal means=2·2 Q/ha.

Crop :- Tobacco (*Rabi*).   **Ref :. K. 63(21), 64(135), 65(100).**

Site :- Tobacco Res. Stn., Kanhangad.   **Type :- 'M'.**

Object :—To fix up a manurial schedule for Chewing Tobacco.

1. BASAL CONDITIONS:

(i) (a) Tobacco—Paddy. (b) Paddy. (c) 251 Q/ha. of F.Y.M. for 63(21); Nil. 1or 64(135); N.A. for 65(100). (ii) Sandy soil. (iii) N.A., 24.11.64 ; 19.11.65. (iv) (a) 2 ploughings, digging and forming ridges and furrows. (b) to (e) N.A. (v) 250 Q/ha. of lose box. C.M. half as basal $\lceil$ dressing and half as top dressing for 63(21) ; 50 C.L./ha. of lose box C.M. as basal dressing for others. (vi) *Pannau* (local). (vii) Irrigated. (viii) Topping and desuckering for 63(21) ; N.A. for others. (ix) Nil for 63(21) ; N.A. for others. (x) N.A., 27.2.65 ; 21.2.66.

2. TREATMENTS :

All combinations of (1), (2) and (3)
  (1) 3 levels of N : $N_1 = 49$, $N_2 = 99$ and $N_3 = 148$ Kg/ha.
  (2) 3 levels of P_2O_5 : $P_1 = 49$, $P_2 = 99$ and $P_3 = 148$ Kg/ha.
  (3) 3 levels of K_2O : $K_1 = 49$, $K_2 = 99$ and $K_3 = 148$ Kg/ha.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 5·5 m.×4·9 m. for 63(21) ; 5·5 m.×5·5 m. for others. (b) 5·5 m.×4·9 m. for 63(21) ; 5·0 m.×4·4 m. for 64(135) ; 5·5 m.×5·5 m. for 65(100). (v) 28 cm.×55 cm. for 64(135) ; Nil for others.

4. GENERAL :

(i) Satisfactory. (ii) Nil. iii) Yield of green leaf. (iv) (a) 1963—65. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and all components of Treatments×years interaction excepting P×K×years are present. Hence pooled results for all factors excepting (P×K) are presented and individual results for (P×K) for different years are presented.

5. RESULTS :

(i) 208·4 Q/ha. (ii) 18·5 Q/ha. (28 d.f. made up of various components of Treatments×years interaction). (iii) None of the effects is significant. (iv) Av. yield of tobacco in Q/ha.

	P_1	P_2	P_3	K_1	K_2	K_3	Mean
N_1	207·0	211·3	207·6	215·2	204·4	206·2	208·6
N_2	205·6	206·7	208·3	210·5	209·3	200·8	206·9
N_3	210·0	209·5	209·3	209·7	213·3	205·8	209·6
Mean	207·5	209·2	208·4	211·8	209·0	204·3	208·4

63(21)

	K_1	K_2	K_3	Mean
P_1	192·3	195·2	184·8	190·8
P_2	201·4	202·3	190·5	198·1
P_3	187·3	199·3	178·6	188·4
Mean	193·7	198·9	184·6	192·4

64(135)

	K₁	K₂	K₃	Mean
P₁	237·2	225·0	209·7	224·0
P₂	234·2	228·0	211·2	224·5
P₃	230.3	231·9	228·8	230·3
Mean	233·9	228·3	216·6	226·3

65(100)

	K₁	K₂	K₃	Mean
P₁	206·6	198·9	218·2	207·9
P₂	208·8	198·9	207·1	204·9
P₃	208·2	201·7	209·3	206·4
Mean	207·9	199·8	211·6	206·4

Crop :- Tobacco.

Ref :- K. 62:(S.F.T.) for Palghat & Kozhikode.

Site :- (District) : Palghat & Kozhikòde.　　**Type :- 'M'.**

Object :—Type A_1 : To study the response curves of important cereals, cash and oilseed crops to Nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

   (i) to (vi) N.A.　(vii) Unirrigated.　(viii) to (x) N.A.

2. TREATMENTS :

   8 manurial treatments

O	=Control (no manure)
N_1	=15 Kg/ha. of N
N_2	=30 Kg/ha. of N
P_1	=30 Kg/ha. of P_2O_5
N_1P_1	=15 Kg/ha. of N+30 Kg/ha. of P_2O_5
N_2P_1	=30 Kg/ha. of N+30 Kg/ha. of P_2O_5
N_2P_2	=30 Kg/ha. of N+60 Kg/ha. of P_2O_5
$N_2P_2K_1$	=30 Kg/ha. of N+60 Kg/ha. of P_2O_5+30 Kg/ha of K_2O

   N applied as A/S, P_2O_5 as Super and K_2O as Mur. Pot.

3. DESIGN :

   A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping pattern etc. In each zone one block is selected at random. A block normally consists of a group of 50-100 villages. In each block 36 experiments are conducted in a year of which 11 are of type A_1, 11 of type A_2, 11 of type A_3 and 3 are of type C. The eleven experiments under type A_1, A_2 and A_3 are distributed as 3 on a *Kharif* cereal, 3 on a *rabi* cereal, 3 on a cash crop and 2 on oilseed. All the three type C experiments are conducted on legume crop. For the purpose of conducting the A_1, A_2 and A_3 experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type A_1, A_2 and A_3 are laid out. For conducting the three type C trials three villages are randomly selected in each block.

4. GENERAL :

   (i) to (iii) N.A. (iv) (a) 1962 for Palghat and Kozhikode. (b) and (c) N.A. (vi) Nil. (v) to (vii) N.A.

5. RESULTS :

Palghat

62(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	1507	1828	1394	2372	2748	3020	3588	187·0

Control yield=3954 Kg/ha. ; No. of trials=3.

Kozhikode

62(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	−143	1250	1371	2100	3183	3584	3842	478·8

Control yield=6237 Kg/ha. ; No. of trials=8.

————

Crop :- Tobacco.   **Ref :- K. 62 (S.F.T.) for Palghat and Kozhikode.**

Site :- (District) : Palghat and Kozhikode.   **Type :- 'M'.**

Object :—Type A_2 : To study the response curves of important cereals, cash and oilseed crops to Phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

   (i) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

   8 manurial treatments :

       N_0=Control (no manure).
       N_1=25 Kg/ha. of N.
       P_1=25 Kg/ha. of P_2O_5.
       P_2=50 Kg/ha. of P_2O_5.
       N_1P_1=25 Kg/ha. of N+25 Kg/ha. of P_2O_5.
       N_1P_2=25 Kg/ha. of N+50 Kg/ha. of P_2O_5.
       N_2P_2=50 Kg/ha. of N+50 Kg/ha. of P_2O_5.
       $N_2P_2K_2$=50 Kg/ha. of N+50 Kg/ha. of P_2O_5+50 Kg/ha. of K_2O.
       N applied as A/S, P_2O_5 as Super and K_2O as Mur. Pot.

3. DESIGN :

   Same as the expt. type A_1 on page 233.

4. GENERAL :

   (i) to (iii) N.A. (iv) (a) 1962 for Palghat and Kozhikode. (v) to (vii) N.A.

5. RESULTS :

Palghat

62(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	2387	2219	2278	2545	3227	3454	3598	452·3

Control yield=4443 Kg/ha. ; No. of trials=3.

Kozhikode
62(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of grain in Kg/ha.	220	845	1945	2291	3007	4134	4947	371·0

Control yield=6635 Kg/ha. ; No. of trials=8.

Crop :- Tobacco.

Ref :- K. 62(S.F.T.) for Palghat and Kozhikode.

Site :- (District) : Palghat and Kozhikode. **Type :- 'M'.**

Object :—Type A_3 : To study the response curves of important cereals, oilseed and cash crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 Manurail Treatments :

N_0 = Control (no manure).
N_1 = 15 Kg/ha. of N.
K_1 = 60 Kg/ha. of K_2O.
K_2 = 120 Kg/ha. of K_2O.
N_1K_1 = 15 Kg/ha. of N+60 Kg/ha. of K_2O.
N_1K_2 = 15 Kg/ha. of N+120 Kg/ha. of K_2O.
N_2K_2 = 30 Kg/ha. of N+120 Kg/ha. of K_2O.
$N_1P_1K_1$ = 15 Kg/ha. of N+30 Kg/ha. of P_2O_5+60 Kg/ha. of K_2O.
N applied as AS, P_2O_5 as Super and K_2O Mur. Pot.

3. DESIGN :

Same as in Type A_1 on page 233.

4. GENERAL:

(i) to (iii) N.A. (iv) 1962. (v) to (vii) N.A.

5. RESULTS:

Palghat
62(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of grain in Kg/ha.	148	—49	178	188	198	316	1433	601·9

Control yield =2273 Kg/ha. ; No. of trials=2.

Kozhikode
62(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of grain in Kg/ha.	722	1384	2604	2436	3150	4235	4359	333·4

Control yield=5883 Kg/ha. ; No. of trials=8.

Crop :- Tobacco (*Rabi*).   **Ref :- K. 60(65), 61(91).**

Site :- Tobacco Res. Stn., Kanhangad.   **Type :- 'C'.**

Object :—To study the effect of different spacings and topping on the yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Paddy. (b) Paddy. (c) Nil. (ii) Sandy soil. (iii) 18.11.60 ; 9.12.61. (iv) (a) Digging and levelling. (b) Planting on ridges. (e) and (d) As per treatments. (e) —. (v) 50 C.L./ha. of loose box C.M. (vi) *Pannan*. (vii) Irrigated. (viii) 3 hoeings, 3 weedings, 2 earthings and desuckering. (ix) Nil ; N.A. (x) 28.2.61 ; 21.3.62.

2. TREATMENTS :

Main-plot treatments :

3 spacings : S_1=91 cm.×76 cm. (48 plants/plot), S_2=91 cm.×61 cm. (60 plants/plot) and S_3=91 cm. ×46 cm. (80 plants/plot).

Sub-plot treatments :

3 numbers of leaves topped/plant : L_1=11, L_2=13 and L_3=15.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 9·8 m. ×4·3 m. (b) 9·1 m.×3·6 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Light attack of grass hopper for 60(65) for which Folidol was sprayed at 1 oz. in 20 gallons of water ; Attack of aphid and mossaic for 61(91) for which Folidol 0·01% was sprayed. (iii) Tobacco yield. (iv) (a) 1958—63. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Data for 62 and 63—N.A.

5. RESULTS :

60(65)

(i) 18·4 Q/ha. (ii) (a) 2·6 Q/ha. (b) 2·1 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of tobacco in Q/ha.

	S_1	S_2	S_3	Mean
L_1	19·3	18·3	17·2	18·3
L_2	19·4	17·7	18·4	18·5
L_3	19·6	18·5	17·5	18·5
Mean	19·4	18·2	17·7	18·4

61(91)

(i) 14·8 Q/ha. (ii) (a) 1·2 Q/ha. (b) 1·5 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of tobacco in Q/ha.

	S_1	S_2	S_3	Mean
L_1	14·4	14·8	13·7	14·3
L_2	15·9	16·1	14·2	15·4
L_3	14·6	14·4	14·8	14·6
Mean	15·0	15·1	14·2	14·8

Crop :- Tobacco (*Rabi*).

Site :- Tobacco Res. Stn., Kanhangad.

Ref :- K. 65(99).

Type :- 'CM'.

Object :— To find out interaction of spacing and different levels of Nitrogen on the yield and quality of Tobacco.

1. BASAL CONDITIONS:

(i) (a) Tobacco—paddy. (b) Paddy. (c) N.A. (ii) Sandy. (iii) 22.11.65. (iv) (a) to (e) N.A. (v) 20 cart loads of loose box cattle manure per acre prior to transplanting. (vi) *Pannan* (local variety). (vii) Irrigated. (viii) 2 weedings, desuckering and topping. (ix) N.A. (x) 23.2.66.

2. TREATMENTS :

Main-plot treatments :

3 spacings : S_1=120 cm. × 50 cm., S_2=120 cm. × 70 cm. and S_3=120 cm. × 90 cm.

Sub-plot treatments :

3 levels of N as A/S : N_1=25, N_2=50 and N_3=75 Kg/ha.

.DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) Five. (iv) (a) and (b) varies according to the treatments. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Green weight. (iv) to (vii) N.A.

5. RESULTS :

(i) 54 Kg/ha. (ii) (a) 5·2 Kg/plot. (b) 4·0 Kg/ha. (iii) Main effects of S and N are highly significant. (iv) Av. yield of Tabacco in Kg/ha.

	S_1	S_2	*S_3	Mean
N_1	49	52	57	53
N_2	50	60	57	56
N_3	51	55	51	52
Mean	50	55	55	54

C.D. for S marginal means=2·7 Kg/ha.

C.D. for N marginal means=3·0 Kg/ha.

———

Crop :- Tobacco (*Rabi*).

Site :- Tobacco Res. Stn., Kanhangad.

Ref :- K. 63(22).

Type :- :CM'.

Object :—To find out the effect of spacing and different levels of N on the yield of Chewing Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Paddy. (b) Paddy. (c) 251 Q/ha. of C.M. (ii) Sandy. (iii) N.A. (iv) (a) Digging with spade. (b) 2 ploughings. (c) to (e) N.A. (v) Loose box cattle manure in two doses : 5 tonnes as basal and 5 tonnes as top dressing. (vi) *Pannan*. (vii) Irrigated. (viii) Topping and de-suckering. (ix) Nil. (x) N.A.

2. TREATMENTS:

Main-plot treatments :

 3 spacings : S_1=120 cm. × 50 cm., S_2=120 cm. × 70 cm. and S_3=120 cm. × 90 cm.

Sub-plot treatments :

 3 levels of N : N_1=62, N_2=124 and N_3=185 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 5·5 m. × 4·9 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Height, total no. of leaves, leaf area and leaf yield. (iv) to (vii) N.A.

5. RESULTS :

(i) 179·7 Q/ha. (ii) (a) 23·7 Q/ha. (b) 21·5 Q/ha. (iii) None of the effects is significant. (iv) Av. yield in Q/ha.

	N_1	N_2	N_3	Mean
S_1	179·2	170·5	166·1	171·9
S_2	179·8	179·2	183·6	180·9
S_3	191·1	181·7	186·1	186·3
Mean	183·4	177·2	178·6	179·7

———

Crop :- Tobacco (*Rabi*).

Site :- Tobacco Res. Stn., Kanhangad.

Ref :- K. 64(134).

Type :- 'CM'.

Object :—To find out the effect of spacing and different levels of Nitrogen on the yield and quality of chewing Tobacco.

1. BASAL CONDITIONS:

(i) (a) Paddy—Tobacco. (b) Paddy. (c) Nil. (ii) Sandy. (iii) 17.11.64. (iv) (a) Digging and levelling. (b) to (e) Nil. (v) 20 C.L. of loose box C.M. as basal dressing. (vi) *Pannan* (local). (vii) Irrigated. (viii) and (ix) N.A. (x) 6.3.65.

2. TREATMENTS :

Main-plot treatments :

 3 spacings : S_1=120 cm. × 50 cm., S_2=120 cm. × 70 cm. and S_3=120 cm. × 90 cm.

Sub-plot treatments :

 5 levels of N : N_1=62, N_2=124 and N_3=185 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 5·5 m. × 4·9 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) to (vii) N.A.

5. RESULTS :

(i) 177·6 Q/ha. (ii) (a) 17·3 Q/ha. (b) 14·9 Q/ha. (iii) Main effect of S is highly significant. (iv) Av. yield of grain in Kg/ha.

	S$_1$	S$_2$	S$_3$	Mean
N$_1$	169·2	176·7	188·6	178·2
N$_2$	156·1	181·1	195 5	177·6
N$_3$	169·9	183·6	177·9	177·2
Mean	165·1	180·5	187·3	177·6

C.D. for S marginal means = 12·9 Q/ha.

— — —

Crop :- Gingelly (*Rabi*).

Site :- Oil Seed Rcs. Stn., Kayamkulam.

Ref :- K. 65(97).

Type :- 'M'.

Object :— To find cut the residual effect of fertilisers applied to second crop Paddy on tne succeeding sesamum crop.

1. BASAL CONDITIONS:

(i) (a) Paddy—Paddy—Sesamum. (b) Paddy. (c) As per the schedule shown under the treatments. (ii) Sandy loam. (iii) 22.1.65. (iv) (a) Ploughing, harrowing, breaking clods, digging with space and removing weeds. (b) to (e) N.A. (v) N, P and K applied as per schedule under treatments. (vi) local. (vii) Unirrigated. (viii) Digging the inter space of sesamum and weeding the crop was carried out twice during the crop pericd. (ix) Not recorded. (x) 10.4.65.

2. TREATMENTS :

All ccmbinations of (1), (2) and (3)
(1) 3 levels of N : N$_0$=0, N$_1$=33·6 and N$_2$=67·2 Kg/ha.
(2) 3 levels of P$_2$O$_5$: P$_0$=0, P$_1$=16·8 and P$_2$=33·6 Kg/ha.
(iii) 3 levels of K$_2$0 : K$_0$=0, K$_1$=16·8 and K$_2$=33·6 Kg/ha.

3. DESIGN :

(i) 3^3 Partially ccnfd. (ii) (a) 9 plots/blcck ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 8 5 m. × 4·0 m. (b) 8·5 m. × 3·2 m. (v) Three rows in each side. (vi) Yes.

4. GENERAL :

(i) Due to lack of rain the crop did not attain the required height. (ii) Nil. (iii) Date of germination, date of flowering, date of harvesting and yield were recorded. (iv) (a) 1965 only. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 84 Kg/ha. (ii) 38·1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of Sesamum in Kg/ha.

	P$_0$	P$_1$	P$_2$	K$_0$	K$_1$	K$_2$	Mean
N$_0$	82	95	74	83	90	77	83
N$_1$	76	98	90	107	69	87	88
N$_2$	79	80	84	78	68	98	81
Mean	79	91	82	89	76	87	84
K$_0$	80	85	103				
K$_1$	71	87	69				
K$_2$	86	100	75				

— — —

Crop :- Paddy.

Site .- (District): Palghat and Kozhikode.   **Type :- 'M'.**

Object :— Type A_1 : To study the response curves of important cereals, cash and oilseed crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS:

   (i) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

   8 manurial treatments :

   N_0 =Control (no manure).
   N_1 =25 Kg/ha. of N
   N_2 =50 Kg/ha. of N
   P_1 =25 Kg/ha. of P_2O_5
   N_1P_1 =25 Kg/ha. of N+25 Kg/ha. of P_2O_5
   N_2P_1 =50 Kg/ha. of N+25 Kg/ha. of P_2O_5
   N_2P_2 =50 Kg/ha. of N+50 Kg/ha. of P_2O_5
   $N_2P_2K_1$ =50 Kg/ha. of N+50 Kg/ha. of P_2O_5+25 Kg/ha. of K_2O

3. DESIGN :

   A selected district is divided into four agriculturally homogeneouous zones based on climate, soil, cropping pattern etc. In each zone one block is selected at random. A block normally consists of a group of 50—100 villages. In each block 35 experiments are conducted in a year of which 11 are of type A_1, 11 of type A_2, 11 of type A_3 are distributed as 3 on kharif cereal, 3 on a rabi cereal, 3 on a cash crop and 2 on oil seed. All the three type—C experiments are conducted on a legume crop. For the purpose of conducting the A_1, A_2 and A_3 experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type A_1, A_2 and A_3 are laid out. For conducting the three type—C trials tnree villages are randomly selected in each block.

4. GENERAL:

   (i) to (iii) N.A. (iv) (a) 1960 (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS:

Palghat

62(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	73	183	128	168	75	357	268	130·9

Control yield=143 Kg/ha. ; No. of trials=2.

63(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	77	123	56	182	275	340	530	24·2

Control yield=608 Kg/ha. ; No. of trials=4.

Kozhikode

62(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of grain in Kg/ha.	110	203	192	271	339	447	531	59·8

Control yield=485 Kg/ha.; No. of trials=7.

63(S.F.T.)

Treatment	N_1	N_2	P_1	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of gingelly in Kg/ha.	256	391	208	452	633	778	913	70·2

Control yield =952 Kg/ha. ; No. of trials=8.

———

Crop :- Gingelly

Ref :- K. 62, 63 (S.F.T) for Kozhikode and Palghat.

Site :- (District) : Palghat, Kozhikode.

Type :- 'M'.

Object :—Type A_2 : To study the response of curves of important, cash crops, cereals and oilseed crop to phosphorous applied singly and combinations.

1. **BASAL CONDITIONS :**

   (i) to (vi) N.A.   (vii) Unirragated.   (viii) to (x) N.A.

2. **TREATMENTS:**

   8 Manurial Treatments :
   N_0 = Control(no Manure)
   N_1 = 25 Kg/ha. of N
   P_1 = 25 Kg/ha. of P_2O_5
   P_2 = 50 Kg/ha. of P_2O_5
   N_1P_1 = 25 Kg/oa. of N+25 Kg/ha. of P_2O_5
   N_1P_2 = 25 Kg/ha. of N+50 Kg/ha. of P_2O_5
   N_2P_2 = 50 Kg/ha. of N+50 Kg/ha. of P_2O_5
   $N_2P_2K_2$ = 50 Kg/ha. of N+50 Kg/ha. P_2O_5+50 Kg/aa. of K_2O
   N applied as A/S, P_2O_5 as Super and K_2O as Mur. Pot.

3. **DESIGN :**

   Same as in experiment Type A_1 on page 240.

4. **GENERAL :**

   (i) to (iii) N.A.   (iv)   (a) 1962 to 1963. (v) to (vii) N.A.

5. **RESULTS :**

Kozhikode

62(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of gingelly in Kg/ha.	102	114	174	253	302	429	578	60·3

Control yield =467 Kg/ha.; No. of trials=7.

63(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of gingelly in Kg/ha.	175	206	288	419	485	749	1010	63·

Control yield=850 Kg/ha.; No. of trials=8.

Palghat

62(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_1P_2	N_2P_2	$N_2P_2K_2$	S.E.
Av. response of gingelly in Kg/ha.	—109	—110	—100	8	73	272	277	61·4

Control yield=462 Kg/ha. ; No. of trials=2.

63(S.F.T.)

Treatment	N_1	P_1	P_2	N_1P_1	N_2P_1	N_2P_2	$N_2P_2K_1$	S.E.
Av. response of gingelly in Kg/ha.	73	96	194	170	269	308	395	31·6

Control yield=635 Kg/ha. ; No. of trials=4.

— — —

Crop :- Gingelly.

Site :- (District) Palghat, Kozhikode.

Ref :- K. 62(S.F.T.) 63 for Palghat Kozhikode.

Type :- 'M'.

Objects: —Type A_3 : To study the response curves of important cereal, cash and oilseeds crops to Potash applied singly, in combination with other nutrients.

1. BASAL CONDITIONS :

   (i) to (vi) N.A. (vii) Unirregated. (viii) to (x) N.A.

2. TREATMENTS :

   8 Manurial Treatments

   N_0 = Control (No Mannure)
   N_1 = 25 Kg/ha. of N
   K_1 = 25 Kg/ha. of K_2O
   K_2 = 51 Kg/ha. of K_2O
   N_1K_1 = 25 Kg/ha. of N+25 Kg/ha. of K_2O
   N_1K_2 = 25 Kg/ha. of N+50 Kg/ha. of K_2O
   N_2K_2 = 50 Kg/ha. of N+50 Kg/ha. of K_2O
   $N_1P_1K_1$ = 25 Kg/ha. of N+25 Kg/ha. of P_2O_5 +25 Kg/ha. of K_2O

   N applied as A/S, P_2O_5 as Super, K_2O as Mur. Pot.

3. DESIGN :

   Same as in Type A_1 on page 240.

4. GENERAL :

   (i) to (iii) N.A. (iv) 1962 only. and Kozhikode. (v) to (vii) N.A.

5. RESULTS :

Palghat

62(S.F.T.)

Treatment	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
Av. response of gingelly in Kg/ha.	71	114	130	177	207	383	452	48·1

Control yield=321 Kg/ha. ; No. of trials=2.

Kozhikode

62(S.F.T.)

Treatment Av. response of	N_1	K_1	K_2	N_1K_1	N_1K_2	N_2K_2	$N_1P_1K_1$	S.E.
gingelly in Kg/ha.	89	87	243	209	315	385	478	42·8

Control yield = 503 Kg/ha. ; No. of trials=7.

———

Crop :- Gingelly.   **Ref :- K. 64(143).**

Site :- Oilseeds Res. Stn., Eruthempathy.   **Type :- 'C'.**

Object :—To find out the optimum time of sowing for sesamum in uplands.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) and (c) N.A. (ii) Lateritic. (iii) As per treatments. (iv) (a) 6 ploughings. (b) Dibbling. (c) 3 to 6 Kg/ha. (d) 15 cm. between rows. (e) 1. (v) N.A. (vi) Pattambi (late). (vii) Unirrigated. (viii) Thinning the seedlings, weedings and interculturing once. (ix) N.A. (x) 9 to 24.12.64.

2. TREATMENTS :

   3 dates of sowing : D_1=17.8.64, D_2=24.8.64 and D_3=31.8.64.

3. DESIGN :

   (i) R.B.D. (ii) (a) 3. (b) 9·9 m.×27·2 m. (iii) 8. (iv) (a) 9·6 m.×8·4 m. (b) 9 0 m.×7·5 m. (v) 0·3 m. ×0·5 m. (vi) Yes.

4. GENERAL:

   (i) Good. (ii) Nil. (iii) Yield of sesamum. (iv) (a) 1964 only. (b) Nil. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

   (i) 87 Kg/ha. (ii) 33·9 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	98	76	87

———

Crop :- Gingelly.   **Ref :- K. 64(142).**

Site :- Oilseeds Res. Stn., Eruthempathy.   **Type :- 'C'.**

Object :—To find out the optimum seed rate for Sesamum.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) and (c) N.A. (ii) Lateritic. (iii) 18.8.64. (iv) (a) 6 ploughings. (b) Dibbling. (iii) As per treatments. (d) 15 cm.×15 cm. (e) 1. (v) N.A. (vi) Pattambi (late). (vii) Unirrigated. (viii) 1 weeding and 1 interculturing. (ix) N.A. (x) 10.2.64.

2. TREATMENTS :

   4 seed rates : R_1=3, R_2=4, R_3=5 and R_4=6 Kg/ha.

3. DESIGN :

   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) and (b) 4·5 m.×6·0 m. (v) Nil. (vi) Yes.

4. GENERAL :

   (i) and (ii) Nil. (iii) Yield of sesamum. (iv) (a) 1964 only. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS ;

(i) 136 Kg/ha. (ii) 28·7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sesamum in Kg/ha.

Treatment	R_1	R_2	R_3	R_4
Av. yield	152	134	137	121

————

Crop :- Gingelly.   **Ref :- K. 65(98).**

Site :- Oilseeds Res. Stn., Kayamkulam.   **Type :- 'C'.**

Object :—To find out the optimum spacing for the best performance of Sesamum crop.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy—Sesamum. (b) Paddy. (c) 123·6 Kg/ha. of A/S, 123·6 Kg/ha. of Super phosphate, 61·8 Kg/ha. of Mur. of Pot. was applied to the Paddy crop. (ii) Sandy loam. (iii) 6.2.66. (iv) (a) Ploughing, harrowing, interculturing, thinning and weeding. (b) to (e) N.A. (v) 74·1 Kg/ha. of A/S, 37·1 Kg/ha. of Super Phosphate. 74·1 Kg/ha. of Mur. of Pot. was applied as basal dose. (vi) Early (70 to 75 days) (vii) Unirrigated. (viii) Thinning, weeding and intercultural operations were done twice during the crop period. (ix) 95·7 m.m. (x) 18.4.66.

2. TREATMENTS:

6 spacings : S_1=15·2 cm.×15·2 cm. S_2=15·2 cm.×22·9 cm. S_3=22·3 cm.×22·9 cm. S_4=22·9 cm.×30·5 cm. S_5=15·2 cm.×30·5 cm. and S_6=30·5 cm.×30·5 cm.

3. DESIGN:

(i) R.B.D. (ii) (a) N.A. (b) Nil. (iii) 5. (iv) (a) 548·6 cm.×274·3 cm. (b) Vary according treatments. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Slight attack of shoot and pod catter pillar was effectively controlled by dusting with 10% B.H.C. (iii) Yield of grain. (iv) (a) 1965—only. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 1162·8 Kg/ha. (ii) 190·4 Kg/ha. (iii) The treatment effects are not significant. (iv) Av. yield of sesamum in Kg/ha.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	1279·2	1202·5	1131·2	1190·7	1145·1	1028·1

————

Crop :- Groundnut (*Kharif*).   **Ref :- K. 65(68).**

Site :- Integrated Seed Development Farm, Eruthempathy.   **Type :- 'M'.**

Object :—To formulate manurial schedule for *Red Pollachi* Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) 10 Kg/ha. of N + 15 Kg/ha. of P and 30 Kg/ha. of K. (ii) Balcareous. (iii) 6 and 7.5.65. (iv) (a) Ploughed and pulverised the soil to a depth of 10 cm. (b) Dibbling. (c) to (e) N.A. (v) Fertilisers applied as per treatments. (vi) *Red Pollachi* (early). (vii) Unirrigated. (viii) 2 intercultures 20 and 40 days after sowing. (ix) N.A. (x) 13.9.65.

2. TREATMENTS :

Main-plot treatments :

3 methods of application of lime : $L_0=$ No lime, $L_1=$Lime at 200 Kg/ha. as basal dressing and $L_2=$ Lime at 200 Kg/ha. as top dressing.

Sub-plot treatments :

5 manurial treatments : $M_0=0$, $M_1=10$ Kg/ha. of N+15 Kg/ha. of P+30 Kg/ha. of K, $M_2=10$ Kg/ha. of N+30 Kg/ha. of each 0f P and K, $M_3=10$ Kg/ha. of N+15 Kg/ha. of P+45 Kg/ha. of K and $M_4=10$ Kg/ha. of N+30 Kg/ha. of P+45 Kg/ha. of K.

8. DESIGN :

(i) Split plot. (ii) (a) 3 main-plots/replication, 5 sub-plots/main-plot. (b) 39.0 m.×9.6 m. (iii) 4. (iv) (a) 7.8 m.×9.6 m. (b) 6.0 m.×9.0 m. (v) and (vi) Yes.

4. GENERAL :

(i) No lodging. (ii) Nil. (iii) Periodical observations on general growth, flowering were taken. Dry pod yield was also noted. (iv) 1965 – N.A. (b) Yes. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 661 Kg/ha. (ii) (a) 173.5 Kg/ha. (b) 228.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of dry pods in Kg/ha.

	M_0	M_1	M_2	M_3	M_4	Mean
L_0	699	662	620	801	606	678
L_1	620	597	741	704	630	658
L_2	588	750	583	565	745	646
Mean	636	670	648	690	660	661

Crop :- Groundnut (*Kharif*).　　　　　　　**Ref :- K. 64(139).**

Site :- Oilseed Res. Stn., Eruthempathy.　　**Type :- 'M'.**

Object :—To formulate a manurial schedule for *Red Pollachi* Groundnut.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite soil with fair admixture of sand. (iil) 1.6.64. (iv) (a) 6 ploughings. (b) (b) Dibbling. (c) to (e) N.A. (v) 10 Kg/ha. of N+30 Kg/ha. of P_2O_5 and K_4O as basal dressing. (vi) *Red pollachi* (medium). (vii) Unirrigated. (viii) 2 weedings and hoeing at monthly intervals. (ix) N.A. (x) 27.9.64.

2. TREATMENTS :

Main-plot treatmnets :

3 methods of application of 200 Kg/ha. of lime : $L_0=$No lime, $L_1=$Basal dressing and $L_2=$Top dressing.

Sub-plot treatments :

5 levels of manures : $M_0=$No manure, $M_1=10$ Kg/ha. of N+30 Kg/ha. of P_2O_5+30 Kg/ha. of K_2O ; $M_2=10$ Kg/ha. of N+15 Kg/ha. P_2O_5+30 Kg/ha. of K_4O ; $M_3=10$ Kg/ha. of N +15 Kg/ha. of P_2O_5+45 Kg/ha. of K_2O and $M_4=10$ Kg/ha. of N+30 Kg/ha. of P_2O_5+45 Kg/ha. of K_2O.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main plots/replications and 5 sub-plots/main plots. (b) 43.0 m. ×30.8 m. (iii) 4. (iv) (a) 9.6 m.×7.8 m. (b) 9.0 m.×6.0 m. (v) 0.3 m.×0.9 m. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of dry pods. (iv) (a) 1964—N.A. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

(i) 663 Kg/ha. (ii) (a) 143·6 Kg/ha. (b) 77·7 Kg/ha. (iii) Main effect of M is highly significant. (iv) Av. yield of dry pods in Kg/ha.

