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FOREWORD

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

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

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

NEW DELHI,
March 26, 1965.

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

PREFACE

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

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

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

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

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

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

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

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

NEW DELHI,
March 25, 1965.

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

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

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9. ORISSA (BHUBANESWAR)	L.B.S. SOMAYAZULU	SHRI B. MISRA, Deputy Director of Agriculture (Hq.) SHRI D. MISRA, Principal, Uttakal Krushi Mahavidyalaya, Bhubaneswar.
10. WEST BENGAL (CALUTTA)	S.N. NATH	SHRI S.N. MUKERJEE, Statistical Officer, Directorate of Agriculture.

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

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

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

Abbreviations adopted for States are as follows :-

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

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

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

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

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

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

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

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

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

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

Other abbreviations used in the text of experiments :

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

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

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

DETAILS OF EXPERIMENTAL STATIONS

A. General information :

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

B. Normal rainfall :

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

C. Irrigation and drainage facilities :

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

D. Soil type and soil analysis :

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

E. No. of experiments :

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

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

BASAL CONDITIONS

A. For experiments on annual crops :

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

B. For experiments on perennial crops :

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

C. For experiments on cultivators' fields :

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

DESIGN

A. For experiments on annual crops :

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

B. For experiments on perennial crops :

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

C. For experiments on cultivators' fields :

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

GENERAL

A. For experiments on annual crops :

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

B. For experiments on perennial crops :

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

C. For experiments on cultivators' fields :

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

TABLE OF CONVERSIONS TO METRIC UNITS

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

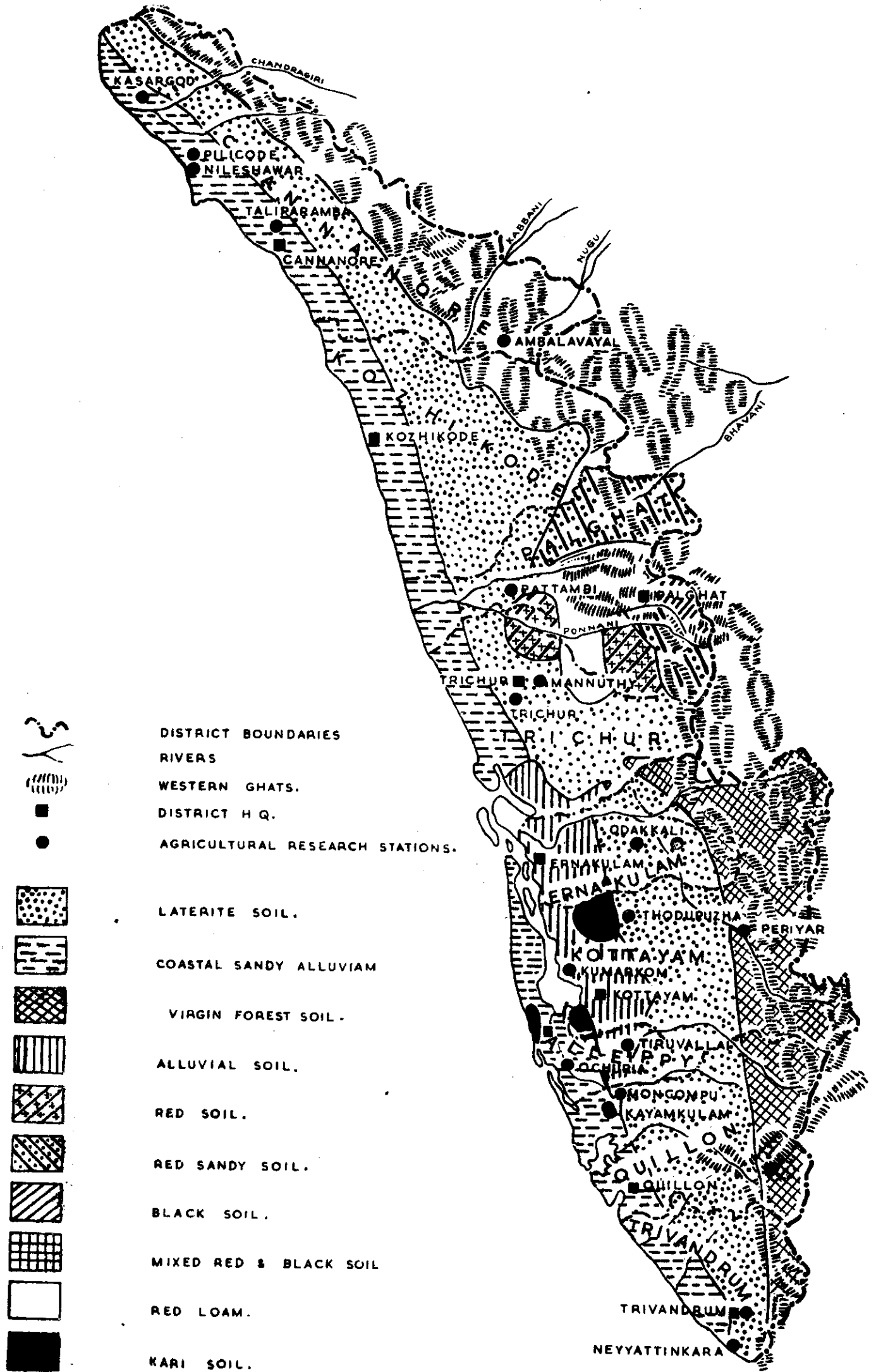
GLOSSARY OF VERNACULAR NAMES OF CROPS

Sl. No.	Name of Crop	Botanical Name	Assamese	Bengali	Oriya	Telugu	Tamili	Malayalam	Kannada	Marathi	Gujarati	Hindi	Punjabi
1.	Paddy	<i>Oryza sativa</i> L.	Dhan	Dhan	Dhano	Vadlu ; Biyyamu	Nel	Nellu	Bhatta	Bhat	Dangar	Dhan ; Chawal	Chaul ; Dhan
2.	Bhindi (Lady's finger)	<i>Hibiscus esculentus</i> ; <i>Abelmoschus esculentus</i> Moench.	Bhendi	Dhenrosh	Vendi	Benda	Bendai kai	Venda	Bende kayi	Bhendi	Bhida ; Bhinda	Bhindi	Bhindi ; Tori
3.	Sweet Potato	<i>Ipomoea batatas</i> Lam.	Mitha aloo	Mistih alu	Kandamula	Chilagada- dumpa	Seeni kilangu	Cheeni kizangu	Genasu	Ratalu	Shakaria	Shakarkandi	Shakarkandi
4.	Tapioca	<i>Manihot utilissima</i> ; <i>Manihot esculenta</i> Crantz.	Simolu Aloo	Shimul alu	—	Karra Pendalamu	Maravalli Kizhangu ; Kuchi Kizhangu	Maracheeni	Maragenasu	Tapioca	—	Tapioca	Tapioca
5.	Sugarcane	<i>Saccharum officinarum</i> L.	Kuhiar	Akh	—	Cheruku	Karumbu	Karimbu	Kabbu	Oos	Sherdi	Ganna ; Kamad ; Naishakar	Kamad ; Ganna ; Eakh
6.	Cotton	<i>Gossypium</i> spp.	Kapah	Karpas, Tula	Kapa	Pratti	Paruthi	Paruthi	Hatti	Kapus	Kapas	Kapas	Kapah
7.	Tobacco	<i>Nicotiana tabacum</i>	Dhopat	Tasnak	Uanpatra	Pogaku	Pugayilai	Pukayila	Hoge Sappu	Tambaku	Tamaku	Tambaku	Tamaku Tambaku
8.	Ginger	<i>Zingiber officinale</i> Rosc	Ada	Ada	Ada	Allamu	Inji	Inchi	Shunti ; Allu	Ale	Adu	Adrahk	Adrak
9.	Sesamum	<i>Sesamum indicum</i> L. <i>Sesamum orientale</i> L.	Til	Til	Rasi	Nuvvulu	Ellu	Ellu	Yellu	Til, Tilli	Tal	Til	Til
10.	Lemon Grass	<i>Cymbopogon flexuosum</i> stapf.	—	—	—	—	—	—	—	—	—	—	—
11.	Mandarin orange	<i>Citrus reticulata</i>	Kamala	Kamala lebu	Santra	Kamalaph alamu	Kamala ; Koorg Kudegu orange	Aranju	—	Santra	Santra Narangi	Santra	Santra
12.	Mango	<i>Mangifera indica</i> L.	Am.	Am.	Amka	Mamidi	Mangai	Mavu	Mavu	Amba	Keri	Aam	Ambi
13.	Sapota	<i>Achras sapota</i> L.	Sopata	Sabeta	Sopeta	Sapota	Sapota ; Seemai elupai	Sapota	Sapota hannu	Chikn	Chiku	Cheeku	Sitalphal
14.	Arecanut	<i>Areca catechu</i> L.	Tamol	Supari	Gua	Poka	Kamubu Pakku	Kavnngu	Adike	Supari	Sopari	Supari	Supari
15.	Coffee	<i>Coffea arabica</i> L.	Coffe	Kafi	Kofi	Coffee	Kappi	Coffe	Kafi	Kafi	Kafi	Coffee	Kofi
16.	Coconut	<i>Cocos nucyera</i> L.	Narikol	Narikel	Madia	Kobbera	Thennai	Thengu	Thengina Kayl	Naral	Nalieri	Narial	Naryal, Narel

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



DISTRICT BOUNDARIES
 RIVERS
 WESTERN GHATS.
 DISTRICT H Q.
 AGRICULTURAL RESEARCH STATIONS.

LATERITE SOIL.
 COASTAL SANDY ALLUVIAM
 VIRGIN FOREST SOIL.
 ALLUVIAL SOIL.
 RED SOIL.
 RED SANDY SOIL.
 BLACK SOIL.
 MIXED RED & BLACK SOIL
 RED LOAM.
 KARI SOIL.

KERALA

I. General :

Kerala, the southern most State of India, lies along the west coast. It stretches along the shores of the Arabian sea over a distance of about 360 miles with Mysore state flanking it on the north and north-east and Madras state on the east and south. The breadth varies from 20 miles in the extreme north and south to over 75 miles in the middle. The state is divided into 9 administrative districts. It has an area of about 9.6 million acres, of which the total cropped area is about 5.54 million acres. The land utilization statistics of this state are given in table 1 below :

TABLE 1

Land utilization statistics of Kerala State (1958-59)

(Area in '000 acres.)

1. Total geographical area	9,603
2. Area by village papers	9,535
3. Forests	2,589
4. Land not available for cultivation	907
5. Permanent pastures and other grazing lands	111
6. Miscellaneous tree-crops and grass	494
7. Culturable waste	468
8. Current fallows	178
9. Fallow land other than (8)	201
10. Net area sown	4,587
11. Total cropped area	5,537
12. Area sown more than once	950

2. Topography :

The State, a strip of land running almost in north south direction is situated between the vast Arabian Sea on the west and ranges of Western Ghats and Nilgiri hills on the east both running parallel to each other. From the Western Ghats the country undulates to the west and presents a series of hills and valleys intersected by numerous rivers. On the west the country is more or less flat. These characteristics demarcate the state into three natural regions the high land, the mid land and the low land which, by virtue of the soil types, the agricultural practices and the climatic conditions, form the agro-climatic regions of the state. The characteristic features of these regions are as follows :

High land : The high land on the eastern portion of the state and containing most of the reserve forests occupies nearly 45 per cent of the total area of the state. The annual rainfall ranges between 350 to 500 cm. The ground under the forests is covered with vegetation and forest litter. The soils below the litter are black in colour containing a lot of organic matter. Below this are grey brown or greyish red soils. These soils being virgin are very rich in plant nutrients and pH is, however, low. Means of communication are poor and cultivation is largely limited to plantation crops like tea, coffee, rubber and cardamom.

Mid land : The mid land region consists of uplands of varying elevations through which rivers have carved out long narrow valleys. It covers an area of about 37 per cent. Rainfall ranges between 300 to 450 cm. Laterite and lateritic type of soils are obtained in this region. These soils are generally poor in N, P, K, and organic matter, the pH ranging between 4.5 to 6.0. In parts of Malabar district red soils are also found, fairly deep and of uniform texture. Rice is grown in the valleys while topioca, cashewnut, coconut, pepper, ginger and rubber are cultivated on the hill tops.

Low land : The low land covering about 18 per cent of the total area is narrow and irregular in shape. A series of back waters, the biggest of which is the Vembanad lake, is met with waters intruding from the sea into this region. These back waters are connected by navigable channels the whole forming a length of inland water communication extending over 250 miles. The rainfall varies between 250 to 350 cm. The soils are of alluvial type, coastal alluvium along the sea coast and alluvials of the river beds. The soils are peculiarly suited to cultivation of rice and coconut.

Along the coast-line the climate is equable and damp. The temperature seldom falls below 70° F, and hardly ever rises over 96°F. In the Ghat area it varies with the altitude and at higher elevation the climate is temperate in character.

3. Irrigation and Rainfall :

The state has a total irrigated area of 879 thousand acres which accounts for about 27.2 per cent of the total area. The extent of area irrigated through different sources is given in table 2 below :

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

Source	Acreage	% of total irrigated area
1. Government canals	377	42.9
2. Private canals	73	8.3
3. Tanks	79	9.0
4. Wells	35	4.0
5. Other sources	315	35.8
Total	879	100

The normal annual rainfall throughout the state is about 300 cm. The state receives majority of the rainfall during the south west monsoon. The south west monsoon sets in early June and continues upto end of September. The normal rainfall during this period is about 210 cm. During the months October to January, the normal rainfall is about 50 cm.

4. Agricultural Production and Normal cropping pattern.

The most important crops of the states are rice, coconut and tapioca. Rice and tapioca are the chief food crops and coconut besides being a food crop, is also a commercial crop. Besides these, Kerala holds practically a monopoly in the cultivation of rubber, cardamom, pepper etc. which cannot be easily grown elsewhere. The following table gives area, production and average yield per acre of principal crops in the State during the year 1963-64.

TABLE 3
Area, production and Av. yield per acre of principal crops (1963-64)

	Area in '000 acres	Production in '000 tons.	Av. yield in lb./ac.
Paddy	1925	1599	1861
Tapioca	598	1656	6200
Sugarcane	23	37	3716
Rubber	304	23	167
Coconut	1237	3220*	2.6*
Cashewnut	134	83	1390
Arecanut	134	7737*	57.7*
Cardamom	71	1	40
Tea	93	40	957
Coffee	42	7	394

*given in million nuts.

5. Agricultural Research and Experimentation.

There are 402 experiments reported from the State for the period 1954-59. The distribution of these experiments crop-wise and type-wise is provided in Table 4 below. Besides there are 89 experiments reported under the Model Agronomic Experiments and the Simple Fertilizer Trial Schemes of the Indian Council of Agricultural Research and on cultivators' fields which are included in the compendium.

TABLE 4

Distribution of the reported experiments crop-wise and type-wise

Crop	M	MV	C	CV	CM	CMV	D	I	IM	IC	Total
Paddy	89	16	23	4	9	4	10	—	—	—	155
Bhindi	—	—	—	—	—	—	1	—	—	—	1
Sweet Potato	6	—	5	—	—	—	—	—	—	—	11
Tapioca	14	3	15	—	8	—	—	—	—	—	40
Sugarcane	7	2	—	2	1	—	—	1	—	—	13
Cotton	1	—	1	—	—	—	—	—	—	—	2
Tobacco	4	—	2	—	—	—	—	—	—	—	6
Ginger	10	—	10	—	4	—	5	—	—	—	29
Sesamum	3	—	—	—	—	—	—	—	—	—	3
Lemon Grass	6	—	6	—	—	—	—	—	—	—	12
Mandarin Orange	—	—	7	—	—	—	—	—	—	—	7
Mango	—	—	3	—	—	—	—	—	—	—	3
Sapota	—	—	6	—	—	—	—	—	—	—	6
Arecanut	—	—	—	—	—	—	—	—	—	1	1
Coffee	22	—	—	—	—	—	—	—	—	—	22
Coconut	48	—	36	—	2	—	2	—	3	—	91
Total	210	21	114	6	24	4	18	1	3	1	402

From the above table it is clear that paddy and coconut account for the largest number of experiments accounting for 39 per cent and 23 per cent respectively of the total number of experiments conducted in the State. The remaining 38 per cent are conducted on crops like tapioca, sugarcane, coffee and ginger. 52 per cent of the experiments conducted are of purely, manurial type while 65 per cent of the experiments have manurial combination of treatments. The important agricultural research stations in the state are Ambalavayal, Mannuthy, Pattambi and Tiruvalla, which account for nearly two-third of the experiments conducted in the state. The block size varied from 2 to 39 in case of R.B.D. and replications from 1 to 8 in case of split-plot designs, no. of main-plots/block varied from 2 to 9 while no. of sub-plots/main-plot varied from 2 to 16. The size of net plot varied from 1/1200 to 1/20 ac. in case of R.B.D. and from 1/1700 ac. to 1/21 ac. in case of split-plot. In case of split-plot the no. of replications varied from 2 to 7.

PARTICULARS OF RESEARCH STATIONS AND SOIL ANALYSIS

1. Agricultural Research Station, Ambalavayal.

A. General information :

(i) Cannanore district, near Calicut R.S. (ii) Hilly tract of Wynaad. (iii) Started in 1954. (iv) Paddy and fruit crops. (v) Experimentation on paddy, ginger and fruit crops.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
388	518	299	158	253	112	11	6	15	34	135	388	2734

(Average based on data for the period 1947—56).

C. Irrigation and drainage facilities :

(i) (a) Facilities are not available. (b) —. (ii) There is no proper drainage.

D. Soil type and soil analysis :

(i) Clay loam and red loam upto 6' depth and reddish brown colour with a good structure.

(ii) Chemical analysis:

	Moisture	Loss on ignition	Lime (CaO)	Total			Avl.	
				K ₂ O	P ₂ O ₅	N	K ₂ O	P ₂ O ₅
Wet 0-9"	1.37	9.04	0.092	0.132	0.058	0.207	0.081	0.004
Level 9"—18"	2.54	3.50	0.064	0.183	0.050	0.085	0.021	0.005
Marshy 0-9"	1.11	3.66	0.078	0.225	0.051	0.130	0.014	0.015
Level 9"—18"	0.54	2.15	0.063	0.119	0.024	0.056	0.011	0.007

(iii) Mechanical analysis :

	Wet land		Marshy land	
	0-9"	9"-18"	0-9"	9"-18"
Clay	16.93	18.13	13.80	7.28
Silt	8.97	7.62	13.80	4.08
Fine sand	50.47	30.99	30.69	45.41
Coarse sand	28.85	42.17	—	—
Acid solubles	—	1.09	—	—

Radicals and Alkalinity

	Wet land		Marshy land	
	0-9"	9"-18"	0-9"	9"-18"
Water soluble salts	0.003	0.040	0.130	0.206
Carbonate	—	—	—	—
Bicarbonate	—	—	0.009	0.006
Sulphate (So ₄)	—	—	0.075	0.104
Chloride (Cl ₂)	—	—	0.007	0.016
Lime (CaO)	—	—	0.008	0.013
Magnesia (MgO)	—	—	Traces	0.001

Calculated salts

Cal. Carbonate	—	—	0.012	0.008
Cal. Sulphate	—	—	0.017	0.024
Mg SO ₄	—	—	—	0.013
Na ₂ SO ₄	—	—	0.093	0.144
NaCl	—	—	0.012	0.0026

E. No. of experiments :

Paddy—3, Ginger—23, Orange—7, Total=33.

2. Tobacco Research Station, Kanhangad.

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

Details N.A.

E. No. of experiments :

Tabacco—6, Total=6.

3. Central Coconut Research Station, Kasargod.

A. General information :

(i) Cannanore district, near Kasargod R.S. Lat. 123°N/Long. 75°E/Alt. 35'. The land is sloping from east to west. Terraced land. (ii) Coastal tract. (iii) Started in 1916. (iv) Coconut plantation. (v) Research on botanical, agronomic and chemical aspects of coconut.

B. Normal rainfall in mm :

May	June	July	Aug	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	Total
207	1043	1036	542	243	204	84	25	4	5	6	57	3456

(Average is based on records for over 20 years.)

C. Irrigation and drainage facilities :

(i) (a) Facilities available. (b) Wells. (ii) Soil well drained and no drainage system is necessary.

D. Soil type and soil analysis :

(i) Sandy loam and gravelly soil to a depth of 2' to 3' with greyish colour and light structure. (ii) Chemical analysis and (iii) Mechanical analysis are as under :

Chemical Analysis :

Soil type	Depth	N%	P ₂ O ₅		K ₂ O		Lime (CaO)	Iron (Fe ₂ O ₃)
			Total	Av.	Total	Av.		
Sand loam	0—12"	0.04	Trace	Trace	0.13	0.004	0.02	4.00
	12"—24"	0.03	0.003	Trace	0.11	Trace	Trace	4.50
	24"—48"	0.03	0.040	Trace	0.70	Trace	Trace	7.12
Red loam	0—12"	0.03	Trace	Trace	0.08	Trace	Trace	2.72
	12"—24"	0.03	0.004	Trace	0.07	Trace	Nil	3.20
	24"—48"	0.04	0.060	Trace	0.03	Trace	Trace	4.08
Sandy soil	0—12"	0.04	0.070	0.010	0.11	Trace	Trace	2.48
	12"—24"	0.04	0.050	0.010	0.07	Trace	Trace	2.48
	24"—48"	0.04	0.060	0.005	0.03	Trace	Trace	3.12
Laterite gravelly soil	0—12"	0.03	0.060	0.020	0.24	Trace	0.03	9.92
	12"—24"	0.03	0.070	0.020	0.23	Trace	0.04	10.96
	24"—48"	0.05	0.060	Trace	1.29	0.05	0.02	3.84

Mechanical analysis :

	Sandy Loam			Red Loam		
	0—12"	12"—24"	24"—48"	0—12"	12"—24"	24"—48"
Coarse Sand%	75.60	68.20	86.75	80.25	83.00	81.50
Fine Sand%	10.52	8.80	2.00	7.28	6.64	3.00
Silt %	1.00	2.00	3.15	4.50	1.00	0.30
Clay %	12.75	16.00	10.90	2.25	1.25	11.40
pH	5.6	4.2	4.4	5.6	4.2	4.2

	Sandy Loam			Laterite gravelly		
	0—12"	12"—24"	24"—48"	0—12"	12"—24"	24"—48"
Coarse sand %	81.50	83.25	87.50	51.75	32.50	15.00
Fine sand %	2.50	3.00	3.00	13.50	11.75	35.00
Silt %	4.60	2.95	1.48	2.20	1.25	3.55
Clay %	10.05	11.20	10.30	32.25	51.30	47.00
pH	4.2	5.4	4.3	4.4	4.2	5.4

E. No. of experiments :

Coconut—21, Total=21.

4. Central Coconut Research Station, Kayamkulam.**A. General information :**

(i) Alleppy district, 1 mile from Kayamkulam R.S. Lat. 9.8°N/Long. 76.3°E/Alt. 10'. Level plain land. (ii) Sandy, coastal. (iii) Started in 1948. (iv) Coconut. (v) Studies in particular on the pests and diseases of coconut.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
610	215	143	185	209	173	287	21	56	16	135	161	2211

(Av. is based on data for the period June 1951 to May 1963.)

C. Irrigation and drainage facilities :

(i) (a) Facilities N.A. (b) —. (ii) No proper drainage.

D. Soil type and soil analysis :

(i) Sandy loam 3' to 13' depth, grey brown or light brown colour with single grained structure.

(ii) Chemical analysis :

Horizon	Total					Available		pH
	N %	P ₂ O ₅ %	K ₂ O %	CaO %	MgO %	P ₂ O ₅ %	K ₂ O %	
A	0.029	0.023	0.039	0.053	0.036	0.012	0.009	6.6
B	0.026	0.020	0.038	0.035	0.035	0.007	0.007	6.5
C	0.025	0.019	0.036	0.029	0.037	0.006	0.008	6.4

(iii) Mechanical analysis—N.A.

E. No. of experiments :

Coconut—6, Total=6.

5. Paddy Breeding Station, Kayamkulam.**A. General information :**

(i) and (ii) As in station no. 3 above. (iii) Started in 1939. (iv) Paddy—sesamum. (v) Agronomic and cultural practices of paddy breeding.

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

Same as in station no. 3 above.

E. No. of experiments :

Paddy—15, Sesamum—3. Total=18.

6. Regional Coconut Research Station, Kumarakom.**A. General information :**

(i) District Kottayam. The area is having a higher water level of 2' to 3'. Lat. 9.4°N/Long. 76.3°E/Alt. 5' to 10'. (ii) Reclaimed clay soils of back water areas. (iii) Started in 1947. (iv) Coconut only. (v) Manurial and cultural aspects of coconut.

B. Normal rainfall in mm :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
883	549	319	55	267	173	54	3	6	39	120	140	2608

(Average based on data for the period 1957—1958).

C. Irrigation and drainage facilities :

(i) (a) and (b). No facilities are needed here. (ii) Proper drainage is available.

D. Soil type and soil analysis :

(i) Clay soil upto 9" to 2' with grey colour and friable clay structure. It has stiff clay and stiff and sticky clay at inner depths. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Coconut—12, Total=12.

7. Agricultural Research Station, Mannuthy.**A. General information :**

(i) Trichur district. Area is mostly undulating except in the wet land. Lat. 10°32'N/ Long. 76.12°E/Alt. 72.84'. (ii) Laterite soil with hill slopes. (iii) Started in 1915. (iv) Paddy and fruit crops. (v) Experimentation on paddy and fruit crops.

B. Normal rainfall in mm. :

N.A.

C. Irrigation and drainage facilities :

(i) (a) Facilities available since 1955. (b) Canal water. (ii) Proper drainage available for paddy fields only.

D. Soil type and soil analysis :

(i) Laterite and sandy loam soil upto 2' depth with brownish colour and coarse structure. (ii) Chemical and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—9, Sweet potato—11, Tapioca—10, Arecanut—1. Total=31.

8. Rice Research Station, Monkompuzha.**A. General information :**

(i) Alleppy district, 50 miles from Ernakulam R.S. Level lands about 4' below mean sea level. (ii) Paddy lands 2' to 10' below mean sea level and liable to incursion of saline waters from sea in February. (iii) Started in 1940. (iv) Paddy two crops. (v) Mainly breeding rice varieties is the research programme.

B. Normal rainfall in mm.

N.A.

C. Irrigation and drainage facilities :

(i) (a) and (b) Irrigation is not necessary. (ii) There is proper drainage.

D. Soil type and soil analysis :

(i) Alluvial to 2' depth, black colour and heavy structure. (ii) Chemical and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—3. Total=3.

9. Regional Coconut Research Station, Neyyathinkara.**A. General information :**

(i) Trivendrum district, Plain land with deep red loam soil and on water level of about 150'. Lat. 8.15° N/Long. 77° E/Alt. 200'. (ii) Deep red loamy soil. (iii) Started in 1948. (iv) Coconut. (v) Manurial and cultural experiments on coconut.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
537	221	86	6	178	157	83	11	10	25	147	236	1697

(Rainfall data for the period June 1957 to May, 1958.)

C. Irrigation and drainage facilities .

(i) (a) Facilities not available. (b) —. (ii) Normal drainage.

D. Soil type and soil analysis :

(i) Loamy soil upto 12', with deep red colour and loamy structure. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Coconut—11. Total=11.

10. Agricultural Research Station, Nileswar.**A. General information :**

(i) Cannanore district. The land is sloping towards the south. Lat. 13°N/Long. 75°E/Alt. 50'. (ii) It represents gravelly laterite soils of the west coast. (iii) Started in 1916. (iv) Coconut. (v) Research on Agronomic, breeding and varietal trials of coconut.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
1021	1105	527	263	267	59	12	6	—	3	3	269	3533

(Average is based on monthly rainfall for the period 1948—1957.)

C. Irrigation and drainage facilities :

(i) (a) Facilities not available. (b) —. (ii) Proper drainage available.

D. Soil type and soil analysis :

(i) Gravelly laterite soil upto 4' to 6' depth, brown colour and sticky structure.

(ii) Chemical analysis.

	Top soil	Sub-soil
(i) Organic matter	5.39	5.76
(ii) Total P ₂ O ₅	0.08	0.06
(iii) Nitrogen	0.08	0.07
(iv) Total K ₂ O	0.17	0.20
(v) Avl. P ₂ O ₅	0.01	0.01

(iii) Mechanical analysis.

	0—12"	12"—24"
(i) Clay	27.73	32.41
(ii) Silt	6.90	7.60
(iii) Fine sand	22.43	18.28
(iv) Coarse sand	44.35	42.70

E. No. of experiments :

Coconut—5, Total=5.

11. Lemongrass Research Station, Odakkali.**A. General information.**

(i) Ernakulam district. Hillocks with plains more or less undulating. (ii) Sloping hilly tract. (iii) Started in 1951. (iv) Perennial crops. (v) Experimentation on Lemongrass.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
675	611	733	140	376	188	173	—	17	66	372	565	3916

(Figures relate to 1957—1958.)

C. Irrigation and drainage facilities :

(i) (a) Facilities available. (b) N.A. (ii) There is proper drainage.

D. Soil type and soil analysis :

(i) Laterite soil to a depth of 6" to 10" with reddish brown colour and grain structure.

(ii) Chemical analysis.

Nitrogen	0.08	Lime (CaO)	Trace
P ₂ O ₅	0.05	T.S.S.	0.02
K ₂ O	0.23	pH	6.4

(iii) Mechanical analysis—N.A.

E. No. of experiments :

Lemongrass—12. Total=12.

12. Agricultural Research Station, Pattambi.**A. General information :**

(i) Palghat district. 1 mile from Pattambi R.S. Lat. 10°48' N/Long. 76°12' E/Alt. 83.2'. Tract consists of uplands, terraced level lands and flat lands. (ii) The type of tract represented by the lands is of lateritic origin. (iii) Started in 1927. (iv) 3 crops of paddy rainfed. (v) Manurial and cultural trials on paddy.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
715	250	154	350	376	116	9	4	24	1	111	305	2415

(Figures relate to the period June 1955 to May 1956.)

C. Irrigation and drainage facilities :

(i) (a) Facilities available June 1955—1956. (b) Paddy irrigation. (ii) Drainage is not necessary for the tract.

D. Soil type and soil analysis :

(i) Red soil upto 8' to 10', red colour and gravelly sometime. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—112, Cotton—2. Total=114.

13. Agricultural Research Station, Pilicode.**A. General information :**

(i) Cannanore district. Lat. 13°N/Long. 75°E/Alt. 50'. (ii) N.A. (iii) Started in 1916. (iv) Coconut. (v) Breeding, manurial and cultural trials on coconut.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
1125	1217	533	282	248	57	8	4	1	5	70	303	3853

(Period—N.A.)

C. Irrigation and drainage facilities :

(i) (a) Facilities available since 1952. (b) Pump irrigation. (ii) Proper drainage available.

D. Soil type and soil analysis :

(i) Pure littoral sandy soils to a depth of 20', white colour and coarse sand and clay structure.

(ii) Chemical analysis.

	Org. matter	Total P ₂ O ₅	Total K ₂ O	Nitrogen	Avl. P ₂ O ₅	Avl. K ₂ O
0—6"	0.78	0.02	0.04	0.03	0.001	0.001
Sub soil (3' depth)	0.47	0.01	0.04	0.02	0.004	0.003

(iii) Mechanical analysis—N.A.

E. No. of experiments :

Coconut 26. Total=26.

14. Agricultural Research Station, Taliparamba.**A. General information :**

(i) Cannanore district. 11 miles from Poppinisseri R.S. The area is undulating. Soils are laterite in nature, (ii) This represents the sub-mountain tract of Cannanore. (iii) Started in 1905. (iv) Paddy and perennials crops like mango, sapota, cocoa, etc. (v) Experimentation on perennial crops and paddy.

B. Normal rainfall in mm. :

June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
1224	1070	556	118	172	169	—	16	—	—	27	267	3619

(Figures relate to data of 1957—1958.)

C. Irrigation and drainage facilities :

(i) (a) Facilities available. (b) N.A. (ii) N.A.

D. Soil type and soil analysis :

(i) Laterite soil 6' to 9' depth, red colour and fairly compact structure. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments :

Paddy—4, Mango—3, Sapota—1. Total=8.

15. Ginger Research Station, Thodupuzha.**A. General information :**

(i) Ernakulam district, 42 miles from Alwaye R.S. Lat. 9°45'N/Long. 76°45'E/Alt. 600'. Area is undulating with hills and valleys. (ii) Hilly tract. (iii) Started in 1958. (iv) Ginger crops. (v) Technical and organic aspects of Ginger.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
456	903	648	606	389	491	206	4	51	45	256	570	4625

(Figures relate to the year 1958—1959.)

C. Irrigation and drainage facilities :

(i) (a) Facilities available. (b) N.A. (ii) Drainage available.

D. Soil type and soil analysis :(i) Laterite soil to 3' depth, of blakish red colour and loamy structure.
(ii) Chemical analysis.

(% of constituents)

Org. carbon.	Avl. P_2O_5	Avl. K_2O	pH.	Total sol. salts
0.74 (medium)	Trace	Trace	4.9 (Acidic)	0.10 (Normal)

(iii) Mecanical analysis—N.A.

E. No. of experiments :

Ginger—6. Total=6.

16. Regional Coconut Research Station, Thodupuzha.**A. General information :**(i) Ernakulam district. Latitude $10^\circ N$ /Long. $77^\circ E$ /Alt. 600'. The area is uneven and undulating. (ii) Laterite soil tract of the hill slopes. (iii) Started in 1948. (iv) Coconut (v) Manurial and cultural experiments on coconut.**B. Normal rainfall in mm. :**

Details—N.A. Total=3175 mm. per year on the average.

C. Irrigation and drainage facilities :

(i) (a) Facilities available. (b) N.A. (ii) No proper drainage.

D. Soil type and soil analysis :

(i) Laterite soil details—N.A. (ii) Chemical analysis—See Appendix no I. on page xxx (iii) Mechanical analysis—N.A.

E. No. of experiments :

Coconut 10. Total=10.

17. Tapioca Research Station, Tiruvalla.**A. General information :**(i) Alleppy district. Lat. $9.5^\circ N$ /Long. $76.3^\circ E$ /Alt. 12' to 14'. Plain land subjected to floods by which deposits of silt are brought to the field. (ii) Typical low-lying area. (iii) Started in 1957. (iv) Sugarcane, paddy and tuber crops. (v) Varietal and manurial trials on various crops.**B. Normal rainfall in mm. :**

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
763	403	300	222	347	158	33	7	7	61	185	367	2853

(Figures based on rainfall data for the period 1954—1958.)

C. Irrigation and drainage facilities :(i) (a) Facilities available since 1957. (b) Lift irrigation with electric motor pump.
(ii) Normal drainage.**D. Soil type and soil analysis :**(i) Loam and alluvial soil to a depth of 8' to 10', of higher-red colour and loose structure.
(ii) Chemical analysis.

	Total			Avl.		Humus	Cao	pH
	N	P ₂ O ₅	K ₂ O	P ₂ O ₅	K ₂ O			
Loam	0.13	0.16	0.16	Trace	13.3 gm.	0.38	0.42	6.4
Alluvial	0.29	0.29	0.11	Trace	16.1 gm.	2.57	0.11	5.98

(per 100 gms.)

(iii) Mechanical analysis—N.A.

E. No. of experiments :

Tapioca—13, Sugercane—13. Total=26.

18. Tapioca Research Station, Trivendrum.

A. General information :

(i) Trivendrum district. Lat. 8°30' N/Long 77° E/Alt. 175'. Land levelled to different terraces of width 60' to 70'. (ii) Laterite tract. (iii) Started in 1944. (iv) Tapioca. (e) Cultural and manurial aspects and chemical analysis of tapioca tubers.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
118	200	121	115	272	178	63	20	19	39	116	223	1448

C. Irrigation and drainage facilities :

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

D. Soil type and soil analysis :

(i) Sandy soil to a depth of 3' to 5', of pale red to reddish brown colour and loose gravelly structure.

(ii) Chemical analysis.

Moisture	2.84
Insoluble minerals	71.34
Total N	0.094
Total P ₂ O ₅	0.47
Total K ₂ O	0.066
CaO	0.043
Avl. P ₂ O ₅	0.0003
Avl. K ₂ O	0.0004
pH	7.0

(iii) Mechanical analysis.

Sand	33.79%
Fine sand	19.97%
Clay	33.95%
Silt	8.65%
Moisture	3.06%

E. No. of experiments

Tapioca—14. Total=14.

19. Agricultural College and Research Institute, Vellayini.

A. General information :

(i) Trivendrum district. Lat. 8°30'N/Long. 76°50' E/Alt.105'. The land has both undulating and level areas. (ii) It represents lateritic and alluvial region. (iii) Started in 1955. (iv) Annual, perennial, fruit and vegetable crops ; Pulses, cotton, tapioca, coconut, cashewnut, rubber and pepper, etc. (v) Agronomical, chemical and botanical aspects of several crops.

B. Normal rainfall in mm. :

June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
600	126	247	16	168	166	4	—	34	12	129	481	1983

C. Irrigation and drainage facilities :

(i) (a) Facilities available since 1955. (b) Lift irrigation from tanks. (ii) Normal drainage.

D. Soil type and soil analysis :

(i) Lateritic and alluvial soil.

(ii) Chemical analysis.

	N	P	K	CaO	pH
Lateritic	0.06	0.05	Trace	Trace	4.9
Alluvial	0.09	0.05	0.03	Trace	4.2

(iii) Mechanical analysis.

(Lateritic soil) Moisture	3.60
Loss on Ignition	0.51
Clay	29.5
Silt	11.5
Fine sand	15.8
Coarse sand	32.1

E. No. of experiments :

Paddy—9, Bhindi—1, Tapioca—3. Total=13.

20. Coffee Estate, Wynaad.**A. General information to D. Soil type and soil analysis :**

Details—N.A.

E. No. of experiments :

Coffee—22. Total=22.

Appendix No. I
Thodpuzha :—Chemical Analysis.

Locally	Horizon	Moisture %	Loss on ignition %	CaO%	MgO%	P ₂ O ₅ %	K ₂ O%	Fe ₂ O ₃ %	N%	Available P ₂ O ₅ %	Available K ₂ O%	pH
Hill	0-12"	3.82	13.56	Trace	0.044	0.051	0.116	11.76	0.046	Trace	0.007	7.0
Slope	12-24"	3.66	13.50	„	0.042	Trace	0.165	11.04	0.119	„	0.008	7.2
Nursery area	24-36"	3.81	13.83	„	0.098	0.046	0.103	13.12	0.070	„	0.003	7.2
Hill top	0-9"	4.41	13.24	„	0.052	0.052	0.061	8.64	0.162	„	Trace	6.8
	9-18"	4.23	12.75	„	0.068	0.053	0.134	8.56	0.074	„	„	7.0
	18-36"	4.05	11.65	„	0.052	0.063	0.118	6.96	0.091	„	„	7.0
Hillslope	0-9"	4.60	13.00	„	0.042	Trace	0.172	9.28	0.008	„	„	7.4
N.E. Corner	9-18"	4.73	13.61	„	0.050	„	0.155	9.60	0.111	„	„	7.2
	18-36"	4.70	21.21	„	0.032	0.042	0.185	11.20	0.066	„	„	6.4

Note (1) Low Calcium status-Addition of lime recommended 1-2 lb. per tree.

(2) High fixation of P₂O₅ and K₂O-Addition of organic fertile F. Y. M. or compost or green manure.

Crop :- Paddy (1st crop).

Ref :- K. 55(1)

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

Type :- 'M'.

Object: —To test the efficiency of different phosphatic fertilizers in increasing the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) G.L. at 5000 lb./ac. + Super at 150 lb./ac. as B.D. Top dressing with A/S at 100 lb./ac. one month after planting. (ii) (a) Sandy loam. (b) Refer soil analysis, Ambalavayal. (iii) 26.4.1958/6.6.1958. (iv) (a) Eight ploughings. (b) Planted in lines. (c) —. (d) 6' x 6". (e) N.A. (v) Nil. (vi) WND-1 (medium, improved) (vii) Unirrigated. (viii) Normal. (ix) 69.75%. (x) 13.10.1958.

2. TREATMENTS :

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

(1) 2 levels of G.L. : $G_0=0$ and $G_1=7500$ lb./ac.(2) 2 levels of Lime : $L_0=0$ and $L_1=3000$ lb./ac.(3) 4 sources of P_2O_5 : $P_0=0$, $P_1=$ Super, $P_2=$ Hyper and $P_3=$ B.M.Phosphate applied at 45 lb./ac. of P_2O_5 . G.L. and Lime applied 15 days before planting and P_2O_5 one day before planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) 56' x 56'. (iii) 4. (iv) (a) and (b) 14' x 14'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) No lodging. (ii) A mild attack of *Leptococisa* noticed at milk stage. Dusting with 10% BHC. (iii) Tiller count, height, grain and straw yield. (iv) (a) 1958— N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2046 lb./ac. (ii) 213 lb./ac. (iii) Effect of G is highly significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	Mean	G_0	G_1
L_0	1969	1840	2031	2049	1972	1844	2101
L_1	2038	2156	2077	2205	2119	2004	2235
Mean	2004	1998	2054	2127	2046	1924	2168
G_0	1858	1962	1913	1962			
G_1	2149	2035	2195	2292			

S.E. of G or L marginal mean = 27 lb./ac.
 S.E. of P marginal mean = 53 lb./ac.
 S.E. of body of G x P or L x P table = 75 lb./ac.
 S.E. of body of G x L table = 53 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 59(2)

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

Type :- 'M'.

Object: —To test the efficiency of different phosphatic fertilizers in increasing the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) G.L. at 1000 lb./ac. and top dressing with C/A/N at 100 lb./ac. (ii) (a) N.A. (b) Refer soil analysis, Ambalavayal. (iii) 9.6.1959. (iv) (a) to (e) N.A. (v) Nil. (vi) Late variety. (vii) Irrigated. (viii) Weeding. (ix) 107.87%. (x) 27.10.1959.

2. TREATMENTS :

Same as in expt. no. 1 above.

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) and (b) 14'×14'. (v) Border left. (vi) Yes.

4. GENERAL :

(i) No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3260 lb./ac. (ii) 420.4 lb./ac. (iii) Main effects of G and P and interaction G×P are highly significant. Others are not significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	P ₃	Mean	G ₀	G ₁
L ₀	3458	2556	3272	3354	3160	3511	2809
L	3521	2910	3500	3507	3359	3552	3167
Mean	3489	2733	3386	3430	3260	3532	2988
G ₀	3570	3376	3618	3562			
G ₁	3410	2090	3154	3299			

S.E. of G or L marginal mean = 75.3 lb./ac.
 S.E. of P marginal mean = 105.1 lb./ac.
 S.E. of body of G×P or L×P table = 148.6 lb./ac.
 S.E. of body of G×L table = 105.1 lb./ac.

Crop :- Paddy.

Site :- Paddy Breeding Stn., Kayamkulam.

Ref :- K. 57(3).

Type :- 'M'.

Object :- To study the effect of manuring on the incidence of stem-borer.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 1½ cwt/ac. of B.M. as B.D. at the time of ploughing, 5 cwt/ac. of wood ash top dressed one month after planting. (ii) (a) Sandy loam. (b) —. (iii) 28.6.1957/28.8.1957. (iv) (a) 4 ploughings. (b) Planting in lines. (c) —. (d) 9'×9'. (e) 2. (v) C.M. at 45 cwt/ac. at the time of ploughing. (vi) U.R-19 (late, improved). (vii) Unirrigated. (viii) 2 weedings. (ix) 34.82". (x) 16.1.1958.

2. TREATMENTS :

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

(1) 3 levels of N as A/S : N₀=0, N₁=25 and N₂=50 lb./ac.

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

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

Half the dose applied as B.D. before planting and the remaining half top dressed one month after planting.

3. DESIGN :

(i) 3³ partially confounded. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 23½'×10½'. (b) 21½'×9'. (v) One row all round the plot. (vi) Yes.

4. GENERAL :

(i) Good ; lodged on 8.1.1958. (ii) Attacked by blast and stem-borer, 2 sprays with shell copper fungicide at 1 lb. in 35 gallons of water. (iii) % damage due to stem-borer and grain yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) The percentage of attack was estimated from an area of 9 square feet selected from the worst affected spots in each treatment with help of a wooden square. The number of tillers produced from that sample were first counted and then the number of tillers affected was recorded and the % damage assessed.

5. RESULTS :

A. (i) 1512 lb./ac. (ii) 317 lb./ac. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	Mean	K ₀	K ₁	K ₂
P ₀	1505.	1522	1245	1424	1282	1572	1419
P ₁	1516	1641	1331	1496	1505	1374	1609
P ₂	1769	1757	1317	1615	1548	1590	1704
Mean	1597	1640	1298	1512	1445	1512	1577
K ₀	1439	1687	1207				
K ₁	1687	1548	1300				
K ₂	1662	1686	1384				

S.E. of any marginal mean = 76 lb./ac.
S.E. of body of any table = 129 lb./ac.

B. (i) 12.42 percent. (ii) 4.05 percent. (iii) Effect of N alone is highly significant. (iv) Percentage of incidence of stem-borer.

	N ₀	N ₁	N ₂	Mean	K ₀	K ₁	K
P ₀	7.26	14.54	13.31	11.70	11.70	8.52	14.89
P ₁	9.32	11.92	17.89	13.04	12.83	13.81	12.49
P ₂	9.63	11.69	16.19	12.50	12.09	11.62	13.83
Mean	8.74	12.72	15.80	12.42	12.21	11.32	13.73
K ₀	9.09	13.12	14.42				
K ₁	8.87	11.15	13.92				
K ₂	8.25	13.88	19.06				

S.E. of any marginal mean = 0.95 percent
S.E. of body of any table = 1.65 percent

Crop :- Paddy (2nd crop).

Site :- Paddy Breeding Stn., Kayamkulam.

Ref :- K. 58(4).

Type :- 'M'.

Object :- To study the effect of manuring on the incidence of stem-borer.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5 C.L. of C.M. and 150 lb. of B.M. as B.D. and 15 lb./ac. of N as Urea top dressed. (ii) (a) Sandy loam. (b) N.A. (iii) 21.6.1958/21.8.1958. (iv) (a) Puddled twice. (b) Planted in lines. (c) —. (d) 6"×9". (e) Double. (v) 4000 lb. C.M. ploughed in before planting. (vi) U.R-19 (late, improved). (vii) Unirrigated. (viii) Nil. (ix) 19.30". (x) 15.1.1959.

2. TREATMENTS :

Same as in expt. no. 3 on page 2.

3. DESIGN :

(i) 3³ partially confounded. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 18'×14'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Lodged on 3.1.1959. (ii) Slight attack of blast. 3 sprayings with shell copper. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 2932 lb./ac. (ii) 300 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	Mean	K ₀	K ₁	K ₂
P ₀	2636	2910	3119	2888	2956	2859	2849
P ₁	2805	3153	2913	2957	2920	2993	2958
P ₂	2984	2827	3043	2951	3030	2863	2960
Mean	2808	2963	3025	2932	2969	2905	2922
K ₀	2920	2976	3011				
K ₁	2795	2944	2976				
K ₂	2710	2969	3088				

S.E. of any marginal mean = 71 lb./ac.
S.E. of body of any table = 123 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 58(5).

Site :- Paddy Breeding Stn., Kayamkulam.

Type :- 'M'.

Object :- To find out the best dose of N for dry sown Paddy.

1. BASAL CONDITIONS:

(i) (a) to (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 22.4.1958. (iv) (a) Ploughing. (b) Broadcasting. (c) 1 lb./plot. (d) —. (e) —. (v) 30 lb./ac. of P₂O₅ as B.M.+30 lb./ac. of K₂O as wood ash. (vi) *Kochuvithu* (early, local). (vii) Unirrigated. (viii) One intercultivation and 2 weedings. (ix) 53.3°. (x) 4.8.1958.

2. TREATMENTS:

4 levels of N : N₀=0, N₁=15, N₂=30 and N₃=45 lb./ac.

$\frac{1}{2}$ N supplied through organic and the rest through inorganic manures half dose of N applied as B.D. and $\frac{1}{4}$ top dressed after sowing.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 24' x 19 $\frac{1}{2}$ '. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) No reasons given for low yields.

5. RESULTS:

(i) 904 lb./ac. (ii) 58 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	N ₀	N ₁	N ₂	N ₃
Av. yield	700	836	1017	1065

S.E./mean = 24 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 59(6).

Site :- Rice Res. Stn., Kayamkulam.

Type :- 'M'.

Object :- To find out the best dose of N, P and K for Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5 C.L./ac. of C.M. and 150 lb./ac. of B.M. as B.D. and 15 lb./ac. of Urea top dressed. (ii) (a) and (b) N.A. (iii) 4.7.1959/18.8.1959. (iv) (a) Puddled. (b) N.A. (c) N.A. (d) 9' x 6'. (e) Doubles. (v) 4000 lb. of C.M. ploughed in. (vi) U.R. 19 (late). (vii) Unirrigated. (viii) Two hand weedings. (ix) 31.5'. (x) 14.1.1960.

2. TREATMENTS :

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

(1) 2 levels of N as A/S : N₁=30 and N₂=60 lb./ac.

(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=15 and P₂=30 lb./ac.

(3) 3 levels of K₂O as Pot. Sul. : K₀=0, K₁=15 and K₂=30 lb./ac.

Half dose of N and full dose of P₂O₅ and K₂O applied as B.D. and the other half of N one month after planting.

3. DESIGN :

(i) 3² x 2 partially confounding PK and NPK interactions. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 31½' x 16'. (b) 30' x 15'. (v) One row all round. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Serious attack of helminthosporium, spraying with cupravit. (iii) Vegetative and productive tiller counts and grain yield. (iv) (a) 1959—N.A. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 2216 lb./ac. (ii) 145.2 lb./ac. (iii) Main effect of N is highly significant. Interaction NP is significant. Others are not significant. (iv) Av. yield of grain in lb./ac.

	K ₀	K ₁	K ₂	Mean	P ₀	P ₁	P ₂
N ₁	2113	2130	2146	2130	2057	2130	2202
N ₂	2292	2364	2251	2302	2299	2323	2283
Mean	2203	2247	2199	2216	2178	2227	2243
P ₀	2180	2189	2166				
P ₁	2093	2342	2247				
P ₂	2336	2211	2183				

S.E. of K or P marginal mean =29.6 lb./ac.
 S.E. of N marginal mean =24.2 lb./ac.
 S.E. of body of N x P or N x K table =41.9 lb./ac.
 S.E. of body of P x K table =51.3 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 59(7).

Site :- Rice Res. Stn., Kayamkulam.

Type :- 'M'.

Object :- To find out the best dose of N for Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 4000 lb./ac. of C.M. as B.D. and 50 lb./ac. of A/S and 56 lb./ac. of Pot. Sul. top dressed. (c) N.A. (ii) (a) and (b) N.A. (iii) 21.4.1959. (iv) (a) N.A. (b) Dibbling (c) N.A. (d) 6' x 6'. (e) N.A. (v) 150 lb. of B.M. and 200Q lb. of wood ash given as B.D. (vi) Kochuvithu (early). (vii) Unirrigated. (viii) 2 intercultures and 2 weedings. (ix) 58.3'. (x) 29.7.1959.

2. TREATMENTS :

4 levels of N : $N_0=0$, $N_1=15$, $N_2=30$ and $N_3=45$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) $24' \times 19\frac{1}{2}'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Cupravit sprayed. (iii) Grain yield. (iv) (a) 1958-1960. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1296 lb./ac. (ii) 202.9 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	N_0	N_1	N_2	N_3
Av. yield	1183	1150	1349	1503

S.E./mean = 82.8 lb./ac.

Crop :- Paddy (1st crop).

Site :- Rice Res. Stn., Kayamkulam,

Ref :- K. 59(8).

Type :- 'M'.

Object :-To find out the effect of organic and inorganic manures on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 4000 lb. of C.M. as B.D. and 50 lb. of A/S and 56 lb. of Pot. Sul. as top dressing. (ii) (a) and (b) N.A. (iii) 21.4.1959. (iv) (a) N.A. (b) Dibbling the seed in the plough. (c) N.A. (d) $6'' \times 6''$. (e) N.A. (v) 150 lb./ac. of B.M. and 2000 lb./ac. of wood ash applied at sowing. (vi) *Kochuvithu* (early). (vii) Unirrigated. (viii) Two intercultivations and two weedings. (ix) 58.3". (x) 29.7.1959.

2. TREATMENTS :

- 30 lb. of N of which $\frac{1}{3}$ applied as C.M. and $\frac{2}{3}$ as A/S.
- 30 lb. of N applied as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) $24' \times 19\frac{1}{2}'$. (v) Nil. (vi) No.

4. GENERAL :

(i) Normal. (ii) Cupravit sprayed. (iii) Grain yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1018 lb./ac. (ii) 207.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2
Av. yield	967	1169

S.E./mean = 84.5 lb./ac.

Crop :- Paddy.

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

Ref :- K. 54(9).

Type :- 'M'.

Object :-To evolve the best combination of A/S, B.M., ash and F.Y.M. to get the highest yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 29.4.1954 to 1.5.1954. (iv) (a) 3 ploughings with country plough. (b) Dibbling in lines. (c) —. (d) 6"×6". (e) 20 seeds for each dibbling. (v) Nil. (vi) *Vattan*, (medium, local) (vii) Unirrigated. (viii) One weeding 4 weeks after sowing when A/S was top dressed. (ix) 80.50° (x) 4.9.1954.

2. TREATMENTS :

- | | |
|--|---|
| 1. Control. | 9. (6)+B.M. at 20 lb./ac. of P ₂ O ₅ . |
| 2. Ash at 1 ton/ac. | 10. (7)+B.M. at 20 lb./ac. of P ₂ O ₅ . |
| 3. F.Y.M. at 2½ ton/ac.+G.L. at 2½ ton/ac. | 11. (5)+B.M. at 40 lb./ac. of P ₂ O ₅ . |
| 4. (2)+(3). | 12. (6)+B.M. at 40 lb./ac. of P ₂ O ₅ . |
| 5. (4)+A/S at 20 lb./ac. of N. | 13. (7)+B.M. at 40 lb./ac. of P ₂ O ₅ . |
| 6. (4)+A/S at 40 lb./ac. of N. | 14. (5)+B.M. at 60 lb./ac. of P ₂ O ₅ . |
| 7. (4)+A/S at 60 lb./ac. of N. | 15. (6)+B.M. at 60 lb./ac. of P ₂ O ₅ . |
| 8. (5)+B.M. at 20 lb./ac. of P ₂ O ₅ . | 16. (7)+B.M. at 60 lb./ac. of P ₂ O ₅ . |

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) Varying slightly from 2½ to 3 cent approximately. (b) 2½ cents (v) A central area of 2½ cent in each plot was harvested leaving the rest for border effects. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1953 (*Mundakan*)—1955 (*Mundakan*). (b) Yes. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1956 lb./ac. (ii) 240 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5	6	7	8
Av. yield	1582	1918	2040	1746	1886	2039	2087	2013
Treatment	9	10	11	12	13	14	15	16
Av. yields	2061	1986	1988	1959	1852	1916	2074	2148

S.E./mean = 120 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 54(10)

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

Type :- 'M'.

Object :- To evolve the best combination of A/S, B.M., ash and F.Y.M. to get the highest yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 18.9.1954. (iv) (a) 3 ploughings with country plough and levelling. (b) Transplanting. (c) —. (d) 6"×6" (e) 2 to 3 (v) Nil. (vi) *Cochin I* (medium, local). (vii) Unirrigated. (viii) One weeding 4 weeks after sowing when A/S was top dressed. (ix) 7.05" (x) 16.1.1955.

2. TREATMENTS :

Same as in expt. no. 9 above.

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) Varies from 2½ to 3 cents. (b) 2½ cents. (v) A central area of 2½ cents was harvested leaving the rest for border effects. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1953 (*Mundakan*)—1955 (*Mundakan*). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2497 lb./ac. (ii) 372 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5	6	7	
Av. yield	2130	2217	2262	2620	2394	2445	2366	2715
Treatment	9	10	11	12	13	14	15	16
Av. yield	2641	2578	2583	2726	2064	2658	2852	2707

S.E./mean = 186 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 58(11).

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

Type :- 'M'.

Object :- To compare the efficacy of different phosphatic manures alone and in combination with lime and G.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sesbania. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 28.4.1958/5, 6 and 7.6.1958. (iv) (a) 6 to 8 ploughings and 2 diggings. (b) Transplanting. (c) -. (d) 6' x 9'. (e) 2. (v) Nil. (vi) PTB-32 (medium, improved). (vii) Unirrigated. (viii) One weeding and filling up of gaps. (ix) 104.7'. (x) 13.10.1958.

2. TREATMENTS :

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

(1) 2 levels of G.L. : $G_0=0$ and $G_1=7500$ lb./ac.

(2) 2 levels of lime : $L_0=0$ and $L_1=3000$ lb./ac.

(3) 3 sources to give 45 lb./ac. of P_2O_5 : $S_1=$ Super, $S_2=$ Hyper and $S_3=$ B.M. and $S_0=$ No P_2O_5 .

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) 60' x 120'. (iii) 4. (iv) (a) 15' x 30'. (b) 14' x 28½'. (v) 9' x 6'. (vi) Yes.

4. GENERAL :

(i) Uniform growth. Lodged at the beginning of Oct. (ii) Leaf roller—dusting with BHC 10%. (iii) Height, tiller count and yield of grain and straw. (iv) (a) 1958 (2nd crop)—contd. (b) Yes. (c) Nil. (v) (a) Taliparamba and Ambalavayal. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2079 lb./ac. (ii) 164 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	S_0	S_1	S_2	S_3	Mean	L_0	L_1
G_0	2107	2107	2088	2063	2091	2083	2099
G_1	2005	2006	2130	2125	2067	2047	2086
Mean	2056	2056	2109	2094	2079	2065	2093
L_0	2092	2008	2136	2025			
L_1	2020	2105	2082	2164			

S.E. of G or L marginal mean

= 29 lb./ac.

S.E. of S marginal mean

= 41 lb./ac.

S.E. of body of G x S or L x S table

= 58 lb./ac.

S.E. of body of G x L table

= 41 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 58(12).

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

Type :- 'M'.

Object :- To compare the efficacy of different phosphatic manures alone and in combination with lime and G.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 11.9.1958/23, 24, 25.10.1958. (iv) (a) 4 diggings. (b) Transplanting. (c) —. (d) 9' x 6". (e) 2. (v) Nil. (vi) PTB-27 (medium, improved). (vii) Unirrigated. (viii) Weeding and filling up of gaps. (ix) 17.69". (x) 27 to 30.1.1959.

2. TREATMENTS :

Same as in expt. No. 11 on page 8.

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) 60' x 120'. (iii) 4. (iv) (a) 15' x 30'. (b) 14' x 28½'. (v) 9' x 6". (vi) Yes.

4. GENERAL :

(i) Satisfactory. Lodged on 10.1.1959. (ii) Stemborer—Folidol sprayed. (iii) Height, tiller count, grain and straw yield. (iv) 1958 (1st crop)—Contd. (b) Yes. (c) Nil. (v) (a) Taliparamba and Ambalavayal. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 980 lb./ac. (ii) 108 lb./ac. (iii) Main effects of G and L are significant. Others are not significant. (iv) Av. yield of grain in lb./ac.

	S ₀	S ₁	S ₂	S ₃	Mean	L ₀	L ₁
G ₀	934	983	914	944	944	893	995
G ₁	1064	996	986	1085	1015	1001	1030
Mean	999	955	950	1015	980	947	1012
L ₀	972	919	936	959			
L ₁	1025	990	964	1070			

S.E. of G or L marginal mean

= 19 lb./ac.

S.E. of S marginal mean

= 27 lb./ac.

S.E. of body of G x S or L x S table

= 54 lb./ac.

S.E. of body of G x L table

= 27 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 59(13).

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

Type :- 'M'

Object :- To compare the efficacy of different phosphatic manures alone and in combination with lime and G.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 3 tons of C.M. and 100 lb. of A/S. (ii) (a) Sandy loam. (b) N.A. (iii) 22.9.1959/26, 27 and 30.10.1959. (iv) (a) Four ploughings. (b) Line planting. (c) 48-50 lb./ac. (d) 10" x 6". (e) 2. (v) As per treatments. (vi) PTB-4 (medium). (vii) Irrigated. (viii) Three weedings after planting. (ix) 22.23". (x) 18 and 19.2.1960.

2. TREATMENTS :

Same as in expt. no. 11 on page 8.

3. DESIGN:

(i) R.B.D. (ii) (a) 16. (b) 66'×126'. (iii) 4. (iv) (a) 15'×30'. (b) 14'×28.5'. (v) One row. (vi) Yes.

4. GENERAL:

(i) Lodged after flowering. (ii) Attack of case worm, leaf roller, rice bug and stem borer. Endrine sprayed. (iii) Grain yield. (iv) (a) 1958-1959. (b) No. (c) Nil. (v) (a) Pattambi and Ambalavayal. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1170 lb./ac. (ii) 223.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	S ₀	S ₁	S ₂	S ₃	Mean	L ₀	L ₁
G ₀	1310	1245	1228	1208	1248	1269	1226
G ₁	1153	976	1228	1017	1093	1088	1098
Mean	1231	1110	1228	1112	1170	1178	1162
L ₀	1344	1078	1262	1030			
L ₁	1119	1143	1194	1194			

S.E. of G or L marginal mean = 39.4 lb./ac.
 S.E. of S marginal mean = 55.8 lb./ac.
 S.E. of G×S or L×S table = 78.8 lb./ac.
 S.E. of G×L table = 55.8 lb./ac.

p :- Paddy (2nd crop).

Ref :- K. 54(14).

e :- Agri. Res. Stn., Mannuthy.

Type :- 'M'.

:-To find out the best combination of N, P and K for Paddy crop.

PL CONDITIONS:

(a) Nil. (b) Paddy. (c) 30 tons of C.M. and 100 lbs. of A/S. (ii) (a) Sandy loam. (b) N.A. (iii) 1959/25.10.1959. (iv) (a) Four ploughings. (b) Line planting. (c) 48 to 50 lb./ac. (d) 10"×6". (v) As per treatments. (vi) PTB-21 (medium). (vii) Irrigated. (viii) 3 weedings. (ix) 21.18". 29.1.1960.

TREATMENTS:

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

- (1) 2 levels of N : N₁=30 and N₂=60 lb./ac.
- (2) 3 levels of P₂O₅ : P₀=0, P₁=15 and P₂=30 lb./ac.
- (3) 3 levels of K₂O : K₀=0, K₁=15 and K₂=30 lb./ac.

Source of N, P and K—N.A.

3. DESIGN:

(i) 3²×2 confounded. (ii) (a) 6. (b) 104'×93'. (iii) 4. (iv) (a) 16'.8"×31'. (b) 15'×30'. (v) One row only. (vi) Yes.

4. GENERAL:

(i) Lodged soon after flowering. (ii) Attack of case worm, leaf roller, rice bug and stem borer—Endrin sprayed. (iii) Tiller habit, height measurement, straw and grain yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) Pattambi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 2031 lb./ac. (ii) 248.3 lb./ac. (iii) Only NK interaction is highly significant. (iv) Av. yield of grain in lb./ac.

	K ₀	K ₁	K ₂	Mean	P ₀	P ₁	P ₂
N ₁	2021	1871	2093	1995	1980	2029	1976
N ₂	2097	2170	1932	2066	2138	2025	2037
Mean	2059	2021	2013	2031	2059	2027	2007
P ₀	2033	2011	2134				
P ₁	2107	2096	1877				
P ₂	2037	1956	2027				

S.E. of K or P marginal mean	=50.68 lb./ac.
S.E. of N marginal mean	=41.38 lb./ac.
S.E. of body of N×P or N×K table	=71.68 lb./ac.
S.E. of body of P×K table	=87.79 lb./ac.

Crop :- Paddy (2nd crop).

Site :- Rice Res. Stn., Monkompu.

Ref :- K. 54(15).

Type :- 'M'.

Object :- To compare the relative efficiencies of Hyper phosphate and B.M. when applied to Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 1 cwt./ac. of B.M. and 1 cwt./ac. of G.N.C. (ii) (a) Clayey soil. (b) N.A. (iii) 10.11.1954 (iv) (a) Two ploughings and levelling. (b) Sprouted seeds broadcast. (c) 130 lb./ac. (d) and (e) —. (v) Nil. (vi) Mo. 2 (early, improved). (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 12.2.1955.

2. TREATMENTS :

(1) 3 cwt./ac. of Hyper phosphate.
(2) 3 cwt./ac. of B.M.
Manure applied 22 days after sowing.

3. DESIGN :

(i) 2×2 L. Sq. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) 68'×30'. (b) 66'×28'. (v) 1' around. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 630 lb./ac. (ii) 34 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2
Av. yield	688	572
S.E./mean	=17 lb./ac.	

Crop :- Paddy (1st crop).

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

Ref :- K. 54(16).

Type :- 'M'.

Object :- To find out the comparative effects of C/N and A/S on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 30.5.1954/29.6.1954. (iv) (a) Puddling six times and levelling three times (b) One month old seedlings transplanted from wet nursery. (c) and (d) N.A. (e) 2 to 3. (v) Nil. (vi) PTB-2 (medium, improved). (vii) Unirrigated. (viii) Two weedings at intervals of one month beginning from one month after planting. (ix) 42.92". (x) 14.10.1954.

2. TREATMENTS :

All combinations of (1), (2) and (3) + an extra treatment (B_1).

(1) 2 levels of basal dressing : $B_0=0$ and $B_1=450$ lb./ac. of lime + 3ton/ac. of F.Y.M. + 30 lb./ac. of P_2O_5 as super.

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

(3) 2 levels of N : $N_1=40$ and $N_2=60$ lb./ac.

B_1 = basal dose as in (1).

Lime applied 2 to 3 weeks before planting as basal dose. F.Y.M. applied at the time of preparation of the field as basal dose. A/S and C/N were applied one month after planting as top dressing.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) $18' \times 23'$. (v) Nil. Uniform interspace of about $1\frac{1}{2}'$ between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Uniform dusting of BHC given against stemborer. (iii) Yield of grain. (iv) (a) 1952 (1st crop)—1954 (2nd crop) (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2661 lb./ac. (ii) 134 lb./ac. (iii) Effects of B, S, N and interaction $S \times N$ are highly significant while others are not significant. (iv) Av. yield of grain in lb./ac.

$B_1=2720$ lb./ac.

	N_1	N_2	Mean	S_1	S_2
B_0	2478	2512	2495	2371	2620
B_1	2714	2914	2814	2806	2822
Mean	2596	2713	2654	2588	2721
S_1	2539	2638			
S_2	2654	2788			

S.E. of any marginal mean = 30.0 lb./ac.

S.E. of body of any table or B_1 = 42.4 lb./ac.

Crop : Paddy (2nd crop).

Site : Agri. Res. Stn., Pattambi.

Ref :- K. 54(17).

Type :- 'M'.

Object :—To find out the comparative effects of C/N and A/S on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 6.9.1954/27.10.1954, (iv) (a) 6 puddlings and 3 levellings. (b) 1 month old seedlings transplanted from wet nursery. (c) and (d) N.A. (e) 2 to 3. (v) Nil. (vi) PTB-20 (medium, improved). (vii) Unirrigated. (viii) Two weedings first one month and 2nd two months after planting. (ix) 15.69". (x) 19.1.1955

2. TREATMENTS :

Same as in expt. no. 54(16) above.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) (a), (b) $18' \times 23'$. (v) Nil. Uniform interspace of about $1\frac{1}{2}'$ between plots. (vi) Yes.

4. GENERAL :

(i) Normal (ii) Uniform dusting of BHC given against stemborer. (iii) Yield of grain. (iv) (a) 1952 (1st crop)—1954 (2nd crop). (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2056 lb./ac. (ii) 164.0 lb./ac. (iii) Effects of B and S are highly significant. The difference between (B_1) and other treatments is significant. (iv) Av. yield of grain in lb./ac.

B₁=1900 lb./ac.

	N ₁	N ₂	Mean	S ₁	S ₂
B ₀	1877	1903	1890	1670	2110
B ₁	2218	2302	2260	2098	2423
Mean	2048	2102	2075	1834	2267
S ₁	1850	1917			
S ₂	2245	2289			

S.E. of any marginal mean = 36.7 lb./ac.

S.E. of body of any table or B₁ = 51.9 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 58(18).

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

Type :- 'M'.

Object :- To compare the efficiency of C/N and A/S as B.D. to Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L. + 30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 1.10.1958. (iv) (a) 6 puddlings and 3 levellings. (b) Transplanted. (c) —. (d) 6" × 10". (e) 2. (v) 5000 lb./ac. of G.L. at puddling. (vi) PTB—20 (improved). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 13". (x) 26.2.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 sources to give 40 lb./ac. of N : S₁=C/N and S₂=A/S.

(2) 6 times of application : T₁=Full dose before planting, T₂=Full dose 2 weeks after planting, T₃=Full dose 4 weeks after planting, T₄=½ dose before planting+½ dose 2 weeks after planting, T₅=½ dose before planting+½ dose 4 weeks after planting and T₆=½ dose 2 weeks after planting+½ dose 4 weeks after planting.

3. DESIGN :

(i) 2×6 Fact. in R.B.D. (ii) (a) 12. (b) 56'×45'. (iii) 4. (iv) (a) N.A. (b) 15'×14'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1958 (2nd crop)—Contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1632 lb./ac. (ii) 162 lb./ac. (iii) None of the effects is significant (iv) Av. yield of grain in lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	Mean
S ₁	1653	1614	1700	1556	1526	1684	1622
S ₂	1654	1616	1453	1676	1722	1738	1643
Mean	1654	1615	1576	1615	1624	1711	1632

S.E. of T marginal mean = 57 lb./ac.

S.E. of S marginal mean = 33 lb./ac.

S.E. of body of table = 81 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 59(19).

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

Type :- 'M'.

Object :- To compare the efficiency of C/N and A/S as B.D. to Paddy.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) As per treatments. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 26.5.1959/30.6.1959. (iv) (a) 6 puddlings and 4 levellings. (b) Transplanting. (c) —. (d) to (e) N.A. (v) G.L. at 5000 lb./ac. + 20 lb./ac. of P_2O_5 as super + 20 lb./ac. of K_2O as Pot. Sul. (vi) PTB-2 (medium). (vii) Unirrigated. (viii) Nil. (ix) 109.8". (x) 20.10.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 sources to give 40 lb./ac. of N : $S_1=C/N$ and $S_2=A/S$.

(2) 6 times of application : $T_1=$ Full dose before planting, $T_2=$ Full dose 2 weeks after planting, $T_3=$ Full dose 4 weeks after planting, $T_4=$ $\frac{1}{2}$ dose before planting + $\frac{1}{2}$ dose 2 weeks after planting, $T_5=$ $\frac{1}{2}$ dose before planting + $\frac{1}{2}$ dose 4 weeks after planting and $T_6=$ $\frac{1}{2}$ dose 2 weeks after planting + $\frac{1}{2}$ dose 4 weeks after planting.

3. DESIGN :

(i) 2×6 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) and (b) $15' \times 14'$. (v) An inter-space of 2' is left between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—Contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2549 lb./ac. (ii) 165.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	T_1	T_2	T_3	T_4	T_5	T_6	Mean
S_1	2642	2514	2474	2448	2539	2437	2509
S_2	2489	2604	2665	2450	2699	2630	2590
Mean	2566	2559	2569	2449	2619	2534	2549

S.E. of marginal mean of S

= 33.8 lb./ac.

S.E. of marginal mean of T

= 58.6 lb./ac.

S.E. of body of table

= 82.8 lb./ac.

Crop :- Paddy (2nd Crop).

Ref :- K. 59 (20)

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

Type :- 'M'.

Object :- To compare the efficiency of C/N and A/S as B.D. to Paddy.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) As per treatments. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 26.9.59/7.11.59. (iv) (a) 6 Puddlings and 4 levellings. (b) Transplanting. (c) —. (d) and (e) N.A. (v) G.L. at 5000 lb./ac. + 20 lb./ac. of P_2O_5 as super + 20 lb./ac. of K_2O as Pot. Sul. (vi) PTB-20 (medium). (vii) Unirrigated. (viii) Nil. (ix) 35.6" (x) 17.2.1960.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 sources to give 40 lb./ac of N : $S_1=C/N$ and $S_2=A/S$.

(2) 6 times of application : $T_1=$ Full dose before planting, $T_2=$ Full dose 2 weeks after planting, $T_3=$ Full dose 4 weeks after planting, $T_4=$ $\frac{1}{2}$ dose before planting + $\frac{1}{2}$ dose 2 weeks after planting, $T_5=$ $\frac{1}{2}$ dose before planting + $\frac{1}{2}$ dose 4 weeks after plantings and $T_6=$ $\frac{1}{2}$ dose 2 weeks after planting + $\frac{1}{2}$ dose 4 weeks after planting.

3. DESIGN:

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) and (b) 15'×14'. (v) An inter-space of 2' is left between plots. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—Contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1614 lb./ac. (ii) 112.3 lb./ac. (iii) Main effect of T and interaction S×T are highly significant. (vi) Av. yield of grain in lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	Mean
S ₁	1430	1644	1746	1505	1622	1736	1614
S ₂	1535	1511	1561	1584	1772	1723	1614
Mean	1482	1578	1654	1544	1697	1729	1614

S.E. of marginal mean of S = 22.9 lb./ac

S.E. of marginal mean of T = 39.7 lb./ac

S.E. of body of table = 56.2 lb./ac

Crop :- Paddy (1st Crop).

Ref :- K. 57(21)

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

Type :- 'M'.

Object :- To find out the comparative efficiency of A/S and Urea in increasing the yield of Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) G.L. 5000 lb./ac. at puddling as basal dose. A/S at 50 lb./ac. top dressed one month after planting. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 8.5.57/10.6.57. (iv) (a) 8 ploughings and 3 diggings. (b) Transplanting. (c) —. (d) 10"×6". (e) 3 to 4. (v) 5000 lb. G.L. at puddling. (vi) PTB-2 (late, improved). (vii) Unirrigated. (viii) One hand weeding a month after planting. (ix) 84.64". (x) 13.10.57.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 3 levels of N as Urea : U₁=30, U₂=60 and U₃=90 lb./ac.

(2) 4 levels of N as A/S : N₀=0, N₁=30, N₂=60 and N₃=90 lb./ac.

Fertilizers applied in two equal doses 20 and 40 days after planting.

3. DESIGN:

(i) 3×4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) 10'×20' (v) Nil. An interspace of 2' between plots. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) BHC dusted against case worms. (iii) Yield of grain. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 3389 lb./ac. (ii) 142 lb./ac. (iii) Effect of N is highly significant while U and U×N are significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean
U ₁	3529	3546	3458	3298	3458
U ₂	3618	3383	3233	3063	3324
U ₃	3390	3600	3298	3247	3384
Mean	3512	3510	3330	3203	3389

S.E. of U marginal mean = 35.5 lb./ac.
 S.E. of N marginal mean = 41.0 lb./ac.
 S.E. of body of table = 71.0 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 57(22)

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

Type :- 'M'.

Object :- To find out the comparative efficiency of A/S and Urea in increasing the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 9.9.57/30.10.57. (iv) (a) 4 ploughings and 4 diggings. (b) Transplanted. (c) —. (d) 10"×6". (e) 3 to 4 seedlings per hole. (v) 5000 lb./ac. G.L. at puddling. (vi) PTB-20 (medium, improved). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 19.97". (x) 14.2.58.

2. TREATMENTS :

Same as in expt. no. 21 on page 15.

3. DESIGN:

(i) 3×4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) 10'×20'. (v) Nil. About 2' interspace between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) BHC dusted against case worms. (iii) Yield of grain. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5 RESULTS :

(i) 2384 lb./ac. (ii) 353 lb./ac. (iii) Only the interaction U×N is highly significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean
U ₁	2106	2318	2808	2392	2406
U ₂	2562	2168	2195	2719	2411
U ₃	2239	2484	2379	2243	2336
Mean	2302	2323	2461	2451	2384

S.E. of U marginal mean = 88.2 lb./ac.
 S.E. of N marginal mean = 101.9 lb./ac.
 S.E. of body of table = 176.5 lb./ac.

Crop :- Paddy.

Ref :- K. 58(23).

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

Type :- 'M'.

Object :- To find out the comparative efficiency of A/S and Urea in increasing the yield of Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 23.4.1958/12.6.1958. (iv) (a) 6 puddlings and 3 levellings. (b) Transplanted. (c) —. (d) 6' x (e) N.A. (v) 5000 lb./ac. of G.L. at puddling time. (vi) PTB-2 (improved, medium). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) About 90°. (x) 18.10.1958.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as Urea : $U_1=30$, $U_2=60$ and $U_3=90$ lb./ac.

(2) 4 levels of N as A/S : $N_0=0$, $N_1=30$, $N_2=60$, $N_3=90$ lb./ac.

Fertilizers applied in two equal doses 20 and 40 days after planting.

3. DESIGN :

(i) 3x4 Fact. in R.B.D. (ii) (a) 12. (b) 120'x20'. (iii) 4. (iv) (a) and (b) 10'x20'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1957 (1st crop)—contd. (b) Yes. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2709 lb./ac. (ii) 226 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean
U_1	2718	2746	2747	2724	2734
U_2	2683	2846	2618	2704	2713
U_3	2802	2632	2818	2472	2681
Mean	2734	2741	2728	2633	2709

S.E. of U marginal mean

= 56.5 lb./ac.

S.E. of N marginal mean

= 65.2 lb./ac.

S.E. of body of table

= 113.0 lb./ac.

Crop :- Paddy.

Ref :- K. 58(24).

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

Type :- 'M'.

Object :- To find out the comparative efficiency of A/S and Urea in increasing the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 17.9.1958 and 6.11.1958. (iv) (a) 6 puddlings and 3 levellings. (b) Transplanting in lines. (c) —. (d) 10'x10'. (e) N.A. (v) Nil. (vi) PTB-20 (improved). (vii) Unirrigated. (viii) One weeding one month after planting. (ix) About 15°. (x) 17.2.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as Urea : $U_1=30$, $U_2=60$ and $U_3=90$ lb./ac.

(2) 4 levels of N as A/S : $N_0=0$, $N_1=30$, $N_2=60$ and $N_3=90$ lb./ac.

Half of the manures applied three weeks after planting and the other half five weeks after planting.

3. DESIGN :

(i) 3x4 Fact. in R.B.D. (ii) (a) 12. (b) 120'x20'. (iii) 4. (iv) (a) and (b) 10'x20'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2177 lb./ac. (ii) 182 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean
U ₁	1654	2090	2198	2443	2096
U ₂	1719	2321	2273	2443	2189
U ₃	1981	2212	2443	2348	2246
Mean	1785	2208	2305	2411	2177

S.E. of U marginal mean = 46 lb./ac.
 S.E. of N marginal mean = 53 lb./ac.
 S.E. of body of table = 91 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 59(25).

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

Type :- 'M'.

Object—To find out the comparative efficiency of A/S and Urea in increasing the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 3.5.1959/18.6.1959. (iv) (a) and (b) N.A. (c) Transplanting. (d) and (e) N.A. (v) G.L. at 5000 lb./ac. (vi) PTB-20 (medium). (viii) One hand weeding one month after planting. (ix) 110". (x) 3.10.1959.

2. TREATMENTS :

Same as as in expt. no 21 on page 15.

Half of the manures applied three weeks after planting and the other half five weeks after planting.

3. DESIGN :

(i) 3×4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) and (b) 20'×10' (v) 2' left between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) B.H.C. dusted against case worm. (iii) Yield of grain. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2777 lb./ac. (ii) 307.0 lb./ac. (iii) Main effects of N and U and their interaction are highly significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean
U ₁	3022	3026	2703	3072	2956
U ₂	3021	2865	2774	2384	2761
U ₃	2946	2629	2671	2217	2616
Mean	2996	2840	2716	2558	2777

S.E. of U marginal mean = 76.8 lb./ac.
 S.E. of N marginal mean = 88.6 lb./ac.
 S.E. of body of table = 153.5 lb./ac.

Crop :- Paddy (2nd crop).
Site :- Agri. Res. Stn., Pattambi.

Ref :- K. 59(26).
Type :- 'M'.

Object :- To find out the comparative efficiency of A/S and Urea in increasing the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 10.9.1959/27.10.1959. (iv) (a) N.A. (b) Transplanting. (c) to (e) N.A. (v) G.L. at 5000 lb./ac. as B.D. (vi) PTB-20 (medium). (vii) Unirrigated. (viii) One hand weeding one month after planting. (ix) 35.63%. (x) 10.2.1960.

2. TREATMENTS :

Same as in expt. no. 21 on page 15.

Half of the manures applied three weeks after planting and the other half five weeks after planting.