	M_0	M_1	M_2	M_3	M_4	Mean
L_0	574	667	634	685	676	647
L_1	556	736	662	667	745	673
L_2	579	694	713	694	662	668
Mean	570	699	670	682	694	663

C.D. for M marginal means=64·2 Kg /ha.

Crop :- Groundnut (*Kharif*).   **Ref :- K. 65(69).**

Site :- Integrated Seed Development Farm, Eruthempathy.   Type :- 'C'.

Object :—To find out suitable time of sowing of Groundnut in Kerala.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) 10 Kg/ha. of N+15 Kg/ha.of P+30 Kg/ha. of K. (ii) Balcareous, (iii) Sown 15 and 30.4.65/15.5.65. (iv) (a) Ploughed the soil and pulverised to a depth of 10 cm. (b) Dibbling. (c) N.A. (d) 30 cm.×10 cm. (e) Nil. (v) Nil. (vi) *Red pollachi* (early). (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 27.8.65 and 3.9.65.

2. TREATMENTS:

3 dates of sowing : T_1=15.4.1965, T_2=30.4.1965 and T_3=15.5.1965.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 7·6 m.×21·8 m. (iii) 8. (iv) (a) 7·6 m.×6·6 m. (b) 6·0 m.×6·0 m. (v) and (vi). Yes.

4. GENERAL:

(i) No lodging. (ii) Nil. (iii) Periodical observations were conducted on flowering peg formation and general growth. (iv) (a) 1965—contd. (b) No. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

(i) 4968 Kg/ha. (ii) 892·7 Kg/ha. (iii) Treatment differences are highly significant, (iv) Av. yield of grain in Kg/ha.

Treatment	T_1	T_2	T_3
Av, yield	6306	6372	2226

C.D.=957·4 Kg/ha.

Crop :- Groundnut (*Kharif*).   **Ref :- K. 65(70)·**

Site :- Integrated Seed Development Farm, Eruthempathy.   Type :- 'C'.

Object :—To find out suitable time of sowing of Groundnut in Kerala.

1. BASAL CONDITIONS :

(i) (a) Nil.   (b) Groundnut.   (c) N.P.K.—10 : 15 : 30 Kg/ha.   (ii) Balcareous.   (iii) As per treatments. (iv) (a) Ploughed the soil and pulverised to a depth of 10 cm.   (b) to (e) N.A.   (v) Nil.   (vi) *Red pollachi* (early).   (vii) Unirrigated.   (viii) 2 intercultures.   (ix) N.A.   (x) 27.8.65 and 3.9.65.

2. TREATMENTS :

3 levels of sowing : T_1=15.4.1965, T_2=30.4.1965. and T_3=15.5.1965.

3. DESIGN:

(i) R.B.D.   (ii) (a) 3.   (b) 7·6 m.×21·8 m,   (iii) 8.   (iv) (a) 7·6 m.×6·6 m.   (b) 6·0 m.×6·0 m.   (v) and (vi) Yes.

4. GENERAL :

(i) No lodging.   (ii) Nil.   (iii) Periodical observations were conducted on flowering, peg formation and general growth. Dry pod yield was also noted.(iv) (a) 1965 contd. (b) No. (c) N.A. (v) and(vi) N.A. (vii) Nil.

5. RESULTS :

(i) 675 Kg/ha.   (ii) 150 Kg/ha.   (iii) Treatment differences are highly significant.   (iv) Av. yield of dry pods in Kg/ha.

Treatment	T_1	T_2	T_3
Av. yield	698	910	417

C.D.=160·9 Kg/ha.

— — — —

Crop :- Groundnut (*Kharif*).   **Ref :- K. 65(67).**

Site :- Integrated Seed Development Farm, Eruthempathy.   Type :- 'C'.

Object :—To find out proper spacing of Groundnut in Kerala.

1. BASAL CONDITIONS :

(i) (a) Nil.   (b) Groundnut.   (c) As in 65 (68).   (iii) Balcareous.   (iii) 29.4.65.   (iv) (a) Ploughed the soil to a depth of 10 cm.   (b) Dibbling.   (c) N.A.   (d) 10 cm.×30 cm.   (e) 1.   (v) N.P.K.=10 : 15 : 30Kg/ha. (vi) *Red pollachi* (early).   (vii) Unirrigated.   (viii) 2 intercultures.   (ix) N.A.   (x) 30·8.65.

2. TREATMENTS :

5 spacing : S_1=30 cm.×10 cm, S_2=30 cm.×15 cm, S_3=30 cm.×20 cm, S_4=30 cm.×25 cm. and S_5=30 cm. ×30 cm.

3. DESIGN :

(i) R.B.D.   (ii) (a) 5.   (b) 39·0 m.×9·6 m.   (iii) 6.   (iv) (a) 9·6 m.×7·8 m.   (b) 9·0 m.×6·0 m.   (v) and   (vi) Yes.

4. GENERAL :

(i) Not lodged.   (ii) Nil.   (iii) Periodical observations on growth flowering and pegging were conducted. Dry pod yield was noted. (iv) (a) 1965—contd.   (b) No.   (c) N.A.   (v) No.   (vi) and (vii) Nil.

5. RESULTS :

(i) 756 Kg/ha.   (ii) 95·7 Kg/ha.   (iii) Treatment differences are highly significant.   (iv) Av. yield of dry pods in Kg/ha.

Treatment	T_1	T_2	T_3	T_4	T_5
Av. yield	929	830	667	725	630

C.D.=115·26 Kg/ha.

———— ——

Crop :- Pepper.

Site :- Pepper Res. Stn., Thodupuzha.

Ref :- K. 63(11), 64(106).

Type :- 'M'.

Object :—To determine the optimum manurial requirements of Pepper for high yield.

1. BASAL CONDITIONS :

(i) (a) Forest land cleared in 1957. During 60, 61 and 62 manures at the rate of 1·4 Kg/ha. of A/S+85 gm. of Super+57 gm. of Mur. Pot. applied to each Vine. In 63 fertilisers as per treatments are applied. (ii) Laterite soil. (iii) Rooted Vines. (iv) *Valiyakaniyakadan.* (v) Planting of rooted Vines in June, 1959 with 3 m.×3 m. spacing. (vi) 3 months old. (vii) N.A. for 63(11), Compost at 3·6 Kg/Vine+lime at 340 gm/Vine for 64(106). (viii) Weeding and mulching. (ix) Nil. (x) Irrigated. (xi) 363 cm. and 397 cm. respectively. (xii) January and February 1964; and January, 65.

2. TREATMENTS :

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

    (1) 3 levels of N as A/S : N_0=0, N_1=44·8 and N_2=89·7 Kg/ha.

    (2) 3 levels of P_2O_5 as Super : P_0=0, P_1=44·8 and P_2=89·7 Kg/ha.

    (3) 3 levels of K_2O as Mur. Pot. : K_0=0, K_1=22·4 and K_2=44·8 Kg/ha.

N applied in two equal doses at an interval of 5 days. P and K applied 15 days after the application of 1st. dose of N. Fertilisers applied around the vines 23 to 30 cm. away and slightly worked into the soil. All manures applied in August.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 4. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil in 1963 (11). Incidence of wilt observed in 64(106) controlled by applying Aretan. (iii) Yield of pepper. (iv) (a) 1963—64. (b) Nil. (v) and (vi) N.A. (vii) and (viii) Nil.

5. RESULTS :

63(11)

(i) 118 gm./plot. (ii) 143 gm./plot. (iii) None of the effects is signficant. (iv) Av. yield of pepper in gm./plot.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	81	104	115	93	105	102	100
P_1	99	91	176	102	130	134	122
P_2	161	129	108	48	117	233	133
Mean	114	108	133	81	117	156	118
K_0	55	122	67				
K_1	142	75	135				
K_2	144	127	198				

64(106)

(i) 309 gm./plot. (ii) 433 gm./plot. (iii) None of the effects is significant. (iv) Av. yield of pepper in gm./plot.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	267	383	164	308	342	164	271
P_1	194	147	538	361	222	296	293
P_2	219	311	562	279	317	497	364
Mean	227	280	421	315	294	319	319
K_0	146	253	549				
K_1	315	276	290				
K_2	220	312	425				

— —

Crop :- Pepper. **Ref :- K. 61(112), 63(9), 64(129).**

Site :- Pepper Res. Stn., Taliparamba. **Type :- 'C'.**

Object :—To determine the optimum pruning treatments of *Eythrina indica* standards for proper growth of Pepper vines.

1. BASAL CONDITIONS :

(i) Scrub jungle cleared for planting pepper. (ii) Red laterite gravelly soil. (iii) Unrooted cuttings ta en from the basal branches of vines. (iv) *Piper Nigrum* L. *Kalluvally*. (v) Planted in June, 1952 with spacing 3·7 m. × 3·7 m. (vi) Fresh unrooted cuttings. (vii) Nil in 61(112); 500 gm. of pepper mixture to each standard in 63(9); 1 Kg. of pepper mixture to each vine in 64(129). (viii) 2 diggings, weeding, tying up the vines and mulching. (ix) Nil. *Calapagoniun muconides* a cover crop is grown. (x) Unirrigated. (xi) 625 cms; 394 cms; 383 cms. (xii) January,1962; 19.2.1964; February, 1965.

2. TREATMENTS :

3 cultural treatments : C_1=Complete lopping of all branches of the standards in March—April every year, C_2=Lopping half the number of branches of the standard in March—April every year and C_3=No lopping of the branches of the standards.

The standards are trained during the first five years to develop a straight to a height of about 5·5 m. before the treatments are given.

3. DESIGN :

(i) R.B D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 3 standards having 2 vines in each standard. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Spike characters and yield of pepper. (iv) (a) 1956—64. (b) Nil. (v) and (vi) N.A. (vii) Nil. (viii) expt. for 62 N.A.

5. RESULTS :

61(112)

(i) 909 gm./plot. (ii) 427 gm./plot. (iii) Treatment differences are highly significant. (iv) Av. yield of pepper in gm./plot.

Treatment	C_1	C_2	C_3
Av. yield	426	897	1405

C.D.=458 gm./plot.

63(9)

(i) 842 gm./plot.   (ii) 896 gm./plot.   (iii) Treatment differences are not significant.   (iv) Av. yield of pepper in gm./plot.

Treatment	C_1	C_2	C_3
Av. yield	519	794	1213

64(129)

(i) 960 gm./plot.   (ii) 885 gm./plot.   (iii) Treatment differences are not significant.   (iv) Av. yield of pepper in gm./plot.

Treatment	C_1	C_2	C_3
Av. yield	661	1176	1042

———

Crop :- Pepper   **Ref :- K. 63(8), 64(132).**

Site :- Pepper Res. Stn., Taliparamba.   **Type :- 'C'.**

Object :—To determine the best planting material for Pepper Crop.

1. BASAL CONDITIONS:

(i) Some jungle cleared for planting Pepper. (ii) Red laterite gravelly soil. (iii) By rooted cuttings. (iv) Piper Nigrum, L. Kalluvally.   (v) Planted in June, 1956 with spacing 3·7 m.×3·7 m.   (vi) 2 months. (vii) Nil. (viii) 2 diggings, weedings and looping of branches.   (ix) Nil.   (x) Unirrigated.   (xi) 394 cms. for 63(8) 329 cms. for 64(132). (xii) 10.2.1964, February—March 65.

2. TREATMENTS :

All combinations of (1) and (2)
  (i) 2 types of cutting : C_1=Unrooted and C_2=Rooted.
  (ii) 3 types of shoots used for cuttings : S_1=lateral shoots (cuttings of growing shoots from top portion of vines), S_2=Basal shoots (cuttings of long shoots that develop from the base of old vines) and S_3=Hanging basal shoots (cutting of shoots hanging down from the top of vines).

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) and (b) 2 standards. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil in 63(8); Insect Pollu attack 0·25% DDT sprayed in 1964(134). (iii) Yield of Pepper. (iv) to (vi) N.A. (vi) and (vii) Nil.

5. RESULTS :

63(8)

(i) 1495 gm./plot. (ii) 1169 gm./plot. (iii) None of the effects is significant. (iv) Av. yield of pepper in gm./plot.

	S_1	S_2	S_3	Mean
C_1	1290	1170	1634	1365
C_2	1955	1060	1860	1625
Mean	1623	1115	1747	1495

64(132)

(i) 2047 gm./plot.   (ii) 2816 gm./plot.   (iii) None of the effects is significant.   (iv) Av. yield of pepper in gm./plot.

	S_1	S_2	S_3	Mean
C_1	1351	1133	1369	1284
C_2	3780	2400	2250	2810
Mean	2566	1767	18·0	2047

— ——

Crop :- Pepper.

Site :- Pepper Res. Stn., Taliparamba.

Ref :- K. 61(11¹), 63(7), 64(131).

Type :- 'C'.

Object :—To determine the optimum economic cultural requirement for Pepper crop.

1. **BASAL CONDITIONS :**

(i) Scrub jungle cleared for planting Pepper.   (ii) Red laterite gravelly soil.   (iii) Vegetative basal rooted cuttings.   (lv) *Pepper Nigrum* L. Kalluvally.   (v) Planted in June, 1955 at 3·66 m. × 3·66 m. specings.   (vi) 90 days.   (vii) Nil in 61(111); 0·5 Kg. of Pepper mixture to each standard in 63(7); 1·5 Kg. of Pepper mixture per vine in 64(131).   (viii) Diggings as per treatments, weedings and tying of vines.   (ix) Nil.   (x) Unirrigated.   (xi) 625 cms. in 61(111); 394 cms. in 63(7) and 383 cms. in 64(134).   (xii) January 1962; 4.2.1964; March—April, 1965.

2. **TREATMENTS :**

5 cultural treatments : C_1=Digging twice for the culture plot in August—September and October—November. C_2=Digging twice round the vines in the plot to a distance of 1·83 m. in August—September and October—Nov; C_3=Digging once in the entire plot in October—Nov. C_4=Digging once round the vines in the plot to a distance of 1·83 m. in October—November and C_5=No digging giving a cover crop of *Calapogonium* muenvoides and Seything once a year in August—September. and spreading the seythed leafy material all round the vines to a distance of 1·83 m.

3. **DESIGN :**

(i) R.B.D.   (ii) (a) 5.   (b) N.A.   (iii) 6.   (iv) (a) and (b) 6 standards.   (v) N.A.   (vi) Yes.

4. **GENERAL :**

(i) Normal.   (ii) Nil in 61(111) and 63(7). Insect pollu attack observed 0·25% DDT and 1·5% Bordeaux mixture with cereson sprayed in 1964(131).   (iii) yield of pepper.   (iv) (a) 1961 – 64.   (v) and (vi) N.A.   (vii) Nil.   (viii) Expt. for 1962 N.A.   Missing value of the yield in C_1 of 2nd replication of 1961 is estimated.

5. **RESULTS :**

61(111)

(i) 2·1 Kg./plot.   (ii) 2·0 Kg /plot.   (iii) Treatment differences are not significant.   (iv) Av. yield of Pepper in Kg./plot.

Treatment	C_1	C_2	C_3	C_4	C_5
Av. Yield	3·0	3·2	1·1	1·8	1·3

63(7)

(i) 6.6 Kg./plot.   (ii) 5·2 Kg./plot.   (iii) Treatment differences are not significant.   (iv) Av. yield of Pepper in Kg./plot.

Treatment	C_1	C_2	C_3	C_4	C_5
Av. yield	8·2	5·9	10·2	5·4	3·2

64(131)

(i) 8·9 Kg/plot. (ii) 7·3 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of Pepper in Kg/plot.

Treatment	C_1	C_2	C_3	C_4	C_5
Av. yield	17·4	4·8	9·7	10·0	2·4

C.D.=8·7 Kg./plot.

— — — —

Crop :- Pepper. **Ref :- K. 62(26), 63(10), 64(110), 65(92).**

Site :- Pepper Res. Stn., Thodupuzha. Type :- 'C'.

Object :—To determine the effect of digging as a cultural practice for Pepper.

1. BASAL CONDITIONS :

(i) Forest land cleared for planting pepper. (ii) Laterite soil. (iii) Vegetative rooted vines. (iv) *Kari mundi.* (v) Planted in June 1959 at 3·1 m.×3·1 m. spacing. (vi) 3 months. (vii) 3·6 Kg/vine of compost+ 227 gm./vine of A/S+170 gm/vine of Mur. Pot.+340 gm./vine of Super and lime mixture for 62(26). and 64(110) ; N.A. for 63(10) ; 4 Kg/vine of compost+lime at 1 Kg/vine applied during August 1955 in 65(92). (viii) As per treatments. (ix) Nil. (x) Pot. Irrigated. (xi) 405 cm., 363 cm., 397 cm. and 294 cm. respectively. (xii) 25.10.62 to 13.11.62 ; Nov. and Dec., 1964 ; Dec., Jan., 1965, Jan. 66.

2. TREATMENTS :

3 cultural treatments : C_0=Control (no digging), C_1=Digging round the vines to a diameter of 183 cm. once every year in October-November and C_2=Digging round the vines to a diameter of 183 cm. twice a year in August—September and in October—November.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 4. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Mild attack of wilt controlled by spraying Aretan. (iii) Yield of pepper. (iv) (a)1962 contd. (b) Nil. (v) N.A. (vi) Nil. (vii) In 62(26) one replication was completely dropped from the analysis as there were two missing treatments in that.

5. RESULTS :

62(26)

(i) 257 gm./plot. (ii) 237 gm./plot. (iii) Teatment differences are not significant. (iv) Av. yield of pepper in gm/plot.

Treatment	C_0	C_1	C_2
Av. yield	108	387	275

63(10)

(i) 729 gm/plot. (ii) 787 gm/plot. (iii) Treatment differences are not significant. (iv) Av. yield of pepper in gm/plot.

Treatment	C_0	C_1	C_2
Av. yield	592	745	849

64(110)

(i) 1254 gm/plot. (ii) 1167 gm/plot. (iii) Treatment differences are not significant. (iv) Av. yield of pepper in gm/plot.

Treatment	C_0	C_1	C_2
Av. yield	766	1108	1888

65(92)

(i) 1824 gm/plot. (ii) 1085 gm/plot. (iii) Treatment differences are not significant. (iv) Av. yield of pepper in gm/plot.

Treatment	C_0	C_1	C_3
Av. yield	2020	1781	1672

— — —

Crop :- Pepper.   **Ref :- K. 64(109), 65(93).**

Site :- Pepper Res. Stn., Thodupuzha.   **Type :- 'C'.**

Object : —To determine the best method of pruning and training the pepper Vines.

1. BASAL CONDITIONS :

(i) Reserved forest area was cleared for planting pepper. (ii) Laterite soil. (iii) Rooted vines. (iv) *Chereya kamyakadan*. (v) Planted in June, 1959 at $3.1m. \times 3.1m.$ spacing. (vi) 3 months (vii) Compost at 3.6 Kg/vine in June,1964 and 227 gm/vine of A/S in August, 1964 and 170 gm/vine of Mur. Pot. in Aug. 1964 +340 gm/vine of Super and lime mixture in Sept. 1964 applied around the vines for 64(109) Compost at 4 Kg/vine in August, 1965. Lime al 1 Kg/vine in August—September 1965 for 65(93). (viii) Weeding and mulching. (ix) Nil. (x) Irrigated. (xi) 397 cm. and 294 cm. respectively. (xii) January., 1965 ; January, 1966.

2. TREATMENTS :

5 cultural treatments : C_0=Control, C_1=Pruning one year old vines to a height of 3 nodes above ground level, C_2=Pruning one year old vines to a height of 6 nodes above ground level, C_3=Stem of one year old vines detached from the standards and the stem completely buried in small trench at the base of the standard exposing only the terminal 15 cm. of the vine trained to the standard and C_4=Stem of one year old vine detached from the standard made into coil and buried in a trench so that portions of the stem come just above ground and the terminal 15 cm. of the vine is trained to the standard.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 4. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Incidence of wilt controlled by Aretan application for 64(109) ; N.A. for 65(93). (iii) Yield of pepper. (iv) 1964—N.A. (v) and (vi) N.A. (vii) Nil.

5. RESULTS :

64(109)

(i) 168 gm/plot. (ii) 206 gm/plot. (iii) Treatment differences are not significant. (iv) Av. yield of pepper in gm/plot.

Treatment	C_0	C_1	C_2	C_3	C_4
Av. yield	48	323	216	177	76

65(93)

(i) 1028 gm/plot. (ii) 878 gm/plot. (iii) Treatment differences are not significant. (iv) Av. yield of pepper in gm/plot.

Treatment	C_0	C_1	C_2	C_3	C_4
Av. yield	847	1603	820	952	920

Crop :- Pepper.	**Ref :- K. 62(25), 63(12), 64(111), 65(94).**
Site :- Pepper Res. Stn.,	**Type :- 'C'.**
Thodupuzaha.	

Object :—To determine the optimum number of Vines to be trained to a standard for pepper yield.

1. **BASAL CONDITIONS :**

(i) Forest land cleared for planting pepper. (ii) Laterite soil. (iii) Rooted vines. (iv) *Mundi.* (v) Planted in June, 1959 a. 3·1 m. × 3·1 m. spacing. (vi) 3 months. (vii) 2·3 Kg/vine of compost+57 gm/vine of A/S +113 gm/vine of super+57 gm/vine of Mur. of Pot.+113 gm/vine of lime then Again manured in 1964. (viii) 2 diggings for 62(25) ; N.A. for 63(12), weeding and mulching for 64(111) ; N.A. for 65. (ix) Nil. (x) Unirrigated for 62(25) ; irrigated for others. (xi) 405 cm. for 62(25) ; 363 cm. for 63(12) ; 397 cm. for 64(111) N.A. for 65. (xii) 25.10.62 to 14.11.62 ; Nov.—Dec., 1963 ; January 65 ; N.A. for 65.

2. **TREATMENTS :**

5 number of vines per standard : $S_1=1$, $S_2=2$, $S_3=3$, $S_4=4$ and $S_5=5$.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5 for 62(25) ; 6 for others. (iv) (a) N.A. (b) 4. (v) N.A. (v) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Incidence of wilt and controlled by treating with Aretan uniformly for all plants. (iii) Yield of pepper. (iv) 1962 —contd. (v) and (vi) N.A. (vii) Individual results are presented since the experiment is contd. beyond 65.

5. **RESULTS :**

64(25)

(i) 247 gm/plot. (ii) 183 gm/plot. (ii) Treatment differences are not significant. (iv) Av. yield of pepper in gm/plot.

Treatment	S_1	S_2	S_3	S_4	S_5
Av. yield	343	321	312	226	35

63(12)

(i) 517 gm/plot. (ii) 330 gm/plot. (iii) Treatment differences are not significant. (iv) Av. yield of pepper in gm/plot.

Treatment	S_1	S_2	S_3	S_4	S_5
Av. yield	446	560	530	523	525

63(111)

(i) 661 gm/plot. (ii) 788 gm/plot. (iii) Treatment differences are not significant. (iv) Av. yield of pepper in gm/plot.

Treatment	S_1	S_2	S_3	S_4	S_5
Av. yield	361	747	797	568	834

65(94)

(i) 1477 gm/plot. (ii) 1016 gm/plot. (iii) Treatment differences are not significant. (iv) Av. yield of pepper in gm/plot.

Treatment	S_1	S_2	S_3	S_4	S_5
Av. yield	927	2272	1221	1949	1014

Crop :- Pepper.   **Ref :- K. 64(107).**

Site :- Pepper Res. Stn., Thodupuzha.   **Type :- 'C'.**

Object :—To determine the best type of planting material for obtaining better yield of Pepper.

1· BASAL CONDITIONS :

(i) Reserve forest area cleared for planting pepper. (ii) Laterite soil. (iii) Rooted vines. (iv) *Malayatoor.* (v) Planted in July, 1958 at 3.1 m. $\times 3.1$ m. spacing. (vi) 3 months. (vii) 3.6 Kg/vine of compost in June 1964+227 gm/vine of A/S in August, 1964+170 gm/vine of Mur. Pot. in August, 1964+340 gm/vine of Super and lime mixture in September, 1964 applied around the vine. (viii) Weeding and mulching. (ix) Nil. (x) Irrigated. (xi) 397 m, (xii) Jan., 1965.

2. TREATMENTS :

All combinations of (1) and (2)

      (1) 2 types of cuttings : C_1 = Unrooted and C_2 = Rooted.
      (2) 3 types of shoots : S_1 = Cuttings with fruiting lateral shoots, S_2 = Cuttings without fruiting lateral shoots and S_3 = Cuttings of hanging shoots.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) 4. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Incidence of wilt controlled by Aretan application. (iii) Yield of pepper. (iv) 1964— N.A. (v) and (vi) N.A. (vii) Expt. failed in 65 and 66.

5. RESULTS :

(i) 471 gm/plot. (ii) 893 gn/plot. (iii) None of the effects is significant. (iv) Av. yield of pepper in gm/plot.

	S_1	S_2	S_3	Mean
C_1	70	477	231	259
C_2	771	1037	238	682
Mean	421	757	235	471

Crop :- Pepper.   **Ref :- K. 64(141).**

Site :- Pepper Res. Stn., Taliparamba.   **Type :- 'CV'.**

Object :—To find out whether providing of a hardy root stock for important variety of Pepper will have any economic importance.

1. BASALCONDITIONS :

(i) Scrub jungle cleared for planting pepper. (ii) Red laterite and gravelly. (iii) Grafting by inarching (iv) As per treatments. (v) Planted in pits in June, 1955 with one graft in each standard at a spacing of 3·7 m.×3·7 m. (vi) Eight months old graft. (vii) 1 Kg./vine of pepper mixture. (viii) 2 diggings, weeding and lopping. (ix) Nil. (x) Unirrigated. (xi) 383 m. (xii) February—March, 1965.

2. TREATMENTS :

All combinations of (1) and (2)

    (1) 3 varieties of pepper : V_1=*Kalluvally*, V_2=*Vally* and V_3=*Karinkotta*.

    (2) 3 root stocks : R_0=Root cuttings (no root stocks), R_1=Piper Attenuatume and R_2= Uthiramkotta.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) 3. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Insect *Pollu* controlled by spraying 0·25% D.D.T. wilt and *Pollu* diseases controlled by spraying 1% Bordeaux mixture with wet ceresan. (iii) Yield of pepper. (iv) to (vi) N.A. (vii) Nil.

5. RESULTS :

(i) 1428 gm./plot. (ii) 2199 gm./plots. (iii) Main effect of R alone is highly significant. (iv) Av. yield of pepper in gm./plot.

	R_0	R_1	R_2	Mean
V_1	3352	328	180	1287
V_2	6470	122	482	2358
V_3	1810	60	46	639
Mean	3877	170	236	1428

C.D. for R marginal means=1622·5 gm./plot.

Crop :- Ginger (*Summer*).   **Ref :- K. 61(80).**

Site :- Central Hort. Res. Stn., Ambalavayal.   **Type :- 'M'.**

Object :—To study the effect of different levels of N, P and K on Ginger.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy loam. (iii) 1.4.1961. (iv) (a) to (e) N.A. (v) 112 Q./ha. of C.M. (vi) Wynad local. (vii) Unirrigated. (viii) N.A. (ix) 311 cm. (x) February, 1962.

2. TREATMENTS :

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

    (1) 3 levels of N as A/S : N_0=0, N_1=56 and N_2=112 Kg/ha.

    (2) 3 levels of P_2O_5 as Super : P_0=0, P_1=50·4 and P_2=100·9 Kg/ha.

    (3) 3 levels of K_2O as Pot. Sul. : K_0=0, K_1=67·3 and K_2=134·5 Kg/ha.

P_2O_5 applied one month before planting as basal and N, K_2O applied one and a half month after planting as top dressing.

3. DESIGN :

(i) 3^3 partially confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) 6·7 m.× 2·4 m. (b) 6·1 m.×1·8 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tiller counts and yield of Ginger. (iv) (a) 1959 –1961 (1960 N.A.) (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 96·5 Q./ha. (ii) 21·46 Q./ha. (iii) Main effect of N alone is significant. (iv) Av. yield of Ginger in Q./ha.

	K_0	K_1	K_2	P_0	P_1	P_2	Mean
N_0	89·0	92·1	107·8	106·6	94·9	87·3	96·3
N_1	100·9	102·6	117·1	103·9	102·4	114·3	106·9
N_2	98·5	84·1	76·6	96·3	87·4	75·3	86·3
Mean	96·1	92·9	100·5	102·3	94·9	92·3	96·5
P_0	105·3	96·0	105·7				
P_1	94·9	94·4	95·4				
P_2	88·2	88·3	100·4				

C.D. for N marginal means=14·8 Q/ha.

— — —

Crop :- Ginger (*Summer*).   **Ref :- K. 64(154).**

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

Object :—To study the effect of different levels of N, P and K on Ginger.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy loam. (iii) 17.4.64. (iv) (a) 5 ploughings. (b) to (d) N.A. (e) ·— (v) 247 Q/ha. of C.M. (vi) Rio—de—Janeiro. (vii) Unirrigated. (viii) 2 weedings, 2 earthing up and 2 mulching with 112 Q/ha. of G.L. (ix) 209 cm. (x) 7.1.65.

2. TREATMENTS :

All combinations of (1), (2) and (3)+one extra treatment.
    (1) 2 levels of N as A/S : N_0=0, N_1=62 Kg/ha·
    (2) 2 levels of P_2O_5 as Super : P_0=0, P_1=62 Kg/ha.
    (3) 2 levels of K_2O as Mur. Pot : K_0=0 and K_1=124 Kg/ha.
Extra Treatment : E_2=FACT Ginger Mixture at 494 Kg/ha.

3 DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 6·7 m. × 2·4 m. (b) 6·1 m. × 1·8 m. (v) 30 cm. × 30 cm.

4. GENERAL :

(i) Satisfactory. (ii) Soft rot incidence noticed. Drenching cheshnut compound was done. (iii) Germination count, tiller count and yield of ginger. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) N.A.

RESULTS :

181·4 Q/ha. (ii) 46·2 Q/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of ginger in Q/ha.

E=148·2 Q/ha.

	P₀	P₁	K₀	K₁	Mean
N₀	151·1	178·5	153·5	176·1	164·8
N₁	196·2	216·4	190·9	221·7	206·3
Mean	173·7	197·5	172·2	198·9	185·6
K₀	160·0	184·4			
K₁	187·4	210·5			

C.D. for N marginal means=33·6 Q/ha.

— — —

Crop :- Ginger (*Kharif*).   **Ref :- K. 65(87).**

Site :- Ginger Res. Stn., Jhodupuzha.   **Type :- 'M'.**

Object :—To study the effect of Nitrogen, Phosphoric acid, Potash and Lime alone and in combination of their vital ingredients at different levels.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Laterite. (iii) 22.5.1965.(iv) One digging and peg marking (b) Placing Rhizomes in pits. (c) 1120 to 1345 Kg/ha. of Rhizomes seed. (d) 23 cm.×23 cm. (e) 1. (v) C.M. at 112·1 Q/ha. for the Experiment at the time of planting. Also 121·1 Q/ha. of a G.L. applied in pit. (vi) Local variety. (vii) Unirrigated. (viii) Earthing up and mulching. (ix) 254·8 cm. (x) 12.12.1965.

2. TREATMENTS :

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

(1) 3 levels of N : $N_0=0$, $N_1=56$ and $N_2=112$ Kg/ha.

(2) 3 levels of P_2O_5 : $P_0=0$, $P_1=34$ and $P_2=67$ Kg/ha.

(3) 3 levels of K_2O : $K_0=0$, $K_1=34$ and $K_2=67$ Kg/ha.

(4) 3 levels of lime :$L_0=0$, $L_1=$half the normal dose, $L_2=$normal dose.

DESIGN :

(i) 3^4 confd. (ii) (a) 9 plots/black; 9 blocks/replication. (b) 43·9 m.×8·5 m. (iii) 1. (iv) (a) 4·9 m.× 8·5 m. (b) 3·7 m.×7·3 m. (v) 61 cm.×61 cm. (vi) Yes.

4. GENERAL:

(i) Normal growth. (ii) Soft rot disease was noticed. N_2 P_0 K_0 L_2 and N_0 P_2 K_0 L_1 and cheshunt compound was applied in all the treatments. (iii) Ginger yield. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 83·2 Q/ha. (ii) 17·9 Q/ha. (iii) Main effect of P alone is highly significant. (iv) Av. yield of ginger in Q/ha.

	N_0	N_1	N_2	L_0	L_1	L_2	K_0	K_1	K_2	Mean
P_0	80·5	84·5	88·0	81·8	82·3	81·9	75·8	88·4	81·8	82 0
P_1	66·7	73·5	85·4	80·7	79·2	65·7	74·2	74·2	77·2	75·2
P_2	90·4	93·1	93 4	89·5	89·3	98·1	87·3	95·1	94·5	92·3
Mean	79 2	83·7	86 6	84·0	83·6	81·9	79·1	85·9	84·5	83·2
K_0	79·4	74·4	83·5	80·1	78·5	78·7				
K_1	78·1	93·7	85·9	87·5	80·1	90·1				
K_2	80·1	83·0	90·4	84·4	92·2	76·9				
L_0	75·4	87·3	89 3							
L_1	72 9	86·9	91·0							
L_2	89·3	76·9	79·5							

C.D. for P marginal means $=9·8$ Q/ha.

Crop :- Ginger (*Kharif*).

Site :- Ginger Res. Stn., Thodupuzha.

Ref :- K. 60(74).

Type :- 'M'.

Object :—To find out the manurial requirements of Ginger.

1. **BASAL CONDITIONS :**

   (i) (a) Nil. (b) and (c) N.A. (ii) Laterite soil. (iii) 6.6.1960. (iv) (a) Digging and levelling. (b) Rhizomes are placed in the pits. (c) 1120 to 1345 Kg/ha. of seed rhizomes. (d) 23 cm.×23 cm. (e) 1. (v) 10 C.L. of C.M.+5600 Kg/ha. of G.L. (vi) Local variety (Medium). (vii) Unirrigated. (viii) Weeding three times after planting, earthing up after 45 days of planting, manuring after 45 days of planting and mulching after 45 days of planting. (ix) 421·1 cm. (x) 12.1.1961.

2. **TREATMENTS :**

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

   (1) 3 levels of N as A/S : $N_0=0$, $N_1=56$ and $N_2=112$ 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 levels of K_2O as Mur. Pot : $K_0=0$, $K_1=33·6$ and $K_2=67·2$ Kg/ha.

3. **DESIGN :**

   (i) 3^3 confd. (ii) (a) 9 plots/biock; 3 blocks/replication. (b) 12·8 m.×23·8 m. (iii) 1. (iv) (a) 4·3 m.× 7·9 m. (b) 3·7 m.×7·3 m. (v) 30 cm.×30 cm. (vi) Yes.

4. **GENERAL :**

   (i) Normal. (ii) Nil. (iii) Mean No. of tillers, No. of modes, mean length of shoots, mean length and bredth of leaf and the yield plot. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) N.A. (vi) to (vii) Nil.

5. **RESULTS :**

   (i) 121·7 Q/ha. (ii) 25 1 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of Ginger in Q/ha.

	P_0	P_1	P_2	K_0	K_1	K_2	Mean
N_0	107·3	120·3	141·7	106·7	141·2	121·4	123·1
N_1	105·6	132·7	131·6	116·9	145·1	107·9	123·3
N_2	110·1	119·7	124·8	115·2	113·5	125·9	118·2
Mean	107·7	124·2	132·7	112·9	133·3	119·0	121·7
K_0	95·4	127·1	116·3				
K_1	124·8	118·6	156·4				
K_2	102·8	127·1	125·4				

Crop :- Ginger (*Kharif*).　　　　　　　　　　　　Ref :- K. 61(76).

Site :- Pepper Res. Stn., Thodupuzha.　　　　　　　Type :- 'M'.

Object :—To study the effect of different levels of N in organic and inorganic forms on Ginger.

1. BASAL CONDITIONS :

(i) N.A. (ii) Laterite soil. (iii) 11.6.61. (iv) (a) 1 digging and levelling. (b) Placed in pits in beds. (c) 1120 to 1345 Kg/ha. of seed rhizomes. (d) 23 cm. ×23 cm. (e) 1. (v) 12 C.L/ha. of G.M.+5604 Kg/ ha. of G.L. (vi) Local (medium). (vii) Unirrigated. (viii) 3 weedings and earthing up. (ix) 429 cm. (x) 4 1.62.

2. TREATMENTS :

Main-plot treatments :

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

(1) 2 levels of N : N_1=112 and N_2=168 Kg/ha.

(2) 6 sources of N : S_1=G.L., S_2=Cowdung, S_3=A/S, S_4=A/S+G.L. in 1 : 1 ratio, S_5=Cowdung +G.L. 1 : 1 ratio and S_6=Cowdung+A/S in 1 : 1 ratio.

Sub-plot treatments :

3 times of application of N : T_1=Full dose at planting, T_2=Half dose at planting+half dose 45 days after planting, T_3=Half dose at planting and remaining quantity in two equal doses 45 days and 65 days after planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 14 main-plots/replication and 3 sub-plots/main-plot. (b) 34·1 m.×51·2 m. (iii) 3. (iv) (a) 4·9 m.×8·5 m. (b) 3·7 m.×7·3 m. (v) 61 cm.×61 cms. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Leaf spot disease and attack of shoot borer observed. (iii) Yield of Ginger. (iv) (a) 1961 only. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 54·3 Q/ha. (ii) (a) 38·5 Q/ha. (b) 16·1 Q/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of Ginger in Q/ha.

	S_1	S_2	S_3	S_4	S_5	S_6	T_1	T_2	T_3	Mean
N_1	45·8	46·8	45·8	41·6	40·3	52·7	43·4	48·0	45·1	45·5
N_2	72·4	73·4	43·2	64·8	60·3	51·9	58·7	59·8	64·5	61·0
Mean	53·9	60·1	44·5	53·2	50·3	52·3	51·1	53·9	54·8	53·3
T_1	63·3	61·1	40·9	49·1	44·4	47·5				
T_2	53·9	59·6	45·1	58·6	51·3	54·9				
T_3	60·1	59·6	47·5	51·9	55·2	54·5				

C.D. for N marginal means=15·2 Q/ha.

Crop :- Ginger (*Kharif*).　　　　　　　　　　　　　Ref :- K. 60(76).

Site :- Pepper Res. Stn., Thodupuzha.　　　　　Type :- 'M'.

Object :—To study the effect of different levels of N through organic and inorganic forms on Ginger.

1. BASAL CONDITIONS:

   (i) Nil. (ii) Laterite soil. (iii) 7.6.60. (iv) (a) 1 digging and levelling. (b) Placed in pits on the beds. (c) 1120 to 1345 Kg/ha. of seed rhizomes. (d) 23 cm.×23 cm. (e) 1. (v) 12 C.L/ha. of C.M.+5604 Kg/ha. of G.L. (vi) Local (medium). (vii) Unirrigated. (viii) 3 weedings, earthing up and mulching. (ix) N.A. (x) 11.1.61.

2. TREATMENTS :

   All combinations of (1) and (2)+control (2 plots)
   (1) 2 levels of N : N_1=112 and N_2=168 Kg/ha.
   (2) 6 sources of N : S_1=G.L., S_2=Cowdung, S_3=A/S, S_4=A/S+G.L. in 1 : 1 ratio, S_5=Cowdung+ G.L. in 1 : 1 ratio and S_6=Cowdung+A/S in 1 : 1 ratio.
   N applied in two instalments, at planting and 45 days after planting.

3. DESIGN :

   (i) Fact. in R.B.D. (ii) (a) 14. (b) 29·9 m.×15·9 m. (iii) 4. (iv) (a) 4·3 m.×7·9 m. (b) 3·7 m.×7·3 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL:

   (i) Normal. (ii) Attack of shoot borer, 50% D.D.T. sprayed twice. (iii) Yield of ginger. (iv) (a) 1958— 60. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

   (i) 92 Q/ha. (ii) 19·8 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of ginger in Q/ha.

Control=87 Q/ha.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean
N_1	93	78	95	109	76	96	91
N_2	87	91	96	95	97	101	94
Mean	90	84	95	102	86	98	92

Crop :- Ginger (*Kharif*).　　　　　　　　　　**Ref :- K. 60(73).**

Site :- Ginger Res. Stn., Thodupuzha.　　　　　**Type :- 'M'.**

Object :—To find out effect of organic and inorganic forms of N. separately and in combination upon the growth of plant tiller formation development of the rhizomes and on the yield of Ginger.

1. **BASAL CONDITIONS :**

(i) N.A. (ii) Laterite soil. (iii) 7.6.60. (iv) N.A. (v) 5 C.L. of C.M. and 5605 Kg/ha. of G.L. in two equal instalments half at planting and the other half after 45 days. (vi) Local (medium). (vii) Unirrigated. (viii) 3 weedings, earthing up and mulching. (ix) 421·1 cm. (x) 11.7.61.

2. **TREATMENTS :**

13 manurial treatments : T_0=Control, T_1=168 Kg. of N as G.L./ha., T_2=168 Kg. of N as Cowdung/ha., T_3=168 Kg. of N as A/S/ha., T_4=112 Kg. of N as G.L/ha., T_5=112 Kg. of N as Cowdung/ha., T_6=112 Kg. of N as A/S/ha., T_7=168 Kg. of N as G.L. and A/S/ha., T_8=168 Kg. of N as G.L. and Cowdung/ha., T_9=168 Kg. of N as Cowdung and A/S/ha., T_{10}=112 Kg. of N as G.L. and A/S/ha., T_{11}=112 Kg. of N as G.L. and Cowdung/ha. and T_{12}=112 Kg. of N as Cowdung and A/S/ha.

Control treatment was applied to two plots.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 14. (b) 29·9 m.×15·8 m. (iii) 4. (iv) (a) 4·3 m.×7·9 m. (b) 3·7 m.×7·3 m. (v) 30 cm. ×30 cm. (vi) Yes.

4. **GENERAL :**

(i) Normal. (ii) Shoot borer was noticed 50% D.D.T. was sprayed. (iii) Mean No. of tillers, modes, length of shoots, length and breadh of leaf and yield. (iv) to (vii) N.A.

5. **RESULTS :**

(i) 9215 Kg/ha. (ii) 1977 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ginger in Kg/ha.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	8752	8688	9112	9621	9282	7841	9536

	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
	9494	9705	10087	10892	7629	9621

Crop :- Giager (*Kharif*).　　　　　　　　　　**Ref :- K. 60(71).**

Site :- Ginger Res. Stn., Thodupuzha.　　　　　**Type :- 'M'.**

Object :—To find out optimum time of application of manures.

1. **BASAL CONDITIONS :**

(i) N.A. (ii) Lateritic soil. (iii) 17.6.60. (iv) and (v) N.A. (vi) Local (medium). (vii) Unirrigated. (viii) 3 weedings, earthing up, manuring and mulching. (ix) 421·1 cm. (x) 19.1.61.

2. **TREATMENTS :**

6 times of application of fertilizer : T_0=Control, T_1=Full dose of manures at the time of planting, T_2= Half at planting+half 45 days after planting, T_3=Half at planting+¼ dose 45 days after planting+¼ dose after 65 days of planting and T_4= ⅓ at planting+2/9, 30 days after planting+2/9 45 days after planting+ 2/9 65 days after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 4·3 m.×7·9 m. (b) 3·7 m.×7·3 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Mean No. of tillers/plant, modes, shoots and yield of ginger. (iv) (a) 1959—N.A. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 118·6 Q/ha. (ii) 15·3 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ginger in Q/ha.

Treatment	T_0	T_1	T_2	T_3	T_4
Av. yield	121·8	111·9	110·8	130·8	117·5

Crop :- Ginger (*Kharif*).
Ref :- K. 62(9), 63(63), 64(165).

Site :- Pepper Res. Stn., Thodupuzha.
Type :- 'M'.

Object :—To study the effect of different levels of N, P, K and lime alone and in combinations on Ginger.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Ginger. (c) N.A. (ii) Laterite soil. (iii) 16.5.1962; 18.5.1963; 27.5.1964. (iv) (a) One digging. (b) Placed in pits on the beds. (c) 1120 to 1345 Kg/ha. of seed rhizomes. (d) 23 cm.×23 cm. (e) 1. (v) 25 C.L./ha. of C.M.+5604 Kg/ha. of C.L. for 62(9) and 63(63). and 25 C.L./ha. of C.M.+112 Q/ha. of G.L. for 64(165). (vi) Local. (vii) Unirrigated. (viii) 3 weedings, earthing up and mulching. (ix) 405 cm. for 62(9) and 340 cm. for others. (x) 5-12-1962, 6-2-1964 and 2-1-1965.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4).
    (1) 3 levels of N as A/S : $N_0=0$, $N_1=56$ and $N_2=112$ 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 levels of K_2O as Mur. Pot : $K_0=0$, $K_1=33·6$ and $K_2=67·2$ Kg/ha.
    (4) 3 levels of lime : $L_0=0$, $L_1=280$ and $L_2=560$ Kg/ha.
Super and lime applied one month before planting. Half A/S applied at planting and other half with Mur. Pot. 45 days after planting.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 4·9 m.×8·5 m. (b) 3·7 m.×7·32 m. (v) 61 cm.×61 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Leaf spot disease due to phyllustita and shoot borer noticed. Bordeaux mixture and Endrin 20 E.C. were sprayed. (iii) Yield of ginger. (iv) (a) 1962—54. (b) No. (c) Results of combined analysis presented under 5. Results. (v) and (vi) N.A. (vii) Error variances are heterogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 87·4 Q/ha. (ii) 22·7 Q/ha. (based on 84 d.f. made up of interactions of years with P, N, L, K, PN, PL, PK, NL and NK) (iii) Main effect of P alone is significant. (iv) Av. yield of ginger in Q/ha.

	N₀	N₁	N₂	L₀	L₁	L₂	K₀	K₁	K₂	Mean
P₀	83·5	90·5	79·8	83·4	84·1	86·4	82·0	89·3	82·5	84·6
P₁	88·0	83·8	85·5	88·9	86·5	81·9	81·9	86·5	88·9	85·8
P₂	93·1	93·9	88·8	93·8	92·0	90·0	90·2	94·0	91·6	91·9
Mean	88·2	89·4	84·7	88·7	87·5	86·1	84·7	89·9	87·7	87·4
K₀	85·6	88·8	79·8	84·4	85·9	83·9				
K₁	90·2	92·6	87·0	94·4	88·0	87·4				
K₂	88·9	86·8	87·3	87·3	88·7	87·0				
L₀	89·1	93·7	83·4							
L₁	85·3	89·5	87·8							
L₂	90·3	85·0	82·9							

C.D. for P marginal means=6·1 Q/ha.

Crop :- Ginger (*Kharif*).   **Ref :- K. 60(75).**

Site :- Pepper Res. Stn., Thodupuzha.   **Type :- 'M'.**

Odject :—To study the effect of different levels of N, P and K on Ginger.

1. BASAL CONDITIONS ;

(i) Nil. (ii) Laterite soil. (iii) 6.6.1960. (iv) (a) one digging and leveling. (b) Placed in the pits on the beds. (c) 1120 to 1345 Kg/ha. of seed rhizomes. (d) 23 cm.×23 cm. (e) 1. (v) 25 C.L./ha. of C.M.+5604 Kg/ha. of G.L. (vi) Local (medium) (vii) Unirrigated. (viii) 3 weedings, earthing up and mulching. (ix) 421 cm. (x) 12.1.1961.

2. TREATMENTS :

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

(1) 3 levels of N as A/S : N₀=0, N₁=56 and N₂=112 Kg/ha.

(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=33·6 and P₂=67.2 Kg/ha.

(3) 3 levels of K₂O as Mur. Pot. K₀=0, K₁=33·6 and K₂=67·2 Kg/ha.

P and K applied at planting. N applied in two equal doses half at planting and the other 45 days after planting.

3. DESIGN :

(i) 3³ confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) 12·8 m.×23.8 m. (iii) 1. (iv) (a) 4·3 m×7·9 m. (b) 3·7 m×7·3 m. (v) 30 cm×30 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of ginger. (iv) (a) 1959—60. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 122 Q/ha. (ii) 25·1 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of ginger in Q/ha.

	N0	N1	N2		K0	K1	K2	Mean
P0	107·5	105·7	110·2		95·5	125·0	102·9	107·8
P1	120·3	132·8	119·8		127·1	118·7	127·1	124·3
P2	141·8	131·7	124·9		116·4	156.5	125·5	132·8
Mean	123·2	123·4	118·3		113·0	133·4	118·5	121·6
K0	106·7	117·0	115·3					
K1	141·4	145·2	113·6					
K2	121·5	108·0	126·0					

Crop :- Ginger (*Kharif*).

Site :- Ginger Res. Stn., Thodupuzha.

Ref :- K. 60(77).

Type :- 'M'.

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

1. BASAL CONDITIONS :

(i) Nil. (ii) Laterite. (iii) 19.6.1960. (iv) (a) One digging and levelling. (b) Placed in pits on the bed. (c) 1120 to 1345 Kg/ha. of seed rhizomes. (d) 23 cm.×23 cm. (e) 1. (v) 25 C.L./ha. of C.M.+ 5604 Kg/ha. of G.L. (vi) Local (medium) (vii) Unirrigated. (viii) Three weedings, earthing up and mulching. (ix) 421 cm. (x) 14.1.1961.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : $N_0=0$, $N_1=56$ and $N_2=112$ Kg/ha.

(2) 2 levels of lime as slaked lime: $L_0=0$ and $L_1=224$ Kg/ha.

N applied as C.M., and G.L. in 1 : 1 ratio. Lime and N applied in two instatments at planting and 45 days after planting.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) 12.8 m.×15·9 m. (iii) 6. (iv) (a) 4.3 m×.7·92 m. (b) 3·7 m.× 7·3 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of ginger. (iv) (a) 1960—N.A. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 95·6 Q/ha. (ii) 25·2 Q/ha. (iii) None of the effects in significant. (iv) Av. yield of ginger in Q/ha.

	N0	N1	N2	Mean
L0	96·6	93·5	98·3	96·1
L1	91·3	94·4	99·7	95·1
Mean	94·0	93·9	99·0	95·6

Crop :- Ginger (*Kharif*).   **Ref :- K. 60(78).**

Site :- Pepper Res. Stn., Thodupuzha.   **Type :- 'M'.**

Object ;—To find out the suitable time of application of N on Ginger.

1. BASAL CONDITIONS :

   (i) Nil. (ii) Laterite soil. (iii) 17.6.1960. (iv) (a) 1 digging and levelling. (b) Placed in pits on the beds. (c) 1120 to 1345 Kg/ha. of seed rhizomes, (d) 23 cm.×23 cm. (e) 1. (v) 12 C.L./ha. of C.M.+560 Kg/ha. of G.L.+448 Kg/ha. of lime+44·8 Kg/ha. of Mur. Pot. (vi) Local (medium) (vii) Unirrigated. (viii) 3 weedings, earthing up and mulching. (ix) 410 cm. (x) 19.1.1961.

2. TREATMENTS :

   5 times of application of 112 Kg/ha. of N : T_0=Control (no application), T_1=full dose at planting, T_2= Half at planting+half 45 days after planting, T_3=Half at planting and remaining quantity in 2 equal doses 45 days and 65 days after planting and T_4=$\frac{1}{4}$ dose at planting and remaining quantity in 3 equal doses 30 days, 45 days and 65 days after planting.

3. DESIGN ;

   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 4·3 m.×7·9 m. (b) 3.7 m.×7·3 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

   (i) Normal. (ii) Nil. (iii) Yield of ginger. (iv) (a) 1959—60. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

   (i) 106 Q/ha. (ii) 13·7 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ginger in Q/ha.

Treatmens	T_0	T_1	T_2	T_3	T_4
Av. yield	108·6	99·8	98·8	116·7	104·9

Crop :- Ginger.   **Ref :- K. 63(46), 64(155).**

Site :- Central Hort. Res. Stn., Ambalavayal.   **Type :- 'C'.**

Object :—To find out the best method of storing seed Ginger for obtaining healthy rhizomes.

1. BASAL CONDITIONS :

   (i) Nil. (ii) Sandy loam. (iii) 8.5.63, 11.4.64. (iv) (a) 5 ploughings with country plough. (b) to (e) N.A. (v) 24 Q/ha. of C.M. (vi) Wynad. (vii) Unirrigated. (viii) Weeding, mulching and earthing up. (ix) 139 cm., 209 cm. (x) 25.1.64, 20.1.65.

2. TREATMENTS :

   6 methods of storing seed : S_1=Control, S_2=Heaping on the floor in a room, S_3=Storing in gunny bags, S_4=Storing in bamboo baskets, S_5=Storing on the floor with sand below and above and S_6=Storing on the floor with straw dust below and above.

3. DESIGN :

   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 6·7 m.×2·4 m. (b) 6·1 m.×1·8 m. (v) 0·3 m.×0·3 m. (vi) Yes.

4. GENERAL :

   (i) Satisfactory. (ii) Nil. (iii) Yield. (iv) (a) 1963—64. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 105'8 Q/ha. (ii) 23'7 Q/ha. (based on 35 d.f. made up of Treatments×years interaction and pooled error). (iii) Treatment differences are significant. (iv) Av. yield of ginger in Q/ha.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	113'3	130'6	104'0	102'0	85'4	99'2

C.D.=33'9 Q/ha.

Crop :- Ginger (*Rabi*).   **Ref :- K. 61(77).**

Site :- Central Hort. Res. Stn., Ambalavayal.   **Type :- 'C'.**

Object :—To find out the optimum stage for harvest of Ginger.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Sandy loam. (iii) 9.11.61. (iv) (a) to (e) N.A. (v) C.M. at 168 Q/ha. (vi) Wynad. (vii) Unirrigated. (viii) 2 weedings and 3 mulchings with G.L. (ix) 311 cm. (x) As per treatments.

2. TREATMENTS :

5 crop periods : H_1=215, H_2=230, H_3=245, H_4=260 and H_5=275 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 6'7 m.×2'4 m. (b) 6.1 m.×1'8 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of Ginger. (iv) (a) 1961—only (changed in 1962). (b) and (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 158'0 Q/ha. (ii) 18'9 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ginger in Q/ha.

Treatment	H_1	H_2	H_3	H_4	H_5
Av. yield	154'0	151'6	157'5	166'8	170'1

Crop :- Ginger (*Kharif*).   **Ref :- K. 62(13), 64(116).**

Site :- Central Hort. Res. Stn., Ambalavayal.   **Type :- 'C'.**

Object :— To find out the optimum stage for harvest of Ginger.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Sandy loam. (iii) 25.4.62. 24.4.64. (iv) (a) 5 ploughings with country plough. (b) to (e) N.A. (v) 168 Q/ha. of C.M. for 62(13) and 247 Q/ha. of C.M. for 64(116). (vi) Wynad. (vii) Unirrigated. (viii) 2 to 3 weedings, earthings and mulchings. (ix) N.A. for 62 and 139 cm. for 64(116). (x) As per treatments.

2. TREATMENTS :

5 crop periods : H_1=215, H_2=230, H_3=245, H_4=260 and H_5=275 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 6·7 m.×2·4 m. (b) 6·1 m.×1·8 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of ginger. (iv) (a) 1962—53. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) N.A. (vi) and (vii) Error variances are homogeneous and Treatments×years interaction is present.

5. RESULTS

(i) 168·8 Q/ha. (ii) 39·3 Q/ha. (based on 4 d.f. made up of Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of ginger in Q/ha.

Treatment	H_1	H_2	H_3	H_4	H_5
Av. yield	174·2	186·8	181·4	156·5	145·3

———

Crop :- Ginger (*Kharif*). **Ref:- K. 61(79), 62(12).**

Site :- Central Hort. Res. Stn., Ambalavayal. **Type :- 'C'.**

Object :—To find out optimum spacing to Ginger.

1. BASAL CONDITIONS :

(i) N.A. (c) Nil. (ii) Sandy loam. (iii) April 1962 for 62(12) and 23.4.61 for 61(79). (iv) (a) 5 ploughings in 62(12) and N.A. in 61(79). (b) to (e) As per treatments. (v) 168 Q/ha. of C.M. (vi) Wynad. (vii) Unirrigated. (viii) 2 weedings, 2 levellings and 3 mulching with G.L. (ix) 311 cm. in 61(79) and N.A. in 62(12). (x) February.

2. TREATMENTS :

5 spacings : S_1=15 cm.×15 cm., S_2=23 cm.×15 cm., S_3=23 cm.×23 cm., S_4=30 cm.×23 cm. and S_5= 30 cm.×30 cm.

Spacings S_4 and S_5 have not been tried in 62(12).

3. DESIGN :

(i) R.B.D. (ii) (a) 5 [3 in 62(12)]. (b) N.A. (iii) 6 [8 in 62(12)]. (iv) (a) 3·7 m.×6·1 m. (b) 2·7 m.× 5·5 m. (v) 46 cm.×30 cm.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of ginger. (iv) (a) 1961—62 (modified in 62). (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

61(79)

(i) 124·1 Q/ha. (ii) 29·3 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ginger in Q/ha.

Treatment	S_1	S_2	S_3	S_4	S_5
Av. yield	113·8	128·7	135·0	119·3	123·8

62(12)

(i) 198·5 Q/ha. (ii) 26·9 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ginger in Q/ha.

Treatment	S_1	S_2	S_3
Av. yield	208·5	195·2	191·9

———

Crop :- Ginger (*Summer*).   **Ref :- K. 61(78).**

Site :- Central Hort. Res. Stn., Ambalavayal.   **Type :- 'C'.**

Object :— To find out the effect of different modes of storage and time of planting on the yield of Ginger.

1. **BASAL CONDITIONS :**

(i) (a) to (c) Nil. (ii) Sandy loam. (iii) As per treatments. (iv) (a) 6 ploughings. (b) to (e) N.A. (v) 135 Q/ha. of C.M. (vi) *Wynad*. (vii) Unirrigated. (viii) 2 weedings, earthing up, mulching with G.L. at 224 Q/ha. (ix) 311 cm. (x) Feb., 1962.

2. **TREATMENTS :**

Main-plot treatments:
    3 types of seed : S_1 = Seeds stored in pits, S_2 = Seeds stored in open and cool dry room and S_3 = Seeds stored in field (Reserving the previous season without harvest).

Sub-plot treatments :
    4 dates of planting : D_1 = 1.4.61, D_2 = 15.4.61, D_3 = 1.5.61 and D_4 = 15.5.61.

3. **DESIGN :**

(i) Split-plot. (ii) (a) 3 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 7. (iv) (a) 2.4 m. $\times$ 6.7 m. (b) 1.8 m. $\times 6.1$ m. (v) 30 cm. $\times$ 30 cm. (vi) Yes.

4. **GENERAL :**

(i) N.A. (ii) Nil. (iii) Yield of ginger. (iv) (a) 1959—61. (b) No. (c) N.A. (v) to (vii) N.A.

5. **RESULTS :**

(i) 98.3 Q/ha. (ii) (a) 26.7 Q/ha. (b) 12.5 Q/ha. (iii) Main effect of D alone is significant. (iv) Av. yield of ginger in Q/ha.

	D_1	D_2	D_3	D_4	Mean
S_1	116.8	98.5	88.4	69.5	93.3
S_2	124.1	109.1	93.1	84.0	102.6
S_3	125.7	99.4	89.7	81.4	99.1
Mean	122.2	102.3	90.4	78.3	98.3

C.D. for D marginal means = 7.7 Q/ha.

———————

Crop :- Ginger (*Summer*).   **Ref :- K. 62(14).**

Site :- Central Hort. Res. Stn., Ambalavayal.   **Type :- 'C'.**

Object :— To study the effect of the weight of seed bits used for planting on the yield of Ginger.

1. **BASAL CONDITIONS :**

(i) (a) to (c) N.A. (ii) Sandy loam. (iii) 25.4.62 (iv) (a) 5 ploughings. (b) to (e) N.A. (v) 168 Q/ha. of C.M. at planting. (v) *Wynad*. (vii) Unirrigated. (viii) 2 weedings, 2 earthings up, mulching thrice with G.L. at 168 Q/ha. (ix) N.A. (x) Feb., 1963.

2. **TREATMENTS :**

4 weights of seed bit planted : W_1 = 7, W_2 = 14, W_3 = 21 and W_4 = 28 gms.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 6.7 m. $\times$ 2.4 m. (b) 6.1 m. $\times$ 1.8 m. (v) 30 cm. $\times$ 30 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of Ginger. (iv) (a) 1962—N.A. (b) No. (c) N.A. (v) to (vii) N.A.

5. RESULTS:

(i) 212·1 Q/ha. (ii) 35·5 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of Ginger in Q/ha.

Treatment	W_1	W_2	W_3	W_4
Av. yield	127·4	179·4	265·5	276·3

C.D.=48·7 Q/ha.

Crop -: Ginger (*Kharif*).   **Ref :- K. 61(85), 62(11), 63(65).**

Site :- Pepper Res. Stn., Thodupuzha.   **Type :- 'C'.**

Object :—To find out the suitable time for harvest of Ginger.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Ginger for 63(65) ; Nil for others. (c) N.A. for 63(65) ; Nil for others. (ii) Laterite soil. (iii) 17.6.61 ; 2.5.62 ; 15.5.63. (iv) (a) 1 digging and levelling. (b) Placed in pits on the beds. (c) 1120 to 1345 Kg. of seed rhizomes. (d) 23 cm. ×23 cm. (e) 1. (v) 25 C.L./ha. of Cowdung+5604 Kg/ha. of G.L. for 63(65) ; 25 C.L./ha. of C.M.+5604 Kg/ha. of G.L. for others. (vi) Local (medium). (vii) Unirrigated. (viii) N.A. for 63(65) ; 3 weedings, earthing up and mulching for others. (ix) 429 cm. ; 409 cm. ; 340 cm. (x) As per treatments.

2. TREATMENTS :

4 times of harvesting : H_1=200, H_2=215, H_3=230 and H_4=245 days after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 9·8 m.×17·1 m. (iii) 6. (iv) (a) 4·9 m.×3·5 m. (b) 3·7 m.×7·3 m. (v) 61 cm. ×61 cm.

4. GENERAL :

(i) Normal. (ii) Incidence of leaf spot disease and attack of shoot borer. Bordeaux Mixture and Endrin sprayed. (iii) Yield of Ginger. (iv) (a) 1961—1963. (b) No. (c) Results pf combined analysis presented under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 52·5 Q/ha. (ii) 24·5 Q/ha. (based on 6 d.f. made up of Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of Ginger in Q/ha.

Treatment	H_1	H_2	H_3	H_4
Av. yield	81·8	50·2	45·3	32·8

Crop :- Ginger.   **Ref :- K. 64(167), 65(88).**

Site :- Ginger Res. Stn., Thodupuzha.   **Type :- 'C'.**

Object :—To test the comparative efficiency of early planting of Ginger for better yield.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Laterite. (iii) N.A. (iv) (a) Digging. (b) Placed in pits on the beds. (c) 1120 to 1345 Kg/ha. (d) 30 cm.×30 cm. (e) 1. (v) 25 C.L./ha. of C.M.+112 Q/ha. of G.L. (vi) Local. (vii) Unirrigated. (viii) 3 weedings and earthing up. (ix) 397 cm. (x) 7.1.65 ; 5.12.65.

2. TREATMENTS :

4 dates of planting : D_1=1.4.64, D_2=15.4.64, D_3=1.5.64 and D_4=15.5.64.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 34·1 m.× 19·5 m. (iii) 6. (iv) (a) 2·1 m.×1·2 m. (b) 1·8 m.×0·9 m. (v) 15 cm.× 15 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of Ginger. (iv) (a) 1964—66. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Experiment is continued beyond 1965. Hence the results of individual years are given under 5. Results.

5. RESULTS :

64(167)

(i) 167 Q/ha. (ii) 22·6 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ginger in Q/ha.

Treatment	D_1	D_2	D_3	D_4
Av. yield	203	172	158	133

C.D.=27·8 Q/ha.

65(88)

(i) 724 Q/ha. (ii) 103·0 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ginger in Q/ha.

Treatment	D_1	D_2	D_3	D_4
Av. yield	764	696	894	541

C.D.=126.7 Q/ha.

———

Crop :- Ginger (*Kharif*). **Ref :- K. 60(70), 61(84), 62(10).**

Site :- Pepper Res. Stn., Thodupuzha. **Type :- 'CM'.**

Object :—To study the effect of different spacings and sizes of seed material in combination with different levels of manures on Ginger.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Laterite soil. (iii) 30.5.60 ; 23.6.61 ; 25.5.62. (iv) (a) 1 digging and levelling. (b) Placed in pits on the beds. (c) 1120 to 1345 Kg/ha. of seed rhizomes. (d) As per treatments. (e) 1. (v) Nil. (vi) Local (medium). (vii) Unirrigated. (viii) 3 weedings, earthing up and mulching. (ix) 421 cm.; 429 cm.; 405 cm. (x) 3.1.61 ; 8.1.62 ; 6.12.62.