3. DESIGN :

(i) 3x4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) and (b) 20'x10'. (v) 2' left between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) B.H.C. dusted against case worm. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2680 lb./ac. (ii) 189 lb./ac. (iii) Main effects of N and U' are highly significant. Interaction is not significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean
U ₁	2342	2517	2461	2826	2536
U ₂	2528	2629	2831	2920	2727
U ₃	2730	2744	2870	2767	2778
Mean	2533	2630	2721	2838	2680

S.E. of U marginal mean = 47 lb./ac.
S.E. of N marginal mean = 55 lb./ac.
S.E. of body of table = 94 lb./ac.

Crop :- Paddy (1st crop).
Site :- Agri. Res. Stn., Pattambi.

Ref :- K. 58(27).
Type :- 'M'.

Object :- To compare the effect of split application of manures individually and in pre-mixed form.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb. of G.L.+30 lb./ac. of N as A/S. (iii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 24.5.1958/7.7.1958. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting. (c) —. (d) 10"x6". (e) 2 seedlings/hole. (v) Nil. (vi) PTB-2 (medium). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 0%. (x) 25.10.58.

2. TREATMENTS :

Main-plot treatments :

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

(1) 2 levels of N as A/S : N₁=20 and N₂=40 lb./ac.

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

(3) 2 levels of K₂O as Pot. Sul. : K₁=20 and K₂=40 lb./ac.

Sub-plot treatments :

2 methods of application : M₁=Individual and M₂=Pre-mixed.

Half the quantity of individual treatments applied as basal and the other half as top dressing one month after planting. Mixture applied as B.D.

3. DESIGN :

(i) Split-plot. (ii) (a) 8 main-plots/block and 2 sub-plots/main-plot. (b) 104' x 67'. (iii) 4. (iv) (a) and (b) 13' x 33.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1958 (1st crop)—1958 (2nd crop). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2534 lb./ac. (ii) (a) 137 lb./ac. (b) 114 lb./ac. (iii) N effect alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N ₁	N ₂	Mean	P ₁	P ₂	K ₁	K ₂
M ₁	2482	2579	2530	2490	2571	2519	2541
M ₂	2474	2602	2538	2533	2542	2568	2568
Mean	2478	2590	2534	2512	2556		
K ₁	2440	2588	2514	2512	2516		
K ₂	2516	2593	2554	2512	2596		
	2440	2583					
P ₂	2516	2597					

S.E. of difference of two

- | | |
|--|--------------|
| 1. N, P or K marginal means | = 34 lb./ac. |
| 2. M marginal means | = 28 lb./ac. |
| 3. M means at the same level of N, P or K | = 40 lb./ac. |
| 4. N, P or K means at the same level of M | = 44 lb./ac. |
| S.E. of body of N x P, N x K or P x K tables | = 34 lb./ac. |

Crop :- Paddy (2nd crop).

Ref :- K. 58(28).

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

Type :- 'M'.

Object :- To compare the effect of split application of manures individually and in pre-mixed form.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 17.9.1958/13.11.1958. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting. (c) —. (d) 10' x 6". (e) 2 seedlings/hole. (v) 5000 lb. of G.L. at puddling. (vi) PTB—20 (medium). (vii) Unirrigated. (viii) One weeding a month after transplanting. (ix) 15°. (x) 18.2.1959.

2. TREATMENTS :

Same as in expt. no. 27 on page 19.

Half the quantity of individual treatments applied as basal and the other half as top dressing one month after planting. Mixture applied as B.D. Top dressing with Pot. Sul. and A/S done on 13.12.1958.

3. DESIGN :

(i) Split-plot. (ii) (a) 8 main-plot/block and 2 sub-plots/main-plot. (b) 104' x 67'. (iii) 4. (iv) (a) and (b) 13' x 33.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1958 (1st crop)—1958 (2nd crop). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1834 lb./ac. (ii) (a) 168 lb./ac. (b) 160 lb./ac. (iii) Main effect of P is highly significant and interaction NPK is significant. Others are not significant. (iv) Av. yield of grain in lb./ac.

	N ₁	N ₂	Mean	P ₁	P ₂	K ₁	K ₂
M ₁	1843	1887	1865	1851	1878	1890	1840
M ₂	1774	1831	1803	1726	1880	1835	1771
Mean	1808	1859	1834	1788	1879		
K ₁	1811	1912	1862	1854	1870		
K ₂	1805	1806	1806	1723	1888		
P ₁	1806	1771					
P ₂	1811	1947					

S.E. of difference of two

1. N, P or K marginal means =42 lb./ac.
 2. M marginal means =40 lb./ac.
 3. M means at the same level of N, P or K =56 lb./ac.
 4. N, P or K means at the same level of M =58 lb./ac.
- S.E. of body of N×P, N×K or P×K tables =42 lb./ac.

Crop :- Paddy (1st crop).

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

Ref :- K. 59(29).

Type :- 'M'.

Object :- To find out the effect of Sodium Chloride as a fertilizer and as a weedicide.

1. BASAL CONDITIONS :

(i) (a) No. (b) Gingilly. (c) 5 ton/ac. of F.Y.M. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 3.5.1959. (iv) (a) 8 ploughings. (b) to (e) N.A. (v) Nil. (vi) PTB-28 (medium). (vii) Unirrigated. (viii) Nil. (ix) 110°. (x) 27.8.1959.

2. TREATMENTS :

Main-plot treatments :

3 levels of Sodium Chloride : A₀=0, A₁=100 and A₂=200 lb./ac.

Sub-plot treatments :

3 doses of A/S and Pot. Sul. : M₀= No manure, M₁=100 lb./ac. of A/S+50 lb./ac. of Pot. Sul. and M₂=200 lb./ac. of A/S+100 lb./ac. of Pot. Sul.

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) 20'×10'. (v) Inter space of 2' is left between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain and count of weeds. (iv) (a) 1959 (1st crop)—contd. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1791 lb./ac. (ii) (a) 234.3 lb./ac. (b) 191.1 lb./ac. (iii) Only M effect is significant. (iv) Av. yield of grain in lb./acre.

	M ₀	M ₁	M ₂	Mean
A ₀	1590	1917	1970	1826
A ₁	1616	1865	1814	1765
A ₂	1585	1793	1967	1782
Mean	1597	1858	1917	1791

S.E. of difference of two

1. A marginal means = 95.7 lb./ac.
2. M marginal means = 78.0 lb./ac.
3. M means at the same level of A = 135.1 lb./ac.
4. A means at the same level of M = 146.0 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 58(30).

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

Type :- 'M'.

Object :- To compare the manurial value of B.M. with A/S, Super and G.L.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L. + 30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 17.9.1958/13.11.1958. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting (c) —. (d) 10' x 6". (e) N.A. (v) G.L. at 5000 lb./ac. at puddling. (vi) PTB-20 (medium). (vii) Unirrigated. (viii) One weeding. (ix) 15". (x) 23.2.1959.

2. TREATMENTS :

5 manures : M₁=B.M., M₂=G.L., M₃=A/S, M₄=Super and M₅=A/S+Super. M₁ is applied at 150 lb./ac. while the others are applied to give either N or P₂O₅ as much as is given by M₁. G.L. applied at ploughing, B.M. and Super before planting and A/S one month after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 33½' x 65'. (iii) 2. (iv) (a) N.A. (b) 33½' x 13'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1275 lb./ac. (ii) 64 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M ₁	M ₂	M ₃	M ₄	M ₅
Av. yield	1295	1196	1329	1239	1315
	S.E./mean		=45 lb./ac.		

Crop :- Paddy (1st crop).

Ref :- K. 59(31).

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

Type :- 'M'.

Object :- To compare the manurial value of B.M. with A/S, Super and G.L.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) B.D. of 5000 lb./ac. of G.L. + 150 lb./ac. of Super. Top dressing of 150 lb./ac. of A/S one months after planting. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 26.5.1959/3.7.1959. (iv) (a) to (e) N.A. (v) Nil. (vi) PTB-20 (medium). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 110" (x) 15.10.1959.

2. TREATMENTS :

Same as in expt. no. 30 on page 22.

M₁ is applied at 150 lb./ac. while others are applied to give either N or P₂O₅ as much as is given by M₁.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 20' × 10'. (v) Interspace of 2' left between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) B.H.C. dusted against case worm. (iii) Grain yield. (iv) (a) 1959 (1st crop)—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2038 lb./ac. (ii) 211.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M ₁	M ₂	M ₃	M ₄	M ₅
Av. yield	2050	1913	1888	2155	2182

S.E./mean = 86.2 lb./ac.

Crop :- Paddy (2nd crop).

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

Ref :- K. 59(32).

Type :- 'M'.

Object :- To compare the manurial value of B.M. with A/S, Super and G.L.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) B.D. of 5000 lb./ac. of G.L. + 150 lb./ac. of Super. Top dressing 150 lb./ac. of A/S one month after planting. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 26.9.1959/2.11.1959. (iv) (a) to (e) N.A. (v) N.A. (vi) PTB-20 (medium). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 36°. (x) 15.2.1960.

2. TREATMENTS :

Same as in expt. no. 30 on page 22.

M₁ is applied at 150 lb./ac. while the others are applied to give either N or P₂O₅ as much as is given by M₁.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 20' × 10'. (v) Interspace of 2' left between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) B.H.C. dusted against case worm. (iii) Grain yield. (iv) (a) 1959 (1st crop)—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1405 lb./ac. (ii) 112.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	M ₁	M ₂	M ₃	M ₄	M ₅
Av. yield	1441	1446	1388	1390	1361

S.E./mean = 45.7 lb./ac.

Crop :- Paddy (1st crop).

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

Ref :- K. 56(33).

Type :- 'M'.

Object :- To compare the relative merits of Ammo. Chloride and A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb. of G.L. + 30 lb. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 10.5.1956/17.6.1956. (iv) (a) 6 puddings and 3 levelling. (b) Transplanting in lines. (c) —. (d) 10"×6". (e) 2 seedlings/hole. (v) 5000 lb. of G.L. + 30 lb./ac. of P_2O_5 as Super. (vi) PTB-26 (medium, improved). (vii) Unirrigated. (viii) One weeding. (ix) 80°. (x) 10.10.1956.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 sources of N :— $S_1 = A/S$ and $S_2 = \text{Ammono. Chloride}$.

(2) 5 levels of N :— $N_0 = 0$, $N_1 = 15$, $N_2 = 30$, $N_3 = 45$ and $N_4 = 60$ lb./ac.

Manures top dressed one month after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) 100'×32'. (iii) 5. (iv) (a) N.A. (b) 10'×32'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 2641 lb./ac. (ii) 171.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 2525 lb./ac.

	N_0	N_1	N_2	N_3	Mean
S_1	2627	2695	2627	2709	2665
S_2	2668	2600	2654	2777	2675
Mean	2647	2647	2641	2743	2670

S.E. of marginal mean of N

= 54.1 lb./ac.

S.E. of marginal mean of S

= 38.3 lb./ac.

S.E. of body of table

= 76.6 lb./ac.

S.E. of control mean

= 54.1 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 56(34).

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

Type :- 'M'.

Object :- To compare to relative merits of Ammono. Chloride and A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 7.9.1956/26.10.1956. (iv) 6 puddings and 3 levellings. (b) Transplanting in lines. (c) —. (d) 10"×6". (e) 2 seedlings/hole. (v) 5000 lb. of G.L. + 150 lb./ac. of Super. (vi) PTB-15 (improved). (vii) Unirrigated. (viii) One weeding. (ix) 11.3°. (x) 2nd week of Feb., 1957.

2. TREATMENTS :

Same as in expt. no. 33 on page 23.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) 100'×32'. (iii) 5. (iv) (a) and (b) 10'×32'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 3211 lb./ac. (ii) 161.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 3138 lb./ac.

	N ₁	N ₂	N ₃	N ₄	Mean
S ₁	3172	3213	3240	3151	3194
S ₂	3165	3267	3342	3281	3264
Mean	3168	3240	3291	3216	3229

S.E. of marginal mean of N = 50.9 lb./ac.
 S.E. of marginal mean of S = 36.0 lb./ac.
 S.E. of body of table = 72.0 lb./ac.
 S.E. of control mean = 50.9 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 57(35).

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

Type :- 'M'.

Object :- To compare the relative merits of Ammon. Chloride and A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 16.5.1957/27.6.1957. (iv) 3 ploughings and 4 diggings. (b) Planting in lines. (c) —. (d) 10' x 6'. (e) 3 to 4. (v) G.L. 5000 lb./ac. at the time of puddling. (vi) PTB-26 (improved, medium). (vii) Unirrigated. (viii) One weeding one month after planting before top dressing. (ix) 82.8°. (x) 5.10.1957.

2. TREATMENTS :

Same as in expt. no. 33 on page 24.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 10' x 32'. (v) Nil ; interspace of 1½ feet between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) B.H.C. dusted against case worm and gall flies. (iii) Grain yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1850 lb./ac. (ii) 250.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 1848 lb./ac.

	N ₁	N ₂	N ₃	N ₄	Mean
S ₁	1809	1899	1787	1797	1823
S ₂	1867	1673	1974	2003	1879
Mean	1838	1786	1880	1900	1851

S.E. of marginal mean of N = 79.0 lb./ac.
 S.E. of marginal mean of S = 44.1 lb./ac.
 S.E. of body of table = 111.8 lb./ac.
 S.E. of control mean = 79.0 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 57(36).

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

Type :- 'M'.

Object :- To compare the relative merits of Ammo. Chloride and A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 3.9.1957/19.10.1957. (iv) (a) 3 ploughings and 4 diggings. (b) Planting in lines. (c) —. (d) 10'×6'. (e) 3 to 4. (v) G.L. 5000 lb./ac. at the time of puddling. (vi) PTB-15 (improved). (vii) Unirrigated. (viii) One weeding one month after planting before top dressing. (ix) 20°. (x) 13.2.1958.

2. TREATMENTS :

Same as in expt. no. 33 on page 24.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) 1/217.8 ac. (iii) 5. (iv) (a) and (b) 10'×32'. (v) Interspace of 1½ feet between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Folidol sprayed against stem-borer. (iii) Grain yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2915 lb./ac. (ii) 206.0 lb./ac. (iii) Control vs. others alone is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 2643 lb./ac.

	N ₁	N ₂	N ₃	N ₄	Mean
S ₁	2916	2923	3032	3024	2974
S ₂	2957	2947	3092	2974	2992
Mean	2937	2935	3062	2999	2983

S.E. of marginal mean of N = 65.1 lb./ac.
 S.E. of marginal mean of S = 46.0 lb./ac.
 S.E. of body of table = 92.1 lb./ac.
 S.E. of control mean = 65.1 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 58(37).

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

Type :- 'M'.

Object :- To compare the relative merits of Ammo. Chloride and A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 8.5.1958/3.7.1958. (iv) (a) 6 puddlings and 3 levellings. (b) Transplanting in lines. (c) —. (d) 10'×6'. (e) 2. (v) 5000 lb. of G.L. + 30 lb. of P₂O₅ as Super before planting. (vi) PTB-26 (improved). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 90°. (x) Last week of Oct. 1958.

2. TREATMENTS :

Same as in expt. no. 33 on page 24.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) 120'×32'. (iii) 5. (iv) (a) N.A. (b) 10'×32'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2428 lb./ac. (ii) 280.0 lb./ac. (iii) Control vs. others alone is significant. (iv) Av. yield of grain in lb./ac.

Control = 2174 lb./ac.

	N ₁	N ₂	N ₃	N ₄	Mean
S ₁	2411	2559	2504	2426	2475
S ₂	2367	2432	2509	2723	2508
Mean	2389	2496	2506	2575	2492

S.E. of marginal mean of N or control mean = 88.5 lb./ac.

S.E. of marginal mean of S = 62.6 lb./ac.

S.E. of body of table = 125.2 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 58(38).

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

Type :- 'M'.

Object :- To compare the relative merits of Ammo. Chloride and A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 17.9.1958/1.11.1958. (iv) (a) 6 puddlings and 3 levellings. (b) Transplanting. (c) —. (d) 10' × 6" double. (e) N.A. (v) Nil. (vi) PTB-15 (improved). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 15". (x) 1.2.1959.

2. TREATMENTS:

Same as in expt. no. 33 on page 24.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 10' × 32'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2536 lb./ac. (ii) 411.0 lb./ac. (iii) Main effect of N and interaction N × S are significant. Control vs. others is not significant. (iv) Av. yield of grain in lb./ac.

Control = 2546 lb./ac.

	N ₁	N ₂	N ₃	N ₄	Mean
S ₁	1972	2166	3120	2646	2476
S ₂	2473	2655	2624	2615	2592
Mean	2222	2410	2872	2630	2534

S.E. of marginal mean of N or control mean = 130.0 lb./ac.

S.E. of marginal mean of S = 91.9 lb./ac.

S.E. of body of table = 183.8 lb./ac.

Crop :- (1st crop)
Site :- Agri. Res. Stn., Pattambi.

Ref :- K. 57(39).
Type :- 'M'.

Object .— To compare the efficiency of P_2O_5 and K_2O applied at different times.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) G.L. 8000 lb./ac. at the time of puddling. A/S 50 lb./ac. top dressed one month after planting. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 11.5.1957/3.7.1957. (iv) (a) 6 ploughings and 3 diggings. (b) Transplanting. (c) —. (d) $10' \times 6'$. (e) 3 to 4. (v) 4000 lb./ac. of G.L. at the time of puddling. (vi) PTB-2 (improved). (vii) Unirrigated. (viii) One hand weeding after planting. (ix) 85°. (x) 14.10.1957.

2. TREATMENTS :

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

- (1) 3 levels of P_2O_5 :— $P_0=0$, $P_1=30$ and $P_2=60$ lb./ac.
- (2) 3 levels of K_2O :— $K_1=15$, $K_2=30$ and $K_3=45$ lb./ac.
- (3) 3 times of application of manures :— $T_1=B.D.$, $T_2=15$ days after sowing and $T_3=30$ days after sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $10' \times 20'$. (v) Nil; interspace of 2' between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) B.H.C. dusted against case-worm. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2881 lb./ac. (ii) 158 lb./ac. (iii) Main effect of P alone is significant. (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_1	K_2	K_3
T_1	2846	2902	2952	2900	2910	2918	2872
T_2	2774	2796	2952	2840	2785	2881	2855
T_3	2837	2878	2990	2902	2928	2882	2895
Mean	2819	2859	2964	2881	2874	2894	2874
K_1	2829	2840	2953				
K_2	2846	2822	3013				
K_3	2781	2913	2928				

S.E. of any marginal mean = 26 lb./ac.
S.E. of body of any table = 46 lb./ac.

Crop :- Paddy (2nd crop).
Site :- Agri. Res. Stn., Pattambi.

Ref :- K. 57(40).
Type :- 'M'.

Object :— To compare the efficiency of P_2O_5 and K_2O applied at different times.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 9.9.1957/31.10.1957. (iv) (a) 4 ploughings and 4 diggings. (b) Transplanting. (c) —. (d) $10' \times 6'$. (e) 3 to 4. (v) 4000 lb./ac. of G.L. at the time of puddling. (vi) PTB-20 (improved). (vii) Unirrigated. (viii) One hand weeding one month after planting. (ix) 85°. (x) 17.2.1958.

2. TREATMENTS :

Same as in expt. no. 39 on page 28.

3. DESIGN :

(i) R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10'×20'. (v) Nil. Inter space of 2' between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Folidol sprayed against stemborer. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1554 lb./ac. (ii) 225 lb./ac. (iii) Effect of P alone is highly significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean	K ₁	K ₂	K ₃
T ₁	1492	1607	1531	1544	1489	1584	1558
T ₂	1483	1609	1525	1539	1524	1526	1566
T ₃	1388	1627	1723	1579	1598	1545	1595
Mean	1454	1614	1593	1554	1537	1551	1573
K ₁	1447	1573	1590				
K ₂	1437	1622	1595				
K ₃	1478	1647	1594				

S.E. of any marginal mean = 38 lb./ac.

S.E. of body of any table = 65 lb./ac.

Crop :- Paddy.

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

Ref :- K. 58(41).

Type :- 'M'.

Object :- To compare the efficiency of P₂O₅ and K₂O applied at different times.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 23.4.1958/13.6.1958. (iv) (a) 6 puddlings and 3 levellings. (b) Transplanting in lines. (c) —. (d) 6"×6". (e) 2. (v) G.L. at 4000 lb./ac. (vi) PTB-2 (improved). (vii) Unirrigated. (viii) One weeding. (ix) 80°. (x) 17.10 1958.

2. TREATMENTS :

Same as in expt. no. 39 on page 28.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) 60'×90'. (iii) 4. (iv) (a) N.A. (b) 10'×20'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2690 lb./ac. (ii) 161 lb./ac. (iii) Effects of P and T are highly significant. Interaction P×T is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean	K ₁	K ₂	K ₃
T ₁	2649	2801	2811	2754	2702	2799	2760
T ₂	2563	2542	2753	2619	2593	2631	2633
T ₃	2620	2770	2706	2699	2691	2709	2695
Mean	2610	2704	2756	2690	2662	2713	2696
K ₁	2597	2690	2698				
K ₂	2651	2738	2751				
K ₃	2583	265	2820				

S.E. of any marginal mean
S.E. of body of any table

=27 lb./ac.
=46 lb./ac.

Crop :- Paddy (1st Crop).

Ref :- K. 59(42).

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

Type :- 'M'.

Object :- To compare the efficiency of P₂O₅ and K₂O applied at different times.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) As per treatments. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 26.5.1959/4.7.1959. (iv) (a) to (e) N.A. (v) N.A. (vi) PTB-2 (medium). (vii) Unirrigated. (viii) One hand weeding one month after planting. (ix) 109°. (x) 26.10.1959.

2. TREATMENTS :

Same as in expt. no. 39 on page 28.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) and (b) 20'×10'. (v) No; inter space of 2' left between the plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) B.H.C. dusted against case worm. (iii) Grain yield. (iv) (a) 1957-1959. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 2662 lb./ac. (ii) 290.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean	K ₁	K ₂	K ₃
T ₁	2630	2720	2781	2710	2603	2804	2724
T ₂	2585	2641	2722	264	2736	2628	2584
T ₃	2540	2722	2619	2627	2644	2656	2582
Mean	2585	2695	2707	2662	2661	2696	2630
K ₁	2580	2665	2738				
K ₂	2622	2702	2764				
K ₃	2553	2717	2620				

S.E. of any marginal mean
S.E. of body of any table

=48.4 lb./ac.
=83.8 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 59(43).

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

Type :- 'M'.

Object :- To compare the efficiency of P_2O_5 and K_2O applied at different times.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 26.9.1959/10.11.1959. (iv) (a) to (e) N.A. (v) N.A. (vi) PTB-20 (medium). (vii) Unirrigated. (viii) One hand weeding one month after planting. (ix) 35.6°. (x) 16.2.1960.

2. TREATMENTS :

Same as in expt. no. 38 on page 28.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) and (b) 20' x 10'. (v) No. Inter space of 2' left between the plot. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) B.H.C. dusted against case worm. (iii) Yield of grain. (iv) (a) 1957-1959. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1481 lb./ac. (ii) 115.3 lb./ac. (iii) Interaction T x K alone is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean	K ₁	K ₂	K ₃
T ₁	1432	1523	1474	1476	1466	1546	1416
T ₂	1436	1493	1500	1476	1459	1476	1494
T ₃	1470	1471	1530	1490	1510	1437	1524
Mean	1446	1496	1502	1481	1478	1486	1478
K ₁	1458	1476	1500				
K ₂	1444	1518	1498				
K ₃	1435	1492	1507				

S.E. of any marginal mean = 19.2 lb./ac.

S.E. of body of any table = 33.3 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 55(44).

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

Type :- 'M'.

Object :- To find out the effect of pre-soaking Paddy seeds and sowing with and without manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb. G.L. +75 to 150 lb./ac. of A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 13.5.1955/25.6.1955. (iv) (a) Six puddlings 3 levellings. (b) Transplanting in lines. (c) —. (d) 10" x 6". (e) 2. (v) Nil. (vi) PTB-2 (medium). (vii) Unirrigated. (viii) One weeding. (ix) 63.95°. (x) 15.10.1955.

2. TREATMENTS:

Main-plot treatments :

2 manures: M₀=No manure and M₁=5000 lb. G.L. at puddling+30 lb. N as A/S top dressed on 27.7.55.

Sub-plot treatments :

5 soaking treatments: S₁, S₂, S₃, S₄ and S₅—Details N.A.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block and 5 sub-plots/main-plot. (b) 40'×70'. (iii) 4. (iv) (a) and (b) 40'×7'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 2777 lb./ac. (ii) (a) 178 lb./ac. (b) 152 lb./ac. (iii) Main effect of M, S and interaction M×S are highly significant. (iv) Av. yield of grain in lb./ac.

	S ₁	S ₂	S ₃	S ₄	S ₅	Mean
M ₀	3131	3209	3189	3131	2450	3022
M ₁	2509	2606	2569	2625	2353	2532
Mean	2820	2907	2878	2878	2402	2777

S.E. of difference of two

1. M marginal means = 56 lb./ac.
2. S marginal means = 76 lb./ac.
3. S means at the same level of M = 107 lb./ac.
4. M means at the same level of S = 111 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 55(45)

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

Type :- 'M'.

Object :- To find out the effect of pre-soaking Paddy seed and sowing with and without manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb. G.L. and 30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 8.9.1955/28 and 29.10.1955. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting in lines. (c) —. (d) 10"×6". (e) 2 seedlings/hole. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) One weeding. (ix) 28.36". (x) 25.1.1956.

2. TREATMENTS:

Main-plot treatments :

2 manures : M₀—No manure and M₁—5000 lb. G.L. as basal before planting+30 lb. N as A/S top dressed one month after planting.

Sub-plot treatments :⁴

8 soaking treatments : S₁, S₂, S₃, S₄, S₅, S₆, S₇ and S₈—Details N.A.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block and 8 sub-plots/main-plot. (b) 48'×60'. (iii) 4. (iv) (a) and (b) 6'×30' (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1205 lb./ac. (ii) (a) 366 lb./ac. (b) 168 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	S ₈	Mean
M ₀	1282	1225	1365	1244	1172	1486	1316	1270	1295
M ₁	1021	1138	1199	1093	1017	1112	1172	1161	1114
Mean	1152	1182	1282	1168	1094	1299	1244	1216	1205

S.E. of difference of two

1. M marginal means = 91 lb./ac.
2. S marginal means = 83 lb./ac.
3. S means at the same level of M = 118 lb./ac.
4. M means at the same level of S = 144 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 56(46).

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

Type :- 'M'.

Object :- To find out the effect of pre-soaking Paddy seeds and sowing with and without manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L. +30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 28.6.1956/30.7.1956. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting. (c) -. (d) 12" x 6". (e) 2. (v) Nil. (vi) PTB-2 (medium). (vii) Unirrigated. (viii) One weeding. (ix) 80°. (x) 18.10.1956.

2. TREATMENTS :

Main-plot treatments :

2 manures : M₀=No manures, M₁=4000 lb./ac. of G.L.+150 lb./ac. of A/S.

Sub-plot treatments :

9 chemicals for soaking : C₀=Control, C₁=Water, C₂=Pot. Sul. M/2, C₃=Indole acetic acid 50 ppm., C₄=Naphthalene acetic acid 50 ppm., C₅=C₂+Indole acetic acid 50 ppm., C₆=C₂+Naphthalene acetic acid 50 ppm., C₇=Foliar spraying with Indole acetic acid and C₈=C₂+C₇.

G.L. applied as basal and A/S as top dressing one month after planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block and 9 sub-plots/main-plot. (b) 90' x 30'. (iii) 4. (iv) (a) and (b) 5' x 30' (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1955 (1st crop)-1956 (1st crop). (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3185 lb./ac. (ii) (a) 366 lb./ac. (b) 238 lb./ac. (iii) M effect alone is highly significant. (iv) Av. yield of grain in lb./ac.

	C ₀	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	C ₇	C ₈	Mean
M ₀	3485	3267	3321	3212	3576	3412	3666	3521	3630	3454
M ₁	2777	2795	3013	2868	2958	2904	2904	3013	3013	2916
Mean	3131	3031	3167	3040	3267	3158	3285	3267	3322	3185

S.E. of difference of two

1. M marginal means = 86 lb./ac.
2. C marginal means = 119 lb./ac.
3. C means at the same level of M = 168 lb./ac.
4. M means at the same level of C = 180 lb./ac.

Crop :- Paddy (1st crop).
Site :- Agri. Res. Stn., Pattambi.

Ref :- K. 54(47).
Type :- 'M'.

Object :- To compare the manurial value of compost prepared from Jack leaf, *Gliricidia* leaf and *Sesbania* leaf with *Sesbania* green leaf.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L.+100 to 150 lb./ac. of A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 1st week of June/1st week of July 1954. (iv) (a) Six puddlings and 3 levellings. (b) Transplanted. (c) —. (d) 10' x 6'. (e) 2. (v) Nil. (vi) PTB-2 (Medium). (vii) Unirrigated. (viii) One weeding one month after planting. (ix) 42.92°. (x) 25.10.1954.

2. TREATMENTS :

1. No manure.
2. A/S at 30 lb./ac. of N 14 days after transplanting.
3. *Sesbania* leaf at 30 lb./ac. of N applied as B.D.
4. *Sesbania* compost at 30 lb./ac. of N as B.D.
5. *Gliricidia* compost at 30 lb./ac. of N as B.D.
6. Jack leaf compost at 30 lb./ac. of N as B.D.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 17' x 26'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1954 (1st crop)—1956 (2nd crop). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1426 lb./ac. (ii) 188 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5	6
Av. yield	1240	1671	1388	1454	1380	1421
	S.E./mean			=77 lb./ac.		

Crop :- Paddy (2nd crop).
Site :- Agri. Res. Stn., Pattambi.

Ref :- K. 54(48).
Type :- 'M'.

Object :- To compare the manurial value of compost prepared from Jack leaf, *Gliricidia* leaf and *Sesbania* leaf with *Sesbania* green leaf.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 4.9.1954/31.10.1954. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting. (c) —. (d) 10' x 6'. (e) 2. (v) Nil. (vi) PTB-4. (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 15.69°. (x) 12.1.1955.

2. TREATMENTS :

Same as in expt. no. 47 above.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 17' x 26'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1954 (1st crop)—1956 (2nd crop). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1723 lb./ac. (ii) 305 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatments	1	2	3	4	5	6
Av. yield	1659	1749	1811	1680	1729	1712

S.E./mean = 125 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 54(49).

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

Type :- 'M'.

Object :- To compare the manurial value of compost prepared from Jack leaf, *Gliricidia* leaf and *Sesbania* with *Sesbania* green leaf.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Basal dressing of 5000 lb. of G.L. and top dressing of 150 lb. of A/S. G.L. at the time of puddling and A/S one month after planting. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 4.9.1954/31.10.1954. (iv) (a) Six puddlings 3 levellings. (b) Transplanting. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) PTB-4 (medium, improved). (vii) Unirrigated. (viii) Hand weeding twice. (ix) 15.69". (x) 12.1.1955.

2. TREATMENTS :

Same as in expt. no. 47 on page 34.

A/S applied as top dressing two weeks after planting. G.L. applied at the time of puddling as basal dressing.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 17' x 26'. (v) Nil. A uniform inter space of 1½' left on all sides of each plot. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Dusting against stemborer with BHC given uniformly to the plots. (iii) Grain yield. (iv) (a) 1954 (1st crop)—1956 (2nd crop). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

RESULTS :

(i) 1757 lb./ac. (ii) 351 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5	6
Av yield	1663	1762	1822	1683	1891	1723

S.E./mean = 143.3 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 55(50).

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

Type :- 'M'.

Object :- To compare the manurial value of compost prepared from Jack leaf, *Gliricidia* leaf and *Sesbania* leaf with *Sesbania* green leaf.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 21.5.1955/15.7.1955. (iv) (a) 4 ploughings, 2 mummatty diggings and levelling. (b) Planted in lines. (c) N.A. (d) Rows 10" apart. (e) 3 to 4. (v) Nil. (vi) PTB-2 (medium, improved). (vii) Unirrigated. (viii) 2 weedings. (ix) 68.93". (x) 25.10.1955.

2. TREATMENTS :

Same as in expt. no. 47 on page 34.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) 17' x 26'. (v) Nil ; about 2' inter space left between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Preventive dusting with [B.H.C. (iii) Yield of grain. (iv) (a) 1954 (1st crop)—1956 (2nd crop). (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1428 lb./ac. (ii) 187.0 lb./ac. (iii) Treatment {differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5	6
Av. yield	1254	1670	1377	1468	1382	1417

S.E. mean = 76.3 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 55(51).

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

Type :- 'M'.

Object :- To compare the manurial value of compost prepared from Jack leaf, *Gliricidia* leaf and *Sesbania* leaf with *Sesbania* green leaf.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 11.8.1955/23.11.1955. (iv) (a) 4 ploughings and 2 *mummatty* diggings, levelling. (b) Planted in lines. (c) —. (d) N.A. (e) 3 to 4. (v) Nil. (vi) PTB-4 (medium, improved). (vii) Unirrigated. (viii) One weeding. (ix) 29.19". (x) 2.2.1956.

2. TREATMENTS :

Same as in expt. no. 47 on page 34.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 17'x26'. (v) Nil; About 2' inter space between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Spraying with D.D.T. against stem borer. (iii) Yield of grain. (iv) (a) 1954 (1st crop)—1956 (2nd crop). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 478 lb./ac. (ii) 175 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5	6
Av. yield	467	503	383	508	457	552

S.E./mean = 71.4 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 56(52).

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

Type :- 'M'.

Object :- To compare the manurial value of compost prepared from Jack leaf, *Gliricidia* leaf and *Sesbania* leaf with *Sesbania* green leaf.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 28.5.1956/12.7.1956. (iv) (a) Six puddlings, 3 levellings. (b) Transplanting in lines. (c) N.A. (d) 10" x 6". (e) N.A. (v) Nil. (vi) PTB-2 (improved). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) About 80". (x) 26.10.1956.

2. TREATMENTS :

Same as in expt. no. 47 on page 34.

A/S applied on 28.7.1956, compost on 12.7.56 and leaf applied before planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 26'×102'. (iii) 6. (iv) (a) and (b) 17'×26'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1954 (1st crop)—1956 (2nd crop). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2086 lb./ac. (ii) 200.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5	6
Av. yield	1971	2119	2028	2119	2077	2201

S.E./mean = 81.7 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 56(53).

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

Type :- 'M'.

Object :- To compare the manurial value of compost prepared from Jack leaf, *Gliricidia* leaf and *Sesbania* leaf with *Sesbania* green leaf.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 28.9.1956/7.11.1956. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting in line. (c) N.A. (d) 10"×4". (e) N.A. (v) Nil. (vi) PTB-12 (improved). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 2.62". (x) 5.2.1957.

2. TREATMENTS :

Same as in expt. no. 47 on page 34.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 102'×26'. (iii) 6. (iv) (a) and (b) 17'×26'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1954 (1st crop) —1956 (2nd crop). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1909 lb./ac. (ii) 158 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5	6
Av. yield	1766	1815	1831	1987	1963	2094

S.E./mean = 64.5 lb./ac.

Crop :- Paddy (2nd Crop).

Ref :- K. 55(54).

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

Type :- 'M'.

Object :- To test the efficacy of compost prepared by re-inforcement with phosphates.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 4000 lb. G.L.+50 lb. A/S as B.D. and another 50 lb. A/S as top dressing one month after planting. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 8.9.1955/9.11.1955. (iv) (a) 4 ploughings, 2 *mummatty* diggings and levelling. (b) Transplanting. (c) —. (d) 10" spacing. (e) 3 to 4 (v) Nil. (vi) PTB-20 (medium, improved). (vii) Unirrigated. (viii) 2 weedings. (ix) 34". (x) 1.2.1956.

2. TREATMENTS :

- (1) A/S at 30 lb./ac. of N+compost at N given by reinforced compost in tr. 2.
- (2) A/S at 30 lb./ac. of N+compost reinforced with super at 30 lb./ac. of P_2O_5 .
- (3) A/S at 30 lb./ac. of N+compost reinforced with rock phosphate to supply 30 lb./ac. P_2O_5 .
- (4) A/S at 30 lb./ac. of N+compost as in tr. 1. +super at 30 lb./ac of P_2O_5 .
- (5) A/S at 30 lb./ac. N+compost at N given by reinforced compost in tr. 3.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8'×40'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) Preventive dusting and spraying given to all plots against pests. (iii) Grain yield. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1359 lb./ac. (ii) 133 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5
Av. yield	1387	1327	1332	1390	1358
	S.E./mean =66 lb./ac.				

Crop :- Paddy (1st Crop).

Ref :- K. 55(55).

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

Type :- 'M'.

Object :- To find out the manurial value of wild rubber leaf as compared to *sesbania* leaf.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) 5000 lb. G.L.+10 C.L. of C.M.+50 lb./ac. of A/S applied as B.D. at the time of puddling. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 23.4.1955/30.6.1955. (iv) (a) 4 ploughings, 1 digging and levelling. (b) Transplanted. (c) —. (d) 10'×6'. (e) 3 to 4. (v) Nil. (vi) PTB—2 (medium). (vii) Unirrigated. (viii) Weeding. (ix) 69°. (x) 16.10.1955.

2. TREATMENTS :

- (1) No G.L.
 - (2) Wild rubber leaf at 6000 lb./ac.
 - (3) *Sesbania* leaf at 6000 lb./ac.
- A/S at 30 lb./ac as top dressing to all treatments one month after planting. G.L. applied as basal at the time of ploughing.

3. DESIGN :

- (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 15'×10'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Preventive dusting of B.H.C. (iii) Grain yield. (iv) (a) 1954 (1st crop)—1955 (1st crop). (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1816 lb./ac. (ii) 135 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	1679	1849	1919
	S.E./mean =48 lb./ac.		

Crop :- Paddy (1st crop).

Ref :- K. 57(56).

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

Type :- 'M'.

Object :- To study the response of G.M. and A/S alone and in combination.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 16.5.1957/26.6.1957. (iv) (a) 6 ploughings and 3 diggings. (b) Planting in lines. (c) —. (d) 10' x 6". (e) 3 to 4. (v) Nil. (vi) PTB-2 (improved). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 85". (x) 17.10.1957.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of G.M. : $L_1=2000$, $L_2=5000$ and $L_3=8000$ lb./ac.(2) 3 levels of N as A/S : $N_1=60$, $N_2=120$ and $N_3=180$ lb./ac.

G M. applied at the time of puddling as B.D. and A/S in two equal doses 20 and 40 days after planting.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 15' x 25'. (v) Nil. 2' inter space between plots (vi) Yes.

4. GENERAL :

(i) Normal. (ii) B.H.C. dusted against case worms. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2593 lb./ac. (ii) 342 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	L_1	L_2	L_3	Mean
N_1	2670	2497	2673	2614
N_2	2835	2604	2692	2710
N_3	2352	2450	2563	2455
Mean	2619	2517	2643	2593

S.E. of any marginal mean

= 99 lb./ac.

S.E. of body of table

= 171 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 57(57).

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

Type :- 'M'.

Object :- To study the response of G.M. and A/S alone and in combination.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 3.9.1957/1.11.1957. (iv) (a) 4 ploughings and 4 diggings. (b) Planting in lines. (c) —. (d) 10' x 6". (e) 3 to 4. (v) Nil. (vi) PTB-20 (improved). (vii) Unirrigated. (viii) One hand weeding a month after planting. (ix) 19.97". (x) 15.2.1958.

2. TREATMENTS :

Same as in expt. no. 56 above.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 15' x 25'. (v) Nil. 2' inter space between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Folidol sprayed against stemborer. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1763 lb./ac. (ii) 247 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	L ₁	L ₂	L ₃	Mean
N ₁	1606	1813	2040	1820
N ₂	1675	1766	1982	1808
N ₃	1644	1717	1623	1661
Mean	1642	1765	1882	1763

S.E. of any marginal mean = 71 lb./ac.
S.E. of body of table = 124 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 58(58).

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

Type :- 'M'.

Object :-To study the effect of response of G.M. and A/S alone and in combination.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 5.5.1958/23.6.1958. (iv) (a) 6 puddlings and 3 levellings. (b) Transplanting in lines. (c) —. (d) 10"×6". (e) 1. (v) Nil. (vi) PFB-2 (improved). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) About 90°. (x) 23.10.1958.

2. TREATMENTS :

Same as in expt. no. 56 on page 39.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) 135'×25' (iii) 4. (iv) 15'×25'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2162 lb./ac. (ii) 207 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	L ₁	L ₂	L ₃	Mean
N ₁	2024	2078	2247	2116
N ₂	2267	2026	2293	2195
N ₃	2195	2127	2199	2174
Mean	2162	2077	2246	2162

S.E. of any marginal mean = 60 lb./ac.
S.E. of body of table = 104 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 58(59).

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

Type :- 'M'.

Object :—To study the response of G.M. and A/S alone and in combination.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 17.9.1958/6.11.1958. (iv) (a) 6 paddlings and 3 levellings. (b) Transplanting in lines. (c) —. (d) 10'×6'. (e) 2. (v) Nil. (vi) PTB—20 (improved). (vii) Unirrigated. (viii) One weeding month after planting. (ix) 15°. (x) 19.2. 1959.

2. TREATMENTS :

Same in the expt. no. 56 on page 39.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 15'×25'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) yield of grain and straw. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1708 lb./ac. (ii) 139 lb./ac. (iii) Main effects of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	L ₁	L ₂	L ₃	Mean
N ₁	1499	1648	1667	1605
N ₂	1621	1676	1712	1670
N ₃	1896	1811	1839	1849
Mean	1672	1712	1739	1708

S.E. of any marginal mean =40 lb./ac.
S.E. of body of table =70 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 59(60).

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

Type :- 'M'.

Object :—To study the response of G.M. and A/S alone and in combination.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 3.5.1959/25.6.1959. (iv) (a) to (e) N.A. (v) Nil. (vi) PTB—2. (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 109.8°. (x) 24.10.1959.

2. TREATMENTS :

Same as in expt. no. 56 on page 39.

G.M. applied as B.D. and A/S in two equal doses 30 and 45 days after planting.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 25'×15'. (v) No. only inter space of 2' between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) B.H.C. dusted against case worms. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1316 lb./ac. (ii) 293.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac

	L ₁	L ₂	L ₃	Mean
N ₁	1258	1396	1532	1395
N ₂	1359	1201	1243	1268
N ₃	1405	1025	1427	1286
Mean	1341	1207	1401	1316

S.E. of any marginal mean = 84.7 lb./ac.
S.E. of body of table = 146.8 lb./ac.

Crop :- Paddy (2nd crop).

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

Ref :- K. 59 (61).

Type :- 'M'.

Object :- To study the response of G.M. and A/S alone and in combination.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 26.9.1959/9.11.1959. (iv) (a) to (e) N.A. (v) Nil. (vi) PTB-20 (medium). (vii) Unirrigated. (viii) One weeding. (ix) 3.56". (x) 23.2.1960.

2. TREATMENTS:

Same as in expt. no. 56. on page 39.

G.M. applied as B.D. and A/S in two equal doses 30 and 45 days after planting.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 25' x 15'. (v) No. Only an inter space of 2' left between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) B.H.C. dusted against case worm. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1337 lb./ac. (ii) 231.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	L ₁	L ₂	L ₃	Mean
N ₁	1377	1247	1355	1326
N ₂	1310	1295	1412	1339
N ₃	1356	1296	1390	1347
Mean	1348	1279	1385	1337

S.E. of any marginal mean = 66.8 lb./ac.
S.E. of body of table = 115.7 lb./ac.

Crop :- Paddy (1st crop).

Site :- Agri Res. Stn., Pattambi.

Ref :- K. 58(62).

Type :- 'M'.

Object :- To compare the effect of giving *Dhaincha* along with Paddy and trampling it later with application of G.L. brought from outside.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L. + 30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 15.4.1958. (iv) (a) 8 to 10 ploughings. (b) Broadcast. (c) Paddy—80 lb./ac. *Dhaincha*—45 lb./ac. (d) and (e) —. (v) Wood ash at 1000 lb./ac. by broadcasting. (vi) PTB-25 (improved). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 89.69". (x) 13.8.1958.

2. TREATMENTS :

1. Broadcasting a mixture of Paddy and *dhaincha* and later on trampling in *dhaincha*.
2. Broadcasting Paddy and applying *gliricidia* leaves brought from outside equal to *dhaincha*.
3. Applying 2500 lb./ac. of *gliricidia* leaves before broadcasting Paddy.
4. Local practice of broadcasting paddy.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) 60'×25'. (iii) 6. (iv) (a) N.A. (b) 15'×25'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) This expt. has been conducted in clayey area.

5. RESULTS :

- (i) 634 lb./ac. (ii) 114 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4
Av. yield	606	5	773	575

S.E./mean = 47 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 58(63).

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

Type :- 'M'.

Object :- To compare the effect of sowing *Dhaincha* along with Paddy and trampling it later with application of G.L. brought from outside.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L. +30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 15.4.1958. (iv) (a) 8 to 10 ploughings. (b) Broadcast. (c) Paddy—80 lb./ac. *dhaincha*—45 lb./ac. (d) and (e) —. (v) Wood ash applied at 1000 lb./ac. (vi) PTB-25 (improved). (vii) Unirrigated. (viii) One weeding a month after sowing. (ix) 89.69°. (x) 11.8.1958.

2. TREATMENTS :

Same as in expt. no. 62 above.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) 100'×15'. (iii) 6. (iv) (a) N.A. (b) 15'×25'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) No. (v) (a) and (b) Nil. (vi) Nil. (vii) This expt. has been conducted in sandy area.

5. RESULTS :

- (i) 813 lb./ac. (ii) 61 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4
Av. yield	797	786	884	786

S.E./mean = 25 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 59(64)

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

Type :- 'M'.

Object :- To compare the effect of sowing *Dhaincha* along with Paddy and trampling it later with application of G.L. brought from outside.

1. BASAL CONDITIONS :

- (i) (a) No. (b) Paddy. (c) G.L. at 4000 lb./ac. + A/S at 1000 lb./ac. as top dressing. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 12.5.1959. (iv) (a) Six puddlings and 4 levellings. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Ash applied at 1000 lb./ac. (vi) PTB—25 (medium). (vii) Unirrigated. (viii) N.A. (ix) 10.98°. (x) 24.8.1959.

2. TREATMENTS :

Same as in expt. no. 62 on page 43.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 25'×15'. (v) An inter space of 1½ left between plots as border. No guard rows left. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 505.7 lb./ac. (ii) 81.1 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4
Av. yield	426.5	506.8	602.1	487.3

S.E./mean = 33.11 lb./ac.

Crop :- Paddy (1st crop).

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

Ref :- K. 57(65).

Type :- 'M'.

Object :- To find out the effect of applying continuously A/S and G.L. alone and in combination.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) G.L. at 8000 lb. at the time of ploughing+50 lb./ac. of A/S one month after planting. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (ii) 8.5.1957./10.6.1957. (iv) (a) 6 puddlings and 3 diggings. (b) Transplanting. (c) —. (d) 6"×10". (e) 3 to 4. (v) Nil. (vi) PTB 20—improved—135 days. (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 85.75". (x) 15.10.1957.

2. TREATMENTS :

1. G.L. at 30 lb./ac. of N.
2. G.L. at 60 lb./ac. of N.
3. G.L. at 30 lb./ac. of N+A/S at 15 lb./ac. of N.
4. A/S at 30 lb./ac. of N.
5. A/S at 60 lb./ac. of N.

G.L. applied as B.D. at the time of puddling. A/S top dressed one month after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 15'×20'. (v) 2' inter space between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) B.H.C. dusted against case worms. (iii) Grain yield. (iv) (a) 1957—contd. (b) and (c) Yes. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3161 lb./ac. (ii) 124 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5
Av. yield	3173	3149	3157	3166	3160

S.E./mean = 51 lb./ac.

Crop :- Paddy (2nd crop).

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

Ref :- K. 57(66).

Type :- 'M'.

Object :- To find out the effect of applying continuously A/S and G.L. alone and in combination.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatment. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 9.9.1957/30.10.1957. (iv) (a) 4 ploughings and 4 diggings. (b) Planting in lines. (c) —. (d) 6' x 10'. (e) 3 to 4. (v) Nil. (vi) PTB-20 (Medium improved). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 19.97%. (x) 12.2.1958.

2. TREATMENTS :

Same as in expt. no. 65 on page 44.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 15' x 20'. (v) Nil; 2' inter space between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Folidol sprayed against stemborer. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1875 lb./ac. (ii) 259 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5
Av. yield	1580	1774	1974	2051	1996

S.E./mean = 106 lb./ac.

Crop :- Paddy (1st crop).

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

Ref :- K. 58(67).

Type :- 'M'.

Object :- To find out the effect of applying continuously A/S and G.L. alone and in combination.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 23.4.1958/9.6.1958. (iv) (a) 6 ploughings and 8 levellings. (b) Transplanting in lines. (c) —. (d) 10' x 6". (e) 2. (v) Nil. (vi) PTB-2 (improved). (vii) Unirrigated. (viii) One weeding one month after planting. (ix) 77.35%. (x) 10.10.1958.

2. TREATMENTS :

Same as in expt. no. 65 on page 44.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 15' x 20'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2510 lb./ac. (ii) 229 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5
Av. yield	2311	2707	2556	2462	2514

S.E./mean = 93 lb./ac.

Crop :- Paddy (2nd crop).
Site :- Agri. Res. Stn., Pattambi.

Ref :- K. 58(68).
Type :- 'M'.

Object :—To find out the effect of applying continuously A/S and G.L. alone and in combination.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 19.9.1958/3.11.1958. (iv) (a) 6 puddlings and 3 levellings. (b) Transplanted in lines. (c) —. (d) 10"×6". (e) 2. (v) Nil. (vi) PTB-20 (improved). (vii) Unirrigated. (viii) One weeding one month after planting. (ix) 15". (x) 17.2.1959.

2. TREATMENTS :

Same as in expt no. 65 on page 44.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 75'×20'. (iii) 6. (iv) (a) and (b) 15'×20'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1201 lb./ac. (ii) 149 lb./ac. (iii) Treatments are not significantly different. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5
Av. yield	1137	1229	1185	1149	1305

S.E./mean = 61 lb./ac.

Crop :- Paddy (1st crop).
Site :- Agri. Res. Stn., Pattambi.

Ref :- K. 59(69).
Type :- 'M'.

Object :—To find out the effect of applying continuously A/S and G.L. alone and in combination.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 3.5.1959/20.6.1959. (iv) (a) to (e) N.A. (v) N.A. (vi) PTB—20 (medium). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 109.8". (x) 14.10.1959.

2. TREATMENTS :

Same as in expt. no. 65 on page 44.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 20'×15'. (v) No. 2' left between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) B.H.C. dusted against caseworm. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2251 lb./ac. (ii) 221.0 lb./ac. (iii) Treatments differ significantly. (iv) Av. yield of grain in lb./ac.

Treatment :	1	2	3	4	5
Av. yield	2154	2565	2201	2100	2235

S.E./mean = 90.2 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 59(70).

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

Type :- 'M'.

Object :-To find out the effect of applying continuously A/S and G.L. alone and in combination.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 10.9.1959/27.10.1959. (iv) (a) to (e) N.A. (v) N.A. (vi) PTB-20 (medium). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 35.63°. (x) 9.2.1960.

2. TREATMENTS :

Same as in expt. no. 65 on page 44.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 20' x 15'. (v) 2' between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) B.H.C. dusted against caseworm. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1698 lb./ac. (ii) 157.3 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5
Av. yield	1537	1710	1709	1675	1860

S.E./mean = 64.2 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 56(71).

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

Type :- 'M'.

Object :-To compare the effect of different phosphatic manures along with G.L. and A/S on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L.+30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 19.5.1956/20.6.1956. (iv) (a) 6 puddlings and 3 levellings. (b) Transplanting. (c) —. (d) 10" x 4". (e) 4. (v) *Gliricidia* at 5000 lb./ac. (vi) PTB-2 (improved). (vii) Unirrigated. (viii) One weeding one month after planting. (ix) 80°. (x) 18.10.1956.

2. TREATMENTS :

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

(1) 4 levels of P_2O_5 : $P_1=15$, $P_2=30$, $P_3=45$ and $P_4=60$ lb./ac.

(2) 3 sources of P_2O_5 : $S_1=$ Super, $S_2=$ Hyper and $S_3=$ Di-calcium phosphate.

(3) 3 levels of N as A/S : $N_1=30$, $N_2=45$, and $N_3=60$ lb./ac.

3 extra treatments : $T_1=30$, $T_2=45$ and $T_3=60$ lb./ac. of N.

P_2O_5 applied on 20.6.1956 and A/S top dressed one month after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 39. (b) 150' x 72'. (iii) 4. (iv) (a) N.A. (b) 30' x 8'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 3713 lb./ac. (ii) 228.6 lb./ac. (iii) None of the effects is significant. (v) Av. yield of grain in lb./ac.

$T_1=3482$ lb./ac., $T_2=3755$ lb./ac. and $T_3=3687$ lb./ac.

	P ₁	P ₂	P ₃	P ₄	Mean	N ₁	N ₂	N ₃
S ₁	3736	3732	3709	3743	3730	3695	3752	3743
S ₂	3645	3785	3683	3751	3716	3729	3763	3655
S ₃	3717	3672	3751	3706	3712	3607	3741	3786
Mean	3699	3730	3713	3733	3719	3677	3752	3728
N ₁	3679	3622	3672	3732				
N ₂	3713	3831	3758	3706				
N ₃	3705	3736	3709	3762				

S.E. of N or S marginal mean = 32.99 lb./ac.
 S.E. of P marginal mean = 38.10 lb./ac.
 S.E. of T marginal mean = 114.30 lb./ac.
 S.E. of body of S×P or N×P tables = 65.99 lb./ac.
 S.E. of body of N×S table = 57.15 lb./ac.

Crop :- Paddy (2nd Crop).

Ref :-K. 56(72).

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

Type :- 'M'.

Object :- To compare the effects of different phosphatic manures along with G.L. and A/S on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 21.9.1956/31.10.1956. (iv) (a) 6 puddlings and 3 levellings. (b) Transplanting in lines. (c) —. (d) 10'×6'. (e) 2. (v) 5000 lb./ac. of G.L. (vi) PTB-20 (improved). (vii) Unirrigated. (viii) One weeding. (ix) 2.62'. (x) 31.1.1957.

2. TREATMENTS :

Same as in expt. no. 71 on page 47.

3. DESIGN :

(i) R.B.D. (ii) (a) 39. (b) 36'×325'. (iii) 4. (iv) (a) N.A. (b) 12'×25'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) In the analysis extra treatments are excluded and error is based on 105 d.f.

5. RESULTS :

(i) 2267 lb./ac. (ii) 184 lb./ac. (iii) Only main effect of S₁s significant. (iv) Av. yield of grain in lb./ac.

$T_1=2195$ lb./ac., $T_2=2304$ lb./ac. and $T_3=2396$ lb./ac.

	P ₁	P ₂	P ₃	P ₄	Mean	N ₁	N ₂	N ₃
S ₁	2305	2154	2136	2299	2224	2178	2296	2196
S ₂	2226	2220	2220	2305	2243	2232	2251	2246
S ₃	2353	2287	2317	2347	2326	2282	2310	2387
Mean	2295	2220	2224	2317	2264	2231	2286	2276
N ₁	2311	2124	2190	2299				
N ₂	2311	2257	2220	2353				
N ₃	2263	2281	2263	2299				

S.E. of marginal mean of S or N	=26.6 lb./ac.
S.E. of marginal mean of P	=30.7 lb./ac.
S.E. of body of P×S or P×N table	=53.2 lb./ac.
S.E. of body of N×S table	=46.0 lb./ac.
S.E. of extra treatment mean	=92.0 lb./ac.

Crop :- Paddy (1st. crop).

Ref :- K. 57(73)

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

Type :- 'M'.

Object :- The compare the effects of different phosphatic manures along with G.L. and A/S on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 11.5.1957/5.7.1957. (iv) (a) 4 ploughings and 4 diggings. (b) Planting in lines. (c) —. (d) 10"×6". (e) 3 to 4. (v) 5000 lb./ac. of G.L. at the time of puddling. (vi) PTB-2 (improved). (vii) Unirigated. (viii) One weeding before top dressing. (ix) 84.69%. (x) 14.10.1957.

2. TREATMENTS :

Same as in expt. no. 71 on page 47.

3. DESIGN :

(i) R.B.D. (ii) (a) 39. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 12'×25'. (v) Nil ; inter space 2' between plots. (vi) Yes.

4. GENERAL .

(i) Normal. (ii) B.H.C. dusted against case worm. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2747 lb./ac. (ii) 245 lb./ac. (iii) Interaction N×P alone is significant. T effect is highly significant.. (iv) Av. yield of grain in lb./ac.

$T_1=2325$ lb./ac., $T_2=2822$ lb./ac. and $T_3=2786$ lb./ac.

	P ₁	P ₂	P ₃	P ₄	Mean	N ₁	N ₂	N ₃
S ₁	2658	2767	2747	2841	2753	2707	2730	2823
S ₂	2710	2742	2706	2809	2742	2652	2755	2818
S ₃	2694	2766	2818	2811	2772	2718	2814	2785
Mean	2687	2758	2757	2821	2756	2692	2766	2809
N ₁	2707	2718	2716	2729				
N ₂	2654	2636	2836	2939				
N ₃	2802	2921	2719	2794				

S.E. of marginal mean of S or N	= 35 lb./ac.
S.E. of marginal mean of P	= 41 lb./ac.
S.E. of body of S×P or N×P table	= 71 lb./ac.
S.E. of body of S×N table	= 61 lb./ac.
S.E. of extra treatment mean	=122 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 57(74).

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

Type :- 'M'.

Object :- To compare the effects of different phosphatic manures along with G.L. and A/S on Paddy.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 11.5.1956/5.7.1957. (iv) (a) 4 ploughings and 4 diggings. (b) Planting in lines. (c) —. (d) 10'×6'. (e) 3 to 4. (v) 5000 lb./ac. of G.L. at the time of puddling. (vi) PTB-2 (improved). (vii) Unirrigated. (viii) One weeding one month after planting. (ix) 19.97%. (x) 19.2.1958.

2. TREATMENTS :

Same as in expt. no. 71 on page 47.

3. DESIGN :

- (i) R.B.D. (ii) (a) 39. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 12'×25'. (v) Nil ; interspace of 2' between plots. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) Folidol sprayed against stemborer. (iii) Grain yield. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2063 lb./ac. (ii) 213 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

$T_1=1840$ lb./ac., $T_2=2051$ lb./ac. and $T_3=1990$ lb./ac.

	P ₁	P ₂	P ₃	P ₄	Mean	N ₁	N ₂	N ₃
S ₁	2148	1953	2027	2080	2052	1968	2091	2097
S ₂	1984	1956	2120	2099	2040	1950	2054	2116
S ₃	2080	2075	2185	2154	2123	2074	2118	2178
Mean	2071	1995	2110	2111	2072	1997	2088	2130
N ₁	1925	1966	2004	2094				
N ₂	2162	1995	2066	2127				
N ₃	2124	2023	2261	2112				

S.E. of marginal mean of S or N = 30.7 lb./ac.
 S.E. of marginal mean of P = 35.5 lb./ac.
 S.E. of body of N×P or S×P table = 61.4 lb./ac.
 S.E. of body of N×S table = 53.3 lb./ac.
 S.E. of extra treatment mean = 106.5 lb./ac.

Crop :- Paddy (1st Crop).

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

Ref :-K. 58(75)

Type :- 'M'.

Object :-To compare the effects of different phosphatic manures along with G.L. and A/S on Paddy.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 23.4.1958/7.6.1958. (iv) (a) 6 puddlings and 3 levellings. (b) Transplanting in lines. (c) —. (d) 10'×6'. (e) 2. (v) 5000 lb./ac. G.L. at the time of puddling. (vi) PTB-2 (improved). (vii) Unirrigated. (viii) One weeding. (ix) 77.35%. (x) 13.10.1958.

2. TREATMENTS :

Same as in expt. no 71 on page 47.

3. DESIGN :

(i) R.B.D. (ii) (a) 39. (b) 75'×156'. (iii) 4. (iv) (a) N.A. (b) 12'×25'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 2736 lb./ac. (ii) 215 lb./ac. (iii) Main effect of N is significant and extra treatments vs. others is significant. All others are not significant. (iv) Av. yield of grain in lb./ac.

$T_1=2668$ lb./ac., $T_2=2669$ lb./ac. and $T_3=2491$ lb./ac.

	P ₁	P ₂	P ₃	P ₄	Mean	N ₁	N ₂	N ₃
S ₁	2802	2702	2736	2754	2748	2626	2849	2770
S ₂	2880	2737	2669	2634	2730	2673	2713	2804
S ₃	2697	2795	2798	2762	2763	2738	2761	2793
Mean	2793	2745	2734	2717	2747	2679	2774	2788
N ₁	2704	2736	2692	2585				
N ₂	2846	2764	2780	2707				
N ₃	2831	2735	2730	2858				

S.E. of marginal mean of S or N

= 31 lb./ac.

S.E. of marginal means of P

= 36 lb./ac.

S.E. of body of S×P or N×P table

= 62 lb./ac.

S.E. of body of S×N table

= 54 lb./ac.

S.E. of extra treatment mean

= 107.5 lb./ac.

Crop :- Paddy (2nd Crop).

Ref :- K. 58(76)

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

Type :- 'M'.

Object :- To compare the effects of different phosphatic manures along with G.L. and A/S on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 17.9.1958/26.10.1958. (iv) (a) 6 puddlings and 3 levellings. (b) Transplanted in lines. (c) —. (d) 10'×6". (e) 2. (v) Nil. (vi) PTB-20 (improved, medium). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) N.A. (x) 11.2.1959.

2. TREATMENTS :

Same as in expt. no. 71 on page 47.

3. DESIGN :

(i) R.B.D. (ii) (a) 39. (b) 75'×156'. (iii) 4. (iv) (a) and (b) 12'×25'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 1485 lb./ac. (ii) 171 lb./ac. (iii) Interaction N×P is significant, N×S and N×S×P are highly significant and others are not significant. (iv) Av. yield of grain in lb./ac.

$T_1=1361$ lb./ac., $T_2=1552$ lb./ac. and $T_3=1588$ lb./ac.

	P ₁	P ₂	P ₃	P ₄	Mean	N ₁	N ₂	N ₃
S ₁	1501	1498	1501	1495	1499	1396	1551	1549
S ₂	1433	1458	1511	1461	1466	1544	1406	1447
S ₃	1513	1473	1536	1422	1486	1503	1441	1514
Mean	1483	1476	1516	1459	1484	1481	1466	1503
N ₁	1418	1471	1571	1465				
N ₂	1522	1399	1545	1397				
N ₃	1508	1559	1432	1515				

S.E. of N or S marginal mean =24.7 lb./ac.
 S.E. of P marginal mean =28.5 lb./ac.
 S.E. of body of N×P or S×P table =49.4 lb./ac.
 S.E. of body of N×S table =42.7 lb./ac.
 S.E. of extra treatment mean =85.5 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 59(77).

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

Type :- 'M'.

Object :- To compare the effect of P₂O₅ and K₂O, when applied in nursery and in transplanted fields, in inducing resistance to pests and diseases.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) G.L. at 4000 lb./acre+100 lb./ac. of A/S as top dressing. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 17.6.1959. (iv) (a) 6 puddlings and 4 levellings. (b) to (e) N.A. (v) N.A. (vi) PTB-2 (medium). (vii) Unirrigated. (viii) N.A. (ix) 10.98°. (x) 2.11.1959.

2. TREATMENTS :

Main-plot treatments :

2 times of applying manures : T₁=At transplanting and T₂=In nursery.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of Super : P₀=0 and P₁=150 lb./ac.

(2) 2 levels of Pot. Sul : K₀=0 and K₁=100 lb./ac.

5000 lb./ac. of G.L. applied in all the plots.

3. DESIGN :

(i) Split-plot. (i) (a) 2 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 20'×10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1952--N.A. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1452 lb./acre. (ii) (a) 160.6 lb./ac. (b) 137.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	K ₀	K ₁	Mean	P ₀	P ₁
T ₁	1620	1399	1510	1486	1533
T ₂	1363	1422	1393	1291	1494
Mean	1492	1411	1452	1389	1514
P ₀	1390	1387			
P ₁	1593	1434			

S.E. of difference of two

- | | |
|--|----------------|
| 1. T marginal means | =56.79 lb./ac. |
| 2. K or P marginal means | =48.58 lb./ac. |
| 3. K or P means at the same level of T | =68.70 lb./ac. |
| 4. T means at the same level of K or P | =74.72 lb./ac. |

Crop :- Paddy (2nd Crop).

Ref :- K 59(78).

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

Type :- 'M'.

Object :- To compare the effect of P₂O₅ and K₂O, when applied in nursery and in transplanted field, in inducing resistance to pests and diseases.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) G.L. at 4000 lb./ac. and 100 lb./ac. of A/S as top dressing. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 30.9.1959. (iv) (a) Six puddings and 4 levellings. (b) to (e) N.A. (v) N.A. (vi) PTB-20. (medium) (vii) Unirrigated. (viii) N.A. (ix) 3.56". (x) 15.2.1960.

2. TREATMENTS :

Same as in expt. no. 77 on page 52.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 20' x 10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Weights of grain of individual plots. (iv) (a) 1959-N.A. (b) and (c) —. (v) (a) and (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1313 lb./ac. (ii) (a) 167.2 lb./ac. (b) 130.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	K ₀	K ₁	Mean	P ₀	P ₁
T ₁	1355	1412	1384	1402	1366
T ₂	1245	1237	1242	1208	1275
Mean	1300	1325	1313	1305	1321
P ₀	1322	1288			
P ₁	1279	1362			

S.E. of difference of two

- | | |
|--|----------------|
| 1. T marginal means | =59.12 lb./ac. |
| 2. K or P marginal means | =45.97 lb./ac. |
| 3. K or P means at the same level of T | =65.00 lb./ac. |
| 4. T means at the same level of K or P | =74.80 lb./ac. |

Crop :- Paddy (1st crop).
Site :- Agri. Res. Stn., Taliparamba.

Ref :- K. 54(97).
Type :- 'M'.

Object :- To find out the effect of continuous application of A/S to Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) G.L. at 4000 lb./ac. + Super at 100 lb./ac. + A/S at 100 lb./ac. (ii) (a) Laterite soils. (b) Refer soil analysis, Taliparamba. (iii) 12.5.1954/24.6.1954. (iv) (a) 4 ploughings. (b) Planting in lines. (c) —. (d) 10" x 4". (e) 2. (v) Nil. (vi) PTB-9 (late). (vii) Unirrigated. (viii) 3 weedings. (ix) 151.63". (x) 5.10.1954.

2. TREATMENTS :

(1) No manure.
(2) 5000 lb./ac. of G.L.
(3) 5000 lb./ac. of G.L. + 150 lb./ac. of A/S.
G.L. applied at the time of puddling. A/S top dressed in two doses 3 weeks and 7 weeks after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 15' x 24'. (v) Nil. (vi) No. Expt. appears to be defective.

4. GENERAL :

(i) Satisfactory. (ii) Case-worm and paddy bug attack. Dusting with 10% B.H.C. (iii) Grain yield. (iv) (a) 1954-1957 (No second crop raised in these plots). (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2319 lb./ac. (ii) 186.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatments	1	2	3
Av. yield*	2023	2303	2632
S.E./mean	=66.0 lb./ac.		

Crop :- Paddy.
Site :- Agri. Res. Stn., Taliparamba.

Ref :- K. 55(80).
Type :- 'M'.

Object :- To find out the effect of continuous application of A/S to Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Gravelly laterite. (b) Refer soil analysis, Taliparamba. (iii) 9.5.1955/11.6.1955. (iv) (a) 6 ploughings and levelling. (b) Transplanting in lines. (c) —. (d) 10" x 4". (e) 2. (v) Nil. (vi) PTB-9 (medium, improved). (vii) Unirrigated. (viii) One weeding a month after planting. (ix) 80". (x) 5.10.1955.

2. TREATMENTS :

(1) No manure.
(2) G.L. at 5000 lb./ac. as B.D.
(3) G.L. at 5000 lb./ac. as B.D. + A/S at 150 lb./ac.
A/S applied one month after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 2. (iv) (a) and (b) N.A. (10 cents for the whole expt.). (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1954-1957 (no second crop raised). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Raw data N.A.

5. RESULTS :

(i) 2750 lb./ac. (ii), (iii) N.A. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	2531	2650	3069

S.E./mean—N.A.

Crop :- Paddy.

Ref :- K. 57(81).

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

Type :- 'M'.

Object :- To find out the effect of continuous application of A/S to Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite. (b) Refer soil analysis, Taliparamba. (iii) 4.5.1957/21.6.1957. (iv) (a) 3 to 4 ploughings. (b) Planting in lines. (c) —. (d) 10"×4". (e) N.A. (v) 4000 lb./ac. of G.L. at ploughing, 115 lb./ac. of Super before planting and 100 lb./ac. of A/S top dressed in two doses, 3 weeks and 7 weeks after planting. (vi) PTB-9 (improved). (vii) Unirrigated. (viii) 2 weedings and 1 rouging. (ix) 128.5". (x) 4.10.1957.

2. TREATMENTS :

1. No manure.
2. 5000 lb./ac. of G.L. alone at the time of ploughing.
3. 5000 lb./ac. of G.L. + 150 lb./ac. of A/S top dressed in two doses 3 weeks and 7 weeks after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/125 acre. (v) Nil. (vi) No.

4. GENERAL :

(i) Better growth under treatment (3). (ii) Slight attack of leaf roller line winnowing was done to control. (iii) Grain yield. (iv) (a) 1954—1957 (no 2nd crop raised). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2712 lb./ac. (ii) N.A. (iii) N.A. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	2575	2700	2862

S.E./mean—N.A.

Crop :- Paddy (1st crop).

Ref :- K. 59(82).

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

Type :- 'M'.

Object :- To find out the effect of potash on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L. as B.D. + 112 lb./ac. A/S + 112 lb./ac. of Super top dressed one month after planting. (ii) (a) Laterite Gravelly. (b) Refer soil analysis, Taliparamba. (iii) 29.4.1959/6.6.1959. (iv) (a) 6 ploughings and levellings. (b) Transplanting in lines. (c) —. (d) 10"×4". (e) 2. (v) 5000 lb./ac. of G.L. + 15 lb./ac. of A/S + 150 lb./ac. of Super. (vi) PTB-9 (improved). (vii) Unirrigated. (viii) One or two weedings at an interval of one month from planting. (ix) 80". (x) 5.10.1959.

2. TREATMENTS :

6 levels of K₂O as Pot.Sul. : K₀=0, K₁=30, K₂=50, K₃=70, K₄=90 and K₅=110 lb./ac.
Pot.Sul. applied at planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 25'×50'. (iii) 6. (iv) (a) and (b) 25'×7'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Rice bug attack. Dusting with B.H.C. 5%. (iii) Grain and straw yield. (iv) (a) 1959 —contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 3115 lb./ac. (ii) 171 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	K ₀	K ₁	K ₂	K ₃	K ₄	K ₅
Av. yield	3100	3007	3174	3122	3225	3060
	S.E./mean		=70 lb./ac.			

Crop :- Paddy.

Ref :- K. 59(83).

Site :- Agri. College and Res. Institute, Vellayani.

Type :- 'M'.

Object:—To study the effect of application of green and dry G.M. crops on Paddy crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) N.A. (b) Yes. (iii) 22.10.1959. (iv) (a) 6 ploughings and 2 diggings with *mummatty*. (c) —. (d) and (e) N.A. (v) Super at 2.5 lb./plot, Pot. Sul. at 0.8 lb./plot. and fully burnt lime at 25 lb./plot broadcast on 25.10.1959. (vi) Cochin I. (vii) Irrigated. (viii) One weeding. (ix) N.A. (x) 27.1.1960.

2. TREATMENTS:

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

(1) 3 sources of N as G.M. : S₁ = *Glyricidia*, S₂ = *Indigo fera* and S₃ = *Eupatorium*.

(2) 2 forms of G.M. : M₁ = Green and M₂ = Dry.

The % of moisture in G.M. was found to be 75%. Hence the application of 25 lb./ac. of dried matter is equivalent to 100 lb./ac. of G.M.

3. DESIGN:

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 16'×31'. (b) 15'×30'. (v) Two rows left on each side as border at the time of harvest. (vi) Yes.

4. GENERAL:

(i) No severe lodging excepts in S₃M₁ plot on 20.1.1960. (ii) At the time of transplanting, the seedlings were dipped in 1% D.D.T., 50% to kill all the larvae lodging on it. There were the egg masses of Paddy stem borer "*Schinobens incertillus*" on the leaves. These were hand picked and destroyed. Two sprayings of D.D.T. 50% were given in the early stages of growth. No other pest attack was observed. There were stray cases of "Foot rot" of Paddy but not of any serious importance. (iii) Grain yield. (iv) (a) and (b) (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) N.A.

5. RESULTS:

(i) 1638 lb./ac. (ii) 228.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	Control =1710 lb./ac.			Mean
	S ₁	S ₂	S ₃	
M ₁	1736	1440	1636	1604
M ₂	1512	1697	1735	1648
Mean	1624	1568	1686	1626

S.E. of S marginal mean = 80.8 lb./ac.

S.E. of N marginal mean = 66.0 lb./ac.

S.E. of body of table = 114.3 lb./ac.

Crop :- Paddy (1st crop).

Ref. :- K. 57(84).

Site :- Agri. College and Res. Institute, Vellayani.

Type :- 'M'.

Object :- To study the relative efficiencies of Hyper Phos. and B.M. with and without N.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 30.1.1958. (iv) (a) Land was spaded and weeds are moved. (b) Sprouted seed were broadcast and covered by hand. (c) 64 lb./ac. (d) and (e) —. (v) Nil. (vi) *Kochavittu*, (local, early). (vii) Irrigated. (viii) Weeding done before applying manure. (ix) 2.37". (x) 4.5.1957.

2. TREATMENTS :

All combinations of (1), (2) and (3) + a control

(1) 2 sources of P_2O_5 : P_1 =Hyper Phos. and P_2 =B.M.(2) 2 levels of P_2O_5 : L_1 =30 and L_2 =49 lb./ac.(3) 2 levels of N as A/S : N_0 =0 and N_1 =30 lb./ac.

Manures applied as B.D. 3 to 4 days before sowing and mixed with the soil by spreading evenly one month after sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 84' x 20'. (v) Nil ; 1.5' bund between plots. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 3052 lb./ac. (ii) 474 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 3065 lb./ac.

	P_1	P_2	Mean	L_1	L_2
N_0	3086	3099	3092	2968	3217
N_1	2942	3076	3009	2898	3119
Mean	3014	3087	3050	2933	3168
L_1	3047	2819			
L_2	2981	3355			

S.E. of P, L or N marginal means = 106 lb./ac.
S.E. of body of any table = 150 lb./ac.

Crop :- Paddy.

Ref :- K. 57(85)

Site :- Agri. College and Res. Institute, Vellayani.

Type :- 'M'.

Object :- To study the relative efficiencies of Hyper Phos. and B.M. with and without N.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Alluvial Soil. (b) N.A. (iii) 1.2.1957. (iv) (a) Digging once and levelling. (b) Broadcast. (c) 80 to 100 lb./ac. (d) —. (e) —. (v) Nil. (vi) *Kochuvittu* (local, early). (vii) Irrigated. (viii) Weeding one month after sowing. (ix) N.A. (x) 4.5.1957.

2. TREATMENTS :

Same as in expt. no. 84 above.

P applied as B.D. and A/S top dressed a month after sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) Nil. (iii) 5. (iv) (a) 90'×24'. (b) 84'×20'. (v) 3' on either side of length and 2' on either side of width. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 2888 lb./ac. (ii) 455 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control=2909 lb./ac.

	P ₁	P ₂	Mean	L ₁	L ₂
N ₀	2926	2912	2919	2781	3057
N ₁	2774	2928	2851	2736	2966
Mean	2850	2920	2885	2758	3012
L ₁	2868	2649			
L ₂	2832	3191			

S.E. of of P, L or N marginal mean =102 lb./ac.

S.E. of body of any table =144 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 58(86).

Site :- Agri. College and Res. Institute, Vellayani.

Type :- 'M'.

Object :-To study the relative efficiencies of Hyper Phos. and B.M. with and without N.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) Red loam, affected by water logging, acidic with blunt black clay in bottom layers. (b) N.A. (iii) 2.3.1958. (iv) (a) One ploughing. (b) Sown by broadcast. (c) 96 lb./ac. (d) N.A. (e) N.A. (v) Nil. (vi) Kochuvittu (early, local). (vii) Irrigated. (viii) Nil. (ix) 1.86°. (x) 20.6.1958.

2. TREATMENTS :

1. B.M. at 40 lb./ac. of P₂O₅
2. Hyper Phos. at 40 lb./ac. of P₂O₅+N as A/S as much as in treatment 1. P₂O₅ as B.D. and N as top dressing one month after sowing.

3. DESIGN :

(i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 5. (iv) (a) and (b) 24'×18'. (v) Nil. (vi) No.

4. GENERAL :

(i) Healthy stand. (ii) Nil. (iii) Grain yield. (iv) (a) 1957-1958. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1784 lb./ac. (ii) 241 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2
Av. yield	1834	1735

S.E./mean =108 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 58(87).

Site :- Agri. College and Res. Institute, Vellayani.

Type :- 'M'.

Object :- To study the effect of method of application of fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Red loam, affected by water logging, acidic with blunt black clay in bottom layer. (b) N.A. (iii) 12.3.1958. (iv) (a) One ploughing. (b) Broadcast. (c) 80 to 100 lb./ac. (d) and (e) —. (v) Nil. (vi) *Kochuvittu* (local, early). (vii) Irrigated. (viii) Nil. (ix) 1.86°. (x) 20.6.1958.

2. TREATMENTS :

Main-plot treatments :

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

(1) 2 levels of N as A/S : $N_1=20$ and $N_2=40$ lb./ac.(2) 2 levels of P_2O_5 as Super : $P_1=20$ and $P_2=40$ lb./ac.(3) 2 levels of K_2O Pot. as Sul. : $K_1=20$ and $K_2=40$ lb./ac.

Sub-plot treatments :

2 methods of application : $M_1=$ Individual and $M_2=$ Pre-mixed. $\frac{1}{2}N+P+\frac{1}{2}K$ as B.D. and remaining as top dressing on 19.1.1958.

3. DESIGN :

(i) Split-plot. (ii) (a) 8 main-plots/block ; 2 sub-plots/main-plot. (b) $208' \times 33.5'$. (iii) 4. (iv) (a) $33.5' \times 13'$ (b) $31.5' \times 11'$. (v) One foot of border plants on all sides discarded. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 2747 lb./ac. (ii) (a) 343 lb./ac. (b) 298 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	N_1	N_2	Mean	M_1	M_2	K_1	K_2
P_1	2726	2754	2740	2766	2715	2758	2722
P_2	2703	2805	2754	2748	2760	2717	2791
Mean	2715	2779	2747	2757	2737	2737	2757
K_1	2677	2797	2737	2695	2779		
K_2	2752	2762	2757	2819	2695		
M_1	2728	2785	2757				
M_2	2701	2774	2737				

S.E. of difference of two

1. N, P or K marginal means = 85 lb./ac.
2. M marginal means = 74 lb./ac.
3. N, P or K means at the same level of M = 113 lb./ac.
4. M means at the same level of N, P or K = 106 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 58(88).

Site :- Agri. College and Res. Institute, Vellayani.

Type :- 'M'.

Object :- To evolve a modified Japanese method of Paddy cultivation which can be easily adapted by the cultivators.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) and (b) N.A. (iii) 2.10.1958/28.10.1958. (iv) (a) 6 ploughings. (b) Planting in lines. (c) N.A. (d) 8" spacing for Japanese method. Not uniform for local method, but approximately same as in Japanese method. (e) 3 seedlings/hole. (v) Nil. (vi) *Kochuvittu* (early). (vii) Irrigated. (viii) Two weedings. (ix) Normal. (x) 12.2.1959.

2. TREATMENTS :

1. Japanese method : Japanese nursery, 4 seedlings/hole. 5000 lb./ac. of G.L.+5 ton/ac. of compost+200 lb./ac. of Super+200 lb./ac. of A/S.
2. Local method : Japanese nursery, 40 ton of ash+5 ton of compost.
3. Modified Japanese method I : Japanese nursery, G.L. at 2000 lb./ac.+5 ton of compost+50 lb./ac. of Super+50 lb./ac. of A/S.
4. Modified Japanese method II : Japanese nursery. G.L. at 3000 lb./ac.+5 ton of compost+100 lb./ac. of Super+100 lb./ac. of A/S.
5. Modified Japanese method III : Japanese nursery. G.L. at 4000 lb./ac.+5 ton of compost+150 lb./ac. of Super+150 lb./ac. of A/S.