2. TREATMENTS :

Main-plot treatments :
6 spacings : S_1=15 cm.× 15 cm., S_2=15 cm.× 23 cm., S_3=23 cm.× 23 cm., S_4=23 cm ×30 cm , S_5=15 cm.× 30 cm. and S_6=30 cm.× 30 cm.

Sub-plot treatments :
All combinations of (1) and (2)
(1) 3 seed sizes : D_1=1·3 cm. to 2·5 cm., D_2=2·5 cm. to 3·8 cm. and D_3=3·8 cm. to 5·1 cm.
(2) 2 levels of manure : M_1=25 and M_2=50 C.L./ha. of C.M.
M applied in two doses : At planting and 45 days after planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 6 sub-plots/main-plot. (b) N.A. for 60(70) ; 29·3 m.× 51·2 m. for others. (iii) 3. (iv) (a) 4·3 m.× 7·9 m. for 60(70) ; 4·9 m.× 8·5 m. for others. (b) 3·7 m.× 7·3 m. (v) 30 cm.× 30 cm. for 60(70) ; 61 cm .× 61 cm. for others.

4. GENERAL :

(i) Normal. (ii) Incidence of soft root disease for 60(70) was controlled by applying Chesnut Mixture ; Incidence of leaf spot disease and attack of shoot borer for others for which Bordeaux Mixture and Endrin were sprayed. (iii) Yield of Ginger. (iv) (a) 1959—1962. (b) No. (c) Resuls of combined analysis presented under 5. Results (v) N.A. (vi) Nil. (vii) Expt. No. 59(25) is also taken into consideration while giving the combined analysis results. Error variances for main-plots and sub-plots are homogeneous and Treatments × years interaction is absent in main-plot and present in sub-plot treatments.

5. RESULTS :

(i) 52.9 Q/ha. (ii) (a) 26.3 Q/ha. (based on 55 d.f. made up of pooled error and Treatments × years interaction). (b) 18.1 Q/ha. (based on 60 d.f. made up of Treatments × years interaction). (iii) Main effects of S and D are highly significant. (iv) Av. yield of ginger in Q/ha.

	S_1	S_2	S_3	S_4	S_5	S_6	D_1	D_2	D_3	Mean
M_1	68.8	59.3	53.5	44.4	48.6	35.8	46.1	50.2	58.9	51.7
M_2	70.6	56.7	62.4	48.2	48.2	38.4	49.3	51.3	61.7	54.1
Mean	69.7	58.0	57.9	46.3	48.4	37.1	47.7	50.8	60.3	52.9
D_1	65.2	53.9	54.6	40.3	41.2	31.1				
D_2	65.0	50.6	56.8	45.0	49.7	37.6				
D_3	78.9	69.5	62.5	53.6	54.5	42.7				

C.D. for S marginal means = 9.0 Q/ha.

C.D. for D marginal means = 4.3 Q/ha.

— — —

Crop :- Ginger (*Summer*).   **Ref :- K 61(81),62(15)**

Site :- Agri. Res. Stn., Ambalavayal.   **Type :- 'D'**

Object :—To find out the effect of treating the soils and the seeds with different fungicides in controlling the incidence of soft-rot disease on Ginger.

1. BASAL CONDITIONS:

(i) (a) to (c) Nil. (ii) Sandy loam. (iii) 4.5.1961 ; 4.5.1962. (iv) (a) N.A. for 1961; 5 plaughings for 1962. (b) to (d) N.A. (e) —; N.A. for 1962. (v) 168 Q/ha. of C.M. (vi) *Wynad*. (vii) Unirrigated. (viii) 2 weedings, 2 earthing up and mulching thrice with G.L. for 1961; 2 weedings, earthing up and mulching thrice with 311 cm; N.A. for 1962. (ix) 168 Q/ha. of G.L. (x) January 1962 ; December 1962.

2. TREATMENTS:

5 fungicidal treatments : T_0=Control (untreated), T_1=Pouring Calloridal Copper 1 litre of stock solution in 13 litres of water, T_2=Pouring Chestnut Compound 28 gm in 9 litres of water, T_3=Pouring Wettable Ceresan 0.1% and T_4=Cupravit 0.4%.

Treatment T_4 is not applied in the year 1962.

3. DESIGN :

(i) R.B.D. (ii) (a) 5 for 1961; 4 for 1962. (b) N.A. (iii) 6 for 1961; 4 for 1962. (iv) (a) 2.44 m × 6.71 m. (b) 1.83 m. × 6.10 m. (v) 30 cm. × 30 cm. (vi) Yes.

4. GENERAL :

(i) satisfactory. (ii) Nil. for 1961, Incidence of leaf spot disease was noticed for 1962. (iii) Yield of ginger. (iv) (a) 1961—1962. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

61(81)

(i) 103·3 Q/ha.   (ii) 12·15 Q/ha.   (iii) Treatment differences are highly significant.   (iv) Yield of ginger in Q/ha.

Treatment	T_0	T_1	T_2	T_3	T_4
Av. yield	96·3	96·0	118·7	116·3	79·2

C.D.=14·6 Q/ha.

62(15)

(i) 100·0 Q/ha.   (ii) 20·69 Q/ha.   (iii) Treatment differences are not significant.   (iv) Av. yield of ginger in Q/ha.

Treatment	T_0	T_1	T_2	T_3
Av. yield	87·2	100·7	95·9	116 0

Crop :- Ginger.   **Ref :- K 61(82), 62(8), 63(66), 65(35)**

Site :- Pepper Res. Stn. Thodupuzha.   **Type .- 'D'**

Object :—To find out the effect of different fungicides in controlling the incidence of soft-rot disease on Ginger.

1. BASAL CONDITIONS :

(i) (a) Nil.   (b) Ginger for 63(66); Nil for others.   (c) N.A. for 63(66); Nil for others.   (ii) Leterite soil. (iii) 1.7.1961; 22.6.1962; 10.5.1963; May, 1965.   (iv) 1 digging and levelling.   (b) Placed in pits on the beds. (c) 1120 to 1345 Kg/ha. of seed rhizomes.   (d) 23 cm. × 23 cm.   (e) 1.   (v) 25 C.L./ha. of C.M.+5604 to 8967 Kg/ha. of G.L. for 62(8); 224·2 Q/ha. of C.M.+224·4 Q/ha. of G.L. for 65(35); 25 C.L./ha of C.M.+ 5604 Kg/ha. of G.L. for others.   (vi) Local (medium)   (vii) Unirrigated.   (viii) N.A. for 63(66); 3 Weedings. earthing up and mulching for others.   (ix) 429 cm. ; 405 cm. ; 340 cm. ; 255 cm.   (x) 12.1.1962 ; 27.12.1963 ; January, 1966.

2. TREATMENTS :

4 fungicidal treatments : T_0=Control (untreated), T_1=Colloidal Copper (1 litre of stock solution in 13 litres of water), T_2=Chestnut compound (28 gm. in 9 litres) and T_3=Wettable ceresan 0·1% (1 gm. in 1 litre of water).

The fungicides to be applied at 0·14 litres/pit in specified concentration once immediately before planting and the 2nd time 6 weeks later.

3. DESIGN :

(i) R.B.D.   (ii) (a) 4.   (b) 9·75 m. × 17·07 m.   (iii) 6.   (iv) (a) 4·88 m. × 8·53 m.   (b) 3.66 m. × 7·32 m. (v) 61 cm. × 61 cm.   (vi) Yes.

4. GENERAL :

(i) Normal.   (ii) No incidence for 65(35); Incidence of leaf spot disease and attack of short borer for others for which Bordeaux Mixture and Endrin were sprayed.   (iii) Yield of Ginger.   (iv) (a) 1961—1965 (Expt. for 1964 is N.A.).   (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 insteraction is present.

5. RESULTS:

(i) 52·8 Q/ha.   (ii) 11·1 Q/ha. (based on 9 d.f. made up of Treatments × years interaction).   (iii) Treatment differences are not significant.   (iv) Av. yield of ginger in Q/ha.

Treatment	T_0	T_1	T_2	T_3
Av. yield	59·6	49·2	46·1	56·2

— — —

Crop :- Lemon grass.   **Ref :- K 60(92), 61(104), 62(66), 63(28).**

Site :- Lemon grass Res. Stn; Odakkali. **Type :- 'M'**

Object :—To study the influence of fertiliser on yield and oil content of Lemon grass.

1. BASAL CONDITIONS :

(i) Virgin land. (ii) Laterite loam. (iii) By vegetative multiplication and through seeds. (iv) Local. (v) 24.6.1959 to 28.6.1959. uniform size rooted slips were transplanted at a spacing of 30 cm. × 15 cm. (vi) N.A. (vii) Nil. (viii) 2 to 3 weedings and 1 harrowing. (ix) Nil. (x) Unirrigated. (xi) 428, 460, 430 and 298 cm. respectively. (xii) 26.4.60 to 21.12.60; 9.5.61 to 13.12.61; once in 45 days during the season for 1962 and 1963.

2. TREATMENTS :

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

  (1) 3 levels of N as A/S : N_0=0, N_1=112 and N_2=224 Kg/ha.

  (2) 3 levels of P_2O_5 as Super : P_0=0, P_1=112 and P_2=224 Kg/ha.

  (3) 3 levels of K_2O as Mur. Pot : K_0=0, K_1=112 and K_2=224 Kg/ha.

3. DESIGN :

(i) 3^3 fact in R.B.D. (ii) (a) 9 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (v) Gross—480 plants Net—396 plants. (v) One row alround. (vi) Yes.

4. GENERAL :

(i) Good vegetative growth. (ii) Nil. (iii) Fresh weight of gross per plot. (vi) 1959—63. (v) N.A. (vi) to (viii) Nil.

5. RESULTS :

60(92)

(a) Grass yield

(i) 242 Kg/plot. (ii) 10·7 Kg/plot. (iii) Main effects of N, P and K and their interactions N×P and N×K are highly significant. Interaction P×K is significant. (iv) Av. yield of grass in Kg/plot.

	P_0	P_1	P_2	K_0	K_1	K_2	Mean
N_0	184	186	195	185	177	203	388
N_1	223	246	269	226	265	247	246
N_2	249	302	322	260	293	320	291
Mean	219	245	262	214	245	257	242
K_0	205	228	238				
K_1	226	246	263				
K_2	225	260	285				

C.D. for N, P or K marginal means=7·40 Kg/plot.
C.D. for body of N×P, P×K or N×K table=12·80 Kg/plot.

(b) Oil Content — N.A.

61(104)

(a) Grass yield

(i) 186 Kg/plot. (ii) 31·8 Kg/plot. (iii) Main effects of N, P and K are highly significant. Interactions N×P and N×K are significant. (iv) Av. yield of grass in Kg/plot.

	P_0	P_1	P_2	K_0	K_1	K_2	Mean
N_0	125	127	134	129	120	137	129
N_1	172	200	234	162	228	216	202
N_2	172	254	253	176	234	269	226
Mean	156	194	207	156	194	207	186
K_0	136	160	171				
K_1	168	198	216				
K_2	165	223	234				

C.D. for N, P or K marginal means$=21.8$ Kg/plot.
C.D. for body of $N \times P$ or $N \times K$ table$=37$ Kg/plot.

(b) Oil Content :-   N.A.

62(66)

(a) Grass Yield

(i) 55 Kg/plot. (ii) 9.9 Kg/plot. (iii) Main effect of N is highly significant. Main of effect P is significant. (iv) Av. yield of grass/plot.

	P_0	P_1	P_2	K_0	K_1	K_2	Mean
N_0	42	49	37	41	46	41	43
N_1	61	57	55	58	61	53	57
N_2	68	70	58	67	64	65	65
Mean	57	59	50	55	57	53	55
K_0	57	62	47				
K_1	59	57	55				
K_2	55	56	48				

C.D. for N or P marginal means$=6.8$ Kg/plot.

(b) Oil Contents

(i) 126 C.C./plot.   (ii) 22.4 C.C./plot.   (iii) Main effect of N is significant.   (iv) Av. yield of oil in C.C./plot.

	P_0	P_1	P_2	K_0	K_1	K_2	Mean
N_0	111	126	102	112	116	110	113
N_1	133	130	121	131	131	122	128
N_2	146	140	126	140	135	137	137
Mean	130	132	116	128	127	123	126
K_0	127	143	114				
K_1	132	132	118				
K_2	131	121	117				

C.D. for N marginal means$=15.3$ C.C./plot.

63(28)

(a) Grass Yield

(i) 403·1 Q/ha. (ii) 64.7 Q/ha. (iii) Main effects of N, P and K are highly significant. (iv) Av. yield of grass in Q/ha.

	P_0	P_1	P_2	K_0	K_1	K_2	Mean
N_0	218·3	233·8	260·0	217·0	218·8	276·3	237·4
N_1	379 2	448·5	477·9	381·0	468·4	456·2	435·2
N_2	454·8	533·6	621·6	451·7	562·6	595 7	536·7
Mean	350·8	405·3	453·2	349·9	416·6	442·7	403·1
K_0	292·2	349·7	407·7				
K_1	375·5	424·5	449·8				
K_2	384·6	441·7	502·0				

C.D. for N, P or K marginal means=44·3 Q/ha.

(b) Oil Contents

(i) 84·5 litres/ha. (ii) 11·6 litres/ha. (iii) Main effects of N, P and K are highly significant. (iv) Av. yield of Oil Contents in litres/ha.

	P_0	P_1	P_2	K_0	K_1	K_2	Mean
N_0	54·6	63·2	61·1	55·9	57·2	65·8	59·6
N_1	82·2	97·0	97·2	83·2	98·5	94·6	92·1
N_2	93·2	103·1	109·1	91·6	100·6	113·2	101 8
Mean	76·7	87·8	89·1	76·9	85·4	91·2	84·5
K_0	67·1	79·3	84 4				
K_1	79 9	88·0	88·4				
K_2	83·3	96·0	94 6				

C.D. for N, P or K marginal means=13·9 litres/ha.

———

Crop :- Lemongrass.   **Ref :- K 63(23), 64(177), 65(89).**

Site :- Lemongrass Res. Stn; Odakkali.   **Type :- 'C'**

Object :—To determine the optimum stage or interval to be given between harvest for the best yield.

1. BASAL CONDITIONS :

(i) Grass compost at 5600 Kg/ha. in 1961 and 1962. (ii) Laterite. (iii) Vegetative propagation. (iv) Local (v) Transplanting from 31.7.1963 to 2.8.1963 and spacing 20 cms.×20 cm. (vi) 3 months. (vii) Nil. (viii) Weeding and earthing. (ix) Nil. (x) Unirrigated. (xi) 691, 339 and 230 cms. respectively. (xii) Four cuttings in 1963; April to Dec, 1964; May to Feb, 1966.

2. TREATMENTS :

4 intervals of cutting : I_1=35, I_2=45, I_3=55 and I_4=65 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) 513. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Quantity of grass and oil contents. (vi) 1963—1966. (v) N.A. (vi) to (viii) Nil.

5. RESULTS :

63(23)

(a) Grass Yield

(i) 4244 Kg/ha. (ii) 857·5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grass in Kg/ha.

Treatment	I_1	I_2	I_3	I_4
Av. yield	2881	4286	4714	5095

C.D.=1055·0 Kg/ha.

(b) Oil Content

(i) 14·2 litres/ha. (ii) 4·04 litres/ha. (iii) Treatment differences are significant. (iv) Av. yield of Oil in litres/ha.

Treatment	I_1	I_2	I_3	I_4
Av. yield	9·0	14·0	15·7	18·0

C.D.=4.9 litres/ha.

64(177)

(a) Grass Yield

(i) 26860 Kg/ha. (ii) 3063·6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grass in Kg/ha.

Treatment	I_1	I_2	I_3	I_4
Av. yield	23355	25980	27574	30531

C.D.=3769·4 Kg/ha.

(b) Oil Content

(i) 73·0 litres/ha. (ii) 8·36 litres/ha. (iii) Treatment differences are not significant. (iv) Av. yield of Oil in litre/ha.

Treatment	I_1	I_2	I_3	I_4
Av. yield	72·7	73·8	77·4	68·1

65(89)

(a) Grass Yield

(i) 100 Kg/plot. (ii) 13·0 Kg/plot. (iii) Treatment differences are significant. (iv) Av. yield of grass in Kg/ha.

Treatment	I_1	I_2	I_3	I_4
Av. yield	85	110	99	104

C.D.=16·0 Kg/plot.

(b) Oil Content

(i) 320 c.c./plot. (ii) 34·1 c.c./plot. (iii) Treatment differences are highly significant. (iv) Av. yield of Oil in c.c./plot.

Treatment	I_1	I_2	I_3	I_4
Av. yield	309	368	312	290

C.D.=41·9 c.c./plot.

Crop :- Lemongrass.　　　　　　　　**Ref :- K. 60(93), 61(103), 62(68), 63(33).**

Site :- Lemongrass Res. Stn.,　　　**Type :- 'C'.**
　　　Odakkali.

Object :—To study the effect of method of planting on the yield of Lemongrass.

1. BASAL CONDITIONS :

(i) Virgin land. (ii) Laterite loam. (iii) By vegetative multiplication and through seeds. (iv) Local. (v) 15.4.60 seeds for both the plots were sown on jthe same day and transplanted for the treatments T_2 on 19.7.60. (vi) 94 days. (vii) Nil. (viii) 2 to 3 weedings and 2 earthings. (ix) Nil. (x) Unirrigated. (xi) 428, 460, 430 and 298 cm. respectively. (xii) N.A.

2. TREATMENTS:

2 methods of planting : T_1=Direct sowing and T_2=Transplanting.

3. DESIGN :

(i) Paired-plot. (ii) 2. (iii) 12. (iv) and (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good vegetative growth. (ii) Nil. (iii) Grass yield, oil content and citral percentage. (iv) 1960—63 (v) N.A. (vi) to (viii) Nil,

5. RESULTS :

60(93)

(a) Grass yield

(i) 14058 Kg/ha. (ii) 1268·5 Kg/ha. (iii) Treatment difference is significant. (iv) Av. yield of grass in Kg/ha.

Treatment	T_1	T_2
Av. yield	16310	11805

C.D.=1142·4 Kg/ha.

(b) Oil Content—N.A.

61(103)

(a) Grass yield

(i) 30402 Kg/ha. (ii) 2266·4 Kg/ha. (iii) Treatment difference is highly significant. (iv) Av. yield of grass in Kg/ha.

Treatment	T_1	T_2
Av. yield	37348	23456

C.D.=2041·1 Kg/ha.

(b) Oil Content—N.A.

62(68)

(a) Grass yield

(i) 15114 Kg/ha. (ii) 1425·1 Kg/ha. (iii) Treatment difference is highly significant. (iv) Av. yield of grass in Kg/ha.

Treatment	T_1	T_2
Av. yield	13714	16513

C.D.=1283·3 Kg/ha.

(b) Oil Content

(i) 38·7 litre/ha. (ii) 4·3 litre/ha. (iii) Treatment difference is not significant. (iv) Av. yield fof Oil in c.c./ha.

Treatment	T_1	T_2
Av. yield	37·3	40·0

63(33)

(a) Grass yield

(I) 35989 Kg/ha.   (ii) 3399·8 Kg/ha.   (iii) Treatment difference is not significant.   (iv) Av. yield of grass in Kg/ha.

Treatment	T_1	T_2
Av. yield	35047	36930

(b) Oil Content

(i) 101·2 litre/ha.   (ii) 9·1 litre/ha.   (iii) Treatment difference is not significant.   (iv) Av. yield of Oil in litre/ha.

Treatment	T_1	T_2
Av. yield	99·9	102·4

————

Crop :- Lemongrass.   **Ref :- K. 63(26).**

Site :- Lemongrass Res. Stn., Odakkali.   **Type :- 'C'.**

Object - -To find out the best interval of cutting Lemongrass.

1. **BASAL CONDITIONS :**

(i) Grass compost at 5600 Kg/ha. in 1961 and 62.   (ii) Typical laterite.   (iii) Transplanting seedlings.   (iv) N.A.   (v) July, 63.   (vi) 3 months.   (vii) to (ix) Nil.   (x) Unirrigated.   (xi) 691 cm. (average).   (xii) 3 cuttings.

2. **TREATMENTS :**

3 intervals of harvesting : I_1=35, I_2=45 and I_3=55 days.

3. **DESIGN :**

(i) R.B.D.   (ii) (a) 3.   (b) N.A.   (iii) 6.   (iv) (a) N.A. (b) 513.   (v) Nil   (vi) Yes.

4. **GENERAL :**

(i) Satisfactory.   (ii) Nil.   (iii) Yield of grass, Oil contents.   (iv) N.A.   (v) to (viii) Nil.

5. **RESULTS :**

(a) Grass Yield

(i) 2698 Kg/ha.   (ii) 381·3 Kg/ha.   (iii) Treatment differences are not significant.   (iv) Av. yield of grass in Kg/ha.

Treatment	I_1	I_2	I_3
Av. yield	2595	2857	2643

(b) Oil Content

(i) 10952 c.c./ha.   (ii) 2110·5 c.c.   (iii) Treatment differences are not significant.   (iv) Av. yield of Oil in c.c./ha.

Treatment	I_1	I_2	I_3
Av. yield	8952	11095	12809

————

Crop :- Lemongrass.   **Ref :- K. 63(27), 64(179), 65(90).**

Site :- Lemongrass Res. Stn., Odakkali.   **Type :- 'C'.**

Object :—To see the effect of drying and chopping Lemongrass before distillation on yield and quality of oil.

1. BASAL CONDITIONS:

(i) Grass compost at 56 Q/ha. in 1961 and 62. (ii) Laterite. (iii) Vegetative. (iv) Local. (v) and (vi) N.A. (vii) to (ix) Nil. (x) Unirrigated. (xi) 691, 320 and 230 cm. for 1963, 64 and 65. (xii) N.A. for 63 and 64; May to Dec. end ; an interval of 45 days for 65.

2. TREATMENTS:

Main-plot treatments:

4 times of distillations : T_0 =Immediately after harvest, T_1 =48, T_2 =96 and T_3 =144 hrs. after harvest.

Sub-plot treatments:

4 lengths of chopping: C_1 =3, C_2 =10, C_3 =20 cm. and C_4 =Without chopping.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 3 for 63(27), 5 for 64(179) and 65(90). (iv) and (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iil) Grass yield. Oil yield and Citral percentage. (iv) 1963 –contd. (v) N.A. (vi) to (viii) Nil.

5. RESULTS :

63(27)

(i) 86 c.c./plot. (ii) (a) 9·2 c.c./plot. (b) 5·4 c.c./plot. (iii) Main effect of C alone is highly significant. (iv) Av. yield of Oil in c.c./plot.

	C_1	C_2	C_3	C_4	Mean
T_0	100	87	84	78	86
T_1	99	89	83	71	85
T_2	95	89	84	75	86
T_3	94	92	84	78	87
Mean	97	89	84	75	86

C.D. for C marginal means=4·6 c.c./plot.

64(179)

(i) 96 c.c./plot. (ii) (a) 7·6 c.c./plot. (b) 4·0 c.c./plot. (iii) Main effects of T is significant. Main effect of C is highly significant. (iv) Av. yield of Oil in c.c./plot.

	C_1	C_2	C_3	C_4	Mean
T_0	104	98	94	82	94
T_1	106	102	97	92	99
T_2	103	102	96	89	98
T_3	95	92	92	85	91
Mean	102	98	95	87	96

C.D. for T marginal means=5·2 c.c./plot.
C.D. for C marginal means=2·6 c.c./plot.

65(90)

(i) 59 c.c./plot. (ii) (a) 12·3 c.c./plot. (b) 5·7 c.c./plot. (iii) Main effect of C is highly significant. (iv) Av. yield of Oil in c.c./plot.

	C_1	C_2	C_3	C_4	Mean
T_0	69	56	59	45	57
T_1	67	69	60	47	61
T_2	63	67	62	52	61
T_3	63	60	54	44	55
Mean	66	63	59	47	59

C.D. for C marginal means = 3·6 Kg/ha.

Crop :- Lemon-grass.

Site :- Lemon-grass Res. Stn., Odakkali.

Object : —To study the effect of Nitrogen, Phosphorus and Potash at the levels on yield and quantity of Oil.

1. BASAL CONDITIONS :

(i) Nil. (ii) N.A. (iii) Vegetative. (iv) O.D.—19. (v) Planted on 25 to 29.5.65. (vi) N.A. (vii) Nil. (viii) Weeding and earthing up. (ix) Nil. (x) Unirrigated. (xi) 230·0 cm. (xii) 3 harvest during the year at an interval of about 45 days.

2. TREATMENTS :

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

(1) 3 levels of N : $N_1 = 84$, $N_2 = 112$ and $N_3 = 140$ Kg/ha.

(2) 3 levels of P_2O_5 : $P_1 = 56$, $P_2 = 78$ and $P_3 = 100$ Kg/ha.

(3) 3 levels of K_2O : $K_1 = 84$, $K_2 = 112$ and $K_3 = 140$ Kg/ha.

(4) 3 spacings : $S_1 = 15$ cm. × 15 cm., $S_2 = 23$ cm. × 15 cm. and $S_3 = 30$ cm. × 15 cm.

3. DESIGN :

(i) 3^3 confd. Fact. (ii) 9 plots/block ; 9 blocks/replication. (b) N.A. (iii) and (iv) N.A. (v) 1 row at each end of all plots. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Quantity of Grass and Oil. (iv) 1965—68. (v) and (vi) N.A. (vii) and (viii) Nil.

5. RESULTS :

(i) 154·7 c.c./plot. (ii) 22·5 c.c./plot. (iii) Main effect of K is highly significant and interaction P×K is significant. (iv) Av. yield of Lemongrass oil in c.c./plot.

	N_1	N_2	N_3	K_1	K_2	K_3	S_1	S_2	S_3	Mean
P_1	155·8	143·9	148·3	144·9	151·2	151·9	153·1	141·5	153·4	149·3
P_2	154·1	159·3	157·5	176·4	143·2	151·3	166·8	158·8	145·4	157·0
P_3	150·5	152·2	170·5	171·3	133·0	168·9	157·4	164·4	151·4	150·1
Mean	153·5	151·8	158·8	164·2	142·5	157·4	159·1	154·9	150·1	154·7
S_1	154·4	161·6	161·2	166·6	148·5	162·2				
S_2	151·7	153·6	159·3	170·3	144·4	150·0				
S_3	154·3	140·1	155·8	155·8	134·5	159·9				
K_1	155·1	169·0	168·5							
K_2	149·1	133·2	145·1							
K_3	156·3	153·2	162·7							

C.D. for K marginal means   = 12·2 c.c./plot.

C.D. for the body of P×K table   = 21·4 c.c./plot.

Crop :- Vanilla.

Ref :- K. 63(54), 64(100).

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

Type :- 'M'.

Object :—To study the effect of manures on blossom fruit setting and crop yield.

1. BASAL CONDITIONS :

(i) Nil. (ii) Sandy loam. (iii) By rooted cuttings. (iv) Vanilla planifolia. (v) 6.7.62. (vi) 2.7 m. in between plants and 1.8 m. between rows. (vii) N.A. (viii) Weeding thrice a year and mulching with 13.6 Kg/vine of G.L. every year. Training the vines once in 60 days. (ix) Nil. (x) Unirrigated. (xi) 162 cm. in 63 and 265 cm. in 64. (xii) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+a control
    (1) 2 sources of 113 gm/vine of N : S_1=Leaf compost and S_2=Well rotten C.M.
    (2) 2 levels of lime : L_0=0 and L_1=454 gm.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a)—(b) 6. (v) 1 row alround. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Growth data of vines. (iv) 1962—63, N.A. (v) N.A. (vi) Nil. (vii) and (viii) Nil.

5. RESULTS :

63(54)

No. of leaves

(i) 27 leaves/vine. (ii) 6 leaves/vine. (iii) None of the effects is significant. (iv) Av. number of leaves/vine.

Control=26 leaves/vine.

	S_1	S_2	Mean
L_0	30	26	28
L_1	25	26	26
Mean	28	26	27

Length of vines

(i) 131.5 cm. (ii) 41.9 cm. (iii) None of the effects is significant. (iv) Av. length of vines in cm.

Control=122.0 cm.

	S_1	S_2	Mean
L_0	154.5	122.9	138.7
L_1	129.6	128.4	129.0
Mean	142.0	125.7	133.9

64(100)

Length of vines

(i) 346.4 cm. (ii) 117.5 cm. (iii) None of the effects is significant. (iv) Av. length of vines in cm.

Control = 328·5 cm.

	S_1	S_2	Mean
L_0	338·5	373·8	356·1
L_1	389·5	301·5	345·5
Mean	364·0	337·6	350·8

Girth of vine

(i) 2·7 cm. (ii) 0·2 cm. (iii) None of the effects is significant. (iv) Av. girth of vines in cm.

Control = 2·8 cm.

	S_1	S_2	Mean
L_0	2·7	2·8	2·7
L_1	2·6	2·7	2·7
Mean	2·7	2·7	2·7

Number of leaves

(i) 58 leaves/vine. (ii) 12 leaves/vine. (iii) None of the effects is significant. (iv) Av. number of leaves/vine.

Control = 53 leaves/vine.

	S_1	S_2	Mean
L_1	60	64	62
L_1	63	49	56
Mean	62	56	59

— — — —

Crop :- Vanilla.   **Ref :- K. 60(98), 61(120), 62(56).**

Site :- Agri. Res. Stn., Ambalavayal.   **Type :- 'C'.**

Object :—To determine the optimum length of planting materials required for better growth and its influence on the pre-leaving period of the Vine.

1. BASAL CONDITIONS :

(i) The area was planted with Coffee previously. No manures were applied. (ii) Sandy loam. (iii) By rooted cuttings. (iv) Vanilla planifolia. (v) 2.9.60 with 1·8 m. × 2·7 m. spacings. (vi) As per treatments. (vii) Nil. (viii) 3 weedings and mulching the vines with 23 Kg/vine of G. L. Training the vine once in 60 days. (ix) Nil. (x) Unirrigated. (xi) and (xii) N.A.

2. TREATMENTS :

4 lengths of rooted cuttings : C_1 = 30, C_2 = 61, C_3 = 91 and C_4 = 122 cm.

3. DESIGN :

(i) R.B.D (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a)—(b) 12. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Number of leaves and length of vines etc. (iv) 1960—62. (v) N.A. (vi) to (viii) Nil.

5. RESULTS :

60(68)

Length of vines

(i) 92 cm./vine. (ii) 19.2 cm/vine. (iii) Treatment differences are highly significant. (iv) Av. length of vines in cm./vine.

Treatment	C_1	C_2	C_3	C_4
Av. length	46	96	101	127

C.D.=26·5 cm./vine.

Number of leaves

(i) 17 leaves/vine. (ii) 2 leaves/vine. (iii) Treatment differences are highly significant. (iv) Av. number of leaves/vine.

Treatment	C_1	C_2	C_3	C_4
Av. number	12	19	17	18

C.D.=2·8 leaves/vine

61(120)

Length of vines

(i) 296 cm./vine. (ii) 76·0 cm./vine. (iii) Treatment differences are highly significant. (iv) Av. length of vines in cm./vine.

Treatment	C_1	C_2	C_3	C_4
Av. length	173	334	304	372

C.D.=104·7 cm./vine.

Number of leaves

(i) 42 leaves/vine. (ii) 9 leaves/vine. (iii) Treatment differences are highly significant. (iv) Av. number of leaves/vine.

Treatment	C_1	C_2	C_3	C_4
Av. number	25	45	44	52

C.D.=12·4 leaves/vine.

62(56)

Length of vines

(i) 587 cm./vine. (ii) 121·6 cm./vine. (iii) Treatment differences are highly significant. (iv) Av. length of vines in cm./vine.

Treatment	C_1	C_2	C_3	C_4
Av. length	395	646	608	699

C.D.=167·5 cm./vine.

Number of leaves

(i) 76 leaves/vine. (ii) 16 leaves/vine. (iii) Treatment differences are significant. (iv) Av. number of leaves/vine.

Treatment	C_1	C_2	C_3	C_4
Av. number	51	78	85	90

C.D.=22·1 leaves/vine.

Crop :- Vanilla.   **Ref :- K. 60(102), 61(123), 62(60), 63(55).**

Site :- Agri. Res. Stn., Ambalavayal. Type :- 'C'.

Object :—To determine the best method of training the Vanilla Vines.