Japanese nursery : 3 ploughings for preparing seed bed. Broadcast seed at 15 lb./ac. A/S at 22½ lb./ac.+ Super at 18 lb./ac.+Pot. Sul. at 6 lb./ac. top dressed one week after sowing. Half dose of N, P and K applied before planting. The other half applied 4 weeks after planting as top dressing.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 45'×24'. (b) Not uniform since the spacings are not uniform. (v) Two rows around the net plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2268 lb./ac. (ii) 189 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5
Av. yield	2407	2169	2165	2312	2285

S.E./mean = 77 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 59(89).

Site :- Agri. College and Res. Institute, Vellayani.

Type :- 'M'.

Object :- To evolve a modified Japanese method of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) N.A. (b) N.A. (iii) 23.10.1959. (iv) (a) to (e) N.A. (v) 250 lbs. Cowdung. (vi) N.A. (vii) Unirrigated. (viii) Weeding. (ix) N.A. (x) 28.1.1960.

2. TREATMENTS :

5 methods of manuring : M_1 =5 tons of compost+5000 lb. of G.L.+200 lb. of A/S+200 lb. of Super (Japanese method), M_2 =5 tons of compost+40 tons of ash (Local), M_3 =5 tons of compost+2000 lb. of G.L.+50 lb. of A/S+50 lb. of Super, M_4 =5 tons of compost+3000 lb. of G.L.+100 lb. of A/S+100 of Super and M_5 =5 tons of compost+4000 lb. of G.L.+150 lb. of A/S+150 lb. of Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 45'×124'. (iii) 6. (iv) (a) 24'×45'. (b) 20'.8"×41'.8". (v) Two rows. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) There was incidence of stem borer. Spraying with D.D.T. and Basudein. (iii) Grain yield. (iv) (a) 1959—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 2449 lb./ac. (ii) 214.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	M ₁	M ₂	M ₃	M ₄	M ₅
Av. yield	2521	2079	2420	2584	2639

S.E./mean = 87.73 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K.56 (90).

Site :- Model Agronomic Exptl. Centre, Karamanai.

Type :- 'M'.

Object :- To study the most suitable time of application of N to Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) 3 ton/ac of cowdung generally applied at the time of ploughing. (ii) (a) Leterite. (b) N.A. (iii) 2.5.1956/22.6.1956. (iv) (a) 2 tractor ploughing in dry condition. One digging with local spade after an irrigation. Another digging and puddling by trampling. (b) Transplanting (c) —. (d) Rows 9" apart. (e) 4. (v) 5000 lb./ac. of compost and 20 lb./ac. of P₂O₅ as super. (vi) *Thulunadan* (medium). (vii) Irrigated. (viii) One weeding a month after transplanting. (ix) 28.82°. (x) 26.9.1956.

2. TREATMENTS:

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

(1) 2 sources of 40 lb./ac. of N : S₁=Urea and S₂=A/S.

(2) 7 times of application of N : T₁=before planting (21.6.1956), T₂=at planting (22.6.1956), T₃=at tillering (13.7.1956), T₄= $\frac{1}{2}$ before planting and $\frac{1}{2}$ at planting, T₅= $\frac{1}{2}$ at planting and $\frac{1}{2}$ at tillering, T₆= $\frac{1}{2}$ before planting, $\frac{1}{2}$ at tillering and $\frac{1}{2}$ at flowering (19.8.1956) and T₇= $\frac{1}{2}$ at planting, $\frac{1}{2}$ at tillering and $\frac{1}{2}$ at flowering.

3. DESIGN:

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) and (b) 45×22 $\frac{1}{2}$ links. (v) Nil. 1' bund between plots. (vi) Yes.

4. GENERAL:

(i) Satisfactory. No lodging. (ii) Slight sporadic attack of stem borer and rice hispa. Dusting with gammexane arranged. (iii) Grain and straw yield. (iv) (a) 1955 (2nd crop)—continued. (b) No. (c) N.A. (v) (a) Chavai and Chinnegonchal (A.P.), Barpalli and Kendrapara (Orissa), Karjat (Maharashtra), Raipur, Reura, Bagwai (M.P.), Hiragachi and Canning (W.B.), Aduthurai (Madras), Tinsukia (Assam), Ponnampet and Shimoga (Mysore). (vi) Severe drought just after flowering in August. (vii) Experiment conducted during 1955 failed.

5. RESULTS:

(i) 2369 lb./ac. (ii) 235 lb./ac. (iii) Control vs. other treatments and T effects are highly significant. Others are not significant. (iv) Av. yield of grain in lb./ac.

Control = 1800 lb./ac.								
	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	2250	2250	2425	2633	2583	2450	2333	2418
S ₂	2067	2042	2750	2658	2433	2292	2567	2401
Mean	2158	2146	2588	2646	2508	2371	2450	2410

S.E. of marginal mean of T = 96 lb./ac.

S.E. of marginal mean of S = 51 lb./ac.

S.E. of body of table = 136 lb./ac.

Crop :- Paddy (1st & 2nd crop).

Ref :- 57(91).

Site :- Model Agronomic Exptl. Centre, Karamanai.

Type :- 'M'.

Object :- To study the most suitable time for the application of nitrogenous fertilizers to Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) Nil. (ii) (a) Laterite. (b) N.A. (iii) N.A. (iv) (a) 4 wet ploughings and one digging. (b) Transplanting. (c) —. (d) 9' x 9'. (e) 2 to 3. (v) 5000 lb./ac. of compost and 20 lb./ac. of P_2O_5 as super. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 90 on page 61.

4. GENERAL :

(i) Satisfactory. (ii), (iii) N.A. (iv) (a) 1955 (2nd crop)—contd. (b) No. (c) N.A. (v) (a) Chinnegonchal and Maruteru (A.P.), Tinsukia (Assam), Karjat (Maharashtra), Raipur, Reura Farm (M.P.), Aduthurai (Madras), Shimoga (Mysore), Barpalli (Orissa), Nasirpur (Punjab), Burdwan and Canning (W.B.). (b) Nil. (vi) and (vii) N.A.

5. RESULTS :

Kharif

(i) 2658 lb./ac. (ii) 310.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 2517 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	2667	2667	2567	2925	2933	2850	2625	2748
S ₂	2442	2942	2117	2758	2708	2400	2758	2589
Mean	2554	2804	2342	2841	2820	2625	2691	2669

S.E. of the marginal mean of T = 126.5 lb./ac.
 S.E. of the marginal mean of S = 67.6 lb./ac.
 S.E. of body of table = 179.0 lb./ac.

Rabi

(i) 743. lb./ac. (ii) 140.4 lb./ac. (iii) Only T effect is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 700 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	542	608	892	758	800	792	825	745
S ₂	617	642	800	883	758	658	867	746
Mean	579	625	846	821	779	725	846	746

S.E. of marginal mean of T = 57.3 lb./ac.
 S.E. of marginal mean of S = 30.6 lb./ac.
 S.E. of body of table = 81.1 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- K. 58(92).

Site :- Model Agronomic Exptl. Centre, Karamanai.

Type :- 'M'.

Object :- To study the most suitable time for the application of nitrogenous fertilisers to Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Laterite. (b) N.A. (iii) *Kharif* 5.5.1958/7.6.1958. *Rabi* 10.8.1958 / 12.9.1958. (iv) (a) 4 wet ploughings and one digging. (b) Transplanting. (c) —. (d) 9" x 9". (e) 2 to 3. (v) 5000 lb./ac. of F.Y.M. and 20 lb./ac. of P₂O₅ as Super applied by broadcasting before planting. (vi) *Kharif Kallukunippan*. (Local, variety, medium). *Rabi*: PTB-16 (long duration). (vii) Irrigated. (viii) Two hand weedings, one digging before planting. (ix) *Kharif* 44". *Rabi* 9.4". (x) *Kharif* 11.9.1958 *Rabi* 4 2.1959.

2. TREATMENTS and 3. DESIGN:

Same as in expt. no. 90 on page 61.

4. GENERAL:

(i) Generally satisfactory. (ii) No. (iii) Grain and straw yield. (iv) (a) 1958 (*kharif*)—contd. (b) No. (c) Nil. (v) (a) Maruteru and Chinnegonchal (A.P.), Tinsukia (Assam), Aduthurai (Madras), Sabour (Bihar), Raipur, Reura (M.P.), Karjat (Maharashtra), Nasirpur (Punjab), Barpalli (Orissa), Shimoga (Mysore), Burdwan and Canning (W.B.). (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

Kharif

(i) 1907 lb./ac. (ii) 215.2 lb./ac. (iii) Control vs others effect is highly significant, T effect is significant while other effects are not significant. (iv) Av. yield of grain in lb./ac.

Control = 1573 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	2207	1990	1783	1813	2090	1690	1890	1923
S ₂	2333	1740	1783	1957	1770	1959	2030	1939
Mean	2270	1865	1783	1885	1930	1824	1960	1931

S.E. of marginal mean of T = 87.9 lb./ac.

S.E. of marginal mean of S = 47.0 lb./ac.

S.E. of body of table = 124.2 lb./ac.

Rabi

(i) 2033 lb./ac. (ii) 400.6 lb./ac. (iii) Only control vs others effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 1566 lb./ac.

	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	1841	2383	1691	2250	2201	1891	1983	2034
S ₂	2008	1766	2107	2199	2399	2133	2083	2099
Mean	1924	2074	1899	2224	2300	2012	2033	2067

S.E. of marginal mean of T = 163.5 lb./ac.

S.E. of marginal mean of S = 87.4 lb./ac.

S.E. of body of table = 231.3 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- K. 59(93).

Site :- Model Agronomic Exptl. Centre, Karamanai.

Type :- 'M'.

Object:—To study the most suitable time for the application of nitrogenous fertilisers to Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Laterite. (b) N.A. (iii) 22.5.1959/26.6.1959. (iv) (a) 4 wet ploughings and one digging. (b) Transplanting. (c) —. (d) 9" x 9". (e) 2 to 3. (v) 5000 lb./ac. of F.Y.M. and 20 lb./ac. of P_2O_5 as Super applied by broadcasting before planting. (vi) PTB—9. (long duration).. (vii) Irrigated. (viii) Two hand weeding one digging before planting. (ix) 51.6". (x) 25.9.1959.

2. TREATMENTS and 3. DESIGN:

Same as in expt. no. 90 on page 61.

4. GENERAL:

(i) Generally satisfactory. (ii) No. (iii) Grain and straw yield. (iv) (a) 1955 *kharif*—contd. (b) No. (c) Nil. (v) (a) Maruteru, Chalvai and Yemmiganur (A. P.), Tinsukia (Assam), Chikali (Gujrat), Aduthurai (Madras), Raipur, Reura Farm (M.P.), Karjat (Maharashtra), Shimoga and Marcara (Mysore), Nasirpur (Punjab), Barpalli (Orissa), Hiraqachi and Canning (W. Bengal). (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 2234 lb./ac. (ii) 214.4 lb./ac. (iii) Only control vs others effect is significant. (iv) Av. yield of grain in lb./ac.

	Control =2016 lb./ac.							
	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	Mean
S ₁	2312	2197	2197	2246	2353	2320	2131	2251
S ₂	2395	2288	2205	2271	2098	2362	2131	2250
Mean	2353	2242	2201	2258	2225	2341	2131	2250

S.E. of marginal mean of T = 87.5 lb./ac.

S.E. of marginal mean of S = 46.8 lb./ac.

S.E. of body of table = 123.8 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 56(94).

Site :- Model Agronomic Exptl. Centre, Karamanai.

Type :- 'M'.

Object :- To determine the most suitable method of placement of fertilizers for Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Laterite. Rep. I to III are clayey in nature and Rep. IV sandy. (b) N.A. (iii) 10.5.1956/24, 25.6.1956. (iv) (a) Two tractor ploughings in dry condition (ploughing and cross ploughing). One digging with local spade after an irrigation. Another digging and puddling. (b) Transplanting in lines. (c) N.A. (d) 9". (e) 4 seedlings/hole. (v) 5000 lb. of compost and 30 lb./ac. of N as A/S. (vi) (Thulunadan medium, local). (vii) Partially irrigated. (viii) One weeding one month after planting. (ix) 28.82". (x) 28.9.1956 and 29.9.1956.

2. TREATMENTS:

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

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

(2) 3 sources of P_2O_5 : $S_1=$ Super, $S_2=$ Ammono. Phos, and $S_3=$ Dicalcium phosphate.

(3) 3 methods of application: $M_1=$ Broadcasting at puddling time, $M_2=$ Dipping seedlings in mud slush mixed with fertilizer, $M_3=$ Application of manure in the form of pellets.

All manures applied at the time of planting.

3. DESIGN :

(i) $3^2 \times 2$ Confd. fact. with SM, PSM partially confounded. (ii) (a) 7 plots/block.; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) and (b) $29.7' \times 14.85'$. (v) Nil; one foot band between plots; (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Slight sporadic attack of stemborer and Rice hispa. Dusting with Gammaxane. (iii) Yield of grain and straw. (iv) (a) 1955—N.A. (b) Yes. (c) Nil. (v) (a) Chalval(A.P.) Aduthurai (Madras), Karjat (Maharashtra), Shimoga (Mysore), Barpalli and Kendrapara (Orissa), Burdwan and Canning (W.B.). (b) Nil. (vi) Expt. vitiated in 1955. Drought at flowering and setting time in August has adversely affected the crop yield. (vii) N.A.

5. RESULTS

(i) 1738 lb./ac. (ii) 177.8 lb./ac. (iii) Only M effect is highly significant. (iv) Av. yield of grain in lb./ac.

Control mean = 1692 lb./ac.

	M ₁	M ₂	M ₃	Mean	S ₁	S ₂	S ₃
P ₁	1802	1676	1728	1735	1684	1764	1758
P ₂	1794	1711	1766	1757	1769	1711	1791
Mean	1798	1694	1747	1746	1727	1737	1775
S ₁	1810	1601	1769				
S ₂	1745	1711	1756				
S ₃	1839	1769	1716				

S.E. of marginal mean of M or S = 36.3 lb./ac.
 S.E. of marginal mean of P = 29.6 lb./ac.
 S.E. of body of M × S table = 67.2 lb./ac.
 S.E. of body of S × P or P × M table = 51.3 lb./ac.
 S.E. of control mean = 51.3 lb./ac.

Crop :- Paddy (Kharif).

Ref :- K. 57(95).

Site :- Model Agronomic Exptl. Centre, Karamanai.

Type :- 'M'.

Object :- To study the best method of placement of fertilizers.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Laterite. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 94 on Page 64.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1955 (2nd crop)—contd. (b) No. (c) N.A. (v) (a) Maruteru, (A.P.), Tinsukia (Assam), Aduthurai (Madras), Raipur (M.P.), Karjat (Maharashtra), Shimoga (Mysore), Burdwan (W.B.). (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

Kharif

(i) 2131 lb./ac. (ii) 221.9 lb./ac. (iii) P effect is significant. Control vs other treatments effect is highly significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

Control=1973 lb./ac.

	M ₁	M ₂	M ₃	Mean	S ₁	S ₂	S ₃
P ₁	2185	2211	2109	2168	2163	2161	2181
P ₂	2251	2316	2343	2303	2276	2320	2314
Mean	2218	2263	2226	2236	2220	2240	2247
S ₁	2141	2246	2272				
S ₂	2180	2374	2166				
S ₃	2333	2170	2238				

S.E. of M or S marginal mean =45.3 lb./ac.
 S.E. of P marginal mean =37.0 lb./ac.
 S.E. of body of M×S table =83.9 lb./ac.
 S.E. of body of P×M or S×P table =64.1 lb./ac.
 S.E. of control mean =64.1 lb./ac.

Rabi

(i) 363 lb./ac. (ii) 344.1 lb./ac. (iii) Only M×S interaction is significant. (iv) Av. yield of grain in lb./ac.

Control=346 lb./ac.

	M ₁	M ₂	M ₃	Mean	S ₁	S ₂	S ₃
P ₁	353	386	355	365	334	388	372
P ₂	339	410	356	368	352	383	370
Mean	346	398	355	366	343	385	371
S ₁	256	387	385				
S ₂	386	412	359				
S ₃	396	395	322				

S.E. of M or S marginal mean =17.2 lb./ac.
 S.E. of P marginal mean =14.0 lb./ac.
 S.E. of body of M×S table =31.8 lb./ac.
 S.E. of body of table P×M or S×P table =24.3 lb./ac.
 S.E. of control mean =24.3 lb./ac.

Crop :- Paddy.

Ref :- K. 58(96).

Site :- Model Agronomic Exptl. Centre, Karamanai.

Type :- 'M'.

Object:—To study the best method of placement of fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Laterite. (b) N.A. (iii) 7.5.1958./7.6.1958. (iv) (a) 4 wet ploughings and one digging. (b) Transplanting. (c) —. (d) 9"×9". (e) 2 to 3. (v) 5000 lb./ac. of F.Y.M. broadcast before planting. (vi) Kallukunippan (Local medium). (vii) Irrigated. (viii) Two hand weeding and one digging. (ix) 44.1". (x) 11.9.1958.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 94 on page 64.

4. GENERAL :

(i) Generally satisfactory. (ii) No. (iii) Grain and straw yield. (iv) (a) 1955 (2nd crop)—contd. (b) No. (c) Nil. (v) Maruteru (A.P.), Tinsukia (Assam), Aduthurai (Madras), Raipur (M.P.), Karjat (Maharashtra), Shimoga (Mysore), Barpalli (Orissa) and Burdwan (W.B.). (vi) Nil. (vii) Nil.

5. GENERAL :

(i) 1567 lb./ac. (ii) 280.3 lb./ac. (iii) Only control vs other treatments is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1415 lb./ac.

	M ₁	M ₂	M ₃	Mean	S ₁	S ₂	S ₃
P ₁	1632	1654	1725	1671	1586	1741	1684
P ₂	1643	1585	1766	1665	1588	1681	1725
Mean	1637	1619	1746	1668	1587	1711	1705
S ₁	1539	1526	1695				
S ₂	1699	1579	1855				
S ₃	1674	1752	1688				

S.E. of marginal mean of M or S = 57.2 lb./ac.
 S.E. of marginal mean of P = 46.7 lb./ac.
 S.E. of body of M×S table = 105.9 lb./ac.
 S.E. of body of P×M or S×P table = 80.9 lb./ac.
 S.E. of control mean = 140.2 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- K. 59 (97).

Site :- Model Agronomic Exptl. Centre, Karamanai.

Type :- 'M'.

Object :- To study the best method of placement of fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Laterite. (b) N.A. (iii) 25.5.1959/30.6.1959. (iv) (a) 4 wet ploughings and one digging. (b) Transplanting. (c) —. (d) 9'×9'. (e) 2 to 3. (v) 5000 lb./ac. of F.Y.M. applied by broadcasting before planting. (vi) PTB-9 (long duration). (vii) Irrigated. (viii) Two weedings and one digging. (ix) 51.6". (x) 25.9.1959.

2. TREATMENTS :

All combinations of (1), (2) and (3) and a control.

- (1) 2 levels of P₂O₅ : P₁=20 and P₂=45 lb./ac.
- (2) 2 sources of P₂O₅ : S₁=Ammono. Phos. and S₂=Super.
- (3) 3 methods of application : M₁=Broadcasting at puddling, M₂=Dipping the seedlings in mud slush mixed with fertilizers before planting, and M₃=Application of fertilizers in the form of pellets.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) and (b) 29.7'×14.85'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Generally satisfactory. (ii) Free from major pests and diseases. (iii) Grain and straw yield. (iv) (a) 1959 (*kharif*)—contd. (b) No. (c) Nil. (v) (a) Maruteru (A.P.), Tinsukia (Assam), Aduthurai (Madras), Raipur and Bagwai (M.P.), Shimoga (Mysore), Barpalli (Orissa), Burdwan and Canning (W.B.). (vi) and (vii) Nil.

5. RESULTS :

(i) 1940 lb./ac. (ii) 226.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 1925 lb./ac.

	M ₁	M ₂	M ₃	Mean	S ₁	S ₂
P ₁	1967	1892	2041	1967	1961	1972
P ₂	1823	1901	2032	1919	1950	1887
Mean	1895	1897	2037	1943	1956	1930
S ₁	1914	1934	2020			
S ₂	1876	1869	2054			

S.E. of marginal mean of P or S = 53.3 lb./ac.
 S.E. of marginal mean of M = 65.3 lb./ac.
 S.E. of body of P×S table = 75.4 lb./ac.
 S.E. of body of P×M or S×M table = 92.4 lb./ac.
 S.E. of control mean = 130.7 lb./ac.

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

Ref :- K. 57(98).

Site :- Model Agronomic Exptl. Centre, Karamanai.

Type :- 'M'.

Object :- To find out the direct, cumulative and residual effects of certain manurial combinations.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) N.A. (ii) (a) Leterite. (b) N.A. (iii) *Kharif*: 1st-2nd week of May 1957/2nd week of June 1957. *Rabi*: Transplanting 2nd week of Nov. 1957. (iv) (a) 5 diggings or 5 ploughings. (b) Transplanting. (c) —. (d) 9'×9'. (e) 2 to 3. (v) Nil. (vi) *Kharif*: Local *Thirbunedan* (145 days). *Rabi*: *Koluvali* (local, 135 days). (vii) Irrigated. (viii) N.A. (ix) 53". (x) *Kharif*: 4th week of Sept. 1957. *Rabi*: N.A.

2. TREATMENTS :

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

- (1) 3 levels of N as A/S : N₀=0, N₁=30 and N₂=60 lb./ac.
 (2) 3 levels of P₂O₅ as Super : P₀=0, P₁=30 and P₂=60 lb./ac.
 (3) 3 levels of K₂O as Muriate of Potash : K₀=0, K₁=30 and K₂=60 lb./ac.
 (4) 3 levels of bulky manures as compost : M₀=0, M₁=5000 lb./ac., and M₂=10,000 lb./ac.

Each of the 81 plots were divided into 3 Sub-plots of R₁, R₂ and R₃.Where R₁=Manuring every season, R₂=Manuring in alternative seasons starting from the 1st season and R₃=Manuring in alternative seasons starting from the 2nd season.

3. DESIGN :

(i) 3⁴ Fact. confd. (ii) [(a) 9 block/replication ; 9 plots/block. (b) N.A. (iii) 1. (iv) (a) 29.7'×14.85' (b) 1/100 ac. (v) Guard rows and bunds kept around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) *Kharif*: slight attack of blast disease. *Rabi*: Heavy attack of stem-borer, leaf roller and caseworm. (iii) Grain and straw yield. (iv) (a) 1956—contd. (b) Yes ; Phases altered in direct and residual effects. (c) N.A. (v) Chinnogonchal and Maruteru (A.P.), Karjat (Maharashtra), Bagwai and Raipur (M.P.), Aduthurai (Madras), Shimoga (Mysore), Barpalli and Kendrapara (Orissa) and Burdwan (W.B.). (vi) *Rabi* crop affected by drought. (vii) Data analysed as split-plot design with manurial treatments in main-plots while phases in sub-plot treatments. Results for the experiment conducted during 1950 not included as it was the first year of the experiment.

5. RESULTS :

Rabi

(i) 527 lb./ac. (ii) (a) 106.9 lb./ac. (b) 98.7 lb./ac. (iii) Main effects of N, P and R, interactions KM, NR are all highly significant. Interaction PK, PM, NPM and KR are significant. No other effects is significant. (iv) Av. yield of grain in lb./ac.

	R ₁	R ₂	R ₃	Mean		K ₀	K ₁	K ₂	Mean
N ₀	606	585	612	601	P ₀	481	522	469	491
N ₁	492	580	501	524	P ₁	559	474	557	530
N ₂	390	533	442	455	P ₂	570	564	544	559

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	M ₀	M ₁	M ₂	Mean
N ₀	561	593	650	614	605	584	607	588	607	601
N ₁	490	518	564	511	518	544	507	511	554	524
N ₂	421	480	464	485	438	442	419	473	472	455
Mean	491	530	559	537	520	523	511	524	544	527
R ₁	461	502	524	503	479	506	475	506	506	496
R ₂	527	577	594	546	594	558	561	538	599	566
R ₂	483	512	559	561	488	506	498	529	528	518
M ₀	434	512	588	558	505	471				
M ₁	491	531	550	537	470	565				
M ₂	546	547	540	515	585	533				

S.E. of difference of two

1. N, P, K or M marginal means =16.8 lb./ac.
2. R marginal means =15.5 lb./ac.
3. R means at the same level of N, P, K or M means =26.9 lb./ac.
4. N, P, K or M means at the same level of R =27.6 lb./ac.

Kharif

(i) 1846 lb./ac. (ii) (a) 514.8 lb./ac. (b) 239.2 lb./ac. (iii) Main effects of N, P and M are significant. Main effect of R, interactions RN and RM are highly significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	R ₁	R ₂	R ₃	Mean		M ₀	M ₁	M ₂	Mean
N ₀	1781	1710	1708	1733	P ₀	1737	1773	1570	1693
N ₁	2036	2013	1480	1843	P ₁	1818	1917	1930	1888
N ₂	2144	2137	1603	1961	P ₂	1884	2047	1935	1955

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	M ₀	M ₁	M ₂	Mean
N ₀	1581	1736	1881	1734	1744	1721	1607	1714	1878	1733
N ₁	1689	1887	1953	1822	1922	1784	1635	1886	2007	1843
N ₂	1810	2042	2032	1882	2071	1931	1922	1869	2092	1961
Mean	1693	1888	1955	1813	1912	1812	1721	1823	1992	1846
R ₁	1795	2066	2100	1930	2072	1959	1783	1971	2206	1987
R ₂	1786	2043	2030	1921	2015	1924	1862	1855	2143	1953
R ₃	1499	1556	1736	1588	1650	1553	1519	1644	1628	1597
M ₀	1446	1796	1922	1729	1802	1631				
M ₁	1673	1860	1936	1814	1774	1881				
M ₂	1961	2008	2008	1896	2161	1920				

S.E. of the difference of two

- | | |
|--|----------------|
| 1. N, P, K or M marginal means | = 80.9 lb./ac. |
| 2. R marginal means | = 37.6 lb./ac. |
| 3. R means at the same level of N, P, K or M means | = 65.1 lb./ac. |
| 4. N, P, K or M means at the same level of R | = 96.8 lb./ac. |

Crop :- Paddy (*Rabi*).

Ref :- K. 58(99).

Site :- Model Agronomic Exptl. Centre, Karamanai.

Type :- 'M'.

Object :- To find out the direct, cumulative and residual effects of certain manurial combinations.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Laterite. (b) N.A. (iii) 7.7.1958/2.9.1958. (iv) (a) Two diggings and two tramlings. (b) Transplanting. (c) —. (d) 9"×9". (e) 2 to 3. (v) Nil. (vi) PTB—15 (late). (vii) Irrigated. (viii) Weeding twice. (ix) 9.4". (x) N.A.

2. TREATMENTS & 3. DESIGN :

Same as in expt. no. 98 on page 68.

4. GENERAL:

(i) Lodging towards the harvest season. (ii) Slight attack of Stemborer during October. Plots with 60 lb./ac. of N heavily damaged. Sprayed folidol E 605. (iii) Grain and straw weight. (iv) (a) 1956 *Kharif* —Contd. (b) Yes. Site changed from year 1958. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Data analysed separately for each effect i.e., cumulative, residual and direct effects.

5. RESULTS :

Cumulative effect

(i) 1618 lb./ac. (ii) 405.1 lb/ac.. (iii) N and P effects are highly significant. Interaction P×M is significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	M ₀	M ₁	M ₂	Mean
N ₀	1280	1727	1350	1497	1258	1603	1425	1472	1461	1452
N ₁	1183	1900	1586	1461	1549	1658	1439	1644	1586	1556
N ₂	1691	1889	1958	1755	1955	1827	1852	1650	2036	1846
Mean	1385	1839	1631	1571	1587	1696	1572	1589	1694	1618
M ₀	1203	1897	1616	1708	1477	1530				
M ₁	1225	1950	1592	1514	1519	1733				
M ₂	1728	1669	1686	1491	1766	1825				
K ₀	1347	1861	1505							
K ₁	1358	1755	1650							
K ₂	1450	1900	1739							

S.E. of any marginal mean

= 78.0 lb./ac.

S.E. of body of any table

= 135.0 lb./ac.

Residual effect

(i) 1599 lb./ac. (ii) 398.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	M ₀	M ₁	M ₂	Mean
N ₀	1341	1450	1583	1430	1369	1575	1300	1489	1586	1458
N ₁	1360	1808	1675	1369	1855	1619	1533	1705	1605	1614
N ₂	1663	1747	1761	1677	1689	1805	1561	1802	1808	1724
Mean	1455	1668	1673	1492	1638	1666	1465	1665	1666	1599
M ₀	1214	1666	1514	1325	1647	1422				
M ₁	1583	1691	1722	1616	1566	1814				
M ₂	1569	1647	1783	1536	1700	1763				
K ₀	1439	1505	1533							
K ₁	1422	1777	1714							
K ₂	1505	1722	1772							

S.E. of any marginal mean = 76.7 lb./ac.
S.E. of body of any table = 132.9 lb./ac.

Direct effect

(i) 1140 lb./ac. (ii) 269.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	M ₀	M ₁	M ₂	Mean
N ₀	1011	1244	1105	1130	1066	1164	1105	1147	1108	1120
N ₁	942	1153	1164	947	1139	1172	964	1008	1286	1086
N ₂	1250	1128	1266	1269	1186	1189	1125	1214	1305	1215
Mean	1067	1175	1178	1116	1130	1175	1065	1123	1233	1140
M ₀	922	1139	1133	1008	1100	1086				
M ₁	1019	1197	1152	1189	1055	1125				
M ₂	1261	1189	1250	1150	1236	1313				
K ₀	1033	1164	1150							
K ₁	997	1141	1252							
K ₂	1172	1219	1133							

S.E. of any marginal mean = 51.8 lb./ac.
S.E. of body of any table = 89.8 lb./ac.

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

Ref :- K. 59(100).

Site :- Model Agronomic Exptl. centre, Karamanai.

Type :- 'M'.

Object :- To find out the direct, cumulative and residual effects of certain manurial combinations.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) Laterite. (b) N.A. (iii) *Kharif* 13.5.1959/14.6.1959 and *Rabi* 20.8.1959/25.9.1959. (iv) (a) Two diggings and two tramplings. (b) Transplanting. (c) —. (d) 9" × 9". (e) 2 to 3 seedlings/hole. (v) Nil. (vi) *Kharif* : PTB 26 (Medium) *Rabi* : PTB 12 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) *Kharif* : 51.6° ; *Rabi* : 20.6°. (x) *Kharif* : 18.9.1959 ; *Rabi* : 2.3.1960.

2. TREATMENTS & 3. DESIGN :

Same as in expt. no. 98 on Page 68.

4. GENERAL :

(i) Generally satisfactory. (ii) *Kharif*: Nil. *Rabi*: Attack of stemborer, caseworm and leaf-roller. A washing spray of Folidol E 605 was given. (iii) Grain and Straw weight. (iv) (a) 1956—contd. (b) Yes. Site changed from 1958. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Data analysed separately for each effect i.e. cumulative, residual and direct.

5. RESULTS :

Cumulative (*Kharif* 59)

(i) 2208 lb./ac. (ii) 337.0 lb./ac. (iii) Main effects of N, P and M and interaction M×P are significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	M ₀	M ₁	M ₂	Mean
N ₀	1808	2072	2140	1923	2074	2024	1845	1968	2208	2007
N ₁	2117	2327	2328	2225	2392	2155	2169	2159	2445	2257
N ₂	2032	2678	2366	2322	2470	2283	2245	2364	2467	2359
Mean	1986	2359	2278	2157	2312	2154	2086	2164	2373	2208
M ₀	1631	2290	2337	2081	2192	1986				
M ₁	1954	2395	2141	2104	2191	2196				
M ₂	2373	2391	2356	2286	2554	2280				
K ₀	1990	2397	2083							
K ₁	2084	2392	2460							
K ₂	1883	2288	2291							

S.E. of any marginal mean

= 64.9 lb./ac.

S.E. of body of any table

= 112.3 lb./ac.

Residual effect

(i) 1738 lb./ac. (ii) 253.6 lb./ac. (iii) Only P effect is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	M ₀	M ₁	M ₂	Mean
N ₀	1642	1776	1847	1743	1705	1817	1690	1789	1786	1755
N ₁	1577	1657	1816	1799	1553	1697	1605	1695	1749	1683
N ₂	1577	1941	1809	1613	1990	1724	1619	1746	1962	1776
Mean	1599	1791	1824	1718	1749	1746	1638	1743	1832	1738
M ₀	1503	1756	1655	1656	1656	1603				
M ₁	1622	1812	1797	1735	1720	1776				
M ₂	1671	1805	2021	1764	1873	1860				
K ₀	1606	1675	1873							
K ₁	1605	1790	1854							
K ₂	1585	1903	1744							

S.E. of any marginal mean

= 48.8 lb./ac.

S.E. of body of any table

= 84.5 lb./ac.

Direct effect

(i) 2116 lb./ac. (ii) 366.8 lb./ac. (iii) Main effect of N and P are highly significant. Interaction M×P is significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	M ₀	M ₁	M ₂	Mean
N ₀	1561	1814	2016	1816	1750	1825	1684	1880	1827	1797
N ₁	2019	2222	2356	2284	2076	2236	2133	2139	2325	2199
N ₂	1929	2624	2508	2309	2449	2302	2370	2195	2496	2354
Mean	1836	2220	2293	2136	2092	2121	2062	2071	2216	2116
M ₀	1589	2320	2278	2096	2070	2021				
M ₁	1873	2174	2166	2075	1899	2239				
M ₂	2046	2166	2436	2238	2307	2103				
K ₀	1846	2336	2227							
K ₁	1891	2019	2366							
K ₂	1772	2305	2287							

S.E. of any marginal mean
S.E. of body of any table

= 70.6 lb./ac.
= 122.3 lb./ac.

Rabi cumulative effect

(i) 1276 lb./ac. (ii) 334.3 lb./ac. (iii) Only N effects is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	M ₀	M ₁	M ₂	Mean
N ₀	992	1197	1286	1225	1189	1061	1094	1145	1236	1158
N ₁	1089	1369	1308	1181	1392	1194	1175	1200	1392	1255
N ₂	1406	1375	1464	1383	1400	1461	1364	1336	1545	1415
Mean	1162	1314	1353	1263	1327	1239	1211	1227	1391	1276
M ₀	1003	1292	1339	1075	1325	1233				
M ₁	1092	1350	1239	1358	1258	1064				
M ₂	1392	1300	1481	1356	1397	1419				
K ₀	1219	1217	1353							
K ₁	1186	1367	1428							
K ₂	1081	1358	1278							

S.E. of any marginal mean
S.E. of body of any table

= 64.3 lb./ac.
= 111.4 lb./ac.

Residual effect

(i) 1036 lb./ac. (ii) 281.1 lb./ac. (iii) Interaction N × K alone is significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	M ₀	M ₁	M ₂	Mean
N ₀	1103	1083	1161	989	1114	1245	1178	1128	1042	1116
N ₁	945	1017	1033	864	1225	906	989	886	1119	998
N ₂	933	1020	1034	1067	908	1011	970	1108	908	995
Mean	994	1040	1076	973	1082	1054	1046	1041	1023	1036
M ₀	981	1083	1072	950	1117	1070				
M ₁	942	1031	1150	1042	1056	1025				
M ₂	1058	1006	1006	928	1075	1067				
K ₀	936	942	1042							
K ₁	1008	1114	1125							
K ₂	1036	1064	1061							

S.E. of any marginal mean =54.1 lb./ac.
S.E. of body of any table =93.7 lb./ac.

Direct effect

(i) 1231 lb./ac. (ii) 300.3 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	M ₀	M ₁	M ₂	Mean
N ₀	931	1067	1172	1133	1092	944	945	1164	1061	1057
N ₁	1194	1294	1306	1217	1397	1180	1292	1219	1283	1265
N ₂	1275	1406	1436	1367	1403	1347	1272	1347	1497	1372
Mean	1133	1256	1305	1239	1297	1157	1170	1243	1280	1231
M ₀	1008	1272	1223	1050	1350	1108				
M ₁	1203	1269	1258	1447	1150	1133				
M ₂	1189	1225	1428	1219	1392	1230				
K ₀	1203	1167	1347							
K ₁	1114	1333	1445							
K ₂	1083	1267	1122							

S.E. of any marginal mean = 57.8 lb./ac.
S.E. of body of any table =100.1 lb./ac.

Crop :- Paddy (1st and 2nd crop).
Centre :- Chalakudy (c.f.).

Ref :- K. 54(101).
Type :- 'M'.

Object :- To study the effect of types and levels of N.

1. BASAL CONDITIONS :

(i) N.A. (ii) Laterite loam, pH. 5.5. (iii) C.M. applied in most trials. (iv) N.A. (v) (a) N.A. (b) 1st crop broadcast ; 2nd crop transplanted. (c) to (e) N.A. (vi) 1st crop Dec.—Jan. and 2nd crop—Sep.—Oct. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 1st crop Mar.—April and 2nd crop Jan.—Feb.

2. TREATMENTS :

O =control (no manure).
N₁=20 lb./ac. of N as A/S.
N₂=40 lb./ac. of N as A/S.
N'₁=20 lb./ac. of N as Urea.
N'₂=40 lb./ac. of N as Urea.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field a non-replicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1955. (b) No. (c) N.A. (v) No. (vi) Nil. (vii) The expt. was conducted in cultivator's field.

5. RESULTS :

	1st crop				
Treatment	O	N ₁	N ₂	N' ₁	N' ₂
Av. yield	1188	1461	1548	1437	1614
G.M. =1450 lb./ac. ; S.E./mean =41.14 lb./ac. ; No. of experiments 19.					

2nd crop

Treatment	0	N ₁	N ₂	N' ₁	N' ₂
Av. yield	1121	1307	1513	1299	1396
G.M. = 1327 lb./ac. ; S.E./mean = 49.37 lb./ac. ; No. of experiments 11.					

Crop :- Paddy (*Mundakan*).

Ref :- K. 55(102).

Centre :- Chalakudy (c.f.).

Type :- 'M'.

Object :- To study the effect of types and levels of N.

1. BASAL CONDITIONS :

(i) N.A. (ii) Laterite loam. pH. 5.5. (iii) C.M. applied in most of the trials. (iv) N.A. (v) (a) N.A. (b) transplanted. (c) to (e) N.A. (vi) Sept.—Oct. (vii) Irrigated. (viii) and (ix) N.A. (x) January—February.

2. TREATMENTS :

Same as in expt. no. 101 on page 74.

3. DESIGN :

Same as in expt. no. 101 on page 74.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1955. (b) No. (c) N.A. (v) No. (vi) Nil. (vii) The expt. was conducted in cultivator's field.

5. RESULTS :

Treatment	0	N ₁	N ₂	N' ₁	N' ₂
Av. yield	1366	1646	1832	1607	1754
G.M. = 1641 lb./ac. ; S.E./mean = 52.85 lb./ac. ; No. of experiments 16.					

Crop :- Paddy (1st and 2nd crop).

Ref :- K. 54(103)

Centre :- Chalakudy (c.f.).

Type :- 'M'.

Object :- To study the effect of types and levels of N and P.

1. BASAL CONDITIONS :

Same as in expt. no. 101 on page 74.

2. TREATMENTS :

0 = Control.

P₁ = 20 lb./ac. of P₂O₅ as Super.

P₁N₁ = 20 lb./ac. of P₂O₅ as Super + 20 lb./ac. of N as A/S.

P₁N₂ = 20 lb./ac. of P₂O₅ as Super + 40 lb./ac. of N as A/S.

P₁N'₁ = 20 lb./ac. of P₂O₅ as Super + 20 lb./ac. of N as Nitrochalk.

P₁N'₂ = 20 lb./ac. of P₂O₅ as Super + 40 lb./ac. of N as Nitrochalk.

3. DESIGN :

Same as in expt. no. 101 on page 74.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1955. (b) No. (c) N.A. (v) No. (vi) Nil. (vii) The expt. was conducted in cultivator's field.

5. RESULTS :

Treatment	1st crop					
	0	P ₁	P ₁ N ₁	P ₁ N ₂	P ₁ N' ₁	P ₁ N' ₂
Av. yield	1234	1506	1695	1868	1605	1819
G.M. = 1621 lb./ac. S.E./mean = 49.37 lb./ac. No. of experiments 20.						

2nd crop

Treatment	0	P ₁	P ₁ N ₁	P ₁ N ₂	P ₁ N' ₁	P ₁ N'' ₁
Av. yield	1259	1374	1514	1679	1506	1712

G.M.=1507 lb./ac. ; S.E./mean=49.37 lb./ac. ; No. of experiments 10.

Crop :- Paddy (*Mundakan*).

Centre :- Chalakudy (c.f.).

Ref :- K. 55(106).

Type :- 'M'.

Object :- To study the effect of types and levels of N and P.

1. BASAL CONDITIONS:

Same as in expt. no 102 on page 75.

2. TREATMENTS :

0 = Control (no manure).

P₁ = 20 lb /ac. of P₂O₅ as Super.

P₁N₁ = 20 lb./ac. of P₂O₅ as Super + 20 lb./ac. of N as A/S.

P₁N₂ = 20 lb./ac. of P₂O₅ as Super + 40 lb./ac. of N as A/S.

P₁N'₁ = 20 lb./ac. of P₂O₅ as Super + 20 lb./ac. of N as Urea.

P₁N''₁ = 40 lb./ac. of P₂O₅ as Super + 40 lb./ac. of N as Urea.

3. DESIGN :

Same as in expt. no. 101 on page 74.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1955. (b) No. (c) N.A. (v) No. (vi) Nil. (vii) The expt. was conducted in cultivator's field.

5. RESULTS:

Treatment	0	P ₁	N ₁ P ₁	N ₂ P ₁	N' ₁ P ₁	N'' ₁ P ₁
Av. yield	1568	1681	2001	2114	1744	1860

G.M.=1828 lb./ac. ; S.E./mean=88.87 lb./ac. ; No. of experiments 14.

Crop :- Paddy (*Mundakan*).

Centre :- Chalakudy (c.f.).

Ref :- K. 55(105).

Type :- 'M'.

Object :- To study the effect of types and levels of N.

1. BASAL CONDITIONS :

Same as in expt. no. 102 on page 75.

2. TREATMENTS :

0 = Control (no manure).

N₁ = 20 lb./ac. of N as A/S.

N₂ = 40 lb./ac. of N as A/S.

N'''₁ = 20 lb./ac. of N as Ammonium chloride.

N''''₁ = 40 lb./ac. of N as Ammonium chloride.

3. DESIGN :

Same as in expt. no. 101 on page 74.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1955. (b) No. (c) N.A. (v) No. (vi) Nil. (vii) The expt. was conducted in cultivator's field.

5. RESULTS :

Treatment	0	N ₁	N ₂	N ₁ P ₁	N ₁ P ₂
Av. yield	1489	1734	1945	1763	1990

G.M.=1784 lb./ac. ; S.E./mean=60.89 lb./ac. ; No. of experiments 16.

Crop :- Paddy (1st and 2nd crop).

Centre :- Chalakudy (c.f.).

Ref :- K. 54(106).

Type :- 'M'.

Object :- To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

Same as in expt. no. 101 on page 74.

2. TREATMENTS :

0=Control (no manure).

N₁=20 lb./ac. of N as A/s.

N₁P₁=20 lb./ac. of N as A/s + 20 lb./ac. of P₂O₅ as Super.

N₁P₂=20 lb./ac. of N as A/S+40 lb./ac. of P₂O₅ as Super.

N₁P₁"=20 lb./ac. of N as A/S+20 lb./ac. of P₂O₅ as Dicalcium Phosphate.

N₁P₂"=20 lb./ac. of N as A/S +40 lb./ac. of P₂O₅ as Dicalcium Phosphate.

3. DESIGN :

Same as in expt. no. 101 on page 74.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1955. (b) No. (c) N.A. (v) No. (vi) Nil. (vii) The expt. was conducted in cultivator's field.

5. RESULTS :

1st Crop

Treatment	0	N ₁	N ₁ P ₁	N ₁ P ₂	N ₁ P ₁ "	N ₁ P ₂ "
Av. yield.	1366	1547	1563	1736	1712	1901

G.M.=1638 lb./ac. ; S.E./mean=41.14 lb./ac. ; No. of experiments 19.

2nd Crop

Treatment	0	N ₁	N ₁ P ₁	N ₁ P ₂	N ₁ P ₁ "	N ₁ P ₂ "
Av. yield	1152	1325	1531	1637	1563	1761

G.M.=1495 lb./ac. ; S.E./mean=24.69 lb./ac. ; No. of experiments 9.

Crop :- Paddy (*Mundakan*).

Centre :- Chalakudy (c.f.).

Ref :- K. 55(107).

Type :- 'M'.

Object :- To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

Same as in expt. no. 102 on page 75.

2. TREATMENTS :

Same as in expt. no. 101 on page 74.

3. DESIGN :

Same as in expt. no. 101 on page 74.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1955. (b) No. (c) N.A. (v) (a) No. (vi) Nil. (vii) The expt. was conducted in cultivator's field.

5. RESULTS :

Treatment	0	N	N ₁ P ₁	N ₁ P ₂	N ₁ P ₁ '	N ₁ P ₂ '
Av. yield	1568	1893	2092	2149	2216	2416

G.M.=2056 lb./ac. ; S.E./mean=65.01 lb./ac. ; No. of experiments 15.

Crop :- Paddy (*Mundakan*).

Centre :- Chalakudy (c.f.).

Ref :- K. 55(108).

Type :- 'M'.

Object :— To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

Same as in expt. no. 102 on page. 75.

2. TREATMENTS :

0 =Control (no manure).

N₁ =20 lb./ac. of N as A/S.

N₁P₁=20 lb./ac. of N as A/S+20 lb./ac. of P₂O₅ as Super.

N₁P₂=20 lb./ac. of N as A/S+40 lb./ac. of P₂O₅ as Super.

N₁P₁'=20 lb./ac. of N as A/S+20 lb./ac. of P₂O₅.

N₁P₂'=20 lb./ac. of N as A/S+40 lb./ac. of P₂O₅.

3. DESIGN :

Same as in expt. no. 101 on page 74.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1955 (b) No. (c) N.A. (v) No. (vi) Nil. (vii) The expt. was conducted in cultivator's field.

5. RESULTS :

Treatment	0	N ₁	N ₁ P ₁	N ₁ P ₂	NP' ₁	NP' ₂
Av. yield	1536	1722	1901	2009	2001	2142

G.M. = 1885 lb./ac. ; S.E./mean=23.04 lb./ac. ; No. of experiments 15.

Crop :- Paddy (1st and 2nd crop).

Centre :- Chalakudy (c.f.).

Ref :- K. 54(109).

Type :- 'M'.

1. BASAL CONDITIONS :

Same as in expt. no. 101 on page 74.

2. TREATMENTS :

0 =Control (no manure).

N₁ =20 lb./ac. of N as A/S.

N₁P₁ =20 lb./ac. of N as A/S+20 lb./ac. of P₂O₅ as Super.

N₁P₂ =20 lb./ac. of N as A/S+40 lb./ac. of P₂O₅ as Super.

N₁P₁K₁=20 lb./ac. of N as A/S+20 lb./ac. of P₂O₅ as Super+20 lb./ac. of K₂O as Pot. Sul.

N₁P₁K₂=20 lb./ac. of N as A/S+20 lb./ac. of P₂O₅ as Super+40 lb./ac. of K₂O as Pot. Sul.

3. DESIGN :

Same as in expt. no. 101 on page 74.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1955 (b) No. (c) N.A. (v) No. (vi) Nil. (vii) The expt. was conducted in cultivator's field.

5. RESULTS :

1st crop

Treatment	0	N ₁	N ₁ P ₁	N ₁ P ₂	N ₁ P ₁ K ₁	N ₁ P ₁ K ₂
Av. yield	1358	1605	1761	1794	2000	2139

G.M. = 1776 lb./ac. ; S.E./mean = 49.37 lb./ac. ; No. of experiments 20.

2nd crop

Treatment	0	N ₁	N ₁ P ₁	N ₁ P ₂	N ₁ P ₁ K ₁	N ₁ P ₁ K ₂
Av. yield	1160	1317	1547	1473	1819	1761

G.M. = 1513 lb./ac. ; S.E./mean = 82.29 lb./ac. ; No. of experiments 10.

Crop :- Paddy (*Mundakan*),
Centre :- Chalakudy (c.f.).

Ref :- K. 55(110).
Type :- 'M'.

Object :- To study the effects of manures (N.P.K.).

1. BASAL CONDITIONS :

Same as in expt. no. 102 on page 75.

2. TREATMENTS :

Same as in expt. no. 101 on page 74.

3. DESIGN :

Same as in expt. no. 101 on page 74.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1955. (b) No. (c) N.A. (v) No. (vi) Nil. (vii) The expt. was conducted in cultivator's field.

5. RESULTS :

Treatment	0	N ₁	N ₁ P ₁	N ₁ P ₂	N ₁ P ₁ K ₁	N ₁ P ₁ K ₂
Av. yield	1541	1899	2021	2107	2235	2445

G.M. = 2041 lb./ac. ; S.E./mean = 161.28 lb./ac. ; No. of experiments 15.

Crop :- Paddy (*Kharif*)
Centre :- Palghat (c.f.).

Ref :- K. 58(111).
Type :- 'M'.

Object :- 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 (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

0 = Control (no manure).

n = 20 lb./ac. of N as A/S.

p = 20 lb./ac. of P₂O₅ as Super.

np = 20 lb./ac. of N as A/S and 20 lb./ac. of P₂O₅ as Super.

k = 20 lb./ac. of K as Mur. of Potash.

nk = 20 lb./ac. of N as A/S + 20 lb./ac. of K as Mur. of Potash.

pk = 20 lb./ac. of P₂O₅ as Super + 20 lb./ac. of K as Mur. of Potash.

npk = 20 lb./ac. of N as A/S + 20 lb./ac. of P₂O₅ as Super + 20 lb./ac. of K as Mur. of Potash.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or thana in the zone and the Circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crop, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half are of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are being studied on type C trials in two out of the four zones in each district every year. The above experiments will be laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) Generally, 1/20 lb./ac. (b) 1/80 lb./ac. generally. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) Palghat, Quilon and Trivandrum. (b) Nil. (vi) Nil. (vii) The expt. was conducted in cultivator's field.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	2115	2460	2460	2781	2312	2625	2576	3020

G.M. = 2544 lb./ac. ; S.E./mean = 27.35 lb./ac. ; No. of trials = 16.

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

Ref :- K. 59(112).

Centre :- Palghat (c.f.).

Type :- 'M'.

Object :- To study the response of Paddy to levels of N, P and K applied individually and in combination.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 111 on page 79.

5. RESULTS :

Treatment	<i>Kharif</i>							
	0	n	p	np	k	nk	pk	npk
Av. yield	2041	2510	2370	2781	2263	2617	2485	3012

G.M. = 2510 lb./ac. ; S.E./mean = 15.94 lb./ac. ; No. of trials = 16.

Treatment	<i>Rabi</i>							
	0	n	p	np	k	nk	pk	npk
Av. yield	2246	2732	2551	3045	2436	2831	2715	3423

G.M. = 2747 lb./ac. ; S.E./mean = 26.04 lb./ac. ; No. of trials = 16.

Crop :- Paddy (*Kharif*).

Ref :- K. 58(113).

Centre :- Quilon (c.f.).

Type :- 'M'.

Object :- To study the response of Paddy to levels of N, P and K applied individually and in combination.

1. BASAL CONDITIONS to 4. GENERAL

Same as in expt. no. 111 on page 79.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	1819	1991	2008	2353	1925	2230	2131	2518

G.M. = 2122 lb./ac. ; S.E./mean = 28.51 lb./ac. ; No. of trials = 16.

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

Ref :- K. 59(114).

Centre :- Quilon (c.f.).

Type :- 'M'.

Object :- To study the response of Paddy to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 111 on page 79.

5. RESULTS :

Kharif

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	1794	2205	1991	2337	1942	2288	2115	2584

G.M. = 2157 lb./ac. ; S.E./mean = 15.98 lb./ac. ; No. of trials = 16.

Rabi

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	1958	2353	2131	2576	2082	2460	2312	2822

G.M. = 2337 lb./ac. ; S.E./mean = 16.81 lb./ac. ; No. of trials = 16.

Crop :- Paddy (*Kharif*).

Ref :- K. 58(115).

Centre :- Trivandrum (c.f.).

Type :- 'M'.

Object :- To study the response of Paddy to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 111 on page 79.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	1884	2213	2131	2567	2000	2403	2279	2740

G.M. = 2277 lb./ac. ; S.E./mean = 35.49 lb./ac. ; No. of trials = 16.

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

Ref :- K. 59(116).

Centre :- Trivandrum (c.f.).

Type :- 'M'.

Object :- To study the response of Paddy to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS : to 4. GENERAL :

Same as in expt. no. 111 on page 79.

5. RESULTS :

Kharif

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	1605	1958	1860	2370	1810	2386	2172	2650

G.M. = 2101 lb./ac. ; S.E./mean = 33.60 lb./ac. ; No. of trials = 16.

Rabi

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	1522	1893	1835	2107	1712	2008	1967	2403

G.M. = 1931 lb./ac. ; S.E./mean = 43.73 lb./ac. ; No. of trials = 18.

Crop :- Paddy.
Centre :- Quilon (c.f.).

Ref :- K. 57(117).
Type :- 'M'.

Object :— To compare the productive values of different nitrogenous fertilizers.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite and forest. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

0 = Control (no manure).
 N_1^r = 20 lb./ac. of N as A/S/N.
 $N_1^r P_1$ = 20 lb./ac. of N as A/S/N + 20 lb./ac. of P_2O_5 as Super.
 $N_1^r P_2$ = 20 lb./ac. of N as A/S/N + 40 lb./ac. of P_2O_5 as Super.
 $N_1^r P_1'$ = 20 lb./ac. of N as A/S/N + 20 lb./ac. of P_2O_5 as dicalcium phosphate.
 $N_1^r P_2'$ = 20 lb./ac. of N as A/S/N + 40 lb./ac. of P_2O_5 as dicalcium phosphate.
 $N_1^r P_1 K_1$ = 20 lb./ac. of N as A/S/N + 20 lb./ac. of P_2O_5 as Super + 20 lb./ac. of K_2O as Pot. Sul.

3. DESIGN :

Same as in expt. no. 111 on page 79.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) and (c) Nil. (v) (a) Quilon and Trivandrum. (b) Nil. (vi) Nil. (vii) The expt. was conducted in cultivators' field.

5. RESULTS :

Treatment	0	N_1^r	$N_1^r P_1$	$N_1^r P_2'$	$N_1^r P_1'$	$N_1^r P_2'$	$N_1^r P_1 K_1$
Av. yield	2123	2312	2945	3143	3020	2831	3349

G.M. = 2818 lb./ac. ; S.E./mean = 25.02 lb./ac. ; No. of trials = 9.

Crop :- Paddy.
Centre :- Trivandrum. (c.f.).

Ref :- K. 57(118).
Type :- 'M'.

Object :— To compare the productive values of different nitrogenous fertilizers.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite and coastal alluvial. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

Same as in expt. no. 117 above.

3. DESIGN :

Same as in expt. no. 111 on page 79.

4. GENERAL :

Same as in expt no. 117 above.

5. RESULTS :

Treatment	0	N_1^r	$N_1^r P_1$	$N_1^r P_2$	$N_1^r P_1'$	$N_1^r P_2$	$N_1^r P_1 K_1$
Av. yield	1695	1958	2041	2189	2074	2057	2296

G.M. = 2044 lb./ac. ; S.E./mean = 28.51 lb./ac. ; No. of trials = 6.

Crop :- Paddy.
Centre :- Quilon. (c.f.).

Ref :- K. 57(119).
Type :- 'M'.

Object :— To study the response of Potash in combination with N and P.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite and forest. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

0 =Control (no manure).

N_1'' =20 lb./ac. of N as A/S/N.

N_2'' =40 lb./ac. of N as A/S/N.

P_1 =20 lb./ac. of P_2O_5 as Super.

$N_1''P_1$ =20 lb./ac. of N as A/S/N+20 lb./ac. of P_2O_5 as Super.

$N_2''P_1$ =40 lb./ac. of N as A/S/N+20 lb./ac. of P_2O_5 as Super.

3. DESIGN :

Same as in expt. no. 111 on page 79.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) No. (b) N.A. (c) N.A. (v) (a) Quilon and Trivandrum. (b) N.A. (vi) Nil. (vii) The expt. was conducted in cultivator's field.

5. RESULTS :

Treatment	0	N_1''	N_2''	P_1	$N_1''P_1$	$N_2''P_1$
Av. yield	2098	2255	2600	2493	2123	3102

G.M.=2445 lb./ac. ; S.E./mean =12.80 lb./ac. ; No. of trials=9.

Crop :- Paddy.

Centre :- Trivandrum. (c.f.).

Ref :- K. 57(120).

Type :- 'M'.

Object :-To study the response of potash in combination with N and P.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite and coastal alluvial. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

Same as in expt. no. 117 on page 82.

3. DESIGN :

Same as in expt. no. 111 on page 79.

4. GENERAL :

Same as in expt. no. 117 on page 82.

5. RESULTS :

Treatment	0	N_1''	N_2''	P_1	$N_1''P_1$	$N_2''P_1$
Av. yield	1744	1967	2082	1901	2098	2271

G.M.=2010 lb./ac. ; S.E./mean =29.67 lb./ac. ; No of trials=6.

Crop :- Paddy (*Kharif*).

Centre :- Palghat. (c.f.).

Ref :- K. 58(121).

Type :- 'M'.

Object :-To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

- 0 =Control (no manure).
 N_1' =20 lb./ac. of N as Urea.
 N_2' =40 lb./ac. of N as Urea.
 N_1'' =20 lb./ac. of N as A/S/N.
 N_2'' =40 lb./ac. of N as A/S/N.
 N_1''' =20 lb./ac. of N as C/A/N.
 N_2''' =40 lb./ac. of N as C/A/N.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or Thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *khari* cereal, 8 on a *rabi* cereal, 8 on cash crop, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are being studied on type C trials in two out of the four zones in each district every year. The above experiments will be laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment/village. (iii) (a) 1/20 ac. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) Yes ; 1957—contd. (b) No. (c) N.A. (v) (a) Palghat, Quilon and Trivandrum. (b) N.A. (vi) Nil. (vii) The expt. was conducted in cultivator's field.

5. RESULTS :

Treatment	0	N_1'	N_2'	N_1''	N_2''	N_1'''	N_2'''
Av. yield	2238	2617	2789	2444	2658	2469	2691

G.M.=2558 lb./ac. ; S.E./mean=30.26 lb./ac. ; No. of trials=16.

Crop :- Paddy (*Khari*).

Centre :- Palghat (c.f.).

Ref :- K. 59(122).

Type :- 'M'.

Object :- To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS : to 4. GENERAL :

Same as in expt. no. 121 on page 83.

5. RESULTS :

Treatment	0	N_1'	N_2'	N_1''	N_2''	N_1'''	N_2'''
Av. yield	2049	2501	2855	2501	2864	2370	2666

G.M. =2544 lb./ac. ; S.E./mean=27.34 lb./ac. ; No. of trials=16.

Crop :- Paddy (*Khari*).

Centre :- Quilon (c.f.).

Ref :- K. 58(123).

Type :- 'M'.

Object :- To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS : to 4. GENERAL :

Same as in expt. no. 121 on page 83.

5. RESULTS :

Treatment	0	N_1'	N_2'	N_1''	N_2''	N_1'''	N_2'''
Av. yield	1728	2032	2205	2008	2288	2008	2205

G.M.=2068 lb./ac. ; S.E./mean=15.71 lb./ac. ; No. of trials=16.

Crop :- Paddy (*Kharif*).

Ref :- K. 59(124).

Centre :- Quilon (c.f.).

Type :- 'M'.

Object :- To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS : to 4. GENERAL :

Same as in expt. no. 121 on page 83.

5. RESULTS:

Treatment	0	N ₁ '	N ₂ '	N ₁ "	N ₂ "	N ₁ '''	N ₂ '''
Av. yield	1810	2082	2312	2049	2296	2057	2271

G.M. = 2125 lb./ac. ; S.E./mean = 17.46 lb./ac. ; No. of trials = 16.

Crop :- Paddy (*Kharif*).

Ref :- K. 58(125).

Centre :- Trivandrum (c.f.).

Type :- 'M'.

Object :- To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS : to 4. GENERAL :

Same as in expt. no. 121 on page 83.

5. RESULTS :

Treatment	0	N ₁ '	N ₂ '	N ₁ "	N ₂ "	N ₁ '''	N ₂ '''
Av. yield	1777	2090	2345	2074	2543	2032	2304

G.M. = 2166 lb./ac. ; S.E./mean = 44.80 lb./ac. ; No. of trials = 15.

Crop :- Paddy (*Kharif*).

Ref :- K. 59(126).

Centre :- Trivandrum.

Type :- 'M'.

Object :- To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS : to 4. GENERAL :

Same as in expt. no. 121 on page 83.

5. RESULTS :

Treatment	0	N ₁ '	N ₂ '	N ₁ "	N ₂ "	N ₁ '''	N ₂ '''
Av. yield	1695	2024	2501	1967	2320	1991	2370

G.M. = 2124 lb./ac. ; S.E./mean = 37.82 lb./ac. ; No. of trials = 16.

Crop :- Paddy.

Ref :- K. 57(127).

Centre :- Trivandrum (c.f.).

Type :- 'M'.

Object :- To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS :

(i) N.A. (ii) Laterite. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

0 = Control.

N₁ = 20 lb./ac. of N as A/S

N₂ = 40 lb./ac. of N as A/S.

N₁' = 20 lb./ac. of N as Urea.

N₂' = 40 lb./ac. of N as Urea.

N₁" = 20 lb./ac. of N as A/S/N.

N₂" = 40 lb./ac. of N as A/S/N.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crop, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The trials on legumes are of type C. Residual effects of phosphate application are being studied on Type C trials in two out of the four zones in each district every year. The above experiments will be laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment/village. (iii) (a) 1/20 ac. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) 1957—contd. (b) No. (c) N.A. (v) (a) Trivandrum, Quilon and Palghat. (b) N.A. (vi) Nil. (vii) The expt. was conducted in cultivator's field.

5. RESULTS :

Treatment	0	N ₁	N ₂	N ₁ '	N ₂ '	N ₁ "	N ₂ "
Av. yield	1728	1967	2098	1901	2074	1884	2041

G.M. = 1956 lb./ac. ; S.E./mean = 30.26 lb./ac. ; No. of trials = 6.

Crop :- Paddy (*Rabi*)

Ref :- K. 59(128).

Centre :- Trivandrum (c.f.).

Type :- 'M'.

Object :- To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 127 on page 85.

5. RESULTS :

Treatment	0	N ₁	N ₂	N ₁ '	N ₂ '	N ₁ "	N ₂ "
Av. yield	1876	2213	2493	2353	2584	2263	2485

G.M. = 2324 lb./ac. ; S.E./mean = 62.26 lb./ac. ; No. of trials = 18.

Crop :- Paddy.

Ref :- K. 57(129).

Centre :- Quilon (c.f.).

Type :- 'M'.

Object :- To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 127 on page 85.

5. RESULTS :

Treatment	0	N ₁	N ₂	N ₁ '	N ₂ '	N ₁ "	N ₂ "
Av. yield	2123	2255	2436	2238	2403	2263	2501

G.M. = 2317 lb/ac ; S.E./mean = 34.91 lb./ac. ; No. of trials = 9.

Crop :- Paddy (*Rabi*).

Ref :- K. 59(130).

Centre :- Quilon (c.f.).

Type :- 'M'.

Object :- To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS to 4. GENERAL :

Same as in expt. no. 127 on page 85.

5. RESULTS :

Treatment	0	N ₁	N ₂	N' ₁	N' ₂	N'' ₁	N'' ₂
Av. yield	1925	2320	2559	2353	2559	2345	2567

G.M.=2375 lb./ac. ; S.E./mean=17.46 lb./ac. ; No. of trials=16.

Crop :- Paddy (*Rabi*).

Ref :- K. 59(131).

Centre :- Palghat (c.f.).

Type :- 'M'.

Object :- To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS : to 4. GENERAL :

Same as in expt. no. 127 on page 85.

5. RESULTS :

Treatment	0	N ₁	N ₂	N' ₁	N' ₂	N'' ₁	N'' ₂
Av. yield	2156	2576	2987	2600	3020	2600	3061

G.M.=2714 lb./ac. ; S.E./mean=27.93 lb./ac. ; No. of trials=16.

Crop :- Paddy. (Kayalpunja)

Ref :- K. 57(132)

Centre :- Kottayam.

Type :- 'M'.

Object :- To study the effect of K, N and P₂O₅ on paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Alluvial soil of laterite origin. (iii) Oct.—Nov. (iv) *Thirinjavellai* (early, local). (v) (a) Ploughing immediately after the previous crop. (b) Seeds broadcast in one foot deep water. (c) 80 lb./ac. (d) and (e) N.A. (vi) Nil. (vii) Irrigated. (viii) Nil. (ix) 24.17°. (x) Jan.—Feb.

2. TREATMENTS :

- (1) Cultivator's usual practice.
- (2) 30 lb./ac. of N+45 lb./ac. of P₂O₅.
- (3) 30 lb./ac. of N+45 lb./ac. of P₂O₅+40 lb./ac. of K.

10 lb. of N+40 lb. of P+20 lb. of K given as 1st top dressings 10 days after sowing. 10 lb. of N+20 lb. of K given as 2nd top dressing 25 days after sowing. 10 lb. of N given as 3rd top dressing 45 days after sowing.

3. DESIGN :

(i) and (ii) Fields selected without any randomisation. No. of trials=12. (iii) (a) 1/4 acre. (b) 32' x 16'. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of leaf roller and stem-borer. Gammexane and Folidol sprayed. (iii) Grain yield. (iv) (a) to (c) No. (v) (a) and (b) No. (vi) Nil. (vii) The expt. was conducted in cultivators' field.

5. RESULTS :

(i) 2011 lb./ac. (ii) 264 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	1768	1944	2321

S.E./mean =76 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 57(133).

Site :- Karunagapally, Mavelikkara, Karthikapally (c.f.).

Type :- 'M'.

Object :- To demonstrate and study the effect of K_2O in conjunction with N and P_2O_5 .

1. BASAL CONDITIONS :

(i) (a) Varied from field to field. (b) and (c) Varied from field to field. (ii) (a) N.A. (b) Sandy. (iii) Transplanted in August. (iv) (a) 4 to 6 ploughings. (b) Dibbled. (c) 60 lb./ac. (d) and (e) N.A. (v) Nil. (vi) UR.19 (early, improved). (vii) Unirrigated. (viii) Nil. (ix) 38.30%. (x) December-January.

2. TREATMENTS :

1. Cultivator's usual practice.

2. 40 lb./ac. of N+40 lb./ac. of P_2O_5 .

3. 40 lb./ac. of N+40 lb./ac. of P_2O_5 +40 lb./ac. of K_2O .

The entire of quantity of P_2O_5 , 20 lb. K_2O and 10 lb. N/acre were applied before planting as B.D. 20 lb. N and 20 lb. K_2O were applied 4 weeks after planting as first top dressing and the remaining 10 lb. N as second top dressings seven weeks after planting.

3. DESIGN :

(i) Fields were selected without any randomisation. No. of trails=12. (ii) (a) and (b) 1/4 acre. (iii) 32' x 16'. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) In few fields attack of stem-borer was noticed. This was more severe in the control and NP plots. (iii) Grain yield. (iv) (a) 1957 (1st crop)—1957 (2nd crop). (b) and (c) —. (v) (a) and (b) Nil. (vi) Nil. (vii) Expt. was conducted on cultivators' fields.

5. RESULTS :

(i) 2615 lb./ac. (ii) 319 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	2354	2444	3046

S.E./mean = 92 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 57(134).

Site :- Karunagapally, Mavelikkara and Karthikapally (c.f.).

Type :- 'M'.

Object :- To study the effect of K_2O in conjunction with N and P_2O_5 .

1. BASAL CONDITIONS :

(i) (a) to (c) Varied from field to field. (ii) (a) N.A. (b) Sandy. (iii) April. (iv) (a) 4 to 6 ploughings. (b) Dibbled. (c) 60 lb./ac. (d) and (e) N.A. (v) 4000 lb./ac. of F.Y.M. (vi) [Kochuvittu (early, improved)]. (vii) Unirrigated. (viii) Nil. (ix) 45.34%. (x) July.

2. TREATMENTS :

1. Cultivator's usual practice.

2. 30 lb./ac. of N+40 lb./ac. of P_2O_5 .

3. 30 lb./ac. of N+40 lb./ac. of P_2O_5 +40 lb./ac. of K_2O .

$\frac{1}{2}$ N, full P, and $\frac{1}{2}$ K were applied at the time of sowing. $\frac{1}{2}$ N and $\frac{1}{2}$ K three weeks after sowing and the remaining $\frac{1}{2}$ N seven weeks after sowing.

3. DESIGN :

(i) and (ii) Fields were selected without strict randomisation. Total no. of trials=11. (iii) (a) 1/4 acre. (b) 32' x 16'. (vi) Yes.

4. GENERAL :

(i) Crop suffered due to drought at the time of sowing and due to heavy rains at the time of first top dressings. (ii) Nil. (iii) Grain yield. (iv) (a) 1957 (1st crop)—1957 (2nd crop). (b) to (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Expt. was conducted on cultivators' fields.

5. RESULTS :

(i) 2204 lb./ac. (ii) 258 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	1953	2195	2463

S.E./mean = 78 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 58(135).

Site :- Karunagapally, Mavelikkara and Karthikapally (c.f.).

Type :- 'M'.

Object :- To study the effect of K_2O in conjunction with N and P_2O_5 .

1. BASAL CONDITIONS :

(i) (a) to (c) Varied from field to field. (ii) Sandy. (iii) April. (iv) (a) 6 ploughings. (b) Line planting. (c) N.A. (d) $9'' \times 6''$. (e) 3 to 4 seedlings/hole. (v) 3000 lb./ac. of F.Y.M. (vi) *Kochuvittu* (medium, improved). (vii) Unirrigated. (viii) Nil. (ix) 45.34° . (x) July.

2. TREATMENTS:

1. Cultivator's usual practice.
2. 20 lb./ac. of N+30 lb./ac. of P_2O_5 .
3. 20 lb./ac. of N+30 lb./ac. of P_2O_5 +30 lb./ac. of K_2O .

The entire quantity of P_2O_5 , 20 lb. of K_2O and 10 lb. N/acre were applied a week before sowing. Remaining dose of N and K was applied one month later.

3. DESIGN :

(i) and (ii) Fields selected without any randomisation. Total no. of trials=18. (iii) (a) 1/4 acre. (b) $16' \times 32'$. (iv) Yes.

4. GENERAL :

(i) Heavy rains were recorded in the early stages of growth causing some delay in the development of the crop. (ii) Nil. (iii) Grain yield. (iv) (a) N.A. (b) and (c) —. (v) (a) and (b) —. (vi) Nil. (vii) Expt. was conducted on cultivators' fields.

5. RESULTS :

(i) 1699 lb./ac. (ii) 267 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	1535	1575	1986

S.E./mean = 63 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 55(136)-

Site :- Agastheswaram, Thorala, Nagercoil, Kalkulam, Chalakudy,

Trinjalakuda, Mukundapuram and Thalapilly (c.f.). Type :- 'M'.

Object :- To study the efficacy of complete and balanced NPK manuring.

1. BASAL CONDITIONS :

(i) (a) Paddy. (b) and (c) Varied from field to field. (ii) Loamy. (iii) September, October 1955. (iv) (a) N.A. (b) Transplanted. (c) to (e) N.A. (v) 2000 lb./ac. of jungle leaves applied only to control plots. (vi) *Panmarvi*, *Vapsiramundan*, *Athiyar* and *Chittani*, (local). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) January, February 1956.

2. TREATMENTS :

1. Control : Usual practice of the cultivator to supply 16 lb./ac. of N+6 lb./ac. of P_2O_5 +11 lb./ac. of K_2O .
2. NP mixture : 20 lb./ac. of N+40 lb./ac. of K_2O applied before planting+20 lb./ac. of N as A/S/N applied after planting.
3. NPK mixture : 20 lb./ac. of N+40 lb./ac. of P_2O_5 +40 lb./ac. of K_2O applied before planting+20 lb./ac. of N as A/S/N applied after planting.

All treatments top dressed.

3. DESIGN :

(i) and (ii) Twelve fields, representative of the tract, were selected without any randomisation. But two fields were dropped from analysis due to excessive damage by rats, leaf roller and stem-borer. (iii) (a) Approximately 0.25 acre and varied from plot to plot. (b) 512 sq. ft. 4 stratified random samples of size $8 \times 16'$ each were taken from each plot with the help of rectangular wooden frames. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack by rats, stem-borer and leaf roller. (iii) Grain yield. (iv) (a) to (c) No. (v) (a) and (b) No. (vi) In Trichur district there were heavy rains in September and fields were submerged for two weeks. Again in October, after top dressing, fields were flooded and even strong plot bunds could not prevent water flowing from one plot to another. (vii) Experiment was conducted under 'Pot. scheme'.

5. RESULTS :

(i) 2945 lb./ac. (ii) 191 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	2701	2996	3138
S.E./mean	=61 lb./ac.		

Crop :- Paddy (*Mundakan*).

Site :- Kuttanad (Kottayam).

Ref :- K. 54(137).

Type :- 'M'.

Object :- To study the efficacy of complete and balanced NPK manuring.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy in almost all fields. (c) Varied from field to field. (ii) Loamy. (iii) September, 1954. (iv) (a) According to owners usual practice—details N.A. (b) Broadcasted. (c) to (e) N.A. (v) Nil. (vi) *Thirinjavellai* and T. 9 (early). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) December 1954.

2. TREATMENTS :

1. Control : Usual practice of the cultivator to supply 20 lb./ac. of N+18 lb./ac. of P_2O_5 +10 lb./ac. of K.
2. NPK mixture : 30 lb./ac. of N+70 lb./ac. of P_2O_5 +40 lb./ac. of K.
Two-third of NPK mixture was applied 10 days after sowing, $\frac{1}{3}$ one month later. All mixtures applied as top dressing, N applied as A/S, P_2O_5 as Super and K as K_2SO_4 .

3. DESIGN :

(i) and (ii) Six fields, one field in each village, representative of the tract, were selected without any randomisation. As one field was harvested by the owner without any supervision it has been dropped from analysis. (iii) (a) Approximately $\frac{1}{3}$ acre ; varied from field to field. (b) 588 sq. ft. Six random samples of size $7' \times 14'$ measured with wooden frames. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) and (c) —. (v) (a) and (b) —. (vi) Nil. (vii) Experiment was conducted under 'Pot. scheme'.

5. RESULTS :

(i) 2652 lb./ac. (ii) 174 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2
Av. yield	2474	2831
S.E./mean	=78 lb./ac.	

Crop :- Paddy (Mundakan).

Ref :- K. 55(138).

Site :- Kottayam, Changanacherry (c.f.).

Type :- 'M'.

Object :- To study the efficacy of complete and balanced NPK manuring.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Varied from field to field. (iii) Nil. (vi) *Thirinjavellai* (short, improved). (v) (a) Owners usual practice. Detailed information N.A. (b) Broadcast. (c) to (e) N.A. (vi) September, 1955. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) December 1955.

2. TREATMENTS :

- Control : Usual practice of cultivator to supply 29 lb./ac. of N+29 lb./ac. of P+11 lb./ac. of K.
 - NP mixture : 15 lb./ac. of N+45 lb./ac. of P_2O_5 applied 15 days after sowing+15 lb./ac. of N applied 45 days after sowing.
 - NPK mixture : 15 lb./ac. of N+45 lb./ac. of P_2O_5 +45 lb./ac. of K_2O applied 15 days after sowing+15 lb./ac. of N applied 45 days after sowing.
- All fertilizers top-dressed.

3. DESIGN :

(i) and (ii) 12 fields, one field in each village, representative of the tract, were selected without any randomisation. (iii) (a) $\frac{1}{2}$ acre approximately ; varied from plot to plot. (b) 512 sq. ft. 4 stratified random samples of size 8'x16' each were taken from each plot with the help of wooden rectangular frames. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Stem-borer attack—no control measures taken. (iii) Grain yield. (iv) (a) No. (b) and (c) —. (v) (a) and (b) —. (vi) Two fields in the villages Kumarakom and Karapuzha had to be dropped because the trials were affected by heavy rains immediately after the top dressings and by floods due to breaches in the bunds between the plots. (vii) Experiment conducted under 'Pot. scheme'.

5. RESULTS :

(i) 2839 lb./ac. (ii) 202 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	2690	2816	3012
	S.E./mean = 64 lb./ac.		

Crop :- Paddy (2nd crop).

Ref :- K. 57(139).

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

Type :- 'MV'.

Object :- To find out the best time of applying quick acting nitrogenous manures for different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy (c) 5000 lb./ac. of G.L. as B.D. at puddling. Triple Super at 25 lb./ac. as basal before planting. A/S at 50 lb./ac. top dressed one month after planting. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 20.9.1957/29.10.1957. (iv) (a) Six ploughings and 3 diggings. (b) Transplanting. (c) —. (d) 10" x 6". (e) 3 to 4. (v) G.L. at 4000 lb./ac. at puddling. (vi) As per treatments. (vii) Unirrigated. (viii) One weeding before applying 2nd dose of A/S. (ix) 19.30". (x) 11.2.1958.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1 =PTB-12 (medium) and V_2 =PTB-20 (medium).

Sub-plot treatments :

4 applications of 30 lb./ac. of N as A/S : M_1 =Full dose top dressed, M_2 =10 lb./ac. as basal+20 lb./ac. as top dressing, M_3 =20 lb./ac. as basal+10 lb./ac. as top dressing and M_4 =Full dose as basal.

Top dressing done one month after planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 15' x 15'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Folidol sprayed against stem-borer. (iii) Grain yield. (iv) (a) 1957 (2nd crop)—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2386 lb./ac. (ii) (a) 321 lb./ac. (b) 167 lb./ac. (iii) M effect alone is highly significant. (iv) Av. yield of grain in lb./ac.

	M ₁	M ₂	M ₃	M ₄	Mean
V ₁	2502	2414	2402	2299	2404
V ₂	2474	2329	2462	2202	2367
Mean	2488	2372	2432	2251	2386

S.E. of difference of two

1. V marginal means = 114 lb./ac.
2. M marginal means = 84 lb./ac.
3. M means at the same level of V = 118 lb./ac.
4. V means at the same level of M = 153 lb./ac.

Crop :- Paddy (1st crop).

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

Ref :- K. 58(140).

Type :- 'MV'.

Object :- To find out the best time of application of A/S for different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 16.4.1958/2.6.1958. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting. (c) —. (d) 6'×6'. (e) 2. (v) 4000 lb./ac. of G.L. before last puddling. (vi) As per treatments. (vii) Unirrigated. (viii) One weeding one month after planting. (ix) 77.35". (x) 11.10.1958.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V₁=PTB-1 (medium) and V₂=PTB-5 (medium).

Sub-plot treatments :

Same as in expt. no. 139 on page 91.

3. DESIGN :

(i) Split-plot. (ii) 2 main-plots/block ; 4 sub-plots/main-plot. (iii) 4. (iv) (a) and (b) 15'×15'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1957 (2nd crop)—1958 (1st crop). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) N.A.

5. RESULTS :

(i) 1662 lb./ac. (ii) (a) 306 lb./ac. (b) 290 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	M ₁	M ₂	M ₃	M ₄	Mean
V ₁	1498	1627	1608	1655	1597
V ₂	1990	1901	1423	1592	1726
Mean	1744	1764	1516	1624	1662

S.E. of difference of two

- | | |
|-----------------------------------|--------------|
| 1. V marginal means | =108 lb./ac. |
| 2. M marginal means | =145 lb./ac. |
| 3. M means at the same level of V | =205 lb./ac. |
| 4. V means at the same level of M | =208 lb./ac. |

Crop :- Paddy (1st crop-single crop area).

Ref :- K. 57(141).

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

Type :- 'MV'.

Object :-To find out the effect of manuring on different PTB varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) G.L. at 5000 lb./ac. as basal and A/S at 75 lb./ac. as top dressing. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 27.5.1957/4.7.1957. (iv) (a) Six ploughings and 3 diggings. (b) Transplanting. (c) —. (d) 10'×6". (e) 3 to 4. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) One weeding 3 weeks after planting. (ix) 70.90". (x) PTB-10 on 11.9.1957 and others on 5.10.1957.

2. TREATMENTS :

Main-plot treatments :

3 doses of manures : M_1 =G.L. at 6000 lb./ac.+C.M. at 4200 lb./ac.+A/S at 200 lb./ac., M_2 =G.L. at 5000 lb./ac.+C.M. at 2100 lb./ac.+A/S at 100 lb./ac. and M_3 =G.L. at 1000 lb./ac.+C.M. at 700 lb./ac.+A/S at 50 lb./ac.

Sub-plot treatments :

4 varieties : V_1 =PTB-7 (medium), V_2 =PTB-10 (early), V_3 =PTB-2 (medium) and V_4 =PTB-32 (medium). G.L. and C.M. applied at puddling and A/S top dressed one month after planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 25'×8'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) BHC dusted against case worms. (iii) Grain yield. (iv) (a) 1957 (1st crop)—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2465 lb./ac. (ii) (a) 312 lb./ac. (b) 259 lb./ac. (iii) M effect is significant, V effect is highly significant. Interaction is not significant. (iv) Av. yield of grain in lb./ac.

	V_1	V_2	V_3	V_4	Mean
M_1	3172	1382	3049	2988	2648
M_2	2886	1450	3022	2644	2500
M_3	2627	1133	2808	2423	2248
Mean	2895	1322	2960	2685	2465

S.E. of difference of two

- | | |
|-----------------------------------|--------------|
| 1. M marginal means | =110 lb./ac. |
| 2. V marginal means | =106 lb./ac. |
| 3. V means at the same level of M | =183 lb./ac. |
| 4. M means at the same level of V | =193 lb./ac. |

Crop :- Paddy (1st crop).

Ref :- K. 58(142).

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

Type :- 'MV'.

Object :-To find out the effect of manuring on different PTB varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 23.5.1958/21.6.1958. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting. (c) —. (d) 10'×6". (e) 2. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) One weeding a month after planting. (ix) N.A. (x) 19.9.1958 to 3.10.1958.

2. TREATMENTS :

Same as in expt. no. 141 on page 93.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) 75'×32'. (iii) 4. (iv) (a) and (b) 8'×25'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 2135 lb./ac. (ii) (a) 403 lb./ac. (b) 304 lb./ac. (iii) M and V effects are highly significant. Interaction is not significant. (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	V ₄	Mean
M ₁	2750	1964	2665	2957	2584
M ₂	2331	1395	2430	2522	2170
M ₃	1964	1147	1722	1776	1652
Mean	2348	1502	2272	2418	2135

S.E. of difference of two

1. M marginal means = 143 lb./ac.
2. V marginal means = 124 lb./ac.
3. V means at the same level of M = 215 lb./ac.
4. M means at the same level of V = 234 lb./ac.

Crop :- Paddy (2nd crop—double crop area).

Site :- Agri. Res. Stn. Pattambi.

Ref :- K. 57(143).

Type :- 'MV'.

Object :- To find out the effect of manuring on different PTB varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite Loam. (b) Refer soil analysis, Pattambi. (iii) 26.9.1957/3.11.1957. (iv) (a) Four ploughings and 4 diggings. (b) Transplanting (c) —. (d) 10'×6". (e) 3 to 4. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) One weeding 4 weeks after planting. (ix) 19.30". (x) 24.2.1958.

2. TREATMENTS :

Main-plot treatments :

Same as in expt. no. 141 on page 93.

Sub-plot treatments :

8 Varieties : V₁=PTB-4, V₂=PTB-12, V₃=PTB-15, V₄=PTB-18, V₅=PTB-20, V₆=PTB-21, V₇=PTB-27 and V₈=PTB-33.

G.L. and C.M. applied as basal at the time of puddling. A/S top dressed one month after planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plot/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 25'×8'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Folidol sprayed against stem-borer. (iii) Grain yield. (iv) (a) 1957 (1st crop)—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2364 lb./ac. (ii) (a) 560 lb./ac. (b) 304 lb./ac. (iii) M and V effects are highly significant. Interaction is not significant. (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	V ₇	V ₈	Mean
M ₁	2600	2855	2090	2746	2876	2437	2978	2352	2617
M ₂	2968	2297	2450	2413	2406	2423	2804	2093	2482
M ₃	2338	1868	1916	1909	1878	2083	2171	1784	1994
Mean	2635	2340	2152	2356	2387	2314	2651	2077	2364

S.E. of difference of two

1. M marginal means = 140 lb./ac.
2. V marginal means = 124 lb./ac.
3. V means at the same level of M = 215 lb./ac.
4. M means at the same level of V = 245 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 58(144).

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

Type :- 'MV'.

Object :- To find out the effect of manuring on different PTB varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 29.9.1958/4.11.1958. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting. (c) —. (d) 6' x 6'. (e) 2 (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) One weeding one month after planting. (ix) N.A. (x) 19.2.1959.

2. TREATMENTS :

Same as in expt. no. 143 on page 94.
A/S applied on 6.11.1958.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 8' x 25'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Folidol sprayed as a precautionary measure. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1567 lb./ac. (ii) (a) 385 lb./ac. (b) 250 lb./ac. (iii) Main effect of V and interaction M x V are highly significant. M effect is not significant. (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	V ₇	V ₈	Mean
M ₁	1496	1856	1497	1909	1734	2035	1457	1673	1707
M ₂	1953	1631	1676	1380	1360	1200	1308	1232	1468
M ₃	1832	1531	1611	1502	1512	1378	1416	1431	1527
Mean	1760	1673	1595	1597	1535	1538	1394	1445	1567

S.E. of difference of two

- | | |
|-----------------------------------|---------------|
| 1. M marginal means | = 96 lb./ac. |
| 2. V marginal means | = 102 lb./ac. |
| 3. V means at the same level of M | = 177 lb./ac. |
| 4. M means at the same level of V | = 191 lb./ac. |

Crop :- Paddy (2nd crop).

Ref :- K. 59(145).

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

Type :- 'MV'.

Object :- To find out the effect of manuring on different PTB varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 8.10.1959/12.11.1959. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) N.A. (ix) 3.56". (x) On different dates according to maturity.

2. TREATMENTS :

Same as in expt. no. 143 on page 94.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 25' x 8'. (v) No. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 2633 lb./ac. (ii) (a) 744.5 lb./ac. (b) 424.7 lb./ac. (iii) V effect alone is highly significant. (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	V ₇	V ₈	Mean
M ₁	3620	2741	2757	3025	2443	2959	2203	2868	2827
M ₂	3401	2436	2651	2642	2638	2504	2339	2606	2652
M ₃	2897	2329	2295	2430	2061	2348	2438	2557	2419
Mean	3306	2502	2568	2699	2381	2604	2327	2677	2633

S.E. of difference of two

- | | |
|-----------------------------------|-----------------|
| 1. M marginal means | = 186.1 lb./ac. |
| 2. V marginal means | = 173.4 lb./ac. |
| 3. V means at the same level of M | = 300.3 lb./ac. |
| 4. M means at the same level of V | = 337.0 lb./ac. |

Crop :- Paddy (1st crop—double crop area)

Ref :- K. 57(146).

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

Type :- 'MV'.

Object :- To find out the effect of manuring on different PTB varieties of Paddy.

BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L. as basal at puddling+250 lb./ac. super as basal before planting+200 lb./ac. as A/S top dressed one month after planting. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 27.5.1957/30.6.1957. (iv) (a) Five ploughings and 3 diggings. (b) Transplanting. (c) —. (d) 10" x 6". (e) 3 to 4. (v) Nil. (vi) As per treatment. (vii) Unirrigated. (viii) One weeding (ix) 70.90". (x) PTB 22 to 26 and 31 on 25.9.1957 ; PTB 1, 2, 5, 8 and 9 on 3.10.1957.

2. TREATMENTS :

Main-plot treatments :

Same as in expt. no. 141 on page 92.

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 at puddling and A/S top dressed one month after planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 11 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) $25' \times 8'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) BHC dusted against case worms. (iii) Grain yield. (iv) (a) 1957 (1st crop)—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2612 lb./ac. (ii) (a) 506 lb./ac. (b) 322 lb./ac. (iii) V effect is highly significant, M effect is significant while interaction is not significant. (iv) Av. yield of grain in lb./ac.

	V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	V_9	V_{10}	V_{11}	Mean
M_1	3655	3563	3665	2695	2876	2552	2855	2566	2665	2059	2120	2843
M_2	3641	3481	3505	2372	2600	2358	2382	1998	2620	2093	1814	2624
M_3	3652	3505	3182	2324	2324	1947	2188	1974	1868	1678	1490	2368
Mean	3649	3516	3451	2437	2600	2286	2475	2179	2384	1943	1808	2612

S.E. of difference of two

1. M marginal means = 108 lb./ac.
2. V marginal means = 132 lb./ac.
3. V means at the same level of M = 228 lb./ac.
4. M means at the same level of V = 243 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 58(147).

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

Type :- 'MV'.

Object :- To find out the effect of manuring on different PTB varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 23.5.1958/30.6.1958. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting. (c) —. (d) $6'' \times 6''$. (e) 2. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) One weeding one month after planting. (iv) $80''$. (x) PTB-22 to 25 and 31 on 7.10.1958 others on 25.10.1958.

2. TREATMENTS :

Same as in expt. no. 146 on page 96.

G.L. and C.M. given as B.D. and A/S as top dressing.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 11 sub-plots/main-plot. (b) $75' \times 88'$. (iii) 4. (iv) (a) and (b) $25' \times 8'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2286 lb./ac. (ii) (a) 417 lb./ac. (b) 330 lb./ac. (iii) V effect alone is highly significant. (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	V ₇	V ₈	V ₉	V ₁₀	V ₁₁	Mean
M ₁	2654	3082	2118	2407	2129	2141	2519	2078	2355	1894	1334	2246
M ₂	2665	2922	2224	2560	2289	2350	2729	2397	2635	2259	1644	2425
M ₃	2250	2579	1428	2467	2068	2334	2664	2602	2519	1729	1409	2186
Mean	2523	2861	1923	2478	2162	2275	2637	2359	2503	1960	1462	2286

S.E difference of two

1. M marginal means = 89 lb./ac.
2. V marginal means = 135 lb./ac.
3. V means at the same level of M = 233 lb./ac.
4. M means at the same level of V = 239 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 59(148)

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

Type :- 'MV'.

Object :- To find out the effect of manuring on the different PTB varieties of Paddy.

1. BASAL CONDITIONS :

- (i) (a) No. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 17.6.1959/14.7.1959. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) N.A. (ix) 10.98%. (x) On different dates according to maturity.

2. TREATMENTS:

Same as in expt. no. 146 on page 96.

3. DESIGN :

- (i) Split-plot. (ii) (a) 3 main-plots/block ; 11 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 25' x 8'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) Nil. (iii) Grain yield. (iv) 1957 (1st crop)—contd. (v) (a) and (b) Nil. (vi) and (vii) N.A.

5. RESULTS :

- (i) 1309 lb./ac. (ii) (a) 560.1 lb./ac. (b) 291.9 lb./ac. (iii) V effect alone is highly significant. (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	V ₇	V ₈	V ₉	V ₁₀	V ₁₁	Mean
M ₁	1797	1576	1518	1540	1247	965	1560	1403	1137	928	1136	1346
M ₂	1849	2045	1386	1400	1158	1053	1563	1299	1253	1250	1038	1390
M ₃	1444	1879	1069	1265	986	972	1337	1166	1139	871	975	1191
Mean	1697	1833	1324	1402	1130	997	1487	1289	1176	1016	1050	1309

S.E of difference of two

1. M marginal means = 119.4 lb./ac.
2. V marginal means = 119.2 lb./ac.
3. V means at the same level of M = 206.4 lb./ac.
4. M means at the same level of V = 230.2 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 54(149).

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

Type :- 'MV'.

Object :- To study the effect of N and P on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) B.D. of 4000 lb./ac. of G.L. and top dressing with 150 lb./ac. of A/S. G.L. applied at the time of puddling and A/S one month after planting. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 9.6.1954/9.7.1954. (iv) (a) Six puddlings and 3 levellings. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) 4000 lb./ac. of G.L. at the time of puddling. (vi) As per treatments. (vii) Unirrigated. (viii) Two weedings. (ix) 42.92°. (x) 16.10.1954.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1 =PTB-2 and V_2 =PTB-9 (both medium).

Sub-plot treatments :

All combinations of (1) and (2)

1. 4 levels of N as A/S : $N_0=0$, $N_1=30$, $N_2=45$ and $N_3=60$ lb./ac.2. 4 levels of P_2O_5 as super : $P_0=0$, $P_1=30$, $P_2=45$ and $P_3=60$ lb./ac.N top dressed one month after planting and P_2O_5 applied as B.D. at the time of final ploughing and levelling.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block and 16 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) $10' \times 20'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Uniform dusting with BHC. against paddy stem-borer. (iii) Grain yield. (iv) 1954 (1st crop)—1956 (2nd crop). (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3226 lb./ac. (ii) (a) 703 lb./ac. (b) 305 lb./ac. (iii) V effect is highly significant while effect of N is significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean	P_0	P_1	P_2	P_3
V_1	3838	3738	3907	3870	3838	3733	3914	3853	3855
V_2	2524	2487	2672	2773	2614	2698	2594	2516	2651
Mean	3182	3114	3289	3321	3226	3215	3254	3184	3254
P_0	3132	3104	3315	3315					
P_1	3341	3123	3226	3321					
P_2	3193	3036	3302	3206					
P_3	3062	3191	3315	3443					

S.E. of difference of two

- V marginal means = 124 lb./ac.
- N or P marginal means = 76 lb./ac.
- N or P means at the same level of V = 109 lb./ac.
- V means at the same level of N or P = 155 lb./ac.
- means in the body of $N \times P$ table = 152 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 55(150).

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

Type :- 'MV'.

Object :- To study the effect of N and P on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 21.5.1955/6 and 7.7.1955. (iv) (a) 2 ploughings, 2 mummy diggings and levelling. (b) Crop transplanted in bulk. (c) —. (d) 10'×6". (e) 3—4. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings. (ix) 68.93°. (x) 28 and 29.10.1955.

2. TREATMENTS :

Same as in expt. no. 149 on page 99.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block; 16 sub-plots/main-plot. (b) 80'×80'. (iii) 4. (iv) (a) and (b) 10'×20'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Dusting of BHC against stem-borer. (iii) Grain yield. (iv) (a) 1954 (1st crop)—1956 (2nd crop). (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2367 lb./ac. (ii) (a) 271 lb./ac. (b) 339 lb./ac. (iii) V and N effects are highly significant. P effect is significant while other effects are not significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean	P ₀	P ₁	P ₂	P ₃
V ₁	2021	2729	2709	2743	2551	2362	2706	2518	2616
V ₂	1638	2266	2290	2539	2183	2080	2194	2307	2151
Mean	1830	2498	2499	2641	2367	2221	2450	2412	2384
P ₀	1640	2518	2341	2382					
P ₁	2069	2334	2471	2927					
P ₂	1770	2600	2606	2675					
P ₃	1838	2539	2580	2580					

S.E. of difference of two

- | | |
|--|---------------|
| 1. V marginal means | = 48 lb./ac. |
| 2. N or P marginal means | = 84 lb./ac. |
| 3. N or P means at the same level of V | = 120 lb./ac. |
| 4. V means at the same level of N or P | = 114 lb./ac. |
| 5. means in the body of N×P table | = 169 lb./ac. |

Crop :- Paddy (1st crop).

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

Ref :- K. 56(151).

Type :- 'MV'.

Object :- To study the effect of N and P on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 4.6.1956/6.7.1956. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting. (c) —. (d) 10'×6". (e) 4. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) One weeding. (ix) 80°. (x) 3rd week of Oct. 1956.

2. TREATMENTS :

Same as in expt. no. 149 on page 99.

3. DESIGN :

(i) (a) Split-plot. (ii) (a) 2 main-plots/block; 16 sub-plots/main-plot. (b) 80'×80' (iii) 4. (iv) (a) and (b) 10'×20'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1954 (1st crop)—1956 (2nd crop). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1671 lb./ac. (ii) (a) 429 lb./ac. (b) 246 lb./ac. (iii) N effect is highly significant. V effect is significant while other effects are not significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean	P ₀	P ₁	P ₂	P ₃
V ₁	1540	1918	1892	1855	1801	1760	1829	1851	1766
V ₂	1216	1403	1688	1855	1541	1544	1523	1616	1481
Mean	1378	1661	1790	1855	1671	1652	1676	1733	1623
P ₀	1369	1770	1718	1753					
P ₁	1437	1549	1736	1982					
P ₂	1446	1702	1948	1838					
P ₃	1259	1625	1761	1846					

S.E. of difference of two

- | | |
|--|---------------|
| 1. V marginal means | = 76 lb./ac. |
| 2. N or P marginal means | = 61 lb./ac. |
| 3. N or P means at the same level of V | = 87 lb./ac. |
| 4. V means at the same level of N or P | = 106 lb./ac. |
| 5. means in the body of N×P table | = 123 lb./ac. |

Crop :- Paddy (2nd crop).

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

Ref :- K. 54(152).

Type :- 'MV'.

Object :- To study the effect of N and P on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 6.9.1954/28.10.1954. (iv) (a) Six puddlings and 3 levellings. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) 4000 lb./ac. of G.L. at the time of puddling. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings. (ix) 15.69°. (x) 28.1.1955.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V₁=PTB-18 V₂=FTB-20 (both medium).

Sub-plot treatments :

Same as in expt. no. 149 on page 99.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 16 sub-plots/main-plot. (b) 80'×80'. (iii) 4. (iv) (a) and (b) 10'×20'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Uniform dusting with BHC against stem-borer. (iii) Grain yield. (iv) (a) 1954 (1st crop)—1956 (2nd crop). (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2937 lb./ac. (ii) (a) 253 lb./ac. (b) 205 lb./ac. (iii) Main effect N and interaction V×N are highly significant. V effect is significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean	P ₀	P ₁	P ₂	P ₃
V ₁	2435	2844	2910	3090	2820	2770	2827	2886	2794
V ₂	2481	2977	3162	3598	3054	3008	3117	3084	3008
Mean	2458	2911	3036	3344	2937	2889	2972	2985	2901
P ₀	2431	2921	2988	3219					
P ₁	2422	2921	3165	3382					
P ₂	2579	2988	3030	3341					
P ₃	2396	2818	2960	3430					

S.E. of difference of two

1. V marginal means = 44 lb./ac.
2. N or P marginal means = 52 lb./ac.
3. N or P means at the same level of V = 72 lb./ac.
4. V means at the same level of N or P = 76 lb./ac.
5. means in the body of N × P table = 102 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 55(153).

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

Type :- 'MV'.

Object :- To study the effect of N and P on different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 23.9.1955/5 and 6.11.1955. (iv) (a) Four ploughings and 2 *mummatty* diggings followed by levelling. (b) Bulk planting. (c) and (d) —. (e) 3 to 4. (v) 5000 lb./ac. of G.M. as B.D. at the time of puddling. (vi) As per treatments. (vii) Unirrigated. (viii) One weeding. (ix) 28.36%. (x) 3.2.1956.

2. TREATMENTS :

Same as in expt. no. 152 on page 101.
Fertilizers applied on 4.11.1955 by broadcasting.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 16 sub-plots/main-plot. (b) 80' × 80'. (iii) 4. (iv) (a) and (b) 10' × 20'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) D.D.T. sprayed against stem-borer. (iii) Grain yield. (iv) (a) 1954 (1st crop)—1956 (2nd crop). (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1680 lb./ac. (ii) (a) 432 lb./ac. (b) 245 lb./ac. (iii) Effect of P is highly significant. N effect is significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean	P ₀	P ₁	P ₂	P ₃
V ₁	1576	1572	1562	1672	1596	1251	1579	1766	1787
V ₂	1728	1634	1811	1882	1764	1252	1814	1949	2039
Mean	1652	1603	1687	1777	1680	1252	1696	1858	1913
P ₀	1201	1247	1206	1351					
P ₁	1576	1639	1807	1764					
P ₂	1878	1753	1850	1950					
P ₃	1953	1773	1884	2044					

S.E. of difference of two

1. V marginal means = 76 lb./ac.
2. N or P marginal means = 61 lb./ac.
3. N or P means at the same level of V = 87 lb./ac.
4. V means at the same level of N or P = 108 lb./ac.
5. means in the body of N x P table = 122 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 56(154).

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

Type :- 'MV'.

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

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam: (b) Refer soil analysis, Pattambi. (iii) 28.9.1956/7.11.1956. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting. (c) —. (d) 10" x 6". (e) 2. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) One weeding one month after planting. (ix) N.A. (x) 7.2.1957.

2. TREATMENTS:

Same as in expt. no. 152 on page 101.

N applied one month after planting and P₂O₅ before planting.

3. DESIGN :

- (i) R.B.D. (ii) (a) 2 main-plots/block ; 16 sub-plots/main-plot. (b) 80' x 80'. (iii) 4. (iv) (a) and (b) 10' x 20'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1954 (1st crop)—1956 (2nd crop). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1587 lb./ac. (ii) (a) 584 lb./ac. (b) 216 lb./ac. (iii) Effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean	P ₀	P ₁	P ₂	P ₃
V ₁	1341	1519	1672	1846	1594	1554	1629	1571	1621
V ₂	1150	1557	1742	1870	1580	1508	1544	1657	1610
Mean	1246	1538	1707	1858	1587	1531	1587	1614	1616
P ₀	1191	1557	1595	1782					
P ₁	1251	1476	1761	1859					
P ₂	1301	1557	1710	1889					
P ₃	1237	1561	1761	1902					

S.E. of difference of two

1. V marginal means = 103 lb./ac.
2. N or P marginal means = 54 lb./ac.
3. N or P means at the same level of V = 76 lb./ac.
4. V means at the same level of N or P = 122 lb./ac.
5. means in the body of N x P table = 109 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 59(155).

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

Type :- 'C'.

Object :- To find out the comparative superiority of different cultures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy, (c) 1000 lb. of G.L. and 100 lb. of Calcium, A/S and Muriate of Potash. (ii) (a) N.A. (b) Refer soil analysis, Ambalavayal. (iii) 23.5.1959. (iv) (a) to (e) N.A. (v) Nil. (vi) Jeerakasala (late). (vii) Irrigated. (viii) One hand weeding. (ix) 107.87°. (x) 9.12.1959.

2. TREATMENTS :

4 cultures :- C₁=No. 190, C₂=No. 179, C₃=No. 534 and C₄=Local.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 20' x 5'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 3163 lb./ac. (ii) 217.8 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	C ₁	C ₂	C ₃	C ₄
Av. yield	3249	3467	3158	2777

S.E./mean = 88.9 lb./ac.

Crop :- Paddy (Mundakan).

Ref :- K. 56(156).

Site :- Paddy Breeding Stn., Kayamkulam.

Type :- 'C'.

Object :- To find out the optimum age of seedlings for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 2 cwt/ac. of B.M. broadcast and A/S/N ploughed in $\frac{1}{2}$ cwt/ac. at the time of sowing and $\frac{1}{2}$ cwt/ac. top dressed 45 days after sowing by broadcast. (ii) (a) Sandy loam. (b) N.A. (iii) 22.6.1956/10.8.1956. (iv) (a) 4 ploughings with *desi* plough and one with iron plough. (b) Transplanted. (c) —. (d) 6" x 6". (e) 1. (v) B.M. at 2 cwt/ac. broadcast and A/S/N ploughed in at the time of planting at 1 cwt/acre. Top dressing with $\frac{1}{2}$ cwt/ac. of Pot. Sul. 40 days after planting by broadcast. (vi) U.R. 19, (improved, late). (vii) Unirrigated. (viii) 2 weedings 15 and 35 days after planting. (ix) 31.46°. (x) 10.1.1957.

2. TREATMENTS :

4 ages of seedlings at transplanting :- C₁=28, C₂=35, C₃=42 and C₄=49 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 9' x 7'. (b) 8' x 6'. (v) One row around each plot discarded. (vi) Yes.

4. GENERAL :

(i) Satisfactory, lodged, date of lodging N.A. (ii) Paddy blight controlled by spraying with 1 lb. of Cupravit in 40 gallons of water per acre. (iii) Height of tillers and grain yield. (iv) (a) No. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 1805 lb./ac. (ii) 150 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	C ₁	C ₂	C ₃	C ₄
Av. yield	1731	1827	1901	1771

S.E./mean = 61.24 lb./ac.

Crop :- Paddy.

Ref :- 57(157).

Site :- Paddy Breeding Stn., Kayamkulam.

Type :- 'C'.

Object :- To find out the optimum age of seedling for transplanting Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 1½ cwt/ac. of B.M. as B.D. and 5 cwt/ac. of wood ash as top dressing. (ii) (a) Sandy loam, slightly acidic. (b) N.A. (iii) 28.6.1957/27.8.1957. (iv) (a) 4 ploughings. (b) Transplanting. (c) —. (d) 9'×9'. (e) 2. (v) 45 cwts/ac. of C.M. at the time of ploughing+1½ cwt./ac. of B.M. applied by broadcast+35 lb. of A/S a month after planting. (vi) U.R. 19 (improved, late). (vii) Unirrigated. (viii) 2 weedings at intervals of one month after planting. (ix) 34.82". (x) 16.1.1958.

2. TREATMENTS :

3 ages of seedlings at transplanting :- C₁=30, C₂=45 and C₃=60 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 16½'×10½'. (b) 15'×9'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Good stand. No lodging. (ii) Rice blast ; sprayed with Shell Copper 1 lb. in 35 gallons of water. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1599 lb./ac. (ii) 268 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	C ₁	C ₂	C ₃
Av. yield	1442	1748	1607

S.E./mean = 109 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 58(158).

Site :- Paddy Breeding Stn., Kayamkulam.

Type :- 'C'.

Object :- To determine the best age of seedling for transplanting Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 1½ cwt. of B.M. as B.D. before planting. 5 cwt of wood ash as top dressing. (ii) (a) Sandy loam. (b) N.A. (iii) 21.6.1958/25.8.1958. (iv) (a) Puddled twice. (b) Transplanted in lines. (c) —. (d) 9'×6'. (e) 2. (v) 4000 lb./ac C.M. and 150 lb./ac. B.M. ploughed in before planting. Top dressed with 50 lb./ac. of A/S and 56 lb./ac. of Pot. Sul. one month after planting. (vi) U.R. 19 (late, improved). (vii) Unirrigated. (viii) 2 weedings. (ix) 19.30". (x) 17.1.1959.

2. TREATMENTS :

4 ages of seedlings at transplanting :- C₁=30, C₂=40, C₃=50 and C₄=60 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) and (b) 20'×5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good stand, no lodging. (ii) Attack of blast, controlled by spraying Cupravit two months after planting. (iii) Grain yield. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2552 lb./ac. (ii) 653 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	C ₁	C ₂	C ₃	C ₄
Av. yield	2688	2576	2321	2624

S.E./mean = 231 lb./ac.

Crop :- Paddy (*Mundakan*).

Ref :- K. 56(159).

Site :- Paddy Breeding Stn., Kayamkulam.

Type :- 'C'.

Object :- To find out whether inter cultivation with Japanese hoe is beneficial to Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) A/S/N at $\frac{1}{2}$ cwt/ac. + B.M. at 2 cwt/ac. B.M. broadcast and ploughed in at the time of sowing. Top dressing with A/S/N 45 days after sowing. (ii) (a) Sandy loam. (b) N.A. (iii) 16.8.1956. (iv) (a) 4 ploughings with *desi* plough and 1 with iron plough. (b) Transplanting from nursery. (c) —. (d) 12" x 6". (e) 2. (v) B.M. at 2 cwt/ac. broadcasted and ploughed in at the time of planting. A/S/N at 1 cwt per acre broadcast soon after planting. Top dressing with $\frac{1}{2}$ cwt/ac. Pot. Sul. 40 days after planting by broadcast. (vi) U.R. 19 (late, improved). (vii) Unirrigated. (viii) 2 weedings 15 and 35 days after planting. (ix) 31.46". (x) 10.1.1957.

2. TREATMENTS :

- No inter cultivation.
- Inter cultivation 15 days after planting.
- Inter cultivation 25 days after planting.
- Inter cultivation 15 and 25 days after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 9' x 7'. (b) 8' x 6'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Satisfactory, lodged. (ii) Paddy blight—controlled by spraying with Cupravit 1 lb in 40 gallons of water per acre. (iii) Height of tiller and grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 1657 lb./ac. (ii) 110 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4
Av. yield	1521	1788	1691	1617

S.E./mean = 45 lb./ac.

Crop :- Paddy.

Ref :- K. 57(160).

Site :- Paddy Breeding Stn., Kayamkulam.

Type :- 'C'.

Object :- To find out whether inter cultivation with Japanese hoe is beneficial to Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) $1\frac{1}{2}$ cwt/ac. of B.M. as B.D. + 5 cwt/ac. of wood ash top dressed one month after planting. (ii) (a) Sandy loam, slightly acidic. (b) N.A. (iii) 28.6.1957/27.8.1957. (iv) (a) 4 ploughings. (b) Transplanting in lines. (c) —. (d) 9" x 9". (e) 2. (v) C.M. at 45 cwt/ac. and B.M. at $\frac{1}{2}$ cwt/ac. applied at the time of ploughing. Top dressing with 35 lb./ac. of A/S one month after planting. (vi) U.R. 19 (improved, late) (vii) Unirrigated. (viii) 2 weedings at intervals of one month from planting (ix) 34.82". (x) 17.1.1958.

2. TREATMENTS :

Same as in expt. no. 159 on page 106.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) $14\frac{1}{2}' \times 10\frac{1}{2}'$. (b) $13\frac{1}{2}' \times 9'$. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Good stand. No lodging. (ii) Sprayed with Shell Copper (1 lb in 35 gallons of water) as a protection against Paddy blast. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) No. (v) (a) and (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 1843 lb./ac. (ii) 231 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4
Av. yield	1929	1830	1830	1782

S.E./mean = 95 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 58(161).

Site :- Paddy Breeding Stn., Kayamkulam.

Type :- 'C'.

Object :—To find out whether inter cultivation with Japanese hoe is beneficial to Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) $1\frac{1}{2}$ cwt/ac. of B.M. as B.D. and 5 cwt/ac. of wood ash as top dressing. (ii) (a) Sandy loam. (b) N.A. (iii) 21.6.1958/22.8.1958. (iv) (a) Puddled twice. (b) Transplanted in lines. (c) —. (d) $9'' \times 6''$. (e) 2. (v) C.M. at 45 cwt/ac. and B.M. at $1\frac{1}{2}$ cwt./ac. ploughed in before planting. Top dressing with 50 lb./ac. of A/S and 56 lb./ac. of Pot. Sul. one month after planting. (vi) U.R-19 (improved) (vii) Unirrigated. (viii) 2 weedings one month after planting. (ix) 19.30°. (x) 17.1.1959.

2. TREATMENTS :

Same as in expt. no. 159 on page 106.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) $20' \times 10'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good stand, no lodging. (ii) Attack of blast; sprayed with Cupravit 2 times. (iii) Yield of grain and tiller count. (iv) (a) 1956—contd. (b) [No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3171 lb./ac. (ii) 350 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4
Av. yield	3161	3134	3138	3252

S.E./mean = 124 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 58(162).

Site :- Paddy Breeding Stn., Kayamkulam.

Type :- 'C'.

Object :—To determine the optimum number of seedlings per hole for planting Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) $1\frac{1}{2}$ cwt/ac. of B.M. as B.D. and 5 cwt/ac. wood ash as top dressing. (ii) (a) Sandy loam. (b) N.A. (iii) 21.6.1958/20.8.1958. (iv) (a) Puddled twice. (b) Planted in lines. (c) —. (d) $9'' \times 6''$. (e) As per treatments. (v) 4000 lb./ac. of C.M. and 150 lb./ac. of B.M. ploughed in before planting; 50 lb./ac. of A/S and 50 lb./ac. of Pot. Sul. top dressed one month after planting. (vi) U.R. 19 (improved, late) (vii) Unirrigated. (viii) 2 weedings. (ix) 19.30°. (x) 16.1.1959.

2. TREATMENTS :

1. Planting 1 seedling/hole.
2. Planting 2 seedlings/hole.
3. Planting 3 seedlings/hole.
4. Planting 4 seedlings/hole.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) $12\frac{1}{2}' \times 12'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good stand. No lodging. (ii) Blast attack, sprayed twice with Cupravit two months after planting. (iv) (a) 1958. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2561 lb./ac. (ii) 519 lb./ac. (iii) Treatments are not significantly different. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4
Av. yield	2448	2548	2670	2579
	S.E./mean = 183 lb./ac.			

Crop :- Paddy (*Mundakan*).

Ref :- K. 56(164).

Site :- Paddy Breeding Stn., Kayamkulam.

Type :- 'C'.

Object :- To find out the best spacing and the optimum number of seedlings/hole for planting Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 2 cwt of B.M./ac. broadcast and ploughed in at the time of sowing. A/S/N at $\frac{1}{2}$ cwt/ac. top dressed 45 days after sowing by broadcast. (ii) (a) Sandy loam. (b) N.A. (iii) 16.8.1956 (iv) (a) 4 ploughings with *desi* plough and 1 with iron plough. (b) Transplanting. (c) —. (d) and (e) As per treatments. (v) B.M. at 2 cwt/ac. broadcast and ploughed in at the time of planting. A/S/N at 1 cwt/ac. broadcast soon after planting. Top dressing with $\frac{1}{2}$ cwt/ac. of Pot. Sul. 40 days after planting by broadcast. (vi) U.R. 19 (improved, late). (vii) Unirrigated. (viii) 2 weedings 15 and 35 days after planting. (ix) 31.46°. (x) 10.1.1957.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 3 spacings :- $C_1=6''$, $C_2=9''$ and $C_3=12''$.

(2) No. of seedlings hole :- $S_1=1$, $S_2=2$ and $S_3=4$.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) $7' \times 7'$. (b) $6' \times 6'$. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. Crop lodged, but date N.A. (ii) Paddy blight controlled by spraying with Cupravit 1 lb. in 40 gallons of water/ac. (iii) Height of tillers and grain yield. (iv) - (a) and (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2753 lb./ac. (ii) 229 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	C ₁	C ₂	C ₃	Mean
S ₁	2647	2660	2584	2630
S ₂	2962	2811	2786	2853
S ₃	2836	2861	2634	2777
Mean	2815	2777	2668	2753

S.E. of any marginal mean = 66 lb./ac.
S.E. of body of table = 114 lb./ac.

Crop :- Paddy (*Mundakan*).

Ref :- K. 55(164).

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

Type :- 'C'.

Object :- To find the optimum age of seedlings to be used for transplanting Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 1875 lb./ac. of Cowdung, 150 lb./ac. of ash, 1 cwt/ac. of A/S and 1½ cwt/ac. of Super. (ii) (a) Sandy loam. (b) N.A. (iii) 5 dates of sowing beginning from 27.7.1955 at weekly intervals. (iv) 6 ploughings. (b) Transplanted on hills. (c) —. (d) 9"×9". (e) 2. (v) Cowdung at 1875 lb./ac. applied as B.D.+ash at 150 lb./ac. applied after transplanting+A/S at 1 cwt/ac. and Super at 1½ cwt/ac. in two equal doses first half one week after transplanting and other half about 40 days after transplanting. (vi) Cochin-1 (local, medium). (vii) Irrigated. (viii) One weeding. (ix) 36". (x) 21.1.1956.

2. TREATMENTS :

Age of seedlings at transplanting :- T₁=21, T₂=28, T₃=35, T₄=42 and T₅=49 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 12'6"×6'9". (b) 12'1"×6'. (v) One row all round. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Nil. (iv) (a) to (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) Conducted by Eco. Bot. Sec.

5. RESULTS :

(i) 3184 lb./ac. (ii) 389 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	T ₁	T ₂	T ₃	T ₄	T ₅
Av. yield	3566	2910	3296	3082	3056

S.E./mean = 159 lb./ac.

Crop :- Paddy (2nd crop)

Ref :- K. 54(165).

Site :- Rice Res. Stn., Monkompu.

Type :- 'C'.

Object :- To study the efficiency of transplanting over local method of sowing Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 1 cwt/ac. of B.M.+1 cwt/ac. of G.N.C.+½ cwt/ac. of A/S. (ii) (a) Clayey soil. (b) N.A. (iii) 12.11.1954/5.12.1954. (iv) (a) 2 ploughings (dry and wet) and levelling. (b) to (e) As per treatments. (v) Nil. (vi) Mo-2 (early, improved) (vii) Irrigated. (viii) 2 weedings. (ix) Nil. (x) 10.2.1955.

2. TREATMENTS :

1. Broadcasting sprouted seeds at 130 lb./ac. (local practice)
2. Transplanting 3 seedlings/hole at a spacing of 9" both ways.

3. DESIGN :

- (i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 37'×15'. (b) 35'×13'. (v) 1' border around (vi) No.

4. GENERAL :

- (i) Stand good, vigorous growth in transplanted plots, partial lodging on 2.1.1955. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1955. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1168 lb./ac. (ii) 73 lb./ac. (iii) Treatment difference is significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2
Av. yield	1053	1284
S.E./mean	= 30 lb./ac.	

Crop :- Paddy.

Ref. :- K. 55(166).

Site :- Rice Res. Stn., Monkompu.

Type :- 'C'.

Object :- To study the efficiency of transplanting over the local method of sowing Paddy.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) B.M. at 1 cwt/ac. + G.N.C. at 1 cwt/ac. + A/S at $\frac{1}{2}$ cwt/ac. (ii) (a) Clayey soil. (b) N.A. (iii) 13.11.1955/4.12.1955. (iv) (a) 2 ploughings (dry and wet) and levelling. (b) to (e) As per treatments. (v) Nil. (vi) M₀-2 (early, improved). (vii) Irrigated. (viii) 2 weedings. (ix) Nil. (x) 11.2.1956.

2. TREATMENTS :

1. Broadcasting of sprouted seeds at the rate of 130 lb./ac.
2. Transplanting 3 seedlings/hole at a spacing of 9" both ways.

3. DESIGN :

- (i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 37'×15'. (b) 35'×13'. (v) One foot border all round the plot. (vi) Yes.

4. GENERAL :

- (i) Stand good, vigorous growth in transplanted plots, partial lodging on 3.1.1956. (ii) Leaf roller D.D.T. 50% sprayed. (iii) Grain yield. (iv) (a) 1953—1955. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1192 lb./ac. (ii) 188 lb./ac. (iii) Treatment difference is significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2
Av. yield	1075	1308
S.E./mean	= 77 lb./ac.	

Crop :- Paddy (1st crop)

Ref :- K. 55(167).

Site :- Agri. Res. Stn., Pat tambi.

Type :- 'C'.

Object :- To assess the utility of working double row rice weeder over the local method of hand weeding.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) G.L. at 5000 lb./ac. as B.D. in Oct.1954 followed by A/S at 75 lb./ac. one month after planting as top dressing. (ii) (a) Sandy loam to loam. (b) Refer soil analysis, Pattambi. (iii) 23.4.1955/16.6.1955. (iv) (a) 7 ploughings and puddling. (b) to (e) As per treatments. (v) 4000 lb./ac. of G.M. +50 lb./ac. of A/S as B.D. in lines.+50 lb./ac. of A/S as top dressing one month after planting. (vi) PTB-2 (medium, improved). (vii) Unirrigated. (viii) As per treatments. (ix) 63.95%. (x) 12.10.1955.

2. TREATMENTS :

1. Planting in at 6"×6" spacing, 1 seeding/hole and hand weeding —(control).
2. Planting in lines at 10"×6" spacing, 4 seedings/hole and hand weeding.
3. Planting in lines at 10"×6" spacing, 4 seedlings/hole [and double row rice weeder worked once in a fortnight i.e., 14, 28 42 and 56 days after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 20'×22'. (v) Nil. About 2' interspace between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Spraying with D.D.T. against stem-borer. (iii) Grain yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 3235 lb./ac. (ii) 157 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	3088	3372	3245
S.E./mean	=55 lb./ac.		

Crop :- Paddy (2nd crop).

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

Ref :- K. 55(168).

Type :- 'C'.

Object :-To assess the utility of working double row rice weeder over the local method of hand weeding.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) 4000 lb./ac. of G.L. +50 lb./ac. of A/S as B.D. in June +50 lb./ac. of A/S as top dressing one month after planting. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 5.9.1955/2.11.1955. (iv) (a) 7 puddlings and levelling. (b) to (e) As per treatments. (v) 6000 lb of G.L.+50 lb./ac. of A/S. G.L. applied one week before planting followed by a ploughing. Half of A/S applied on 1.11.1955 and the other half on 14.11.1955. (vi) PTB-20 (medium, improved). (vii) Unirrigated. (viii) As per treatments. (ix) 31.11%. (x) 24.1.1956.

2. TREATMENTS :

Same as in expt. no. 167 above.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 20'×10'. (v) Nil. About 2' interspace between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Spraying with D.D.T. against stem-borer. (iii) Grain yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 1896 lb./ac. (ii) 197 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	2411	1687	1592
S.E./mean	=70 lb./ac.		

Crop :- Paddy (1st crop).

Ref :- K. 56(169).

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

Type :- 'C'.

Object :- To assess the utility of working double row rice weeder over the local method of hand weeding.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L.+30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 19.5.1955/21.6.1956. (iv) (a) 6 puddlings and 3 levellings. (b) to (e) N.A. (v) 5000 lb./ac. of G.L. +30 lb./ac. of N as A/S. G.L. applied as B.D. and A/S as top dressing one month after planting. (vi) PTB-2 (improved). (vii) Unirrigated. (viii) One weeding one month after planting. (ix) About 80%. (x) 16.10.1956.

2. TREATMENTS :

Same as in expt. no. 167 on page 110.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 60' x 10'. (iii) 8. (iv) (a) and (b) 10' x 20'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) 1955-1957. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2759 lb./ac. (ii) 141.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	2818	2764	2696
S.E./mean	=50.1 lb./ac.		

Crop :- Paddy (2nd crop).

Ref :- K. 56(170).

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

Type :- 'C'.

Object :- To assess the utility of working double row rice weeder over the local method of hand weeding.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L.+30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 21.9.1956/31.10.1956. (iv) (a) 6 puddlings and 3 levellings. (b) to (e) N.A. (v) 5000 lb./ac. of G.L. at the time of puddling+30 lb./ac. of N as A/S one month after planting. (vi) PTB-20 (improved). (vii) Unirrigated. (viii) One weeding. (ix) 2.62%. (x) 4.2.1957.

2. TREATMENTS :

Same as in expt. no. 167 on page 110.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 60' x 10'. (iii) 8. (iv) (a) N.A. (b) 10' x 20'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1955-1957. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2212 lb./ac. (ii) 192 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	2103	2265	2266
S.E./mean	=68 lb./ac.		

Crop :- Paddy (1st crop).

Ref :- K. 57(171).

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

Type :- 'C'.

Object :- To assess the utility of working double row rice weeder over the local method of hand weeding.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L.+30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 8.5.1957/7.6.1957. (iv) (a) 4 ploughings and 4 diggings. (b) to (e) As per treatments. (v) G.L. at 5000 lb./ac. at the time of puddling+150 lb./ac. of Super before planting+A/S at 100 lb./ac. top dressed one month after planting. (vi) PTB-2 (improved). (vii) Unirrigated. (viii) As per treatments. (ix) 84.64%. (x) 12.10.1957.

2. TREATMENTS :

1. Planting in bulk and weeding, hand weeding one month after planting.
2. Planting in lines at 10"×6" spacing, 4 seedlings/hole and hand weeding thrice 14, 28 and 42 days after planting.
3. Planting in lines at 10"×6" spacing, 4 seedlings/hole and double row rice weeder worked at 14, 28 and 42 days after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 10'×20'. (v) Nil; 1½' interspace between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) BHC dusted against case-worm. (iii) Grain yield. (iv) (a) 1955-1957. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 3168 lb./ac. (ii) 137 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	3333	3066	3105

S.E./mean = 49 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 57(172).

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

Type :- 'C'.

Object :- To assess the utility of working double row rice weeder over the local practice of hand weeding.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L.+30 lb./ac. of N as A/S. (ii) (a) Laterite loam (b) Refer soil analysis, Pattambi. (iii) 9.9.1957/25.10.1957. (iv) (a) 4 ploughings and 4 diggings. (b) to (e) As per treatments (v) G.L. at 5000 lb./ac. at the time of puddling+A/S 100 lb./ac., half as B.D. before planting and half top dressed one month after planting. (vi) PTB-20 (improved). (vii) Unirrigated. (viii) As per treatments. (ix) 19.49%. (x) 3.2.1958.

2. TREATMENTS :

Same as in expt. no. 171 above.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 10'×20'. (v) Nil; 1½' interspace between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Folidol sprayed against stem-borer. (iii) Grain yield. (iv) (a) 1955-1957. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 2133 lb./ac. (ii) 130 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	2265	2095	2038
S.E./mean	= 46 lb./ac.		

Crop :- Paddy.
Site :- Agri. Res. Stn., Pattambi.

Ref :- K. 58(173).
Type :- 'C'.

Object :- To study the effect of transplanting Paddy in lines against bulk planting.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 4000 lb./ac. of G.L.+50 lb./ac. of A/S+25 lb./ac. of triple Super as B.D. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 8.5.1958/2,7.1958. (iv) 6 puddlings and 3 levellings. (b) As per treatments. (c) N.A. (d) As per treatments. (e) N.A. (v) 5000 lb./ac. of G.L. as B.D.+30 lb./ac. of N as A/S one month after planting. (vi) PTB-26 (improved). (vii) Unirrigated. (viii) One hand weeding one month after planting. (ix) 80°. (x) 23.10.1958.

2. TREATMENTS :

1. Planting in bulk.
2. Planting in lines 10" apart.
3. Planting at 6' x 6' doubles.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 24' x 16'. (iii) 8. (iv) (a) N.A. (b) 8' x 16'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1958--contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2820 lb./ac. (ii) 124 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	2932	2760	2768
S.E./mean	= 44 lb./ac.		

Crop :- Paddy.
Site :- Agri. Res. Stn., Pattambi.

Ref :- K. 58(174).
Type :- 'C'.

Object :- To study the effect of transplanting Paddy in lines against bulk planting.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L.+30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) Last week of Sept. 1958/1st week of Nov. 1958. (iv) (a) 6 puddlings and 3 levellings. (b) As per treatments. (c) N.A. (d) As per treatments. (e) N.A. (v) 5000 lb./ac. of G.L. (vi) PTB-15 (improved). (vii) Unirrigated. (viii) One weeding one month after planting. (ix) 15°. (x) 23.2.1959.

2. TREATMENTS :

Same as in expt. no. 173 above.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 24' x 16'. (iii) 8. (iv) (a) N.A. (b) 8' x 16'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1958—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2898 lb./ac. (ii) 190 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	2916	2885	2892

S.E./mean = 67 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 56(175).

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

Type :- 'C'.

Object :—To compare different methods of Paddy cultivation.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L.+30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 31.5.1956/3.7.1956. (iv) (a) 6 puddlings and 3 levellings. (b) As per treatments. (c) —. (d) As per treatments. (e) N.A. (v) Super at 150 lb./ac. as B.D. (vi) PTB-2 (improved). (vii) Unirrigated. (viii) One weeding. (ix) About 80%. (x) 17.10.1956.

2. TREATMENTS :

1. Modified Japanese method of planting with 10"×6" spacing and 2 seedlings/hole.
2. Local method of planting (Ryots' method adopted in the locality) with varying number of seedlings/hole.
3. Wave shaped method of planting with 1'-6"×4" spacing and 2 seedlings/hole.
4. Wave shaped method of planting 2'-6"×2½" spacing with 2 seedlings/hole.
5. Wave shaped method of planting with 10"×5" spacing and 2 seedlings/hole.
6. Japanese method with 10"×5" spacing and 4 seedlings/hole.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 45½'×40'. (iii) 6. (iv) (a) and (b) 7.5'×40'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—1957. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3214 lb./ac. (ii) 166.7 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5	6
Av. yield	3061	3254	3363	2940	3327	3340

S.E./mean = 68.0 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 57(176).

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

Type :- 'C'.

Object :—To compare different methods of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) G.L. at 8000 lb./ac.+A/S at 50 lb./ac. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 3.6.1957/6.7.1957. (iv) (a) 4 ploughings. (b) As per treatments. (c) —. (d) As per treatments. (e) N.A. (v) G.L. at 5000 lb./ac.+Super at 150 lb./ac.+A/S at 100 lb./ac. G.L. applied as B.D. at puddling, Super as B.D. before planting and A/S top dressed one month after planting. (vi) PTB-2 (improved). (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 77.02%. (x) 1.11.1957.

2. TREATMENTS :

Same as in expt. no. 175 on page 115.

3. DESIGN :(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $7\frac{1}{2}' \times 35'$. (v) Nil. (vi) Yes.**4. GENERAL :**

(i) Normal. (ii) BHC dusted against case-worm. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2705 lb./ac. (ii) 114 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5	6
Av. yield	2725	2883	2536	2489	2767	2831

S.E./mean = 57 lb./ac.

Crop :- Paddy.**Ref :- K. 58(177).****Site :- Agri. Res. Stn., Pattambi.****Type :- 'C'.****Object :-**To compare wave shaped method of paddy cultivation with modified Japanese method and local method of cultivation.**1. BASAL CONDITIONS :**

(i) (a) Nil. (b) Paddy. (c) G.L. at 5000 lb./ac. + A/S 100 lb./ac. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 27.5.1958/4.7.1958. (iv) (a) 6 puddlings and 3 levellings. (b) Transplanting according to treatments. (c) —. (d) and (e) N.A. (v) 5000 lb./ac. of G.L. + Super 150 lb./ac. as B.D. A/S at 100 lb./ac. top dressing one month after planting. (vi) PTB-2 (improved). (vii) Rainfed. (viii) one weeding. (ix) About 90°. (x) 27.10.1958.

2. TREATMENTS :

Same as in expt. no. 175 on page 115.

3. DESIGN :(i) R.B.D. (ii) (a) 6. (b) $45' \times 35'$. (iii) 6. (iv) (a) N.A. (b) $7\frac{1}{2}' \times 35'$. (v) Nil. (vi) Yes.**4. GENERAL :**

(i) Satisfactory. (ii) Nil. (iii) Grain and straw weight. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2098 lb./ac. (ii) 191 lb./ac. (iii) Treatment differences are highly [significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5	6
Av. yield	2008	2387	2058	1863	2109	2164

S.E./mean = 78 lb./ac.

Crop :- Paddy.**Ref :- K. 54(178).****Site :- Agri. Res. Stn., Pattambi.****Type :- 'CV'.****Object :-**To determine the best spacing and optimum number of seedlings per hole for different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 2 cwt/ac. of B.M. 1 cwt/ac. of G.N.C. and 40 tins/ac. of ash. (ii) (a) Sandy loam. (b) N.A. (iii) 19.6.1954/26.8.1954. (iv) (a) 2 ploughings with iron plough and 3 with *desi* plough. One levelling and breaking of clots. (b) Transplanting in lines. (c) 60 lb./ac. (d) 6"×6" (both ways). (e) As per treatments. (v) 1 cwt/ac. of A/S and 35 tins/ac. of ash as top dressing. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings 21 and 36 days after planting. (ix) 120". (x) 8.1.1955.

2. TREATMENTS :

Main-plot treatments :

3 varieties :— $V_1=U.R. 19$, $V_2=C.H.2$ and $V_3=C.H.3$.

Sub-plot treatments :

3 spacings :— $S_1=6"$, $S_2=9"$ and $S_3=12"$.

Sub-sub-plot treatments :

No. of seedlings/hole : $C_1=1$, $C_2=2$ and $C_3=4$.

3. DESIGN :

(i) Split-plot in L. Sq. (ii) (a) 3 main-plots, 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) 12'×9'. (b) 9'×6'. (v) 1½' border row between plots. No guard rows kept. (vi) Yes.

4. GENERAL :

(i) Good, no lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—1955. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2707 lb./ac. (ii) (a) 834 lb./ac. (b) 472 lb./ac. (c) 332 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	V_1	V_2	V_3	Mean	C_1	C_2	C_3
S_1	2335	2790	2935	2683	2482	2722	2846
S_2	2593	2493	3092	2726	2543	2935	2700
S_3	2868	2426	2846	2713	2722	2638	2778
Mean.	2595	2569	2958	2707	2582	2765	2775
C_1	2487	2330	2930				
C_2	2666	2622	3008				
C_3	2633	2756	2935				

S.E. of difference of two

- | | | | |
|---|----------------|-----------------------------------|--------------|
| 1. V marginal means | =226.9 lb./ac. | 6. C means at the same level of V | =156 lb./ac. |
| 2. S marginal means | =128.1 lb./ac. | 7. V means at the same level of C | =260 lb./ac. |
| 3. C marginal means | = 90.0 lb./ac. | 8. C means at the same level of S | =156 lb./ac. |
| 4. S means at the same level of V=222.9 lb./ac. | | 9. S means at the same level of C | =181 lb./ac. |
| 5. V means at the same level of S=290.9 lb./ac. | | | |

Crop :- Paddy.

Ref :- K. 55(179).

Site :- Paddy Breeding Stn., Kayamkulam.

Type :- 'CV'.

Object :- To determine the best spacing and optimum number of seedlings per hole for different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 2 cwt/ac. of B.M. 1 cwt/ac. of G.N.C. and 40 tins/ac. of ash. (ii) (a) Sandy loam. (b) N.A. (iii) 18.6.1955/25.8.1955. (iv) (a) 2 ploughings with iron plough and 3 with *desi* plough. One levelling and breaking of clots. (b) Transplanting. (c) 60 lb./ac. (d) 6"×6". (e) As per treatments. (v) 1 cwt/ac. of A/S and 35 tins/ac. of ash as top dressing. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings 21 and 36 days after planting. (ix) 125". (x) 10.1.1956.

2. TREATMENTS :

Same as in expt. no. 178 on page 116.

3. DESIGN :

(i) Split-plot in L. Sq. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) 12'×9'. (b) 9'×6'. (v) 1½' border row between plots. No guard row discarded. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1954-1955. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2446 lb./ac. (ii) (a) 279 lb./ac. (b) 330 lb./ac. (c) 255 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	Mean	C ₁	C ₂	C ₃
S ₁	2314	2252	2650	2405	2258	2476	2482
S ₂	2274	2336	2487	2366	2336	2409	2353
S ₃	2297	2560	2840	2566	2588	2431	2678
Mean	2295	2383	2659	2446	2394	2439	2504
C ₁	2190	2353	2638				
C ₂	2325	2341	2550				
C ₃	2370	2454	2689				

S.E. of difference of two

- | | | | |
|-----------------------------------|-----------------|-----------------------------------|-----------------|
| 1. V marginal means | = 75.8 lb./ac. | 6. C means at the same level of V | = 120.2 lb./ac. |
| 2. S marginal means | = 89.7 lb./ac. | 7. V means at the same level of C | = 124.0 lb./ac. |
| 3. C marginal means | = 69.3 lb./ac. | 8. C means at the same level of S | = 120.2 lb./ac. |
| 4. S means at the same level of V | = 155.5 lb./ac. | 9. S means at the same level of C | = 132.9 lb./ac. |
| 5. V means at the same level of S | = 147.9 lb./ac. | | |

Crop :- Paddy.

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

Ref :- K. 58(180).

Type :- 'CV'.

Object :- To test the performance of *Sahasralingam* variety against two normal *viruppu* and *Mundakan* crops.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L.+100 lb./ac. of A/S. (ii) (a) Sandy loam. (b) N.A. (iii) 4.6.1958/5.7.1958. (iv) (a) 6 to 8 ploughings and 2 diggings. (b) Transplanted. (c) N.A. (d) 6"×6". (e) 2. (v) 5000 lb./ac. of G.L.+200 lb./ac. of A/S. G.L. as B.D. and A/S a month after planting for each of the varieties. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings one month and two months after planting. (ix) 117.77". (x) 26.9.1958, 22.12.1958, 2.1.1959.

2. TREATMENTS :

1. Normal *Viruppu* (1st crop) of PTB-7 followed by PTB-20 during *Mundakan*.
 2. *Sahasralingam* variety sown in May-June, planted in Aug.-Sept. and harvested in Jan.-Feb.
 3. Normal 1st crop of PTB-7 followed by *Sahasralingam* variety planted in September.
 4. Mixed seedlings of PTB-7 and *Sahasralingam* in 3:1 ratio planted in June-July, PTB-7 harvested normally in Sept. while *Sahasralingam* variety in Jan.-Feb.
- Sahasralingam* variety grown in *Sahasralingam* farm with its profuse tillering is claimed to be as good as the two crops of normal *Viruppu* and *Mundakan*.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) 40'×25'. (iii) 8. (iv) (a) 10'×25'. (b) 9'×24'. (v) One row all round. (vi) Yes.

4. GENERAL :

- (i) Satisfactory PTB-7, PTB-20 and *Sahasralingam* lodged about two weeks before harvest. Mixture of PTB-7 and *Sahasralingam* did not lodge. (ii) Case-worm controlled by dusting with BHC 10%. (iii) Height tiller counts, grain and straw yield. (iv) (a) 1958 (1st and 2nd crop)—contd. (b) Changed to a different area in 1959. (c) Nil. (v) (a) Pattambi. (b) Nil. (vi) Nil. (vii) Conducted by Rice Res. Sec.

5. RESULTS :

- (i) 3063 lb./ac. (ii) 508 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4
Av. yield	2894	2223	3458	3677

S.E./mean = 180 lb./ac.

Crop :- Paddy.

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

Ref :- K. 58(181).

Type :- 'CV'.

Object :—To test the performance of *Sahasralingam* variety against two normal *Viruppu* and *Mundakan* crops.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L. + 30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) As per treatments. (iv) (a) 6 puddlings and 3 levellings. (b) to (c) As per treatments. (v) B.D. of 5000 lb./ac. of G.L. before last ploughing. Also see treatments. (vi) As per treatments. (vii) Unirrigated. (viii) One weeding. (ix) 106.98°. (x) 24.2.1959.

2. TREATMENTS :

- Normal *Viruppu* (1st crop) of PTB-7 followed by PTB-20 during *Mundakan*—Sown 3 lb./cent and planted 6'×6". 1st crop sown in April, May and 2nd crop in early Sept.
- Sahasralingam* variety sown May-June, planted in Aug.-Sept. with 10'×10' and 1 seedling/hole and harvested in Jan.-Feb.
- Normal 1st crop of PTB-7 followed by *Sahasralingam* variety planted in September. With seed rate and spacing as in treatment 1.
- Mixed seedlings of PTB-7 and *Sahasralingam* in 3 : 1 ratio planted in June-July, PTB-7 harvested in Sept. while *Sahasralingam* variety in Jan.-Feb. Seed rate and spacing as in treatment 1 and PTB-7 harvested without injuring the other crop.

150 lb./ac. of N as A/S applied a month after planting of each crop in treatments 1 to 3. 300 lb./ac. of N as A/S applied in two equal doses a month after planting and during November for treatment 4.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) 40'×30'. (b) (iii) 8. (iv) (a) N.A. (b) 10'×30'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) Yes. (c) Nil. (v) (a) Mannuthy. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 5194 lb./ac. (ii) 569 lb./ac. (iii) Treatments differ highly significantly. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4
Av. yield	4881	4295	5633	5968

S.E./mean = 202 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 58(182).

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

Type :- 'CM'.

Object :- To find out the best age of planting seedlings.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L.+100 lb./ac. of A/S. (ii) (a) Sandy loam. (b) N.A. (iii) 29.9.1958, 4.10.1958 and 9.10.1958/29.10.1958. (iv) (a) 6 to 8 ploughings and 2 diggings. (b) Transplanting. (c) —. (d) 6' x 6'. (e) 2. (v) 5000 lb./ac. of G.L. at ploughing+100 lb./ac. of A/S one month after planting. (vi) Local *chittini* (medium). (vii) Unirrigated. (viii) One weeding one month after planting. (ix) 17.69". (x) 3.2.1959.

2. TREATMENTS :

Main-plot treatments :

2 levels of manuring to nursery : $M_0=0$ and $M_1=10$ C.L./ac. of C.M.+100 lb./ac. 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/block and 3 sub-plots/main-plot. (b) 30' x 20'. (iii) 4. (iv) (a) 5' x 20'. (b) 4' x 19'. (v) 6' along the border. (vi) Yes.

4. GENERAL :

(i) Normal. Lodged in middle of January. (ii) Case-worm attack—BHC dusted at 10%. (iii) Grain and straw yield, tiller counts and length measurements. (iv) (a) 1958 (2nd crop) —contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1055 lb./ac. (ii) (a) 573 lb./ac. (b) 269 lb./ac. (iii) Only S effect is significant. (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	Mean
M_0	815	1155	1164	1045
M_1	752	1272	1173	1066
Mean	784	1214	1168	1055

S.E. of difference of two

1. M marginal means =233.9 lb./ac.
2. S marginal means =134.5 lb./ac.
3. S means at the same level of M =190.2 lb./ac.
4. M means at the same level of S =280.7 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 59(183).

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

Type :- 'CM'.

Object :- To compare the Chinese method with modified Japanese method and Farm method of paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) 5000 lb./ac. of G.L.+100 lb./ac. of A/S as top dressing. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 17.6.1959/16.7.1959. (iv) (a) Six puddlings and 4 levelling. (b) to (e) N.A. (v) As per treatments. (vi) PTB-I. (vii) Unirrigated. (viii) Nil. (ix) 12.15". (x) 22.10.1959.

2. TREATMENTS :

3 doses of basal manuring : B_1 (Farm method)=G.L. at 5000 lb./ac.+Super at 150 lb./ac., B_2 (Japanese method)=G.L. at 6000 lb./ac.+C.M. at 3 ton/ac. and B_3 (Chinese method)=20 ton/ac. of C.M.+200 lb./ac. of A/S+250 lb./ac. of Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 30' × 30'. (v) Two rows as border were left all round the plot. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) No. (b) —. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Information is not available about the cultural practices for different methods.

5. RESULTS :

(i) 1144 lb./ac. (ii) 340.6 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	B ₁	B ₂	B ₃
Av. yield	1442	778	1212

S.E./mean = 139.0 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 55(184).

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

Type :- 'CM'.

Object :- To find out the effect of different doses of manure and methods of interculture on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L. in 1st week of June, 1953 followed by ploughings + 50 lb./ac. of A/S on 15.6.1956 along the last plough furrows as B.D. 50 lb./ac. of A/S as top dressing one month after planting on 21.7.1955. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 5.9.1955. (iv) (a) 2 ploughings and 2 mummy diggings. (b) Transplanted in lines. (c) —. (d) 6' × 4". (e) 3 to 4. (v) Nil. (vi) PTB-20 (medium). (vii) Unirrigated. (viii) As per treatments. (ix) 34.28". (x) 30.1.1956.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 methods of manuring : M₁ = Japanese method—G.L. at 6000 lb./ac. + C.M. at 5 C.L./ac. applied a week before planting. Super and A/S, each at 100 lb./ac., broadcast at planting and an equal amount of A/S and Super top dressed a month before planting and M₂ = Local method—G.L. at 5000 lb./ac. applied a week before planting. Super at 150 lb./ac. broadcast at transplanting and A/S at 150 lb./ac. top-dressed a month after planting.

(2) 5 intercultural : W₀ = No weeding, W₁ = 2 weedings 15 and 30 days after planting, W₂ = 2 weedings and intercultural with intercultivator 15 and 30 days after planting, W₃ = intercultural with hand rake 15, 30 and 45 days after planting and W₄ = intercultural with rotary weeder 15, 30 and 45 days after planting.

3. DESIGN :

(i) 2 × 5 Fact. in R.B.D. (ii) 10. (iii) 4. (iv) (a) and (b) 15' × 35'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Spraying with D.D.T. against stem-borer. (iii) Grain yield. (iv) (a) 1955—(2nd crop) contd. (b) No. (c) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 689 lb./ac. (ii) 31 lb./ac. (iii) M and W effects are highly significant. Interaction is not significant. (iv) Av. yield of grain in lb./ac.

	W ₀	W ₁	W ₂	W ₃	W ₄	Mean
M ₁	710	821	671	716	647	713
M ₂	640	776	638	671	601	665
Mean	675	798	654	693	624	689

S.E. of W marginal mean	=10.96 lb./ac.
S.E. of M marginal mean	= 6.93 lb./ac.
S.E. of body of table	=15.50 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 56(185).

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

Type :- 'CM'.

Object :—To find out the effect of different doses of manures and methods of interculture on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L.+80 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 5.5.1956/14 and 15.6.1956. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting. (c) —. (d) 6"×10" and 10"×10". (e) 2 to 4. (v) Nil. (vi) PTB-2 (medium). (vii) Unirrigated. (viii) As per treatments. (ix) About 80°. (x) 9.10.1956.

2. TREATMENTS :

Same as in expt. no. 184 on page 121.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) 150'×40'. (iii) 4. (iv) (a) and (b) 15'×40'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1955 (2nd crop)—1958 (1st crop). (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2714 lb./ac. (ii) 222.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

	W ₀	W ₁	W ₂	W ₃	W ₄	Mean
M ₁	2859	2859	2886	2877	2859	2868
M ₂	2496	2587	2696	2623	2405	2561
Mean	2678	2723	2891	2750	2632	2715

S.E. of W marginal mean	= 78.5 lb./ac.
S.E. of M marginal mean	= 49.6 lb./ac.
S.E. of body of table	=111.0 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 56(186).

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

Type :- 'CM'.

Object :—To find out the effect of different doses of manures and methods of interculture on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L.+30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 21.9.1956/4.11.1956. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting. (c) —. (d) 10"×4". (e) 2. (v) Nil. (vi) PTB-20 (medium). (vii) Unirrigated (viii) As per treatments. (ix) 2.62°. (x) 12.2.1957.

2. TREATMENTS :

Same as in expt. no. 184 on page 121.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) 100'×40'. (iii) 4. (iv) (a) and (b) 40'×10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1955 (2nd crop)—1958 (1st crop). (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1610 lb./ac. (ii) 103 lb./ac. (iii) Interaction $M \times W$ alone is highly significant. (iv) Av. yield of grain in lb./ac.

	W ₀	W ₁	W ₂	W ₃	W ₄	Mean
M ₁	1634	1681	1688	1613	1586	1640
M ₂	1586	1552	1504	1640	1613	1579
Mean	1610	1616	1596	1626	1600	1610

S.E. of W marginal mean = 36.4 lb./ac.

S.E. of M marginal mean = 23.0 lb./ac.

S.E. of body of table = 51.5 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 57(187).

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

Type :- 'M'.

Object :- To find out the effect of different doses of manures and methods of interculture on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 8.5.1957/23.6.1957. (iv) (a) Four ploughings and 4 diggings. (b) Transplanting. (c) —. (d) 10' x 6'. (e) 3 to 4. (v) Nil. (vi) PTB-2 (improved). (vii) Unirrigated. (viii) As per treatments. (ix) 85.79%. (x) 16.10.1957.

2. TREATMENTS :

Same as in expt. no. 184 on page 121.

3. DESIGN :

(i) 2 x 5 Fact. in R.B.D. (ii) (a) No. (b) N.A. (iii) 4. (iv) (a) and (b) 10' x 35'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) BHC dusted against case-worm. (iii) Grain yield. (iv) (a) 1955 (2nd crop)—1958 (1st crop). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3054 lb./ac. (ii) 200 lb./ac. (iii) M effect alone is highly significant. (iv) Av. yield of grain in lb./ac.

	W ₀	W ₁	W ₂	W ₃	W ₄	Mean
M ₁	3154	3271	3183	3055	3251	3183
M ₂	3036	2818	2975	2948	2853	2926
Mean	3095	3044	3079	3002	3052	3054

S.E. of W marginal mean = 70.7 lb./ac.

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

S.E. of body of table = 100.0 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 57(188).

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

Type :- 'CM'.

Object :- To find out the effect of different doses of manures and methods of interculture on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 9.9.1957/30.10.1957. (iv) (a) Four ploughings and 4 diggings. (b) Transplanting. (c) —. (d) 10'×6'. (e) 3 to 4. (v) Nil. (vi) PTB-20 (medium). (vii) Unirrigated. (viii) As per treatments. (ix) 19.97'. (x) 21.2.1957.

2. TREATMENTS :

Same as in expt. no. 184 on page 121.

3. DESIGN :

(i) 2×5 Fact in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 10'×35'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Folidol sprayed against stem-borer. (iii) Grain yield. (iv) (a) 1955 (2nd crop)—1958 (1st crop). (v) (a) and (b) Nil. (vi) and (vii) Nil.

6. RESULTS :

(i) 1804 lb./ac. (ii) 174 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	W ₀	W ₁	W ₂	W ₃	W ₄	Mean
M ₁	1834	1867	1863	1694	1993	1850
M ₂	1618	1826	1824	1750	1775	1759
Mean	1726	1846	1844	1722	1884	1804

S.E. of W marginal means = 61.5 lb./ac.

S.E. of M marginal means = 38.9 lb./ac.

S.E. of body of table = 87.0 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 58(189).

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

Type :- 'CM'.

Object :- To find out the effect of different doses of manures and methods of interculture on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 5.5.1958/26.6.1958. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting. (c) —. (d) 10'×6'. (e) 2. (v) Nil. (vi) PTB-2 (medium). (vii) Unirrigated. (viii) As per treatments. (ix) About 90°. (x) 26.10.1958.

2. TREATMENTS :

Same as in expt. no. 184 on page 121.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) 100'×40'. (iii) 4. (iv) (a) and (b) 10'×40'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1955 (2nd crop)—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2405 lb./ac. (ii) 165 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

	W ₀	W ₁	W ₂	W ₃	W ₄	Mean
M ₁	2423	2518	2423	2328	2464	2431
M ₂	2450	2369	2437	2246	2396	2380
Mean	2437	2444	2430	2287	2430	2405

S.E. of M marginal mean = 37.1 lb./ac.
 S.E. of W marginal mean = 58.7 lb./ac.
 S.E. of body of table = 83.0 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 58(190).

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

Type :- 'CM'.

Object :- To find out whether application of Pot. Sul. to thick and thin nursery, will induce pest resistance in the transplanted Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L.+30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 22.9.1958/11.11.1958. (iv) (a) Six puddlings and 3 levellings. (b) Transplanting. (c) —. (d) 6"×10". (e) N.A. (v) 4000 lb./ac. of G.L. (vi) PTB-20 (medium). (vii) Unirrigated. (viii) One weeding one month after transplanting. (ix) 15". (x) 25.2.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 seed rates : S₁=3 and S₂=6 lb./cent.

(2) 2 manures : M₁=G.L. at 5000 lb./ac. and M₂=Pot. Sul. at 200 lb./ac.

3. DESIGN :

(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) 60'×20'. (iii) 2. (iv) (a) N.A. (b) 20'×15'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1775 lb./ac. (ii) 156 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac..

	M ₁	M ₂	Mean
S ₁	1952	1744	1848
S ₂	1754	1650	1702
Mean	1853	1697	1775

S.E. of S or M marginal mean = 78 lb./ac.
 S.E. of body of table = 110 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 54(191).

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

Type :- 'CMV'.

Object :- To compare the Japanese method of Paddy cultivation with Farm method.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 22.5.1954/25.6.1954. (iv) (a) Six puddlings and 3 levellings. (b) to (d) As per treatments. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Weedings as and when required. (ix) 42.92". (x) 9.10.1954.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 methods of cultivation : M_1 =Japanese method and M_2 =Farm method.

- (2) 2 varieties : V_1 =PTB-2 and V_2 =PTB-9.

Japanese method : Long and narrow nursery beds manured with C.M. at 40 C.L./ac.+ Wood ash at 2000 lb./ac. + Compost at 2000 lb./ac. and mixture of A/S and Super at 2 lb./ac. per lb. of seed. Seeds, treated with salt solution, sown at 15 lb./ac. Second dose of manure mixture applied 15 days after sowing. Seedlings transplanted at 10" x 10" spacing and intercultivation done with rotary weeder. Then 20 C.L./ac. of F.Y.M. + 30 lb./ac. of N as A/S + 30 lb./ac. of P_2O_5 given as B.D. to field before transplanting. 15 lb./ac. of N + 15 lb./ac. of P_2O_5 given one month after transplanting and an equal dose given two months after transplanting.

Farm method : Wet seed beds manured with 10000 lb./ac. of G.M. at the time of puddling. Seeds sown in nursery at 3 lb./ac. B.D. of 5000 lb./ac. of G.L. and 30 lb./ac. of P_2O_5 as Super given at the time of last ploughing. Seedlings transplanted at 6" x 6" spacing in bluk. 30 lb./ac. of N as A/S applied 3 to 4 weeks after planting. Hand weeding.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) and (b) 25' x 30'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) Uniform dusting with BHC against the stem-borer. (iii) Grain and straw yield. (iv) (a) 1951-1955. (b) Yes. (c) Nil (v) (a) and (b) Nil. (vi) Nil. (vii) Cultural practices given are not available in detail.

5. RESULTS :

- (i) 2359 lb./ac. (ii) 206 lb./ac. (iii) All effects are highly significant. (iv) Av. yield of grain in lb./ac.

	V_1	V_2	Mean
M_1	3031	1951	2491
M_2	2515	1940	2228
Mean	2773	1946	2359

S.E. of M or V marginal mean = 51.5 lb./ac.
S.E. of body of table = 72.8 lb./ac.

Crop :- Paddy (2nd crop).

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

Ref :- K. 54(192).

Type :- 'CMV'.

Object :- To compare the Japanese method of Paddy cultivation with Farm method.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 8.9.1954/16.10.1954. (iv) (a) Puddling 8 to 10 times, levelling 6 to 8 times. (b) to (d) As per treatments. (e) 2 to 3. (v) and (vi) As per treatments. (vii) Unirrigated. (viii) One or two weedings at intervals of one month from planting according to need. (ix) 15.69". (x) 21.1.1955.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 methods of cultivation : M_1 =Japanese and M_2 =Farm method.

- (2) 2 varieties : V_1 =PTB-18 and V_2 =PTB-20.

Refer expt. no. 191 above for details.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 25' x 30'. (v) Nil; an inter space of 1½' left between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Uniform dusting with BHC against stem-borer. (iii) Grain and straw yield. (iv) (a) 1951-1955. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Cultural practices not available in detail.

5. RESULTS :

(i) 2670 lb./ac. (ii) 110 lb./ac. (iii) M and V effects are highly significant. (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	Mean
M ₁	2592	3049	2820
M ₂	2301	2737	2520
Mean	2446	2893	2670

S.E. of M or V marginal mean = 27.5 lb./ac.
S.E. of body of table = 38.9 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 55(193).

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

Type :- 'CMV'.

Object :- To compare Japanese method of Paddy cultivation with Farm method.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 28.5.1955/29.6. 1955. (iv) (a) 2 mummatty diggings and levelling. (b) to (d) As per treatments. (e) Japanese method-4 and Farm method-2. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings. (ix) 68.93°. (x) 15.10.1955.

2. TREATMENTS :

Same as in expt. no. 192 on page 126.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) and (b) 15' x 20'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Preventive dusting with BHC. (iii) Grain weight. (iv) (a) 1951 (1st crop) - 1955 (2nd crop). (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Cultural practices not available in detail.

5. RESULTS :

(i) 2471 lb./ac. (ii) 189 lb./ac. (iii) M and V effects are highly significant. (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	Mean
M ₁	2770	2500	2639
M ₂	2464	2142	2303
Mean	2620	2321	2471

S.E. of M or V marginal mean = 47.2 lb./ac.
S.E. of body of table = 66.8 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 55(194).

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

Type :- 'CMV'.

Object :- To compare Japanese method of Paddy cultivation with Farm method.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 4000 lb./ac. of G.L.+50 lb./ac. of A/S as basal and 50 lb./ac. of A/S as top dressing one month after planting. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 5.11.1955/2.12.1955. (iv) (a) to (e) As per treatments. (v) and (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 1.09°. (x) 13.3.1956.

2. TREATMENTS :

Same as in expt. no. 192 on page 126.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) and (b) 15'×20'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Attack of stem-borer and case worm ; 2 spraying of Folidol. (iii) Grain yield. (iv) (a) 1953 (1st crop)—1955 (2nd crop). (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1479 lb./ac. (ii) 182 lb./ac. (iii) V effect alone is highly significant. (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	Mean
M ₁	1789	1108	1448
M ₂	1744	1275	1510
Mean	1767	1192	1479

S.E. of M or V marginal means =45.5 lb./ac.
S.E. of body of table =64.3 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 58(195).

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

Type :- 'D'.

Object :- To compare the efficiency of Endrex as an insecticide with Folidol.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L.+30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 24.9.1958/9.11.1958. (iv) (a) 6 puddlings and 3 levellings. (b) Transplanting in lines. (c) —. (d) 10'×6'. (e) 2. (v) 5000 lb./ac. of G.L.+30 lb./ac. of N as A/S one month after planting. (vi) PTB-20 (improved). (vii) Unirrigated. (viii) One weeding one month after planting. (ix) 15°. (x) 18.2.1959.

2. TREATMENTS :

- (1) Control.
- (2) Endrex 20 E.C. at 12 oz./ac. one week after planting+16 oz./ac. 2 weeks after planting+16 oz./ac. 5 weeks after planting.
- (3) Folidol applied in the same manner as Endrex.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 15'×50'. (iii) 8. (iv) (a) N.A. (b) 5'×50'. (v) 2 rows left as guard rows. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1308 lb./ac. (ii) 129 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	1260	1437	1228

S.E./mean = 46 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 59(196).

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

Type :- 'D'.

Object :- To compare the efficiency of Endrex as an insecticide with Folidol.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) 5000 lb./ac. of G.L. + 30 lb./ac. of N as A/S. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 3.5.1959/22.6.1959. (iv) (a) 6 puddlings and 4 levellings. (b) to (c) N.A. (v) G.L. at 5000 lb./ac. (vi) PTB-20 (medium). (vii) Unirrigated. (viii) N.A. (ix) 110°. (x) 16.10.1959.

2. TREATMENTS :

Same as in expt. no. 195 on page 128.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 50' x 5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) As per treatments. (iii) Grain yield and pest count. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 2815 lb./ac. (ii) 241.9 lb./ac. (iii) None on the effects is significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	2655	2953	2838

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

Crop :- Paddy (2nd crop).

Ref :- K. 59(197).

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

Type :- 'D'.

Object :- To compare the efficiency of Endrex as an insecticide with Folidol.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) 5000 lb./ac. of G.L. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 24.9.1959/24.10.1959. (iv) (a) 6 puddlings and 4 levellings. (b) to (c) N.A. (v) G.L. at 5000 lb./ac. (vi) PTB-20 (medium). (vii) Unirrigated. (viii) N.A. (ix) 36°. (x) 10.2.1960.

2. TREATMENTS :

Same as in expt. no. 195 on page 128.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 50' x 5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) As per treatments. (iii) Pest count and grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1920 lb./ac. (ii) 127.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	1839	1984	1936
S.E./mean	=45.2 lb./ac.		

Crop :- Paddy (1st crop).
Site :- Agri. Res. Stn., Pattambi.

Ref :- K. 59(198).
Type :- 'D'.

Object :-To study the effect of spraying different insecticides as a pest control measure.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) G.L. at 4000 lb./ac. +A/S at 100 lb./ac. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 3.5.1959/22.6.1959. (iv) (a) 6 puddlings and 4 levellings. (b) to (e) N.A. (v) G.L. at 4000 lb./ac. as B.D.+A/S at 100 lb./ac. one month after planting. (vi) PTB-2, PTB-9, PTB-26 (medium). (vii) Unirrigated. (viii) N.A. (ix) 110". (x) 26.8.1959.

2. TREATMENTS :

1. Endrine at 1 oz. in 6½ gallons of water.
 2. Folidol at 1 oz. in 12½ gallons of water.
 3. D.D.T. 550 at 1 lb. in 25 gallons of water.
 4. Control.
 35-45 gallons/ac. of the mixture sprayed. Shoot portions of seedlings dipped in the solution for one hour before planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 50' x 5'. (v) An inter space of 1' is left between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) As per treatments. (iii) Pest count and grain yield. (iv) (a) 1959-contd. (b) No. (c) Nil. (v) (a) No. (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 2152 lb./ac. (ii) 217.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4
Av. yield	2067	2165	2127	2250

S.E./mean =88.6 lb./ac.

Crop :- Paddy (2nd crop).
Site :- Agri. Res. Stn., Pattambi.

Ref :- K. 59(199).
Type :- 'D'.

Object :-To study the effect of spraying insecticides as a pest control measure.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) G.L. at 4000 lb./ac. +A/S at 100 lb./ac. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 26.9.1959/4.11.1959. (iv) (a) 6 Puddlings and 4 levellings. (b) to (e) N.A. (v) G.L. at 4000 lb./ac. as B.D.+A/S at 100 lb./ac. one month after planting. (vi) PTB-12 (medium); PTB-15 (long); PTB-20 (medium); PTB-21 (medium). (vii) Unirrigated. (viii) N.A. (ix) 36". (x) 10.2.1960.

2. TREATMENTS :

Same as in expt. no 198 above.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 50' x 5'. (v) An inter space of 1' is left between plots. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) As per treatments. (iii) Pest count and grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1246 lb./ac. (ii) 95.51 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4
Av. yield	1444	1231	1198	1113

S.E./mean = 38.58 lb./ac.