1. BASAL CONDITIONS :

(i) The area was planted with coffee previously. No manures were applied. (ii) Sandy loam. (iii) By rooted cuttings. (iv) Vanilla planifolia. (v) 30.8.60 with 1·8 m. ×2·7 m. spacings. (vi) Rooted cuttings of 30 cm. length with 4 months nursery growth. (vii) Nil. (viii) 8 weedings and training the vines in 60 days. (ix) Nil. (x) Unirrigated. (xi) 162 cm. for 63. N.A. for other years. (xii) Nil.

2. TREATMENTS :

3 methods of training Vines : M_1=Training the vines erect on wooden posts upto a height of 1·8 m. and then training horizontally on wooden trellis, M_2=Training the vines horizontally on wooden trellis when they reach 1·2 m. high and M_3=Training the vines horizontally in loops when they reach 1·2 m. height.

3. DESIGN :

(i) R B.D. (ii) (a) 3. (b) N.A. (iii) 7. (iv) (a) –(b) 6. (v) Nil. (vi) Yes.

4. GENERAL

(i) Satisfactory. (ii) Nil. (iii) Length of vines and number of leaves etc. (iv) 1960—63. (v) N.A. (vi) to (viii) Nil.

5. RESULTS:

60(102)

Length of vines

(i) 73 cm./vine. (ii) 18·7 cm./vine. (iii) Treatment differences are not significant. (iv) Av. length of vines in cm.

Treatment	M_1	M_2	M_3
Av. length	88	65	67

Number of leaves

(i) 21 leaves/vine. (ii) 4 leaves/vine. (iii) Treatment differences are not significant. (iv) Av. number of leaves/vine.

Treatment	M_1	M_2	M_3
Av. number	24	19	20

61(123)

Length of vines

(i) 212 cm./vine. (ii) 81·0 cm./vine. (iii) Treatment differences are not significant. (iv) Av. length of vines in cm.

Treatment	M_1	M_2	M_3
Av. length	266	178	191

Number of vines

(i) 37 leaves/vine. (ii) 8 leaves/vine. (iii) Treatment differences are not significant. (iv) Av. number of leaves/vine.

Treatment	M_1	M_2	M_3
Av. number	39	36	35

62(60)

Length of vines

(i) 456 cm. (ii) 127 cm. (iii) Treatment differences are significant. (iv) Av. length of vines in cm.

Treatment	M_1	M_2	M_3
Av. length	544	350	473

C.D.=147·9 cm./vine.

Number of leaves

(i) 52 leaves/vine. (ii) 13 leaves/vine. (iii) Treatment differences are not significant. (iv) Av. number of leaves/vine.

Treatment	M_1	M_2	M_3
Av. number	57	47	52

63(55)

Length of vines

(i) 782 cm./vine. (ii) and (iii) N.A. (iv) Av. length of vines in cm.

Treatment	M_1	M_2	M_3
Av. length	841	755	751

Number of leaves

(i) 76 leaves/vine. (ii) and (iii) N.A. (iv) Av. number of leaves/vine.

Treatment	M_1	M_2	M_3
Av. number	81	75	73

———

Crop :- Vanilla.   **Ref :- K. 63(57), 64(123).**

Site :- Agri. Res. Stn., Ambalavayal.   **Type :- 'C'.**

Object :—To determine the best standard for Vanilla.

1. **BBSAL CONDITIONS :**

(i) N.A. (ii) Sandy loam. (iii) By rooted cuttings. (iv) Vanilla planifolia. (v) 27.6.61 with 1·8 m. × 2·7 m. spacings. (vi) 4 months. (vii) Nil. (viii) 3 weedings and mulching the vines with 23 Kg/vine of G.L. Training the vines once in 60 days. (ix) Nil. (x) Unirrigated. (xi) 162 cm. in 1963 and 265 cm. in 1964. (xii) N.A.

2. **TREATMENTS :**

5 types of standards : T_1=Limb cuttings of Glyricidia, T_2=Limb cuttings of Plumania Alba, T_3=Limb cuttings of Erythrina Lithosperma, T_4=Limb cuttings of Indigofera Termania and T_5=Dead wood cuttings.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a)—(b) 6. (v) Nil. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Quantitative growth data of vines. (iv) 1961—64. (v) to (vii) Nil. (viii) Expts. of other years—N.A.

5. **RESULTS :**

63(57)

Length of vines

(i) 131 cm. (ii) 41·0 cm. (iii) Treatment differences are not signifinant. (iv) Av. length of vines in cm.

Treatment	T_1	T_2	T_3	T_4	T_5
Av. length	115	129	165	94	152

Number of leaves

(i) 27 leaves/vine. (ii) 6 leaves/vine. (iii) Treatment differences are not significant. (iv) Av. number of leaves/vine.

Treatment	T_1	T_2	T_3	T_4	T_5
Av. length	25	27	32	20	31

64(123)

Length of vine

(i) 316 cm.   (ii) 160·1 cm.   (iii) Treatment differences are not significant.   (iv) Av. length of vines in cm

Treatment	T_1	T_2	T_3	T_4	T_5
Av. number	306	394	300	215	365

Number of leaves

(i) 52 leaves/vine.   (ii) 18 leaves/vine.   (iii) Treatment differences are not significant.   (iv) Av. number of leaves/vine.

Treatment	T_1	T_2	T_3	T_4	T_5
Av. number	51	60	53	41	56

Girth of vine

(i) 2·8 cm.   (ii) 0·3 cm.   (iii) Treatment differences are not significant.   (iv) Av. girth of vines in cm.

Treatment	T_1	T_2	T_3	T_4	T_5
Av. girth	2·8	2·9	2·8	2·4	2·9

—————

Crop :- Vanilla.   **Ref :- K. 60(101), 61(122), 62(58), 63(60).**

Site :- Agri. Res. Stn., Ambalavayal.   Type :- 'IC'.

Object :—To study the effect of pot watering during summer months and mulching throughout the year on Vanila vines.

1. BASAL CONDITIONS :

(i) The area was planted with coffee previously.   No manures were applied. (ii) Sandy loam.   (iii) By rooted cuttings.   (iv) Vanilla planifolia.   (v) 14.9.60 with 1·8 m×2·7 m. spacings.   (vi) Rooted cuttings of 30 cm. length with 5 months nursery growth.   (vii) Nil.   (viii) 3 weedings and training of vines once in 60 days.   (ix) Nil.   (x) Irrigated.   (xi) 152 cm. in 1963.   (xii) Nil. N.A. for other years.

2. TREATMENTS :

All combinations of (1) and (2)+a control
    (1) 4 frequencies of irrigations : I_1=2, I_2=4, I_3=8 and I_4=12 days interval during summer.
    (2) 2 cultural treatments : T_1=No mulching and T_2=Mulching.

3. DESIGN :

(i) R.B.D.   (ii) (a) 9.   (b)—(iii) 4.   (iv) (a) N.A. (b) 6.   (v) Nil.   (vi) Yes.

4. GENERAL :

(i) Satisfactory.   (ii) Nil.   (iii) Length of vines and number of leaves etc.   (iv) 1960—63.   (v) to (viii) Nil.

60(101)

Length of vine

(i) 84 cm./vine.   (ii) 31·8 cm./vine.   (iii) None of the effects is significant.   (iv) Av. length of vines in cm.

Control=92 cm.

	I_1	I_2	I_3	I_4	Mean
T_1	92	49	51	97	72
T_2	77	97	100	104	94
Mean	84	73	76	104	83

Number of leaves

(i) 19 leaves/vine. (ii) 5 leaves/vine. (iii) None of the effects is significant. (iv) Av. number of leaves/vine.

Control=17 leaves/vine.

	I_1	I_2	I_3	I_4	Mean
T_1	21	16	13	21	18
T_2	17	22	22	21	20
Mean	19	19	18	21	19

61(122)

Length of vine

(i) N.A. (ii) 72·6 cm./vine. (iii) Main effect of T is highly significant. (iv) Av. length of vines in cm.

Control=N.A.

	I_1	I_2	I_3	I_4	Mean
N_1	155	111	99	162	132
N_2	187	228	199	215	207
Mean	171	170	149	188	170

C.D. for T marginal means=53·0 cm./vine

Number of leaves

(i) 29 leaves/vine. (ii) 7 leaves/vine. (iii) Main effect of T is highly significant. (iv) Av. number of leaves/vine.

Control=29.

	I_1	I_2	I_3	I_4	Mean
T_1	28	25	20	27	25
T_2	35	32	35	33	34
Mean	32	28	28	30	30

C.D. for T marginal means=5·1 leaves/vine.

62(58)

Length of vine

(i) 458 cm./vine. (ii) 184·8 cm./vine. (iii) Main effect of T is highly significant. (iv) Av. length of vines in cm.

Control=288 cm./vine.

	I_1	I_2	I_3	I_4	Mean
T_1	411	263	327	460	365
T_2	540	545	690	598	593
Mean	476	404	508	529	479

C.D. for T marginal means=134·8 cm./vine.

Number of leaves/vine

(i) 57 leaves/vine. (ii) 16 leaves/vine. (iii) None of the effects is significant. (iv) Av. number of leaves/vine.

Control=41 leaves/vine.

	I_1	I_2	I_3	I_4	Maen
T_1	54	35	40	49	44
T_2	60	74	77	82	73
Mean	57	54	58	66	59

63(60)

Length of vines

(i) 643 cm./vine. (ii) and (iii) N.A. (iv) Av. length of vines in cm./vine.

Control=330 cm./vine.

	I_1	I_2	I_3	I_4	Mean
T_1	606	450	416	469	485
T_2	890	898	840	882	878
Mean	748	674	628	676	682

Number of leaves/vine

(i) 72 leaves/vine. (ii) and (iii) N.A. (iv) Av. number of leaves/vine.

Control=45 leaves/vine.

	I_1	I_2	I_3	I_4	Mean
T_1	70	49	50	55	56
T_2	87	97	91	101	94
Mean	78	73	70	78	75

Crop :- Vettiver.

Site :- Lemongrass Res. Stn., Odakkali.

Ref :- K. 63(52), 65(73).

Type :- 'M'.

Object : —To see the effect of P_2O_4 and K_2O singly and in combination on yield and quality of oil over a dose of 5 C.L. of C.M.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite. (iii) 16.7.63, N.A. (iv) (a) to (e) N.A. (v) 12·4 C.L. of F.Y.M./ha. (vi) Local. (vii) Unirrigated. (viii) Gap- fillng. (ix) 583 cm. in 63 ; 331 cm. in 65. (x) 9 to 17.11.64 ; N.A.

2. TREATMENTS :

All combinationations of (1) and (2)

(1) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=22·4$ and $P_2=33·6$ Kg/ha.

(2) 3 levels of K_2O as Mur. Pot. : $K_0=0$, $K_1=22·4$, $K_2=33·6$ Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 7·5 m.×7·5 m. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Blast like spots due to fungi on leaves. (iii) Wet root yield and oil contents. (iv) (a) 1963—N.A. (b) No. (c) Nil. (v) Vettiver Sub—Stn., Thiruvambadi., Kozhikode district. (vi) Nil. (vii) Expt. for 64 in N.A.

5. RESULTS :

63(52)

Root yield

(i) 9584 Kg/ha. (ii) 1323·6 Kg/ha. (iii) Interaction P×K is highly significant. (iv) Av. yield of wet roots in Kg/ha.

	P_0	P_1	P_2	Mean
K_0	8813	7822	10773	9136
K_1	8387	11058	9271	9572
K_2	10284	10707	9142	10044
Mean	9161	9862	9729	9584

C.D. for body of table=1932·0 Kg/ha.

Oil yield of wet roots

(i) 40·3 c.c./25 Kg. (ii) 10·1 c.c./25 Kg. (iii) None of the effects is significant. (iv) Av. yield of oil in c.c./25 Kg.

	P_0	P_1	P_2	Mean
K_0	33·5	44·3	40·3	39·3
K_1	48·5	45·0	37·3	43·6
K_2	33·5	39·3	40·8	37·8
Mean	38·5	42·8	39·4	40·3

65(73)

Root yield

(i) 3134 Kg/ha. (ii) 277·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of roots in Kg/ha.

	P_0	P_1	P_2	Mean
K_0	2954	2666	3085	2902
K_1	3137	3582	3294	3338
K_2	3085	3111	3294	3163
Mean	3059	3120	3224	3134

Oil yield

(i) 7·523 litres/ha. (ii) 1·809 litres/ha. (iii) Main effect of P and interaction P×K are significant. (iv) Av. yield of oil contents in litres/ha.

	P_0	P_1	P_2	Mean
K_0	8·313	6·117	7·372	7·267
K_1	8·679	8·052	6·954	7·895
K_2	8·836	5·019	8·365	7·407
Mean	8·609	6·396	7·564	7·523

C.D. for P marginal means= 1·524 litres/ha.
C.D. for body of the table=2·640 litres/ha.

Crop :- Vettiver.   **Ref :- K. 64(192).**

Site :- Vettiver Sub-Stn., Thiruvambadi.   **Type :- 'M'.**

Object :—To find out the effect of P and K singly and in combinations on yield and quality of Oil.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A.   (ii) Laterite.   (iii) 21.10.64 to 27.10.64.   (iv) (a) Digging, levelling.   (b) to (e) N.A.   (v) 5 C.L. of C.M./ha.   (vi) Local (medium).   (vii) Unirrigated.   (viii) Weeding and earthing up twice.   (ix) N.A.   (x) 6.3.66 to 28.3.66.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of P_2O_5 applied as S/P : $P_0=0$, $P_1=22.4$, $P_2=33.6$ Kg/ha.

(2) 3 levels of K_2O applied as Mur. Pot. : $K_0=0$, $K_1=22.4$, $K_2=33.6$ Kg/ha.

3. DESIGN :

(i) R.B.D.   (ii) (a) 9 (per replication or block).   (b) 78 m. × 7.5 m.   (iii) 4.   (iv) (a) and (b) 8.0 m. × 7.5 m.   (v) Nil.   (vi) Yes.

4. GENERAL :

(i) Fair.   (ii) Attack of seak insects was noticed and sprayed with 'Parmar 50'.   (iii) Quantity of Root and Oil.   (iv) (a) No.   (b) and (c) N.A.   (v) Lemongrass Res. Stn., Odakkali.   (vi) and (vii) Nil.

5. RESULTS :

Root yield

(i) 1032.9 Kg/ha.   (ii) 145.3 Kg/ha.   (iii) Main effect of P and the interaction P×K are significant.   (iv) Av. yield of Vettiver roots in Kg/ha.

	P_0	P_1	P_2	Mean
K_0	1125.0	1041.7	1166.7	1111.1
K_1	979.2	1020.8	1020.8	1006.9
K_2	1129.2	854.2	958.3	980.6
Mean	1077.8	972.2	1048.6	1032.9

C.D. for P marginal means=122.4 Kg/ha.

C.D. for body of the table=212.1 Kg/ha.

Oil yield

(i) 9.7 litre/ha.   (ii) 1.9 litre/ha.   (iii) None of the effects is significant.   (iv) Av. yield of Vettiver oil in litres/ha.

	P_0	P_1	P_2	Mean
K_0	10.4	9.2	11.2	10.3
K_1	8.9	8.3	11.0	9.4
K_2	11.3	8.2	8.7	9.4
Mean	10.2	8.6	10.3	9.7

Crop :- Vettiver. **Ref :- K. 64(152).**

Site :- Lemongrass Res. Stn., Odakkali. **Type :- 'C'.**

Object :—To determine the best time for planting Vettier so as to get the maximum yield.

1. BASAL CONDITIONS:

(i) (a) No. (b) Lemongrass. (c) Nil. (ii) N.A.; As per treatments. (iv) (a) Digging and levelling. (b) Planted in raised lands. (c) to (e) N.A. (v) 217 Q/ha. of Cowdung applied during the second week of May before planting. (vi) *Nilambur* (medium). (vii) Unirrigated. (viii) 2 weedings and 2 earthings. (ix) 545·4 cm. (x) 3rd week of July to December, 65.

2. TREATMENTS :

6 times of planting : T_1=May, T_2=June, T_3=July, T_4=August, T_5=September and T_6=October.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 17·0 m.×15·9 m. (iii) 4. (iv) (a) 8 m.×6 m. (b) 7·5 m.×5·2 m. (v) 25 cm.× 40 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of mealy bugs and sprayed with 0·05%. Folidol. Blast like spots appeared on leaves and sprayed with 1% Bordeaux mixture. (iii) Root and oil yield. (iv) (a) No. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS :

Root yield

(i) 2916 Kg/ha. (ii) 573·4 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of roots in Kg/ha.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	3782	3513	2789	2763	2500	2147

C.D.=864 Kg/ha.

Oil yield

(i) 14·7 litre/ha. (ii) 3·0 litre/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of oil in litres/ha.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	20·2	16·7	14·6	13·5	12·8	10·7

C.D.=45 litres/ha.

Crop :- Vettiver. **Ref :- K. 63(50), 65(71).**

Site :- Lemongrass Res. Stn., Odakkali. **Type :- 'C'.**

Object :—To determine the most economic system of planting of Vettiver.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite. (iii) 22.7.63 ; 15, 16 and 19.7.65. (iv) (a) to (e) N.A. (v) 22·4 Kg/ha. of N as A/S, 22·4 Kg/ha. of P_2O_5 as Super and 28·0 Kg/ha. of K_2O as Mur. Pot. (vi) Local. (vii) Unirrigated. (viii) Gap filling, weeding and earthing up. (ix) 583 cm.; 316 cm. (x) 7 to 16.12.64 ; 8.9.66 to 24.9.66.

2. TREATMENTS :

4 methods of planting : M_1=Beds with 61 cm. width and height 46 cm., M_2=Beds with 69 cm. width and height 30 cm., M_3=Ridges at distance 46 cm. and height 41 cm. and M_4=Local practice of ridges.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 7·9 m. × 7·0 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Blast like spots on leaves noted and protective measures were taken. (iii) Yield of root and oil. (iv) (a) 1963—contd. (Expt. for 64 N.A). (b) No. (c) Nil. (v) Vettiver Sub-Stn., Thiruvambadi and Kozhikode. (vi) and (vii) Nil.

5. RESULTS :

63(50)

Wet root yield

(i) 6473 Kg/ha. (ii) 1205·1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of roots in Kg/ha.

Treatment	M_1	M_2	M_3	M_4
Av. yield	6571	7179	6357	5786

Oil yield of wet roots

(i) 50·3 c.c./25 Kg. (ii) 13·0 c.c./25 Kg. (iii) Treatment differences are not significant. (iv) Av. yield of oil in c.c./25 Kg.

Treatment	M_1	M_2	M_3	M_4
Av. yield	46·6	45·2	61·0	48·2

65(71)

Root yield

(i) 3960 Kg/ha. (ii) 680·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of roots in Kg/ha.

Treatment	M_1	M_2	M_3	M_4
Av. yield	3725	4195	4087	3834

Oil yield of roots

(i) 11·501 litres/ha. (ii) 2·714 litres/ha. (iii) Treatment differences are not significant. (iv) Av. yield of oil in litres/ha.

Treatment	M_1	M_2	M_3	M_4
Av. yield	11.211	10·669	13·445	10·778

———

Crop :- Vettiver.　　　　　　　　　　　　　　**Ref :- K: 64(191).**

Site :- Vettiver Sub-Stn., Thiruvambadi.　　　**Type :- 'C'.**

Object: —To determine the most economic system of planting.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite. (iii) 12.9.64 to 14.9.64. (iv) (a) Digging, levelling. (b) to (e) N.A. (v) ¼ ton of C.M. applied uniformly in the area before planting. (vi) Local (medium). (vii) Unirrigated. (viii) Weeding and earthing up twice. (ix) N.A. (x) 2.2.66 to 26.2.66.

2. TREATMENTS :

4 treatments planting on: T_1 = Ridges, T_2 = Beds of 70 cm. wide, T_3 = Beds of 60 cm. wide, T_4 = Local practice.

3. DESIGN :

(i) R.B.D. (ii) (a) 4 (per replication or block). (b) 33·5 m. × 6·5 m. (iii) 5. (iv) (a) and (b) 8 m. × 6·5 m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Fair. (ii) Attack of seak insects was noticed and sprayed with 'Paramar 50'. (iii) Quantity of Root and Oil. (iv) (a) No. (b) and (c) N.A. (v) Lemongrass Res. Stn., Odakkali. (vi) and (vii) N.A.

5. RESULTS:

(i) 1317·3. (ii) 174·9. (iii) Treatments differences are not significant. (iv) Mean yield of Vettiver root in Kg/ha.

Treatment	T_1	T_2	T_3	T_4
Av. yield	1446·2	1173·1	1423·1	1326·9

Crop :- Vettiver.	**Ref :- K. 63(25), 64(150), 65(72).**
Site :- Lemongrass Res. Stn., Odakkali.	**Type :- 'C'.**

Object :—To determine the correct stage of harvest of Vettiver for maximum yield.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite. (iii) 20.7.63; 25 to 27.6.64; June 65. (iv) (a) Preparation of beds. (b) Planting on raised beds. (c) to (e) N.A. (v) 22 Kg/ha. of N as A/S, 22 Kg/ha. of P_2O_5 as Super and 28 Kg/ha. of K_2O Mur. Pot. for 63(25) and 52·3 Q/ha. of C.M. for 64(150) and 65(72). (vi) Local. (vii) Un-irrigated. (viii) 2 weedings and 1 earthing up. (ix) 454 cm. for 63(25), N.A. for 64(150) and 536 cm. for 65(72). (x) As per treatments.

2. TREATMENTS :

8 stages of harvest : $A_1=11$, $A_2=12$, $A_3=13$, $A_4=14$, $A_5=15$, $A_6=16$, $A_7=17$ and $A_8=18$ months.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. for 63; 37·5 m. × 12·8 m. for 64. (iii) 4. (iv) (a) and (b) 7·5 m.× 5·0 m. for 63 and 9·0 m.× 6·0 m. for 64. (v) Nil for 63; 50 cm.× 75 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Incidence of blast during 63 was noticed and phytolan was sprayed. During 64 there was attack of scale insects and Paramar—50 was sprayed. (iii) Yield of roots and oil. (iv) 1963—contd. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

63(25)

Root yield

(i) 11348 Kg/ha. (ii) 2409·9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of root in Kg/ha.

Treatment	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
Av. yield	13587	10253	12440	12467	13467	12800	9867	5900

C.D.=3545·0 Kg/ha.

Oil yield of wet roots

(i) 64·9 c.c./25 Kg. (ii) 16·6 c.c./25 Kg. (iii) Treatment differences are not significant. (iv) Av. yield of Oil in c.c./25 Kg. of wet roots.

Treatment	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
Av. yield	75·3	61·5	65·3	56·5	56·0	53·0	70·5	81·3

64(150)

Root yield

(i) 3300 Kg/ha. (ii) 786·5 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of root in Kg/ha.

Treatment	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
Av. yield	4273	3727	3704	3657	3565	2847	2338	2292

C.D.=1156·8 Kg/ha.

Oil yield

(i) 18·9 litres/ha. (ii) 6·2 litres/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of oil in litres/ha.

Treatment	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
Av. yield	12·4	13·0	17·1	19·6	27·2	26·5	22·9	12·7

C.D.=9·1 litres/ha.

65(72)

Root yield

(i) 3239 Kg/ha. (ii) 778·6 Kg/ha. (iii) Treatment differences are significant. (iv) Av. root yield in Kg/ha.

Treatment	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
Av. yield	1606	2467	2754	2869	4246	3328	4917	3643

C.D.=1145·2 Kg/ha.

Oil yield

(i) 11300 c.c./ha. (ii) 3462·8 c.c./ha. (iii) Treatment differences are signigcant. (iv) Av. yield of oil in c.c./ha.

Treatment	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8
Av. yield	10499	12220	7172	9180	10304	10901	14033	16093

C.D.=5093·1 c.c./ha.

Crop :- Banana. **Ref :- K. 62(1).**

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

Object :—To find out the optimum manurial requirements for Banana.

1. **BASAL CONDITIONS :**

(i) Fallow—land. (ii) Sandy loam. (iii) N.A. (iv) Grosmichel. (v) 17.10.62. (vi) N.A. (vii) 11 Kg/plant. of C.M. (viii) Mammuthy weeding and earthing. (ix) N.A. (x) Irrigated. (xi) 159 cm. (xii) N.A.

2. **TREATMENTS :**

All combinations of (1), (2), (3) and (4)
    (1) 2 levels of C.M. : C_0=0 and C_1=11·3 Kg/ha.
    (2) 2 levels of A/S in 4 doses : N_0=0 and N_1=0·9 Kg/plant.
    (3) 2 levels of Super in 2 doses : P_0=0 and P_1=0·5 Kg/plant.
    (4) 2 levels of Mur. Pot. in 2 doses : K_0=0 and K_1=0·9 Kg/plant.

3. **DESIGN :**

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 5. (iv) (a) 9·1 m.×3·1 m. (b) 10·7 m.×4·6 m. (v) 76 cm. ×76 cm.

4. **GENERAL :**

(i) Satisfactory. (ii) Slight incidences of Banana disease. (iii) Yield of banana. (iv) to (viii) N.A.

5. **RESULTS :**

(i) 12·1 Kg/plant. (ii) 2·5 Kg/plant. (iii) None of the effects is significant. (iv) Mean and differential response in Kg/plant.

Effect	Mean	C		N		P		K	
		—	+	—	+	—	+	—	+
C	0·82	—	—	1·31	0·33	1·63	0·01	1·47	0·17
N	0·36	0·85	—0·13	—	—	0·77	—0·05	0·15	0·57
P	1·09	1·90	0·28	1·50	0·68	—	—	1·45	0·73
K	—0·29	0·36	—0·94	—0·50	—0·09	—0·07	—0·65	—	—

Column header (above C, N, P, K): Differential response

Crop :- Banana.

Site :- Banana Res. Stn., Mannuthy.

Ref :- K. 65(74).

Type :- 'M'.

Object :—To study the comparative merits of existing and new types of phosphatic fertilizers.

1. BASAL CONDITIONS :

(i) N.A. (ii) Loam. (iii) Preliminary preparation by ploughing two rounds, making pits of 75 cm.×75 cm.× 45 cm. as specified specings. (iv) Nendran (medium). (v) 18.11.65 planting single medium sized sucker in a pit. (vi) N.A. (vii) 3500 Kg. G.L. manure applied at 5 Kg. per plant in the pits at the time of planting. (viii) 2 weedings. (ix) No. (x) Irrigated. (xi) 264·6 cm. (xii) N.A .

2. TREATMENTS :

All combinations of (1) and (2)+control (2 plots)
   (1) 2 levels of P_2O_5 : P_1=34 and P_2=68 Kg/ha.
   (2) 5 sources of P_2O_5 : S_1=Super S_2=Fused Magnesium Phos., S_3=Deflorinated Phos., S_4=Multi Phos. and S_5=Thomas basic slag.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) 39·6 m.×16·5 m. (iii) 4. (iv) (a) and (b) 5·9 m.×1·8 m. (v) 1 row alround the plot.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) No. of fruits and weight of bunches. (iv) N.A. (v) to (viii) Nil.

5. RESULTS :

Yield in number

(i) 104630 No./ha. (ii) 11364 No./ha. (iii) Treatment differences are not significant. (iv) Av. yield of fruits in No/ha.

Control=99359

	S_1	S_2	S_3	S_4	S_5	Mean
P_1	104419	99589	98899	109019	107639	103913
P_2	106719	107408	104649	110629	107869	107455
Mean	105569	103498	101774	109824	107754	105684

Yield in weight

(i) 94·1 Q/ha. (ii) 22·7 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of fruits in Q/ha.

Control=197·4 Q/ha.

	S₁	S₂	S₃	S₄	S₅	Mean
P₁	206·5	186·9	184·9	201·2	182·8	192·5
P₂	195·2	206·3	188·1	199·6	183·3	194·5
Mean	200·9	196·6	186 5	200·4	183·0	193·5

—————

Crop :- Banana.　　　　　　　　　　　　　　**Ref :- K. 65(75).**

Site :- Banana Res. Stn., Mannuthy.　　　　　**Type :- 'M'.**

Object:—To study the effect of N, P and K at different levels applied singly and in combinations on Banana.

1. BASAL CONDITIONS :

(i) 2·5 Kg. Cowdung and 5 Kg. G.L. manure per plant. (ii) Black loam. (iii) Planting single sucker in pits. (iv) Nendran (medium). (v) 9.11.1965. (vi) N.A. (vii) 8100 kg. of G.L. manure applied at 5 Kg/ plant at the time of planting. (viii) Making pits. (ix) Nil. (x) Irrigated. (xi) 264·6 cm. (xii) October, 1966.

2. TREATMENTS :

All combinations of (1), (2) and (3)
　　(1) 3 levels of N : N₀=0, N₁=35·6 and N₂=71·2 Kg/ha.
　　(2) 3 levels of P : P₀=0, P₁=35·6 and P₂=71.2 Kg/ha.
　　(3) 3 levels of K : K₀=0, K₁=71·2 and K₂=142·4 Kg/ha.

3. DESIGN :

(i) 3³ Confd. fact. (ii) (a) 9 plots/block; 3 blocks/replication. (b) 54 m×20 m. (iii) 2. (iv) (a) 16 m.×2 m. (b) N.A. (v) One row alround each plot.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Number of fruits and weight of bunches. (iv) to (viii) N.A.

5. RESULTS :

Yield in Number :

(i) 105243 no./ha. (ii) 7913 no./ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of fruits in no./ha.

	N₀	N₁	N₂	K₀	K₁	K₂	Mean
P₀	93385	109270	113437	100312	108958	106823	105364
P₁	95260	106510	107604	105364	103281	100729	103125
P₂	95260	111614	114844	102604	109323	109791	107239
Mean	94635	109131	111962	102760	107187	105781	105243
K₀	95312	104739	108229				
K₁	98229	107291	116041				
K₂	90364	115364	111614				

C.D. for N marginal means=5469·972 Kg/ha.

Yield in weight :

(i) 198·7 Q/ha.   (ii) 19·4 Q/ha.   (iii) Main effect of N alone is highly significant.   (iv) Av. yield of fruits in Q/ha.

	N₀	N₁	N₂	K₀	K₁	K₂	Mean
P₀	172·5	205·5	206·8	188·4	202·0	194·3	194·9
P₁	182·4	199·2	203·2	195·3	201·9	187·7	195·0
P₂	184·7	209·7	224·5	200·1	212·9	205·8	206·3
Mean	179·9	204 8	211·5	194·6	205·6	195·9	198·7
K₀	177·8	195·4	210 6				
K₁	193·1	204·7	219·0				
K₂	168·8	214·2	204·9				

C.D. for N marginal means=13·5 Q/ha.

———

Crop :- Banana.   Ref :- K. 65(76).

Site :- Banana Res. Stn., Mannuthy.   Type :- 'M'.

Object :—To study the effect of lime application for banana at different levels of manuring.

1. BASAL CONDITIONS :

(i) 27·00 Kg. Cowdung and 5400 Kg. of G.L. manure.   (ii) Black loam.   (iii) Planting single sucker in pits. (iv) Nendran (medium)   (v) 22.11.1965.   (vi) N.A.   (vii) 5400 Kg. G.L. manure applied at the time of planting in the basins at 5 Kg. per plant.   (viii) Digging pits.   (ix) Nil.   (x) Irrigated.   (xi) 264.6 cm. (x) October, 1966.

2. TREATMENTS :

All combinations of (1) and (2)
    (1) 3 levels of lime : L₀=0, L₁=½ Kg./plant and L₂=1 Kg./plant.
    (2) 3 levels of fertilizers : M₀=0, M₁=114 gm. of N+114 gm. of P+228 gm. of K per plant applied
                as (8 : 8 : 16) as mixture, and M₂=228 gm. of N+228 gm. of P+ 456 gm. of
                K per plant as(8 : 8 : 16).

3. DESIGN :

(i) Fact. in R.B.D.   (ii) (a) 9.   (b) 54 m.×20 m.   (iii) 4.   (iv) (a) 16 m.×2m.   (b) N.A.   (v) One row alround each net plot.

4. GENERAL :

(i) Satisfactory.   (ii) Slight stem borer attack-controlled by applying B.H.C.   (iii) Number of fruits and weight of bunches.   (iv) to (viii) N.A.

5. RESULTS :

Yield in numbers

(i) 107161 fruits/ha.   (ii) 10315 fruits/ha.   (iii) Main effect of M alone is highly significant.   (iv) Av. Banana fruits per/ha.