Crop :- Paddy (2nd crop).

Ref :- K. 58(200).

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

Type :- 'D'.

Object :- To compare the insecticidal value of Aldrex with BHC 10%.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 5000 lb./ac. of G.L.+30 lb./ac. of N as A/S. (ii) (a) Laterite loam. (b) Refer soil analysis, Pattambi. (iii) 24.9.1958/7.11.1958. (iv) (a) 6 puddlings and 3 levellings. (b) Transplanting in lines. (c) —. (d) 6"×6". (e) 2. (v) 5000 lb./ac. of G.L. as B.D.+30 lb./ac. of N as A/S one month after planting. (vi) PTB-20 (improved). (vii) Unirrigated. (viii) One weeding. (ix) 15". (x) 18th Feb. 1959.

2. TREATMENTS :

1. Control.
2. Aldrex 5%.
3. BHC 10%.

Dusting one, two and three weeks after planting at 15 lb./ac. each time.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 15'×50'. (iii) 8. (iv) (a) N.A. (b) 5'×50'. (v) 4 rows at a spacing of 10" on either side of the plot left as guard rows. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) As per treatments. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 1474 lb./ac. (ii) 102 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	1595	1392	1435

S.E./mean = 36 lb./ac.

Crop :- Paddy (1st crop).

Ref :- K. 59(201).

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

Type :- 'D'.

Object :- To compare the insecticidal value of Aldrex with BHC.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) 5000 lb./ac. of G.L.+30 lb./ac. of N as A/S. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 3.5.1959/20.6.1959. (iv) (a) 6 puddlings and 4 levellings. (b) to (e) N.A. (v) G.L. at 5000 lb./ac. (vi) PTB-20 (medium). (vii) Unirrigated. (viii) N.A. (ix) 110". (x) 12.10.1959.

2. TREATMENTS :

Same as in expt. no. 200 above.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 50' x 5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) As per treatments. (iii) Pest count and grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 3190 lb./ac. (ii) 164.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	3079	3268	3224
S.E./mean	= 58.2 lb./ac.		

Crop :- Paddy (2nd crop).

Ref :- K. 59(202).

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

Type :- 'D'.

Object :- To compare the insecticidal value of Aldrex with BHC.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) 5000 lb./ac. of G.L. (ii) (a) N.A. (b) Refer soil analysis, Pattambi. (iii) 10.9.1959/23.10.1959. (iv) (a) 6 puddings and 4 levellings. (b) to (e) N.A. (v) G.L. at 5000 lb./ac. (vi) PTB-20 (medium). (vii) Unirrigated. (viii) N.A. (ix) 36". (x) 9.2.1960.

2. TREATMENTS :

Same as in expt. no. 230 on page 131.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 50' x 5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) As per treatments. (iii) Pest count and grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 2103 lb./ac. (ii) 122.0 lb./ac. (iii) Treatment differences are not significant (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3
Av. yield	2093	2104	2112
S.E./mean	= 43.1 lb./ac.		

Crop :- Paddy.

Ref :- K. 57(203).

Site :- Agri. College and Res. Institute, Vellayani.

Type :- 'D'.

Object :- To find out the best insecticide for controlling stem-borer.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Alluvial soil. (b) Refer soil analysis, Vellayani. (iii) 26.1.1957. (iv) (a) Digging. (b) Broadcast. (c) 80 to 100 lb./ac. (d) and (e) — (v) Nil. (vi) Kochuvittu (early, local). (vii) Irrigated. (viii) One weeding. (ix) N.A. (x) 29.4.1957.

2. TREATMENTS :

- | | | |
|---------------------|------------------------|------------------------|
| 1. Folidol at 0.04% | 5. Endrin at 0.050% | 9. Dieldrin at 0.1800% |
| 2. Folidol at 0.88% | 6. Endrin at 0.100% | 10. D.D.T at 0.1% |
| 3. Folidol at 0.10% | 7. Dieldrin at 0.0625% | 11. D.D.T at 0.2% |
| 4. Endrin at 0.025% | 8. Dieldrin at 0.1250% | 12. D.D.T at 0.6% |
| | | 13. Control (3 plots). |

Insecticide sprayed 15 and 40 days after sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) 60'×108' (iii) 5. (iv) (a) N.A. (b) 36'×12'. (v) Border left. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Stem-borer ; As per treatments. (iii) No. of dead ear heads. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 8.48 earheads/plot. (ii) 2.63 earheads/plot. (iii) Control vs others and levels of insecticides are highly significant while sources are not significant. (iv) Av. no. of dead earheads/plot.

Treatment	1	2	3	4	5	6	7
Av. yield	8.60	6.40	7.80	8.40	8.20	6.00	13.60
Treatment	8	9	10	11	12	13	
Av. yield	6.80	6.80	10.80	7.00	8.00	9.60	

S.E./mean = 1.18 earheads/plot.

Crop :- Paddy.

Ref :- K. 58(204).

Site :- Agri. College and Res. Institute, Vellayani.

Type :- 'D'.

Object :- To find out the best insecticide for controlling the rice stem-borer.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) Red loam. (b) Refer soil analysis, Vellayani. (iii) 18.3.1958. (iv) (a) One ploughing. (b) Broadcast. (c) 200 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Kochuvittu (local). (vii) Irrigated. (viii) One weeding. (ix) 1.86". (x) 5.6.1958.

2. TREATMENTS :

1. D.D.T. at 0.2%.
2. Endrin at 0.1%.
3. Basudin (E-20) at 0.15%.
4. Folidol at 0.1%.
5. Ekatox at 0.1%.
6. Control.

Two sprayings 15 and 41 days after sowing at 25 gallons/ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 162'×12'. (iii) 4. (iv) (a) 27'×12'. (b) 24'×9'. (v) 1½ feet border around the net plot. (vi) Yes.

4. GENERAL :

(i) Average. (ii) Stem-borer ; As per treatments. (iii) No. of dead earheads, weight of equal no. of good earheads. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 220 earheads/plot. (ii) 79 earheads/plot. (iii) Treatments are not significantly different. (iv) Av. no. of dead earheads/plot.

Treatments	1	2	3	4	5	6
Av. yield	224	160	187	248	266	234

S.E./mean = 39 earheads/plot.

Crop :- Bhindi.

Ref :- K. 59(1).

Site :- Agri. College and Res. Institute, Vellayani.

Type :- 'D'.

Object :- To study the effect of insecticides as a pest control measure on the yield of *Bhindi*.

1. BASAL CONDITIONS :

(i) (a) No. (b) *Bhindi*. (c) Cow dung at 5 lb./plant. (ii) (a) Red soil. (b) Refer soil analysis, Vellayani. (iii) 13.6.1959. (iv) (a) to (e) N.A. (v) Cow dung at 5 lb./plant. (vi) Local. (vii) Irrigated. (viii) Two weedings. (ix) N.A. (x) 31.7.1959 to 8.9.1959.

2. TREATMENTS :

1. D.D.T. (dose N.A.)
2. Endrin at 0.05%.
3. Dieldrin at 0.05%.
4. Ekatim (dose N.A.)
5. Lindane at 1% dust.
6. Mechanical aid.
7. Control (no treatment).

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) 55' x 12.5'. (iii) 5. (iv) (a) 12.5' x 7.5' (b) 7.5' x 5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Average. (ii) Slight attack. (iii) Pest count and *bhindi* yield. (iv) (a) to (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 2884 lb./ac. (ii) 749.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment	1	2	3	4	5	6	7
Av. yield	3100	3267	2621	3267	3060	2240	2425

S.E./mean = 335.4 lb./ac.

Crop :- Sweet Potato.

Ref :- K. 54(1).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy. Type :- 'M'.

Object :- To determine the optimum requirements of N, P and K for Sweet potato crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet potato. (c) As per treatments. (ii) (a) Loamy. (b) N.A. (iii) 20.7.1954. (iv) (a) Two ploughings. (b) Vines are cut with 3 nodes and planted at a depth of 3" on ridges. (c) N.A. (d) 3". (e) One cutting/groove. (v) 5 C.L./ac. of cow dung broadcast before ploughing and 50 tin/ac. of ash after ploughing. (vi) Local (medium). (vii) Unirrigated. (viii) Two weedings and two intercultures. (ix) 12 6". (x) 18.11.1954.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

(2) 3 levels of K_2O as Pot. Sul. : $K_0=0$, $K_1=80$ and $K_2=160$ lb./ac.

Sub-plot treatments :

2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=80$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 24' x 12'. (b) 22' x 6'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tuber yield. (iv) (a) 1952--contd. (b) Yes. (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 10296 lb./ac. (ii) (a) 2488 lb./ac. (b) 1261 lb./ac. (iii) Main effects of N, P and K are highly significant. Interaction NP is significant. (iv) Av. yield of tuber in lb./ac.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁
K ₀	8052	10461	9075	9207	8250	10164
K ₁	7821	11748	10890	10164	8712	11616
K ₂	8877	13563	12012	11484	9867	13134
Mean	8250	11913	10659	10296	8943	11616
P ₀	7392	10395	9042			
P ₁	9141	13464	12309			

S.E. of difference of two

1. N or K marginal means = 587 lb./ac.
 2. P marginal means = 244 lb./ac.
 3. P means at the same level of N or K = 419 lb./ac.
 4. N or K means at the same level of P = 657 lb./ac.
- S.E. of body of N×K table = 719 lb./ac.

Crop :- Sweet Potato.

Ref :- K. 55(2).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy. Type :- 'M'.

Object :- To determine the optimum requirements of N, P and K for Sweet potato crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet potato. (c) As per treatments. (ii) (a) Loamy. (b) N.A. (iii) 10.7.1955. (iv) (a) Two ploughings. (b) Vines cut with 3 nodes and planted at a depth of 3". (c) N.A. (d) 1'. (e) One cutting/groove. (v) 5 C.L./ac. of cow dung applied before ploughing; 50 tin/ac. of ash applied at the time of planting. (vi) Local white (medium). (vii) Unirrigated. (viii) Two weedings and two intercures. (ix) 32". (x) 5.12.1955.

2. TREATMENTS :

Same as in expt. no. 1 on page 134 on Sweet potato.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 24'×12' (b) 22'×6'. (v) One row around the plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tuber yield. (iv) (a) 1952—contd. (b) Yes. (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 8415 lb./ac. (ii) (a) 2686 lb./ac. (b) 2214 lb./ac. (iii) Main effects of P and K alone are highly significant. (iv) Av. yield of tuber in lb./ac.]

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁
K ₀	5016	5742	5247	5346	5049	5643
K ₁	8283	10362	8052	8910	8283	9537
K ₂	10395	10230	12309	7689	9702	12276
Mean	7920	8778	8547	8415	7656	9141
P ₀	7524	7986	7524			
P ₁	8316	9570	9570			

S.E. of difference of two

1. N or K marginal means	=634 lb./ac.
2. P marginal means	=426 lb./ac.
3. P means at the same level of N or K	=739 lb./ac.
4. N or K means at the same level of P	=822 lb./ac.
S.E. of body of N×K table	=776 lb./ac.

Crop :- Sweet Potato.

Ref :- K. 56(3).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy. Type :- 'M'.

Object : To determine the optimum requirements of N, P and K for Sweet potato crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet potato. (c) As per treatments. (ii) (a) Laterite and gravelly soil. (b) N.A. (iii) 8.7.1956. (iv) (a) Two ploughings. (b) Planting along ridges, erect planting. (c) —. (d) 3' between ridges. (e) Single cutting/hole, 4 nodes per cutting (v) 50 tin/ac. of compost was applied before making the ridges. (vi) Local white (medium). (vii) Unirrigated. (viii) Two weedings one month and two months after planting. (ix) N.A. (x) 6.12.1956.

2. TREATMENTS :

Same as in expt. no. 1 on page 134 on Sweet potato.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) 24'×12'. (v) 22'×6'. (vi) One row around the plot discarded. (vii) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of tuber. (iv) (a) 1952—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 5478 lb./ac. (ii) (a) 2072 lb./ac. (b) 1152 lb./ac. (iii) Main effects of P and K are highly significant. Others are not significant. (iv) Av. yield of tuber in lb./ac.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁
K ₀	4646	3904	3369	3973	3382	4564
K ₁	6422	5706	5184	5772	5059	6478
K ₂	7399	6310	6352	6686	5775	7600
Mean	6154	5306	4970	5478	4739	6214
P ₀	5260	4775	4181			
P ₁	7049	5838	5755			

S.E. of difference of two

1. N or K marginal means	=488 lb./ac.
2. P marginal means	=221 lb./ac.
3. P means at the same level of N or K	=383 lb./ac.
4. N or K mean at the same level of P	=558 lb./ac.
S.E. of body of N×K table	=601 lb./ac.

Crop :- Sweet Potato.

Ref :- K. 57(4).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy. Type :- 'M'.

Object :- To determine the optimum requirements of N, P and K for Sweet potato crop.

1. BASAL CONDITIONS :

- (i) Nil. (b) Sweet potato. (c) As per treatments. (ii) (a) Laterite, gravelly soil. (b) N.A. (iii) 22.7.1957.
 (iv) (a) Two ploughings. (b) Planting. (c) —. (d) N.A. (e) Single cutting. (v) Nil. (vi) Local (medium).
 (vii) Unirrigated. (viii) One weeding 2 months after planting. (ix) N.A. (x) 13.12.1957.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of K_2O as Pot. Sul. : $K_0=0$, $K_1=80$ and $K_2=160$ lb./ac.

(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=50$ and $P_2=100$ lb./ac.

Sub-plot treatments :

2 levels of N as A/S : $N_0=0$ and $N_1=50$ lb./ac.

P_2O_5 applied at planting and N and K_2O about one month after planting.

3. DESIGN :

- (i) Split-plot. (ii) (a) 9 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A.
 (b) 22' x 6'. (v) Border rows around the plots discarded. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Nil. (iii) Tuber yield. (iv) (a) 1957—contd. (b) No. (c) No. (v) (a) and (b) Nil.
 (vi) and (vii) Nil.

5. RESULTS :

- (i) 2010 lb./ac. (ii) (a) 934 lb./ac. (b) 475 lb./ac. (iii) Main effect of K and interaction NPK are highly significant. Other effects are not significant. (iv) Av. yield of tuber in lb./ac.

	P_0	P_1	P_2	Mean	N_0	N_1
K_0	1396	1822	1940	1719	1713	1723
K_1	2349	1719	1808	1838	1713	2003
K_2	2185	2392	2792	2455	2465	2449
Mean	1878	1977	2178	2010	1964	2059
N_0	1898	1779	2218			
N_1	1855	2178	2142			

S.E. of difference of two

1. K or P marginal means = 218 lb./ac.
 2. N marginal means = 92 lb./ac.
 3. N means the same level of K or P = 158 lb./ac.
 4. K or P means at the same level of N = 248 lb./ac.
- S.E. of body of $P \times K$ table = 270 lb./ac.

Crop :- Sweet Potato.

Ref :- K. 58(5).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy. Type :- 'M'.

Object :- To determine the optimum requirements of N, P and K for Sweet potato crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Sweet potato. (c) As per treatments. (ii) (a) Laterite and gravelly soil. (b) N.A. (iii) 16.7.1958. (iv) (a) Two ploughings and weeding. (b) Planting cuttings of 9" length on ridges. (c) —. (d) 1' between plants and 3' between rows. (e) Single cutting/hole. (v) 5 C.L./ac. of cow dung before ploughing and 25 tin/ac. of ash before making ridges. (vi) Local white (medium). (vii) Unirrigated. (viii) One weeding one month after planting. (ix) N.A. (x) 5.12.1958.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=50$ and $P_2=100$ lb./ac.(2) 3 levels of K_2O as Pot. Sul. : $K_0=0$, $K_1=80$ and $K_2=160$ lb./ac.

Sub-plot treatments :

2 levels of N as A/S : $N_0=0$ and $N_1=80$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) $24' \times 12'$, (b) $22' \times 6'$. (v) 1' along length and 3' along width. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tuber weight. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) N.A. (vii) No reason given for low yield.

5. RESULTS :

(i) 1243 lb./ac. (ii) (a) 1008 lb./ac. (b) 425.6 lb./ac. (iii) Main effects of N and K are highly significant. Interaction $N \times K$ is significant. Other effects are not significant. (iv) Av. yield of tuber in lb./ac.

	P_0	P_1	P_2	Mean	N_0	N_1
K_0	840	941	739	840	784	896
K_1	1322	998	1378	1233	1142	1322
K_2	1837	1187	1949	1658	1344	1971
Mean	1333	1042	1355	1243	1090	1277
N_0	1075	941	1254			
N_1	1590	1142	1456			

S.E. of difference of two

1. K or P marginal means = 168.0 lb./ac.
2. N marginal means = 57.9 lb./ac.
3. N means at the same level of P or K = 100.3 lb./ac.
4. K or P means at the same level of N = 182.3 lb./ac.

S.E. of body of $P \times K$ table = 291.0 lb./ac.Crop :- Sweet Potato (*Khari*).

Ref :- K. 59(6).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy. Type :- 'M'.

Object :- To determine optimum requirements of N, P and K for Sweet potato crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet potato. (c) 5 C.L./ac. of cow dung and 40 tins/ac. of ash. (ii) (a) Laterite and gravelly red soil. (b) N.A. (iii) 6.7.1959. (iv) (a) 2 ploughings, removing of weeds and forming ridges. (b) Planting on ridges. (c) N.A. (d) 1' plant to plant. (e) Single cutting/hole. (v) 5 C.L. of cow dung and 40 tins of ash applied as B.D. before planting. (vi) Local. (vii) Unirrigated. (viii) Weeding and hand picking during the 2nd month. (ix) N.A. (x) 5.12.1959.

2. TREATMENTS :

Same as in expt. no. 5 on page 137.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 2 sub-plots/main-plot. (b) $24' \times 324'$. (iii) 6. (iv) (a) $18' \times 22'$ (b) $22' \times 12'$. (v) Border rows discarded. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 6678 lb./ac. (ii) (a) 3247 lb./ac. (b) 1675 lb./ac. (iii) Effects of K and interaction NK are significant. (iv) Av. yield in lb./ac.

	P ₀	P ₁	P ₂	Mean	K ₀	K ₁	K ₂
N ₀	4482	4155	5321	4653	4139	5088	4733
N ₁	6999	7535	7975	7503	5871	8786	7851
Mean	5741	5845	6648	6678	5005	6937	6292
K ₀	4998	5720	4297				
K ₁	5816	6614	8381				
K ₂	6407	5201	7267				

S.E. of difference of two

1. P or K marginal means = 765 lb./ac.
 2. N marginal means = 322 lb./ac.
 3. N means at the same level of P or K = 558 lb./ac.
 4. P or K means at the same level of N = 861 lb./ac.
- S.E. of body of P × K table = 937 lb./ac.

Crop :- Sweet Potato.

Ref :- K. 54(7).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy. Type :- 'C'.

Object :- To determine the best spacing and best method of planting for Sweet potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet potato. (c) As per treatments. (ii) (a) Loamy. (b) N.A. (iii) 21.7.1954. (iv) (a) Two ploughings before making ridges. (b) Vines are cut with 3 nodes and planted at a depth of 3" on ridges or flat beds. (c) Only one cutting per groove. (d) As per treatments. (v) 5 C.L./ac. of cow dung and 100 tins/ac. of ash. Cow dung broadcast before planting and ash at the time of planting. (vi) Local (medium). (vii) Unirrigated. (viii) Two weedings and one interculture. (ix) 12.6°. (x) 19.11.1954.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 methods of planting : M₁=On ridges and M₂=On flat beds.
- (2) 4 spacings : S₁=1', S₂=2', S₃=3' and S₄=4'.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 12'×24'. (b) 12'×24'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tuber yield. (iv) (a) 1952—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3255 lb./ac. (ii) 568 lb./ac. (iii) All the effects are highly significant. (iv) Av. yield of tuber in lb./ac.

	S ₁	S ₂	S ₃	S ₄	Mean
M ₁	2565	3405	2895	2235	2775
M ₂	6585	3345	3105	1890	3735
Mean	4575	3375	3000	2070	3255

S.E. of marginal mean of S	=164 lb./ac.
S.E. of marginal mean of M	=116 lb./ac.
S.E. of body of table	=231 lb./ac.

Crop :- Sweet Potato.

Ref :- K. 55(8).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy.

Type :- 'C'.

Object :- To determine the best spacing and best method of planting for Sweet potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet potato. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 11.7.1955. (iv) (a) Two ploughings before planting. (b) Vines cut with 3 nodes and planted at a depth of 3" on ridges or flat beds. (c) —. (d) As per treatments. (e) Only one cutting/groove. (v) 5 C.L./ac. of cow dung applied before ploughing. 100 tins/ac. of ash applied at the time of planting. (vi) Local white (medium). (vii) Unirrigated. (viii) Two weedings. (ix) 32". (x) 5.12.1955.

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 = 1', S_2 = 2' and S_3 = 3'.

3. DESIGN :

(i) 2x3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 14'x26'; 16'x28'; 18'x30'. (b) 12'x24'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Tuber yield. (iv) (a) 1952—contd. (b) No. (c) Yes. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 5955 lb./ac. (ii) 2747 lb./ac. (iii) Interaction M x S is highly significant. (iv) Av. yield of tuber in lb./ac.

	S_1	S_2	S_3	Mean
M_1	8325	5175	4170	5895
M_2	10695	4050	3270	6015
Mean	9510	4605	3720	5955

S.E. of S marginal mean	= 793 lb./ac.
S.E. of M marginal mean	= 648 lb./ac.
S.E. of body of table	= 1120 lb./ac.

Crop :- Sweet Potato.

Ref :- K. 56(9).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy.

Type :- 'C'.

Object :- To determine the best spacing and best method of planting of Sweet potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet potato. (c) 5 C.L./ac. of cow dung+100 tins/ac. of ash. (ii) (a) Laterite and gravelly soil. (b) N.A. (iii) 13.7.1956. (iv) (a) Two ploughings and removing weeds. (b) to (d) N.A. (e) Single cutting/hole with 4 nodes. (v) 5 C.L./ac. of compost applied after ploughing and 50 tins/ac. of ash before planting. (vi) Local white (medium). (vii) Unirrigated. (viii) Two weedings one month and two months after planting. (ix) N.A. (x) 7.12.1956.

2. TREATMENTS :

Same as in expt. no. 8 on page 140.

3. DESIGN :

(i) 3×2 Fact. R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 14'×26' ; 16'×28' ; 18'×30'. (b) 12'×24'.
(v) One row all round. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tuber yield. (iv) (a) 1952—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2334 lb./ac. (ii) 562 lb./ac. (iii) All the effects are highly significant. (iv) Av. yield of tuber in lb./ac.

	S ₁	S ₂	S ₃	Mean
M ₁	2428	1661	1748	1946
M ₂	4429	2555	1182	2722
Mean	3429	2108	1466	2334

S.E. of marginal mean of S = 163 lb./ac.
S.E. of marginal mean of M = 133 lb./ac.
S.E. of body of table = 231 lb./ac.

Crop :- Sweet Potato.

Ref :- K. 58(10).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy. Type :- 'C'.

Object :- To determine the best spacing and best method of planting of Sweet potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet potato. (c) 3 C.L./ac. of compost and 30 tin/ac. of ash. (ii) (a) Laterite and gravelly soil. (b) N.A. (iii) 22.7.1958. (iv) (a) Two ploughings. (b) to (d) N.A. (e) Single cutting 9' long planted erect. (v) 3 C.L./ac. of cow dung and 50 tin/ac. of ash applied before planting. (vi) Local white (medium). (vii) Unirrigated. (viii) One weeding one month after planting. (ix) N.A. (x) 5.12.1958.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 methods of planting :- M₁=On ridges and M₂=On flat beds.

(2) 3 spacings :- S₁=½'×2', S₂=1'×2' and S₃=1½'×2'.

3. DESIGN :

(i) 2×3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 13'×28' ; 14'×28' and 15'×28'. (b) 12'×24'.
(v) One row all round. (vi) Yes.

4. GENERAL :

(i) Moderately good. (ii) Nil. (iii) Tuber yield. (iv) (a) 1957—contd. (b) No. (c) Yes. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 4129 lb./ac. (ii) 1568 lb./ac. (iii) Main effect of S alone is significant. (iv) Av. yield of tuber in lb./ac.

	S ₁	S ₂	S ₃	Mean
M ₁	5712	4144	3539	4465
M ₂	4838	3136	3405	3793
Mean	5275	3640	3472	4129

S.E. of S marginal mean =453 lb./ac.
 S.E. of M marginal mean =370 lb./ac.
 S.E. of body of table =640 lb./ac.

Crop :- Sweet Potato (*Kharif*).

Ref :- K. 58(11).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy. Type :- 'C'.

Object :- To determine the best spacing and best method of planting for Sweet potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet potato. (c) 3 C.L./ac. of cow dung and 50 tins of ash. (ii) (a) Laterite and gravelly soil. (b) N.A. (iii) 22.7.1958. (iv) (a) Two ploughings, removing weeds and preparing seed beds and ridges (b) As per treatments. (c) N.A. (d) As per treatments. (e) Single cutting 9" long. (v) 3 C.L. of cow dung and 50 tins of ash mixed in soil before planting. (vi) Local white (medium). (vii) Irrigated. (viii) One weeding one month after planting. (ix) N.A. (x) 5.12.1958.

2. TREATMENTS :

Same as in expt. no. 10 on page 141.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 13'x28' (S₁), 14'x28' (S₂) and 15'x28' (S₃). (b) 12'x24' for all. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of tuber. (iv) (a) 1952—contd. (treatments changed in 1957). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2755 lb./ac. (ii) 777.0 lb./ac. (iii) Effects of S and interaction M x S are highly significant while M is not significant. (iv) Av. yield of tuber in lb./ac.

	S ₁	S ₂	S ₃	Mean
M ₁	3815	2769	2361	2982
M ₂	3231	2088	2269	2529
Mean	3523	2428	2315	2755

S.E. of S marginal mean =224.3 lb./ac.
 S.E. of M marginal mean =183.2 lb./ac.
 S.E. of body of table =317.2 lb./ac.

Crop :- Tapioca.

Ref :- K. 54(1).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy. Type :- 'M'.

Object :- To determine the optimum dose of N, P and K manures for Tapioca to give the best yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per treatments. (ii) (a) Laterite gravelly soil. (b) N.A. (iii) 28.4.1954. (iv) (a) Two rounds of ploughing and removal of weeds before planting. (b) Planting erect on mounds. (c) and (d) N.A. (e) Single cutting of 6" length per hole. (v) Nil. (vi) No. 97 (local, medium). (vii) Unirrigated. (viii) Weeding and intercultivations one month and two months after planting. Next weeding 4 months after planting. (ix) N.A. (x) 2.4.1955.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.(2) 3 levels of K : $K_0=0$, $K_1=80$ and $K_2=160$ lb./ac.

Sub-plot treatments :

2 levels of P : $P_0=0$ and $P_1=80$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 57'×24' (main-plot) ; 51'×18' (sub-plot). (b) 57'×12' (main-plot) ; 51'×6' (sub-plot). (v) Border row discarded. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tuber yield. (iv) (a) 1952—contd. (b) Yes. (c) N.A. (v) (a) Trivandrum and Tiruvalla. (vi) and (vii) Nil.

5. RESULTS :

(i) 9022 lb./ac. (ii) (a) 2769 lb./ac. (b) 1676 lb./ac. (iii) Main effect of N is highly significant. Main effect of P and K are significant. Interactions $N \times P$, $N \times K$ and $P \times K$ are significant. (iv) Av. yield of tuber in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1
K_0	5101	8648	10356	8035	7624	8446
K_1	5504	9526	12254	9095	9015	9174
K_2	6560	11779	11471	9937	9245	10629
Mean	5722	9984	11360	9022	8628	9416
P_0	5117	9996	10771			
P_1	6327	9972	11949			

S.E. of difference of two

1. N or K marginal means = 652.7 lb./ac.
 2. P marginal means = 322.5 lb./ac.
 3. P means at the same level of N or K = 558.7 lb./ac.
 4. N or K means at the same level of P = 762.9 lb./ac.
- S.E. of body of $N \times K$ table = 799.4 lb./ac.

Crop :- Tapioca.

Ref :- K. 55(2).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy.

Type :- 'M'.

Object :- To determine the optimum requirements of N, P and K for Tapioca to give the best yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per treatments. (ii) (a) Gravelly and laterite soil. (b) N.A. (iii) 4.5.1955. (iv) (a) Two rounds of ploughing. After removing weeds, mounds were made. (b) Straight planting. (c) —. (d) 3' both ways. (e) Single cuttings. (v) 5 C.L./acre of cow dung broadcasted before ploughing. (vi) Loca (late). (vii) Unirrigated. (viii) Weeding and intercultivation during 2nd and 4th month after planting, weeding again at the 6th month. (ix) N.A. (x) 27.2.1956.

2. TREATMENTS :

Same as in expt. no. 1 above.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 57'×24' (main-plot) ; 51'×18' (sub-plot). (b) 57'×12' (main-plot) ; 51'×6' (sub-plot). (v) Border discarded. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Slight attack of scale insects in some plants. Completely controlled by spraying 1% Folidol. (iii) Tuber yield. (iv) (a) 1952—contd. (b) Yes. (c) N.A. (v) (a) and (b) Trivandrum and Tiruvalla. (vi) and (vii) Nil.

5. RESULTS :

(i) 11369 lb./ac. (ii) (a) 3622 lb./ac. (b) 1769 lb./ac. (iii) Main effects of N and K are highly significant. Others are not significant. (iv) Av. yield of tuber in lb./ac.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁
K ₀	5706	11026	13375	10036	9802	10269
K ₁	8155	12539	15587	12094	11835	12353
K ₂	8096	12972	14864	11977	11613	12341
Mean	7319	12179	14609	11369	11083	11654
P ₀	6971	11795	14484			
P ₁	7667	12562	14733			

S.E. of difference of two

1. N or K marginal means = 853.6 lb./ac.
 2. P marginal means = 340.4 lb./ac.
 3. P means at the same level of N or K = 589.7 lb./ac.
 4. N or K means at the same level of P = 950.0 lb./ac.
- S.E. of body of N × K table = 1045.0 lb./ac.

Crop :- Tapioca.

Ref :- K. 56(3).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy.

Type :- 'M'.

Object :—To determine the optimum requirements of N, P and K manures for Tapioca to give the best yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per treatments. (ii) (a) Gravelly and laterite. (b) N.A. (iii) 20.5.1956. (iv) (a) 2 ploughings. (b) Planting in mounds cuttings of 6"—8" length. (c) —. (d) Along mounds 3' × 3'. (e) Single cutting/hole. (v) C.M. at 5 C.L./ac, applied before ploughing. Applying 50 tins of ash. (vi) No. 97 (medium). (vii) Irrigated, (viii) Four weedings. (ix) N.A. (x) 2.3.1957.

2. TREATMENTS :

Same as in expt. no. 1 on page 142.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 57' × 24' (main-plot). (b) 51' × 6' (sub-plot). (v) One row all round each sub-plot discarded. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Tuber weight. (iv) (a) 1952—contd. (b) Yes. (c) N.A. (v) (a) Trivandrum, Tiruvalla. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 12252 lb./ac. (ii) (a) 2162 lb./ac. (b) 1180 lb./ac. (iii) Main effect of N is highly significant and main effect of P is significant. Others are not significant. (iv) Av. yield of tuber in lb./ac.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁
K ₀	8719	12551	13192	11486	11328	11644
K ₁	9846	13890	13671	12469	12329	12609
K ₂	10011	14063	14330	12801	12384	13219
Mean	9525	13501	13731	12252	12014	12491
P ₀	9280	13167	13594			
P ₁	9771	13835	13868			

S.E. of difference of two

1. N or K marginal means = 509.6 lb./ac.
 2. P marginal means = 227.1 lb./ac.
 3. P means at the same level of N or K = 393.1 lb./ac.
 4. N or K means at the same level of P = 580.5 lb./ac.
- S.E. of body of N×K table = 624.1 lb./ac.

Crop :- Tapioca.

Ref :- K. 57(4).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy. Type :- 'M'.

Object : -To determine the optimum requirements of N, P and K manures for Tapioca to give the best yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per treatments. (ii) (a) Laterite and gravelly soil. (b) N.A. (iii) 27.5.1957. (iv) (a) Two rounds of ploughing. (b) Planting cuttings of about 10" length on mounds. (c) —. (d) 3'×3'. (e) Single cutting/hole. (v) 5 C.L. of cow dung/ac. broadcast before ploughing. (vi) Local 97 (early). (vii) Irrigated. (viii) 1st weeding and digging one month after planting and 2nd weeding during the 4th month after planting. (ix) N.A. (x) 22.3.1958.

2. TREATMENTS :

Same as in expt. no. 1 on page 142.

P applied one month after planting. N as A/S applied 15 days after the application of P and K applied one month after the application of P.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block : 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 57'×24' (main-plot), 57'×12' (sub-plot). (b) 51'×6'. (v) One row all round each net sub-plot discarded. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tuber yield. (iv) (a) 1952—contd. (b) Yes. (c) N.A. (v) (a) Trivandrum and Tiruvalla. (b) Nil. (vi) and (vii) Nil.

5. RESULTS .

(i) 10914 lb./ac. (ii) (a) 3453 lb./ac. (b) 1526 lb./ac. (iii) Main effect of N is highly significant and of P is significant. Effect of K and two factor interactions are not significant. (iv) Av. yield of tuber in lb./ac.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁
K ₀	5220	10996	13499	9905	9742	10067
K ₁	7046	13192	14567	11602	11419	11784
K ₂	6880	12064	14757	11234	10596	11871
Mean	6382	12084	14274	10914	10586	11241
P ₀	6359	11586	13816			
P ₁	6406	12582	14733			

S.E. of difference of two	
1. N or K marginal means	= 813.9 lb./ac.
2. P marginal means	= 293.7 lb./ac.
3. P means at the same level of N or K	= 508.7 lb./ac.
4. N or K means at the same level of P	= 889.8 lb./ac.
S.E. of body of N×K table	= 996.8 lb./ac.

Crop :- Tapioca.

Ref :- 54(5).

Site :- Tapioca Res. Stn., Tiruvalla.

Type :- 'M'.

Object :- To determine the optimum requirements of N, P and K manures for Tapioca to give the best yield.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Tapioca. (c) As per treatments. (ii) (a) Laterite. (b) Refer soil analysis, Tiruvalla. (iii) 10.4.1954. (iv) (a) Ploughed two rounds before transplanting. (b) Erect planting of fresh cuttings of uniform length (7") on small mounds in lines. (c) —. (d) 3' × 3'. (e) One cutting per hole. (v) 3240 lbs. of F.Y.M. applied to the whole experimental area. (vi) *Ariyan* (medium—local). (vii) Un-irrigated. (viii) Interculturing three times at two months interval; weeding was done along with intercultures. (ix) 80°. (x) 15.2.1955.

2. TREATMENTS:

Same as in expt. no. 1 on page 142.

3. DESIGN:

(i) Split-plot. (ii) (a) 9 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 30' × 18' (main-plot); 30' × 9' (sub-plot), (b) 24' × 12' (main-plot); 24' × 3' (sub-plot). (v) One row around each sub-plot and main-plot. (vi) Yes.

4. GENERAL:

(i) Growth very good in N_2P_1 plots and poor in control plot. (ii) Nil. (iii) Height of plants and number of sprouts. (iv) (a) 1953—contd. (b) Yes. (c) N.A. (v) (a) Mannuthy and Trivandrum. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 16691 lb./ac. (ii) (a) 3061 lb./ac. (b) 3086 lb./ac. (iii) Main effects of N and K are highly significant. Other effects are not significant. (iv) Av. yield of tuber in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1
K_0	9176	14748	18805	14243	13831	14654
K_1	11168	18452	22385	17335	17444	17225
K_2	11546	19764	24176	18495	17176	19813
Mean	10630	17654	21788	16691	16150	17231
P_0	10067	17813	20569			
P_1	11192	17494	23006			

S.E. of difference of two

1. N or K marginal means	= 721 lb./ac.
2. P marginal means	= 594 lb./ac.
3. P means at the same level of N or K	= 1029 lb./ac.
4. N or K means at the same level of P	= 1024 lb./ac.
S.E. of body of N×K table	= 884 lb./ac.

Crop :- Tapioca.

Ref :- K. 55 (6).

Site :- Tapioca Res. Stn., Tiruvalla.

Type :- 'M'.

Object :- To determine the optimum dose of N, P and K manures for Tapioca to give the best yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) Cow dung at the rate of 5000 lb./ac. (ii) (a) Laterite. (b) Refer soil analysis, Tiruvalla. (iii) 20.4.1955. (iv) (a) Ploughed two rounds before planting. (b) Erect planting of fresh cuttings of uniform length 7" on small mounds. (c) —. (d) 3' both ways. (e) Single cutting per hole. (v) 3240 lb. of F.Y.M. applied to the whole experimental area. (vi) *Ariyan*—(medium—local). (vii) Unirrigated. (viii) Interculturing three times at two months interval, weeding was done along with interculturing. (ix) 80°. (x) 20.2.1956.

2. TREATMENTS :

Same as in expt. no. 1 on page 142.

A/S, Super and Pot. Sul. are generally applied about one month [after planting and raked into the soil. Sometimes Super applied as basal dressing before planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 30'×18' (main plot) ; 30'×9' (sub-plot). (b) 24'×3' (sub-plot). (v) One guard row around the sub-plot. (vi) Yes.

4. GENERAL :

(i) Growth very good in N and P plots and poor in control and K plots. (ii) Nil. (iii) Tuber yield. Height of plants and number of sprouts. (iv) (a) 1953—contd. (b) Yes. (c) N.A. (v) (a) Mannuthy and Trivandrum. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 23777 lb./ac. (ii) (a) 5499 lb./ac. (b) 3775 lb./ac. (iii) Main effect of N alone is highly significant. Other effects are not significant. (iv) Av. yield of tuber in lb./ac.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁
K ₀	18377	22145	25889	22137	21670	22603
K ₁	18364	24124	30224	24237	24275	24199
K ₂	19524	23620	31724	24956	24796	25115
Mean	18755	23296	29279	23777	23580	23973
P ₀	18603	24073	28064			
P ₁	18906	22519	30493			

S.E. of difference of two

1. N or K marginal means = 1296 lb./ac.
 2. P marginal means = 727 lb./ac.
 3. P means at a level of N or K = 1258 lb./ac.
 4. N or K means at a level of P = 1573 lb./ac.
- S.E. of body of N×K table = 1587 lb./ac.

Crop :- Tapioca.

Ref :- K. 56(7).

Site :- Tapioca Res. Stn., Tiruvalla.

Type :- 'M'.

Object :- To determine the optimum dose of N, P and K manures for Tapioca to give the best yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per treatments. (ii) (a) Laterite. (b) Refer soil analysis, Tiruvalla. (iii) 12.4.1956. (iv) (a) Ploughing twice for initial preparation of land. (b) Fresh cuttings of uniform length planted erect on mounds. (c) —. (d) 3'. (e) Single cutting per hole. (v) 3240 lb./ac. of cow dung applied to the whole experimental area. (vi) Nedumangadan, (local, late). (vii) Unirrigated. (viii) Weeding was done along with intercultivation thrice. (ix) 80°. (x) 28.1.1957.

2. TREATMENTS :

Same as in expt. no. 1 on page 142.

A/S, Super and Pot. Sul. applied about one month after planting and raked into the soil.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 30'×18' (main-plot) ; 30'×9' (sub-plot). (b) 24'×3' (sub-plot). (v) One row all round each sub-plot. (vi) Yes.

4. GENERAL :

(i) Uniform stand and uneven growth in plots under different treatments. (ii) Nil. (iii) Yield of tuber. (iv) (a) 1953—contd. (b) Yes. (c) N.A. (v) (a) Mannuthy, Trivandrum. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 18256 lb./ac. (ii) (a) 5046 lb./ac. (b) 3025 lb./ac. (iii) Main effect of N is highly significant. Main effect of K and P are significant, while interactions are not significant. (iv) Av. yield of tuber in lb./ac.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁
K ₀	14394	17343	17469	16402	15645	17158
K ₁	16360	19864	21981	19402	19040	19763
K ₂	17141	19360	20393	18965	18032	19897
Mean	15965	18855	19948	18256	17572	18939
P ₀	16048	18183	18486			
P ₁	15881	19527	21410			

S.E. of difference of two

- | | |
|--|----------------|
| 1. N or K marginal means | = 1189 lb./ac. |
| 2. P marginal means | = 582 lb./ac. |
| 3. P means at the same level of N or K | = 1008 lb./ac. |
| 4. N or K means at the same level of P | = 1386 lb./ac. |
| S.E. of body of N×K table | = 1457 lb./ac. |

Crop :- Tapioca.

Ref :- K. 57(8).

Site :- Tapioca Res. Stn., Tiruvalla.

Type :- 'M'.

Object :- To determine the optimum dose of N, P and K manures for Tapioca to give the best yield.

1. BASAL CONDITIONS :

(i) Nil. (b) Tapioca. (c) As per treatments. (ii) (a) Laterite. (b) Refer soil analysis, Tiruvalla. (iii) 15.4.1957. (iv) (a) Ploughing two rounds. (b) Erect planting of cuttings of uniform length 7" on mounds. (c) —. (d) 3'×3' (e) One cutting/hole. (v) 2700 lb./ac. of cow dung. (vi) T. 37. (late local). (viii) Weeding was done with intercultivation three times. (ix) 80°. (x) 11.2.1958.

2. TREATMENTS :

Same as in expt. no. 1 on page 142..

Manures applied on 23.7.1957 in shallow pits around each plant.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 24'×6' (main-plot) ; 30'×9' sub-plot. (b) 24'×3'. (v) One row around each sub-plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory. Growth good in N and K plots and poor in P plots. (ii) Nil. (iii) Tuber yield. (iv) (a) 1953—1957. (b) Yes. (c) N.A. (v) (a) Mannuthy, Trivandrum. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 15441 lb./ac. (ii) (a) 5360 lb./ac. (b) 3092 lb./ac. (iii) Main effect of P is highly significant. Main effects of N and K are significant. Two factor interactions are not significant. (iv) Av. yield of tuber in lb./ac.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁
K ₀	10461	13562	16284	13436	12200	14671
K ₁	15654	17368	17015	16679	15578	17780
K ₂	14016	16511	18099	16209	15494	16923
Mean	13377	15814	17133	15441	14424	16458
P ₀	12856	14990	15427			
P ₁	13898	16637	18838			

S.E. of difference of two

1. N or K marginal means = 1263 lb./ac.
 2. P marginal means = 595 lb./ac.
 3. P means at the same level of N or K = 1031 lb./ac.
 4. N or K means at the same level of P = 1458 lb./ac.
- S.E. of body of N×K table = 1547 lb./ac.

Crop :- Tapioca.

Ref :- K. 54(9).

Site :- Tapioca Res. Stn., Trivandrum.

Type :- 'M'.

Object :- To determine the optimum dose of N, P and K manures for Tapioca to give the best yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per treatments. (ii) (a) Laterite soil. (b) Refer soil analysis, Trivandrum. (iii) 2.4.1954. (iv) (a) Soil well tilled and levelled. (b) Erect planting of cutting of length 8" in shallow pits. (c) —. (d) 3' both ways. (e) Single cutting per hole. (v) Night soil compost applied before tilling the plots by broadcasting uniformly at a rate of 3 ton/ac. (vi) No. 97 (*Kali kalan*, medium). (vii) Partially irrigated—hand watering once a week for the first three months after planting when there is no rain. (viii) Intercultivated before and after applying manures. Two weedings before harvest were given. (ix) 67.5". (x) 9.3.1955.

2. TREATMENTS :

Same as in expt. no. 1 on page 142.

P was applied on 8.5.1954, N was applied on 12.5.1954, K was applied on 25.5.1954 (all after intercultivation).

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 27'×18' (main-plot) ; 27'×9' (sub-plot). (b) 21'×12' (main-plot) ; 21'×3' (sub-plot). (v) One row around the net plot. (vi) Yes.

4. GENERAL :

(i) Stand good. Vigorous vegetative growth was noticed in plots which received maximum dose of N. Growth was comparatively poor in control plots. (ii) Nil. (iii) Yield of tubers and weight of vegetative products. (iv) (a) 1952—1955. (b) Yes. (c) N.A. (v) (a) Tiruvalla, Mannuthy. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 25426 lb./ac. (ii) (a) 5542 lb./ac. (b) 4201 lb./ac. (iii) Main effect of N is highly significant and of P is significant. Other effects and interactions are not significant. (iv) Av. yield of tuber.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁
K ₀	20329	25968	25304	23867	22458	25277
K ₁	23176	27814	27122	26037	25526	26548
K ₂	20613	28796	29714	26374	25760	26989
Mean	21373	27526	27380	25426	24581	26271
P ₀	20232	27025	26486			
P ₁	22513	28027	28276			

S.E. of difference of two

1. N or K marginal means =1306 lb./ac.
 2. P marginal mean = 808 lb./ac.
 3. P means at the level of N or K =1400 lb./ac.
 4. N or K means at the level of P =1639 lb./ac.
- S.E. of body of N×K table =1600 lb./ac.

Crop :- Tapioca.

Ref :- K. 55(10).

Site :- Tapioca Res. Stn., Trivandrum.

Type :- 'M'.

Object:—To determine the optimum dose of N, P and K manures for Tapioca to give the best yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per treatments. (ii) (a) Laterite soil. (b) Refer soil analysis, Trivandrum. (iii) 28.6.1955. (iv) (a) After tilling, shallow pits at 3' spacing are made. (b) Erect planting. (c) —. (d) 3' both ways (e) One fresh cutting each of 8" length planted per hole. (v) Night soil compost at the rate of 3 ton/ac. by broadcasting uniformly before tilling. (vi) Malayan no. 4 (late). (vii) Partially irrigated; hand watering twice a week till the start of monsoon. (viii) Intercultivated on 11.8.1955 and weeding. (ix) 67.5". (x) 15.3.1956.

2. TREATMENTS :

Same as in expt. no. 1 on page 142.

A/S and Super were applied on 18.8.1955 and raked into the soil. Pot. Sul. was applied on 6.9.1955 and raked with the soil.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 27'×18' (main-plot); 27'×9' (sub-plot). (b) 21'×12' (main-plot); 21'×3' (sub-plot). (v) One row all round the net sub-plot. (vi) Yes.

4. GENERAL:

(i) Growth of plants more vigorous in treated plots than in control plots. (ii) Nil. (iii) Yield of tuber. (iv) (a) 1952—1955. (b) Yes. (c) N.A. (v) (a) Mannuthy, Tiruvalla. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 18976 lb./ac. (ii) (a) 3020 lb./ac. (b) 1603 lb./ac. (iii) Main effects of N, P and K are highly significant. None of the interactions is significant. (iv) Av. yield of tuber in lb./ac.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁
K ₀	15264	18000	19238	17501	16934	18067
K ₁	17914	19757	21254	19642	19162	20122
K ₂	17050	21571	20736	19786	19334	20237
Mean	16743	19776	20409	18976	18477	19475
P ₀	15975	19373	20083			
P ₁	17510	20179	20736			

S.E. of difference of two

1. N or K marginal means = 711.7 lb./ac.
 2. P marginal means = 308.5 lb./ac.
 3. P means at the same level of N or K = 534.3 lb./ac.
 4. N or K means at the same level of P = 805.7 lb./ac.
- S.E. of body of N×K table = 871.8 lb./ac.

Crop :- Tapioca.

Ref :- K. 56(11).

Site :- Tapioca Res. Stn., Trivandrum.

Type :- 'M'.

Object :- To determine the optimum dose of N, P and K manures for Tapioca and give the best yield.

1. BASAL CONDITIONS :

(i) (a) No. (b) Tapioca. (c) As per treatments. (ii) (a) Laterite soil. (b) Refer soil analysis, Trivandrum. (iii) 19.6.1956. (iv) (a) Soil tilled to a depth of 18". Shallow pits were made. (b) Cuttings of 8" length planted. (c) —. (d) 3' both ways. (e) Single cutting per hole. (v) Cow dung at the rate of 5 ton/ac. applied before tilling by broadcast. (vi) Malayan no. 4. (late, improved). (vii) Partially Irrigated—hand watering twice a week till the starting of monsoon. (viii) Weeding and intercultivation on 20.7.1956. (ix) 67.5". (x) 11.3.1957.

2. TREATMENTS :

Same as in expt. no. 1 on page 142.

A/S, Pol. Sul. and Super applied on 20.7.1956 and raked into the soil.

3. DESIGN :

(i) Spilt-plot. (ii) (a) 9 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 27'×18' (main-plot); 27'×9' (sub-plot). (b) 21'×3'. (v) One row around the net sub-plot. (vi) Yes.

4. GENERAL :

(i) Growth in treated plots more vigorous than in control plots. (ii) Nil. (iii) Yield of tubers. (iv) (a) 1952—1956. (b) Yes. (c) N.A. (v) (a) Mannuthy and Tiruvalla. (b) Nil. (vi) and (vii) Nil. in lb./ac.

5. RESULTS :

(i) 17023 lb./ac. (ii) a) 2849 lb./ac. (b) 1894 lb./ac. (iii) Main effect of N is highly significant. Main effect of K and interaction N×K are significant. Others are not significant. (iv) Av. yield of tuber.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁
K ₀	13915	15125	19042	16027	16324	15729
K ₁	14895	17574	20483	17650	17323	17976
K ₂	14722	19533	17920	17391	17228	17553
Mean	14510	17410	19148	17023	16958	17086
P ₀	14250	17457	19167			
P ₁	14769	17362	19128			

S.E. of difference of two

1. N or K marginal means	=671.5 lb./ac.
2. P marginal means	=364.5 lb./ac.
3. P means at the same level of N or K	=631.3 lb./ac.
4. N or K means at the same level of P	=806.4 lb./ac.
S.E. of body of N×K table	=822.4 lb./ac.

Crop :- Tapioca.

Ref :- K. 57(12).

Site :- Tapioca Res. Strn., Trivandrum.

Type :- 'M'.

Object :- To determine the optimum dose of N, P and K manures for Tapioca to give the best yield.

1. BASAL CONDITIONS :

(i) (a) No. (b) Tapioca. (c) As per treatments. (ii) (a) Laterite soil. (b) Refer soil analysis, Trivandrum. (iii) 29.5.1957. (iv) (a) The soil tilled to a depth of 18", shallow pits at 3' spacings were made. (b) Cuttings of 8" length planted. (c) —. (d) 3'. (e) One cutting/hole. (v) Cowdung at the rate of 5 ton/ac. applied before tilling. (vi) Malayan no. 4. (late). (vii) Partially irrigated. (viii) One weeding before the application of manures. Another weeding one or two months afterwards. (ix) 67.5". (x) 18.3.1958.

2. TREATMENTS :

Same as in expt. no. 1 on page 142.

Applied on 19.7.1957. after thorough weeding and intercultivation.

3. DESIGN :

(i) Spilt-plot. (i) (a) 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 27'×9' (sub-plot). (b) 21'×6' (main-plot) ; 21'×3' (sub-plot). (v) One row all round the net plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tuber yield. (iv) (a) 1952—1957. (b) Yes. (c) Nil. (v) (a) Tiruvalla and Mannuthy. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 18950 lb./ac. (ii) (a) 2289 lb./ac. (b) 938 lb./ac. (iii) Main effect of N and K are highly significant. Interaction N×K is highly significant. Other effects are not significant. (iv) Av. yield of tuber in lb./ac.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁
K ₀	15701	16249	19216	17055	17036	17074
K ₁	17459	19015	22702	19725	19495	19955
K ₂	18006	21175	21031	20071	20244	19898
Mean	17055	18813	20983	18950	18925	18976
P ₀	16978	18899	20896			
P ₁	17132	18726	21069			

S.E. of difference of two

1. N or K marginal means	=539.5 lb./ac.
2. P marginal means	=180.4 lb./ac.
3. P means at the same level of N or K	=312.51 lb./ac.
4. N or K means at the same level of P	=583.0 lb./ac.
S.E. of body of N×K table	=660.8 lb./ac.

Crop :- Tapioca.

Ref :- K. 58(13).

Site :- Agri. College and Res. Institute, Vellayani.

Type :- 'M'.

Object :—To compare the manurial effects of compost and ash.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) Nil. (ii) (a) Red soil. (b) Refer soil analysis, Vellayani. (iii) 16.6.1958. (iv) (a) One digging. (b) Planting in lines on heaps. (c) —. (d) 3'×3'. (e) One cutting of 8" length. (v) Nil. (vi) *Kali kalan*, (local, medium.) (vii) Rainfed. (viii) One weeding and intercultivation two months after planting. (ix) 69.5". (x) 28.4.1959.

2. TREATMENTS :

1. Compost.
2. Ash.
3. Control.

Equal quantities of dry leaves were taken for preparing compost and ash. Quantity N.A. Applied before planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 45'×24'. (iii) 6. (iv) (a) 24'×15'. (b) 18'×9'. (v) One row all round the net plot. (vi) Yes.

4. GENERAL :

(i) Healthy growth. (ii) Nil. (iii) Tuber Weight. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 12305 lb./ac. (ii) 3651 lb./ac. (iii) The treatments are not significantly different. (iv) Av. yield of tuber in lb./ac.

Treatment	1	2	3
Av. yield	11738	13552	11626
S.E./mean	=1491.0 lb./ac.		

Crop :- Tapioca.

Ref :- K: 59(14).

Site :- Agri. College and Res. Institute, Vellayani.

Type :- 'M'.

Object :—To compare the manurial effects of compost and ash.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per treatments. (ii) (a) Red soil. (b) Refer soil analysis, Vellayani. (iii) 27.6.1959. (iv) (a) to (e) N.A. (v) Nil. (vi) *Kali kalan*. (vii) Unirrigated. (viii) Weeding on 26.7.1959. (ix) N.A. (x) 21.4.1960.

2. TREATMENTS :

Same as in expt. no. 13 above.
Other details N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 47'×24'. (iii) 6. (iv) (a) and (b) 24'×15'. (v) —. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 5542 lb./ac. (ii) 1651 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of tuber.

Treatment	1	2	3
Av. yield	5284	5243	6100
	S.E./mean		=674.0 lb./ac.

Crop :- Tapioca.

Ref :- K. 56(15).

Centre :- Trichur, Kottayam, Quilon and Trivandrum (c.f.). Type :- 'M'.

Object :- To study the efficiency of complete and balanced manuring of N, P and K fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca in most of the cases. (c) N.A. (ii) (a) Laterite. (b) N.A. (iii) In some of the fields, F.Y.M. or G.L. were uniformly applied. (iv) Nedumangadan or *Ariyan*. (v) (a) Digging and piling up of mounds. (b) Erect planting of cuttings of length about 10" on the mounds. (c) to (e) N.A. (vi) Varied from field to field—March-April 1956. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) Varied from field to field. Dec. 1956 to Jan. 1957.

2. TREATMENTS :

1. Control.
2. 80 N+80 P.
3. 80 N+80 P+160 K.

Manures applied as mixtures.

A uniform treatment, that is, usual practice of the cultivators in the tract was given to the control plots. This treatment was 2000 lb./ac. of ash at the time of planting and 2000 lb./ac. ash+3000 lb./ac. of F.Y.M. three months after planting. In NP and NPK plots, half of the total dose was applied before planting and the remaining half three months after planting.

3. DESIGN :

(i) No randomisation was adopted but care was taken to select a field which could be considered as representing local tract conditions. Within a field, the treatments were allotted at random. (ii) There were in all 21 experimental fields. (iii) (a) 0.25 ac. (b) 1176 sq.ft. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of tapioca tubers. (iv) (a) No. (b) Nil. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Expt. was conducted on cultivators' fields.

5. RESULTS :

(i) 20389 lb./ac. (ii) 3354 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of green tapioca tubers in lb./ac.

Treatment	1	2	3
Av. yield	14939	18772	27456
	S.E./mean		=732 lb./ac.

Crop :- Tapioca.

Ref :- K. 56(16).

Centre :- Tiruvalla (c.f.).

Type :- 'M'.

Object :- To find out the effect of NP and NPK mixtures on the yield of Tapioca in the presence and absence of lime.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) N.A. (ii) Laterite loam. (iii) $\frac{1}{2}$ ton/ac. of F.Y.M. as B.D. before planting. (iv) Nedumangadan (local), (v) (a) Digging, levelling. (b) Planting cuttings of 9" length after rain on heaps. (c) —. (d) $3\frac{1}{2}$ ' spacing. (e) Single cutting per hole. (vi) 18.4.1956. (vii) Rainfed. (viii) Nil. (ix) 103.74°. (x) 1.1.1957.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 mixtures of NPK manures : $M_1=NP$ and $M_2=NPK$.

(2) 2 levels of lime : $L_0=0$ and $L_1=1$ ton/ac.

N, P and K are applied at 80 lb./ac. of N, 80 lb./ac. of P_2O_5 and 160 lb./ac. of K_2O as Parry's mixture. Manures applied as B.D. before planting. Lime applied after digging and levelling.

3. DESIGN:

(i) 3 cultivator's fields located at different places were selected. (ii) One cultivator had 3 fields under experiment. (iii) (a) and (b) Varied from cultivator to cultivator. (iv) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Tuber yield. (iv) (a) to (c) No. (v) No. (vi) and (vii) Expt. was conducted in cultivators' fields.

5. RESULTS :

(i) 20412 lb./ac. (ii) 1680 lb./ac. (iii) Only main effect of M is significant. (iv) Av. yield of tuber in lb./ac.

	M_1	M_2	Mean
L_0	19466	21347	20407
L_1	19466	21369	20418
Mean	19466	21358	20412

S.E. of any marginal mean = 686 lb./ac.

S.E. of body of table = 970 lb./ac.

Crop :- Tapioca.

Centre :- Tiruvalla (c.f.).

Ref :- K. 58(17).

Type :- 'M'.

Object :- To find out the optimum dose of N, P and K manures required by Tapioca tubers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) F.Y.M. 100 tons (2400 lb./ac.) as B.D. (ii) Gravelly loam with less percentage of gravel. (iii) F.Y.M. 2400 lb./ac. Half the quantity of manures given under treatment at planting. (iv) Nedumangadan (local, medium). (v) (a) 2 diggings during 1st and last weeks of March 1958. (b) Planting cuttings of length about 10" along mounds. (c) —. (d) $3\frac{1}{2}' \times 3\frac{1}{2}'$. (e) Single cutting per hole (vi) 28.3.1958. (vii) Rainfed. (viii) Nil. (ix) 121.95'. (x) 19.1.1959.

2. TREATMENTS:

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

(1) 3 levels of N as A/S : $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac.

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

(3) 3 levels of K_2O as Pot. Sul. : $K_0=0$, $K_1=40$ and $K_2=80$ lb./ac.

3. DESIGN :

(i) Garden of one cultivator in the Tiruvalla taluk which was a typical tapioca growing tract was selected. (ii) Experiment laid in a 3^3 confounded design with 2 replications in blocks of 9 plots. (iii) (a) $35' \times 17\frac{1}{2}'$. (b) $28' \times 10\frac{1}{2}'$. (iv) Yes.

4. GENERAL:

(i) Good. (ii) Rat attack in some plots. (iii) Yield of tubers. (iv) (a) No. (b) and (c) No. (v) No. (vi) and (vii) Expt. was conducted in cultivator's field.

5. RESULTS :

(i) 15708 lb./ac. (ii) 2325 lb./ac. (iii) Main effects of N, P and K are highly significant. Interactions are not significant. (iv) Av. yield of tuber in lb./ac.

	N ₀	N ₁	N ₂	Mean	K ₀	K ₁	K ₂
P ₀	10297	15928	16125	14117	10174	16471	15705
P ₁	11705	17582	18323	15870	11186	18051	18372
P ₂	13483	17731	20199	17138	11631	19187	20595
Mean	11828	17080	18216	15708	10997	17903	18224
K ₀	8100	12816	12075				
K ₁	14050	18842	20817				
K ₂	13335	19583	21755				

S.E. of any marginal mean
S.E. of body of any table

=548.0 lb./ac.
=949.1 lb./ac.

Crop :- Tapioca.

Ref :- K. 54(18).

Centre :- Neyyattin Kara, Kunnathunad (c.f.).

Type :- 'M'.

Object :- To demonstrate the usefulness of complete and balanced N, P and K fertilizers.

1. BASAL CONDITIONS :

(i) (a) In most of the cases tapioca. (b) and (c) N.A. (ii) Laterite. (iii) F.Y.M. or G.L. (quantity N.A.). (iv) *Ariyan* or Nedumangadan. (v) (a) Preparing the land by digging the field with a spade to a depth of about 1½' or ploughing twice or thrice to obtain proper tilth. (b) Forming small heaps or mounds at three to four feet distance or making ridges and furrows. (c) to (e) N.A. (vi) March 1954. (vii) Irrigated. (viii) Inter cultivation and weeding thrice or four times depending upon weed growth and rainfall. (ix) N.A. (x) January, 1955.

2. TREATMENTS :

1. Control.

2. 80N+135P+150 K.

In the control plots, the owners applied their own manures mostly ash, but some of them also used chemical fertilizers. In the NPK plots, ⅓ of the mixture was given before planting ⅓ at the time of 1st inter-cultivation and the balance ⅓ at the time of 2nd intercultivation. N as A/S, P₂O₅ as Super and K as K₂SO₄.

3. DESIGN :

(i) No randomisation was adopted but care was taken to select a field which could be considered representing local tract conditions. (ii) 12. (iii) (a) 80' × 120'. (b) 102 sq. ft. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of tapioca tubers (iv) (a) to (c) No. (v) No. (vi) Nil. (vii) Demonstration under 'Pot. scheme'.

5. RESULTS :

(i) 24349 lb./ac. (ii) 4588 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of tube in lb./ac.

Treatment	1	2
Av. yield	21027	27671

S.E./mean =1324 lb./ac.

Crop :- Tapioca.

Ref :- K. 55(19).

Centre :- Trivandrum (c.f.).

Type :- 'M'.

Object :- To demonstrate the usefulness of complete and balanced N, P and K fertilizers.

1. BASAL CONDITIONS :

(i) (a) Tapioca in most of the cases. (b) and (c) N.A. (ii) Laterite. (iii) F.Y.M. or green leaves (quantity N.A.) (iv) Ariyan or (Kalikalan, Kannam or white Ariyan). (v) (a) Preparing the land by digging the field with spade to a depth of about a foot and a half or ploughing twice or thrice to obtain proper tilth. (b) Forming small heaps or mounds at three to four feet distances or making ridge and furrows for planting sets. (c) to (e) N.A. (vi) March to August 1955. (vii) Irrigated. (viii) Inter cultivation and weeding thrice or four times depending upon weed growth and rainfall. (ix) N.A. (x) Dec. 1955 to April 1956.

2. TREATMENTS:

1. Control.
2. 80 N + 60 P + 120 K.
3. 80 N + 80 P + 160 K.

In the control plots, the owners applied their own manures, mostly ash but some of them used chemical fertilizers also. In the NPK plots, $\frac{1}{2}$ dose was applied before planting and the remaining $\frac{1}{2}$ dose 3 months after planting. N as A/S, P_2O_5 as super and K_2O as K_2SO_4 .

3. DESIGN :

(i) No randomisation was adopted but care was taken to select a field which could be considered representing local tract conditions. (ii) Nine fields, one in each village. (iii) (a) About 0.25 acres (80' x 120'). (b) 1176 sq ft. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of tapioca tuber. (iv) (a) to (c) No. (v) Nil. (vi) Nil. (vii) Demonstration trial under 'Pot. scheme'.

5. RESULTS :

(i) 16912 lb./ac. (ii) 3255 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tuber in lb./ac.

Treatment	1	2	3
Av. yield	11336	17659	21741
	S.E./mean = 1085 lb./ac.		

Crop :- Tapioca.

Ref :- K. 59(20).

Centre :- Trivandrum (c.f.).

Type :- 'M'.

Object :- To study the response of Tapioca to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 3. DESIGN :

Same as in expt. no. 111 on page 79 on paddy crop.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Tuber yield. (iv) (a) 1959 - contd. (b) No. (c) Nil. (v) (a) Palghat, Quilon and Trivandrum. (vi) and (vii) Expt. was conducted on cultivator's field.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	6369	7941	7439	8418	7537	8541	8122	9644

G.M. = 8001 lb./ac. ; S.E./mean = 129.7 lb./ac. ; No. of trials = 16.

Crop :- Tapioca.
Centre :- Palghat (c.f.).

Ref :- K. 59(21)
Type :- 'M'.

Object :—To study the response] of Tapioca to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 3. DESIGN :

Same as in expt. no. 111 on page 79 on paddy crop.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Tuber yield. (iv) (a) and (b) No. (c) Nil. (v) (a) Palghat, Quilon and Trivandrum. (vi) and (vii) Expt. was conducted on cultivator's field.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	6920	8459	8278	11429	8928	12014	11216	12902

G.M.=10018 lb./ac. ; S.E./mean=190.7 lb./ac. ; No. of trials=12.

Crop :- Tapioca.
Centre :- Palghat.

Ref :- K. 59(22).
Type :- 'M'.

Object :—To investigate the relative efficiency of different nitrogenous fertilizers at different levels.

1. BASAL CONDITIONS to 3. DESIGN :

Same as in expt. no. 121 on page 83, 84 on paddy crop.

4. GENERAL :

Same as in expt. no. 20 on page 157.

5. RESULTS :

Treatment	0	N ₁ '	N ₂ '	N ₁ "	N ₂ "	N ₁ ""	N ₂ ""
Av. yield	7101	9183	11150	9455	12096	9068	11701

G.M. =9965 lb./ac. ; S.E./mean=243.8 lb./ac. ; No of trials=12.

Crop :- Tapioca.
Centre :- Quilon (c.f.).

Ref :- K. 59(23).
Type :- 'M'.

Object :—To study the response of Tapioca to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 3. DESIGN :

Same as in expt. no. 111 on page 79 on paddy crop.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Tuber yield. (iv) (a) and (b) No. (c) Nil. (v) (a) Palghat, Quilon and Trivandrum. (vi) and (vii) Expt. was conducted on cultivator's field.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	7694	8640	8722	9381	8986	9660	9381	10426

G.M.=9111 lb./ac. ; S.E./mean=64.4 lb./ac. ; No. of trials=16.

Crop :- Tapioca.

Ref :- K. 59(24).

Centre :- Quilon (c.f).

Type :- 'M'.

Object :- To investigate the relative efficiency of nitrogenous fertilizers at different levels.

1. BASAL CONDITIONS to 3. DESIGN :

Same as in expt. no. 121 on page 83, 84 on paddy crop.

4. GENERAL :

Same as in expt. no. 20 on page 157.

5. RESULTS :

Treatment	0	N ₁ '	N ₂ '	N ₁ "	N ₂ "	N ₁ ''	N ₂ ''
Av. yield	7850	8870	9496	9068	9570	9060	9455

G.M.=9053 lb./ac. ; S.E./mean=48.88 lb./ac. ; No. of trials=16.

Crop :- Tapioca.

Ref :- K. 59(25).

Centre :- Trivandrum.

Type :- 'M'.

Object :- To investigate the relative efficiency of different nitrogenous fertilizers at different levels.

1. BASAL CONDITIONS to 3. DESIGN :

Same as in expt. no. 121 on page 83, 84 on paddy crop.

4. GENERAL :

Same as in expt. no. 20 on page 157.

5. RESULTS :

Treatment	0	N ₁ '	N ₂ '	N ₁ "	N ₂ "	N ₁ ''	N ₂ ''
Av. yield	6566	8393	9413	8048	8837	7768	8574

G.M. =8371 lb./ac. ; S.E./mean=151.3 lb./ac. ; No. of trials=16

Crop :- Tapioca.

Ref :- K. 55(26).

Site :- Tapioca Res. Stn., Tiruvalla.

Type :- 'MV'.

Object :- To study the differential response of Tapioca varieties to intensive nitrogenous manuring.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) Cow dung at the rate of 5000 lb./ac. (ii) (a) Laterite soil. (b) Refer soil analysis, Tiruvalla. (iii) 27.4.1955. (iv) (a) Two ploughings. (b) Erect planting of fresh cuttings of 7" length on small mounds. (c) —. (d) Between plants 3½', between rows 4'. (e) Single cutting per hole (v) Applied 900 lb. of F.Y.M. as cow dung procured from different cattle sheds. (vi) As per treatments (medium duration). (vii) Unirrigated. (viii) Interculturing 3 times at two months interval, weeding along with interculturing. (ix) 80°. (x) 23.2.1956.

2. TREATMENTS :

Main-plot treatments :

3 levels of N as A/S : N₀=0, N₁=80 and N₂=160 lb./ac.

Sub-plot treatments :

10 varieties : V₁=T-1, V₂=T-37, V₃=T-47, V₄=T-57, V₅=T-97, V₆=T-134, V₇=Areekara, V₈=M-2, V₉=B-2 and V₁₀=H-105.

3. DESIGN :

(i) Spl t-plot. (ii) (a) 3 main-plots/block and 10 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) main-plot 40'×10½'. (b) Sub-plot 4'×10½'. (v) 4' spacing between main-plots and 3½' spacing between plants. Each row consists of 3 plants. (vi) Yes.

4. GENERAL :

(i) Response in growth was different for different varieties. (ii) Nil (iii) Tuber yield. (iv) (a) 1955—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 13258 lb./ac. (ii) (a) 5411 lb./ac. (b) 3291 lb./ac. (iii) Main effect of N is significant and of V is highly significant. Interaction is not significant. (iv) Av. yield of tuber in lb./ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	V ₇	V ₈	V ₉	V ₁₀	Mean
N ₀	5393	9749	5497	10579	16179	4563	6638	11409	7727	14935	9267
N ₁	9438	19706	8297	21573	19913	6223	9334	17528	12394	20587	14499
N ₂	13690	19498	8142	19343	17891	10112	12031	20276	13794	25306	16008
Mean	9507	16318	7312	17165	17994	6966	9334	16404	11305	20276	13258

S.E. of difference of two

1. N marginal means = 1082 lb./ac.
2. V marginal means = 1201 lb./ac.
3. V means at the same level of N = 2081 lb./ac.
4. N means at the same level of V = 2252 lb./ac.

Crop :- Tapioca.

Ref :- K. 56(27).

Site :- Tapioca Res. Stn., Tiruvalla.

Type :- 'MV'.

Object :—To study the differential response of Tapioca varieties to intensive nitrogenous manuring.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per treatments. (ii) (a) Laterite. (b) Refer soil analysis, Tiruvalla. (iii) 23.4.1956. (iv) (a) Two ploughings. (b) Erect planting of single cutting of uniform length (7") per hole in mounds. (c) —. (d) 4'×3½'. (e) Single cutting/hole. (v) 900 lb. of cow dung equally distributed in the plots. (vi) As per treatments (improved, medium). (vii) Unirrigated. (viii) Three weedings and 3 intercultivations. (ix) 80°. (x) 22.1.1957.

2. TREATMENTS :

Main-plot treatments :

3 levels of N as A/S : N₀=0, N₁=80 and N₂=160 lb./ac.

Sub-plot treatments :

10 varieties : V₁=T-1, V₂=T-37, V₃=T-47, V₄=T-57, V₅=T-97, V₆=T-134, V₇=T-291, V₈=M-2, V₉=B-2 and V₁₀=M-105.**3. DESIGN :**

(i) Split-plot (ii) (a) 3 main-plots/block 10 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) 40'×10½' (main-plot) ; 10½'×4' (sub-plot). (b) 1/1037.14. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Uniform stand but uneven growth in different plots. (ii) Nil. (iii) Yield of tuber. (iv) (a) 1955—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 14679 lb./ac. (ii) (a) 4646 lb./ac. (b) 2925 lb./ac. (iii) Main effects of N and V and interaction N×V are significant. (iv) Av. yield of tuber in lb./ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	V ₇	V ₈	V ₉	V ₁₀	Mean
N ₀	8401	9749	10268	12446	12342	6741	9023	10683	9749	19498	10890
N ₁	14520	22195	13794	21365	16283	10164	13587	16179	13275	22506	16387
N ₂	16491	21676	15453	23647	16594	14001	13483	16802	15142	14312	16760
Mean	13137	17873	13172	19153	15073	10302	12031	14555	12722	18772	14679

S.E. of difference of two

1. N marginal means = 929 lb./ac.
2. V marginal means = 1068 lb./ac.
3. V means at the same level of N = 1850 lb./ac.
4. N means at the same level of V = 1986 lb./ac.

Crop :- Tapioca.

Ref :- K. 57(28).

Site :- Tapioca Res. Stn., Tiruvalla.

Type :- 'MV'.

Object :- To study the differential response of Tapioca varieties to intensive nitrogenous manuring.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per treatments. (ii) (a) Laterite. (b) Refer soil analysis, Tiruvalla. (iii) 23.4.1957. (iv) (a) Two ploughings. (b) Planting single cuttings of length 7" on mounds. (c) —. (d) 3½' between plants and 4' between rows. (e) Single cutting/hole. (v) 900 lb./ac. cow dung dried powdered and applied uniformly in small pits over which mounds were formed. (vi) As per treatments. (vii) Un-irrigated. (viii) Weeding done along with intercultivation. (ix) 80°. (x) 7.3.1958.

2. TREATMENTS :

Main-plot treatments :

3 levels of N as A/S : $N_0=0$, $N_1=80$ and $N_2=160$ lb./ac.

Sub-plot treatments :

10 varieties : $V_1=T-1$, $V_2=T-37$, $V_3=T-57$, $V_4=T-97$, $V_5=T-29$, $V_6=M-2$, $V_7=M-4$, $V_8=M-6$, $V_9=B-2$, and $V_{10}=H-105$.

All are of medium duration except T-37 which is a late variety.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 10 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 40' × 10½' (main-plot) ; 4' × 10½' (sub-plot). (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Tuber yield. (iv) (a) 1955—1957. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 12940 lb./ac. (ii) (a) 3713 lb./ac. (b) 3060 lb./ac. (iii) Main effects of N and V and interaction $N \times V$ are highly significant. (iv) Av. yield of tuber in lb./ac.

	V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	V_9	V_{10}	Mean
N_0	7467	10786	14520	12134	10475	9749	7260	7467	7779	11305	9894
N_1	11201	17631	17631	20328	11201	12653	9438	13483	9645	16387	13960
N_2	13794	16387	12964	19706	11823	17528	13483	15453	9438	19083	14966
Mean	10821	14935	15038	17389	11166	13310	10060	12134	8954	15592	12940

S.E. of difference of two

1. N marginal means = 743 lb./ac.
2. V marginal means = 1117 lb./ac.
3. V means at the same level of N = 1935 lb./ac.
4. N means at the same level of V = 1981 lb./ac.

Crop :- Tapioca.

Ref :- K. 54(29).

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

Type :- 'C'.

Object :- To determine the best spacing and best method of cultivation for Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per basal manuring. (ii) (a) Laterite and gravelly. (b) N.A. (iii) 20.4.1954. (iv) (a) Two ploughings before planting. (b) As per treatments. (c) —. (d) As per treatments. (e) Single cutting of 6" length/hole. (v) 5 C.L. of cow dung/ac. was applied before ploughing and 50 tins of ash/ac. before planting. 50 tins of ash/ac. two months after planting at the time of intercultivation. (vi) No. 97 (local, medium). (vii) Unirrigated. (viii) First weeding and intercultivation two months after planting. Next weeding 4 months after planting. (ix) N.A. (x) 30.3.1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 methods of planting : M_1 —On ridges and M_2 —On mounds.

(2) 3 spacings : $S_1=2'$, $S_2=4'$ and $S_3=6'$ both ways.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) $16' \times 30'$ (S_1), $20' \times 30'$ (S_2) and $24' \times 30'$ (S_3). (b) $12' \times 24'$. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of tuber. (iv) (a) 1952—contd. (b) Yes. (c) Yes. (v) (a) Trivandrum and Tiruvalla. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 10476 lb./ac. (ii) 1691 lb./ac. (iii) Main effects of M and S and interaction $M \times S$ are not significant. (iv) Av. yield of tuber in lb./ac.

	S_1	S_2	S_3	Mean
M_1	10494	11262	10534	10863
M_2	10872	9551	9841	10088
Mean	10683	10407	10337	10476

S.E. of marginal mean of M = 399.0 lb./ac.
 S.E. of marginal mean of S = 488.1 lb./ac.
 S.E. of body of table = 690.3 lb./ac.

Crop :- Tapioca.

Ref :- K. 55(30).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy. Type :- 'C'.

Object :—To determine the best spacing and best method of planting for Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per basal manuring. (ii) (a) Gravelly and laterite. (b) N.A. (iii) 12.5.1955. (iv) (a) Digging the entire area to a depth of about 9". (b) As per treatments. (c) —. (d) As per treatments. (e) Single cutting per hole planted erect. (v) 5 C.L./ac. of cow dung was broadcast before digging, 100 tins of ash/ac. was added at the time of planting. (vi) Local (late). (vii) Unirrigated. (viii) Weeding and intercultivation during the 2nd and 3rd months after planting. During the 6th month also weeding was carried out. (ix) N.A. (x) 26.2.1956.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 methods of planting : M_1 —On ridges and M_2 —On mounds.

(2) 3 spacings : $S_1=2'$, $S_2=3'$ and $S_3=4'$ both ways.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) $16' \times 28'$ (S_1), $18' \times 30'$ (S_2) and $20' \times 32'$ (S_3). (b) $12' \times 24'$. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Very good. (ii) Slight attack of scale insects was noticed on the stems. Completely controlled by spraying 1% Folidol. (iii) Yield of tuber. (iv) (a) 1952—contd. (b) and (c) Yes. (v) (a) Trivandrum and Tiruvalla. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 15085 lb./ac. (ii) 2268 lb./ac. (ii) Main effect of S is highly significant and main effect of M is significant. (iv) Av. yield of tuber in lb./ac.

	S ₁	S ₂	S ₃	Mean
M ₁	16565	16308	14798	15885
M ₂	16157	14874	11823	14285
Mean	16353	15583	13318	15085

S.E. of marginal means of S = 654.7 lb./ac.
 S.E. of marginal means of M = 534.5 lb./ac.
 S.E. of body of table = 926.0 lb./ac.

Crop :- Tapioca.

Ref :- K. 56(31).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy. Type :- 'C'.

Object :- To determine the best spacing and best method of planting for Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per basal manuring. (ii) (a) Gravelly and laterite. (b) N.A. (iii) 16.5.1956. (iv) (a) 2 rounds of ploughing. (b) As per treatments. (c) —. (d) As per treatments. (e) Single cutting of 6" to 8" length per hole. (v) 5 C.L./ac. of cattle manure+50 tins of ash. Cattle manure applied before ploughing and ash applied along ridges. (vi) No. 97 (local, medium). (vii) Rainfed (viii) 3 weedings 1st before the application of ash, 2nd one month after planting and 3rd during the 3rd month. (ix) N.A. (x) 8.3.1957.

2. TREATMENTS :

Same as in expt. no. 30 on page 162.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 16'×28' (S₁), 18'×30' (S₂) and 20'×32' (S₃). (b) 12'×24'. (v) One row all round the plot. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Tuber yield. (iv) (a) 1952—contd. (b) and (c) Yes. (v) (a) Trivandrum and Tiruvalla. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 12558 lb./ac. (ii) 3539 lb./ac. (iii) Main effect of S alone is significant. (iv) Av. yield of tuber in lb./ac.

	S ₁	S ₂	S ₃	Mean
M ₁	11672	15137	11974	12928
M ₂	11230	14659	10675	12188
Mean	11451	14898	11325	12558

S.E. of marginal mean of S = 1022 lb./ac.
 S.E. of marginal mean of M = 834 lb./ac.
 S.E. of body of table = 1445 lb./ac.

Crop :- Tapioca.

Ref :- K. 57(32).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy. Type :- 'C'.

Object :- To determine the best spacing and best method of planting for Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per basal manuring. (ii) (a) Laterite and gravelly soil. (b) N.A. (iii) 5.6.1957. (iv) (a) Two rounds of ploughing before planting. (b) As per treatments. (c) —. (d) As per treatments. (e) Single cutting of length 10" per hole. (v) 5 C.L./ac. of cow dung before ploughing and 50 tins of ash at the time of planting. (vi) No. 97 (local, early). (vii) Rainfed. (viii) Weeding and intercultivation twice during the season one month and 4 months after planting. (ix) N.A. (x) 27.3.1958.

2. TREATMENTS:

Same as in expt. no. 30 on page 162.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 16'×28' (S₁), 18'×30' (S₂) and 20'×32' (S₃). (b) 12'×24'. (v) One row all round. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tuber yield. (iv) (a) 1952—contd. (b) Yes. (c) —. (v) (a) Trivandrum and Tiruvalla. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 12965 lb./ac. (ii) 3349 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of tuber in lb./ac.

	S ₁	S ₂	S ₃	Mean
M ₁	14570	13764	11974	13436
M ₂	13789	11974	11722	12495
Mean	14180	12868	11842	12965

S.E. of marginal mean of S = 966.8 lb./ac.
 S.E. of marginal mean of M = 789.4 lb./ac.
 S.E. body of table = 1367 lb./ac.

Crop :- Tapioca.

Ref :- K. 54(33).

Site :- Tapioca Res. Stn., Tiruvalla.

Type :- 'C'.

Object :- To determine the best spacing and best method of planting for Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per basal manuring (ii) (a) Laterite. (b) Refer soil analysis, Tiruvalla. (iii) 3.4.1954. (iv) (a) Ploughed two rounds before planting. (b) As per treatments. (c) —. (d) Between rows 3' and between plants as per treatments. (e) One cutting of 7" length per hole. (v) Applied 2880 lbs cow dung equally distributed in the different plots one month before planting. Cow dung procured from different sheds was dried, powdered and applied uniformly. (vi) Ariyan (local, medium). (vii) Unirrigated. (viii) Interculturing three times at two months interval. Weeding done along with interculture. (ix) 80". (x) 31.1.1955.

2. TREATMENTS :

Same as in expt. no. 29 on page 161.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 24'×12'. (b) 24'×12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Growth poor in S_1 plots. (ii) Nil. (iii) Height of plants, number of sprouts and yield. (iv) (a) 1952—contd. (b) Yes. (c) —. (v) (a) Trivandrum and Mannuthy. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 11713 lb./ac. (ii) 947 lb./ac. (iii) Main effect of S and interaction $S \times M$ are highly significant. Main effect of M is not significant. (iv) Av. yield of tuber in lb./ac.

	S_1	S_2	S_3	Mean
M_1	12910	12322	9604	11612
M_2	13605	12216	9619	11813
Mean	13258	12269	9611	11713

S.E. of marginal mean of S = 273.3 lb./ac.

S.E. of marginal mean of M = 223.2 lb./ac.

S.E. of body of table = 386.6 lb./ac.

Crop :- Tapioca.

Ref :- K. 55(34).

Site :- Tapioca Res. Stn., Tiruvalla.

Type :- 'C'.

Object :- To determine the best spacing and best method of planting for Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) Cow dung at the rate of 5000 lb./ac. (ii) (a) Laterite. (b) Refer soil analysis, Tiruvalla. (iii) 21.4.1955. (iv) (a) Two ploughings. (b) As per treatments. (c) —. (d) 3' spacing between rows and as per treatments between plants. (e) Single cutting of 7" length/hole. (v) 2880 lb./ac. of cow dung procured from different cattle sheds. Dried and powdered cow dung measured out and applied in shallow pits over which mounds and ridges are prepared. (vi) Type 37 Nedumangadan (local, late). (vii) Unirrigated. (viii) Interculturing three times at two months interval. Weeding along with interculturing. (ix) 80°. (x) 27.2.1956.

2. TREATMENTS :

Same as in expt. no. 29 on, page 161.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 24' x 12'. (b) 24' x 12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Growth poor in S_1 plots. (ii) Nil. (iii) Yield of tuber, height of plants and number of sprouts (iv) (a) 1952—contd. (b) Yes. (c) —. (v) (a) Trivandrum and Mannuthy. (b) —. (vi) and (vii) Nil

5. RESULTS :

(i) 26075 lb./ac. (ii) 4451 lb./ac. (iii) Main effects and interaction are not significant. (iv) Av. yield of tuber in lb./ac.

	S_1	S_2	S_3	Mean
M_1	27142	27772	23846	26253
M_2	24317	26538	26834	25896
Mean	25730	27155	25340	26075

S.E. of marginal mean of S = 1285 lb./ac.

S.E. of marginal mean of M = 1049 lb./ac.

S.E. of body of table = 1817 lb./ac.

Crop :- Tapioca.

Ref :- K. 56(35).

Site :- Tapioca Res. Stn., Tiruvalla.

Type :- 'C'.

Object :- To find out the best spacing and best method of planting for Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) Cow dung at 5000 lb./ac. and fertilizers to give 50 lb./ac. of N, 40 lb./ac. of P and 80 lb./ac. of K. (ii) (a) Laterite. (b) Refer soil analysis, Tiruvalla. (iii) 11, 12.4.1956. (iv) (a) Two ploughings. (b) As per treatments. (c) —. (d) As per treatments. (e) Single cuttings of uniform length 7" per hole. (v) 1800 lb. of cow dung equally distributed in the plots—applied uniformly in shallow pits at prescribed spacings over which mounds and ridges were made before planting. (vi) *Ariyan* (local, medium). (vii) Unirrigated. (viii) Weeding was done along with intercultivation thrice. (ix) 80°. (x) 17, 18.1.1957.

2. TREATMENTS :

Same as in expt. no. 30 on page 162.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 16'×28' (S₁), 18'×30' (S₂) and 20'×32' (S₃). (b) 12'×24'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Uniform stand and healthy growth except in the S₁ plots where plants looked weak and stunted. (ii) Nil. (iii) Yield of tuber. (iv) (a) 1952—contd. (b) Yes. (c) —. (v) (a) Trivandrum and Mannuthy. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 21698 lb./ac. (ii) 3172 lb./ac. (iii) None of the effects and interaction is significant. (iv) Av. yield of tuber in lb./ac.

	S ₁	S ₂	S ₃	Mean
M ₁	22008	18120	22310	20813
M ₂	22851	22562	22336	22583
Mean	22430	20341	22323	21698

S.E. of marginal mean of S = 916 lb./ac.
 S.E. of marginal mean of M = 747 lb./ac.
 S.E. of body of table = 1295 lb./ac.

Crop :- Tapioca.

Ref :- K. 57(36).

Site :- Tapioca Res. Stn., Tiruvalla.

Type :- 'C'.

Object :- To find out the best spacing and best method of planting for Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per basal manuring. (ii) (a) Laterite. (b) Refer soil analysis, Tiruvalla. (iii) 5.4.1957. (iv) (a) Ploughed twice. (b) As per treatments. (c) —. (d) As per treatments. (e) Single cuttings of uniform length 7". (v) 1800 lb./ac. of cow dung equally distributed in shallow pits over which the mounds and ridges were formed. (vi) *Ariyan* (medium, local). (vii) Rainfed. (viii) Weeding was done along with intercultivation thrice. (ix) 80°. (x) 5.2.1958.

2. TREATMENTS :

Same as in expt. no. 30 on page 162.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 16'×28' (S₁), 18'×30' (S₂) and 20'×32' (S₃). (b) 12'×24'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Uniform stand and healthy growth except. in S_1 plots where the plants looked weak and stunted. (ii) Nil. (iii) Tuber yield. (iv) (a) 1952—contd. (b) Yes. (c) —. (v) (a) Trivandrum and Mannuthy. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 18159 lb./ac. (ii) 2470 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of tuber in lb./ac.

	S_1	S_2	S_3	Mean
M_1	18540	17217	17141	17633
M_2	19398	10587	17066	18684
Mean	18969	18402	17104	18159

S.E. of marginal mean of S = 713 lb./ac.

S.E. of marginal mean of M = 582 lb./ac.

S.E. of body of table = 1009 lb./ac.

Crop :- Tapioca.

Ref :- K. 58(37).

Site :- Tapioca Res. Stn., Tiruvalla.

Type :- 'C'.

Object :—To find out the best spacing and best method of planting for Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per basal manuring. (ii) (a) Laterite. (b) Refer soil analysis, Tiruvalla. (iii) 28.4.1958. (iv) (a) Two ploughings. (b) As per treatments. (c) —. (d) As per treatments. (e) Single cutting per hole. (v) 1800 lb./ac. cow dung equally distributed among plots in shallow pits. (vi) *Ariyan* (medium local). (vii) Rainfed. (viii) Intercultivation and weeding done twice. (ix) 80°. (x) 22.1.1959.

2. TREATMENTS :

Same as in expt. no. 30 on page 162.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 16'×28' (S_1), 18'×30' (S_2) and 20'×32' (S_3). (b) 12'×24'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Uniform stand and healthy growth except. in S_1 plots where the plants looked stunted and weak. (ii) Nil. (iii) Tuber yield. (iv) (a) 1952—1958. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 15172 lb./ac. (ii) 2934 lb./ac. (iii) None of the effects and interactions is significant. (iv) Av. yield of tuber in lb./ac.

	S_1	S_2	S_3	Mean
M_1	14515	14941	15187	14881
M_2	16934	15971	13485	15463
Mean	15724	15456	14336	15172

S.E. of marginal mean of S = 847 lb./ac.

S.E. of marginal mean of M = 692 lb./ac.

S.E. of body of table = 1198 lb./ac.

Crop :- Tapioca.
Site :- Tapioca Res. Stn., Trivandrum.

Ref :- K. 54(38).
Type :- 'C'.

Object :- To find out the best spacing and best method of planting for Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per basal manuring. (ii) (a) Laterite. (b) Refer soil analysis, Trivandrum. (iii) 7.4.1954. (iv) (a) Well tilled. (b) As per treatments. (c) —. (d) As per treatments. (e) Single cutting of 8" length taking only the tender top portion. (v) 3 ton/ac. of night soil compost broadcast uniformly before tilling 250 lb./block of ash applied. (vi) No. 97 (*kalikalan*, medium). (vii) Partially irrigated—hand watering before rains. (viii) Weeding twice before harvest. (ix) 67.5". (x) 2.5.1955.

2. TREATMENTS

Same as in expt. no. 29 on page 161.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) 381 sq. yds. (iii) 6. (iv) (a) 27'×16' (S₁), 27'×20' (S₂) and 27'×24' (S₃). (b) 21'×12'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Stand good. (ii) Nil. (iii) Yield of tuber. (iv) (a) 1952—1954. (b) Yes. (c) —. (v) (a) Tiruvalla and Mannuthy. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 23413 lb./ac. (ii) 5849 lb./ac. (iii) Main effect of S is highly significant. Interaction M×S is significant. Effect of M is not significant. (iv) Av. yield of tuber in lb./ac.

	S ₁	S ₂	S ₃	Mean
M ₁	27507	20298	18944	22250
M ₂	27824	25864	20038	24575
Mean	27666	23081	19491	23413

S.E. of marginal mean of S = 1689 lb./ac.
S.E. of marginal mean of M = 1379 lb./ac.
S.E. of body of table = 2388 lb./ac.

Crop :- Tapioca.
Site :- Tapioca Res. Stn., Trivandrum.

Ref :- K. 35(89).
Type :- 'C'.

Object :- To find out the best spacing and best method of planting for Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per basal manuring. (ii) (a) Laterite. (b) Refer soil analysis, Trivandrum. (iii) 7.4.1954. (iv) (a) Well tilled. (b) As per treatments. (c) —. (d) As per treatments. (e) Single cutting of 8" length taking only the tender top portion. (v) Compost at 3 ton/ac. broadcast uniformly before tilling the field. Ash at 1½ ton/ac. top dressed. (vi) No. 97 (medium, local). (vii) Partially irrigated—watered twice a week till monsoon. (viii) Intercultured on 27.6.1955 after giving ash. Weeding twice before harvest. (ix) 67.5". (x) 14.3.1956.

2. TREATMENTS :

Same as in expt. no. 29 on page 161.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) 381 sq. yds. (iii) 6. (iv) (a) 16'×28' (S₁), 18'×30' (S₂) and 20'×32' (S₃). (b) 12'×24'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Growth uniform. (ii) Nil. (iii) Yield of tuber. (iv) (a) 1952—1955 (spacing between plants was modified in 1955 experiment). (b) Yes. (c) —. (v) (a) Tiruvalla, Mannuthy. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 17556 lb./ac. (ii) 2574 lb./ac. (iii) Main effect of S is highly significant. Other effects are not significant. (iv) Av. yield of tuber in lb./ac.

	S ₁	S ₂	S ₃	Mean
M ₁	20415	19298	15523	18412
M ₂	19298	17712	13092	16701
Mean	19856	18505	14308	17556

S.E. of marginal mean of S = 743 lb./ac.

S.E. of marginal mean of M = 607 lb./ac.

S.E. of body of table = 1051 lb./ac.

Crop :- Tapioca.

Site :- Tapioca Res. Stn., Trivandrum.

Ref :- K. 56(40).

Type :- 'C'.

Object :- To find out the best spacing and best method of planting for Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per basal manuring. (ii) (a) Laterite. (b) Refer analysis, Trivandrum. (iii) 3.5.1956. (iv) (a) The soil tilled to a depth of 18" and mounds and ridges were made. (b) As per treatments. (c) —. (d) As per treatments. (e) Single cutting of 8" length per hole. (v) Cow dung at the rate of 5 ton per acre applied at the time of tilling and ash at the rate of 1.5 tons per acre applied during intercultivation as top dressing. (vi) No. 97 (local, medium). (vii) Partially irrigated. Hand watering twice a week till sprouting. (viii) Intercultivation done after 1½ month of growth. Applying ash at the rate of 1.5 ton per acre. Twice weeding was done before harvest. (ix) 67.5%. (x) 11.2.1957.

2. TREATMENTS :

Same as in expt. no. 30 on page 162.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 16'×28' (S₁), 18'×30' (S₂) and 20'×32' (S₃). (b) 12'×24'. (v) One row all round the net plot. (vi) Yes.

4. GENERAL :

(i) Growth good. (ii) Nil. (iii) Yield of tuber. (vi) (a) 1952—1956. (b) Yes. (c) —. (v) (a) Tiruvalla and Mannuthy. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 19284 lb /ac. (ii) 2801 lb./ac. (iii) Main effect of S is highly significant and of M is significant. Interaction M×S is not significant. (iv) Av. yield of tuber in lb./ac.

	S ₁	S ₂	S ₃	Mean
M ₁	22108	20620	18679	20469
M ₂	20797	18226	15276	18100
Mean	21452	19423	16978	19284

S.E. of marginal mean of S = 809 lb./ac.
 S.E. of marginal mean of M = 660 lb./ac.
 S.E. of body of table = 1143 lb./ac.

Crop :- Tapioca.

Ref :- K. 57(41).

Site :- Tapioca Res. Stn., Trivandrum.

Type :- 'C'.

Object :—To find out the best spacing and best method of planting for Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per basal manuring. (ii) (a) Laterite. (b) Refer soil analysis, Trivandrum. (iii) 2.4.1957. (iv) (a) Soil tilled to a depth of 18" in shallow pits. (b) As per treatments. (c) —. (d) As per treatments. (e) Single cutting of 8" length per hole. (v) Cow dung at the rate of 5 ton per acre applied before tilling. (vi) No. 97 (local, medium). (vii) Partially irrigated. Hand watering twice a week till sprouting. (viii) Intercultivation done after 1½ months growth, applying ash at the rate of 1.5 ton/ac.; two weedings before harvest. (ix) 67.5". (x) 3.3.1958.

2. TREATMENTS :

Same as in expt. no. 30 on page 162.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 16'×28', 18'×30' and 20'×32', for 2, 3 and 4 feet spacings respectively. (b) 12'×24'. (v) One row around.

4. GENERAL :

(i) Growth of plants was good. (ii) Nil. (iii) Tuber yield. (iv) (a) 1952—1957. (b) Yes. (c) —. (v) (a) Tiruvalla and Mannuthy. (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 23285 lb./ac. (ii) 1124 lb./ac. (iii) Main effect of S is highly significant. Other effects are not significant. (iv) Av. yield of tuber in lb./ac.

	S ₁	S ₂	S ₃	Mean
M ₁	25233	23179	21414	23275
M ₂	24578	23470	21818	23289
Mean	24906	23324	21616	23282

S.E. of marginal mean of S = 324.4 lb./ac.
 S.E. of marginal mean of M = 264.9 lb./ac.
 S.E. of body of table = 458.9 lb./ac.

Crop :- Tapioca.

Ref :- K. 54(42).

Site :- Tapioca Res. Stn., Trivandrum.

Type :- 'C'.

Object :- To find out the effect of curing Tapioca stems before planting.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) Compost used for basal dressing at the rate of 3 ton/ac. by broad casting uniformly. Ash for top dressing at the rate of one ton/ac. (ii) (a) Laterite. (b) Refer soil analysis, Trivandrum. (iii) 25.5.1954. (iv) (a) Soil well tilled and levelled. (b) Erect planting of cuttings of 8" length in shallow pits. (c) —. (d) 3' between plants. (e) Single cutting per hole. (v) Compost at the rate of 3 ton/ac. applied before tilling by broadcasting uniformly. (vi) Malayan 4 (late). (vii) Partially irrigated. (viii) Intercultivated after one and a half month growth with ash at the rate of 1 ton/ac. Weeded twice before harvest. (ix) 67 5". (x) 14.5.1955.

2. TREATMENTS :

1. Stems cured in smoke for 4 weeks.
2. Stems cured in smoke for 3 weeks.
3. Stems cured in smoke for 2 weeks.
4. Stems cured in smoke for 1 week.
5. Fresh stems cut at the time of planting.
6. Stems stored in shade (usual practice) for 4 weeks (control).

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) Nil. (iii) 4. (iv) (a) N.A. (b) 9' x 5'. (v) Nil ; one row between replications discarded. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of tuber. (iv) (a) No. (b) and (c) Yes. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 23087 lb./ac. (ii) 3040 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of tuber in lb./ac.

Treatment	1	2	3	4	5	6
Av. yield	24200	25362	21393	22748	22070	22748

S.E./mean = 1520 lb./ac.

Crop :- Tapioca.

Ref :- K. 59(43).

Site :- Agri. College and Res. Institute, Vellayani.

Type :- 'C'.

Object :- To study the effect of mixed cropping of Tapioca with Cowpeas.

1. BASAL CONDITIONS :

(i) (a) Mixed cropping with cowpeas. (b) and (c) N.A. (ii) (a) Loamy. (b) Refer soil analysis, Vellayani. (iii) 9.6.1959. (iv) (a) to (e) N.A. (v) Cow dung at 20 lb /plot as basal dressing. (vi) *Kalikalan* (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 methods of planting : M₁=Level, M₂=Mound and M₃=Ridge planting.

(2) 2 crops : C₁=Tapioca alone and C₂=Tapioca and cowpeas.

Cowpeas broadcast in the plots.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) 97½' x 24'. (iii) 6. (iv) (a) and (b) 24' x 15'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of tuber. (iv) (a) 1958—N.A. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3651 lb./ac. (ii) 1791 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of tuber in lb./ac.

	M ₁	M ₂	M ₃	Mean
C ₁	3615	31.6	2975	3232
C ₂	5087	2274	4850	4070
Mean	4351	2690	3912	3651

S.E. of M marginal mean = 517.0 lb./ac.

S.E. of C marginal mean = 422.2 lb./ac.

S.E. of body of table = 731.2 lb./ac.

Crop :- Tapioca.

Ref :- K. 58(44).

Site :- Tapioca and Sweet Potato Res. Strn., Mannuthy. Type :- 'CM'.

Object : - To determine the best dose of N, P, K and to find the best spacing to give the highest yield in the cultivation of Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) 5 C.L. of cow dung and 50 tins of ash were applied per acre for the previous crop. (ii) (a) Laterite and gravelly soil. (b) N.A. (iii) 14.6.1958. (iv) (a) Grass weeds were first removed using *mummatty*, two rounds of ploughing and weeding. (b) Planted on mounds. (c) —. (d) N.A. (e) Single cutting of about 10" length. (v) Nil. (vi) No. 97 (local, medium). (vii) Rainfed. (viii) Weeding and 1st interculture one month after planting. Another weeding during the 2nd month. Weeding and earthing up during 3rd month. (ix) N.A. (x) 2.3.1959.

2. TREATMENTS :

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

(1) 3 levels of N as A/S : N₁=50, N₂=100 and N₃=150 lb./ac.

(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=60 and P₂=120 lb./ac.

(3) 3 levels of K₂O as Mur. of Potash : K₁=80, K₂=120 and K₃=160 lb./ac.

(4) 3 spacings : S₁=2', S₂=3' and S₃=4'.

P₂O₅ was applied immediately after planting. N was applied one month and K was applied 3 months after planting.

3. DESIGN :

(i) 3⁴ Confd. Fact. NP²K², NPS³, NKS and PK²S confounded. (ii) (a) 9 plots/block and 9 blocks/replication. (b) (iii) 1. (iv) (a) 16'×28', 18'×30' and 20'×32' for 2', 3' and 4' spacings respectively. (b) 12'×24'. (v) Outer rows of each net plot discarded. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tuber yield. (iv) (a) 1958—contd. (b) and (c) Nil. (v) (a) Trivandrum. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 12908 lb./ac. (ii) 2554 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of tuber in lb./ac.

	N ₁	N ₂	N ₃	S ₁	S ₂	S ₃	K ₁	K ₂	K ₃	Mean
P ₀	11747	13024	13637	13536	13091	11780	13167	12503	12738	12802
P ₁	12234	13944	13041	12394	13339	13486	11658	12982	13578	13073
P ₂	11755	15561	11234	13570	14108	10873	11654	12931	13965	12850
Mean	11912	14176	12637	13167	13513	12046	12493	12805	13427	12908
K ₁	11562	14431	11486	12108	13146	12226				
K ₂	12041	14259	12116	13704	13662	11049				
K ₃	12133	13839	14309	13688	13730	12864				
S ₁	12410	13721	13368							
S ₂	11528	15692	13318							
S ₃	11797	13116	11226							

S.E. of any marginal mean =491.5 lb./ac.

S.E. of body of table =851.3 lb./ac.

Crop :- Tapioca.

Ref :- K. 59(45).

Site :- Tapioca and Sweet Potato Res. Stn., Mannuthy. Type :- 'CM'.

Object :—To determine the best dose of N, P, K and to find the best spacing to give the highest yield in the cultivation of Tapioca.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Tapioca. (c) N.A. (ii) (a) Laterite and gravelly soil. (b) N.A. (iii) 13.4.1959. (iv) (a) The plot was tilled to a depth of 9" and weeds were removed along with the application of cow dung. (b) Mounds were taken after the application of definite quantity of ash and planting done on mounds. (c) —. (d) N.A. (e) Single cutting of length 9". (v) 5 C.L./ac. of cowdung and 50 tins of ash per acre applied before planting. Specific dose of fertilizers were applied. (vi) H. 105. (vii) Unirrigated. (viii) 1st weeding one month after planting, 2nd weeding and intercultivation during the 2nd month after planting. (ix) N.A. (x) 26.2.1960.

2. TREATMENTS:

Same as in expt. no. 44 on page 172.

3. DESIGN :

(i) 3⁴ Fact. Confounded. (ii) (a) 9 plots/block and 9 blocks/replication. (b) 54'×90'. (iii) 1. (iv) (a) 18'×30'. (b) 12'×24'. (v) Border rows discarded. (vi) Yes.

4. GENERAL :

(i) Good (ii) Nil. (iii) Yield of tuber. (iv) (a) 1958—contd. (b) Yes. (c) Nil. (v) (a) Trivandrum and Tiruvalla. (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 13964 lb./ac. (ii) 2284 lb./ac. (iii) Only the interaction K×P is significant. (iv) Av. yield of tuber in lb./ac.

	N ₁	N ₂	N ₃	S ₁	S ₂	S ₃	K ₁	K ₂	K ₃	Mean
P ₀	12386	14444	14033	14251	13629	12982	11277	13444	16142	13621
P ₁	13411	13814	14234	13125	15545	12789	14755	13713	12991	13820
P ₂	14369	13932	15058	14638	14604	14117	15108	14722	13528	14453
Mean	13388	14063	14442	14005	14593	13296	13713	13960	14220	13964
K ₁	13276	13915	13949	13881	14554	12705				
K ₂	13058	14302	14520	14823	14016	13041				
K ₃	13831	13974	14856	13310	15209	14142				
S ₁	14066	13831	14117							
S ₂	14033	14772	14974							
S ₃	12056	13587	14234							

S.E. of any marginal mean = 439.6 lb./ac.

S.E. of body of table = 761.0 lb./ac.

Crop :- Tapioca.

Ref :- K. 59(46).

Site :- Tapioca Res. Stn., Tiruvalla.

Type :- 'CM'.

Object :- To determine the best dose of N, P, K and to find the best spacing to give the highest yield in the cultivation of Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) 2000 lb. of cow dung/acre as basal dressing and fertilizers to give 50 lb. N, 40 lb. P₂O₅ and 80 lb. K./acre. (ii) (a) Laterite. (b) Refer soil analysis, Tiruvalla. (iii) 16.4.1959. (iv) (a) Ploughing twice, applying basal dressing and making mounds over it. (b) N.A. (c) —. (d) As per treatments. (e) One cutting of 7' length/hole. (v) 3240 lb. of dried and powdered cow dung applied at 40 lb./plot in shallow pits at specified spacing and mounds made over it. (vi) No. 37 Nedumangadan (local, late). (vii) Unirrigated. (viii) 3 intercultivations and 2 weeding. (ix) 80°. (x) 22.2.1960.

2. TREATMENTS :

Same as in expt. no. 44 on page 172.
Fertilizers applied on 22, 23.7.1959.

3. DESIGN :

(i) 3⁴ confounded. (ii) (a) 9 plots/block and 9 blocks/replication. (b) 90' × 54'. (iii) I. (iv) 30' × 18'. (v) 24' × 12'. (vi) One row around each plot. (vii) Yes.

4. GENERAL :

(i) Uniform growth in plots of 2' spacing. (ii) Nil. (iii) Yield of tuber. (iv) (a) No. (b) No. (c) Nil. (v) (a) Trivandrum and Mamuthy. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 15913 lb./ac. (ii) 2330 lb./ac. (iii) Only main effect of S is significant. (iv) Av. yield of tuber in lb./ac.

	N ₁	N ₂	N ₃	S ₁	S ₂	S ₃	K ₁	K ₂	K ₃	Mean
P ₀	15814	17436	14831	15839	16932	15310	15663	15948	16469	16027
P ₁	16873	14646	15419	14755	17167	15016	15318	15554	16066	15646
P ₂	17604	15201	15394	15461	16906	15831	15612	16570	16016	16066
Mean	16764	15761	15215	15352	17002	15385	15531	16024	16184	15913
K ₁	15570	15537	15486	14638	17125	14831				
K ₂	17226	15629	15217	15360	17461	15251				
K ₃	17495	16117	14940	16058	16419	16075				
S ₁	17318	14260	14478							
S ₂	17789	17427	15789							
S ₃	15184	15595	15377							

S.E. of any marginal mean = 448.3 lb./ac.

S.E. of body of table = 776.6 lb./ac.

Crop :- Tapioca.

Ref :- K. 58(47).

Site :- Tapioca Res. Stn., Trivandrum.

Type :- 'CM'.

Object :—To determine the best dose of N, P, K and to find the best spacing to give the highest yield in the cultivation of Tapioca.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Tapioca. (c) Cowdung at the rate of 5 ton/ac. applied before the 1st tilling as basal dressing
(ii) (a) Laterite soil. (b) Refer soil analysis, Trivandrum. (iii) 9.6.1958. (iv) (a) Soil tilled to a depth of 18" and shallow pits were taken at desired spacing. (b) Erect planting in lines. (c) —. (d) As under treatments. (e) Single cutting of 10" length. (v) Cow dung at the rate of 5 ton/ac. applied at the time of tilling. (vi) M-4 (improved late). (vii) Unirrigated. (viii) Weeding and intercultivation before the application of manures. (ix) 67.5". (x) 13.3.1959.

2. TREATMENTS :

Same as in expt. no. 44 on page 172.

3. DESIGN :

- (i) 3⁴ Confd. fact. (ii) (a) 9 plots/block and 9 blocks/replication. (b) 32'×162' (approximately). (iii) 1.
(iv) (a) 16'×28' (S₁), 18'×30' (S₂), and 20'×32' (S₃). (b) 12'×24'. (v) One row around the net plot.
(vi) Yes.

4. GENERAL :

- (i) Good. (ii) Nil. (iii) Tuber yield. (iv) (a) 1958—contd. (b) No; site was changed in 1959. (c) Nil.
(v) (a) Mannuthy and Tiruvalla. (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 15302 lb./ac. (ii) 1472 lb./ac. (iii) Main effect of S and interaction NPS are highly significant. Main effects of N and P are significant. Other effects are not significant. (iv) Av. yield of tuber in lb./ac.

	N ₁	N ₂	N ₃	S ₁	S ₂	S ₃	K ₁	K ₂	K ₃	Mean
P ₀	14007	14764	15704	14520	15250	14704	15083	14832	14562	14825
P ₁	15267	15990	16210	14806	17351	15310	15680	16536	15250	15822
P ₂	14773	15671	15335	14227	16158	15394	15402	14872	15503	15260
Mean	14682	15474	15750	14517	16253	15136	15388	15413	15105	15302
K ₁	14503	16309	15352	14570	15924	15671				
K ₂	15116	15276	15848	14813	16351	15075				
K ₃	14428	14839	16049	14168	16486	14662				
S ₁	14310	14243	14999							
S ₂	15260	16696	16805							
S ₃	14478	15486	15444							

S.E. of any marginal mean

=283.3 lb./ac.

S.E. of body of table

=490.7 lb./ac.

Crop :- Tapioca.**Ref :- K. 59(48).****Site :- Tapioca Res. Stn., Trivandrum.****Type :- 'CM'.**

Object :- To determine the best dose of N, P, K and to find the best spacing to give the highest yield in the cultivation of Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (b) Cowdung at the rate of 5 ton/ac. applied before the 1st tilling as basal dressing. (ii) (a) Laterite soil. (b) Refer soil analysis, Trivandrum. (iii) 18.4.1959. (iv) (a) Soil tilled to a depth of 18" and shallow pits were taken at the desired spacings. (b) N.A. (c) —. (d) As per treatments. (e) N.A. (v) Cow dung at the rate of 5 ton/ac. applied at the time of tilling. (vi) M-4 (late). (vii) Partially irrigated—hand watering twice a week till sprouting. (viii) Thorough weeding and intercultivation. (x) 67.5". (x) 4.3.1960.

2. TREATMENTS:

Same as in expt. no. 44 on page 172.

A/S applied on 8.7.1959 Mur. of Potash and Super applied on 9.7.1959.

3. DESIGN :

(i) 3⁴ confounded fact. (ii) (a) 9. (b) 90' × 54'. (iii) 1. (iv) (a) 28' × 16' (S₁), 30' × 18' (S₂) and 32' × 20' (S₃). (b) 24' × 12'. (v) One row around the net plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of tuber. (iv) (a) 1958—1961. (b) Yes. (c) Nil. (v) (a) Mannuthy and Tiruvalla. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 25999 lb./ac. (b) 1249 lb./ac. (iii) Main effects of N and K are significant. Other effects and interactions are not significant. (iv) Av. yield of tuber in lb./ac.

	N ₁	N ₂	N ₃	S ₁	S ₂	S ₃	K ₁	K ₂	K ₃	Mean
P ₀	23091	27485	27208	28317	28721	20746	24435	26512	26847	25928
P ₁	24242	25628	27223	28309	27612	21183	25065	25931	26107	25701
P ₂	25780	26998	26326	29939	28443	20721	25645	26343	27116	26368
Mean	24371	26704	26922	28855	28259	20884	25048	26259	26690	25999
K ₁	22713	26141	26292	27544	27763	19839				
K ₂	25032	26880	26864	29771	28704	20301				
K ₃	25368	27091	27612	29250	28309	22511				
S ₁	26612	29637	30317							
S ₂	26628	29611	28536							
S ₃	19873	20864	21914							

S.E. of any marginal mean =416.5 lb./ac.

S.E. of body of any table =721.4 lb./ac.

Crop :- Tapioca.

Ref :- K. 54(49).

Site :- Tapioca Res. Stn., Trivandrum.

Type :- 'CM'.

Object :- To study the effect of varying doses of potash on the starch content of Tapioca.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) Compost at the rate of 3 ton/ac. as B.D. and ash at 1 ton/ac. for top dressing. (ii) (a) Laterite soil. (b) Refer soil analysis, Trivandrum. (iii) 27.8.1954. (iv) (a) Soil well tilled and levelled. (b) Erect planting of cuttings of length 8" in shallow pits. (c) —. (d) 3' between plants. (e) Single cutting per hole. (v) Compost at 3 ton/ac. applied before tilling and super at 1 cwt./ac. used before planting. (vi) No. 302 (late). (vii) Hand watering twice a week for [the first two months of growth when there is no rain. (viii) Intercultivated after one and a half months of growth. Weeded twice before harvest. (ix) 67.5". (x) Sample tubers were collected from all the plots every month as under treatments.

2. TREATMENTS :

Main-plot treatments :

4 levels of K₂O as Muriate of Potash : K₀=0, K₁=50, K₂=100 and K₃=150 lb./ac.

Sub-plot treatments :

5 stages of sample harvest : H₁=7, H₂=8, H₃=9, H₄=10 and H₅=11 months after planting.

3. DESIGN :

(i) Split-plot (main-plots in latin square). (ii) (a) 4 main-plots/row or column and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12'×12'. (b) 9'×9'. (v) 1½' wide border around the net plot of 9'×9' size. (vi) Yes.

4. GENERAL :

(i) General stand was good. (ii) Nil. (iii) Yield of tuber for study of starch content. (iv) (a) 1954—1955. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) Each plot contains 9 plants. One plant at random will be selected from each plot during the 7th, 8th, 9th, 10th and 11th months (from the date of planting) and the % starch content of each sample estimated chemically.

5. RESULTS :

(i) 76.13%. (ii) (a) 1.53%. (b) 1.70%. (iii) Main effects of P, H and interaction P×H are highly significant. (iv) % starch content of tuber.

	K ₀	K ₁	K ₂	K ₃	Mean
H ₁	77.50	77.63	80.26	82.12	79.38
H	78.19	79.00	80.64	82.99	80.22
H ₃	73.25	70.73	75.28	71.33	72.65
H ₄	71.12	71.58	71.86	76.36	72.73
H ₅	72.86	74.38	76.69	78.90	75.71
Mean	74.58	74.66	76.95	78.34	76.13

S.E. of difference of two

1. P marginal means = 0.48 %.
2. H marginal means = 0.60 %.
3. H means at the same level of P = 1.21 %.
4. P means at the same level of H = 1.18 %.

Crop :- Tapioca.

Ref :- K. 57(50).

Site :- Tapioca Res. Stn., Trivandrum.

Type :- 'CM'.

Object :- To study the combined effect of N and K on the starch content of Tapioca tubers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) Compost at 3 ton/ac. as B.D. (ii) (a) Laterite soil. (b) Refer soil analysis, Trivandrum. (iii) 16.9.1957. (iv) (a) The soil was tilled well. (b) Cuttings planted. (c) N.A. (d) 2½'. (e) N.A. (v) Cow dung at 3 ton/ac. prior to planting. (vi) No. 97 (Kalikalan, local). (vii) Irrigated. (viii) Intercultivated after 1½ months of growth, weeded twice during the course of the experiment 1½ months and 3 months after planting. (ix) N.A. (x) As per treatments.

2. TREATMENTS :

Main-plot treatments :

4 levels of K : K₀=0, K₁=50, K₂=100 and K₃=150 lb./ac.

Sub-plot treatments :

3 levels of N : N₀=0, N₁=50 and N₂=100 lb./ac.

Sub-sub-plot treatments :

4 stages of harvest : H₁=6, H₂=7, H₃=10 and H₄=12 months after planting.

N applied as A/S and K as muriate of potash one month after planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 3 sub-plots/main-plot and 4 sub-sub-plots/sub-plot. (b) 15'×90'. (iii) 4. (iv) (a) 15'×22½' (main-plot). 15'×7½' (sub-plot). (b) 10'×2½' (sub-sub-plot). (v) One row around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tuber yield for estimating starch content. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 79.90%. (ii) (a) 3.74%. (b) 2.34%. (c) 2.47%. (iii) Main effects of N and H and interaction N×H are highly significant. Interaction K×H is significant. Others are not significant. (iv) % starch content in tuber.

	K ₀	K ₁	K ₂	K ₃	Mean	N ₀	N ₁	N ₂
H ₁	79.82	78.29	80.40	78.48	79.25	80.46	79.31	77.97
H ₂	77.53	78.28	79.07	81.31	79.05	80.73	80.37	76.03
H ₃	80.37	81.30	82.92	83.30	81.97	82.32	81.49	82.10
H ₄	77.74	78.43	80.64	80.47	79.32	78.88	79.74	79.35
Mean	78.87	79.08	80.76	80.89	79.90	80.60	80.23	78.86
N ₀	80.50	79.64	80.72	81.54				
N ₁	79.14	79.61	81.15	81.02				
N ₂	76.96	77.98	80.40	80.11				

S.E. of difference of two

- | | | | |
|-----------------------------------|---------|-----------------------------------|---------|
| 1. K marginal means | =0.76 % | 6. H means at the same level of N | =0.87 % |
| 2. N marginal means | =0.41 % | 7. N means at the same level of H | =0.86 % |
| 3. H marginal means | =0.50 % | 8. H means at the same level of K | =1.01 % |
| 4. N means at the same level of K | =0.83 % | 9. K means at the same level of H | =1.16 % |
| 5. K means at the same level of N | =1.02 % | | |

Crop :- Tapioca.

Ref :- K. 58(51).

Site :- Tapioca Res. Stn., Trivandrum.

Type :- 'CM'.

Object :- To study the combined effect of N and K on the starch content of Tapioca tubers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tapioca. (c) As per treatments. (ii) (a) Laterite. (b) Refer soil analysis, Trivandrum. (iii) 13.10.1958. (iv) (a) Soil tilled well before planting. (b) Cuttings of length 10" planted erect. (c) —. (d) 2½'. (e) Single cutting per hole. (v) Cow dung at 3 ton/acre before planting. (vi) Malayan No. 4 imported. (vii) Irrigated. (viii) Intercultivated 1½ months after planting along with a weeding. Another weeding 3 months after planting. (ix) N.A. (x) 14.4.1959, 18.8.1959. and 16.10.1959.

2. TREATMENTS :

Main-plot and sub-plot treatments :

Same as in expt. no. 50 on page 178.

Sub-sub-plot treatments :

3 stages of harvest : H₁=6, H₂=10 and H₃=12 months after planting.

N as A/S, K as Mur. of Potash applied one month after planting.

3. DESIGN :

(i) Split-plot (main-plot treatments in latin sq.). (ii) (a) 4 main-plots/block, 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) 15'×90'. (iii) 4. (iv) (a) N.A. (b) 10'×7½' (main-plot) ; 10'×2½' (sub-plot). one plant/sub-sub-plot. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of tuber for estimating starch content. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Being a chemical experiment, the starch content is the important character investigated. Yield data is N.A.

5. RESULTS :

(i) 83.59 %. (ii) (a) 1.95 %. (b) 1.27 %. (c) 1.23 %. (iii) Main effects of N and H are highly significant. Other effects and interactions are not significant. (iv) % starch content of tubers.

	K ₀	K ₁	K ₂	K ₃	Mean	N ₀	N ₁	N ₂
H ₁	82.37	82.56	82.25	83.72	82.73	83.33	82.32	82.54
H ₂	81.83	82.81	82.23	83.73	82.65	83.23	82.35	82.37
H ₃	84.65	85.27	85.69	85.96	85.39	85.98	85.48	84.72
Mean	82.95	83.55	83.39	84.47	83.59	84.18	83.38	83.21
N ₀	83.77	84.33	83.56	85.05				
N ₁	82.51	83.55	83.22	84.26				
N ₂	82.57	82.77	83.39	84.11				

S.E. of difference of two

- | | | | |
|-----------------------------------|----------|-----------------------------------|----------|
| 1. K marginal means | =0.46 %. | 6. H means at the same level of N | =0.44 %. |
| 2. N marginal means | =0.26 %. | 7. N means at the same level of H | =0.44 %. |
| 3. H marginal means | =0.25 %. | 8. H means at the same level of K | =0.50 %. |
| 4. N means at the same level of K | =0.52 %. | 9. K means at the same level of H | =0.62 %. |
| 5. K means at the same level of N | =0.62 %. | | |

Crop :- Horse-gram.

Centre :- Palghat (c.f.).

Ref :- K. 59(1).

Type :- 'M'.

Object :—To study the effect of P on the yield of Horse-gram.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

3 levels of P₂O₅ as Super : P₀=0, P₁=30 and P₂=60 lb./ac.

3. DESIGN :

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant has been posted in each zone. The field assistant conducts the trials in one revenue circle or Thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on a *kharif* cereal, 8 on a *rabi* cereal, 8 on cash crop, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are being studied on type C trials in two out of the four zones in each district every year. The above experiments will be laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) 1/20 ac. (b) 1/80 ac. (iv) Yes.

4. GENERAL :

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

5. RESULTS :

Treatment	P ₀	P ₁	P ₂
Av. yield	485	773	946

G.M. = 735 lb./ac ; S.E./mean = 29.67 lb./ac. ; No. of trials = 3.

Crop :- Horse-gram.
Centre :- Quilon (c.f.).

Ref :- K. 59(2).
Type :- 'M'.

Object :—To study the effect of P on the yield of Horse-gram.

1. BASAL CONDITIONS to : 4. GENERAL :

Same as in expt. no. 1 on page 180.

5. RESULTS :

Treatment	0	P ₁	P ₂
Av. yield	922	1325	1440

G.M. = 1229 lb./ac. ; S.E./mean = N.A. ; No. of trials = 2.

Crop :- Horse-gram.
Centre :- Quilon (c.f.).

Ref :- K. 59(3).
Type :- 'M'.

Object :—To study the effect of P on the yield of Horse-gram.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

0 = Control

p₁ = 30 lb./ac. of P₂O₅ as Super.

p₂ = 60 lb./ac. of P₂O₅ as Super.

p₁' = 30 lb./ac. of P₂O₅ as Dicalcium phosphate.

p₂' = 60 lb./ac. of P₂O₅ as Dicalcium phosphate.

3. DESIGN :

Same as in expt. no. 1 on page 180.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) N.A. (v) (a) Quilon and Trivandrum. (b) N.A. (vi) and (vii) Expt. was conducted on cultivator's field.

5. RESULTS :

Treatment	0	P ₁	P ₂	P ₁ '	P ₂ '
Av. yield	453	634	773	584	716

G.M. = 632 lb./ac. ; S.E./mean = 6.40 lb./ac. ; No. of trials = 9.

Crop :- Horse-gram.
Centre :- Trivandrum (c.f.).

Ref :- K. 59(4).
Type :- 'M'.

Object :—To study the effect of P on the yield of Horse-gram.

1. BASAL CONDITIONS to 4 GENERAL :

Same as in expt. no. 3 above.

5. RESULTS :

Treatment	0	P ₁	P ₂	P ₁ '	P ₂ '
Av. yield	370	494	592	518	634

G.M. = 522 lb./ac. ; S.E./mean = 28.51 lb./ac. ; No. of trials = 12.

Crop :- Black gram.
Centre :- Palghat (c.f.).

Ref :- K. 59(1).
Type :- 'M'.

Object :- To study the effect of P on the yield of Black gram.

1. BASAL CONDITIONS to 3. DESIGN :

Same as in expt. no. 1 on page 180. on Horse-gram.

4. GENERAL:

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

5. RESULTS :

Treatment	0	P ₁	P ₂
Av. yield	494	823	1119

G.M.=812 lb./ac. ; S.E./mean=30.84 lb./ac. ; No. of trials=3.

Crop :- Sugarcane.
Site :- Pampa River Factory Res. Stn., Tiruvalla.

Ref :- K. 57(1).
Type :- 'M'.

Object :- To study the effect of N, P and K fertilizers on the yield and quality of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) 50 lb./ac. of N+40 lb./ac. of P₂O₅+100 lb./ac. of K₂O as Farry's alluvial mixture. (ii) (a) Alluvial. (b) Refer soil analysis, Tiruvalla. (iii) 10.12.1956 to 5.1.1957. (iv) (a) Digging and removing stubbles. (b) Planting cane setts end to end in furrows. (c) 12000 setts/ac. (d) 3' in rows. (e) —. (v) Nil. (vi) CO. 449 (improved). (vii) Irrigated. (viii) Earthing up and propping. (ix) N.A. (x) 13.12.1957.

2. TREATMENTS:

Main-plot treatments

All combinations of (1) and (2)

- (1) 3 levels of P₂O₅ as Rock Phos. : P₀=0, P₁=50 and P₂=100 lb./ac.
(2) 2 levels of N as A/S : N₁=100 and N₂=150 lb./ac.

Sub-plot treatments :

3 levels of K₂O as Pot. Sul. : K₀=0, K₁=100 and K₂=200 lb./ac.

Half of the manure applied from 28.2.1957 to 4.3.1957 and the other half from 30.3.1957 to 4.4.1957.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 51'×43'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cane yield, brix, pol and purity. (iv) (a) No. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 32.34 ton/ac. (ii) (a) 3.91 ton/ac. (b) 2.97 ton/ac. (iii) Only K effect is significant. (iv) Av. yield of sugarcane in ton/ac.

	N ₁	N ₂	Mean	K ₀	K ₁	K ₂
P ₀	30.40	31.89	31.14	29.19	31.87	32.38
P ₁	30.97	33.59	32.29	30.75	34.50	31.60
P ₂	33.46	33.73	33.60	32.83	33.38	34.58
Mean	31.61	33.07	32.34	30.92	33.25	32.85
K ₀	30.60	31.25				
K ₁	31.75	34.75				
K ₂	32.49	33.22				

S.E. of difference of two

1. P marginal means = 1.13 ton/ac.
 2. N marginal means = 0.92 ton/ac.
 3. K marginal means = 0.86 ton/ac.
 4. K means at the same level of N = 1.21 ton/ac.
 5. K means at the same level of P = 1.49 ton/ac.
 6. N means at the same level of K = 1.35 ton/ac.
 7. P means at the same level of K = 1.65 ton/ac.
- S.E. of body of N×P table = 1.13 ton/ac.

Crop :- Sugarcane.

Ref :- K. 58(2).

Site :- Pampa River Factory Res., Stn., Tiruvalla.

Type :- 'M'.

Object :- To determine the optimum dose of P and K manures for Sugarcane.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Sugarcane. (c) 3 cwt./ac. of G.N.C. + 1½ cwt./ac. of A/S by broadcasting. (ii) (a) Loam. (b) Refer soil analysis, Tiruvalla. (iii) 5.1.1958. (iv) (a) Digging and removing stubbles. (b) Planting cane cuttings end to end in furrows. (c) 13000 setts/ac. (d) and (e) N.A. (v) Replication I and III treated with 1 ton lime/ac. and 100 lb./ac. of N as A/S applied to all plots. (vi) CO. 449 (improved). (vii) Unirrigated. (viii) One hoeing and 2 weedings. (ix) 111.7". (x) 10.1.1959.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 3 levels of P₂O₅ : P₀=0, P₁=50 and P₂=100 lb./ac.
 (2) 3 levels of K₂O : K₀=0, K₁=50 and K₂=100 lb./ac.

P and K applied in two equal doses on 5.3.1958 and 28.4.1958. 25 lb./ac. of N applied as B.D. while the rest is applied along with P and K as Parry's mixture.

3. DESIGN :

- (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 51'×43'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Nil. (iii) Cane yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 24.01 ton/ac. (ii) 2.12 ton/ac. (iii) K effect is highly significant. (iv) Av. yield of sugarcane in ton/ac.

	P ₀	P ₁	P ₂	Mean
K ₀	21.53	20.14	19.74	20.47
K ₁	26.58	24.48	25.84	25.63
K ₂	26.07	26.53	25.15	25.92
Mean	24.73	23.72	23.58	24.01

S.E. of P marginal mean	=0.61 ton/ac.
S.E. of K marginal mean	=0.61 ton/ac.
S.E. of body of table	=1.06 ton/ac.

Crop :- Sugarcane.

Ref :- K. 56(3).

Site :- Pampa River Factory Res. Stn., Tiruvalla.

Type :- 'M'.

Object :- To find out the effect of application of lime on the yield of Sugarcane.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Sugarcane. (c) 50 lb./ac. of N+40 lb./ac. of P_2O_5 +100 lb./ac. of K_2O as Parry's mixture. (ii) (a) Alluvial. (b) Refer soil analysis, Tiruvalla. (iii) 3.2.1956. (iv) (a) Digging and up-rooting stubbles. (b) Planting cane setts end to end in furrows. (c) About 13000 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO. 349 (medium, improved). (vii) Irrigated. (viii) One slight hoeing, 2 weedings and one earthing. (ix) 103.74°. (x) 8.2.1957.

2. TREATMENTS :

(1) 4 cwt./ac. of Alluvial mixture+1 cwt./ac. of A/S one month after planting.
 (2) 4 cwt./ac. of Alluvial mixture+1 ton/ac. of lime top dressed on 28.2.1956.
 (3) 50 lb./ac. of N as A/S one month after planting+1 ton/ac. of lime top dressed on 28.2.1956.
 (4) 4 cwt./ac. of Alluvial mixture.
 25 lb./ac. of N as A/S/N applied one month after planting and the balance applied by placement in two equal doses 2 and 3½ months after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) and (b) Varied from replication to replication. Dimensions—N.A. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory ; propping done to prevent lodging. (ii) Nil. (iii) Cane yield. (iv) (a) to (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 26.51 ton/ac. (ii) 5.45 ton/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in ton/ac.

Treatment	1	2	3	4
Av. yield	21.02	24.40	32.88	27.73
S.E./mean	=3.85 ton/ac.			

Crop :- Sugarcane.

Ref :- K. 56(4).

Site :- Pampa River Factory Res. Stn., Tiruvalla.

Type :- 'M'.

Object :- To find the best time of application of manure to Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) 50 lb./ac. of N+40 lb./ac. of P_2O_5 +100 lb./ac. of K_2O as Parry's mixture. (ii) (a) Alluvial. (b) Refer soil analysis, Tiruvalla. (iii) 13.12.1956. (iv) (a) Digging and removing stubbles. (b) Planting cane setts end to end in furrows. (c) 12000 setts/ac. (d) 3' row to row. (e) N.A. (v) As per treatments. (vi) CO. 349 (improved). (vii) Irrigated. (viii) Earthing up 3 months after planting, propping. in May—June to prevent lodging. (ix) 120°. (x) 13.12.1957.

2. TREATMENTS :

T_1 =1st dose at planting, 2nd 6 weeks after planting and 3rd 12 weeks after planting.

T_2 =1st dose 4 weeks, 2nd 10 weeks and 3rd 16 weeks after planting.

T_3 =1st dose 4 weeks, 2nd 10 weeks after planting and 3rd in May.

1st dose=A/S at 1 cwt./ac., 2nd dose=2 cwt./ac. of Parry's alluvial mixture (i.e., 50 lb. of N+40 lb. of P_2O_5 and 100 lb. of K_2O .) and 3rd dose=2½ cwt./ac. of Parry's alluvial mixture.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) and (b) 51'×43'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cane yield. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 28.40 ton/ac. (ii) 3.64 ton/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in ton/ac.

Treatment	T ₁	T ₂	T ₃
Av. yield	26.57	28.75	29.92

S.E./mean = 1.82 ton/ac.

Crop :- Sugarcane.

Ref :- K. 57(5).

Site :- Pampa River Factory Res. Stn., Tiruvalla.

Type :- 'M'.

Object :- To find the best time of application of manure.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) 50 lb. of N+40 lb. of P+100 lb. of K as Parry's mixture. (ii) (a) Alluvial. (b) Refer soil analysis, Tiruvalla. (iii) 6.2.1957. (iv) (a) Digging and removing stubbles. (b) Planting cane setts end to end in furrows. (c) 12000 setts/ac. (d) 3' between rows. (e) —. (v) As per treatments. (vi) CO. 349 (improved). (vii) Irrigated. (viii) Earthing up 3 months after planting, propping May—June to prevent lodging. (ix) N.A. (x) 2.2.1958 to 4.2.1958

2. TREATMENTS :

Same as in expt. no. 4 on page 184.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) and (b) 51'×43'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cane yield. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 18.64 ton/ac. (ii) 4.01 ton/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in ton/ac.

Treatment	T ₁	T ₂	T ₃
Av. yield	22.20	17.35	16.36

S.E./mean = 2.00 ton/ac.

Crop :- Sugarcane.

Ref :- K. 54(6).

Site :- Pampa River Factory Res. Stn., Tiruvalla.

Type :- 'M'.

Object :- To verify whether filter press mud, a by-product of sugar industry, can be used as manure to Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) N.A. (ii) (a) N.A. (b) Refer soil analysis, Tiruvalla. (iii) End of Jan., 1954. (iv) (a) Digging the soil and up-rooting stubbles. (b) Planting cane setts end to end in furrows. (c) About 7500 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO. 349 (improved, medium). (vii) Irrigated. (viii) Light hoeing, 2 weedings and one earthing up. (ix) 108.41". (x) 28 to 30.12.1954.

2. TREATMENTS :

5 manurial treatments : M_0 =Control, M_1 =20 ton/ac. of filter press mud, M_2 =2 ton/ac. of lime, M_3 =4 ton/ac. of lime and M_4 =100 lb./ac. of P_2O_5 as Super. Manures applied as B.D. at planting. Setts dipped in 1% Agrosan solution before planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 1/50 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory ; propping done to prevent lodging. (ii) Nil. (iii) Cane yield. (iv) (a) No. (b) No. (c) Nil (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 53.64 ton/ac. (ii) 5.42 ton/ac. (iii) Treatment differences are significant. (iv) Av. yield of sugarcane in ton/ac.

Treatment	M_0	M_1	M_2	M_3	M_4
Av. yield	45.04	58.48	55.24	55.13	54.33
	S.E./mean		=2.71 ton/ac.		

Crop :- Sugarcane.

Ref :- K. 55(7).

Site :- Pampa River Factory Res. Stn., Tiruvalla.

Type :- 'M'.

Object :- To determine the effect of molasses and sodium molybdate against burying trash on the yield and juice quality of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) 75 lb./ac. of N+100 lb./ac. of K_2O (ii) (a) Alluvial. (b) Refer soil analysis, Tiruvalla. (iii) 27.12.1955. (iv) (a) Digging the soil and up-rooting stubbles. (b) Planting cane setts end to end in furrows. (c) about 13000 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO. 449 (medium, improved). (vii) Irrigated. (viii) Light hoeing, 2 weedings and earthing up. (ix) 120°. (x) 27.12.1956.

2. TREATMENTS :

5 manurial treatments : M_1 =Periodical burying of trash bi-monthly starting from 15th May, M_2 =Digging up of soil between rows without disturbing earthed portion immediately after each flood, M_3 =Applying 10 ton/ac. of molasses between rows after 1st flood with deep stirring of soil immediately, M_4 =Applying 10 ton/ac. of molasses after flowering and about 1½ month before planting and M_5 =Applying 2 oz./ac. of sodium molybdate with 1st manuring and stirring of soil.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 2. (iv) (a) and (b) 35'×54'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Population count, [flowering details and cane yield. (iv) (a) Nil. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 37.88 ton/ac. (ii) 3.68 ton/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in ton/ac.

Treatment	M_1	M_2	M_3	M_4	M_5
Av. yield	36.52	35.23	41.78	35.35	40.55
	S.E./mean		=2.60 ton/ac.		

Crop :- Sugarcane.
Centre :- Tiruvalla (c.f.).

Ref :- K. 54(8).
Type :- 'M'.

Object :—To determine the optimum dose of N and the best ratio of A/S and G.N.C.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Sugarcane. (c) Parry's mixture (50 N+40 P+160 K) applied in two doses by placement 1 month and 2 months after planting. (ii) Alluvial. (iii) Nil. (iv) CO. 349 (medium). (v) (a) Digging, removing stubbles. (b) Planting cane setts end to end along furrows. (c) About 13000 setts/ac. (d) N.A. (e) —. (vi) 5 to 8.2.1954. (vii) Irrigated. (viii) Earthing up 3 months after planting. (ix) 108.41". (x) 17 to 21.12.1954.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 2 levels of N : $N_1=100$ and $N_2=150$ lb./ac.

(2) 3 ratios of A/S to G.N.C : $R_1=1:1$, $R_2=1:2$ and $R_3=2:1$.

N applied one month after planting.

3. DESIGN:

(i) R.B.D. One cultivators field was selected. (ii) 6 plots/block with 4 replications. (iii) (a) N.A. (b) 1.9 cents (iv) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Cane yield. (iv) (a) Nil. (b) and (c) No. (v) (a) and (b) No. (vi) Nil. (vii) Expt. was conducted on cultivator's field.

5. RESULTS:

(i) 35.17 ton/ac. (ii) 2.98 ton/ac. (iii) Treatment differences are not significant. (iv) Av. yield of cane in ton/ac.

	R_1	R_2	R_3	Mean
N_1	36.35	31.58	34.70	34.21
N_2	34.87	36.18	37.34	36.14
Mean	35.62	33.88	36.02	35.17

S.E. of N marginal mean = 0.86 ton/ac.

S.E. of R marginal mean = 1.06 ton/ac.

S.E. of body of table = 1.49 ton/ac.

Crop :- Sugarcane.
Centre :- Tiruvalla (c.f.).

Ref :- K. 54(9).
Type :- 'M'.

Object :—To find out the optimum dose of N required for Sugarcane.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Sugarcane. (c) 50 lb./ac. of N+40 lb./ac. of P_2O_5 +100 lb./ac. of K_2O as Parry's alluvial mixture. (ii) (a) Alluvial ; N : 0.183, P_2O_5 : 0.199, K_2O : 0.193, Available K_2O : 12.2 mgm/100 gm, Humus : 1.67, CaO : 0.25 and pH : 6.1. (iii) Nil. (iv) CO. 449 (medium, improved), except in 4 plots of rep. IV where only 8% of this variety was used. (v) (a) Digging the soil ; up-rooting stubbles ; preparation of furrows. (b) Planting cane setts end to end in furrows. (c) About 13000 setts/ac. (d) 3' between furrows. (e) —. (vi) 15 and 29.12.1954. (vii) Irrigated. (viii) Nil. (ix) 120.37". (x) Middle of December, 1955.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 3 levels of N as A/S and G.N.C. in 2 : 1 ratio : $N_1=75$, $N_2=100$ and $N_3=150$ lb./ac.

(2) 2 levels of manures : M_1 =Ash at 5 ton/ac. and $M_2=100$ lb./ac. of P_2O_5 +100 lb./ac. of K_2O . N applied on 9.2.1955 and 23.3.1955, P_2O_5 as Rock Phos. and K_2O as Pot. Sul. on 8.2.1955.

3. DESIGN :

(i) A field by the side of Pampa River factory was selected for the experiment. (ii) R.B.D. with 6 plots/block and 4 replications. (iii) (a) and (b) 75'×45'. (iv) Yes.

4. GENERAL :

(i) Good ; Trash twist propping done to prevent lodging. (ii) Nil. (iii) Population count, flowering details, cane yield and quality of juice by estimating brix, pol and purity. (iv) (a) No. (b) —. (c) —. (v) (a) and (b) Nil. (vi) Nil. (vii) The experiment was conducted on cultivator's field.

5. RESULTS :**Yield of cane**

(i) 37.83 ton/ac. (ii) 2.62 ton/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in ton/ac.

	N ₁	N ₂	N ₃	Mean
M ₁	37.58	36.42	37.26	37.09
M ₂	39.33	37.29	39.11	38.48
Mean	38.45	36.86	38.19	37.83

S.E. of marginal mean of N = 0.92 ton/ac.

S.E. of marginal mean of M = 0.76 ton/ac.

S.E. of body of table = 1.31 ton/ac.

Brix Percentage

(i) 18.24 %. (ii) 0.78 %. (iii) None of the effects is significant. (iv) Percentage of soluble salts in the juice (i.e. brix %).

	N ₁	N ₂	N ₃	Mean
M ₁	18.28	18.42	18.08	18.25
M ₂	18.02	18.42	18.22	18.22
Mean	18.15	18.42	18.15	18.24

S.E. of marginal mean of N = 0.28 %.

S.E. of marginal mean of M = 0.22 %.

S.E. of body of table = 0.40 %.

Crop :- Sugarcane.

Ref :- K. 54(10).

Centre :- Tiruvalla (c.f.).

Type :- 'M'.

Object :- To determine the optimum nitrogen requirement in the presence of single and double dose of P₂O₅, the best form of P₂O₅ and the effect of K₂O on Paddy.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sugarcane. (c) Parry's alluvial mixture (50 N+40 P+100 K) applied in two doses by placement 1 month and 2. months after planting. (ii) Alluvial. (iii) Nil. (iv) CO. 349 (improved, medium). (v) (a) Digging and removing stubbles. (b) Planting cane setts end to end along furrows. (c) About 13000 setts/ac. (d) and (e) N.A. (vi) 19.2.1954. (vii) Irrigated. (viii) Earthing up 3 months after planting. (ix) 108.41". (x) 27.9.1954.

2. TREATMENTS :

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

(1) 6 NP mixtures : M₁=100 lb./ac. of N+50 lb./ac. of P₂O₅, M₂=100 lb./ac. of N+100 lb./ac. of P₂O₅, M₃=150 lb./ac. of N+75 lb./ac. of P₂O₅, M₄=150 lb./ac. of N+150 lb./ac. of P₂O₅, M₅=200 lb./ac. of N+100 lb./ac. of P₂O₅ and M₆=200 lb./ac. of N+200 lb./ac. of P₂O₅.

(2) 3 sources of P₂O₅ : S₁=Super, S₂=Rock Phos. and S₃=B.M.

(3) 2 levels of K₂O as Pot. Sul. : K₀=0 and K₁=100 lb./ac.

N applied in the form of A/S and G.N.C. in 2 : 1 ratio one month after planting. P applied just before planting. K applied as B.D. before planting.

3. DESIGN :

(i) R.B.D. (ii) 36 plots/block with 3 replications. (iii) (a) N.A. (b) 24' x 36'. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cane yield, brix %, pol and purity. (iv) (a) to (c) No. (v) (a) and (b) Nil. (vi) Nil. (vii) Expt. was conducted on cultivator's field.

5. RESULTS :

(i) 38.42 ton/ac. (ii) 5.90 ton/ac. (iii) K effect is highly significant. (iv) Av. yield of sugarcane in ton/ac.

	M ₁	M ₂	M ₃	M ₄	M ₅	M ₆	Mean	K ₀	K ₁
S ₁	34.71	38.80	36.03	39.68	33.00	39.14	36.89	34.10	39.68
S ₂	38.13	37.41	38.65	39.41	39.70	42.97	39.39	35.79	42.99
S ₃	39.03	39.18	35.81	40.76	39.52	39.59	38.98	37.00	40.96
Mean	37.30	38.46	36.82	39.95	37.41	40.56	38.42	35.63	41.21
K ₀	34.39	35.74	33.99	37.52	35.67	36.46			
K ₁	40.20	41.19	39.66	42.38	39.14	44.68			

S.E. of M marginal mean	=1.39 ton/ac.
S.E. of K marginal mean	=0.80 ton/ac.
S.E. of S marginal mean	=0.98 ton/ac.
S.E. of body of M x S table	=1.39 ton/ac.
S.E. of body of M x K table	=1.97 ton/ac.
S.E. of body of K x S table	=2.41 ton/ac.

Crop :- Sugarcane.

Centre :- Tiruvalla (c.f.).

Ref :- K. 55(11).

Type :- 'M'.

Object :- To find out the manurial requirements of Sugarcane in different types of soils in Pampa river factory zone.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sugarcane. (c) 50 lb./ac. of N+40 lb./ac. of P₂O₅+100 lb./ac. of K₂O as Parry's alluvial mixture. (ii) Alluvial ; N : 0.183, P₂O₅ : 0.199, K₂O : 0.193, Available K₂O : 12.2 mgm./100 gm., Humus : 1.67, CaO : 0.25 and pH : 6.1. (iii) Nil. (iv) CO. 349 and CO. 449 (medium, improved). (v) (a) Digging the soil once. (b) Planting cane setts in pits. (c) and (d) N.A. (e) 2 setts/pit. (vi) 1st week of Jan., 1955. (vii) Irrigated. (viii) Two hoeings, weeding and propping up. (ix) 120.37". (x) 1st week of Jan., 1956.

2. TREATMENTS :

(1) 40 lb./ac. of N.

(2) 40 lb./ac. of N+100 lb./ac. of K.

N applied as A/S and G.N.C. in 2 : 1 ratio. in two doses 1½ months and 2½ months after planting, K₂O along with 1st manuring as Pot. Sul. Manures applied at plant base.

3. DESIGN :

(i) and (ii) 32 demonstration fields from different cultivators were selected. No specific method was adopted in the selection. (iii) (a) and (b) 10 cents. Dimensions—N.A. (iv) Randomisation defective.

4. GENERAL :

(i) Early floods in the month of May which had an adverse effect on the growth of the crop. (ii) Nil. (iii) Cane yield, juice quality by estimating brix, pol and purity. (iv) (a), (b) and (c) No. (v) (a) and (b) No. (vi) Nil. (vii) Expt. was conducted on cultivator's field.

5. RESULTS :

(i) 28.66 ton/ac. (ii) 4.05 ton/ac. (iii) Treatment difference is not significant. (iv) Av. yield of sugarcane in ton/ac.

Treatment	1	2
Av. yield	27.70	29.62

S.E./mean = 0.72 lb./ac.

Crop :- Sugarcane.

Ref :- K. 55(12).

Centre :- Tiruvalla (c.f.).

Type :- 'M'.

Object :- To find out the ~~manurial~~ requirements of Sugarcane in the different types of soils in the Pampa river factory zone.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sugarcane. (c) 100 lb./ac. of N, 40 lb./ac. of P_2O_5 and 100 lb./ac. of K_2O as Parry's loam mixture. (ii) Loam ; N : 0.126, P_2O_5 : 0.163, K_2O : 0.163, Available K_2O : 13.3 mgm/100 gm., Humus : 0.38, CaO : 0.42 and pH : 6.4. (iii) F.Y.M. at 2 ton/ac. (iv) CO. 349 and CO. 449 (improved, medium). (v) (a) Digging the soil once. (b) Planting cane setts in pits. (c) and (d) N.A. (e) 2 setts/pit. (vi) 1st week of Jan., 1955. (vii) Irrigated. (viii) Two hoeings, weeding and propping up. (ix) 120.37". (x) 1st week of January, 1956.

2. TREATMENTS :

1. 100 lb./ac. of N.

2. 100 lb./ac. of N+100 lb./ac. of K.

N applied as A/S and G.N.C. in 2 : 1 ratio in two doses, one 1½ months and other 2½ months after planting, K_2O along with 1st manuring as Pot. Sul. The manures are applied at the foot of the plant.

3. DESIGN :

(i) and (ii) 33 demonstration fields were selected. No specific method was adopted in the selection. (iii) (a) and (b) 10 cents. Dimensions—N.A. (iv) Yes.

4. GENERAL :

(i) Early floods in the month of May had an adverse effect on the growth of the crop. (ii) Nil. (iii) Cane yield, juice quality by estimating brix, pol and purity. (iv) (a) Nil. (b) and (c) —. (v) (a) and (b) Nil. (vi) Nil. (vii) Expt. was conducted on cultivator's field.

5. RESULTS :

(i) 26.88 ton/ac. (ii) 4.82 ton/ac. (iii) Treatment difference is highly significant. (iv) Av. yield of sugarcane in ton/ac.

Treatment	1	2
Av. yield	25.18	28.59

S.E./mean = 0.84 ton/ac.

Crop :- Sugarcane.

Ref :- K. 54(13).

Centre :- Tiruvalla (c.f.).

Type :- 'M'.

Object :- To find out the effect of application of lime on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sugarcane. (c) 50 lb./ac. of N+40 lb./ac. of P_2O_5 +100 lb./ac. of K_2O as Parry's alluvial mixture. (ii) Alluvial ; N : 0.183, P_2O_5 : 0.199, K_2O : 0.193, Available K_2O : 12.2 mgm/100 gms, Humus : 1.67, CaO : 0.25 and pH : 6.1. (iii) 100 lb./ac. of K_2O as Pot. Sul. before planting+100 lb./ac. of P_2O_5 as Rock Phos. one month after planting+50 lb./ac. of N as A/S and G.N.C. in 2 : 1 ratio in two equal doses. Manures applied by dibbling. (iv) CO. 349 (medium, improved). (v) (a) Digging the soil ; uprooting stubbles and preparation of furrows. (b) Planting cane setts end to end in furrows. (c) About 13000 setts/ac. (d) 3' between furrows. (e) N.A. (vi) 24.12.1954. (vii) Irrigated. (viii) Nil. (ix) 120.37". (x) 14.12.1955.

2. TREATMENTS :

2 levels of lime : L_0 =Control (no lime) and L_1 =1 ton/ac. of lime applied by dibbling.

3. DESIGN :

(i) One cultivator's field by the side of the Pampa river was selected for the experiment. (ii) R.B.D. with two replications and 2 plots/block. (iii) (a) and (b) 1/20 ac. (iv) Yes.

4. GENERAL :

(i) Good. Not propped well and hence crop lodged. (ii) Nil. (iii) Population count, flowering details, cane yield, disease observation and juice analysis to get brix, pol and purity. (iv) (a) Nil. (b) and (c) —. (v) (a) and (b) —. (vi) Nil. (vii) Expt. was conducted on cultivator's field.

5. RESULTS :

(i) 38.18 ton/ac. (ii) 4.76 ton/ac. (iii) Treatment difference is not significant. (iv) Av. yield of cane in ton/ac.

Treatment	L_0	L_1
Av. yield	37.21	39.15
	S.E./mean	=3.36 ton/ac.

Crop :- Sugarcane.

Ref :- K. 56(14).

Centre :- Tiruvalla (c.f.).

Type :- 'M'.

Object :- To find out the effect of application of lime on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sugarcane. (c) 50 lb./ac. of N+40 lb./ac. of P_2O_5 +100 lb./ac. of K_2O applied as Parry's mixture. (ii) Alluvial soil ; N : 0.183, P : 0.199, K : 0.193, available K_2O : 12.2 mgm./100 gm., Humus : 1.67, CaO : 0.25 and pH : 6.1. (iii) N.A. (iv) CO. 349 (medium, improved). (v) (a) Digging and up-rooting stubbles. (b) Planting cane setts end to end in furrows. (c) About 12000 sets/ac. (d) and (e) N.A. (vi) January, 1956. (vii) Irrigated. (viii) Nil. (ix) 103.74°. (x) January, 1957.

2. TREATMENTS :

Two levels of lime : L_0 =Control (no lime) and L_1 =Lime at 1 ton/ac.
Lime applied one month after planting as top dressing.

3. DESIGN :

(i) and (ii) 13 fields were selected from different cultivators. (iii) (a) and (b) Varied from cultivator to cultivator. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cane yield. (iv) (a) No. (b) and (c) No. (v) (a) and (b) Nil. (vi) Nil. (vii) Expt. was conducted on cultivators' fields.

5. RESULTS :

(i) 31.31 ton/ac. (ii) 5.22 ton/ac. (iii) Treatment difference is not significant. (iv) Av. yield of sugarcane in ton/ac.

Treatment	L_0	L_1
Av. yield	31.90	30.71
	S.E./mean	=1.45 ton/ac.

Crop :- Sugarcane.

Ref :- K. 56(15).

Centre :- Tiruvalla (c.f.).

Type :- 'M'.

Object :- To find out the effect of application of lime on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sugarcane. (c) 100 lb./ac. of N+40 lb./ac. of P_2O_5 +100 lb./ac. of K_2O as Parry's loam mixture. (ii) Loam; N: 0.126, P_2O_5 : 0.163, K_2O : 0.163, available K_2O : 13.3 mgm./100 gm. Humus: 0.38, CaO: 0.42 and pH: 6.4. (iii) N.A. (iv) CO. 349 (medium, improved). (v) (a) Digging and removing stubbles. (b) Planting cane setts end to end along furrows. (c) 13000 setts/ac. (d) and (e) N.A. (vi) January, 1956. (vii) Irrigated. (viii) Earthing up 2 to 3 months after planting. (ix) 103.74%. (x) January, 1957.

2. TREATMENTS :

Two levels of lime : L_0 =Control (no lime) and L_1 =Lime 1 ton/ac.
Lime applied one month after planting as top dressing.

3. DESIGN :

(i) and (ii) 14 fields were selected from different cultivators. (iii) (a) and (b) Varied from cultivator to cultivator. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cane yield. (iv) (a) No. (b) and (c) No. (v) (a) and (b) No. (vi) Nil. (vii) Expt. was conducted on cultivators' fields.

5. RESULTS :

(i) 27.93 ton/ac. (ii) 4.61 ton/ac. (iii) Treatment difference is not significant. (iv) Av. yield of sugarcane in ton/ac.

Treatment	L_0	L_1
Av. yield	26.89	28.97

S.E./mean=1.23 ton/ac.

Crop :- Sugarcane.

Ref :- K. 54(16).

Centre :- Tiruvalla (c.f.).

Type :- 'M'.

Object :- To find out the best period of application of manures.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sugarcane. (c) Parry's alluvial mixture (50 N+40 P+ 100 K). (iii) As per treatments. (iv) CO. 349 (improved, medium). (v) (a) Digging, removing stubbles. (b) Planting cane setts end to end along furrows. (c) 13000 setts/ac. (d) and (e) N.A. (vi) 22.2.1954. (vii) Irrigated. (viii) Earthing up three months after planting. (ix) 108.41%. (x) 14 to 16.12.1954.

2. TREATMENTS :

(1) 1st dose at planting + 2nd a month after planting.
(2) 1st dose 3 weeks after planting + 2nd a month after planting.
(3) 1st dose a month after planting + 2nd 3 months after planting.
1st dose=75 N+80 P+80 K as Parry's mixture, 2nd dose=75 N as a mixture containing A/S and G.N.C. in 1 : 1 ratio.

3. DESIGN :

(i) R.B.D. (ii) 3 plots/block with 4 replications. (iii) (a) N.A. (b) 2 cents. Dimensions—N.A. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cane yield. (iv) (a), (b) and (c) Nil. (v) (a) and (b) No. (vi) Nil. (vii) Expt. was conducted on cultivator's field.

5. RESULTS :

(i) 37.32 ton/ac. (ii) 2.81 ton/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in ton/ac.

Treatment	1	2	3
Av. yield	37.34	37.70	36.96
S.E./mean	=1.41 ton/ac.		

Crop :- Sugarcane.
Centre :- Tiruvalla (c.f.).

Ref :- K. 56(17).
Type :- 'M'.

Object :- To verify whether addition of loam mixture as extra manure has any effect on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sugarcane. (c) 100 N+40 P+100 K as Parry's loam mixture. (ii) Loam. (iii) As per treatments. (iv) CO. 349 (improved, medium). (v) (a) Digging and removing stubbles. (b) Planting cane setts end to end along furrows. (c) About 13000 setts/ac. (d) and (e) N.A. (vi) December, 1955. (vii) Irrigated. (viii) Earthing up about 3 months after planting. (ix) 103.74°. (x) December, 1956.

2. TREATMENTS :

(1) Extra dose of 2 cwt/ac. of Parry's loam mixture over and above the normal dose.
(2) Normal loam mixture : 100 N+40 P+100 K.
50% of N applied one month after planting. Rest applied in split doses two months and 3½ months after planting.

3. DESIGN :

(i) and (ii) 31 cultivators' fields in the Pampa river area were selected. (iii) (a) and (b) Varied from cultivator to cultivator. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cane yield, quality of cane by estimating brix, pol and purity. (iv) (a) No. (b) and (c) No. (v) No. (vi) Nil. (vii) Expt. was conducted on cultivators' fields.

5. RESULTS :

(i) 25.76 ton/ac. (ii) 6.09 ton/ac. (iii) Treatment difference is not significant. (iv) Av. yield of sugarcane in ton/ac.

Treatment	1	2
Av. yield	25.22	26.30
S.E./mean	=1.09 ton/ac.	

Crop :- Sugarcane.
Centre :- Tiruvalla (c.f.).

Ref :- K. 54(18).
Type :- 'M'.

Object :- To find out the manurial value of trace elements for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sugarcane. (c) 100 N+40 P+100 K applied as Parry's loam mixture. (ii) Loam soil ; P_2O_5 : 0.199, K_2O : 0.193. Humus : 1.67, CaO : 0.25 and pH : 6.1. (iii) Nil. (iv) CO. 349 (improved, medium). (v) (a) Digging ; up-rooting stubbles. (b) Planting cane setts end to end in furrows. (c) 13000 setts/ac. (d) and (e) N.A. (vi) 8.1.1954. (vii) Irrigated. (viii) Earthing up 3 months after planting. (ix) 108.41°. (x) 19.11.1954.

2. TREATMENTS :

M_1 = Copper sulphate at 10 lb./ac. M_2 = Copper sulphate at 20 lb./ac., M_3 = Borax at 5 lb./ac. M_4 = Borax at 10 lb./ac., M_5 = Manganese at 10 lb./ac., M_6 = Manganese at 20 lb./ac., M_7 = Zinc sulphate at 10 lb./ac., M_8 = Zinc sulphate at 20 lb./ac., M_9 = Bordeaux mixture at 10 lb./ac., M_{10} = Bordeaux mixture at 20 lb./ac. M_{11} = Perenox treated setts and M_{12} = Control.

3. DESIGN :

(i) R.B.D. One cultivator's field was selected ; method of selection—N.A. (ii) 12 plots/block. with 3 replications. (iii) (a) N.A. (b) 2.6 cents. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cane yield. (iv) (a) Nil. (b) No. (c) Nil. (v) Nil. (vi) Nil. (vii) Expt. was conducted on cultivator's field.

5. RESULTS :

(i) (i) 32.58 ton/ac. (ii) 3.95 ton/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in ton/ac.

Treatment	M ₁	M ₂	M ₃	M ₄	M ₅	M ₆	M ₇	M ₈	M ₉	M ₁₀	M ₁₁	M ₁₂
Av. yield	33.20	32.58	31.03	32.89	32.23	32.46	32.22	34.05	30.40	31.32	31.16	37.41

S.E./mean = 2.28 ton/ac.

Crop :- Sugarcane.
Centre :- Tiruvalla (c.f.).

Ref :- K. 54(19).
Type :- 'M'.

Object :- To investigate whether molasses, a by-product of sugar industry, has any effect in the yield and other characters of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sugarcane. (c) 50 lb./ac. of N+40 lb./ac. of P₂O₅+100 lb./ac. of K₂O as Parry's alluvial mixture. (ii) Alluvial ; N : 0.183, P₂O₅ : 0.199, K₂O : 0.193, Available K₂O : 12.2 mgm/100 gm, Humus : 1.67, CaO : 0.25 and pH : 6.1. (iii) Nil. (iv) CO. 349 (medium, improved). (v) (a) Digging the soil, up-rooting stubbles. (b) Planting cane setts end to end in furrows. (c) About 13000 setts/ac. (d) N.A. (e) —. (vi) December, 1954. (vii) Irrigated. (viii) Nil. (ix) 120.37". (x) December, 1955.

2. TREATMENTS :

T₀=Control (untreated), T₁=5 ton of molasses/ac. applied in the 2nd and third week of October, 1955 along the furrows.

3. DESIGN :

(i) and (ii) 4 cultivators on the side of the Pampa river selected for the experiment. (iii) (a) and (b) One cultivator's plot of 40 cents and others each of 10 cents. Dimensions N.A. (iv) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Population count, flowering details, cane yield and juice analysis to obtain brix, pol and purity. (iv) (a) Nil. (b) and (c) No. (v) No. (vi) Nil. (vii) Yield data N.A. Expt. was Conducted on on cultivator's fields.

5. RESULTS :

I. Brix %

(i) 15.19 %. (ii) 1.22 %. (iii) Treatment difference is not significant. (iv) % soluble salts in the juice.

Treatment	T ₀	T ₁
Av. yield	15.03	15.36

S.E./mean = 0.61 %.

II. Pol %

(i) 12.08 %. (ii) 1.75 %. (iii) Treatment difference is not significant. (iv) % sugar in juice.

Treatment	T ₀	T ₁
Av. yield	11.72	12.45

S.E./mean = 0.88 %.

III. Purity%

(i) 79.45 %. (ii) 5.14 %. (iii) Treatment difference is not significant. (iv) % purity of the juice.

Treatment	T ₀	T ₁
Av. yield	77.93	80.98
S.E./mean	=2.57 %.	

Crop :- Sugarcane.
Centre :- Tiruvalla (c.f.).

Ref :- K. 56(20).
Type :- 'M'.

Object :- To find out whether molasses, a by-product of sugar industry, has any effect on the yield and other characters of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sugarcane. (c) 50 N+40 P+100 K as Parry's alluvial mixture. (ii) Alluvial. (iii) Nil. (iv) CO. 349 (improved, medium). (v) (a) Digging and removing stubbles. (b) Planting cane setts end to end along furrows. (c) About 13000 setts/ac. (d) and (e) N.A. (vi) January 1956. (vii) Irrigated. (viii) Earthing up about 2 months after planting. (ix) 103.74". (x) December 1957.

2. TREATMENTS :

M₀ = Control (untreated).
M₁ = 5 ton/ac. of molasses.
Applied in between rows after light digging up of soil on 31.7.1956.