	M₀	M₁	M₂	Mean
L₀	93594	108125	111328	104349
L₁	97578	108750	112500	106276
L₂	93437	119844	119297	110859
Mean	94870	112240	114375	107161

C.D. for M marginal means=8691 fruits/ha.

Yield in weight

(i) 194·1 Q/ha. (ii) 26·2 Q/ha. (iii) Main effect of M alone is highly significant. (iv) Av. yield of Banana bunches in Qh/a.

	M₀	M₁	M₂	Mean
L₀	163·4	192·4	211·1	189·0
L₁	160·1	198·7	219·6	192·8
L₂	155·5	217·5	228·2	200·4
Mean	159·7	202·9	219·6	194·1

C.D. for M marginal means=22·1 Kg/ha.

Crop :- Banana. **Ref :- K. 63(43), 64(250).**

Site :- Banana Res. Stn., Trichur. **Type :- 'M'.**

Object :—To study the effect of N, P and K applied singly and in combination on the yield of Banana.

1. BASAL CONDITIONS :

(i) Farmer crop site newly acquired. (ii) Red loam. (iii) Preparatory cultivation by ploughing rounds. (iv) Nendran (medium). (v) Planting pits of size 61cm.×61 cm.×61 cm. at 2 cm.×2 cm. spacing; 18.10.63; 4.11.1964. (vi) N.A. (vii) 4418 Kg. of F.Y.M. applied at 2·7 Kg/plant in pits, 8100 Kg. of G.L. applied at 5 Kg./plant at the time of planting. (viii) Intercultivation twice and weeding twice. (ix) N.A. (x) Irrigated. (xi) N.A. (xii) 3.9.1964; 25.9.1965.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 3 levels of N : N₀=0, N₁=114 and N₂=228 gm./plant.
(2) 3 levels of P₂O₅ : P₀=0, P₁=114 and P₂=228 gm./plant.
(3) 3 levels of K₂O : K₀=0, K₁=228 and K₂=456 gm./plant.

3. DESIGN :

(i) 3³ Confd. (ii) (a) 9 plots/block; 9 blocks/replication. (b) 54 cm.×20 cm. (iii) 2. (iv) (a) 20 m.× 20 m. (b) 6 m.×2 m. (v) One row alround each plot. (vi) Yes.

4. GENERAL :

(i) No lodging. (ii) Attack of leaf eating catter pillar once, controlled by sepraying Endrin. Also incidence of kokkan disease noticed. (iii) Yield of fruits. (iv) 1963—N.A. (v) N.A. (iv) to (viii) Nil.

5. RESULTS :

63(43)

(i) 143·9 Q/ha. (ii) 35·9 Q/ha. (iii) Main effects of N and K are highly significant and interaction $N \times P \times K$ is significant. (iv) Av. yield of fruits in Q/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	Mean
K_0	93·4	123·9	131·8	99·5	125·2	125·3	116·4
K_1	128·5	185·3	170·9	149·8	155·5	179·4	161·5
K_2	132·5	154·1	174·7	137·6	178·3	145·4	153·8
Mean	118·1	154·4	159·1	128·9	152·7	150·0	143·9
P_0	113 0	134·1	139·8				
P_1	121·4	181·4	155·2				
P_2	119·9	147·9	182·4				

C.D. for N or K marginal means = 24·9 Q/ha.

64(250)

(i) 152·3 Q/ha. (ii) 26·0 Q/ha. (iii) Main effects of N and K are highly significant. (iv) Av. yield of fruits in Q/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	Mean
K_0	106·9	130·3	135·6	129·1	114·2	129·5	124·3
K_1	142·8	192·9	180·0	169·6	168·6	177·5	171·9
K_2	130·9	169·8	181·3	138·1	185·4	158·5	160·7
Mean	126·9	164·3	165·6	145·6	156·0	155·2	152·3
P_0	119·8	156 0	161·0				
P_1	121·9	188·3	157·9				
	138·8	148·7	178·0				

C.D. for N or K marginal means = 18·0 Q/ha.

———

Crop :- Banana.   **Ref :- K. 63(38), 64(126).**

Site :- Banana Res. Stn., Trichur.   **Type :- 'M'.**

Object :—To find the effect of lime and N, P and K fertilizers on Banana.

1. BASAL CONDITIONS :

(i) Previous year or farmer's Banana crop was there and information about manuring is N.A. (ii) Red loam. (iii) 2 ploughings as preparatory cultivation. Digging pits of 6 cm. cube. Planting of one sucker (medium size)/pit. (iv) Nendran (medium). (v) 30, 31.10.1963. One sucker (medium size) was planted per pit with spacing 2 m × 2 m., 11.11.1964. (vi) N.A. (vii) 2·7 Kg/plant of F.Y.M.+5 Kg/plant of G.L. (viii) Intercultivations and weeding twice. Earthing up basins just before commencement of monsoon. (ix) N.A. (x) Irrigated. (xi) N.A. (xii) 10.9.1964 onwards; 27.9.1965.

2. TREATMENTS :

All combinations of (1) and (2)

    (1) 3 levels of lime : $L_0=0$, $L_1=0.5$ and $L_2=1$ Kg/plant.

    (2) 3 levels of manures : $M_0=0$, $M_1=114$ gms/tree of $N+114$ gm./tree of P_2O_4+228 gm./tree of K_2O and $M_2=2 M_1$.

3. DESIGN :

    (i) Fact. in R.B.D.   (ii)(a) 9.   (b) 54 m.×20 m.   (iii) 4.   (iv) 20 m.×6 m. (gross) 16 m.×2 m. (net) (v) 2 m.×2 m.   (vi) Yes.

4. GENERAL:

    (i) Normal.   (ii) Leaf eating catter pillars really seen were controlled by spraying Endrin. Incidence of Kokkar disease. Endrin sprayed twice to control insect vactor. (iii) Yield and number of fruits. (i) (a) 1963—contd. (b) Yes. (c) Nil. (v) to (viii) Nil.

5. RESULTS :

63(38)

Fruit yield.

    (i) 167.9 Q/ha.   (ii) 30.9 Q/ha.   (iii) Main effect of M alone is highly significant.   (iv) Av. yield of fruits in Q/ha.

	L_0	L_1	L_2	Mean
M_0	116.6	132.5	117.2	122.1
M_1	187.5	177.2	195.3	186.7
M_2	181.2	195.0	208.8	195.0
Mean	161.8	168.2	173.8	167.9

C.D. for M marginal means=26.0 Q/ha.

Number of fruits.

    (i) 94479 fruits/ha.   (ii) 12500 fruits/ha.   (ii) Main effect of M alone is highly significant. (iv) Av. number of fruits/ha.

	L_0	L_1	L_2	Mean
M_0	72188	81562	78438	77394
M_1	100312	96250	100000	98854
M_2	107500	107188	106875	107188
Mean	93333	95000	95104	94479

C.D. for M marginal means=10532 fruits/ha.

64(126)

Fruit yield.

    (i) 163.7 Q/ha.   (ii) 19.5 Q/ha.   (iii) Main effect of M is highly significant and that of L is significant. (iv) Av. yield of fruits in Q/ha.

	L_0	L_1	L_2	Mean
M_0	131.2	111.8	133.0	125.3
M_1	161.8	170.9	200.0	177.6
M_2	174.1	192.4	198.3	188.3
Mean	155.7	158.4	177.1	163.7

C.D. for M or L marginal means=16.4 Q/ha.

Number of fruits.

(i) 94800 fruits/ha. (ii) 10550 fruits/ha. (iii) Main effects of L and M are highly significant. (iv) Av. number of fruits/ha.

	L_0	L_1	L_2	Mean
M_0	71016	65078	84297	73464
M_1	96172	101484	113906	103854
M_2	97500	110469	113281	107083
Mean	88229	92344	103828	94800

C.D. for M or L marginal means=8889 fruits/ha.

Crop :- Banana.

Site :- Banana Res. Stn., Trichur.

Ref :- K. 63(42), 64(165).

Type :- 'M'.

Object :—To study the effect of N, P and K on Banana.

1. **BASAL CONDITIONS :**

(i) 1·8 Kg/plant of Cowdung+5 Kg/plant of G.L. was given to previous Banana crop at the time of planting. (ii) Red loam. (iii) N.A. (iv) Nendran (medium). (v) One sucker (medium size) per pit of 60 cm. cube was planted on 18.10.63 for 63(42) ; 4.11.64 for 64(165). (vi) N.A. (vii) 2·7 Kg/plant of F.Y.M.+5 Kg/plant of G.L. for 63(42); 5 Kg/plant of G.M. for 64(165). (viii) 2 interculturings 2 weedings and earthing. (ix) N.A. (x) Irrigated. (xi) N.A.; 222 cm. (xii) 3.9.64; 25.9.65.

2. **TREATMENTS :**

All combinations of (1), (2) and (3)
(1) 3 levels of N : $N_0=0$, $N_1=144$ and $N_2=228$ gm/plant.
(2) 3 levels of P_2O_5 : $P_0=0$, $P_1=114$ and $P_2=228$ gm/plant.
(3) 3 levels of K_2O : $K_0=0$, $K_1=228$ and $K_2=456$ gm/plant.

3. **DESIGN :**

(i) 3^3 fact. confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) 54 cm.×20 cm. (iii) 2. (iv) (a) 16 m.× 2 m. (b) 20 m.×6 m. (v) 2 m.×2 m.

4. **GENERAL :**

(i) Normal. (ii) Sporadic attack of leaf eating catter pillar and incidence of *kokkan* disease for 63(42) controlled by spraying Endrin. Incidence of *kokkan* disease for 64(165). Endrin and Fytolan were sprayed. (iii) Number and weight of fruits. (iv) 1963—contd. (v) to (viii) N.A.

5. **RESULTS :**

63(42)
Yield of fruits

(i) 143·9 Q/ha . (ii) 35·9 Q/ha. (iii) Main effects of N and K are highly significant and interaction N×P×K is significant. (iv) Av. yield of fruits in Q/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	Mean
K_0	93·4	123·9	131·8	99·5	124·2	125·4	116·4
K_1	128·5	185·3	170·9	149·8	155·5	179·5	161·5
K_2	132·5	154 1	174·7	137·7	178·4	145·2	153·8
Mean	118·1	154·4	159·1	129·0	152·7	150·0	143·9
P_0	113·0	134·1	139·8				
P_1	121·5	181·4	155·2				
P_2	119·9	147·7	182·3				

C.D. for N or K marginal means=24·8 Q/ha.

Number of fruits

(i) 88125 fruits/ha. (ii) 18766 fruits/ha. (iii) **Main effect of N alone is highly significant.** (iv) Av. no. of fruits/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	Mean
K_0	75625	78125	93438	77812	92188	77188	82396
K_1	78750	99062	100000	88750	90938	98124	92604
K_2	77813	87188	103125	83125	99687	85313	89375
Mean	77396	88125	98854	83229	94271	86875	88125
P_0	74688	82500	92500				
P_1	81250	98750	102812				
P_2	76250	83125	101250				

C D. for N marginal means=12972 Q/ha.

64(165)

Yield of fruits

(i) 152·3 Q/ha. (ii) 26·0 Q/ha. (iii) Main effects of N and K are highly significant. (iv) Av. yield of fruits in Kg/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	Mean
K_0	107·0	130·3	135·6	129·1	114·2	129·5	124·3
K_1	142·8	192·9	180·0	169·6	168·6	177·5	171·9
K_2	130·8	169·8	181·3	138·1	185·4	158·4	160·6
Mean	126·9	164·3	165·6	145·6	156·1	155·1	152·3
P_0	119·9	156·0	161·0				
P_1	121·9	188·4	157·9				
P_2	138·8	148·8	178·0				

C.D. for N or K marginal means=18·0 Q/ha.

Number of fruits

(i) 92928 fruits/ha. (ii) 13368 fruits/ha. (iii) Main effects of N and K and interaction $N \times P \times K$ are highly significant. Main effect of P is significant. (iv) Av. number of fruits/ha.

	N_0	N_1	N_2	P_0	P_1	P_2	Mean
K_0	73281	84531	82187	75469	79427	85104	80000
K_1	87916	104010	103437	94739	95885	104739	98454
K_2	84062	100781	116146	88073	113124	99792	100330
Mean	81753	96441	100590	86094	96145	96545	92928
P_0	76198	91146	90937				
P_1	77655	106510	104271				
P_2	91406	91667	106562				

C.D. for N, K or P marginal means=9240·8 No. of fruits/ha.

Crop :- Banana.   **Ref :- K. 61(102).**

Site :- Banana Res. Stn., Mannuthy.   **Type :- 'C'.**

Object :—To find out the best season for planting Banana.

1. **BASAL CONDITIONS :**

(i) Previous Banana crop was manured with 6·8 Kg/plant of G.L.+6·8 Kg/plant of F.Y.M.+1·8 Kg/plant of (8: 8 : 16) fertilizer mixture. (ii) Laterite and loam. (iii) N.A. (iv) Nendran (medium). (v) Planting in pits of size 60 cm. cube as per treatments. (vi) N.A. (vii) 6·8 Kg/plant of G.L.+6·8 Kg/plant of F.Y.M. at planting and 1·8 Kg/plant of 8 : 8 : 16 fertilizer mixture later. (viii) Interculturing, weeding and earthing up. (ix) N.A. (x) Irrigated. (xi) N.A. (xii) May, 62 onwards.

2. **TREATMENTS :**

3 seasons of planting : S_1 = May to June, S_2 = August to September and S_3 = October to November.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) 36·6 m. × 12·2 m. (iii) 8. (iv) (a) 7·3 m. × 7·3 m. (9 plants). (b) 12·2 m. × 12·2 m. (25 plants). (v) 2·4 m. × 2·4 m.

4. **GENERAL :**

(i) Satisfactory. (ii) Incidence of *"kokkan"* disease. (iii) Number and weight of fruits. (iv) No. (v) Trichur. (vi) to (viii) Nil.

5. **RESULTS :**

(i) 120·9 Q/ha. (ii) 14 0 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of fruits in Q/ha.

Treatment	S_1	S_2	S_3
Av. yield	139·6	117·8	105·3

C.D. = 15 0 Q/ha.

———

Crop :- Banana.   **Ref :- K. 63(34), 64(124).**

Site :- Banana Res. Stn., Trichur.   **Type :- 'C'.**

Object :—To ascertain the best season for planting Banana.

1. **BASAL CONDITIONS :**

(i) Fallow land for 63(34) ; 1·8 Kg/plant of Cowdung+5 Kg/plant of G.L. at planting and 2 Kg/plant of 8 : 8 : 16 mixture later were given to previous Banana crop for 64(124). (ii) Red loam. (iii) N.A. (iv) Nendran (medium). (v) Planting of suckers (medium size) in pits of 60 cm. cube as per treatments with spacing 2·4 m. × 2·4 m. (vi) N.A. (vii) 2·7 Kg/plant of F.Y.M.+5 Kg/plot of G.L. for 63(34); 5 Kg/plant of G.L. for 64(124). (viii) 2 interculturings, 2 weedings and 1 earthing. (ix) N.A. (x) Irrigated. (xi) N.A.; 222 cm. (xii) 19.6.64 ; 3, 22.9.64 ; 14.6 65; 6.8.65. ; 3.9.65.

2. **TREATMENTS:**

3 seasons of planting : S_1 = May to June, S_2 = August to September and S_3 = October to November.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 3. (b) 36·6 m. × 12·2 m. (iii) 8. (iv) Gross : 12·2 m. × 12·2 m. (25 plants). Net : 7·3 m. × 7·3 m. (9 plants). (v) 2·4 m. × 2 4 m. (vi) Yes.

4. **GENERAL:**

(i) Satisfactory. (ii) Sporadic attack of leaf eating catter pillar and incidence of *kokkan* for 63(34) was controlled by spraying Endrin. Incidence of *kokkan* for 64(124). (iii) Number and weight of fruits. (iv) (a) 1962—64. (b) and (c) Nil. (v) to (viii) Nil.

5. RESULTS :

63(34)

Weight of fruits

(i) 120·1 Q/ha. (ii) 17·4 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of fruit in Kg/ha.

Treatment	S_1	S_2	S_3
Av. yield	102·6	123·3	134·4

C.D.=18·7 Q/ha.

Number of fruits

(i) 68669 fruits/ha. (ii) 6344 fruits/ha. (iii) Treatment differences are highly significant. (iv) Av. number of fruits/ha.

Treatment	S_1	S_2	S_3
Av. number	61391	69602	75013

C.D.=6804 fruits/ha.

64(12)

Weight of fruits

(i) 132·6 Q/ha. (ii) 8·8 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of fruit in Q/ha.

Treatment	S_1	S_2	S_3
Av. yield	106·8	148·8	142·3

C.D.=9·4 Q/ha.

Number of fruits

(i) 71533 fruits/ha. (ii) 5372 fruits/ha. (iii) Treatment differences are highly significant. (iv) Av. number of fruits/ha.

Treatment	S_1	S_2	S_3
Av. number	57066	79187	78346

C.D.=5761 fruits/ha.

Crop :- Banana.

Site :- Banana Res. Stn., Mannuthy.

Ref :- K. 64(182).

Type :- 'CM'.

Object :—To find out optimum manurial dose and plant population of Banana.

1. BASAL CONDITIONS :

(i) 2·5 Kg. Cowdung and 5 Kg. G.L. manure per plant. (ii) Black loam. (iii) Nil. (iv) Nendran (medium). (v) 5.11.64. (vi) N.A. (vii) Nil. (viii) Interculture and weeding. (ix) N.A. (x) Irrigated. (xi) 264·6 cm. (xii) N.A.

2. TREATMENTS :

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

(1) 2 spacings : S_1=2 m.×2 m. and S_2=2·5 m.×2·5 m.

(2) 2 number of plants per plot : N_1=1 and N_2=2.

(3) 2 manurial treatments: M_1=114 gm./plant of N+114 gm./plant of P+228 Kg/plant of L and M_2=2 M_1.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 8. (b) 36 m.×30 m. (maximum). (iii) 4. (iv) (a) For S_1 12 m.×8 m., for S_2 : 15 m.×10 m. (b) For S_1 : 8 m.×4 m., for S_2 : 10 m.×5 m. (v) 1 row alround each net plot. (vi) Yes.

4. GENERAL:

(i) Not very healthy since ratoon. (ii) Rhizome borer attack controlled by BHC application. (iii) Number of fruits and weight of bunches. (iv) 1964—only. (v) to (viii) N.A.

5. RESULTS:

Yield of fruits

(i) 171·1 Q/ha. (ii) 26·1 Q/ha. (iii) Main effects of N, S and M are significant. (iv) Av. yield of fruit in Q/ha.

	N_1	N_2	M_1	M_2	Mean
S_1	151·9	258·6	193·9	216·5	205·2
S_2	100·6	173·3	127·1	146·7	136·9
Mean	126·2	216·2	160·5	181·6	171·1
M_1	124·2	196·9			
M_2	128·2	235·1			

C.D. for N, S or M marginal means=19·2 Q/ha.

Number of fruits

(i) 95057 No./ha. (ii) 14452 No./ha. (iii) Main effects of N and S are significant. (iv) Av. number of fruits in Q/ha.

	N_1	N_2	M_1	M_2	Mean
S_1	83200	146925	107000	123125	115063
S_2	54950	95150	70000	80100	75050
Mean	69075	121038	88500	101613	95057
M_1	67375	109625			
M_2	70775	132450			

C.D. for N or S marginal means=10626 fruits/ha.

———

Crop :- Banana.

Site :- Banana Res. Stn., Trichur.

Ref :- K. 63(40).

Type :- 'CM'.

Object :—To study the comparative merits of suckers of different sizes under fresh and dry conditions.

1. BASAL CONDITIONS :

(i) Fallow land. (ii) Red loam. (iii) N.A. (iv) *Nendran* (medium). (v) Planted one sucker/pit of size 60 cm. cube on 9.11.63. (vi) N.A. (vii) 1·8 Kg/plant of cowdung applied in the basines+5 Kg/plant of G.L. (viii) 2 intercultivations, 2 weedings and earthing up. (ix) N.A. (x) Irrigated. (xi) N.A. (xii) 1.10.64 onwards.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 sizes of suckers : S_1=Large (35 to 45 cm. girth), S_2=Medium (25 to 35 cm. girth) and S_3=Small (15 to 25 cm. girth).

(2) 2 types of suckers : T_1=Fresh suckers at collar and T_2=Dried suckers dipped in cowdung emulsion, dried and stored for 15 days.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) 22 m.×20 m. (iii) 6. (iv) (a) 8 m.×4 m. (b) 12 m.×8 m. (v) 2 m.× 2 m. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Sporadic attack of leaf eating catter pillor in the early stages of growth was controlle1 by spraying Endrin. (iii) Number and weight of fruits. (iv) to (viii) Nil.

5. RESULTS :

Weight of fruits

(i) 213·0 Q/ha. (ii) 22·2 Q/ha. (iii) Main effects of T and S are significant. (iv) Av. yield of fruit in Q/ha.

	S_1	S_2	S_3	Mean
T_1	226·2	191·9	189·7	202·6
T_2	240·9	217·8	211·2	223·3
Mean	233·6	204·8	200·5	213·0

C.D. for T marginal means=15·2 Q/ha.

C.D. for S marginal means=18·7 Q/ha.

Number of fruits

(i) 116875 fruits/ha. (ii) 9688 fruits/ha. (iii) Main effect of T alone is significant. (iv) Av. number of fruits/ha.

	S_1	S_2	S_3	Mean
T_1	115938	111250	113438	113542
T_2	123125	115938	121562	120208
Mean	119532	113594	117500	116875

C.D. for T marginal means=6652·3 No./ha.

———

Crop :- Banana.

Site :- Banana Res. Stn., Trichur.

Ref :- K. 64(128).

Type :- 'CM'.

Object : —To study the effect of cultural and manurial treatments on Banana crop .

1. BASAL CONDITIONS :

(i) Fallow land. (ii) Loam. (iii) N.A. (iv) Nendran (medium). (v) 15.11.64. (vi) N.A. (vii) 5 Kg/plant of G.L. at planting. (viii)Weeding and intercultivation twice. (ix) N.A. (x) Irrigated. (xi) 222 cm. (xii) 6.9.65.

2. TREATMENTS :

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

(1) 2 spacings : $S_1 = 2$ m. $\times 2$ m. and $S_2 = 2.5$ m. $\times 2.5$ m.

(2) 2 follower types : $C_1 =$ Single follower and $C_2 =$ Double follower.

(3) 2 levels of manure : $M_1 = 114$ gm/plant of $P_2O_5 + 228$ gm/plant of K_2O and $M_2 = 2M_1$.

3. DESIGN :

(i) Fact. in R.B.D.   (ii) (a) 8.   (b) 36 m. $\times 30$ m.   (iii) 4.   (iv) (a) 8 m. $\times 4$ m. for S_1 ; 10 m. $\times 5$ m. for S_2
(b) 12 m. $\times 8$ m. for S_1 ; 15 m. $\times 10$ m. for S_2 (v) One row $\{$ ahcund each plot.   (vi) Yes.

4. GENERAL :

(i) Normal.   (ii) Incidence of kokkan. Endrin and Fytolan sprayed.   (iii) Weight and number of fruits.
(iv) 1964—only.   (v) to (viii) N.A.

5. RESULTS :

Number of fruits

(i) 91044.   (ii) 3972.   (iii) Main effects of S and M are significant.   (iv) Av. number of fruits/ha.

	S_1	S_2	M_1	M_2	Mean
C_1	113250	70803	84500	99550	92025
C_2	109700	70425	87300	92825	90063
Mean	111475	70613	85900	96188	91044
M_1	108175	63625			
M_2	114775	77600			

C.D. for S or M marginal means $= 2920.9$ fruits/ha.

Yield of fruits

(i) 169.8 Q/ha.   (ii) 7.7 Q/ha.   (iii) Main effects of S and M are significant.   (iv) Av. yield of fruit in Q/ha.

	S_1	S_2	M_1	M_2	Mean
C_1	211.0	130.5	157.6	183.9	170.7
C_2	206.2	131.4	163.7	174.0	168.8
Mean	208.6	131.0	160.6	179.0	169.8
M_1	200.0	121.2			
M_2	217.2	140.7			

C.D. for S or M marginal means $= 5.6$ Q/ha.

— - —

Crop :- Pineapple.   **Ref :- K. 63(145), 64(186).**

Site :- Banana and Pineapple Res. Stn., Kannara,   Type 'M'.
Trichur Dist.

Object :— To find out optimum cultivation of major nutrients (N, P and K).

1. BASAL CONDITIONS :

(i) Nil.   (ii) Black loam.   (iii) Planting in double rows in bunches.   (iv) Kew.   (v) 28, 29, 30, and 31st Oct.
1963 ; 20 and 21st July 1963.   40 cm. $\times 50$ cm.   (vi) N.A.   (vii) 12.5 tons/ha. of FYM.   (viii) Clearing
the plot, digging and taking bunches.   Weeding, manuring and earthing up.   (ix) N.A.   (x) Unirrigated.
(xi) N.A.   (xii) Continuous harvest.

2. TREATMENTS :

All combinations of (1), (2) and (3)
   (1) 3 levels of N : $N_0=0$, $N_1=80$, $N_2=160$ Kg/ha.
   (2) 3 levels of P_2O_5 : $P_0=0$, $P_1=40$, $P_2=80$ Kg/ha.
   (3) 3 levels of K_2O : $K_0=0$, $K_1=160$, $K_2=320$Kg/ha.

3. DESIGN :

(i) 3^3—Confd. fact. (ii) (a) 9. (b) 21·6 m.× 21·6 m. (iii) 2. (iv) (a) 7·2 m.×6·4 m. (b) 108 suckers.
(v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) No. and weight of fruits. (iv) 1963—1970 (Expt. for 65—N.A) (v) to (viii)
N.A.

5. RESULTS :

63(145)

Number of fruits

(i) 8986 fruits/ha. (ii) 1837 fruits/ha. (iii) Main effects of N and K are highly significant. (iv) Av. number
of fruits/ha.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	4304	10742	10236	7342	9295	8644	8427
P_1	5208	11357	11755	7668	10851	9802	9440
P_2	4955	11502	10814	7017	12188	8066	9090
Mean	4822	11200	10935	7342	10778	8837	8986
K_0	3508	10019	8500				
K_1	5606	12731	13997				
K_2	5353	10851	10308				

C.D. for N or K marginal means=125·0 fruits/ha.

Yield of fruits

(i) 105·2 Q/ha. (ii) 29·9 Q/ha. (iii) Main effects of N and K are highly significant. (iv) Av. yield of
fruit in Q/ha.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	39·5	142·1	124·9	87·3	106·7	112·4	102·2
P_1	53·5	130·4	145·1	75·5	130·3	124·3	110·0
P_2	53·9	130·2	126·1	77·6	130·5	102·1	103·4
Mean	49·0	134·2	132·4	80·1	122·5	112·9	105·2
K_0	24·6	121·7	94·7				
K_1	60·9	143·8	162·8				
K_2	62·0	137·2	139·6				

C.D. for N or K marginal means=20·3 Q/ha.

64(186)

Number of fruits

(i) 16521 fruits/ha. (ii) 4994 fruits/ha. (iii) Main effect of N is significant. (iv) Av. number of fruits/ha.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	6619	19386	26945	19169	16674	17108	17650
P_1	1944	20725	20869	17035	15842	15661	16179
P_2	6691	16059	24450	13094	18808	15299	15733
Mean	6751	18723	24088	16433	17108	16023	16521
K_0	5461	21412	22425				
K_1	6510	17253	27560				
K_2	8283	17506	22280				

C.D. for N marginal means = 3398·9 fruits/ha.

Yield of fruits

(i) 193·8 Q/ha. (ii) 74·4 Q/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of fruit in Q/ha.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	60·5	216·0	351·6	216·0	195·0	216·9	209·4
P_1	70·6	243·3	241·7	195·9	181·5	183·0	185·2
P_2	70·6	179·3	310·9	144·5	239·2	177·0	186·9
Mean	67·2	212·9	301·4	183·9	205·3	192·3	193·8
K_0	50·3	240·2	261·2				
K_1	65·5	195·0	355·4				
K_2	85·8	203·4	287·6				

C.D. for N marginal means = 50·6 Q/ha.

———

Crop :- Pineapple.　　　　　　　　　　**Ref :- K. 63(85), 64(183).**

Site :- Banana and Pineapple Res. Stn., Kannara.　　**Type :- 'M'.**

Object :—To find out the effect of liming and optimum dose of fertilizers.

1. BASAL CONDITIONS :

(i) N.A. (ii) Black loam. (iii) Planting in double rows in trenches. (iv) Kew. (v) 6, 7, 13 and 14.11.63 for 63(85) ; 6, 7.10.64 ; spacing 40 cm.× 50 cm. (vi) N.A. (vii) Cowdung at 100 Q/ha. (viii) Weeding and earthing up twice. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Continuous harvest.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of lime: L_0=No lime, L_1=600 and L_2=1200 Kg/ha. of basal dose.

(2) 3 levels of manure : M_0=No manure, M_1=700 and M_2=1400 Kg/ha. of fertilizers mixture as basal dose.

Lime applied before planting and fertilizer mixture in two split doses.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) 43·2 m.× 16 m. (iii) 4. (iv) (a) 16 m.× 4·8 m. (b) Net plot size 15·2 m.× 4·8 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Number of fruits and yield. (iv) 1963—70 (1965—N.A.) (v) to (viii) Nil.

5. RESULTS :

63(85)

Number of fruits

(i) 6320 fruits/ha. (ii) 1445 fruits/ha. (iii) None of the effects is significant. (iv) Av. number of fruits/ha.

	M_0	M_1	M_2	Mean
L_0	6408	7298	7675	7127
L_1	5242	7573	5791	6202
L_2	5380	5242	6270	5631
Mean	5677	6704	6579	6320

Yield of fruits

(i) 5951 Kg/ha. (ii) 1573·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of fruit in Kg/ha.

	M_0	M_1	M_2	Mean
L_0	5198	6839	7905	6647
L_1	4920	6884	5993	5932
L_2	5054	4807	5953	5273
Mean	5057	6177	6618	5951

64(183)

Number of fruits

(i) 3750 fruits/ha. (ii) 1524 fruits/ha. (iii) Main effect of L and interaction L × M are significant. (iv) Av. number of fruits/ha.

	M_0	M_1	M_2	Mean
L_0	5894	4866	4557	5106
L_1	4523	3838	3563	3966
L_2	2741	2570	1199	2170
Mean	4386	3758	3106	3750

C.D. for L marginal means = 1284·0 fruits/ha.
C.D. for means in the body of the table = 2224·2 fruits/ha.

Yield of fruits

(i) 3474 Kg/ha. (ii) 1474 Kg/ha. (iii) Main effect of L is sigaificant and that of M is highly significant. (iv) Av. yield of fruit in Kg/ha.

	M_0	M_1	M_2	Mean
L_0	3135	3995	5520	4217
L_1	2155	4211	4657	3674
L_2	2801	2446	4246	2531
Mean	2064	3551	4808	3474

C.D. for L or M marginal means = 1242·0 Kg/ha.

Crop :- Pineapple.   **Ref :- K. 63(87); 64(178).**

Site :- Banana and Pineapple Res. Stn., Kannara.   **Type :- 'CM'.**

Object :—To find out optimum spacing and best level of fertilizers.

1. BASAL CONDITIONS:

(i) (a) N.A. (ii) Black loam. (iii) Planting in double rows in trenches. (iv) Kew. (v) 17 to 20.9.63, 23, 24, 25.9.63 ; 10, 11.8.64. Spacings as per treatments. (vi) and (vii) N.A. (viii) Weeding and earthing up twice. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Continuous.

2. TREATMENTS :

Main-plot treatments :

3 spacings : S_1=45 cm.×60 cm., S_2=37 cm.×53 cm. and S_3=30 cm.×46 cm.

Sub-plot treatments :

2 manurial levels : M_1=50 Kg/ha. of N+25 Kg/ha. of P_2O_5+100 Kg/ha. of K_2O and M_2=100 Kg/ha. of N+50 Kg/ha. of P_2O_5+200 Kg/ha. of K_2O.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 2 sub-plots/main-plot. (b) 19.8 m.×6.1 m. for S_1, 19.5 m. ×6.1 m. for S_2, 19.2 m.×6.1 m. for S_3. (iii) 6. (iv) (a) 6.1 m.×9.9 m. for S_1, 6.1 m.×9.8 m. for S_2, 6.1 m. ×9.6 m. for S_3. (b) 6.1 m.×9.0 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Number and weight of fruits. (iv) 1963—70 (Expt. for 65—N.A.). (v) N.A. (vi) to (viii) Nil.