3. DESIGN :

(i) and (ii) 7 cultivators field were selected in the Pampa river factory area. (iii) (a) and (b) Varied from cultivator to cultivator. (iv) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cane weight, estimating brix, pol and purity. (iv) (a) 1954--1956 (not conducted in 1955). (b) and (c) No. (v) No. (vi) Nil. (vii) E xpt. was conducted on cultivators' fields.

5. RESULTS :

(i) 33.33 ton/ac. (ii) 9.22 ton/ac. (iii) Treatment difference is not significant. (iv) Av. yield of sugarcane in ton/ac.

Treatment	M ₀	M ₁
Av. yield	34.52	32.14
S.E./mean	=3.48 ton/ac.	

Crop :- Sugarcane.
Site :- Pampa River Factory Res. Stn., Tiruvalla.

Ref :- K. 54(21).
Type :- 'MV'.

Object :- To find out the best varieties of Sugarcane and its optimum manurial requirements.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Sugarcane. (c) 50 lb./ac. of N+40 lb./ac. of P₂O₅+100 lb./ac. of K₂O as Parry's alluvial mixture (ii) (a) Alluvial. (b) Refer soil analysis, Tiruvalla. (iii) 2.12.1954 to 4.12.1954 (iv) (a) Digging the soil; up-rooting stubbles and preparation of furrows. (b) Planting cane setts end to end in furrows. (c) 13000 setts/ac. (d) Furrows 3' apart. (e) —. (v) 100 lb./ac. of K₂O as Pot. Sul. (vi) As per treatments. (vii) Irrigated. (viii) 2 hoeings, 2 weedings, 1 earthing and 3 proppings. (ix) 120.37". (x) 29.11.1955 to 4.12.1955.

2. TREATMENTS :

Main-plot treatments :2 levels of N as A/S and G.N.C. in 2 : 1 ratio : $N_1=25$ and $N_2=50$ lb./ac.**Sub-plot treatments :**8 varieties : $V_1=CO. 927$ (early), $V_2=CO. 349$ (medium) $V_3=CO. 449$ (medium), $V_4=CO. 876$ (late), $V_5=CO. 949$ (late), $V_6=CO. 959$ (late), $V_7=CO. 960$ (late) and $V_8=CO. 898$.

Manures applied by dibbling.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block and 8 sub-plots/main-plot. (b) $31' \times 240'$. (iii) 2. (iv) (a) N.A. (b) $31' \times 15'$ for 1st and $36' \times 15'$ for 2nd replications. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Population count, flowering details, cane yield, disease observation, chemical analysis of cane to determine juice quality by estimating brix, pol and purity. (iv) (a) to (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 16.32 ton/ac. (ii) (a) 2.09 ton/ac. (b) 1.31 ton/ac. (iii) Only V effect is highly significant. (iv) Av. yield of sugarcane in ton/ac.

	V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	Mean
N_1	15.36	14.18	18.46	17.36	14.41	15.61	17.76	15.96	16.14
N_2	15.68	16.06	17.76	18.31	13.70	16.61	18.06	15.84	16.50
Mean	15.52	15.12	18.11	17.84	14.05	16.11	17.91	15.90	16.32

S.E. of difference of two

1. N marginal means = 0.74 ton/ac.
2. V marginal means = 0.93 ton/ac.
3. V means at the same level of N = 1.31 ton/ac.
4. N means at the same level of V = 1.43 ton/ac.

Crop :- Sugarcane.

Ref :- K. 55(22).

Site :- Pampa River Factory Res. Stn., Tiruvalla.

Type :- 'MV'.

Object :- To find out the best variety of Sugarcane and its optimum manurial requirements.

1. BASAL CONDITIONS :-

(i) (a) Nil. (b) Sugarcane. (c) 50 lb./ac. of N+40 lb./ac. of P_2O_5 +100 lb./ac. of K_2O as Parry's alluvial mixture. (ii) (a) Alluvial. (b) Refer soil analysis, Tiruvalla. (iii) 7.3.1955. (iv) (a) Digging the soil, up-rooting stubbles and preparation of furrows. (b) Planting cane setts end to end in furrows. (c) 13000 setts/ac. (d) 3' between furrows. (e) N.A. (v) 100 lb./ac. of K_2O as Pot. Sul. and 100 lb./ac. of P_2O_5 as Rock Phos. dibbled on 4.4.1955. (vi) As per treatments. (vii) Irrigated. (viii) 1 light hoeing, 2 weedings, 1 earthing and trash twist propping. (ix) 120.37". (x) 20.1.1956.

2. TREATMENTS :

Main-plot treatments :2 levels of N as A/S and G.N.C. in 2 : 1 ratio : $N_1=25$ and $N_2=50$ lb./ac.**Sub-plot treatments :**5 varieties : $V_1=CO. 349$, $V_2=CO. 449$, $V_3=CO. 785$, $V_4=CO. 810$ (medium) and $V_5=CO. 950$ (late). Manures applied by dibbling on 4.4.1955.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block and 5 sub-plots/main-plot. (b) $50' \times 75'$. (iii) 2. (iv) (a) and (b) $25' \times 15'$. (v) Nil. The blocks are generally not compact. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Population count, flowering times, cane yield, disease observations, chemical analysis of cane to determine juice quality by estimating brix, pol and purity. (iv) (a), (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 25.41 ton/ac. (ii) (a) 5.27 ton/ac. (b) 4.67 ton/ac. (iii) Only V effect is significant. (iv) Av. yield of sugarcane in ton/ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	Mean
N ₁	24.85	23.57	27.72	26.97	31.99	27.02
N ₂	11.58	25.10	29.38	24.88	28.05	23.80
Mean	18.22	24.33	28.54	25.92	30.02	25.41

S.E. of difference of two

1. N marginal means = 2.36 ton/ac.
2. V marginal means = 3.30 ton/ac.
3. V means at the same level of N = 4.67 ton/ac.
4. N means at the same level of V = 4.80 ton/ac.

Crop :- Sugarcane.

Ref :- K. 55(23).

Centre :- Tiruvalla. (c.f.).

Type :- 'MV'.

Object :—To find out the effect of N applied at different times, in two ratios of A/S and G.N.C., on three varieties of Paddy.

1. BASAL CONDITIONS .

(i) (a) Nil. (b) Sugarcane. (c) 50 lb./ac. of N+40 lb./ac. of P₂O₅+100 lb./ac. of K₂O as Parry's alluvial mixture. (ii) Alluvial; N₂: 0.183%, P₂O₅: 0.199%, K₂O: 0.193%, Available K₂O: 12.2 mgm/100 gm., Humus: 1.67%, CaO: 0.25% and H: 6.1. (iii) Nil. (iv) A₂ per treatments. (v) (a) Digging the soil, up-rooting stubbles and preparation of furrows. (b) Planting sugarcane setts end to end in furrows. (c) About 13000 setts/ac. (d) Between furrows 3'. (e) —. (vi) 1st week of January, 1955. (vii) Irrigated. (viii) Nil. (ix) 120.37". (x) 1st week of January, 1956.

2. TREATMENTS :

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

(1) 3 varieties : V₁=CO. 349, V₂=CO. 449 and V₃=CO. 785.

(2) 2 levels of N : N₁=50 and N₂=75 lb./ac.

(3) 2 times of application : T₁= At planting and in March and T₂=6 weeks after planting and in May.

(4) 2 ratios of A/S and G.N.C. : R₁=2:1 and R₂=4:1.

Manures dibbled at 40 lb./ac. of P₂O₅ and 100 lb./ac. of K₂O applied, as Parry's alluvial mixture, to all plots.

3. DESIGN :

(i) and (ii) One cultivator's field by the side of the Pampa river was taken for the experiments. (iii) (a) and (b) R.B.D. with 24 plots/block of size 5 cents and three replications. Dimensions—N.A. (vi) Yes.

4. GENERAL :

(i) Good ; crop lodged. (ii) Nil. (iii) Population count, flowering times, sugarcane yield, disease observations and juice analysis to get brix, pol and purity. (iv) (a) Nil. (b) and (c) No. (v) (a) and (b) No. (vi) Nil. (vii) Expt. was a conducted in cultivator's field.

5. RESULTS :

(i) 35.38 ton/ac. (ii) 5.15 ton/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in ton/ac.

	N ₁	N ₂	Mean	R ₁	R ₂	T ₁	T ₂
V ₁	32.44	34.20	33.32	33.28	33.37	35.71	30.93
V ₂	37.55	36.19	36.87	36.95	36.78	38.04	35.70
V ₃	34.97	36.93	35.95	36.83	35.07	35.86	36.04
Mean	34.99	35.77	35.38	35.69	35.07		
T ₁	35.73	37.34	36.54	37.48	35.60		
T ₂	34.24	34.20	34.22	33.89	34.55		
R ₁	35.39	35.98					
R ₂	34.58	35.57					

S.E. of V marginal mean = 1.05 ton/ac.
 S.E. of N, R or T marginal mean = 0.86 ton/ac.
 S.E. of body of N×R, R×T or N×T table = 1.21 ton/ac.
 S.E. of body of V×N, V×R or V×T table = 1.48 ton/ac.

Crop :- Sugarcane.

Ref :- K. 54(24).

Site :- Pampa River Factory Res. Stn., Tiruvalla.

Type :- 'CV'.

Object :- To find out the best time of planting for different Sugarcane varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) 100 lb./ac. of N+40 lb./ac. of P₂O₅+100 lb./ac. of K₂O as Parry's loam mixture. (ii) (a) Loam. (b) Refer soil analysis, Tiruvalla. (iii) As per treatments. (iv) (a) Digging and up-rooting stubbles. (b) Planting cane setts end to end in furrows. (c) About 13000 setts/ac. (d) N.A. (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Light hoeing after 2 months, 2 weedings, earthing-up and propping. (ix) 108.41". (x) December.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 5 varieties : V₁=C.O. 349, V₂=C.O. 449, V₃=C.O. 453, V₄=B.O. 11 and V₅=B.O. 24.

(2) 3 dates of planting : D₁=31.12.1953, D₂=15.1.1954 and D₃=15.2.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) and (b) 1/50 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (i) Nil. (iii) Population count, growth observations, cane yield and quality of cane by estimating brix, pol and purity. (iv) (a) to (c) No. (v) (a) and (b) Nil. (vi) Nil. (vii) Raw data N.A.

5. RESULTS :

(i) 27.62 ton/ac. (ii) N.A. (iii) N.A. (iv) Av. yield of sugarcane in ton/ac.

	D ₁	D ₂	D ₃	Mean
V ₁	30.38	35.39	25.74	30.50
V ₂	35.21	35.76	26.23	32.40
V ₃	40.25	37.65	26.12	34.67
V ₄	22.99	18.75	14.15	18.63
V ₅	25.45	22.52	17.71	21.89
Mean	30.86	30.01	21.99	27.62
	S.E.'s		N.A.	

Crop :- Sugarcane.

Ref :- K. 55(25).

Site :- Pampa River Factory Res. Stn., Tiruvalla.

Type :- 'CV'.

Object :- To find out the best time of planting for different Sugarcane varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) 100 lb./ac. of N+40 lb./ac. of P_2O_5 +100 lb./ac. of K_2O as Parry's loam mixture. (ii) (a) Loam. (b) Refer soil analysis, Tiruvalla. (iii) 21.11.1955. (iv) (a) Once digging the soil and up-rooting stubbles. (b) Planting cane setts end to end in furrows. (c) 13000 setts/ac. (d) and (e) N.A. (v) 8 cwt/ac. of Parry's loam mixture+1 cwt/ac. of A/S applied thrice. (vi) As per treatments. (vii) Irrigated. (viii) Light hoeing, 2 weedings, 1 earthing and propping. (ix) 120°. (x) 15 to 24.11.1956.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 3 varieties: $V_1=CO. 349$, $V_2=CO. 449$ and $V_3=CO. 785$ (all of medium duration).
 (2) 2 methods of planting: $M_1=Royangan$ and $M_2=Normal$ planting.

3. DESIGN :

(i) 3×2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) and (b) 1/25 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Population count, flowering details, juice quality by determining brix, pol and purity and cane yield. (iv) (a) to (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 26.93 ton/ac. (ii) 5.62 ton/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in ton/ac.

	V_1	V_2	V_3	Mean
M_1	20.48	28.64	32.51	27.21
M_2	23.93	28.82	27.20	26.65
Mean	22.20	28.73	29.86	26.93

S.E. of V marginal mean = 2.29 ton/ac.
 S.E. of N marginal mean = 1.87 ton/ac.
 S.E. of body of table = 3.24 ton/ac.

Crop :- Sugarcane.

Ref :- K. 54(26).

Site :- Pampa River Factory Res. Stn., Tiruvalla.

Type :- 'CM'.

Object :- To find out the optimum spacing, the effect of earthing-up and the optimum N requirement for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) 100 lb./ac. of N+40 lb./ac. of P_2O_5 +100 lb./ac. of K_2O as Parry's loam mixture. (ii) (a) Loam. (b) Refer soil analysis, Tiruvalla. (iii) 21.1.1954. (iv) (a) Digging the soil and up-rooting stubbles. (b) Planting cane setts end to end in furrows. (c) About 13000 setts/ac. (d) and (e) —. (v) Nil. (vi) CO. 349. (improved, medium). (vii) Irrigated. (viii) Light hoeing, 2 weedings and propping. (ix) 108.41°. (x) 25.11.1954 to 3.12.1954.

2. TREATMENTS :

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

- (1) 4 spacings between rows: $S_1=2\frac{1}{2}'$, $S_2=3'$, $S_3=3\frac{1}{2}'$ and $S_4=4'$.
 (2) 2 cultural operations: $E_0=No$ earthing and $E_1=Earthing$ up in last week of May.
 (3) 2 levels of N: $N_1=100$ and $N_2=150$ lb./ac. of N.

N applied as A/S and G.N.C. in 1 : 1 ratio in two doses, at planting and one month after planting as top dressing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) and (b) 36'×26'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Juice quality by determining brix, pol and purity and cane yield. (iv) (a) to (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 27.07 ton/ac. (ii) 3.00 ton/ac. (iii) Only N effect is highly significant. (iv) Av. yield of sugarcane in ton/ac.

	S ₁	S ₂	S ₃	S ₄	Mean	N ₁	N ₂
E ₀	29.92	27.88	27.19	26.18	27.79	26.16	29.43
E ₁	27.19	27.68	26.29	24.25	26.35	25.97	26.73
Mean	28.56	27.78	26.74	25.21	27.07	26.06	28.08
N ₁	27.50	27.27	25.53	23.95			
N ₂	29.61	28.30	27.94	26.47			

S.E. of S marginal mean =0.75 ton/ac.

S.E. of N or E marginal mean =0.53 ton/ac.

S.E. of body of N×E table =0.75 ton/ac.

S.E. of body of E×S or N×S table =1.06 ton/ac.

Crop :- Sugarcane.

Ref :- K. 56(27).

Site :- Pampa River Factory Res. Stn., Tiruvalla

Type :- 'P'.

Object :- To find out the effect of irrigation on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) 100 lb./ac. of N+40 lb./ac. of P₂O₅+100 lb./ac. of K₂O as Parry's loam mixture. (ii) (a) Loam. (b) Refer soil analysis, Tiruvalla. (iii) 11.1.1956. (iv) (a) Digging and up-rooting stubbles. (b) Planting cane setts end to end in furrows. (c) About 13000 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO. 449 (medium, improved). (vii) As per treatments. (viii) Slight hoeing, 2 weedings, 1 earthing-up and propping. (ix) 103.74°. (x) 12 months after planting.

2. TREATMENTS :

I₀=Control (No irrigation).

I₁=Irrigating once in March

I₂=Irrigating twice in Feb. and March.

I₃=Irrigating thrice in Feb., March and April.

I₄=Irrigating every fortnight up to monsoon.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 2. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cane yield and quality of cane by estimating brix, pol and purity. (iv) (a) Nil. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 29.23 ton/ac. (ii) 3.51 ton/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in ton/ac.

Treatment	I ₀	I ₁	I ₂	I ₃	I ₄
Av. yield	26.50	28.78	22.96	22.61	35.28

S.E./mean =2.48 ton/ac.

Crop :- Sugarcane.
Centre :- Tiruvalla (c.f.).

Ref :- K. 56(28).
Type :- 'D'.

Object :- To find out the effect of soil application of 2, 4-D on the quality and yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) 50 lb./ac. of N+40 lb./ac. of P_2O_5 +100 lb./ac. of K_2O applied as Parry's alluvial mixture. (ii) Alluvial soil; N : 0.183, P : 0.199, K : 0.193, available K_2O : 12.2 mgm/100 gm. Humus : 1.67, CaO : 0.25 and pH : 6.1. (iii) N.A. (iv) CO. 349 (improved, medium). (v) (a) Digging and up-rooting stubbles. (b) Planting cane setts end to end in furrows. (c) 13000 setts/ac. (d) and (e) N.A. (vi) 2.2.1956 to 10.2.1956. (vii) Irrigated. (viii) Nil. (ix) 103.74" (x) 7.2.1957 to 8.2.1957.

2. TREATMENTS :

M_0 = Control (untreated) and M_1 = 2, 4-D applied to the soil at the rate of 3 lb./ac. (fernoxone) mixed with water on 5.11.1956.

3. DESIGN :

(i) and (ii) 4 cultivators' fields in Pampa river factory area were selected for this experiment. (iii) (a) and (b) Varied from cultivator to cultivator. (iv) Yes.

4. GENERAL :

(i) Satisfactory, lodging prevented by propping. (ii) Nil. (iii) Cane yield, estimating juice quality by brix, pol and purity. (iv) (a), (b) and (c) No. (v) (a) and (b) Nil. (vi) Nil. (vii) Expt. was conducted in cultivators' fields.

5. RESULTS :

(i) 34.68 ton/ac. (ii) 4.06 ton/ac. (iii) Treatment difference is not significant. (iv) Av. yield of sugarcane in ton/ac.

Treatment	M_0	M_1
Av. yield	36.79	32.56
	S.E./mean = 2.03 ton/ac.	

Crop :- Cotton.
Site :- Agri. Res. Stn., Pattambi.

Ref :- K. 54(1).
Type :- 'M'.

Object :- To study the effect of A/S and C/N singly and with a basal dose on Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 3 ton/ac. of C.M. and 20 lb./ac. of N as A/S. (ii) (a) Laterite soil. (b) Refer soil analysis, Pattambi. (iii) 21.6.1954. (iv) (a) Ploughing four times and forming ridges. (b) N.A. (c) 15 lb./ac. (d) $2\frac{1}{2}' \times 1'$. (e) N.A. (v) Nil. (vi) Seaisland montserrat (late). (vii) Unirrigated. (viii) Weeding twice and earthing-up with spade. (ix) 65.39". (x) 24.11.1954 to 29.1.1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 5 doses of N as top dressing : $N_0=0$, $N_1=40$ lb./ac. of N as A/S, $N_2=60$ lb./ac. of N as A/S, $N_3=40$ lb./ac. of N as C/N and $N_4=60$ lb./ac. of N as C/N.

(2) 2 levels of B.D. : M_0 = No B.D. and M_1 = 3 ton/ac. of C.M. + 30 lb./ac. of P_2O_5 as Super + 50 lb./ac. of K_2O as Pot. Sul. + 550 lb./ac. of lime.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) $20' \times 10'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Stand uneven due to heavy rains in the initial stages of crop. (ii) Heavy incidence of secondary infection of black-arm. (iii) Yield of kapas and fibre. (iv) (a) 1952-1954. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) The season was not favourable for cotton. Conducted by cotton breeding section.

5. RESULTS :

(i) 103.3 lb./ac. (ii) 89.6 lb./ac. (iii) Effect of N is significant and M is highly significant. Interaction is not significant. (iv) Av. yield of kapas in lb./ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	Mean
M ₀	37	90	63	71	30	58
M ₁	41	292	184	122	103	148
Mean	39	191	123	96	67	103

S.E. of N marginal mean = 34.8 lb./ac.
 S.E. of M marginal mean = 22.0 lb./ac.
 S.E. of body of table = 44.8 lb./ac.

Crop :- Cotton.
 Centre :- Palghat (c.f.).

Ref :- K. 59(2).
 Type :- 'M'.

Object :- To study the response of Cotton to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS to 3. DESIGN :

Same as in expt. no. 111 on page 79 on paddy crop.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Cotton yield. (iv) (a), (b) and (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) The Expt. was conducted on cultivator's field.

5. RESULTS :

Treatment	o	n	p	np	k	nk	pk	npk
Av. yield	411	494	453	543	428	543	560	625

G.M. = 507 lb./ac.; S.E./mean = 13.06 lb./ac.; No. of trials = 6.

Crop :- Cotton
 Centre :- Palghat (c.f.).

Ref :- K. 59(3)
 Type :- 'M'.

Object :- To investigate the relative efficiency of different nitrogenous fertilizers at different levels.

1. BASAL CONDITIONS to 3. DESIGN :

Same as in expt. no. 121 on page 83, 84 on paddy crop.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cotton yield. (iv) (a) to (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

Treatment	o	n ₁ '	n ₂ '	n ₁ ''	n ₂ ''	n ₁ '''	n ₂ '''
Av. yield	90.5	123.4	164.6	148.1	156.3	123.4	181.0

G.M. = 141. lb./ac. ; S.E./mean = 12.22 lb./ac. ; No. of trials = 4.

Crop :- Cotton.
 Site :- Agri. Res. Stn., Pattambi.

Ref :- K. 54(4)
 Type :- 'C'.

Object :- To study the effect of spacing on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Paddy and Cotton. (b) Paddy. (c) 3 ton/ac. of C.M. and 20 lb./ac. of N as A/S. (ii) (a) Laterite. (b) Refer soil analysis, Pattambi. (iii) 16.6.1954. (iv) (a) 4 ploughings. (b) N.A. (c) N.A. (d) As per treatments. (e) N.A. (v) $1\frac{1}{2}$ ton/ac. of C.M., 30 lb./ac. of P_2O_5 as Super and 50 lb./ac. of K_2O as Pot. Sul. and top dressing with 60 lb./ac. of N as A/S. (vi) Sea island, montserrat (late). (vii) Unirrigated. (viii) Weeding twice and earthing up with spade. (ix) 65.39%. (x) 24.11.1954 to 29.1.1955.

2. TREATMENTS :

Main-plot treatments :

3 row to row spacings : $C_1=1\frac{1}{4}'$, $C_2=2'$ and $C_3=2\frac{1}{2}'$.

Sub-plot treatments :

3 plant to plant spacings : $S_1=6''$, $S_2=9''$ and $S_3=12''$.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) Main-plot : 0.86 cent., Sub-plot : 0.43 cent. Dimensions N.A. (b) Main-plot : $15' \times 36'$, Sub-plot : $15' \times 12'$. (v) Two rows on either side. (vi) Yes.

4. GENERAL :

(i) Uneven stand due to heavy rains. (ii) Severe incidence of black-arm disease. (iii) Yield of *kapas* and fibre. (iv) (a) 1954—1955. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) Poor yield due to heavy rains. (vii) Nil.

5. RESULTS :

(i) 155.2 lb./ac. (ii) (a) 124.6 lb./ac. (b) 63.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in lb./ac.

	C_1	C_2	C_3	Mean
S_1	167.6	119.2	184.8	157.2
S_2	159.7	123.4	198.4	160.5
S_3	202.4	111.0	129.8	147.8
Mean	176.6	117.9	171.0	155.2

S.E. of difference of two

1. C marginal means = 45.5 lb./ac.
2. S marginal means = 23.1 lb./ac.
3. S means at the same level of C = 40.1 lb./ac.
4. C means at the same level of S = 56.1 lb./ac.

Crop :- Tobacco.

Ref :- K. 58(1).

Site :- Tobacco Res. Stn., Kanhangad.

Type :- 'M'.

Object :- To study the effect of organic and inorganic manures and fertilizers on yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Paddy. (b) Paddy. (c) 200 lb./ac. of wood ash. (ii) (a) Sandy (coastal) with varying admixture of clay. (b) N.A. (iii) End of Aug. 1958/3rd and 4th December, 1958. (iv) (a) Three ploughings with *desi* plough. Furrows dug 9" deep and 3' apart with spade. (b) Transplanting in line. (c) —. (d) $2\frac{1}{2}'$ apart. (e) One seedling/hole. (v) 10 ton/ac. of F.Y.M. before planting. 5 ton/ac. of F.Y.M. one month after transplanting applied for mulching purpose. (vi) *Pannan* (local). (vii) Irrigated. (viii) 2 hoeings, 2 weedings and 2 earthings. (ix) Nil. (x) 4.3.1959.

2. TREATMENTS :

All combinations of (1) and (2)+one extra treatment

- (1) 10 manurial combinations : M_1 =Fish manure at 210 lb./ac. of N, M_2 =G.M. at 210 lb./ac. of N, M_3 =C.M. at 210 lb./ac. of N, M_4 =A/S at 210 lb./ac. of N, M_5 = $\frac{1}{2}M_1 + \frac{1}{2}M_2$, M_6 = $\frac{1}{2}M_1 + \frac{1}{2}M_3$, M_7 = $\frac{1}{2}M_1 + \frac{1}{2}M_4$, M_8 = $\frac{1}{2}M_2 + \frac{1}{2}M_3$, M_9 = $\frac{1}{2}M_2 + \frac{1}{2}M_4$ and M_{10} = $\frac{1}{2}M_3 + \frac{1}{2}M_4$.

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

Extra treatment : T = Fish manure at 210 lb./ac. of N + A/S at 40 lb./ac. of N.

Fish manure top dressed in 3 equal doses 15, 45 and 75 days after planting. G.M. and C.M. applied in furrows just before transplanting. A/S applied in 5 equal doses 15, 30, 45, 60 and 75 days after planting. Super applied as B.D. before planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 21. (b) N.A. (iii) 4. (iv) (a) and (b) 21' x 15'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Healthy. (ii) Grass-hopper attack in the seedling stage, crop sprayed with 0.01% of Folidol by means of a pneumatic sprayer twice at interval of 15 days. (iii) Yield of cured leaf. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1604 lb./ac. (ii) 236 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of cured leaf in lb./ac. $T_1=1559$ lb./ac.

	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}	Mean
P_0	1490	1749	1798	1448	1542	1493	1611	1656	1594	1646	1603
P_1	1867	1621	1611	1514	1556	1570	1570	1563	1528	1690	1609
Mean	1678	1685	1704	1481	1549	1532	1590	1609	1561	1668	1606

S.E. of marginal mean of M = 83 lb./ac.
 S.E. of marginal mean of P = 37 lb./ac.
 S.E. of body of table = 118 lb./ac.

Crop :- Tobacco.

Site :- Tobacco Res. Stn., Kanhangad.

Ref :- K. 58(2).

Type :- 'M'.

Object :- To study the effect of split application of nitrogen as fish manure at different levels.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Paddy. (b) Paddy. (c) 200 lb./ac. of wood ash. (ii) (a) Coastal sandy with varying admixture of clay. (b) N.A. (iii) End of Aug. 1958/23 and 24.12.1958. (iv) (a) 3 ploughings with *dest* plough. Furrows dug 9" deep, 8" wide and 3' apart. (b) Transplanted in lines. (c) —. (d) 2½' plant to plant. (e) One seedling/hole. (v) 10 tons of F.Y.M. before planting + 5 tons of F.Y.M. one month after planting as a mulch. (vi) *Pannan* (local). (vii) Irrigated. (viii) 2 hoeings, 3 weedings and 2 earthings. (ix) Nil. (x) 4.3.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as fish manure : $N_1=180$, $N_2=210$ and $N_3=240$ lb./ac.

(2) 3 applications of N : T_1 = Full dose at the time of planting, T_2 = Half at planting + half 15 days after planting and T_3 = 3 equal doses at planting, 15 days and 30 days after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 21' x 15'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Healthy. (ii) Grass-hopper attack in the seedling stage, crop sprayed with 0.01% Folidol by means of a pneumatic sprayer twice at interval of 15 days. (iii) Weight of cured leaf, height, no. of leaves and leaf area. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1897 lb./ac. (ii) 144 lb./ac. (iii) N is highly significant, T is significant while interaction is not significant. (iv) Av. yield of cured leaf in lb./ac.

	N ₁	N ₂	N ₃	Mean
T ₁	1774	1863	1974	1870
T ₂	1898	1926	2126	1983
T ₃	1703	1843	1960	1837
Mean	1793	1877	2020	1897

S.E. of any marginal mean = 41 lb./ac.
S.E. of body of table = 72 lb./ac.

Crop :- Tobacco (*Rabi*).

Ref :- K. 53(3).

Site :- Tobacco Res. Stn., Kanhangad.

Type :- 'M'.

Object :- To study the effect of different doses and times of application of fish manure on the yield of chewing Tobacco.

1. BASAL CONDITIONS :

(i) (a) Paddy—tobacco—paddy. (b) Faddy. (c) 50 lb./ac. of wood ash. (ii) (a) Littoral sand. (b) Refer soil analysis, Kanhangad. (iii) 12.11.1959. (iv) (a) Digging, levelling, furrow and ridge making. (b) Transplanting. (c) —. (d) 2.5' × 3'. (e) 42 plants/plot. (v) 15 C.L./ac. of loose box C.M. filled in furrows 15 days before transplanting up to 6" and 2" layer of soil spread over it ; 5 C.L./ac. loose box C.M. applied as mulch 15 days after transplanting. (vi) *Pannan* (local). (vii) Irrigated. (viii) 3 hoeings-weeding, 2 earthings, topping and suckering once in a week. (ix) Nil. (x) 19.2.1960.

2. TREATMENTS :

Main-plot treatments :

3 levels of fish manure : L₁=4000, L₂=6000 and L₃=8000 lb./ac.

Sub-plot treatments :

3 times of application : T₁=3 equal doses 15, 45 and 75 days after transplanting, T₂=4 equal doses 15, 45, 60 and 75 days after transplanting and T₃=5 equal doses 15, 30, 45, 60 and 75 days after transplanting.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 23' × 17'. (b) 21' × 15'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Light incidence of grass hopper, spraying Folidol of 0.01 strength. (iii) Relative growth of G.L., yield of 1st grade and 2nd grade cured chewing tobacco. (iv) (a) 1959—1963. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2090 lb./ac. (ii) (a) 208.8 lb./ac. (b) 239.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of G.L. in lb./ac.

	L ₁	L ₂	L ₃	Mean
T ₁	2028	2075	2132	2078
T ₂	2029	2038	2362	2143
T ₃	1979	2155	2016	2050
Mean	2012	2089	2170	2090

S.E. of difference of two

1. L marginal means = 49.2 lb./ac.
2. T marginal means = 56.4 lb./ac.
3. T means at the same level of L = 138.0 lb./ac.
4. L means at the same level of T = 132.4 lb./ac.

Crop :- Tobacco (*Rabi*).

Ref :- K. 59(4).

Site :- Tobacco Res. Stn., Kanhangad.

Type :- 'M'.

Object :- To find out the effect of different doses of N, P and K for Tobacco crop.

1. BASAL CONDITIONS:

(i) (a) Paddy after tobacco. (b) and (c) Nil. (ii) (a) Littoral sand. (b) N.A. (iii) 12.11.1959. (iv) (a) Digging, levelling and making furrows and ridges. (b) Transplanting. (c) —. (d) 2.5' x 3'. (e) 1. (v) 15 C.L./ac. of loose box, C.M. applied 15 days before transplanting up to 6" and 2" layer of soil spread over it. 5 C.L./ac. of loose box C.M. applied as mulch 30 days after transplanting. 4000 lb/ac. of fish and 1 cwt. of A/S applied in three equal doses 15, 30 and 45 days after transplanting. (vi) *Pannan* (local). (vii) Irrigated. (viii) 3 hoeings, 3 weedings, 2 earthings and suckering once in a week. (ix) Nil. (x) 19.2.1960.

2. TREATMENTS:

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

- (1) 3 levels of N as A/S : $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac.
- (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=40$ and $P_2=80$ lb./ac.
- (3) 3 levels of K_2O as Pot. Sul. : $K_0=0$, $K_1=40$ and $K_2=80$ lb./ac.

A/S applied in four equal doses, P_2O_5 15 days before transplanting and K_2O in two equal doses 15 and 30 days after transplanting.

3. DESIGN:

(i) 3^3 Confounded. (ii) (a) 9 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 23' x 17'. (b) 21' x 15'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Light attack of grass-hoppers. Spraying Folidol of 0.01 strength. (iii) Height, no. of leaves, leaf area, 1st grade and 2nd grade cured leaves and green leaf yield. (iv) (a) 1959—1963. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1808 lb./ac. (ii) 79.63 lb./ac. (iii) Main effect of N and interaction NP are highly significant. Effect of P is significant. (iv) Av. yield of G.L. in lb./ac.

	K_0	K_1	K_2	Mean	P_0	P_1	P_2
N_0	1625	1671	1752	1682	1510	1630	1907
N_1	1890	1924	1769	1861	1809	1906	1867
N_2	1850	1913	1884	1882	1855	1954	1838
Mean	1788	1836	1801	1808	1724	1830	1871
P_0	1602	1751	1821				
P_1	1843	1873	1774				
P_2	1919	1884	1809				

S.E. of any marginal mean = 32.60 lb./ac.
S.E. of body of any table = 56.31 lb./ac.

Crop :- Tobacco.

Ref :- K. 58(5).

Site :- Tobacco Res. Stn., Kanhangad.

Type :- 'C'.

Object :- To study the effect of spacing and topping on the yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Paddy. (b) Paddy. (c) 200 lb./ac. of wood ash. (ii) (a) Coastal sandy with varying admixture of clay. (b) N.A. (iii) End of Aug. 1958/28th and 29th December. (iv) (a) Three ploughings with *desi* plough and furrows dug at 9" deep 8" wide and three feet apart with spade. (b) transplanted. (c) —. (d) As per treatments. (e) N.A. (v) 10 ton of F.Y.M. before planting and 5 tons of F.Y.M. one month after transplanting as mulch. (vi) *Pannan* (local). (vii) Irrigated. (viii) 2 hoeings, 3 weedings and 2 earthings. (ix) Nil. (x) 10.3.1959.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 spacings : $S_1=18" \times 3'$, $S_2=22" \times 3'$ and $S_3=30" \times 3'$.(2) 3 levels of topping : $L_1=11$, $L_2=13$ and $L_3=15$ leaves.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) (a) 4. (b) N.A. (iv) $21' \times 15'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Healthy. (ii) Grass-hopper attack in the seedling stage crop sprayed with 0.01% of Folidol by means of a pneumatic sprayer twice at interval of 15 days. (iii) Weight, no. of leaves and leaf yield. (iv) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 20.90 lb./ac. (ii) 250 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of cured leaf in lb./ac.

	S_1	S_2	S_3	Mean
L_1	2302	1964	1822	2029
L_2	2019	2140	2102	2087
L_3	2285	2123	2054	2154
Mean	2202	2075	1992	2090

S.E. of any marginal mean = 72 lb./ac.

S.E. of body of table = 125 lb./ac.

Crop :- Tobacco.

Ref :- K. 59(6).

Site :- Tobacco Res. Stn., Kanhangad.

Type :- 'C'.

Object :- To study the effect of spacing and topping on the yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Paddy Tobacco. (b) Paddy. (c) 50 lb./ac. of wood ash. (ii) Litteral soil. (b) Refer soil analysis, Kanhangad. (iii) 20.11.1959. (iv) (a) Preparatory cultivation, digging and levelling with spade, furrow and ridge making. (b) Transplanting. (c) —. (d) As per treatments. (e) N.A. (v) 15 C.L. of loose box C.M. before planting 5 C.L. of loose C.M. after 15 days of transplanting and 6000 lb./ac. of fish manure in 3 doses. (vi) *Pannan*. (vii) Irrigated. (viii) 3 hoeings, 3 weedings, 2 earthings and 1 topping. Suckering once a week. (ix) Nil. (x) 24.2.1960.

2. TREATMENTS:

Main-plot treatments :

3 spacings : $S_1=3' \times 18"$, $S_2=3' \times 24"$ and $S_3=3' \times 30"$.

Sub-plot treatments :

3 levels of topping : $L_1=11$, $L_2=13$ and $L_3=15$ leaves.

3. DESIGN :

(i) Split-plot. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 32'×14'. (b) 30'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Light grass-hopper attack. Folidol of 0.01% strength sprayed. (iii) Cured leaf yield. (iv) (a) No. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2190 lb./ac. (ii) (a) 311.7 lb./ac. (b) 259.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of cured leaves in lb./ac.

	L ₁	L ₂	L ₃	Mean
S ₁	2319	2199	2390	2302
S ₂	2259	2178	2249	2229
S ₃	2027	2067	2027	2040
Mean	2202	2148	2222	2190

S.E. of difference of two

1. S marginal means = 73.5 lb./ac.
2. L marginal means = 61.2 lb./ac.
3. L means at the same level of S = 149.9 lb./ac.
4. S means at the same level of L = 160.5 lb./ac.

Crop :- Ginger.

Ref :- K. 55(1).

Site :- Agri Res. Stn., Ambalavayal.

Type :- 'M'.

Object :- To determine the optimum dose of N and P for getting higher yield of Ginger.

1. BASAL CONDITIONS :

(i) (a), (b) and (c) Nil. (ii) (a) Brown to red clayey soil. (b) Refer soil analysis, Ambalavayal. (iii) 17.5.1955. (iv) (a) Three ploughings and forming seed beds. (b) Sown in pits and covered with soil. (c) N.A. (d) 9'×9'. (e) N.A. (v) 2 ton/ac. of powdered C.M. broadcast at planting. (vi) Local. (vii) Unirrigated. (viii) Three weedings and earthing up twice. (ix) 82.00°. (x) 17.1.1955.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N₀=0, N₁=50 and N₂=100 lb./ac.

(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=45 and P₂=90 lb./ac.

N applied one month after planting as top dressing and P₂O₅ applied one month before planting as B.D.

3. DESIGN :

(i) R.B.D. (ii) (a) and (b) N.A. (iii) 4. (iv) (a) 22'×16'. (b) 19.5'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of leaf spot. 1.0% Bordeaux mixture was sprayed. (iii) Yield of the rhizome was recorded at the time of harvest. (iv) (a), (b) and (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 17449 lb./ac. (ii) 1867 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of tuber in lb./ac.

	N ₀	N ₁	N ₂	Mean
P ₀	17391	16182	17019	16865
P ₁	16508	18832	19112	18150
P ₂	15856	16694	19437	17330
Mean	16586	17237	18522	17449

S.E. of any marginal mean = 539 lb./ac.
S.E. of body of table = 934 lb./ac.

Crop :- Ginger.

Ref :- K. 56(2).

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

Type :- 'M'.

Object :- To determine the optimum dose of N and P for getting higher yield of Ginger.

1. BASAL CONDITIONS

(i) (a), (b) and (c) Nil. (ii) (a) Brown to red clayey soil. (b) Refer soil analysis, Ambalavayal. (iii) 4.5.1956. (iv) (a) Ploughing thrice and forming beds. (b) Sown in pits. (c) N.A. (d) 9" x 9". (e) N.A. (v) 10 ton/ac. of powdered G.M. applied as B.D. at the time of planting. (vi) Local. (vii) Un-irrigated. (viii) Three weedings at an interval of 45 days each followed by a mulching with G.L. at 20000 lb./ac. and earthing up. (ix) 84.00". (x) 24.1.1957.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : N₀=0, N₁=50, N₂=100 and N₃=150 lb./ac.

(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=45 and P₂=90 lb./ac.

N top dressed one month after planting and P₂O₅ given as B.D. one month before planting.

3. DESIGN :

(i) Fact in R.B.D. (ii) (a) 12 (b) N.A. (iii) 4. (iv) (a) and (b) 12' x 19.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Light attack of leaf spot—1% Bordeaux mixture sprayed. (iii) Yield of rhizomes. (iv) (a) 1955—N.A. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 23808 lb./ac. (ii) 2678 lb./ac. (iii) Effect of N alone is significant. (iv) Av. yield of rhizomes in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean
P ₀	21948	24180	23808	26040	23994
P ₁	21576	24180	25110	24738	23808
P ₂	21576	22692	25110	25296	23622
Mean	21576	23622	24552	25296	23808

S.E. of N marginal mean = 773 lb./ac.
S.E. of P marginal mean = 670 lb./ac.
S.E. of body of table = 1339 lb./ac.

Crop :- Ginger.

Ref :- K. 57(3).

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

Type :- 'M'.

Object :- To determine the optimum dose of N and P for getting higher yield of Ginger.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) Nil. (ii) (a) Loamy to red clayey soil. (b) Refer soil analysis, Ambalavayal. (iii) 18.4.1957. (iv) (a) Three ploughings and making beds. (b) Planting in pits. (c) 1200 lb./ac. (d) 9"×9". (e) N.A. (v) Crop mulched with green leaf at 20,000 lb./ac. 10 ton/ac. of powdered C.M. applied at planting. (vi) Local. (vii) Unirrigated. (viii) Weeding and earthing up. Mulching with G.L. at 20000 lb./ac. (ix) 90.10". (x) 16.1.1958.

2. TREATMENTS :

Same as in expt no. 56(2) on page 209.

3. DESIGN :

(i) 4×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 12'×19½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Light incidence of leaf spot—1% Bordeaux mixture sprayed. (iii) Yield of rhizomes. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 13407 lb./ac. (ii) 2018 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of rhizomes in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean
P ₀	13263	12984	12984	12007	12807
P ₁	13170	14660	13589	14613	14008
P ₂	11867	13915	14241	13589	13403
Mean	12766	13854	13604	13403	13407

S.E. of N marginal mean = 583 lb./ac.

S.E. of P marginal mean = 504 lb./ac.

S.E. of body of table = 1009 lb./ac.

Crop :- Ginger.

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

Ref :- 58(4).

Type :- 'M'.

Object :- To determine the optimum dose of N and P for getting higher yield of Ginger.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) Nil. (ii) (a) Loamy to red clayey soil. (b) Refer soil analysis, Ambalavayal. (iii) 17.4.1958. (iv) (a) Three ploughings and forming seed beds. (b) Sown in pits. (c) N.A. (d) 9"×9". (e) N.A. (v) The crop was mulched with G.L. at 20000 lb./ac. 10 ton/ac. of C.M. applied before planting. (vi) Local. (vii) Unirrigated. (viii) Weeding and 3 earthing up. Mulching with G.L. at 20000 lb./ac. (ix) 95.61". (x) 24.1.1959.

2. TREATMENTS :

Same as in expt. no. 56(2) on page 209.

3. DESIGN :

(i) 4×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 12'×19.5'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 20109 lb./ac. (ii) 3786 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of rhizomes in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean
P ₀	18749	21459	17584	21325	19779
P ₁	17875	20205	22982	19385	20037
P ₂	18480	19174	22982	21414	20512
Mean	18368	20289	21183	20608	20109

S.E. of N marginal mean = 1098 lb./ac.
 S.E. of P marginal mean = 941 lb./ac.
 S.E. of body of table = 1882 lb./ac.

Crop :- Ginger.

Ref :- K. 55(5).

Site :- Agri Res. Stn, Ambalavayal.

Type :- 'M'.

Object :- To determine the optimum dose of leaf mulch required for getting higher yield of Ginger.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) (a) Brown to red clayey soil. (b) Refer soil analysis, Ambalavayal. (iii) 2.5.1955. (iv) (a) Ploughing thrice and making beds. (b) Sown in pits and covered with soil. (c) 1200 lb./ac. (d) 9'×9'. (e) N.A. (v) 20 ton of powdered C.M. applied at the time of planting. (vi) Local. (vii) Unirrigated. (viii) Three weedings and 2 earthings. (ix) 82.00'. (x) 16.1.1956.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 3 times of mulching : T₁=At planting, T₂=At planting+30 days after planting and T₃=At planting+60 days after planting.

(2) 2 sources of mulch : S₁=G.L. and S₂=straw each at 5000 lb./ac.

3. DESIGN :

(i) 3×2 fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 8'×22'. (b) 6'×19.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(1) N.A. (ii) Medium infection of leaf spot —1% Bordeaux mixture sprayed. (iii) Yield of rhizomes. (iv) (a) 1955—N.A. (b) —. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 18864 lb./ac. (ii) 1797 lb./ac. (iii) T effect alone is highly significant. (iv) Av. yield in lb./ac.

	T ₁	T ₂	T ₃	Mean
S ₁	16275	20460	21762	19500
S ₂	15532	18507	20646	18228
Mean	15903	19485	21204	18864

S.E. of T marginal mean = 635 lb./ac.
 S.E. of S marginal mean = 519 lb./ac.
 S.E. of body of table = 900 lb./ac.

Crop :- Ginger.

Ref :- K. 59(6).

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

Type :- 'M'.

Object —To find out the optimum manurial requirement of Ginger crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) Nil. (ii) (a) Brown to red clayey soil. (b) Refer soil analysis, Ambalavayal. (iii) 28.4.1959. (iv) (a) Ploughing. (b) to (e) N.A. (v) 5 ton/ac. of C.M. applied at the time of planting. Mulching with 15,000 lb./ac. of G.L. (vi) Wynad local (medium). (vii) Unirrigated. (viii) Weeding 4 times. (ix) About 80°. (x) 5.1.1960.

2. TREATMENTS :

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

(1) 3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=45$ and $P_2=90$ lb./ac.(3) 3 levels of K_2O as Pot. Sul. : $K_0=0$, $K_1=60$ and $K_2=120$ lb./ac.

Super applied one month before planting while A/S and Pot. Sul. applied one and a half months after planting.

3. DESIGN :

(i) 3^3 partially confounding NPK interaction. (ii) (a) 9. (b) 66'×72' (iii) 2. (iv) (a) 22'×8'. (b) 20'×6'. (v) One foot all round the plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield and tiller count. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) N.A. (ii) 1028 lb./ac. (iii) Interaction $N \times P$ and $N \times P \times K$ are significant. Other effects are not significant. (iv) % increase in yield over the control

	K_0			K_1			K_2		
	P_0	P_1	P_2	P_0	P_1	P_2	P_0	P_1	P_2
N_0	0	1.64	2.46	3.30	21.30	11.50	19.10	6.60	24.60
N_1	0	41.00	9.80	14.80	0	29.50	18.00	19.70	16.40
N_2	21.30	18.00	13.10	11.50	9.80	4.90	6.60	16.40	16.40

Details N.A.

Crop :- Ginger.

Ref :- K. 59(7).

Site :- Ginger Res. Stn., Thodupuzha.

Type :- 'M'.

Object :-To find out the optimum manurial requirement of Ginger.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) (a) Laterite soil. (b) Refer soil analysis, Thodupuzha. (iii) 4.7.1959. (iv) Digging, levelling, preparing beds and then digging pits. (b) Dibbling. (c) 1000 lb./ac. (d) 9"×9". (e) N.A. (v) 10 C.L./ac. of C.M. and 5000 lb./ac. of G.L. given as B.D. Five C.L. of C.M. given at planting and the other five 45 days after planting. Mulching with G.L. in two doses, one at planting and the second 45 days after planting. (vi) Local (medium). (vii) Unirrigated. (viii) Weeding 3 times after planting. Earthing up after 45 days of planting. (ix) 167.2°. (x) 29.1.1960.

2. TREATMENTS :

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

(1) 3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=30$ and $P_2=60$ lb./ac.(3) 3 levels of K_2O as Pot. Sul. : $K_0=0$, $K_1=30$ and $K_2=60$ lb./ac.

Super applied one month before planting. Half the quantity of A/S applied at planting and the other half along with full dose of Pot. Sul. applied 45 days after planting.

3. DESIGN :

(i) 3³ confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 14'×26'. (b) 12'×24' (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Slight attack of leaf-spot and shoot-borer—D.D.T. and Cupravit sprayed. (iii) No. of tillers/plant, no. of nodes, length of shoots, length of leaves and rhizome yield. (iv) (a) 1959 —N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3515 lb./ac. (ii) 1165 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of rhizomes in lb./ac.

	P ₀	P ₁	P ₂	Mean	K ₀	K ₁	K ₂
N ₀	3315	2445	3769	3176	3996	2344	3189
N ₁	3617	4248	3403	3756	3630	3025	4613
N ₂	3441	3277	4122	3613	2281	4323	4235
Mean	3458	3323	3765	3515	3302	3231	4012
K ₀	4437	2899	2571				
K ₁	2407	2975	4311				
K ₂	3529	4096	4411				

S.E. of any marginal mean = 388.3 lb./ac.

S.E. of body of any table = 672.6 lb./ac.

Cop :- Ginger.

Ref :- K. 59(8).

Site :- Ginger Res. Stn., Thodupuzha.

Type :- 'M'.

Object :- To find out the effect of different forms of N on Ginger crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) Nil. (ii) (a) Laterite soil. (b) Refer soil analysis, Thodupuzha. (iii) 19.6.1959. (iv) (a) Digging, levelling, preparing beds and then digging. (b) Dibbling. (c) 1000 lb./ac. (d) 9"×9". (e) —. (v) 5 C.L. of C.M. and 5000 lb./ac. of G.L. were applied in two equal doses, $\frac{1}{2}$ at the time of planting and the remaining $\frac{1}{2}$, 45 days after planting. Manures were given according to treatments over the basal dose. (vi) Local variety (medium). (vii) Unirrigated. (viii) Three weedings. (ix) 167.2". (x) 21.1.1960.

2. TREATMENTS :

All combinations of (1) and (2)+2 controls

(1) 2 doses of N : N₁=100 and N₂=150 lb./ac.

(2) 6 sources of N : S₁=G.L., S₂=Cow dung, S₃=A/S, S₄=G.L.+A/S, S₅=G.L.+cow dung and S₆=Cow dung+A/S.

In treatments S₄, S₅ and S₆ N has been applied in 1 : 1 proportion. Manures were applied in two equal doses, half at planting and the other half 45 days after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 14. (b) 52'×98'. (iii) 4. (iv) (a) 14'×26', (b) 12'×24'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal growth. (ii) Attack of shoot borer—D.D.T. sprayed. (iii) Mean no. of tillers per plant, mean no. of nodes, length of shoot and yield of rhizomes. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 7857 lb./ac. (ii) 1058 lb./ac. (iii) None of the effects and interaction is significant. (iv) Av. yield of rhizomes in lb./ac.

control=7681 lb./ac.

	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	Mean
N ₁	8300	8026	7165	8555	7742	7307	7849
N ₂	7874	8338	7288	7988	8886	7156	7922
Mean	8087	8182	7227	8272	8314	7232	7886

S.E. of S marginal mean =374.1 lb./ac.

S.E. of N marginal mean =215.9 lb./ac.

S.E. of control mean =374.1 lb./ac.

S.E. of control vs other means =402.0 lb./ac.

S.E. of body of N×S table =529.0 lb./ac.

Crop :- Ginger.

Ref. :- K. 58(9)

Site :- Ginger Res. Stn., Thodupuzha.

Type :- 'M'.

Object :- To find out the effect of different combinations of manures on the growth of the plant, tillering and development of rhizomes of Ginger.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Nil. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Thodupuzha. (iii) 15.5.1958. (iv) (a) One digging, preparing seed beds of size 6'×12'×9". (b) Planting seed bits in lines. (c) 1000 lb./ac (d) 9"×9". (e) N.A. (v) C.M. at 10 C.L./ac. at the planting of rhizomes in pits. (vi) Local (medium). (vii) Unirrigated. (ix) 105". (x) 1.1.1959.

2. TREATMENTS :

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

(1) 2 doses of N : N₁=80 and N₂=100 lb./ac.

(2) 6 sources of N : S₁=G.L., S₂=A/S, S₃=Cow dung, S₄=A/S+G.L., S₅=G.L.+cow dung and S₆=A/S+cow dung.

Organic and inorganic manures will be added in two equal doses at planting and one month after planting. At planting manure will be applied in small pits where rhizomes are planted.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) 12'×24'. (b) 10.5'×22.5'. (v) One row around the net plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of shoot borer - 50% D.D.T. was sprayed. (iii) Weight of rhizomes. (iv) a 1958—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1107 lb./ac. (ii) 470 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of rhizomes in lb./ac.

control=1141 lb./ac.

	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	Mean
N ₁	773	1003	911	1210	1221	1429	1091
N ₂	1095	992	1337	749	1429	1106	1118
Mean	934	998	1124	979	1325	1268	1105

S.E. of N marginal mean	= 95.9 lb./ac.
S.E. of S marginal mean	= 166.2 lb./ac.
S.E. of body of table	= 235.0 lb./ac.
S.E. of control vs others means	= 244.4 lb./ac.

Crop :- Ginger.

Ref :- K. 59(10)

Site :- Ginger Res. Stn., Thodupuzha.

Type :- 'M'.

Object :- To find out the best time of application of manure to get maximum yield of Ginger.

1. BASAL CONDITIONS :

(i) (a) and (b) N.A. (c) N.A. (ii) (a) Laterite soil. (b) Refer soil analysis, Thodupuzha. (iii) 29.6.1959. (iv) (a) One digging, levelling and preparing beds of 12' x 6' x 6" size. (b) Planting in lines. (c) 1000 lb./ac. (d) 9" x 9". (e) N.A. (v) 5 C.L. of C.M. and 5000 lb./ac. of G.L. were applied at the time of planting as B.D. Lime was added before planting the rhizomes at 400 lb./ac. 40 lb./ac. of K₂O has been supplied in the form of Pot. Sul. 45 days after planting. (vi) Local (medium). (vii) Unirrigated. (viii) Weeding, earthing up and mulching. (ix) 167.2". (x) 25.1.1960.

2. TREATMENTS :

1. Full dose of manure applied at planting.
2. Half dose applied at planting and the other half 45 days after planting.
3. Half dose applied at planting, $\frac{1}{4}$ applied 45 days after planting and the remaining 65 days after planting.
4. $\frac{1}{3}$ dose applied at planting, the remaining dose divided into 3 equal parts and given 30, 45 and 65 days after planting.
5. N.A.
Manure : 100 lb./ac. of N supplied through cow dung, A/S and G.L. in equal ratio.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 14' x 26' (b) 12' x 24'. (v) Yes. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of leaf spot disease and shoot borer—Cupravit and D.D.T. sprayed with an interval of 1 week. (iii) The percentage of sprouting, mean no. of tillers/plant, mean no. of nodes, mean length of shoots, length and breadth of leaf and yield of rhizomes. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 5184 lb./ac. (ii) 1280 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of rhizomes in lb./ac.

Treatment	1	2	3	4	5
Av. yield	4853	5514	4872	5521	5161

S.E./mean = 522.4 lb./ac.

Crop :- Ginger.

Ref :- K. 57(11).

Site :- Ettumanoor, Peroor (c.f.).

Type :- 'M'.

Object :- To demonstrate and study the effect of K in conjunction with N and P₂O₅ on Ginger yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Ginger and Tapioca. (c) Ash and F.Y.M.—doses N.A. (ii) Gravelly laterite. (iii) On an average an application of 8285 lb./ac. of F.Y.M. (iv) Local. (v) (a) Planting and levelling. (b) Planting in pits. (c) N.A. (d) 9" x 9". (e) N.A. (vi) May, 1957. (vii) Unirrigated. (viii) Nil. (ix) 87.98". (x) Dec. 1957.

2. TREATMENTS :

- (1) Cultivators' practice.
 (2) 50 lb./ac. of N+50 lb./ac. of P_2O_5 .
 (3) 50 lb./ac. of N+50 lb./ac. of P_2O_5 +100 lb./ac. of K.

Half the dose at planting and the other half two months after planting.

3. DESIGN :

- (i), (ii) Representative fields were selected without randomisation. No. of trials is N.A. (iii) (a) 20 cents. (b) N.A. (iv) Yes.

4. GENERAL:

- (i) Very unfavourable season due to untimely rains. (ii) Decaying disease and *pinjal* attack was noticed in a few fields. (iii) Yield of rhizomes. (iv) (a) 1957—contd. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Expt. was conducted on cultivators' field.

5. RESULTS :

- (i) 6699 lb./ac. (ii) N.A. (iii) Treatment differences are significant. (iv) Av. yield of rhizomes in lb./ac.

Treatment	1	2	3
Av. yield	6115	5872	8109
S.E./mean	=487 lb./ac.		

Crop :- Ginger.

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

Object :- To determine the optimum tilth and time of planting of Ginger.

Ref :- K. 55(12).

Type :- 'C'.

1. BASAL CONDITIONS :

- (i) (a) to (c) Nil. (ii) (a) Brown to red clayey soil. (b) Refer soil analysis, Ambalavayal. (iii) As per treatments. (iv) (a) As per treatments. (b) Sown in pits. (c) N.A. (d) 9"×9". (e) N.A. (v) 20 ton of powdered C.M. broadcast at planting. (vi) Local. (vii) Unirrigated. (viii) Three weedings, two earthing up and mulching. (ix) 82.00°. (x) 28th January, 1956.

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

- 4 cultural operations : C_1 =Digging before planting, C_2 =Three ploughings, C_3 =six ploughings and C_4 =nine ploughings.

Sub-plot treatments :

- 4 dates of planting : D_1 =1.5.1955, D_2 =15.5.1955, D_3 =1.6.1955 and D_4 =15.6.1955.

3. DESIGN :

- (i) Split-plot. (ii) (a) 4 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 8'×22'. (b) 6'×19.5'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Vegetative portion began drying up by November 1955 indicating the maturity of the crop. (ii) Medium infection of leaf spot—1%. Bordeaux mixture sprayed. (iii) Yield of rhizomes. (iv) (a) N.A. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 14062 lb./ac. (ii) (a) 3073 lb./ac. (b) 2012 lb./ac. (iii) D effect alone is highly significant. (iv) Av. yield of rhizomes in lb./ac.

	C_1	C_2	C_3	C_4	Mean
D_1	19314	18693	19530	17640	18793
D_2	13299	14415	16305	15717	14936
D_3	11502	11376	12153	12585	11904
D_4	10044	11067	10539	10818	10617
Mean	13541	13887	14631	14192	14062

S.E. of difference of two

1. C marginal means = 885 lb./ac.
2. D marginal means = 580 lb./ac.
3. D means at the same level of C = 1161 lb./ac.
4. C means at the same level of C = 1341 lb./ac.

Crop :- Ginger.

Ref :- K. 56(13).

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

Type :- 'C'.

Object :- To determine the optimum tilth and time of planting for Ginger.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) and (c) Nil. (ii) (a) Brown to red clayey soil. (b) Refer soil analysis, Ambalavayal. (iii) As per treatments. (iv) (a) Three ploughings and forming beds. (b) Sown in pits on the seed bed. (c) N.A. (d) 9' x 9'. (e) N.A. (v) 20 tons of powdered C.M. applied at planting as B.D. (vi) Local. (vii) Unirrigated. (viii) Three weedings, earthing up and mulching with G.L. at 20000 lb./ac. (ix) 84.00". (x) 23.1.1957.

2. TREATMENTS :

Main-plot treatments :

3 levels of ploughing : $P_1=1$, $P_2=3$ and $P_3=5$.

Sub-plot treatments :

4 dates of planting : $D_1=15.4.1956$, $D_2=1.5.1956$, $D_3=15.5.1956$ and $D_4=1.6.1956$.**3. DESIGN :**

- (i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) Main-plot : 24' x 20'. (b) Sub-plot : 20' x 6'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Leaf spot disease—1% Bordeaux mixture sprayed. (iii) Rhizome yield. (iv) (a) 1955—N.A. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 22934 lb./ac. (ii) (a) 2197 lb./ac. (b) 1780 lb./ac. (iii) D effect alone is highly significant. (iv) Av. yield of rhizomes in lb./ac.

	P_1	P_2	P_3	Mean
D_1	28183	28593	27625	28146
D_2	25800	25577	25800	25726
D_3	20849	20849	19732	20476
D_4	16754	18056	17203	17349
Mean	22896	23259	22599	22934

S.E. of difference of two

1. P marginal means = 633 lb./ac.
2. D marginal means = 592 lb./ac.
3. D means at the same level of P = 1090 lb./ac.
4. P means at the same level of D = 1028 lb./ac.

Crop :- Ginger.

Ref :- K. 57(14).

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

Type :- 'C'.

Object :- To determine the optimum tilth and time of planting for Ginger.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) Nil. (ii) (a) Loamy to red clayey. (b) Refer soil analysis, Ambalavayal. (iii) As per treatments. (iv) (a) As per treatments. (b) Sown in pits. (c) 1200 lb./ac. (d) 9"×9". (e) N.A. (v) 20 ton/ac. of C.M. applied at planting. (vi) Local. (vii) Unirrigated. (viii) Weeding, 3 earthings and mulching with G.L. at 20000 lb./ac. (ix) 90.10". (x) 15.1.1958.

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

3 levels of ploughing : $P_1=1$, $P_2=3$ and $P_3=5$.

Sub-plot treatments :

4 dates of planting : $D_1=15.4.1957$, $D_2=1.5.1957$, $D_3=15.5.1957$ and $D_4=1.6.1957$.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 7. (iv) (a) N.A. (b) 6'×19½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Slight infection of leaf spot disease—1% Bordeaux mixture sprayed. (iii) Yield of rhizomes. (iv) (a) N.A. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 13373 lb./ac. (ii) (a) 2066 lb./ac. (b) 1593 lb./ac. (iii) D effect alone is highly significant. (iv) Av. yield of rhizomes in lb./ac.

	P_1	P_2	P_3	Mean
D_1	18031	19944	18295	18757
D_2	15372	15477	15157	15335
D_3	11754	11702	10905	11452
D_4	7926	8031	7871	7941
Mean	13269	13790	13057	13373

S.E. of difference of two

1. P marginal means =551 lb./ac.
2. D marginal means =491 lb./ac.
3. D means at the same level of P =849 lb./ac.
4. P means at the same level of D =920 lb./ac.

Crop :- Ginger.

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

Ref. :- K. 58(15).

Type :- 'C'.

Object :- To determine the optimum tilth and time of planting of Ginger.

1. BASAL CONDITIONS :

(i) (a) Nil (b) Nil. (c) Nil. (ii) (a) Loamy to red clayey. (b) Refer soil analysis, Ambalavayal. (iii) As per treatments. (iv) (a) As per treatments. (b) Sown in beds. (c) N.A. (d) 9"×9". (e) N.A. (v) The crop was mulched with green leaf at 20000 lb./ac. and 20 ton/ac. of powdered C.M. applied at planting. (vi) Local (vii) Unirrigated. (viii) Weeding, 3 earthings and mulching with G.L. at 20000 lb./ac. (ix) 95.61". (x) 22.1. 1959.

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

3 levels of ploughings : $P_1=1$, $P_2=2$ and $P_3=5$.

Sub-plot treatments :

4 dates of planting : $D_1=15.4.1958$, $D_2=1.5.1958$, $D_3=15.5.1958$ and $D_4=1.6.1958$.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (iii) 7. (iv) (a) N.A. (b) 6'×19.5'. (v) Nil. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 13569 lb./ac. (ii) (a) 2598 lb./ac. (b) 2285 lb./ac. (iii) D effect alone is highly significant. (iv) Av. yield of rhizomes in lb./ac.

	P ₁	P ₂	P ₃	Mean
D ₁	20787	21168	23498	21818
D ₂	15322	12656	15165	14381
D ₃	11290	10259	11872	11140
D ₄	7235	6384	7190	6936
Mean	13658	12617	14431	13569

S.E. of difference of two

1. P marginal means = 694.4 lb./ac.
2. D marginal means = 716.8 lb./ac.
3. D means at the same level of P = 1232.0 lb./ac.
4. P means at the same level of D = 1254.4 lb./ac.

Crop :- Ginger.

Ref :- K. 55(16).

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

Type :- 'C'.

Object :- To determine the optimum spacing for Ginger.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Nil. (c) Nil. (ii) (a) Brown to red clayey. (b) Refer soil analysis, Ambalavayal. (iii) 29.5.1955. (iv) (a) 3 ploughings and forming of beds. (b) Seed planted in pits. (c) N.A. (d) As per treatments. (e) N.A. (v) 20 tons/ac. of powdered C.M. broadcast at planting. (vi) Local. (vii) Unirrigated. (viii) Weeding was given thrice at intervals of 45 days and the crop was earthed up twice. (ix) 82.00%. (x) 30.1.1956.

2. TREATMENTS :

5 Spacings : S₁=6'×6', S₂=9'×6', S₃=9'×9', S₄=12'×9' and S₅=12'×12'.

3. DESIGN :

(i) R.B.D. (ii) (a) 5 (b) N.A. (iii) 6. (iv) (a) 9'×21' except for S₅ plots where the net plot size is 9'×20'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Medium infection of leaf spot disease—1%. Bordeaux mixture sprayed. (iii) Yield of rhizomes. (iv) (a) 1953—N.A. (b) and (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 6455 lb./ac. (ii) 1021 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of rhizomes in lb./ac.

Treatment	S ₁	S ₂	S ₃	S ₄	S ₅
Av. yield	10311	7648	6364	4791	3159
S.E./mean	=416 lb./ac.				

Crop :- Ginger.

Ref :- K. 56(17).

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

Type :- 'C'.

Object :- To determine the optimum spacing for Ginger crop.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) (a) Brown to red clayey. (b) Refer soil analysis, Ambalavayal. (iii) 8.5.1956. (iv) (a) Three ploughings and forming beds. (b) Sown in pits. (c) N.A. (d) As per treatments. (e) N.A. (v) 20 tons/ac. of C.M. was applied at planting as B.D. (vi) Local. (vii) Unirrigated. (viii) Three weedings, earthing up and mulching with G.L. at 20000 lb./ac. (ix) 84.00°. (x) 28.1.1957.

2. TREATMENTS :

Same as in expt. no. 16 on page 219.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 21'x9'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Leaf spot attack—1% Bordeaux mixture sprayed. (iii) Weight of rhizomes. (iv) (a) 1953—N.A. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 20468 lb./ac. (ii) 2144 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of rhizomes in lb./ac.

Treatment	S ₁	S ₂	S ₃	S ₄	S ₅
Av. yield	25401	22405	19408	19938	15259
S.E./mean	=876 lb./ac.				

Crop :- Ginger.

Ref :- K. 57(18).

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

Type :- 'C'.

Object :- To determine the optimum spacing for Ginger crop.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) (a) Loamy to red clayey. (b) Refer soil analysis, Ambalavayal. (iii) 26.4.1957. (iv) (a) 3 ploughings, forming beds of size 3'x9½'. Planting seed bits ½oz./pit. (b) Planted in pits. (c) 1200 lb./ac. (d) As per treatments. (e) N.A. (v) 20 tons/ac. of powdered C.M. applied at planting. (vi) Local. (vii) Unirrigated. (viii) 3 weedings, earthing up and mulching with G.L. at 20000 lb./ac. (ix) 90.10°. (x) 14.1.1958.

2. TREATMENTS :

Same as in expt. no. 16 on page 219.

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) Satisfactory. (ii) Light infection of leaf spot—1% Bordeaux mixture sprayed. (iii) Yield of rhizomes. (iv) (a) N.A. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 13516 lb./ac. (ii) 3646 lb./ac. (iii) Treatment differences are **not significant**. (iv) Av. yield of rhizomes in lb./ac.

Treatment	S ₁	S ₂	S ₃	S ₄	S ₅
Av. yield	14790	15327	13790	13149	10528

S.E./mean = 1489 lb./ac.

Crop :- Ginger.

Ref :- K. 58(19).

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

Type :- 'C'

Object :- To determine the optimum spacing for Ginger crop.

1. BASAL CONDITIONS:

(i) (a) to (c) Nil. (ii) (a) Loamy to red clayey. (b) Refer soil analysis, Ambalavayal. (iii) 21.4.1958. (iv) (a) 3 ploughings and forming seed beds. (b) sown in pits. (c) **N.A.** (d) As per treatments. (e) N.A. (v) 20 tons/ac. of powdered cow dung applied at planting. (vi) **Local**. (vii) **Unirrigated**. (viii) 3 weedings, earthing up, and mulching with 20,000 lb./ac. of G.L. (ix) 95.6°. (x) 24.1.1959.

2. TREATMENTS :

Same as in expt. no. 16 on page 219.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 18'x9'. (v) **Nil**. (vi) Yes.

4. GENERAL :

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

5. RESULTS:

(i) 16469 lb./ac. (ii) 2621 lb./ac. (iii) Treatment differences are **highly significant**. (iv) Av. yield of rhizomes in lb./ac.

Treatment	S ₁	S ₂	S ₃	S ₄	S ₅
Av. yield	10797	13664	17786	19354	20742

S.E./mean = 1070 lb./ac.

Crop :- Ginger.

Ref :- K. 59(20).

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

Type :- 'C'

Object :- To determine the optimum spacing for Ginger crop.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) (a) Loamy to red clayey. (b) Refer soil analysis, Ambalavayal. (iii) 29.4.1959. (iv) (a) Four ploughings and removing weeds and stubbles. (b) to (e) **N.A.** (v) 10 tons/ac. of C.M. applied at planting by putting in the pit. (vi) **Local**. (vii) **Unirrigated**. (viii) **Mulching** with 15,000 lb./ac. of G.L. and 4 weedings. (ix) 80° to 90°. (x) 5.1.1960.

2. TREATMENTS :

Same as in expt. no. 16 on page 219.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 100'x12'. (iii) 6. (iv) (a) 20'x12'. (b) 18'x9'. (v) 1 ft. wide pathways are provided with each bed. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Germination counts, tiller counts and rhizome yield. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 14714 lb./ac. (ii) 3574 lb./ac. (iii) The treatment differences are significant. (iv) Av. yield of rhizomes in lb./ac.

Treatment	S ₁	S ₂	S ₃	S ₄	S ₅
Av. yield.	14601	16617	16752	13633	11966

S.E./mean = 1460 lb./ac.

Crop :- Ginger.

Site :- Ginger Res. Stn., Thodupuzha.

Ref :- K. 58(21).

Type :- 'C'.

Object :- To find out the effect of different spacings on yield of Ginger.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Nil. (c) Nil. (ii) (a) Loam (b) Refer soil analysis, Thodupuzha. (iii) 15.5.1958. (iv) (a) one digging, preparing seed beds of size 12' x 6' and 6" high (b) Planting seed bits in lines (c) 1000 lb./ac. (d) As per treatments. (e) N.A. (v) 10 C.L./ac. of C.M. at planting. (vi) Local. (vii) Unirrigated. (viii) Weeding, earthing up and mulching with 20000 lb./ac. of G.L. (ix) 80° to 130°. (x) 1.1.1959.

2. TREATMENTS :

6 spacings : S₁=6" x 6", S₂=6" x 9", S₃=9" x 9", S₄=6" x 12", S₅=9" x 12" and S₆=12" x 12".

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 12' x 24'. (b) For S₁ : 22' x 10', S₂ : 21' x 10', S₃ : 21' x 9', S₄ : 20' x 10', S₅ : 20' x 9' and S₆ : 20' x 8'. (v) One row all round the net plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of rhizomes. (iv) (a) 1958—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1059 lb./ac. (ii) 382 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of rhizomes in lb./ac.

Treatment	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆
Av. yield	932	1132	855	880	1422	1134

S.E. of means = 156 lb./ac.

Crop :- Ginger.

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

Ref :- K. 56(22).

Type :- 'CM'.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Nil. (c) Nil. (ii) (a) Brown to red clayey. (b) Refer soil analysis, Ambalavayal. (iii) 6.5.1957. (iv) (a) Ploughings thrice and forming beds (b) Sown in pits on the seed bed. (c) N.A. (d) 9" x 9". (e) N.A. (v) 20 tons of C.M. applied at planting as B.D. Mulching with G.L. at 20000 lb./ac. (vi) Local. (vii) Unirrigated. (viii) Three weedings followed by earthing up. (ix) 84.00°. (x) 31.1.57.

2. TREATMENTS :

All combinations of (1) and (2)

1. 2 cultural treatments : C_0 = No shade and C_1 = shade.

2. 5 levels of mulch : M_0 = no mulch, M_1 = 10000 lb./ac. of G.L. at planting, M_2 = M_1 + 5000 lb./ac. 45 days after planting and M_3 = M_2 + 5000 lb./ac. 90 days after planting.

Shade provided by *Pandal*. G.L. given as mulch.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 6' × 19.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Leaf spot disease—1%. Bordeaux mixture sprayed. (iii) Yield of rhizomes. (iv) (a) 1955—1956 (instead of shade, two forms of mulch were tried in 1955) (b) No (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 14259 lb./ac. (ii) 2384 lb./ac. (iii) M and C effects are highly significant. Interaction is not significant. (iv) Av. yield of rhizomes in lb./ac.

	M_0	M_1	M_2	M_3	Mean
C_0	10722	15376	17610	17498	15302
C_1	11243	11541	15264	14818	13217
Mean	10983	13477	16456	16158	14259

S.E. of C marginal means = 487 lb./ac.

S.E. of M marginal means = 688 lb./ac.

S.E. of body of table = 973 lb./ac.

Crop :- Ginger.

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

Ref :- K. 57(23).

Type :- 'CM'.

Object:—To determine the effect of shade and optimum dose of leaf mulch for Ginger.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) (a) N.A. (b) Refer soil analysis, Ambalavayal. (iii) 22.4.1957. (iv) (a) 3 ploughings Forming seed beds of 3' × 9½' size. (b) Planting seed bits. (c) 1200 lb./ac. (d) 9" × 9". (e) N.A. (v) Mulching was given as per treatments. 20 ton of F.Y.M. applied at planting. (vi) Local. (vii) Unirrigated. (viii) 3 weedings followed by earthing up. (ix) 90.10". (x) 18.1.1958.

2. TREATMENTS :

Same as in expt. no. 22 above.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 6' × 19½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Yield of rhizomes. (iv) (a) 1957—1958. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 17792 lb./ac. (ii) 2063 lb./ac. (iii) C and M effects are highly significant and interaction C × M is also significant. (iv) Av. yield of rhizomes in lb./ac.

	M ₀	M ₁	M ₂	M ₃	Mean
C ₀	8254	18924	18802	21035	16754
C ₁	13712	18615	20291	22711	18831
Mean	10983	18772	19546	21873	17792

S.E. of C marginal mean = 421 lb./ac.

S.E. of M marginal mean = 596 lb./ac.

S.E. of body of table = 841 lb./ac.

Crop :- Ginger.

Ref :- K. 58(24).

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

Type :- 'CM'.

Object :- To determine the effect of shade and the optimum dose of leaf mulch for Ginger.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) (a) Loamy to red clayey soil. (b) Refer soil analysis, Ambalavayal. (iii) 16.4.1958. (iv) (a) Three ploughings and forming beds. (b) Sown in pits. (c) N.A. (d) 9'×9'. (e) N.A. (v) 20 tons/ac. of F.Y.M. applied at planting. (vi) Local (vii) Unirrigated. (viii) Weeding and earthing up thrice. (ix) 95.61%. (x) 27.1.1959.

2. TREATMENTS :

Same on in expt. no. 22 on page 222.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 6'×19.15'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Yield of ginger. (iv) (a) 1957—1958. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 18675 lb./ac. (ii) 2666 lb./ac. (iii) Main effect of M and interaction C×M are highly significant. C effect is also significant. (iv) Av. yield of rhizomes in lb./ac.

	M ₀	M ₁	M ₂	M ₃	Mean
C ₀	8557	19779	21034	21728	17775
C ₁	15008	19488	22960	20854	19577
Mean	11783	19634	21997	21291	18675

S.E. of C marginal means = 544.2 lb./ac.

S.E. of M marginal means = 769.6 lb./ac.

S.E. of body of table = 1088.4 lb./ac.

Crop :- Ginger.

Ref :- K. 59(25).

Site :- Ginger Res. Stn., Thodupuzha.

Type :- 'CM'.

Object :- To ascertain the effect of different spacings, seed size and levels of manure on Ginger yield.

1. BASAL CONDITIONS :

(1) (a) to (c) Nil. (ii) (a) Laterite soil. (b) Refer soil analysis, Thodupuzha. (iii) 22.6.1959. (iv) (a) Digging, levelling and preparing seed beds. (b) Sowing in pits (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) Local (medium). (vii) Unirrigated. (viii) Three weedings, earthing up and mulching with G.L. (ix) 167.2". (x) 24.1.1960.

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

Six spacings : $S_1=6'' \times 6''$, $S_2=6'' \times 9''$, $S_3=9'' \times 9''$, $S_4=6'' \times 12''$, $S_5=9'' \times 12''$ and $S_6=12'' \times 12''$.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 seed sizes : $R_1=\frac{1}{2}''$ to $1''$, $R_2=1''$ to $1\frac{1}{2}''$ and $R_3=1\frac{1}{2}''$ to $2\frac{1}{2}''$.

(2) 2 levels of manure : $M_1=10$ and $M_2=20$ C.L./ac. of C.M.

The manures were applied in two equal doses, half at planting and the other half 45 days after planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main plots/block ; 6 sub plots/main-plot. (b) $84' \times 156'$. (iii) 2. (iv) (a) $14' \times 26'$. (b) $12' \times 24'$. (v) Yes. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of shoot-borer and leaf-spot—D.D.T. and Cupravit sprayed. (iii) No. of tillers/plant, no. of nodes, length of shoots, average length and breadth of leaves and rhizome yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 4499 lb./ac. (ii) (a) 2113 lb./ac. (b) 1017 lb./ac. (iii) S effect is highly significant while that of R is significant. Others are not significant. (iv) Av. yield of rhizomes in lb./ac.

	S_1	S_2	S_3	S_4	S_5	S_6	Mean	M	M_2
R_1	6485	4519	4074	3554	2685	2940	4043	4468	3617
R_2	5965	4604	4865	3649	4566	3252	4483	4471	4495
R_3	7493	5710	4433	4538	4641	3006	4970	4664	5277
Mean	6648	4944	4457	3914	3964	3056	4499	4534	4463
M_1	6649	4802	4846	3857	3926	3126			
M_2	6646	5086	4069	3970	4002	3006			

S.E. of difference of two

1. S marginal means = 862.8 lb./ac.
2. R marginal means = 293.5 lb./ac.
3. M marginal means = 239.4 lb./ac.
4. R means at the same level of S = 719.1 lb./ac.
5. S means at the same level of R = 1043.5 lb./ac.
6. M means at the same level of S = 587.2 lb./ac.
7. S means at the same level of M = 957.3 lb./ac.
8. Body of M×R table = 293.6 lb./ac.

Crop :- Ginger.

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

Ref :- K. 55(26).

Type :- 'D'.

Object :- To find out a suitable and efficient fungicide for the control of soft rot disease.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) (a) Brown to red clayey soil. (b) Refer soil analysis, Ambalavayal. (iii) 16.5.1955. (iv) (a) Three ploughings and forming beds. (b) Sown in pits (c) N.A. (d) $9'' \times 9''$. (e) N.A. (v) 20 tons of powdered C.M. applied at planting as B.D. (vi) Local. (vii) Unirrigated. (viii) Three weedings followed by earthing up. Mulching with G.L. at 20700 lb./ac. (ix) 82.00. (x) 18.2.1956.

2. TREATMENTS :

1. Control.
2. Colloidal copper (3 gallons of stock solution in 40 gallons of water).
3. Chestnut compound (1 oz. compound in two gallons of water).
4. 0.1 % wettable Ceresan at $\frac{1}{4}$ pint per pit.

The fungicides were applied twice, once before planting and then one month after planting.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 6'×19.5'. (v) No. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) Control measures as per treatments. (iii) Yield of rhizomes. (iv) (a) 1955—contd. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 21921 lb./ac. (ii) 1928 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of rhizomes in lb./ac.

Treatment	1	2	3	4
Av. yield	21966	20570	23734	21407
S.E./mean	=786 lb./ac.			

Crop :- Ginger.

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

Ref :- K. 56(27).

Type :- 'D'.

Object :—To find out a suitable and efficient fungicide for the control of soft rot disease.

1. BASAL CONDITIONS :

- (i) (a) to (c) Nil. (ii) (a) Brown to red clayey soil. (b) Refer soil analysis, Ambalavayal. (iii) 10.5.1956. (iv) (a) Three ploughings and firming beds. (b) Sown in pits. (c) —. (d) 9'×9'. (e) N.A. (v) 20 tons of powdered C.M. applied at planting as B.D. (vi) Local. (vii) Unirrigated. (viii) Three weedings followed by earthing up. Mulching with G.L. at 20000 lb./ac. (ix) 84.00%. (x) 25.1.1957.

2. TREATMENTS :

Same as in expt. no. 26 on page 225.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 6'×20'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) Under investigation. (iii) Yield of rhizomes. (iv) (a) 1955—contd. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 14505 lb./ac. (ii) 2290 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of rhizomes in lb./ac.

Treatment	1	2	3	4
Av. yield	11850	12409	17621	16132
S.E./mean	=934 lb./ac.			

Crop :- Ginger.

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

Ref :- K. 57(28).

Type :- 'D'.

Object :—To find out a suitable fungicide to control the soft rot disease of Ginger.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) (a) Loamy to red clayey. (b) Refer soil analysis, Ambalavayal. (iii) 16.4.1957. (iv) (a) Ploughed thrice and formed beds. (b) Sown in pits. (c) —. (d) 9'×9'. (e) N.A. (v) 20 tons/ac. of powdered C.M. was applied at planting. (vi) Local. (vii) Unirrigated. (ix) 90.1". (x) 14.1.1958.