5. RESULTS :

63(87)

Number of friuts

(i) 5351 fruits/ha. (ii) (a) 1441.3 fruits/ha. (b) 1727.8 fruits/ha. (iii) None of the effects is significant. (iv) Av. number of fruits/ha.

	S_1	S_2	S_3	Mean
M_1	5109	5473	5109	5230
M_2	5473	5291	5656	5473
Mean	5291	5382	5382	5351

Yield of fruits

(i) 4023 Kg/ha. (ii) (a) 912.2 Kg/ha. (b) 1549.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of fruit in Kg/ha.

	S_1	S_2	S_3	Mean
M_1	3375	4069	3393	3612
M_2	4652	4470	4178	4433
Mean	4014	4269	3786	4023

64(178)

Number of fruits

(i) 6141 fruits/ha. (ii) (a) 2671.1 fruits/ha. (b) 1751.5 fruits/ha. (iii) None of the effects is significant. (iv) Av. number of fruits/ha.

	S_1	S_2	S_3	Mean
M_1	5474	7845	6203	6507
M_2	4926	6568	5834	5776
Mean	5200	7206	6018	6141

Yield of fruits

(i) 6454 Kg/ha. (ii) (a) 2554·3 Kg/ha. (b) 1574·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of fruit in Kg/ha.

	S_1	S_2	S_3	Mean
M_1	6030	7922	6072	6674
M_2	5683	6851	6170	6234
Mean	5856	7386	6121	6454

Crop :- Eucalyptus. **Ref :- K. 63(49), 64(157).**

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

Object :—To determine the optimum dose of C.M. for Eucalyptus Citriodore.

1. BASAL CONDITIONS :

(i) Virgin land. (ii) Red loam. (iii) Raised from seeds. (iv) Eucalyptus Citriodore. (v) July 1959 at a spacing of 4·6 m.×4·6 m. (vi) One year. (vii) Nil. (viii) Sickle weeding and cleaning the basins of the plants. (ix) Nil. (x) Unirrigated. (xi) 143 cm. for 63(49), 209 cm. for 64(157). (xii) N.A.

2. TREATMENTS :

4 levels of of C.M. : N_0=0, N_1=22·4, N_2=33·6 and N_3=44·8 Kg/plant.

3. DESIGN :

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

4. GENERAL :

(i) Good. (ii) Nil. (iii) Leaf yield and oil contents. (iv) 1963—contd. (1965 data N.A). (v) to (viii) Nil.

5. RESULTS :

63(49)

Leaf yield

(i) 50·7 Kg/plot. (ii) 11·9 Kg/plot. (iii) Treatment differences are significant. (iv) Av. yield of leaf in Kg/plot.

Treatment	N_0	N_1	N_2	N_3
Av. yield	50·7	43·3	45·1	63·6

C.D.=14·6 Kg/plot

Oil content

(i) 0·752 litres/plot. (ii) 0·166 litres/plot. (iii) Treatment differences are significant. (iv) Av. yield of oil in litres/plot.

Treatment	N_0	N_1	N_2	N_3
Av. yield	0·781	0·634	0·660	0·933

C.D.=0·204 litres/plot

64(157)

Leaf yield

(i) 57·2 Kg/plot. (ii) 10·4 Kg/plot. (iii) Treatment differences are highly significant. (iv) Av. yield of leaf in Kg/plot.

Treatment	N_0	N_1	N_2	N_3
Av. yield	61·2	46·3	51·9	69·6

C.D.=12·8 Kg/plot

Oil content

(i) 0·724 litres/plot. (ii) 0·154 litres/plot. (iii) Treatment differences are not significant. (iv) Av. yield of oil in litre/plot.

Treatment	N_0	N_1	N_2	N_3
Av. yield	0·810	0·592	0·717	0·779

Crop :- Eucalyptus.

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

Ref :- K. 63(51).

Type :- 'C'.

Object :—To determine the height at which the trees should be maintained to obtain maximum yield.

1. BASAL CONDITIONS :

   (i) Virgin land. (ii) Red loam. (iii) Raised from seeds. (iv) Eucalyptus Citriodora. (v) 21.8.58. (vi) One year. (vii) N.A. (viii) Sickle weeding and cleaning the basins of the plants. (ix) N.A. (x) Unirrigated. (xi) 143 cm. (xii) N.A.

2. TREATMENTS :

   6 heights for topping : L_1=1·5 m., L_2=3·0 m., L_3=4·6 m., L_4=6·1 m., L_5=7·6 m. and L_6=9·1 m.

3. DESIGN:

   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 2. (v) N.A. (vi) Yes.

4. GENERAL :

   (i) Good. (ii) Nil. (iii) Leaf and oil yield. (iv) 1963 only. (v) and (vi) N.A. (vii) and (viii) Nil.

5. RESULTS :

Leaf yield

(i) 15·2 Kg/plot. (ii) 3·8 Kg/plot. (iii) Treatment differences are highly significant. (iv) Av. yield of leaf in Kg/plot.

Treatment	L_1	L_2	L_3	L_4	L_5	L_6
Av. yield	7·1	10·5	13·8	15·4	19·2	25·3

C.D.=5·0 Kg/plot

Oil content

(i) 0·175 litre/plot. (ii) 0·061 litre/plot. (iii) Treatment differences are highly significant. (iv) Av. yield of oil in litre/plot.

Treatment	L_1	L_2	L_3	L_4	L_5	L_6
Av. yield	0·060	0·139	0·150	0·159	0·256	0·284

C.D.=0·080 litre/plot

Crop :- Eucalyptus.   **Ref :- K. 63(47), 64(159).**

Site :- Agri. Res. Stn., Ambalavayal.   **Type :- 'C'.**

Object :—To determine the optimum interval for pruning of Eucalyptus for obtaining maximum oil yield.

1. BASAL CONDITIONS :

    (i) Virgin land. (ii) Red loam. (iii) Raised from seeds. (iv) Eucalyptus Citriodora. (v) 21.8.58 at a spacing of 4.6 m. $\times 4.6$ m. (vi) 1 year. (vii) Nil. (viii) Sickle weeding and cleaning the basins of the plants. (ix) Nil. (x) Unirrigated. (xi) 143 cm. ; 209 cm. (xii) N.A.

2. TREATMENTS :

    10 intervals of pruning : $I_1=3$, $I_2=4$, $I_3=5$, $I_4=6$, $I_5=7$, $I_6=8$, $I_7=9$, $I_8=10$, $I_9=11$ and $I_{10}=12$ months.

3. DESIGN :

    (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 4. (v) N.A. (vi) Yes.

4. GENERAL :

    (i) Good. (ii) Nil. (iii) Leaf and oil yield. (iv) 1963—64. (v) to (vii) Nil. (viii) Expt. for 1962—N.A.

5. RESULTS :

63(47)

Leaf yield

    (i) 39.1 Kg/plot. (ii) 12.0 Kg/plot. (iii) Treatment differences are highly significant. (iv) Av. yield of leaf in Kg/plot.

Treatment	I_1	I_2	I_3	I_4	I_5
Av. yield	28.1	32.2	38.4	53.0	23.7
	I_6	I_7	I_8	I_9	I_{10}
	40.4	44.3	28.8	53.4	48.6

C.D.=15.4 Kg/plot.

Oil contents

    (i) 0.480 litre/plot. (ii) 0.144 litre/plot. (iii) Treatment differences are highly significant. (iv) Av. yield of oil in litre/ha.

Treatment	I_1	I_2	I_3	I_4	I_5
Av. yield	0.270	0.358	0.514	0.699	0.369
	I_6	I_7	I_8	I_9	I_{10}
	0.435	0.469	0.378	0.722	0.591

C.D.=0.184 litre/plot.

64(159)

Leaf yield

    (i) 80.7 Kg/plot. (ii) 23.8 Kg/plot. (iii) Treatment differences are highly significant. (iv) Av. yield of leaf in Kg/plot.

Treatment	I_1	I_2	I_3	I_4	I_5
Av. yield	40.0	76.3	55.7	96.7	75.6
	I_6	I_7	I_8	I_9	I_{10}
	119.8	84.5	53.3	97.2	107.6

C.D.=30.4 Kg/plot.

Oil contents

    (i) 1.010 litre/plot. (ii) 0.295 litre/plot. (iii) Treatment differences are highly significant. (iv) Av. yield of oil in litre/ha.

Treatment	I_1	I_2	I_3	I_4	I_5
Av. yield	0·440	0·963	0·777	1·287	1·102

	I_6	I_7	I_8	I_9	I_{10}
	1·477	0·929	0·639	1·062	1·421

C.D.=0·377 litre/plot.

Crop :- Coffee.
Site :- Coffee Demons. Farm, Kalpetta.

Ref :- K. 64(85), 65(86).
Type :- 'M'.

Object : –To study the effect of dose and time of application of N, P and K on Coffee.

1. **BASAL CONDITIONS :**

(i) N.A. (ii) (a) Laterite generally acidic in reaction. (b) N.A. (iii) By seedlings. (iv) Arabic (S—795 selection). (v) Planted in Sept., 1960. (vi) Seven months. (vii) Nil. (viii) Shade regulations, weeding, desuckering and mulching etc. (ix) Nil. (x) Unirrigated. (xi) 205 cm. ; 249 cm. (xii) N.A. for 1965 ; 6, 15, 22 Oct., 10, 15, 24 Nov. and 3rd. Dec. '64.

2. **TREATMENT :**

Main-plot treatments :

5 levels of N, P and K in Kg/ha. : M_1=60 N+30 P+40 K, M_2=100 N+60 P+80 K, M_3=140 N + 90 P+120 K, M_4=180 N+120 P+160 K and M_5=220 N+150 P+ 200 K.

Sub-plot treatments :

3 numbers of application : T_1=Twice in a year (pre-monsoon and post-monsoon), T_2=3 applications in a year (pre-blossom, pre-monsoon, and post-monsoon) and T_3=Four applications in a year (pre-blossom, pre-monsoon, monsoon breaked and post-monsoon)

3. **DESIGN :**

(i) Split-plot. (ii) (a) 5 main-plots/replication and 3 sub-plots/main plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) Gross : 144, Net : 36. (v) and (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Sprayings of B.H.C. against white stem Borer from April to Nov. 1964. (iii) Yield of coffee seeds. (iv) 1960—N.A. (v) N.A. (vi) to (viii) Nil.

5. **RESULTS:**

64(85)

(i) 34·4 Kg/plot. (ii) (a) 17·6 Kg/plot. (b) 13·3 Kg/plot. (iii) Interaction M×T is significant. (iv) Av. yield of Coffee seeds in Kg/plot.

	M_1	M_2	M_3	M_4	M_5	Mean
T_1	39·6	39·5	36·1	28·2	36·2	35·9
T_2	34·6	28·5	46·2	47·8	17·9	35·0
T_3	24·9	30·6	24·2	41·5	39·9	32·2
Mean	33·0	32·9	35·5	39·2	31·3	34·4

C.D. for T means at the same level of M=19·2 Kg/plot.
C.D. for M means at the same level of T =22·1 Kg/plot.

65(86)

(i) 13·7 Kg/plot. (ii) (a) 10·0 Kg/plot. (b) 6·52 Kg/plot. (iii) None of the effects is significant. (iv) Av. yield of coffee seeds in Kg/plot.

	M_1	M_2	M_3	M_4	M_5	Mean
T_1	10·2	8·1	12·1	12·6	12·4	11·1
T_2	9·2	18·6	21·2	13·1	10·8	14·6
T_3	12·5	16·2	15·9	16·2	16·8	15·5
Mean	10·6	14·3	16·4	14·0	13·3	13·7

Crop :- Coffee.

Site :- Chellotte Estate, Kalpetta.

Ref :- K. 60(95), 61(110).

Type :- 'M'.

Object :—To study the effects of manuring on Coffee.

1. BASAL CONDITIONS :

(i) N.A.　(ii) Reddish coloured latosol.　(iii) By seedlings.　(iv) Robusta.　(v) Square method of planting at 3 m.×3 m. spacings.　(vi) N.A.　(vii) Nil. (viii) Weedings, shade regulations, soil cultivation and desuckering.　(ix) Nil.　(x) Unirrigated.　(xi) 485 cm. ; 518 cm.　(xii) January to March.

2. TREATMENTS :

Main plot treatments :
   4 levels of N : N_1=45, N_2=67, N_3=90 and N_4=112 Kg/ha.

Sub-plot treatments :
   4 methods of application of manures : M_1= N applied in two equal doses once in the pre-blossom and once in the post blossom period, M_2=N applied in 3 equal doses once in pre-blossom, once in pre-blossom, once in pre-monsoon and once in post-monsoon period, M_3=M_1+34 Kg/ha. of P_2O_5 applied in 2 doses, once in pre-blossom and once in pest blossom season and M_4=M_3+45 Kg/ha. of K_2O applied in 2 equal doses, once in the pre-blossom and once in post blossom season. N applied as A/S, P_2O_5 as Rock Phos. and K_2O as Mur. Pot.

3. DESIGN :

(i) Split-plot.　(ii) (a) 4 main-plots/replication ; 4 sub-plots/main-plot.　(b) N.A.　(iii) 2.　(iv) (a) N.A. (b) Gross-42, Net-24.　(v) One row alround.　(vi) Yes.

4. GENERAL :

(i) Fair.　(ii) Shot-hole borer—severe in 1960, but mild in 1961.　(iii) Yield of coffee seeds.　(iv) 1955—1961. (v) At several places.　(vi) to (viii) Nil.

5. RESULTS :

60(95)

(i) 6862 Kg/ha.　(ii) (a) 2794·1 Kg/ha.　(b) 1906·7 Kg/ha.　(iii) None of the effects is significant.　(iv) Av. yield of coffee seeds in Kg/ha.

	N_1	N_2	N_3	N_4	Mean
M_1	6781	6719	5075	8186	6690
M_2	7263	8308	6629	5840	7010
M_3	5204	7554	7043	6787	6647
M_4	8247	6174	6601	7385	7102
Mean	6874	7189	6337	7050	6862

61(110)

(i) 2964 Kg/ha.   (ii) (a) 557·7 Kg/ha.   (b) 577·3 Kg/ha.   (iii) None of the effects is significant.   (iv) Av. yield of coffee seeds in Kg/ha.

	N_1	N_2	N_3	N_4	Mean
M_1	2659	2712	2834	2348	2638
M_2	3383	2652	2854	2688	2894
M_3	3067	3573	3406	2030	3019
M_4	3421	2991	3817	3000	3307
Mean	3132	2982	3228	2516	2964

Crop :- Coffee.   Ref :- K. 60(97), 61(108).

Site :- Krishna Estate, Kalpetta.   Type :- 'M'.

Object :—To study the effect of manuring on Coffee.

1.   BASAL CONDITIONS to 4. GENERAL :

Same as in expt. No. 60(95) and 61(110) on page 317.

5.   RESULTS :

60(97)

(i) 6624 Kg/ha.   (ii) (a) 1642·8 Kg/ha.   (b) 2031·0 Kg/ha.   (iii) None of the effects is significant.   (iv) Av. yield of coffee seeds in Kg/ha.

	N_1	N_2	N_3	N_4	Mean
M_1	6520	8232	5710	5118	6395
M_2	6456	4529	8251	6288	6381
M_3	6114	10155	6873	5524	7166
M_4	5559	7671	6086	6895	6553
Mean	6162	7647	6730	5956	6624

61(108)

(i) 2794 Kg/ha.   (ii) (a) 1214·2 Kg/ha.   (b) 592·7 Kg/ha.   (iii) Main effect of M is highly significant.
(iv) Av. yield of coffee seeds in Kg/ha.

	N_1	N_2	N_3	N_4	Mean
M_1	2121	2118	1935	2888	2266
M_2	2768	2650	2934	2055	2602
M_3	2919	2824	3201	2699	2911
M_4	3609	3681	2934	3365	3397
Mean	2854	2818	2751	2752	2794

C.D. for M marginal means = 499·4 Kg/ha.

Crop :- Coffee.

Site :- North Carolina Estate, Kalpetta.

Ref :- K. 60(96), 61(107).

Type :- 'M'.

Object :—To study the effect of manuring on Coffee.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. No. 60(95), 61(110) on page 317.

5. RESULTS :

60(96)

(i) 6917 Kg/ha. (ii) (a) 2368·7 Kg/ha. (b) 1452·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of coffee seeds in Kg/ha.

	N_1	N_2	N_3	N_4	Mean
M_1	6328	6846	7686	6606	6864
M_2	5472	6438	7816	7214	6735
M_3	5202	5867	7383	8888	6835
M_4	5869	6894	6056	10113	7233
Mean	5718	6511	7235	8205	6917

61(107)

(i) 3747 Kg/ha. (ii) (a) 907·1 Kg/ha. (b) 630·7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of coffee seeds in Kg/ha.

	N_1	N_2	N_3	N_4	Mean
M_1	3293	3403	4484	3067	3562
M_2	3929	4134	4087	3615	3941
M_3	4196	3884	3641	3264	3746
M_4	4010	3408	3865	3675	3739
Mean	3857	3707	4019	3405	3747

Crop :- Coffee.

Site :- Coffee Res. Stn., Malamthottom Estate, Paderipare.

Ref :- K. 60(94), 61(109).

Type :- 'M'.

Object :—To study the effect of manuring on Coffee.

1- BASAL CONDITIONS :

(i) N.A. (ii) Reddish coloured latosol. (iii) By seedlings. (iv) Robusta. (v) Square method of planting at 2·7 m. × 2·7 m. spacings. (vi) N.A. (vii) Nil. (viii) Weedings, shade regulation, soil cultivation, and desuckering. (ix) Nil. (x) Unirrigated. (xi) 485 cm. ; 518 cm. (xii) January to March.

2. TREATMENTS :

Main-plot treatments :

4 levels of N : N_1=45, N_2=67, N_3=90 and N_4=112 Kg/ha.

Sub-plot-treatments

4 methods of application of manures M_1=N applied in two equal doses once in the pre-blossom and once in the post-blossom period. M_2=N applied in 3 equal doses once in pre-blossom, once in pre-monsoon and once in post-monsoon period, M_3=M_2+34 Kg/ha. of P_2O_5 applied in 2 doses, once in pre-blossom and once in post-blossom season and M_4=M_3+45 Kg/ha. of K_2O applied in 2 equal doses, once in the pre-blossom and once in post blossom season.

N applied as A/S, P_2O_5 as Rock Phos. and K_2O as Mur. Pot.

3. DESIGN :

(i) Split-plot. (ii) 4 main-plots/replication ; 4 sub-plots/main-plot. (b) *N.A. (ii) 3. (iv) (a) N.A. (b) Gross—42, Net—24. (v) One row alround. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Shot hole borer severe in 1960 and mild in 1961. (iii) Yield of coffee seeds. (iv) 1955—1961. (v) N.A. (vi) to (viii) Nil.

5. RESULTS :

60(94)

(i) 7045 Kg/ha. (ii) (a) 2328·7 Kg/ha. (b) 1997·7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of coffee seeds in Kg/ha.

	N_1	N_2	N_3	N_4	Mean
M_1	5989	8321	7306	5926	6886
M_2	6303	6723	5248	6280	6138
M_3	7804	7072	9239	6217	7583
M_4	8867	8884	5029	7514	7574
Mean	7241	7750	6706	6484	7045

61(109)

(i) 3946 Kg/ha. (ii) (a) 981·4 Kg/ha. (b) 1018·0 Kg/ha. (iii) Main effect of M alone is significant. (iv) Av. yield of coffee seeds in Kg/ha.

	N_1	N_2	N_3	N_4	Mean
M_1	3559	3134	3356	3154	3301
M_2	3709	4846	2966	3636	3789
M_3	4525	3741	4595	4181	4260
M_4	4307	4483	4125	4826	4435
Mean	4025	4051	3760	3949	3946

C.D. for M marginal means = 857·8 Kg/ha.

Crop :- Coffee.

Site :- Coffee Demons. Farm, Kalpetta.

Object :—To find out optimum spacing for Coffee.

Ref :- K. 64(83), 65(85).

Type :- 'C'.

1. BASAL CONDITIONS :

(i) N.A. (ii) Laterite, generally acidic in reaction. (iii) By seedlings. (iv) Arabica (S—795 selection) (v) Planted in Sept. 1960. (vi) 7 months. (vii) N : P : K at 40 : 75 : 40 in March 64; 20 : 0 : 0 in June 64. ; 20 : 0 : 40 in Oct. 64 and Zinc Sulphate+Urea spray in April and Nov., 64. (viii) Shade regulation, weeding. desuckering and Scuffling etc. (ix) Nil. (x) Unirrigated. (xi) 305 cm. in 1964 and 1965. (xii) 24, 28 Oct., 17, 21 Nov., 8, 19 Dec. 1964 and 1965 respectively.

2. TREATMENTS :

6 spacings : $S_1 = 0.91$ m. $\times 0.91$ m. ; $S_2 = 0.91$ m. $\times 1.22$ m. ; $S_3 = 1.22$ m. $\times 1.22$ m. ; $S_4 = 1.83$ m. $\times 0.91$ m. ; $S_5 = 1.83$ m. $\times 1.22$ m. ; and $S_6 = 1.83$ m. $\times 1.83$ m.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) N.A. (b) Gross : $S_1 = 192$, $S_2 = 108$, $S_3 = 96$, $S_4 = 72$, $S_5 = 48$, $S_6 = 32$. Net : $S_1 = 140$, $S_2 = 70$, $S_3 = 60$, $S_4 = 42$, $S_5 = 24$, $S_6 = 12$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Spraying B.H.C. against white stemborer incidence in April and November. (iii) Yield of coffee seeds. (iv) 1960—N.A. (v) N.A. (vi) to (viii) Nil.

5. RESULTS :

64(83)

(i) 2597 Kg/ha. (ii) 1356·5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of Coffee seeds in Kg/ha.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield	3992	2707	3068	2191	1651	1973

65(85)

(i) 5040 Kg/ha. (ii) 133·9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of coffee in Kg/ha.

Treatment	S_1	S_2	S_3	S_4	S_5	S_6
Av. yield.	7104	5679	5658	5113	4134	2554

C.D. = 1593·3 Kg/ha.

(

Crop :- Rubber.　　　　　　　　　　　　　　**Ref :- K. 63(5), 64(120).**

Site :- Rubber Res. Instt. of India, Mundakayam　　**Type :- 'M'.**
Estate, Kottayam.

Object :—To find out the optimum requirements of N, P and K for Rubber crop.

1. BASAL CONDITION :

(i) Replanted area. (ii) Laterite soil. (iii) Budding. (iv) P.B. 5/60. (v) Planted in 1956 at a spacing of 4·9 m. $\times$ 4·9 m. (vi) 10 months. (vii) N A. (viii) Weedings. (ix) Nil. (x) Unirrigated. (xi) 430 cm. for 63(5); N.A for 64'120). (xii) Tapping started in March, 1964.

2. TREATMENTS :

All combinations of (1), (2) and (3)
    (1) 3 levels of N as A/S : $N_0 = 0$, $N_1 = 33.6$ and $N_2 = 67.2$ Kg/ha.
    (2) 3 levels of P_2O_5 as Rock Phos. : $P_0 = 0$, $P_1 = 44.8$ and $P_2 = 89.6$ Kg/ha.
    (3) 3 levels of K_2O as Mur. Pot. : $K_0 = 0$, $K_1 = 44.8$ and $K_2 = 89.6$ Kg/ha.
N applied as A/S/N is 1964(1·0).

3. DESIGN :

(i) 3^3 Confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 12. (v) 8. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Sprayings against abnormal leaf fall. (iii) Girth measurements. (iv) 1963—64. (v) Malankera, Pudukada and Vaikundam estates. (vi) and (vii) Nil. (viii) Assuming 3rd order interactions to be insignificant, they are pooled with error.

5. RESULTS :
63(5)

(i) 54·6 cm./tree. (ii) 2·05 cm./tree. (iii) Main effect of P alone is highly significant. (iv) Av. girth in cm./tree.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	50·9	53·3	53·3	52·4	53·1	52·0	52·5
P_1	55·4	54·4	56·1	55·7	55·5	54·7	55·3
P_2	54·8	57·0	56·2	56·6	55·8	55·6	56·0
Mean	53·7	54·9	55·2	54·9	54·8	54·1	54·6
K_0	53·0	55·5	56·2				
K_1	55·3	54·1	55·0				
K_2	52·8	55·1	54·4				

C.D. for P marginal means=1·9 cm./tree.

64(120)

(i) 54·7 cm./tree. (ii) 2·2 cm/tree. (iii) Main effect of P alone is highly significant. (iv) Av. girth in cm./tree.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	51·3	53·9	53·2	52·7	53·7	52·0	52·8
P_1	55·3	54·4	56·5	55·7	55·8	54·7	55·4
P_2	54·8	57·0	56·2	56·6	55·8	55·6	56·0
Mean	53·8	55·1	55·3	55·0	55·1	54·1	54·7
K_0	53·3	55·5	56·2				
K_1	55·4	54·7	55·2				
K_2	52·7	55·1	54·5				

C.D. for P marginal means=2·1 cm./tree.

———

Crop :- Rubber.

Site :- Rubber Res. Instt. of India, Malankara Estate, Kottayam.

Ref :- K. 63(3), 64(119).

Type :- 'M'.

Object :—To find out the optimum requirements of N, P and K for Rubber.

1. BASAL CONDITIONS :

(i) Replanting area. (ii) Loam soil. (iii) Budding. (iv) T.J.I.R. clonal seedlings. (v) Planted in June, 1956 at 4·9 m.×4·9 m. spacings. (vi) One year. (vii) N.A. (viii) Weeding. (ix) Nil. (x) Unirrigated. (xi) 380 cm. for 63(3) and N.A. for 1964. (xii) Tapping started in Sept. 1962.

2. TREATMENTS :

All combinations of (1), (2) and (3)
    (1) 3 levels of N as A/S : $N_0=0$, $N_1=33\cdot6$ and $N_2=67\cdot2$ Kg/ha.
    (2) 3 levels of P_2O_5 as Rock Phos. : $P_0=0$, $P_1=44\cdot8$ and $P_2=89\cdot6$ Kg/ha.
    (3) 3 levels of K_2O as Mur. Pot. : $K_0=0$, $K_1=44\cdot8$ and $K_2=89\cdot6$ Kg/ha.
N applied as A/S/N in 64(119).

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) Nil (b) 6. (v) 14. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Sprayed against abnormal leaf fall. (iii) Girth measurements. (iv) 1963—64. (v) Mundakayam, Pudukade and Vaikundom estate. (vi) and (vii) Nil. (viii) Assuming the 3rd interactions to be insignificant, they are pooled with error.

5. RESULTS :

63(3)

(i) $52\cdot2$ cm./tree. (ii) $4\cdot0$ cm./tree (iii) Main effect of N is significant and the main effect of P is highly significant. (iv) Av. girth in cm./tree.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	45·4	49·8	48·5	51·6	46·4	45·7	47·9
P_1	53·2	55·9	54·7	55·0	53·3	55·5	54·6
P_2	51·4	56·0	54·9	54·8	53·6	53·9	54 1
Mean	50·0	53·9	52·7	53·8	51·1	51·7	52·2
K_0	50·6	55·7	55·1				
K_1	48·8	54·7	49·8				
K_2	50·6	51·3	53·2				

C.D. for N or P marginal means$=2\cdot7$ cm./tree.

64(119)

(i) $53\cdot1$ cm/tree. (ii) $3\cdot3$ cm./tree. (iii) Main effect of P is highly significant and the main effect of K and interaction N×K are significant. (iv) Av. girth in cm./tree.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	45·3	49·9	48·8	52 2	46·2	45·6	48·0
P_1	56·1	56·0	54·7	57·0	54·3	55·5	55·6
P_2	54·3	57·0	56·1	55·8	56·1	55·5	55·8
Mean	51·9	54 3	53·2	55·0	52·2	52·2	53·1
K_0	52·6	56.0	56·4				
K_1	51·5	55·5	49·6				
K_2	51·6	51·4	53 6				

C.D. for P or K marginal means$=2\cdot2$ cm./tree.
C.D. for the body of N×K table $=3\cdot9$ cm./tree.

Crop :- Rubber.

Ref :- K. 61(125), 62(54).

Site :- Thodupuzha (c.f.) Dist. Ernakulam.

Type :- 'M'.

Object :—To find out the optimum requirement of N, P and K for Rubber crop,

1. BASAL CONDITIONS :

(i) Replanted area. (ii) Laterite soil. (iii) N.A. (iv) T.J.I.R.— 1 (improved). (v) Planted in June—July, 1956. (vi) N.A. (vii) Nil. (viii) Weedings. (ix) Nil. *Pueraria Phascolordes* grown as a cover crop in between rubber rows. (x) Unirrigated. (xi) N.A. (xii) N.A.

2. TREATMENTS :

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

(1) 3 levels of N as A/S/N : $N_0=0$, $N_1=33.6$ and $N_2=67.2$ Kg/ha.

(2) 3 levels of P_2O_5 as Rock. Phos. : $P_0=0$, $P_1=44.8$ and $P_2=89.6$ Kg/ha.

(3) 3 levels of K_2O as Mur. Pot. : $K_0=0$, $K_1=44.8$ and $K_2=89.6$ Kg/ha.

Fertilizers broadcast in bases around the trees and light forking in.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) Nil. (b) 6. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Control measures adopted for secondary leaf fall and pink disease. (iii) Girth measurements. (iv) 1961—62. (v) different places. (vi) to (viii) Nil.

5. RESULTS :

61(125)

(i) 38.3 cm./tree. (ii) 4.3 cm./tree. (iii) Main effect of P alone is highly significant. (iv) Av. girth in cm./tree.

	N_0	N_1	N_2	K_0	K_1	K	Mean
P_0	31.3	34.7	33.6	36.5	32.2	30.9	33.2
P_1	40.2	40.6	40.1	40.3	38.9	41.7	40.3
P_2	41.3	41.7	41.5	40.8	42.0	41.7	41.5
Mean	37.6	39.0	38.4	39.2	37.7	38.1	38.3
K_0	37.3	38.8	41.5				
K_1	37.7	40.4	35.0				
K_2	37.8	37.8	38.7				

C.D. for P marginal means=2.9 cm./tree.

62(54)

(i) 45.7 cm./tree. (ii) 3.7 cm./tree. (iii) Main effect of P is highly significant and interaction N×K is significant. (iv) Av. girth in cm./tree.

	N_0	N_1	N_2		K_0	K_1	K_2	Mean
P_0	38·0	42·0	40·9		44·0	39·1	37·8	40·3
P_1	46·6	49·4	48·6		48·0	47·0	49·6	48·2
P_2	47·4	49·0	49·1		48·4	48·9	48·2	48·5
Mean	44·0	46·8	46·2		46·8	45·0	45·2	45·7
K_0	44·1	47·2	49·1					
K_1	43·9	48·8	42·3					
K_2	44·0	44·4	47·2					

C.D. for P marginal means = 2·5 cm./tree.

C.D. for the body of N × K table = 4·4 cm./tree.

———

Crop :- Rubber.

Site :- Kanjirapally (c.f.)**, Kottayam.**

Ref :- K. 61(127), 62(57).

Type :- 'M'.

Object :—To find out the optimum requirement of N, P and K for Rubber crop.

1. BASAL CONDITIONS :

(i) N.A. (ii) Laterite soil. (iii) Budding. (iv) P.B.—5/139 (improved). (v) Planted in June-July, 1956. (vi) N.A. (vii) Nil. (viii) Weedings. (ix) Nil. *Pueraria Phascoloides* grown as a cover crop in between rubber rows. (x) Unirrigated. (xi) N.A. (xii) N.A.

2. TREATMENTS :

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

(1) 3 levels of N as A/S/N : $N_0=0$, $N_1=33·6$ and $N_2=67·2$ Kg/ha.

(2) 3 levels of P_2O_5 as Rock. Phos. : $P_0=0$, $P=44·8$ and $P_2=89·6$ Kg/ha.

(3) 3 levels of K_2O as Mur. Pot. : $K_0=0$, $K_1=44·8$ and $K_2=89·6$ Kg/ha.

Fertilizers broadcast in annular bands round the tree and light forking in April-May and Sept.-Oct.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 12. (v) 18. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Control measures adopted for secondary leaf fall and pink disease. (iii) Girth measurements. (iv) 1961—62. (v) At many places. (vi) to (viii) Nil.

5. RESULTS :

61(127)

(i) 40·1 cm./tree. (ii) 2·3 cm./tree. (iii) Main effect of P alone is highly significant. (iv) Av. girth in cm./tree.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	37·0	38·1	38·6	37·6	38·2	37·9	37·9
P_1	40·5	40·0	41·9	40·2	41·8	40·4	40·8
P_2	40·1	42·5	41·9	42·5	41·2	40·8	41·5
Mean	39·2	40·2	40·8	40·1	40·4	39·7	40·1
K_0	38·7	40·4	41·2				
K_1	40·8	39·7	40·7				
K_2	38·1	40·5	40·5				

C.D. for P marginal means=1·6 cm./tree.

62(57)

(i) 47·7 cm./tree. (ii) 1·9 cm./tree. (iii) Main effect of P is highly significant. Interaction $N \times K$ is significant. (iv) Av. girth in cm./tree.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	44·7	46·0	46·7	45·9	46·0	45·5	45·8
P_1	48·3	47·8	49·4	48·6	49·4	47·5	48·5
P_2	47·4	49·9	49·4	48·9	49·2	48·6	48·9
Mean	46·8	47·9	48·5	47·8	48·2	47·2	47·7
K_0	45·6	48·5	49·3				
K_1	48·8	47·2	48·6				
K_2	46·0	48·0	47·6				

C.D. for P marginal means=1·3 cm./tree.
C.D. for the body of $N \times K$ table=2·3 cm./tree.

———

Crop :- Rubber.　　　　　　　　　　　　**Ref :- K. 63(6), 64(118)·**

Site :- Rubber Res. Instt. of India,　　　**Type :- 'M'.**
　　　Vaikundam Estate, Kottayam.

Object :—To find out the optimum requirements of N, P and K for Rubber crop.

1. BASAL CONDITIONS :

(i) New planted area. (ii) Laterite soil. (iii) Budding. (iv) P.B. 5/139. (v) Planted in 1955 at a spacing of 6·7 m.×3·3 m. (vi) 10 months. (vii) N.A. (viii) Weedings. (ix) Nil. (x) Unirrigated. (xi) 2·6 cm. for 63(6) ; N.A. for 64(118). (xii) Tapping started in 1963.

2. TREATMENTS :

All combinations of (1), (2) and (3)
　　(1) 3 levels of N as A/S : N_0=0, N_1=33·6 and N_2=67·2 Kg/ha.
　　(2) 3 levels of P_2O_5 as Rock. Phos. : P_0=0, P_1=44·8 and P_2=89·6 Kg/ha.
　　(3) 3 levels of K_2O as Mur. Pot. : K_0=0, K_1=44·8 and K_2=89·6 Kg/ha.

N applied as A/S/N in 64(118).

3. DESIGN :

   (i) 3^3 confd.   (ii) (a) 9 plots/block; 3 blocks/replication.   (b) N.A.   (iii) 1.   (iv) (a) Nil: (b) About 20.
   (v) N.A.   (vi) Yes.

4. GENERAL :

   (i) Satisfactory.   (ii) N.A.   (iii) Girth measurements.   (iv) 1963—64.   (v) Malankara, Mundakayam and
   Pudukade Estates.   (vi) to (viii) Nil.

5. RESULTS :

63(6)

   (i) 52·8 cm./tree.   (ii) 1·5 cm./tree.   (iii) **Main effect of P is highly significant.**   Interaction $N \times P$ is significant.   (iv) Av. girth in cm./tree.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	48·5	49·5	54·4	50·3	52·2	49·9	50·8
P_1	54·2	53·8	53·1	53·7	54·4	53·0	53·7
P_2	52·4	55·4	53·9	53·5	54·5	53·7	53·9
Mean	51·7	52·9	53·8	52·5	53·7	52·2	52·8
K_0	52·0	53·3	52·2				
K_1	53·0	53·5	54·6				
K_2	50·1	51·9	54·6				

C.D. for P marginal means=1·8 cm./tree.

C.D. for the body of $N \times P$ table=3·1 cm./tree.

64(118)

   (i) 53·0 cm./tree.   (ii) 1·3 cm./tree.   (iii) Main effect of P is highly significant.   Main effect of N and interaction $N \times P$ are significant.   (iv) Av. girth in cm./tree.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	48·5	49·4	54·5	50·4	52·2	49·8	50·8
P_1	54·2	54·2	53·6	54·2	54·4	53·4	54·0
P_2	53·0	55·4	54·2	54·1	54·5	54·0	54·2
Mean	51·9	53·0	54·1	52·9	53·7	52·4	53·0
K_0	52·6	53·3	52·8				
K_1	53·1	53·4	54·6				
K_2	50·1	52·3	54·9				

C.D. for N or P marginal means =1·8 cm./tree.

C.D. for the body of $N \times P$ table =3·1 cm./tree.

Crop :- **Rubber.**   Ref :- **K. 63(4), 64(117).**

Site :- **Rubber Res. Instt. of India,**   Type :- **'M'.**
         Pudukade Estate, Kottayam.

Object :—To find out the optimum requirements of N, P and K for Rubber crop.

1. BASAL CONDITIONS:

(i) Replanted area. (ii) Sandy loam. (iii) By budding. (iv) P.B. 86. (v) Planted in 1956 at a spacing of 4·9 m.×4·9 m. (vi) 10 months. (vii) N.A. (viii) Weedings. (ix) Nil. (x) Unirrigated. (xi) 380 cm.; N.A. (xii) Tapping not commenced.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S : $N_0=0$, $N_1=33·6$ and $N_2=67·2$ Kg/ha.
(2) 3 levels of P_2O_5 as Rock. Phos. : $P_0=0$, $P_1=44·8$ and $P_2=89·6$ Kg/ha.
(3) 3 levels of K_2O as Mur. Pot. : $K_0=0$, $K_1=44·8$ and $K_2=89·6$ Kg/ha.
In 64(117) N applied as A/S/N.

3. DESIGN :

(i) 3^3 confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) Nil. (b) 14 to 16. (v) and (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Treated against pink disease by Bordeaux spraying against phytophthera. (iii) Girth measurement. (iv) 1963—64. (v) Malankara, Mundakayam and Vaikundam Estates. (vi) to (viii) Nil.

5. RESULTS :

63(4)

(i) 47·9 cm./tree. (ii) 2·8 cm./tree. (iii) None of the effects is significant. (iv) Av. girth in cm./tree.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	48·1	48·1	48·4	47·5	48·8	48·3	48·2
P_1	46·2	47·0	47·5	47·7	46·5	46·5	46·9
P_2	48·2	49·2	48·4	50·9	46·6	48·3	48·6
Mean	47·5	48·1	48·1	48·7	47·3	47·7	47·9
K_0	47·6	49·2	49·3				
K_1	47·5	46·2	48·2				
K_2	47·4	48·9	46·8				

64(117)

(i) 48·6 cm./tree. (ii) 2·6 cm/tree. (iii) None of the effects is significant. (iv) Av. girth in cm/tree.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	48·5	48·2	49·1	48·0	49·3	48·5	48·6
P_1	47·9	49·0	47·4	49·4	48·1	46·8	48·1
P_2	48·5	49·2	49·6	50·8	48·1	48·4	49·1
Mean	48·3	48·8	48·7	49·4	48·5	47·9	48·6
K_0	49·3	49·4	49·5				
K_1	47·9	47·8	49·8				
K_2	47·7	49·2	46·8				

Crop :- Rubber.　　　　　　　　　　　　　　　　**Ref :- K. 61(126), 62(55).**

Site :- Mukumdapuram (c.f.), **Trichur.**　　　　　　　**Type :- 'M'.**

Object :—To find out the optimum requirement of N, P and K for Rubber crop.

1. BASAL CONDITIONS :

(i) N.A. (ii) Laterite soil. (iii) By budding. (iv) P.B. 86 (improved). (v) Planted in June-July, 1956. (vi) N.A. (vii) Nil. (viii) Weeding. (ix) Nil, *Pueraria Phascolorides* grown as a cover crop in between rubber rows. (x) Unirrigated. (xi) N.A. (xii) N.A.

2. TREATMENTS :

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

(1) 3 levels of N as A/S/N : $N_0=0$, $N_1=33.6$ and $N_2=67.2$ Kg/ha.

(2) 3 levels of P_2O_5 as Rock. Phos. : $P_0=0$, $P_1=44.8$ and $P_2=89.6$ Kg/ha.

(3) 3 levels of K_2O as Mur. Pot. : $K_0=0$, $K_1=44.8$ and $K_2=89.6$ Kg/ha.

Fertilisers broadcast in annular bands round the tree and light forking in April-May and September-October.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) Nil. (b) 18 trees/plot in the 1st replication and 16 trees/plot in the 2nd replication. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Controlled measures adopted for secondary leaf fall and pink disease. (iii) Girth measurements. (iv) 1961—62. (v) At many places. (vi) to (viii) Nil.

5. RESULTS :

61(126)

(i) 35.9 cm/tree. (ii) 3.8 cm/tree. (iii) None of the effects is significant. (iv) Av. girth in cm/tree.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	36.8	36.4	36.9	35.3	37.6	37.2	36.7
P_1	33.9	34.5	35.7	35.9	33.6	34.6	34.7
P_2	36.4	36.5	35.7	39.5	33.8	35.3	36.2
Mean	35.7	35.8	36.1	36.9	35.0	35.7	35.9
K_0	36.2	37.2	37.3				
K_1	35.3	33.4	36.3				
K_2	35.6	36.8	34.7				

62(55)

(i) 41.6 cm/tree. (ii) 3.1 cm/tree. (iii) None of the effects is significant. (iv) Av. girth in cm/tree.

	N_0	N_1	N_2	K_0	K_1	K_2	Mean
P_0	42.2	41.9	42.5	41.2	43.1	42.3	42.2
P_1	40.0	40.6	40.6	41.9	39.6	39.7	40.4
P_2	42.0	42.9	41.4	44.7	39.7	41.9	42.1
Mean	41.4	41.8	41.5	42.6	40.8	41.3	41.6
K_0	41.6	42.9	43.3				
K_1	41.4	39.5	41.5				
K_2	41.2	43.0	39.7				

Crop :- Coconut.   **Ref :- K. 60(88).**

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

Object :—To determine a suitable and economic dose of N, P and K for Coconut.

1. BASAL CONDITIONS :

(i) The area was standardised for three years prior to the expt. and during this period 19·6 cubic metres/ha. of sand and 11 Kg/ha. of ash was applied uniformly. (ii) Reclaimed clayey soil. (iii) Nil. (iv) *Tipica* (ordinary tal)l. (v) Nil. (vi) N.A. (vii) River sand at 19·6 cubic m./ha. and lime at 12·6 Q/ha. spread over the area and dug in during October—November. (viii) Digging the plots with mammuthy annually in October—November. (ix) Nil. (x) Unirrigated. (xi) 330 cm. (xii) Monthly harvest.

2. TREATMENTS :

6 manurial treatments : M_0=Control (no manure), M_1=0·1 Kg of N+0·1 Kg of P_2O_5+0·2 Kg of K_2O per tree, M_2=0·1 Kg of N+0·1 Kg of P_2O_5+0·5 Kg of K_2O per tree, M_3=0·2 Kg of N +0.1 Kg of P_2O_5+0·5 Kg of K_2O per tree, M_4=0·2 Kg of N+0·3 Kg of P_2O_5+0·5 Kg of K_2O per tree and M_5=0·2 Kg of N+0·3 Kg of P_2O_5+0·7 Kg of K_2O per tree.

2. DESIGN :

(i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 8. (v) Guard trees are left between rows as deep channels separate them. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) No serious incidence of pests. 30% of the trees are affected with leaf and root diseases. Trees are sprayed with fungicides twice a year. (iii) Number of nuts and leaves per tree annually. (iv) 1952—60. (v) to (viii) N.A.

5. RESULTS :

(i) 420 nuts/plot. (ii) 11 nuts/plot. (iii) Treatment differences are significant. (iv) Av. yield of coconut in nuts/plots.

Treatment	T_1	T_2	T_3	T_4	T_5	T_6
Av. yield	437	400	417	497	459	311

C.D.=13·1 nuts/plot.

Crop :- Coconut.   **Ref :- K. 64(190), 65(78).**

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

Object :—To assess the effect of Manik compound in regard to incidence in yellowing of leaves and/or disease condition and recovery of coconut palms.

1. BASAL CONDITIONS :

(i) N.A. (ii) Reclaimed clayey. (iii) By seedlings. (iv) West coast tall. (v) 6·1 m. to 7·6 m. spacings (vi) N.A. (vii) As per treatments. (viii) One digging. (ix) No. (x) Unirrigated. (xi) N.A. for 1964 ; 183 cm. for 1965. (xii) Monthly harvest.

2. TREATMENTS :

4 manurial treatments : M_0=Control (no manure), M_1=2 Kg Manik applied basally once in a year per tree, M_2=2 Kg Manik as spray (4 sprayings of ½ Kg each) per tree and M_3=1 Kg Manik basally and 1 Kg Manik as spray (2 sprayings of ½ Kg each) per tree.
N :P : K (8 : 8 : 16) mixture at 3·2 Kg/tree per year applied to all the treatments.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) 8. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Two sprayings with Copper fungicides and D.D.T. (iii) Yield of nuts and female flowers. (iv) 1964—contd. (v) to (viii) Nil.

5. RESULTS :

64(190)

(i) 237·0 nuts/plots. (ii) 19·4 nuts/plot. (iii) Treatment differences are not significant. (iv) Av. number of nuts/plot.

Treatment	M_0	M_1	M_2	M_3
Av. number	238·0	230·5	244·5	235·2

65(78)

(i) 249·8 nuts/plot. (ii) 70·8 nuts/plot. (iii) Treatment differences are not significant. (iv) Av. number of nuts/plot.

Treatment	M_0	M_1	M_2	M_3
Av. number	215·2	190·4	276.0	317·6

Crop :- Coconut. **Ref :- K. 62(131), 63(16), 64(121), 65(79).**

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

Object :—To study the length of period of residual effect of manures under local conditions.

1. BASAL CONDITIONS :

(i) The area was under a manurial trial from 1952 to 1959. (ii) Reclaimed clayey. (iii) By weedings (iv) West coast tall. (v) and (vi) N.A. (vii) Lime at 740 Kg/ha. in 1963 and 1964. (viii) One digging. (ix) Nil. (x) Unirrigated. (xi) N.A. for 1962. 265 cm. in 1963, 280 cm. in 1964 and 183 cm. in 1965. (xii) Monthly harvests .

2. TREATMENTS :

6 manurial treatments : T_0=Control (no manure), T_1=0·11 Kg of N+0·11 Kg of P_2O_4+0·23 Kg of K_2O, per tree, T_2=0.11 Kg of N+0·11 Kg of P_2O_5+0·45 Kg of K_2O per tree, T_3=0·23 Kg of N+0·11 Kg of P_2O_5+0·45 Kg of K_2O per tree, T_4=0·23 Kg of N+0·34 Kg of P_2O_5+0·45 Kg of K_2O per tree and T_5=0·23 Kg of N+0·34 Kg of P_2O_5+0·68 Kg of K_2O per tree.

3. DESIGN :

(i) R.B.D. (ii) 6. (b) N.A. (iii) 6. (iv) 8. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. 2 sprayings of fungicides in 1964. (iii) Yield of number of nuts and female flowers produced. (iv) 1960—1965. (v) N.A. (vi) and (vii) Nil. (viii) Yield data for 1960 and 1961 N.A. Nursing plot technique is used in T_4 of Replication II of 1962.

5. RESULTS :

62(131)

(i) 282·4 nuts/plot. (ii) 65·6 nuts/plot. (iii) Treatment differences are highly significant. (iv) Av. number of nuts/plot.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. number	200·3	284·0	243·8	275·0	314·0	377·3

C.D.=78·2 nuts/plot.

63(16)

(i) 248·8 nuts/plot. (ii) 63·3 nuts/plot. (iii) Treatment differences are highly significant. (iv) Av. number of nuts/plot of 8 trees.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. number	177·1	220·6	217·5	261·6	288·5	327·6

C.D.=75·1 nuts/plot.

64(121)

(i) 198·6 nuts/plot. (ii) 63·4 nuts/plot. (iii) Treatment differences are significant. (iv) Av. number of nuts/plot of 8 trees.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. number	135·6	188·3	177·1	205·0	217·5	268·3

C.D.=75·4 nuts/plot.

65(79)

(i) 182·0 nuts/plot. (ii) 58·8 nuts/plots. (iii) Treatment differences are significant. (iv) Av. number of nuts/plot of 8 trees.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5
Av. number	131·1	166·0	156·3	184·1	197·6	257·0

C.D.=69·9 nuts/plot.

———

Crop :- Coconut.   **Ref :- K. 62(129), 63(166), 64(188), 65(80).**

Site :- Reg. Coconut Res. Stn.,   Type :- 'M'.
Kumarakam.

Object :—To assess the effect of the application of fertilizers with and without a dose of trace elements on yield and disease condition of plants.

1. BASAL CONDITIONS :

(i) N.A. (ii) Reclaimed clayey. (iii) By seedlings. (iv) West coast tall. (v) 6·1 m. to 7·1 m. spacings. (vi) and (vii) N.A. (viii) One digging. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Monthly harvests.

2. TREATMENTS :

9 manurial treatments : T_0=Control, T_1=0·25 Kg of N+0·35 Kg of P_2O_5+·70 Kg of K_2O per tree, T_2=·50 Kg of N+·70 Kg of P_2O_5+1·40 Kg of K_2O, T_3=NPK+Boron (200 gm. Borax per palm), T_4=NPK+Manganese (200 gm Mn. Sul. per palm), T_5=NPK+Copper (200 gm Cu. Sul. per palm), T_6=NPK+Molybdenum (2 gm Ammo. Molybdate per palm), T_7=NPK+Zinc (200 gm Zinc Sulphate) and T_8=NPK+all the above 5 trace elements.

NPK=0·25 Kg of N+0·35 Kg of P_2O_5+·70 Kg of K_2O.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) 8. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) 2 sprayings with Copper fungicides. (iii) Yield of nuts and female flowers produced. (iv) 1962—contd. (v) N.A. (vi) and (viii) Nil.

5. RESULTS :

62(129)

(i) 294·2 nuts/plot. (ii) 63·1 nuts/plot. (iii) Treatment differences are not significant. (iv) Av. number of nuts/plot of 8 trees.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8
Av. number	338·7	310·5	317·5	310·2	268·7	271·0	253·5	296·7	276·5

63(166)

(i) 326·5 nuts/plot.　(ii) 85·1 nuts/plot.　(iii) Treatment differences are not significant.　(iv) Av. number of nuts/plot of 8 trees.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8
Av. number	360·0	316·0	375·0	333·7	339·2	298·7	279·5	362·2	274·5

64(188)

(i) 448·8 nuts/plot.　(ii) 85·9 nuts/plot.　(iii) Treatment differences are not significant.　(iv) Av. number of nuts/plot of 8 trees.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8
Av. number	379·2	450·5	567·0	466·7	491·5	438·0	375·2	491·2	380·2

65(80)

(i) 530·4 nuts/plot.　(ii) 107·2 nuts/plot.　(iii) Treatment differences are not significant.　(iv) Av. number of nuts/plot of 8 trees.

Treatment	T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8
Av. number	409·6	492·8	660·8	528·8	501·6	488·8	556·0	613·6	521·6

Crop :- Coconut.

Site :- Reg. Coconut Res. Stn., Neyyattinkara.

Ref :- K. 60(87), 61(115), 62(16).

Type :- 'M'.

Object :—To study the residual effect of N, P and K applied in the previous years to Coconut.

1. **BASAL CONDITIONS :**

(i) The area is given a uniform digging raising a green manure crop and burying in *situ* in between the trees for a period of three years. (ii) Deep red loam. (iii) By seedlings. (iv) West coast variety. (v) and (vi) N.A. (vii) G.M. at 23 Kg/tree was given in 1961, 0·11 Kg/tree of N+0·11 Kg/tree of P_2O_5+0·23 Kg/tree of K_2O applied during 1960 and 1962. (viii) A general digging was given after taking basins round the trees. (ix) G.M. crop. (x) Unirrigated. (xi) 214 cm. in 1960, 200 cm. in 1961, N.A. for 1962. (xii) 6 harvests during the year.

2. **TREATMENTS :**

6 manurial treatments : M_0=Control, M_1=0·11 Kg/tree of N+0·11 Kg/tree of P_2O_5+0·23 Kg/tree of K_2O, M_2=0·11 Kg/tree of N+0·11 Kg/tree of P_2O_5+0·45 Kg/tree of K_2O, M_3=0·23 Kg/tree of N+0·11 Kg/tree of P_2O_5+0·45 Kg/tree of K_2O, M_4=0·23 Kg/tree of N+0·34 Kg/tree of P_2O_5+0·45 Kg/tree of K_2O and M_5=0·23 Kg/tree of N+0·34 Kg/tree of P_2O_5+0·68 Kg/tree of K_2O.

P_2O_5 as B.M. was applied at the time of sowing of G.M. crop.

3. **DESIGN :**

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6 in 1960, 4 in 1961 and 2 in 1962. (iv) 8. (v) N.A. (vi) Yes.

4. **GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Yield of nuts/plot. (iv) 1952—59. Residual effect studied from 1960. (v) to (viii) Nil.

5. **RESULTS :**

60(87)

(i) 664 nuts/plot. (ii) and (iii) N.A. (iv) Av. number of nuts/plot.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. number	398	621	568	769	755	876

61(115)

(i) 656 nuts/plot. (ii) 117 nuts/plot. (iii) Treatment differences are highly significant. (iv) Av. number of nuts/plot.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. number	416	576	688	728	712	816

C.D.=176 nuts/plot.

62(16)

(i) 569·5 nuts/plot. (ii) 73·3 nuts/plot. (iii) Treatment differences are not significant. (iv) Av. number of nuts/plot.

Treatment	M_0	M_1	M_2	M_3	M_4	M_5
Av. number	431·0	477·5	600·5	663·0	558·5	686·5

Crop :- Coconut.　　　　　　　　**Ref :- K. 61(137), 62(128), 63(15), 65(81).**

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

Object :—To study the effect of N and P on the yield of Coconut.

1. BASAL CONDITIONS :

(i) The experimental area received uniform cultural and manurial operation in the pre-experimental period. (ii) Gravelly laterite soil. (iii) Seedlings. (iv) West coast tall. (v) C and D 1918, E 1919—Triangular planting 9·14 m spacing. (vi) One year old. (vii) ½ Kg of Mur. Pot. and 25 Kg of green stuff/tree per year were applied in the basins dug round the trees. (viii) 2 ploughings. Basins 1½ meter radius dug round the trees with *mamothy* in July. (ix) Nil. (x) Unirrigated: (xi) 623 cm. in 1961 ; 540 cm. in 1962 ; N.A. for 1963 ; 285 cm. in 1965. (xii) Monthly harvests.

2. TREATMENTS :

Main-plot treatments :
　4 levels of N as A/S : N_0=0, N_1=0·250, N_2=0·375 and N_3=0·500 Kg/ha.
Sub-plot treatments :
　4 levels of P_2O_5 as Super : P_0=0, P_1=0·125, P_2=0·250 and P_3=0·375 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) N.A. (b) 8. (v) and (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Monthly yield of nuts, female flowers production etc. (iv) 1961—contd. (v) N.A. (vi) and (vii) Nil. (viii) Expt. for 1964—N.A.

5. RESULTS :

61(137)

(i) 48 nuts/tree. (ii) (a) 20·1 nuts/tree. (b) 18·5 nuts/tree. (iii) None of the effects is significant. (iv) Av. number of nuts/tree

	P_0	P_1	P_2	P_3	Mean
N_0	45	53	36	50	46
N_1	51	37	45	59	48
N_2	43	42	56	39	45
N_3	50	57	58	52	54
Mean	47	47	49	50	48

62(128)

(i) 34 nuts/tree. (ii) (a) 11·6 nuts/tree. (b) 13·1 nuts/tree. (iii) None of the effects is significant. (iv) Av. number of nuts/tree.

	P_0	P_1	P_2	P_3	Mean
N_0	40	39	39	21	35
N_1	33	40	27	36	34
N_2	35	32	31	22	30
N_3	33	35	43	38	37
Mean	35	36	35	29	34

63(15)

(i) 458 nuts/plot. (ii) (a) 162·5 nuts/plot. (b) 64·2 nuts/plot (iii) None of the effects is significant. (iv) Av. number of nuts/plot.

	P_0	P_1	P_2	P_3	Mean
N_0	438	482	421	523	466
N_1	440	523	499	469	483
N_2	431	451	412	422	429
N_3	430	487	415	475	452
Mean	435	486	437	472	458

65(81)

(i) 80 nuts/plot. (ii) (a) 31·3 nuts/plot. (b) 32·4 nuts/plot. (iii) None of the effects is significant. (iv) Av. number of nuts/plot.

	N_0	N_1	N_2	N_3	Mean
P_0	87	73	69	80	77
P_1	98	74	80	83	84
P_2	64	76	74	84	74
P_3	86	75	83	94	84
Mean	84	74	76	85	80

Crop :- Coconut.

Site :- Reg. Coconut Res. Stn., Kumarakam.

Ref :- K. 62(130), 63(167), 64(189), 65(77).

Type :- 'C'.

Object:—To study whether cultural practices have any effect on the performance of Coconut.

1. BASAL CONDITIONS:

(i) N.A. (ii) Reclaimed clayey soil. (iii) By seedlings. (iv) West coast tall. (v) 6·1 to 7·6 m. spacing. (vi) N.A. (vii) Nil. (viii) As per treatments. (ix) N.A. (x) Unirrigated. (xi) 183 cm. in 1965 ; N.A. for others. (xii) 12 monthly harvests.

2. TREATMENTS :

4 cultural treatments : C_1=2 diggings annually with mammuthy. First in August-Sept. and 2nd in December-January, C_2=Clean surface removal of grass, C_3=Perennial cover of leguminous crop and C_4=Perennial cover of grass.

3. DESIGN :

(i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 6. (iv) 12. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) 2 sprayings with Copper fungicides and D.D.T (iii) Number of nuts per tree. (iv) 1962—contd. (v) No. (vi) to (viii) Nil.

5. RESULTS :

62(130)

(i) 312·8 nuts/plot. (ii) 63·8 nuts/plot. (iii) Treatment differences are not significant. (iv) Av. number of nuts/plot.

Treatment	C_1	C_2	C_3	C_4
Av. number	340·8	339·5	266·8	304·3

63(167)

(i) 428·6 nuts/plot. (ii) 60·8 nuts/plot (iii) Treatment differences are significant. (iv) Av. number of nuts/plot.

Treatment	C_1	C_2	C_3	C_4
Av. number	487·5	441·8	379·5	405·6

C.D.=74·8 nuts/plot.

64(189)

(i) 469·1 nuts/plot. (ii) 71·4 nuts/plot. (iii) Treatment differences are significant. (iv) Av. number of nuts/plot.

Treatment	C_1	C_2	C_3	C_4
Av. number	521·6	515·6	410·0	429·1

C.D.=87·8 nuts/pot.

65(77)

(i) 461·7 nuts/plot. (ii) 62·8 nuts/plot. (iii) Treatment differences are significant. (iv) Av. number of nuts/plot.

Treatment	C_1	C_2	C_3	C_4
Av. number	431·0	577·0	446·5	392·3

C.D.=77·2 nuts/plot.

———

Crop :- Coconut.   **Ref :- K. 60(89),61(114), 62(17).**

Site :- Reg. Coconut Res. Stn., Kumarakam.   Type :- 'C'.

Object :—To evaluate various intercultural operations for Coconut with special reference to clayey soils of the back water area.

1. BASAL CONDITIONS :

(i) Area standardised for three years before the trial. (ii) Clayey loam. (iii) By seedlings. (iv) Ordinary tall. (v) Trees stand on long and narrow bunds with channels in between them spacings ranges from 7·6 m. to 9·1 m. (vi) N.A. (vii) River sand at 19·6 cubic m./ha.+Lime at 12·6 Q/ha. and ash at 4·5 Kg/tree spread over the area before the cultural operation in 1960, 250 gm of N+350 gm. of P_2O_5+450 gm. of K_2O per tree broadcast in Dec. 1961. Lime at 740 Kg/ha. was also applied. No manures applied in 1962. (ix) Nil. (x) Unirrigated. (xi) 330 cm. in 1960, 349 cm. in 1961 and 284 cm. in 1962. (xii) 12 monthly harvest.

2. TREATMENTS :

4 cultural treatments : C_0=Uncultivated (control) ; C_1=Forming mounds around the trees in August—Sept. and levelling them in Dec.—Jan., C_2=Shallow diggings with local *mammuthies* and C_3=Deep diggings with *koonthalees*.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) 8. (v) No. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Trees are affected with leaf and root diseases. Sprayed with Copper fungicides annually. (iii) Number of nuts and female flowers. (iv) 1952—62. (v) No. (vi) to (viii) Nil.

5. RESULTS :

60(89)

(i) 382 nuts/plot. (ii) and (iii) N.A. (iv) Av. number of nuts per plot.

Treatment	C_0	C_1	C_2	C_3
Av. number	273	304	315	271

61(114)

(i) 273 nuts/plot. (ii) 54·7 nuts/plot. (iii) Treatment differences are not significant. (iv) Av. number of nuts per plot.

Treatment	C_0	C_1	C_2	C_3
Av. number	273	274	253	291

62(17)

(i) 229 nuts/plots. (ii) 55·8 nuts/plot. (iii) Treatment differences are not significant. (iv) Av. number of nuts per plot.

Treatment	C_0	C_1	C_2	C_3
Av. number	254	247	207	206

————

Crop :- Tapioca and Horsegram.   **Ref :- K. 64(172).**

Site :- Pulses Res. Stn., Sasthamcottah.   **Type :- 'X'.**

Object :—To find out the economics of mixed cropping of Topioca with Horse gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Pulses. (c) Super at 100 Kg/ha. (ii) N.A. (iii) Taploca 23.9.64 and horsegram on 21.9.64 (iv) (a) 2 diggings. (b) Horsegram on broad ridges and topioca in furrows between ridges. (c) to (e) N.A. (v) Super at 100 Kg/ha. for Horse gram and tapioca mixture at the rate of 500 Kg/ha. for Topioca. (vi) Local. (vii) Unirrigated. (viii) After the harvest of horsegram the ridges are dismenteled and hoeing of topioca is done twice. (ix) N.A. (x) Topioca on 17.9.65 and Horsegram on 13.11.64.

2. TREATMENTS:

3 treatments : T_1=Tapioca alone, T_2=Horsegram alone, T_3=Horsegram and Tapioca mixed.

3. DESIGN:

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 6 m.×9 m. (v) N. A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of mixed cropping. (iv) (a) 1964—only. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 79·6 Rs./ha. (ii) 67·7 Rs./ha. (iii) Treatment differences are highly significant. (iv) Av. profit in Rs./ha.

Treatment	T_1	T_2	T_3
Av. profit	85·2	—38·7	192·1

C.D.=72·6 Rs./ha.

————

NATIONAL INDEX OF AGRICULTURAL FIELD EXPERIMENTS

Volume No.	Region	Part 1 (1948-53)		Part 2 (1954-59)	
		No. of pages	Price per copy (Excld. postage)	No. of pages	Price per copy (Excld. postage)
1.	Andhra Pradesh	386	Rs. 12.00	510	Rs. 12.80
2.	Assam	87	Rs. 4.00	152	Rs. 6.80
3.	Bihar	303	Rs. 9.75	933	Rs. 21.85
4.	Gujarat	185	Rs. 6.75	444	Rs. 9.25
5.	Kerala	204	Rs. 7.25	292	Rs. 8.05
6.	Madhya Pradesh	357	Rs. 11.25	554	Rs. 13.70
7.	Tamil Nadu	436	Rs. 13.25	466	Rs. 11.70
8.	Maharashtra	886	Rs. 25.00	1035	Rs. 24.25
9.	Mysore	467	Rs. 14.00	866	Rs. 20.45
10.	Orissa	70	Rs. 3.50	213	Rs. 6.30
11.	Punjab, Haryana, Himachal Pradesh, Jammu & Kashmir	672	Rs. 19.50	799	Rs. 19.20
12.	Rajasthan	84	Rs. 4.00	213	Rs. 6.20
13.	Uttar Pradesh	1274	Rs. 35.75	1724	Rs. 42.10
14.	West Bengal	226	Rs. 7.75	297	Rs. 8.15
15.	Central Institutes	348	Rs. 11.00	666	Rs. 16.50
	Complete set (excluding postage)		Rs. 184.75		Rs. 227.30

For copies, please write to :

The Chief Administrative Officer,

INSTITUTE OF AGRICULTURAL RESEARCH STATISTICS

(I. C. A. R.)

Library Avenue, New Delhi-110012