2. TREATMENTS :

Same as in expt. no. 26 on page 225.

Applied first immediately before planting and next 6 weeks after planting at $\frac{1}{2}$ pint per pit.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 6'×19.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Yield of rhizomes. (iv) (a) 1957—1958. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 18475 lb./ac. (ii) 1936 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of rhizomes in lb./ac.

Treatment	1	2	3	4
Av. yield	17685	17621	20228	18366
S.E./mean	=790 lb./ac.			

Crop :- Ginger.

Ref :- K. 58(29).

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

Type :- 'D'.

Object :—To find out a suitable and efficient fungicide for the control of soft-rot disease.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) (a) Loamy to red clayey. (b) Refer soil analysis, Ambalavayal. (iii) 1.12.1958. (iv) (a) Three ploughings and forming seed beds. (b) Seed bits of weight $\frac{1}{2}$ oz. were sown. (c) N.A. (d) 9'×9'. (e) N.A. (v) Leaf mulch at 20000 lb./ac., 20 tins of C.M. applied at planting. (vi) Local. (vii) Unirrigated. (viii) Weeding and three earthing up. (ix) 95.61". (x) 26.4.1958.

2. TREATMENTS :

Same as in expt. no. 28 on page 226.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 6'×19.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Nil. (ii) Nil. (iii) Yield of rhizomes. (iv) (a) 1955—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 19230 lb./ac. (ii) 3674 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of rhizomes in lb./ac.

Treatment	1	2	3	4
Av. yield	19488	17741	19846	19846
S.E./mean	=1501 lb./ac.			

Crop :- Ginger.

Ref :- K. 59(30).

Site :- Agri Res. Stn., Ambalavayal.

Type :- 'D'

Object :—To find out an effective control measure against the soft-rot disease of Ginger caused by the *Pythium* or *Sclerotium* species of fungi.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) (a) Virgin soil rich in organic matter. (b) Refer soil analysis, Ambalavayal. (iii) 9.5.1959. (iv) (a) Ploughed and tilled well. Weeds and stubbles are removed. (b) 10'×3' beds are formed (c) N.A. (d) 12'×12'. (e) N.A. (v) 10 tons/ac. of C.M. applied at planting. (vi) Local (medium). (vii) Unirrigated. (viii) Mulching with 15000 lb./ac. of green leaf, weeding 4 times. (ix) 80° to 90°. (x) 4.1.1960.

2. TREATMENTS:

1. Control
2. Applying colloidal copper (3 gallons of stock solution in 40 gallons of water) at $\frac{1}{4}$ pint per pit.
3. Applying chestnut compound (1.02 in 2 gallons of water) at $\frac{1}{4}$ pint per pit.
4. Applying wettable ceresan (0.1% solution) at $\frac{1}{4}$ pint per pit.
5. Cupravit (0.4% solution) at $\frac{1}{4}$ pint per pit.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 110'×8'. (iii) 6. (iv) (a) 8'×22'. (b) 6'×20'. (v) 1 ft. wide path ways after each bed and 2 ft. path ways after each plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Germination and tiller counts of plants were taken. (iv) 1955—contd. (b) No. (c) Nil. (v) (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 7020 lb./ac. (ii) 1513 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of rhizomes in lb./ac.

Treatment	1	2	3	4	5
Av. yield	6607	7187	7804	8349	5155

S.E./mean = 618 lb./ac.

Crop :- Pepper.

Ref :- K. 57(1).

Centre :- Kottayam and Kanjirapally. (c.f.)

Type :- 'M'.

Object:—To demonstrate and study the effect of potash in conjunction with N and P_2O_5 on Pepper yield.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Pepper. (c) N.A. (ii) Reclaimed soil in 2 fields and gravelly laterite in the remaining fields. (iii) On an average 27 lb. F.Y.M. and 12 lb. green leaf per vine. (iv) *karimunda* (local). (v) (a) to (e) N.A. (vi) N.A. (vii) Unirrigated. (viii) Nil. (ix) 105.29°. (x) Feb.—March.

2. TREATMENTS :

1. Cultivator's usual practice.
2. 0.12 lb. of N+0.18 lb. of P per vine.
3. 0.12 lb. of N+0.18 lb. of P+0.24 lb. of K per vine.

3. DESIGN :

(i) Representative fields were selected but without any randomisation. No. of trials N.A. (ii) 1/10 acre ; 50 vines spaced 9'×9'. (iii) 8 vines. (iv) Yes.

4. GENERAL :

(i) Good. (ii) *Pullu* disease was noticed in two of the fields. No control measures taken. (iii) Yield of green pepper. (iv) (a) 1957—contd. (b) and (c) —. (v) (a) and (b) —. (vi) Nil. (vii) Expt. was conducted on cultivators' fields.

5. RESULTS :

(i) 8.39 lb./vine. (ii) N.A. (iii) The treatment differences are highly significant. (iv) Av. yield of green pepper in lb./vine.

Treatment	1	2	3
Av. yield	6.92	7.66	10.58
S.E./mean	=0.663 lb./vine.		

Crop :- Sesamum (3rd crop).

Site :- Oilseed Res. Stn., Kayamkulam.

Ref :- K. 58(1).

Type :- 'M'.

Object :- To find out the optimum dose of manure for Sesamum.

BASAL CONDITIONS :

(i) Paddy—paddy—sesamum. (b) Paddy. (c) C.M. at 4000 lb./ac. (ii) (a) Sandy loam. (b) N.A. (iii) 24.1.1958. (iv) (a) 2 ploughings with wooden plough, 2 with iron plough, 2 harrowings and levellings with wooden beam. (b) Sown by dibbling. (c) —. (d) 1'×1'. (e) Only one seedling/hole allowed to grow. (v) Nil. (vi) Local (early). (vii) Unirrigated. (viii) 2 hoeings and weedings. (ix) 1.77". (x) 7.4.1958.

2. TREATMENTS :

1. 15 lb./ac. of N as C.M.
2. 30 lb./ac. of N as C.M.
3. 15 lb./ac. of N as C.M. + 20 lb./ac. of P_2O_5 as B.M. + 20 lb./ac. of K_2O as wood ash.
4. 30 lb./ac. of N as C.M. + 20 lb./ac. of P_2O_5 as B.M. + 20 lb./ac. of K_2O as wood ash.
5. Control.

Manures broadcast before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 46'×13'. (b) 44'×11'. (v) One row all round the net plot. (vi) Yes.

4. GENERAL :

(i) Stunted growth due to less rain. Poor flowering and setting. (ii) Phyllody was noticed on a small scale. Infected plants pulled out and destroyed. (iii) Yield of sesamum. (iv) (a) 1958—contd. with modifications. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3027 lb./ac. (ii) 582 lb./ac. (iii) Treatments are not significantly different. (iv) Av. yield of sesamum in lb./ac.

Treatment	1	2	3	4	5
Av. yield	3082	2940	3184	3105	2824

S.E /mean = 238 lb./ac.

Crop :- Sesamum.

Site :- Oilseeds Res. Stn., Kayamkulam.

Ref :- K. 58(2).

Type :- 'M'.

Object :- To find out the optimum dose of manure required for Sesamum.

1. BASAL CONDITIONS :

(i) (a) The land is double crop wet land and gingelly is cultivated after the harvest of second crop paddy. (b) Paddy. (c) Six C.L. of C.M. at transplanting and A/S and Pot. Sul. at 1 cwt. each one month after transplanting. (ii) (a) Sandy loam (b) N.A. (iii) 10.1.1959. (iv) (a) One digging with *mummatti* and two harrowings with toothed country harrow. (b) to (e) N.A. (v) Nil. (vi) *Onathukara* (early). (vii) Unirrigated. (viii) Two inter cultivations with *Kochuthumba*. (ix) N.A. (x) 28.3.1959.

TREATMENTS :

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

- (1) 3 levels of N : $N_0=0$, $N_1=15$ and $N_2=30$ lb./ac.
- (2) 3 levels of P_2O_5 : $P_0=0$, $P_1=15$ and $P_2=30$ lb./ac.
- (3) 3 levels of K_2O : $K_0=0$, $K_1=15$ and $K_2=30$ lb./ac.

3. DESIGN :

(i) 3³ Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 3. (iv) (a) 15'×7½' (b) 12'×6'. (v) ½' border all round the net plot to be discarded. (vi) Yes.

4. GENERAL :

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

5. RESULTS :

(i) 436.8 lb./ac. (ii) 59.5 lb./ac. (iii) P and K effects are highly significant. Others are not significant. (iv) Av. yield of oilseed in lb./ac.

	K ₀	K ₁	K ₂	Mean	P ₀	P ₁	P ₂
N ₀	313.7	443.4	456.3	404.5	447.3	378.6	387.6
N ₁	391.5	404.5	623.6	473.2	403.2	631.9	385.0
N ₂	342.3	438.2	517.3	432.6	457.6	560.0	280.1
Mean	349.2	428.7	532.4	436.8	436.0	523.3	350.9
P ₀	312.4	418.7	576.9				
P ₁	423.9	505.6	640.4				
P ₂	311.2	361.7	379.8				

S.E. of any marginal mean

=11.4 lb./ac.

S.E. of body of any table

=19.8 lb./ac.

Crop :- Sesamum.

Ref :- K. 59(3).

Site :- Oilseeds Res. Stn., Kayamkulam.

Type :- 'M'.

Object :-To determine the optimum dose of different manures for Sesamum.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy—Sesamum. (b) Paddy. (c) C.M. at 6 C.L./ac.+28 lb./ac. of Pot. Sul.+28 lb./ac. of A/S. (ii) (a) Sandy loam (b) N.A. (iii) 12.1.59. (iv) (a) 2 ploughings with country plough, 2 with iron plough, breaking the clots and levelling. (b) Dibbling with hand to a depth of ½" to 1" (c)—. (d) 9"×9". (e) N.A. (v) Nil. (vi) Local (75 days duration). (vii) Unirrigated. (viii) Two weedings. (ix) 2.92°. (x) 28 and 29.3.1959.

2. TREATMENTS:

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

(1) 3 levels of N as A/S : N₀=0, N₁=15 and N₂=30 lb./ac.

(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=15 and P₂=30 lb./ac.

(3) 3 levels of K₂O as Pot. Sul. : K₀=0, K₁=15 and K₂=30 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) 15'×202½'. (iii) 3. (iv) (a) 15'×7½' (b) 12'×6'. (v) One row along length and two rows along breadth. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Sesamum yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 140.4 lb./ac. (ii) 57.11 lb./ac. (iii) Main effects of P and K are highly significant. Interaction N×P is significant. (iv) Av. yield of sesamum in lb./ac.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁	P ₂
K ₀	100.3	125.4	110.1	112.0	100.3	135.7	99.9
K ₁	142.9	129.7	141.9	138.1	136.0	162.3	116.1
K ₂	146.3	200.3	166.6	171.1	185.3	205.6	122.3
Mean	129.8	151.8	139.5	140.4	140.6	167.8	112.8
P ₀	144.2	128.9	148.6				
P ₁	120.7	203.0	179.9				
P ₂	124.7	123.6	90.1				

S.E. of any marginal mean = 11.0 lb./ac.
S.E. of body of any table = 19.0 lb./ac.

Crop :- Sesamum.
Centre :- Palghat (c.f.).

Ref :- K. 49(4).
Type :- 'M'.

Object :- To investigate the relative efficiency of different nitrogenous fertilizers at different levels.

1. BASAL CONDITIONS TO 3. DESIGN :

Same as in expt. no. 121 on pages 83 and 84 on paddy crop.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Sesamum yield. (iv) (a) 1959—contd. (b) N.A. (c) Nil. (v) Quilon. (vi) Nil. (vii) Expt. was conducted on cultivator's fields.

5. RESULTS :

Treatment	0	n ₁ '	n ₂ '	n ₁ ''	n ₂ ''	n ₁ '''	n ₂ '''
Av. yield	304	469	494	494	485	370	502

G.M.=445 lb./ac. ; S.E.=36.07 lb./ac. ; No. of trials=4.

Crop :- Sesamum.
Centre :- Palghat (c.f.).

Ref :- K. 59(5).
Type :- 'M'.

Object. :- To study the response of sesamum to levels of N, P and K, applied individually and in combination.

1. BASAL CONDITIONS TO 3. DESIGN :

Same as in expt. no. 111 on page 79 on paddy crop.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Sesamum yield. (iv) (a) 1959—Contd. (b) No. (c) N.A. (v) (a) Palghat and Quilon. (b) Nil. (vi) Nil. (vii) Expt. was conducted on cultivator's fields.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	313	411	379	527	346	477	428	568

G.M.=431 lb./ac. ; S.E.=21.17 lb./ac. ; No. of trials=4.

Crop :- Sesamum.
Centre :- Quilon (c.f.).

Ref :- K. 59(6).
Type :- 'M'.

Object :—To investigate the relative efficiency of different nitrogenous fertilizers at different levels.

1. BASAL CONDITIONS TO 3. DESIGN :

Same as in expt. no. 121 on pages 83, 84 on paddy crop.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Sesamum yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) Palghat. (vi) Nil. (vii) Expt. was conducted on cultivators' fields.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	444	560	625	592	650	609	625

G.M.=586 lb./ac. ; S.E.=21.53 lb./ac. ; No. of trials=8.

Crop :- Sesamum.
Centre :- Quilon (c.f.).

Ref :- K. 59(7).
Type :- 'M'.

Object :—To study the response of Sesamum to levels of N, P and K applied individually and in combinations.

1. BASAL CONDITIONS TO 3. DESIGN :

Same as in expt. no. 111 on page 79 on paddy crop.

4. GENERAL :

Same as in expt. no. 5 on page 231 on sesamum crop.

5. RESULTS :

Treatment	0	n	p	np	k	nk	pk	npk
Av. yield	436	543	510	625	494	592	592	749

G.M.=568 lb./ac. ; S.E.=12.87 lb./ac. ; No. of trials=8.

Crop :- Groundnut.
Center :- Palghat (c.f.).

Ref :- K. 59(1).
Type :- 'M'.

Object :—To investigate the relative efficiency of different nitrogenous fertilizers at different levels.

1. BASAL CONDITIONS TO 3. DESIGN :

Same as in expt. no. 121 on page 83 and 84 on paddy crop.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Groundnut yield. (iv) (a) 1959—contd. (b) No. (c) N.A. (v) No. (vi) Nil. (vii) Expt. was conducted on cultivators' fields.

5. RESULTS :

Treatment	0	n_1'	n_2'	n_1''	n_2''	n_1'''	n_2'''
Av. yield	839	1012	1284	1144	1506	1210	913

G.M.=1130 lb./ac. ; S.E.=11.64 lb./ac. ; No. of trials=2.

Crop :- Lemon Grass.

Ref :- K. 54(1).

Site :- Lemon Grass Res. Stn., Odakkali.

Type :- 'M'.

Object :- To study the effect of different combinations of N, P and K on yield and quality of oil in Lemon Grass.

1. BASAL CONDITIONS :

(i) Fallow land. (ii) (a) Typical laterite. (b) Refer soil analysis, Odakkali. (iii) By seed. (iv) Red Stemmed grass (local) (v) 28.4.1953/9.8.1953. Sowing by broadcast in a nursery. Seed rate 15 lb./ac. The plants were transplanted along raised beds separated by furrows. Spacing 12" plant to plant and 15" between rows. Single plant per hole. (vi) 103 days. (vii) Nil. (viii) 3 Weeding. (ix) Nil. (x) Unirrigated. (xi) 100%. (xii) Generally 4 to 5 harvests/year. The analysis is based on only one harvest done on 5.5.1954.

2. TREATMENTS :

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

(1) 2 levels of A/S : $N_0=0$, $N_1=1$ lb./plot.

(2) 2 levels of Super : $P_0=0$, $P_1=1.2$ lb./plot.

(3) 2 levels of Mur. of Pot. : $K_0=0$, $K_1=0.4$ lb./plot.

3. DESIGN :

(i) 2^3 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) 120 plants, plot of size 20' x 6'. (v) 2 feet furrow between plots and a foot path between blocks. (vi) Yes.

4. GENERAL :

(i) Growth very good in NPK plots. (ii) Nil. (iii) Fresh weight of grass, yield of oil and citral content. (iv) (a) 1953—contd. (b) N.A. (v) Nil. (vi) The experiment commenced with 120 plants per plot; but many plants died afterwards. The analysis is based on a single harvest of 120 plants per plot of size 20' x 6' and hence not used for estimating per acre yield.

5. RESULTS :

(i) 32.44 lb./plot. (ii) 8.06 lb./plot. (iii) Main effect of P is highly significant. Other effects and interactions are not significant. (iv) Av. yield of grass adjusted in lb./plot.

	N_0	N_1	Mean	K_0	K_1
P_0	26.77	26.35	26.56	28.73	24.39
P_1	37.12	39.51	38.32	38.16	38.48
Mean	31.94	32.93	32.44	33.44	31.44
K_0	33.64	33.25			
K_1	30.26	32.61			

S.E. of any marginal mean = 2.01 lb./plot.

S.E. of body of any table = 2.84 lb./plot.

Crop :- Lemon Grass.

Ref :- K. 55(2).

Site :- Lemon Grass Res. Stn., Odakkali.

Type :- 'M'.

Object :- To study the effect of different combinations of N, P and K on yield and quality of oil in Lemon Grass.

1. BASAL CONDITIONS :

(i) Fallow land. (ii) (a) Typical laterite (b) Refer soil analysis, Odakkali. (iii) By seed. (iv) Red stemmed grass (local). (v) 28.4.1953/9.8.1953. Seed rate 15 lb./ac. The plants were transplanted along raised beds separated by furrows. Spacing 12" plant to plant and 15" between rows. Single plant/hole. (vi) 102 days. (vii) Nil. (viii) 3 weeding. (ix) Nil. (x) Unirrigated. (xi) 100%. (xii) 28.6.1955 ; 8, 9.9.1955 ; 28.10.1955 ; 12, 13.12.1955.

2. TREATMENTS :

Same as in expt. no. 1 on page 233.

3. DESIGN :

(i) 2³ Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) About 120 plants, plot of size 20' x 6'. (v) 2 feet border between plots. (vi) Yes.

4. GENERAL :

(i) Growth very good in NPK plots. (ii) Nil. (iii) Fresh weight of grass, yield of oil and citral content. (a) 1953—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

(i) 66.28 lb./plot. (ii) 11.67 lb./plot. (iii) Main effect of N is significant and of P is highly significant. Others are not significant. (iv) Av. yield of grass in lb./plot.

	N ₀	N ₁	Mean	K ₀	K ₁
P ₀	46.61	71.54	59.08	59.59	58.56
P ₁	60.43	86.55	73.49	70.44	76.55
Mean	53.52	79.04	66.28	65.01	67.55
K ₀	50.84	56.20			
K ₁	99.19	78.90			

S.E. of any marginal mean = 2.92 lb./plot.
S.E. of body of any table = 4.12 lb./plot.

Crop :- Lemon Grass.

Ref :- K. 56(3).

Site :- Lemon Grass Res. Stn., Odakkali.

Type :- 'M'.

Object :- To study the effect of different combinations of N, P and K on the yield and quality of oil in Lemon Grass.

1. BASAL CONDITIONS :

(i) Fallow land. (ii) (a) Laterite. (b) Refer soil analysis, Odakkali. (iii) By seeds. (iv) Red stemmed grass—(local). (v) The plants were transplanted along raised beds separated by furrows. Sowing by broadcast in a nursery. Spacing 12" plant to plant and 15" between rows. Seed rate 15 lb./ac. Single plant per hole. (vi) 102 days. (vii) Nil. (viii) 2 weedings. (ix) Nil. (x) Unirrigated. (xi) 100°. (xii) 4 to 5 harvests in a year (23.6.1956 ; 7.8.1956 ; 3.10.1956. and 3.12.1956.)

2. TREATMENTS :

Same as in expt. no. 1 on page 233.

The manure was applied after each cutting of grass on 17.7.1956, 13.8.1956 and 13.12.1956. The plots were first mulched with hand forks and the manure sprinkled in the plots and mixed with the soil by hand hoeing.

3. DESIGN :

(i) 2³ Fact. in R.B.D. (ii) (a) 8 (b) N.A. (iii) 4. (iv) About 120 plants per plot, plot of size 1/363 ac. (v) (a) Nil. (b) 2' furrow between plots. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Fresh weight of grass, yield of oil and citral content. (iv) (a) 1953—contd. (b) N.A. (v) The expt. was conducted only on a small scale due to limited facilities. The number of plants in each experimental plot was not the same and hence the analysis was attempted by the covariance technique utilising the number of plants as the concomitant character. (vi) Nil.

5. RESULTS:

A. Yield of Grass.

- (i) 24.8 lb./plot. (ii) 3.4 lb./plot. (iii) Main effects of N and P and interaction N×P are highly significant.
 (iv) Av. yield of grass adjusted in lb./plot.

	N ₀	N ₁	Mean	K ₀	K ₁
P ₀	17.0	23.9	20.4	20.2	20.7
P ₁	20.0	38.1	29.1	27.7	30.4
Mean	18.5	31.0	24.8	23.9	25.6
K ₀	17.8	30.0			
K ₁	19.2	32.0			

S.E. of any marginal mean = 0.85 lb./plot

S.E. of body of any table = 1.20 lb./plot

B. Yield of Oil.

- (i) 17.5 c.c./plot. (ii) 2.8 c.c./plot. (iii) Main effect of N and P are highly significant. Interaction P×K is significant. (iv) Yield of oil in c.c. per plot.

	N ₀	N ₁	Mean	K ₀	K ₁
P ₀	13.6	17.8	15.7	16.5	14.8
P ₁	15.9	22.7	19.3	17.1	21.5
Mean	14.8	20.2	17.5	16.8	18.2
K ₀	14.6	19.0			
K ₁	14.8	21.5			

S.E. of any marginal mean = 0.70 c.c./plot.

S.E. of body of any table = 0.99 c.c./plot.

Crop :- Lemon Grass.

Ref :- K. 57(4).

Site :- Lemon Grass Res. Stn., Odakkali.

Type :- 'M'.

Object :- To study the effect of different combinations of N, P and K on the yield and quality of oil in Lemon Grass.

1. BASAL CONDITIONS:

- (i) Fallow land. (ii) (a) Laterite. (b) Refer soil analysis, Odakkali. (iii) By tiller separation. (iv) Red stemmed grass (local). (v) Transplanted in lines on 9.8.1953 on well prepared raised beds 1 foot apart and 1 plant per hole. (vi) 90 days. (vii) Nil. (viii) 2 weedings, (ix) Nil. (x) Rainfed. (xi) 100%. (xii) 1st cutting : 22.7.1957. 2nd cutting : 16.10.1957.

2. TREATMENTS:

Same as in expt. no. 1 on page 233.

The manures were applied after each harvest. The soil was mulched with hand forks and the manure sprinkled and mixed with the soil.

3. DESIGN:

- (i) 2³ Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) 20'×6' net (120 plants approximately). (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Fair. (ii) Nil. (iii) Fresh weight of grass, yield of oil per plot and citral content. (iv) (a) 1953—1957. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

A. Yield of Grass.

- (i) 80.48 lb./plot. (ii) 1.28 lb./plot. (iii) Main effects of P and K are highly significant. Main effect of N and interaction $N \times K$ are significant. (iv) Av. yield of grass in lb./plot.

	N ₀	N ₁	Mean	K ₀	K ₁
P ₀	61.44	71.50	66.47	61.12	71.81
P ₁	88.50	100.50	94.50	82.31	106.69
Mean	74.97	86.00	80.48	71.72	89.25
K ₀	71.44	72.00			
K ₁	78.50	100.00			

S.E. of any marginal mean = 0.32 lb./plot
S.E. of body of any table = 0.45 lb./plot

B. Yield of Oil.

- (i) 50.81 c.c./plot. (ii) 11.47 c.c./plot. (iii) Main effect of P is highly significant. Other effects and interaction are not significant. (iv) Av. yield of oil in c.c./plot.

	N ₀	N ₁	Mean	K ₀	K ₁
P ₀	38.38	46.75	42.56	39.12	46.00
P ₁	56.25	61.88	59.06	56.75	61.38
Mean	47.31	54.31	50.81	47.94	53.68
K ₀	45.88	50.00			
K ₁	48.75	58.62			

S.E. of any marginal mean = 2.86 c.c./plot.
S.E. of body of any table = 4.06 c.c./plot.

Crop :- Lemon Grass.

Ref :- K. 59(5).

Site :- Lemon Grass Res. Stn., Odakkali.

Type :- 'M'.

Object :- To study the effect of different combinations of N, P and K on the yield of Lemon Grass.

1. BASAL CONDITIONS :

- (i) Virgin land. (ii) (a) Laterite loam. (b) Refer soil analysis, Odakkali. (iii) By vegetative multiplication and through seeds. (iv) Local. (v) 24.6.1959 to 28.6.1959. (vi) Uniform rooted slips were transplanted, row to row distance : one foot, plant to plant : 6". About three years. (vii) Nil. (viii) 2 weedings. (ix) Nil. (x) Unirrigated. (xi) 169.60°. (xii) 1st cutting : 23.4.1959, 2nd cutting : 5.1.1960 to 7.1.1960.

2. TREATMENTS :

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

- (1) 3 levels of N as A/S : N₀ = 0, N₁ = 100 and N₂ = 200 lb./ac.
(2) 3 levels of P₂O₅ as Super : P₀ = 0, P₁ = 100 and P₂ = 200 lb./ac.
(3) 3 levels of K as Mur. of Potash : K₀ = 0, K₁ = 100 and K₂ = 200 lb./ac.

3. DESIGN :

(i) 3rd Fact. confounding NPK. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) Net : 396 plants ; gross : 480 plants. (v) One row around each plot. (vi) Yes.

4. GENERAL :

(i) Good vegetative growth. (ii) Nil. (iii) Only fresh weight of grass from each plot. (iv) (a) 1959—N.A. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

(i) 74.15 lb./plot. (ii) 9.92 lb./plot. (iii) Main effects of N, P and K and interactions N×P and N×K are highly significant. (iv) Av. yield of fresh grass in lb./plot.

	N ₀	N ₁	N ₂	Mean	K ₀	K ₁	K ₂
P ₀	60.58	65.67	66.83	64.36	58.25	68.50	66.33
P ₁	53.58	22.91	88.50	75.00	66.17	76.42	82.42
P ₂	57.92	96.50	94.83	83.08	74.00	81.75	93.50
Mean	57.36	81.69	83.39	74.15	66.14	75.55	80.75
K ₀	51.75	68.17	78.50				
K ₁	53.92	93.25	79.50				
K ₂	66.42	83.67	92.17				

S.E. of any marginal mean = 2.34 lb./plot.

S.E. of body of any table = 4.05 lb./plot.

Crop :- Lemon Grass.

Site :- Lemon Grass Res. Stn., Odakkali.

Ref :- K. 56(6).

Type :- 'M'.

Object :- To study the effect of a fertilizer mixture (sterameal) containing N, P and K in the proportion of 7 : 10 : 5 on the yield and quality of oil in Lemon Grass.

1. BASAL CONDITIONS :

(i) Fallow land. (ii) (a) Laterite. (b) Refer soil analysis, Odakkali. (iii) By seeds. (iv) Red stemmed grass (local). (v) 10.4.1954/2 and 6.6.1956. 1' spacing between rows and plants and single plant/hole. (vi) N.A. (vii) Nil. (viii) 2 weedings, 2 hoeings. (ix) Nil. (x) Unirrigated. (xi) 100'. (xii) 3 harvests on 6, 7.9.1956 ; 22, 24.10.1956 and 10, 11.2.1957.

2 TREATMENTS :

(1) Control (untreated):

(2) 600 lb. of sterameal per acre (i.e. 6.17 lb. per plot).

The manure was applied after each cutting at the rate of 600 lb. per acre. The dates of manure application were 13.7.1956, 10.9.1956 and 17.12.1956. The plots were mulched with hand forks and the manure sprinkled and covered lightly.

3. DESIGN :

(i) 2×2 L. Sq. (ii) (a) 2. (b) N.A. (iii) 6 (3 squares). (iv) [About 403 excluding border plants in rows. (v) One row all round each plot discarded for border effects. A space of 2 to 3 feet was left as foot path between the plots. (vi) No.

4. GENERAL :

(i) Growth very good ; there was marked difference in vegetative growth between treated and control plots. (ii) Nil. (iii) Fresh weight of grass, yield of oil and citral content. (iv) (a) 1956—N.A. (b) N.A. (v) Analysis attempted by covariance technique with number of plants/plot as concomitant character. (vi) Nil.

5. RESULTS :

A. Yield of Grass

(i) 190.20 lb./plot. (ii) 7.12 lb./plot. (iii) Treatment difference is significant. (iv) Av. yield of grass (adjusted) in lb./plot.

Treatment	1	2
Av. yield	133.3	247.0
S.E./mean	=2.91 lb./plot.	

B. Yield of Oil

(i) 109.35 c.c./plot. (ii) 19.96 c.c./plot. (iii) Treatment difference is not significant. (iv) Av. yield of oil (adjusted) in c.c./plot.

Treatment	1	2
Av. yield	82.1	136.6
S.E./mean	=6.92 lb./plot.	

Crop :- Lemon Grass.

Ref :- K. 56(7).

Site :- Lemon Grass. Res. Stn., Odakkali.

Type :- 'C'.

Object :- To study the effect of setting fire to the field during summer on the yield and quality of oil in Lemon Grass.

1. BASAL CONDITIONS :

(i) Fallow land. (ii) (a) Laterite. (b) Refer soil analysis, Odakkali. (iii) By seed. (iv) Red stemmed grass—(local). (v) 14.5.1955 to 18/19.8.1955. 4' spacing between plants and 8' between rows; single seedling/hole. (vi) N.A. (vii) Nil. (viii) 2 weedings and hoeing. (ix) Nil. (x) Unirrigated. (xi) 100". (xii) 4 harvests on 20, 21.6.1956; 3 to 6.8.1956; 24, 25.9.1956 and 6, 7.11.1956.

2. TREATMENTS :

- (1) Burning stubbles in the field.
(2) No burning (control).

3. DESIGN :

(i) 2x2 L. Sq. (ii) (a) 2. (b) N.A. (iii) 4 (2 squares). (iv) 2000 plants (approx.). (v) One row all round each plot was discarded. (vi) No.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Fresh weight of grass, yield of oil and citral content. (iv) (a) 1955 (late)—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

A. Yield of Grass

(i) 323.4 lb./plot. (ii) 19.97 lb./plot. (iii) Treatment difference is not significant. (iv) Av. yield of grass in lb./plot.

Treatment	1	2
Av. yield	322.75	324.12
S.E./mean	=9.99 lb./plot.	

B. Yield of Oil

(i) 9.56 oz./plot. (ii) 0.70 oz./plot. (iii) Treatment difference is not significant. (iv) Av. yield of oil in oz./plot.

Treatment	1	2
Av. yield	9.81	9.31
S.E./mean	=0.35 oz./plot.	

Crop :- Lemon Grass.

Ref :- K. 57(8).

Site :- Lemon Grass Res. Stn., Odakkali.

Type :- 'C'.

Object :- To study the effect of setting fire to the fields during summer on the yield and quality of oil in Lemon Grass.

1. BASAL CONDITIONS :

(i) Fallow land. (ii) (a) Laterite soil. (b) Refer soil analysis, Odakkali. (iii) By tiller separation. (iv) Local variety, red stemmed. (v) Spacing 4" between plants and 8" between rows. (vi) 90 days. (vii) Nil. (viii) Two weedings. (ix) Nil. (x) Rainfed. (xi) 100%. (xii) 25.6.1957 ; 21.8.1957 ; 12.10.1957 and 9.12.1957.

2. TREATMENTS :

Same as in expt. no. 7 on page 238.

3. DESIGN :

(i) Two 2x2 L. Sq. (ii) (a) 2. (b) N.A. (iii) 4 (2 squares). (iv) 2000. (v) One row around the net plot. (vi) No.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Fresh weight of grass, yield of oil in c.c. and citral content. (iv) (a) 1955—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

A. Yield of Grass

(i) 190.2 lb./plot. (ii) 5.83 lb./plot. (iii) Treatment difference is not significant. (iv) Av. yield of grass in lb./plot.

Treatment	1	2
Av. yield	191.00	189.38

S.E./mean = 2.92 lb./plot

B. Yield of Oil

(i) 206.5 c.c./plot. (ii) 0.85 c.c./plot. (iii) Treatment difference is not significant. (iv) Av. yield of oil in c.c./plot.

Treatment	1	2
Av. yield	217.5	195.5

S.E./mean = 0.42 c.c./plot

Crop :- Lemon Grass.

Ref :- K. 58(9).

Site :- Lemon Grass Res. Stn., Odakkali.

Type :- 'C'.

Object :- To study the effect of setting fire to the fields during summer on the yield and quality of oil in Lemon Grass.

1. BASAL CONDITIONS :

(i) Fallow land. (ii) (a) Laterite soil. (b) Refer soil analysis, Odakkali. (iii) By tiller separation. (iv) Local variety, red stemmed. (v) Transplanted 18 to 19.8.1955. on raised beds, plant to plant distance 4". Row to row 1 foot. (vi) 90 days. (vii) Nil. (viii) One weeding. (ix) Nil. (x) Rainfed. (xi) 140.74%. (xii) 1.7.1958 to 2.7.1958, 18.8.1958 and 8.10.1958.

2. TREATMENTS :

Same as in expt. no. 7 on page 238.

3. DESIGN :

(i) 2x2 L. Sq. (ii) (a) 2. (b) N.A. (iii) 4 (2 squares). (iv) 2000 plants. (v) Nil. (vi) No.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Weight of grass and yield of oil. (iv) (a) 1955—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

A. Yield of Grass

(i) 180.8 lb./plot. (ii) 24.4 lb./plot. (iii) Treatment difference is not significant. (iv) Av. yield of grass in lb./plot.

Treatment	1	2
Av. yield	175.12	186.62

S.E./mean = 12.20 lb./plot.

B. Yield of Oil

(i) 203.9 c.c./plot. (ii) 49.1 c.c./plot. (iii) Treatments are not significantly different. (iv) Av. yield of oil in c.c./plot.

Treatment	1	2
Av. yield	207.8	200.0

S.E./mean = 24.6 c.c./plot.

Crop :- Lemon Grass.

Ref :- K. 56(10).

Site :- Lemon Grass Res. Stn., Odakkali.

Type :- 'C'.

Object :- To study the effect of transplanting against direct sowing on the yield and quality of lemon grass oil.

1. BASAL CONDITIONS :

(i) Fallow land. (ii) (a) Laterite. (b) Refer soil analysis, Odakkali. (iii) By seeds. (iv) Red stemmed grass—local. (v) As per treatments 12" spacing between plants. (vi) The age of transplanted and direct sown plants are same (about 3 to 3½ months). (vii) Nil. (viii) 2 weedings and one hoeing. (ix) Nil. (x) Unirrigated. (xi) 100%. (xii) 18, 19.6.1956 ; 2, 3.8.1956 ; 19, 20.9.1956 and 5, 6.11.1956.

2. TREATMENTS :

- (1) Direct sowing.
(2) Transplanted.

Seed at the rate of 15 lbs per acre was sown in a nursery on 14.5.1955. On the same day, seed was dibbled in the direct sown plots in lines previously prepared with the aid of ropes (more or less like the Japanese method). From 16 to 17.8.1955 healthy seedlings of uniform size were transplanted in the transplanted plot in rows 1' apart at a spacing of 4". Thinning was done in direct sown plots to maintain equal no. of plants under both treatments.

3. DESIGN :

(i) 2 x 2 L. Sq. (ii) (a) 2. (b) N.A. (iii) 6 (3 squares). (iv) 1470 (approximately) ; plot size 24' x 22'. (v) One row around the plot. (vi) No.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Fresh weight of grass, yield of oil and citral content. (iv) (a) 1955 (late)—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

A. Yield of Grass

(i) 314.2 lb./plot. (ii) 22.09 lb./plot. (iii) Treatment difference is not significant. (iv) Av. yield of grass in lb./plot.

Treatment	1	2
Av. yield	255.6	372.7

S.E./mean = 9.01 lb./plot.

B. Yield of Oil

(i) 10.72 oz./plot. (ii) 0.44 oz./plot. (iii) Treatment difference is not significant. (iv) Av. yield of oil in oz./plot.

Treatment	1	2
Av. yield	10.50	10.94
S.E./mean	=0.18 oz./plot.	

Crop :- Lemon Grass.

Ref :- K. 57(11).

Site :- Lemon Grass Res. Stn., Odakkali.

Type :- 'C'.

Object :-To study the effect of transplanting against direct sowing on the yield and quality of oil in Lemon Grass.

1. BASAL CONDITIONS :

(i) Fallow land. (ii) (a) Laterite soil. (b) Refer soil analysis, Odakkali. (iii) By tiller separation. (iv) Red stemmed, local. (v) Date of sowing 14.5.1955. (in direct sown plots). Method of sowing : Line sowing and afterward thinning to give 4" spacing between plants and to keep fixed no. of plants. Date of transplanting 16/17.8.1955. Healthy uniform tillers were planted in each hole. Plant to plant distance 4". Row to row distance 1 foot. (vi) N.A. (vii) Nil. (viii) Two weedings. (ix) Nil. (x) Rainfed. (xi) 100%. (xii) 14.6.1957, 13.8.1957, 9.10.1957 and 5.12.1957.

2. TREATMENTS :

(1) Direct sowing.
(2) Transplanting.

3. DESIGN :

(i) 2x2 L. Sq. (ii) (a) 2. (b) N.A. (iii) 4 (2 squares). (iv) plot size 23' 4" x 20'. 1470 plants. (v) One row all round the net plot. (vi) No.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Fresh weight of grass, yield of oil and citral content. (iv) (a) 1955—continued. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

A. Yield of Grass

(i) 201.1 lb./plot. (ii) 23.3 lb./plot. (iii) Treatment difference is not significant. (iv) Av. yield of fresh grass in lb./plot.

Treatment	1	2
Av. yield	188.6	213.6
S.E./mean	=11.65 lb./plot.	

B. Yield of Oil

(i) 230.0 c.c./plot. (ii) 17.4 c.c./plot. (iii) Treatment difference is not significant. (iv) Av. yield of oil in c.c./plot.

Treatment	1	2
Av. yield	224	235
S.E./mean	=8.7 c.c./plot	

Crop :- Lemon Grass.

Ref :- K. 58(12).

Site :- Lemon Grass Res. Stn., Odakkali.

Type :- 'C'.

Object :-To study the effect of transplanting against direct sowing on the yield and quality of oil in Lemon Grass.

1. BASAL CONDITIONS :

(i) Fallow land. (ii) (a) Laterite soil. (b) Refer soil analysis, Odakkali. (iii) By tiller separation. (iv) Red stemmed, Local. (v) Sown on 14.5.1955. Line sowing and thinning afterwards to give uniform spacing of 4" between plants. Transplanted on 16 to 17.8.1955. Spacing 4' between plants and 1' between rows. (vi) 90 days. (vii) Nil. (viii) One weeding. (ix) Nil. (x) Rainfed. (xi) 140.74%. (xii) 30.6.1958 to 1.7.1958, 16.8.1958 and 7.10.1958.

2. TREATMENTS :

- (1) Direct sowing.
- (2) Transplanting.

3. DESIGN :

(i) 2x2 L. Sq. (ii) (a) 2. (b) N.A. (iii) 4 (2 squares). (iv) 1470 plants. (v) Nil. (vi) No.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Fresh weight of grass and yield of oil. (iv) (a) 1955—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :**A. Yield of Grass**

(i) 156.9 lb./plot. (ii) 13.08 lb./plot. (iii) Treatment difference is not significant. (iv) Av. yield of grass in lb./plot.

Treatment	1	2
Av. yield	145.1	168.6

S.E./mean = 6.54 lbs/plot.

B. Yield of Oil

(i) 226.0 c.c./plot. (ii) 11.3 cc./plot. (iii) Treatment difference is not significant. (iv) Av. yield of oil in c.c./plot.

Treatment	1	2
Av. yield	217.5	234.5

S.E./mean = 5.6 c. c./plot.

Crop :- Mandarin Orange.

Ref :- K. 54(1).

Site : Agri. Res. Stn., Ambalavayal.

Type :- 'C'.

Object :- To determine a suitable root-stock for Mandarin Orange to ward off the decline malady of this fruit.

1. BASAL CONDITIONS:

(i) Uncultivated forest land. (ii) (a) Brown to red clayey. (b) Refer soil analysis, Ambalavayal. (iii) Seed propagation. (iv) Mandarin orange. (v) 15.11.1950/30.6.1952. Square method of planting. 22 feet spacing. (vi) One year and seven months. (vii) Nil. (viii) Sickle weeding and ploughing twice a year during June and sept. The following manurial doses were given to each tree : A/S 3 lb., Super 1.5 lb., wood ash 6 lb, and cattle manure 100 lb. (ix) Nil. (x) Rainfed. (xi) 87.69%. (xii) Not yet started bearing.

2. TREATMENTS :

- (1) Budder plants of mandarin orange 1/6 on rough lemon.
- (2) Budder plants of mandarin orange on kichili.
- (3) Budder plants of mandarin orange on sweet orange.
- (4) Budder plants of mandarin orange on marmalade orange.
- (5) Budder plants of mandarin orange on Wynaad country orange.
- (6) Unworked seedling mandarin orange).

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) One. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Severe shoot borer attack was observed from May to Aug. in all the years for which

systematic clipping of borer affected shoots was done. (iii) Measurement of girth, height and spread in cms. (iv) (a) 1952—contd. (b) N.A. (v) Treatment 2 in one replication was missing. (vi) Nil.

5. RESULTS :

A. Girth measurement

(i) 8.85 cm./tree. (ii) 1.25 cm./tree. (iii) Treatment differences are highly significant. (iv) Av. girth in cm./tree.

Treatment	1	2	3	4	5	6
Av. girth	12.76	8.28	7.33	7.45	9.12	8.86

S.E./mean (excluding treatment 2)=0.52 cm./tree.

B. Height of tree

(i) 130.2 cm./tree. (ii) 19.4 cm./tree. (iii) Treatment differences are highly significant. (iv) Av. height in cm./tree.

Treatment	1	2	3	4	5	6
Av. height	157.5	112.7	106.8	127.7	132.7	144.3

S.E./mean (excl. treatment 2)=7.9 cm/tree.

Crop :- Mandarin Orange.

Ref :- K. 55(2).

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

Type :- 'C'.

Object :- To determine a suitable root-stock for Mandarin Orange to ward off the decline malady of this fruit.

1. BASAL CONDITIONS :

(i) Uncultivated forest land. (ii) (a) Brown red clayey. (b) Refer soil analysis, Ambalavayal. (iii) Seed sown. (iv) Mandarin orange. (v) 15.11.1950/30.6.1952 square method of planting, 22' spacing. (vi) One year and 7 months. (vii) Nil. (viii) Sickle weeding and ploughing twice a year during June and Sept. The following manurial doses were given to each tree. A/S 4 lb., Super 2 lb., woodash 8 lb. cattle manure 100 lb. (ix) Nil. (x) Rainfed. (xi) 78.0°. (xii) Not yet started bearing.

2. TREATMENTS :

Same as in expt. no. 1 on page 242.

3. DESIGN :

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

4. GENERAL :

(i) Normal. (ii) Severe shoot borer attack was observed from May to Aug. in all the years for which systematic clipping of borer affected shoots was done. (iii) Measurement of girth, height and spread in cms. (iv) (a) 1952—contd. (b) N.A. (v) Treatment 3 in one replication was missing. (vi) Nil.

5. RESULTS :

A. Girth measurement.

(i) 16.79 cm./tree. (ii) 1.93 cm./tree. (iii) Treatment differences are highly significant. (iv) Mean girth in cm./tree.

Treatment	1	2	3	4	5	6
Mean	21.35	16.00	14.50	14.72	16.95	17.20

S.E./mean (excl. treatment 3) = 0.79 cm./tree.

S.E. of difference of treatment 3 with any other treatment mean = 1.18 cm./tree.

B. Height of trees

(i) 183.0 cm./tree. (ii) 21.4 cm./tree. (iii) Treatment differences are not significant. (iv) Mean height of trees in cm./tree.

Treatment	1	2	3	4	5	6
Mean	201.7	159.5	157.5	177.1	194.2	208.3

S.E./mean (excl. treatment 3) = 8.7 cm./tree.
 S.E. of difference of treatment 3 with any other treatment mean = 13.1 cm./tree.

Crop :- Mandarin Orange.

Ref :- K. 56(3).

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

Type :- 'C'.

Object :- To determine a suitable root-stock for Mandarin Orange to ward off the decline malady of this fruit.

1. BASAL CONDITIONS :

(i) Virgin land. (ii) (a) Brown red clayey soil. (b) Refer soil analysis, Ambalavayal. (iii) Seed sowing. (iv) Mandarin orange. (v) 15.11.1950/30.6.1952 ; Square method of planting ; 22' spacing. (vi) One year and 7 months. (vii) Nil. (viii) Sickle weeding and ploughing twice a year during June and September. 5 lb. of A/S, 30 lb. of Super, 10 lb. of wood ash and 150 lb. of C.M. per tree per year broadcast around the plants and covered by ploughing in the month of September. (ix) Nil. (x) Unirrigated. (xi) 86.26". (xii) Trees not yet started bearing.

2. TREATMENTS :

Same as in expt. no. 1 on page 242.

3. DESIGN :

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

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Measurement of girth, height and spread. (iv) (a) 1952—contd. (b) N.A. (v) Treatment 2 is missing in the first replication. (vi) Nil.

5. RESULTS :

A. Girth measurements

(i) 22.31 cm./tree. (ii) 2.56 cm./tree. (iii) Treatment differences are highly significant. (iv) Mean girth in cm./tree.

Treatment	1	2	3	4	5	6
Mean	27.62	19.32	20.22	22.20	21.23	23.30

S.E./mean (excl. treatment 2) = 1.05 cm./tree.
 S.E. of difference of treatment 2 with any other treatment mean = 1.57 cm./tree.

B. Height of trees

(i) 225.6 cm./tree. (ii) 27.6 cm./tree. (iii) Treatment differences are not significant. (iv) Mean height in cm./tree.

Treatment	1	2	3	4	5	6
Mean	238.8	229.3	201.5	215.3	217.4	251.5

S.E./mean (excl. treatment 2) = 11.3 cm./tree.
 S.E. of difference of treatment 2 with any other treatment mean = 16.9 cm./tree.

Crop :- Mandarin Orange.

Ref :- K. 57(4).

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

Type :- 'C'.

Object :- To determine a suitable root-stock for Mandarin Orange to ward off the decline malady of this fruit.

1. BASAL CONDITIONS :

(i) Virgin land. (ii) (a) Brown red clayey soil. (b) Refer soil analysis, Ambalavayal. (iii) Seed sowing. (iv) Mandarin orange. (v) 15.11.1950/30.6.1952; square method of planting ; 22' spacing. (vi) One year and 7 months. (vii) Nil. (viii) Sickle weeding and ploughing twice a year during June and Sept. The following manurial doses were given to each tree : 6 lb. of A/S, 3 lb. of Super, 12 lb. of wood ash and 150 lb. of C.M. (ix) Nil. (x) Unirrigated. (xi) 96.14". (xii) Trees not yet started bearing.

2. TREATMENTS :

Same as in expt. no. 1 on page 242.

3. DESIGN :

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

4. GENERAL :

(i) Normal. (ii) Severe shoot borer attack was observed from May to Aug. in all the years for which systematic clipping of borer affected shoots was done. (iii) Measurement of girth, height and spread. (iv) (a) 1952-contd. (b) N.A. (v) Treatment 2 in 1st replication is missing. (vi) Nil.

5. RESULTS :**A. Girth measurement**

(i) 27.62 cm./tree. (ii) 4.10 cm./tree. (iii) Treatment differences are highly significant. (iv) Mean girth in cm./tree.

Treatment	1	2	3	4	5	6
Mean	33.95	24.42	25.97	27.15	25.83	28.35

S.E./mean (excl. treatment 2) = 1.68 cm./tree.
S.E. of difference of treatment 2 with any other treatment mean = 2.50 cm./tree.

B. Height of trees

(i) 250.7 cm./tree. (ii) 2.91 cm./tree. (iii) Treatment differences are significant. (iv) Mean height in cm./tree.

Treatment	1	2	3	4	5	6
Mean	279.0	252.0	230.5	236.5	254.8	281.5

S.E./mean (excl. treatment 2) = 1.19 cm./tree.
S.E. of difference of treatment 2 with any other treatment mean = 1.78 cm./tree.

Crop :- Mandarin Orange.

Ref :- K. 58(5)

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

Type :- 'C'.

Object :- To determine the best root-stock for Mandarin Orange to ward off the decline malady of this fruit.

1. BASAL CONDITIONS :

(i) Virgin land. (ii) (a) Brown red clayey loam. (b) Refer soil analysis, Ambalavayal. (iii) Seedlings and buddlings. (iv) Mandarin orange. (v) 30.6.52, 22 feet between plants, square method of planting. (vi) One year and 7 months. (vii) Nil. (viii) Weeding and mulching throughout the year (200 lb mulch per tree per year.) 7 lb. of A/S+3.5 lb. of Super+14.0 lb. of wood ash+150 lb. of cattle manure was applied during the year per tree. (ix) Nil. (x) Unirrigated. (xi) 88.07". (xii) All trees have not started bearing.

2. TREATMENTS :

Same as in experiment no. 1 on page 242.

3. DESIGN:

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

4. GENERAL :

(i) Satisfactory. (ii) Severe attack of shoot borer was observed from May to August in all the years for which systematic clipping of borer affected shoots was done. (iii) Measurement of girth, height and spread. (iv) (a) 1952-contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

A. Girth measurement

(i) 31.2 cm./tree. (ii) 7.9 cm./tree. (iii) Treatment differences are not significant. (iv) Mean girth in cm./tree.

Treatment	1	2	3	4	5	6
Mean	38.9	26.8	30.9	30.9	28.7	31.2

S.E./mean = 3.2 cm./tree.

B. Height of trees

(i) 279.7 cm./tree. (ii) 37.3 cm./tree. (iii) Treatment differences are not significant. (iv) Mean height in cm./tree.

Treatment	1	2	3	4	5	6
Mean	307.7	258.8	264.8	261.7	283.5	301.7

S.E./mean = 15.2 cm./tree.

Crop :- Mandarin Orange.

Ref :- K. 54(6).

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

Type :- 'C'.

Object :- To compare the orchard performance of two kinds of progenies on different root-stocks.

1. BASAL CONDITIONS :

(i) Virgin land. (ii) (a) Brown red clayey. (b) Refer soil analysis, Ambalavayal. (iii) By seed. (iv) Mandarin orange. (v) 15.11.50/22.6.52. Square method of planting ; 22 feet spacing. (vi) 1½ years. (vii) Nil. (viii) Sickle weeding and ploughing twice a year during June and September. The following manurial doses were given to each tree : A/S 3 lbs., Super 1.5 lbs., wood ash 6 lbs. and Cattle manure 100 lbs. (ix) Nil. (x) Unirrigated. (xi) 87.69" in 106 rainy days. (xii) Trees not yet started bearing.

2. TREATMENTS :

1. Budder plants of mandarin orange on rough lemon.
2. Seedlings of same scion.

3. DESIGN :

(i) 2x2 L. Sq. (ii) (a) 2. (b) N.A. (iii) 8 (4 squares). (iv) 4. (v) Nil. (vi) No.

4. GENERAL :

(i) Normal. (ii) Severe shoot borer attack was observed from May to August in all the years for which systematic clipping of borer affected shoots was done. (iii) Measurements of height, girth and spread. (iv) (a) 1952-1955. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

A. Girth measurement

(i) 9.28 cm./tree. (ii) 0.50 cm./tree. (iii) Treatment difference is highly significant. (iv) Mean girth in cm./tree.

Treatment	1	2
Mean	11.32	7.25

S.E./mean = 0.18 cm./tree.

B. Height of trees

(i) 128.5 cm./tree. (ii) 4.18 cm./tree. (iii) Treatment difference is highly significant. (iv) Height in cm./tree.

Treatment	1	2
Mean	140.59	116.41

S.E./mean = 1.48 cm./tree.

Crop :- Mandarin Orange.

Ref :- K. 55(7).

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

Type :- 'C'.

Object :- To compare the orchard performance of two kinds of progenies on different root-stocks.

1. BASAL CONDITIONS :

(i) Virgin land. (ii) (a) Brown red clayey. (b) Refer soil analysis, Ambalavayal. (iii) By seed. (iv) Mandarin Orange. (v) 15.11.1950/2.6.1952, square method of planting with a spacing of 22 feet. (vi) 1½ years. (vii) Nil. (viii) Sickle weeding and ploughing twice a year during June and Sept. The following manurial doses were given to each tree : A/S 4 lb., Super 2 lb., woodash 8 lb. and C.M. 100 lb. (ix) Nil. (x) Unirrigated. (xi) 78.0' in 120 rainy days. (xii) Trees have not started bearing.

2. TREATMENTS :

Same as in expt. no 6 on page 246.

3. DESIGN :

(i) 2×2 L. Sq. (ii) (a) 2. (b) N.A. (iii) 8 (4 squares). (iv) 4. (v) Nil. (vi) No.

4. GENERAL :

(i) Normal. (ii) Severe shoot borer attack was observed from May to Aug. in all the years for which systematic clipping of borer affected shoots was done. (iii) Measurements of height, girth and spread. (iv) (a) 1952—1955. (b) N.A. (v) and (vi) Nil.

5. RESULTS :**A. Girth measurements**

(i) 16.4 cm./tree. (ii) 1.0 cm./tree. (iii) Treatment difference is highly significant. (iv) Av. girth in cm./tree.

Treatment	1	2
Mean	18.6	14.2

S.E./mean = 0.35 cm./tree.

B. Height of trees

(i) 193.3 cm./tree. (ii) 13.4 cm./tree. (iii) Treatment difference is not significant. (iv) Mean height in cm./tree.

Treatment	1	2
Mean	201.7	184.9

S.E./mean = 4.7 cm./tree.

Crop :- Mango.

Ref :- K. 57(1).

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

Type :- 'C'.

Object :- To compare the influence of mono-embryonic and poly-embryonic root-stocks.

1. BASAL CONDITIONS :

(i) Virgin land. (ii) (a) Gravelly laterite. (b) Refer soil analysis, Taliparamba. (iii) Grafting. (iv) As per treatment. (v) 19.8.1957; forming pits 3'×3'×3' and planting at a spacing of 30'×30'. (vi) One year. (vii) 50 lb. compost/plant. (viii) Weeding and scrapping round the plants every year in August before manuring. Manuring at 8 oz./plant of A/S in 1st year and 1 lb./plant thereafter. (ix) Pineapple, vegetables and pulses. (x) Unirrigated. (xi) 143.98". (xii) Trees have not started bearing.

2. TREATMENTS :

Treatment	Scion	Root stock
(1)	Bennet Alphonso	Chandrakaran.
(2)	Benishan	Chandrakaran.
(3)	Bennet Alphonso	Bappakai.
(4)	Benishan	Bappakai.
(5)	Bennet Alphonso	Puliyani.
(6)	Benishan	Puliyani.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 8. (iv) 2. (v) Nil. (vi) yes.

4. GENERAL :

(i) Satisfactory. (ii) Borers—Gusarol sprayed. (iii) Growth measurements, girth of stock and scion, height and spread. (iv) (a) 1957—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

(i) 85.1 cm./plant. (ii) 13.8 cm./plant. (iii) Treatment differences are highly significant. (iv) Mean height in cm./plant.

Treatment	1	2	3	4	5	6
Mean	86.2	101.4	75.5	108.6	65.4	73.7

S.E./mean = 4.9 cm./plant.

Crop :- Mango.**Ref :- K. 58(2).****Site :- Agri. Res. Stn., Taliparamba.****Type :- 'C'.****Object :-**To compare the influence of mono-embryonic and poly-embryonic root-stocks.**1. BASAL CONDITIONS :**

(i) to (x) same as in experiment 1 on page 247. (xi) 142.56". (xii) Trees have not started bearing.

2. TREATMENTS to 4. GENERAL :

Same as in experiment no. 1 on page 247.

5. RESULTS :

(i) 121.7 cm./plant. (ii) 21.8 cm./plant. (iii) Treatment differences are highly significant. (iv) Mean height in cm./plant.

Treatment	1	2	3	4	5	6
Mean	134.7	134.9	120.0	135.2	98.2	107.2

S.E./mean = 7.7 cm./plant.

Crop :- Mango.**Ref :- K. 59(3).****Site :- Agri. Res. Stn., Taliparamba.****Type :- 'C'.****Object :-**To compare the influence of mono-embryonic and poly-embryonic root-stocks.**1. BASAL CONDITIONS :**

(i) to (x) same as in experiment no. 1 on page 247. (xi) 191.76". (xii) Trees have not started bearing.

2. TREATMENTS to 4. GENERAL :

Same as in experiment no. 1 on page 247.

5. RESULTS :

(i) 143.7 cm./plant. (ii) 21.7 cm./plant. (iii) Treatment differences are highly significant. (iv) Mean height in cm./plant.

Treatment	1	2	3	4	5	6
Mean	165.4	153.8	144.8	147.5	119.6	131.1

S.E./mean = 7.7 cm./plant.

Crop :- Sapota.

Ref :- K. 54 to 59(1).

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

Type :- 'C'.

Object :- To determine the most suitable root-stock for Sapota.

1. BASAL CONDITIONS :

(i) Virgin land. (ii) (a) Gravelly laterite. (b) Refer soil analysis, Taliparamba. (iii) Grafting (iv) Local. (v) 19.6.1951 in pits 3'×3'×3', spacing 25'×25'. (vi) One year. (vii) 50 lb. compost/tree. (viii) Weeding, digging and cleaning round basins twice in a year during July and Dec. (ix) Nil. (x) Unirrigated. (xi) 156.61" (1954), 137.54" (1955), 131.50" (1956), 143.98" (1957), 142.56" (1958) and 191.76" (1959). (xii) Once in 3 months.

2. TREATMENTS :

Treatment	Scion	Root-stock
(1)	Local sapota	Local sapota.
(2)	Local sapota	<i>Bassialongifolia</i> .
(3)	Local sapota	<i>Manakharahexandra</i> .

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) 3. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Girth stock, and height of scion. (iv) (a) 1951—contd. (b) N.A. (v) Plants under treatment (2) failed in all the years. Reasons not available. (vi) Nil.

5. RESULTS :

1954

(i) 117.33 cm./tree. (ii) 21.45 cm./tree. (iii) Treatment difference is highly significant. (iv) Mean height in cm./tree.

Treatment	1	2
Mean	96.85	137.81

S.E./mean = 7.58 cm./tree.

1955

(i) 154.91 cm./tree. (ii) 93.00 cm./tree. (iii) Treatment difference is not significant. (iv) Mean height in cm./tree.

Treatment	1	2
Mean	132.54	177.29

S.E./mean = 13.79 cm./tree.

1956

(i) 175.95 cm./tree. (ii) 56.78 cm./tree. (iii) Treatment difference is not significant. (iv) Mean height in cm./tree.

Treatment	1	2
Mean	154.27	197.63

S.E./mean = 20.08 cm./tree.

1957

(i) 201.15 cm./tree. (ii) 53.71 cm./tree. (iii) Treatment difference is not significant. (iv) Mean height in cm./tree.

Treatment	1	2
Mean	174.05	228.25

S.E./mean = 19.0 cm./tree.

1958

(i) 253.48 cm./tree. (ii) 65.19 cm./tree. (iii) Treatment difference is significant. (iv) Mean height in cm./tree.

Treatment	1	2
Mean	212.63	294.33
S.E./mean	=23.05 cm./tree.	

1959

(i) 308.84 cm./tree. (ii) 68.01 cm./tree. (iii) Treatment difference is significant. (iv) Mean height in cm./tree.

Treatment	1	2
Mean	259.58	358.10
S.E./mean	=24.05 cm./tree.	

Crop :- Arecanut.

Ref :- K. 54(1).

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

Type :- 'CI'.

Object :- To find the optimum level of irrigation, depth of sowing of nuts and age of mother tree.

1. BASAL CONDITIONS :

(i) The site was previously used for a botanical garden. (ii) (a) Loam. (b) Refer soil analysis, Mannuthy. (iii) By seed. (iv) Local. (v) 30.11.1954. Sowing in raised beds. As per treatments. (vi) The experiment was restricted to study the germination only. (vii) Half a cart load of sand was applied per a cent of land at the time of preparing the seed bed. (viii) (a) Periodical weeding. (b) Providing shade during the summer months. (ix) —. (x) As per treatments. (xi) 55.96° during the period of observation. (xii) N.A.

2. TREATMENTS :

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

- (1) 3 levels of irrigation : I_1 = Daily, I_2 = once in two days and I_3 = once in 3 days.
 (2) 3 depths of sowing nuts : D_1 = 1", D_2 = 2" and D_3 = 3".
 (3) Age of mother tree : A_1 = Young, A_2 = Middle and A_3 = Old.

3. DESIGN :

(i) 3^3 Confd. fact. design. (ii) 9. (iii) 4. (iv) 64 nuts/plot. (v) Double guard rows between 2 plots. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Germination counts taken per 64 nuts sown per plot. (iv) (a) Conducted only for one season. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

(i) 30.12 nuts/plot. (ii) 2.16 nuts/plot. (iii) Treatment differences are not significant. (iv) Av. germination count/plot.

	I_1	I_2	I_3	Mean	A_1	A_2	A_3
D_1	29.92	29.67	30.08	29.89	29.92	30.17	29.58
D_2	30.42	29.33	30.58	30.11	30.08	30.58	29.67
D_3	29.83	31.00	30.25	30.36	29.17	31.58	30.33
Mean	30.06	30.11	30.36	30.12	29.72	30.78	29.86
A_1	29.58	30.00	29.58				
A_2	30.25	30.17	31.92				
A_3	30.33	29.83	29.42				

S.E. of any marginal mean = 0.36 nuts/plot.
 S.E. of body of any table = 0.62 nuts/plot.

Crop :- Robusta Coffee.

Ref :- K. 56(1).

Site :- Chellote Estate, Kalpetta, Wynaad.

Type :- 'M'.

Object :- To find out the response of Coffee to manuring with N, P and K.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) Reddish coloured latosol. (b) N.A. (iii) By seedling. (iv) Robusta. (v) Date of planting—N.A. ; sq. method of planting at a spacing of 10' × 10'. (vi) N.A. (vii) Nil. (viii) Weeding, suckering, handling of manures, shade regulations and scuffling. (ix) Nil. (x) Rainfed. (xi) N.A. (xii) 1956.

2. TREATMENTS :

Main-plot treatments :

4 levels of N : $N_1=40$, $N_2=60$, $N_3=80$ and $N_4=100$ lb./ac.

Sub plot treatments :

$M_1=N$ 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 periods, $M_3=M_2+30$ lb./ac. P_2O_5 applied in 2 doses, once in pre-blossom and once in post-blossom season and $M_4=M_3+40$ lb./ac. 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. of Potash.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 Main-plots/block, 4 sub plots/main-plot. (b) N.A. (iii) 2. (iv) Gross : 42 plants (60' × 70'), Net : 20 plants (40' × 50'). (v) One row all round the net plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of ripe cherry, floats in the harvest and yield of clean coffee. (iv) (a) 1955—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

(i) 3.38 lb./plant. (ii) (a) 1.25 lb./plant. (b) 0.74 lb./plant. (iii) Effect of M is significant. Other effect and interaction are not significant. (iv) Av. yield of coffee in lb./plant.

	N_1	N_2	N_3	N_4	Mean
M_1	2.45	3.55	2.95	3.10	3.01
M_2	2.10	4.70	3.10	2.85	3.19
M_3	2.00	4.40	2.90	3.45	3.19
M_4	2.80	4.90	4.15	4.70	4.14
Mean	2.34	4.39	3.28	3.52	3.38

S.E. of difference of two

1. N marginal means = 0.62 lb./plant.
2. M marginal means = 0.37 lb./plant.
3. M means at a level of N = 0.74 lb./plant.
4. N means at a level of M = 0.89 lb./plant.

Crop :- Robusta Coffee.

Ref :- K. 57(2).

Site :- Chellote Estate, Kalpetta, Wynaad.

Type :- 'M'.

Object :- To determine the response of Coffee to manuring with N, P and K.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) Reddish coloured latosol. (b) N.A. (iii) By seedling. (iv) Robusta (local). (v) Date of planting—N.A. ; sq. method of planting at a spacing of 10' × 10'. (vi) N.A. (vii) Nil. (viii) Weeding, suckering, handling of manures, shade regulation and scuffling. (ix) Nil. (x) Rainfed. (xi) 125.50" (xii) 1957.

2. TREATMENT :

Same as in expt. no. 56(1) above.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) Gross : 42 plants (70'×60'), Net : 20 plants (50'×40'). (v) One row all round the net plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of ripe cherry, floats in the harvest and yield of clean coffee. (iv) (a) 1955—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

(i) 4.97 lb./plant. (ii) (a) 2.01 lb./plant. (b) 1.51 lb./plant. (iii) None of the effects and interaction is significant. (iv) Av. yield of coffee in lb./plant.

	N ₁	N ₂	N ₃	N ₄	Mean
M ₁	4.45	3.70	4.45	3.70	4.08
M ₂	5.30	6.20	4.05	3.70	4.81
M ₃	6.45	5.50	3.55	4.05	4.89
M ₄	6.85	6.15	6.15	5.30	6.11
Mean	5.76	5.39	4.55	4.19	4.97

S.E. of difference of two

1. N marginal means = 1.01 lb./plant.
2. M marginal means = 0.75 lb./plant.
3. M means at a level of N = 1.51 lb./plant.
4. N means at a level of M = 1.65 lb./plant.

Crop :- Coffee.

Ref :- K. 58 and 59(3).

Site :- Chellotte Estate, Kalpetta, Wynaad.

Type :- 'M'.

Object :—To determine the response of Coffee to manuring with N, P and K.

1. BASAL CONDITIONS :

(i) N.A. G.L. and compost were applied occasionally. (ii) (a) Reddish coloured latosol and gravelly laterite. (b) N.A. (iii) By seedling. (iv) Robusta (imported). (v) 13 to 15 years in 1955, sq. method of planting at a spacing of 10'×10'. (vi) 18 months. (vii) Nil. (viii) 2 or 3 weedings, 3 scufflings in May June, Sept and Nov.—Dec. (ix) Pepper vines in few plots. (x) Rainfed. (xi) 110"—130". (xii) Beginning of Jan. to end of Feb.

2. TREATMENTS :

Same as in expt. no. 56 on page 251.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) Gross : 42 plants, Net : 20 plants. (v) one row all round the net plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Shot pole borer attacking the tender shoots controlled by limiting shade and weeding and by removal and trimming of attacked branches. (iii) Yield of ripe cherry, floats in the harvest and yield of clean coffee. (iv) (a) 1955—contd. (b) N.A. (v) Nil. (vi) Nil.

5. RESULTS :

1958

(i) 8.86 lb./plant. (ii) (a) 2.80 lb./plant. (b) 2.10 lb./plant. (iii) None of the effects is significant. (iv) Av. yield of coffee in lb./plant.

	N ₁	N ₂	N ₃	N ₄	Mean
M ₁	8.58	7.86	7.04	6.76	7.56
M ₂	10.33	15.06	6.48	5.37	9.31
M ₃	8.32	11.42	8.30	7.00	8.76
M ₄	10.47	11.26	8.25	9.28	9.82
Mean	9.42	11.40	7.51	7.10	8.86

S.E. of difference of two

1. N marginal means = 1.40 lb./plant.
2. M marginal means = 1.05 lb./plant.
3. M means at the same level of N = 2.10 lb./plant.
4. N means at the same level of M = 2.30 lb./plant.

1959

(i) 3.93 lb./plant. (ii) (a) 1.38 lb./plant. (b) 1.07 lb./plant. (iii) None of the effects is significant. (iv) Av. yield of coffee in lb./plant.

	N ₁	N ₂	N ₃	N ₄	Mean
M ₁	4.91	3.70	3.32	3.18	3.78
M ₂	3.68	4.40	3.80	2.95	3.71
M ₃	3.94	4.33	4.17	3.72	4.04
M ₄	4.64	5.40	3.66	3.04	4.19
Mean	4.29	4.46	3.74	3.22	3.93

S.E. of difference of two

1. N marginal means = 0.69 lb./plant.
2. M marginal means = 0.53 lb./plant.
3. M means at the same level of N = 1.07 lb./plant.
4. N means at the same level of M = 1.16 lb./plant.

Crop :- Robusta Coffee.

Ref :- K. 56 and 57(4).

Site :- Krishna Estate, Kalpetta, Wynaad.

Type :- 'M'.

Object :- To find out the response of Coffee to manuring with N, P and K.

1. BASAL CONDITIONS :

(i) N.A. (ii) Reddish coloured latosol. (b) N.A. (iii) By seedling. (iv) Robusta. (v) Date of planting —N.A. Square method of planting at a spacing of 9'×9'. (vi) N.A. (vii) Nil. (viii) Weeding, suckering, handling of manures, shade regulation and scuffling. (ix) Nil. (x) Rainfed. (xi) N.A. in 1956 and 98.50% in 1957. (xii) N.A.

2. TREATMENTS :

Same as in expt. no. 56(1) on page 251.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) Gross : 42 plants (63'×54'), Net : 20 plants (45'×36'). (v) One row all round the net plot (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of ripe cherry, floats in the harvest and yield of clean coffee. (iv) (a) 1955—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1956

(i) 6.30 lb./plant. (ii) (a) 1.06 lb./plant. (b) 0.70 lb./plant. (iii) Effect of M is significant. Effect of N and interaction M × N are not significant. (iv) Av. yield of coffee in lb./plant.

	N ₁	N ₂	N ₃	N ₄	Mean
M ₁	6.43	5.83	5.37	6.00	5.91
M ₂	6.67	5.73	6.27	6.03	6.18
M ₃	6.87	6.67	6.20	5.60	6.33
M ₄	6.83	7.37	6.77	6.20	6.79
Mean	6.70	6.40	6.15	5.96	6.30

S.E. of difference of two

1. N marginal means = 0.43 lb./plant.
2. M marginal means = 0.28 lb./plant.
3. M means at the same level of N = 0.58 lb./plant.
4. N means at the same level of M = 0.65 lb./plant.

1957

(i) 4.22 lb./plant. (ii) (a) 1.36 lb./plant. (b) 1.31 lb./plant. (iii) None of the effects is significant. (iv) Av. yield of coffee in lb./plant.

	N ₁	N ₂	N ₃	N ₄	Mean
M ₁	5.40	4.00	3.23	2.93	3.89
M ₂	3.80	4.07	4.27	5.47	4.40
M ₃	5.10	2.97	2.57	4.83	3.89
M ₄	4.33	4.53	5.00	5.03	4.72
Mean	4.66	3.89	3.76	4.57	4.22

S.E. of difference of two

1. N marginal means = 0.55 lb./plant.
2. M marginal means = 0.54 lb./plant.
3. M means at the same level of N = 1.07 lb./plant.
4. N means at the same level of M = 1.08 lb./plant.

Crop :- Robusta Coffee.

Ref :- K. 58 and 59(5).

Site :- Krishna Estate, Kalpetta, Wynaad.

Type :- 'M'.

Object :- To find out the response to manuring with N, P and K.

1. BASAL CONDITIONS :

(i) G.L. and compost were applied occasionally. (ii) (a) Reddish coloured latosol and gravelly laterite. (b) N.A. (iii) By seedling. (iv) Robusta (Imported.) (v) 1940. Square method of planting at a spacing of 9' × 9'. (vi) 18 months. (vii) Nil. (viii) 2 or 3 weedings, 3 scuffings in May—June, Sept. and Nov.—Dec. (ix) Pepper vines in few plots. (x) Rainfed. (xi) About 105". (xii) Jan. and Feb.

2. TREATMENTS :

Same as in expt. no. 56(1) on page 251.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) Gross : 42 plants, (63' × 54'). Net : 20 plants (45' × 36'). (v) One row around the net plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Shot pole borer attacking the tender shoots ; controlled by limiting shade and weeding and by removal and burning of attacked branches. (iii) Yield of ripe cherry, floats in the harvest and yield of clean coffee. (iv) a) 1955—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1958

(i) 6.30 lb./plant. (ii) (a) 2.76 lb./plant. (b) 1.23 lb./plant. (iii) None of the effects is significant. (iv) Av. yield of coffee in lb./plant.

	N ₁	N ₂	N ₃	N ₄	Mean
M ₁	5.95	7.00	5.45	5.13	5.88
M ₂	7.09	6.09	7.30	7.29	6.94
M ₃	5.38	6.89	5.97	7.02	6.32
M ₄	5.76	7.48	5.93	5.02	6.05
Mean	6.04	6.86	6.16	6.12	6.30

S.E. of difference of two

1. N marginal means = 1.13 lb./plant.
2. M marginal means = 0.50 lb./plant.
3. M means at the same level of N = 1.01 lb./plant.
4. N means at the same level of M = 1.43 lb./plant.

1959

(i) 4.04 lb./plant. (ii) (a) 1.03 lb./plant. (b) 1.03 lb./plant. (iii) None of the effects is significant. (iv) Av. yield of coffee in lb./plant.

	N ₁	N ₂	N ₃	N ₄	Mean
M ₁	4.39	4.60	4.52	4.53	4.51
M ₂	3.46	3.69	5.01	3.70	3.97
M ₃	3.96	4.81	4.51	3.68	4.24
M ₄	2.91	3.32	3.91	3.55	3.42
Mean	3.68	4.11	4.49	3.87	4.04

S.E. of difference of two

1. N marginal means = 0.42 lb./plant.
2. M marginal means = 0.42 lb./plant.
3. M means at the same level of N = 0.84 lb./plant.
4. N means at the same level of M = 0.84 lb./plant.

Crop :- Robusta Coffee.

Site :- Maniancode Estate, Kalpetta, Wynaad.

Ref :- K. 57(6).

Type :- 'M'.

Object :- To find out the response of Coffee to manuring with N, P and K.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) Reddish coloured latosol. (b) N.A. (iii) By seedling. (iv) Robusta. (v) Date of planting N.A. Square method of planting at a spacing of 9'×9'. (vi) N.A. (vii) Nil. (viii) Weeding, suckering, handling of manures, shade regulation and scuffling. (ix) Nil. (x) Rainfed. (xi) 98.00°. (xii) 1957.

2. TREATMENTS :

- (1) 40 lb. N+30 lb. P_2O_5 +40 lb. K_2O per acre.
 - (2) 60 lb. N+30 lb. P_2O_5 +40 lb. K_2O per acre.
 - (3) 60 lb. N+45 lb. P_2O_5 +60 lb. K_2O per acre.
 - (4) 80 lb. N+60 lb. P_2O_5 +80 lb. K_2O per acre.
 - (5) 60 lb. N+60 lb. P_2O_5 +80 lb. K_2O per acre.
 - (6) 45 lb. N+60 lb. P_2O_5 +80 lb. K_2O per acre.
- N as A/S, P_2O_5 as Rock Phos. and K_2O as Mur. of Pot.

3. DESIGN :

- (i) 6×6 L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) Net : 20 plants (45'×36'). (v) One row all round the net plot. (vi) No.

4. GENERAL :

- (i) Good. (ii) Nil. (iii) Yield of ripe cherry, floats in the harvest and yield of clean coffee. (iv) (a) 1956—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

- (i) 117 lb./plot. (ii) 27.2 lb./plot. (iii) Treatment differences are not significant. (iv) Av. yield of coffee in lb./plot.

Treatment	1	2	3	4	5	6
Av. yield	106	116	127	117	126	111
S.E./mean	= 11.1 lb./plot.					

Crop :- Robusta Coffee.

Ref :- K. 57(7).

Site :- Maniancode Estate, Kalpetta, Wynaad.

Type :- 'M'.

Object :- To find out the response of Coffee to manuring with N, P and K.

1. BASAL CONDITIONS :

- (i) N.A. (ii) (a) Reddish coloured latosol. (b) N.A. (iii) By seedling. (iv) Robusta (local). (v) Date of planting—N.A. (vi) Nil. (vii) N.A. Square method of planting at a of spacings 9'×9'. (viii) Weeding suckering, handling of manures, shade regulation and scuffling. (ix) Nil. (x) Rained. (xi) 98.00%. (xii) 1957.

2. TREATMENTS :

- (1) 60 lb./ac. of N as A/S.
- (2) 60 lb./ac. of N as A/S+45 lb./ac. of P_2O_5 as Hyper Phos.
- (3) Tr. 1+60 lb./ac of K_2O as Mur. of Pot.
- (4) 45 lb./ac. of P_2O_5 as Hyper Phos+60 lb./ac. of K_2O as Mur. of Pot.
- (5) Tr. 2+60 lb./ac. of K_2O as Mur. of Pot.
- (6) Control.

3. DESIGN :

- (i) 6×6 L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) Net : 20 plants (45'×36'). (v) One row all round the net plot. (vi) Yes.

4. GENERAL :

- (i) Good. (ii) Nil. (iii) Yield of ripe cherry, floats in the harvest and yield of clean coffee. (iv) (a) 1956—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

- (i) 133 lb./plot. (ii) 29.6 lb./plot. (iii) Treatment differences are highly significant. (iv) Av. yield of coffee in lb./plot.

Treatment	1	2	3	4	5	6
Av. yield	121	132	120	154	168	101
S.E./mean	= 12.1 lb./plot.					

Crop :- Robusta Coffee.

Ref :- K. 58 and 59(8).

Site :- Maniancode Estate, Kalpetta, Wynad.

Type :- 'M'.

Object :- To find out the response of Coffee to manuring with N, P and K—Series I.

1. BASAL CONDITIONS :

(i) N.A. Only G.L. and compost were applied occasionally. (ii) (a) Reddish coloured lattosal—Red loam. (b) N.A. (iii) By seedling. (iv) Robusta (imported). (v) The trees were 11 years old at the commencement of the experiment in 1955, square method of planting at a spacing of 8' x 8'. (vi) 18 months. (vii) Nil. (viii) 2 or 3 weedings, 3 scufflings (May-June, Sept. and Nov.-Dec.). (ix) Pepper vines in few plots (x) Rainfed. (xi) 100°—110°. (xii) Beginning of Jan. to end of Feb.

2. TREATMENTS :

1. 40 lb./ac. of N+30 lb./ac. of P_2O_5 +40 lb./ac. of K_2O .
2. 60 lb./ac. of N+30 lb./ac. of P_2O_5 +40 lb./ac. of K_2O .
3. 60 lb./ac. of N+45 lb./ac. of P_2O_5 +60 lb./ac. of K_2O .
4. 80 lb./ac. of N+60 lb./ac. of P_2O_5 +80 lb./ac. of K_2O .
5. 60 lb./ac. of N+60 lb./ac. of P_2O_5 +80 lb./ac. of K_2O .
6. 40 lb./ac. of N+60 lb./ac. of P_2O_5 +80 lb./ac. of K_2O .

3. DESIGN :

(i) 6x6 L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) Gross : 42 plants ; Net : 20 plants. (v) One row all round the net plot. (vi) No.

4. GENERAL :

(i) Satisfactory. (ii) Shoot-borer attacking the tender shoots—controlled by limiting shade, weeding and by the removal and of burning the attacked branches. (iii) Yield of ripe cherry, floats in harvest and yield of clean coffee. (iv) (a) 1955—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1958

(i) 67.56 lb./plot. (ii) 15.15 lb./plot. (iii) Treatment differences are not significant. (iv) Av. yield (adjusted) of coffee in lb./plot.

Treatment	1	2	3	4	5	6
Av. yield	72.35	67.74	75.18	56.73	67.08	66.27

S.E./mean (adjusted) = 6.27 lb./plot.

1959.

(i) 91.28 lb./plot. (ii) 15.12 lb./plot. (iii) Treatment differences are not significant. (iv) Av. yield (adjusted) of coffee in lb./plot.

Treatment	1	2	3	4	5	6
Av. yield	86.54	85.15	99.35	91.02	93.14	92.46

S.E./mean = 6.33 lb./plot.

Crop :- Robusta Coffee.

Ref :- K. 58 and 59(9).

Site :- Maniancode Estate, Kalpetta, Wynad.

Type :- 'M'.

Object :- To find out the response of Coffee to manuring with N, P and K—Series II.

1. BASAL CONDITIONS :

(i) N.A. Only G.L. and compost were applied occasionally. (ii) (a) Reddish coloured lattosal—Red loam. (b) N.A. (iii) By seedlings. (iv) Robusta (imported). (v) The trees were 11 years old at the commencement of the experiment in 1955 ; square method of planting at a spacing of 8' x 8'. (vi) N.A. (vii) Nil. (viii) 2 or 3 weedings, 3 scufflings (May-June, Sept. and Nov.-Dec.). (ix) Pepper vines in few plots. (x) Rainfed. (xi) 1.0°—110°. (xii) 1st Jan. to 28th Feb.

2. TREATMENTS :

1. 60 lb./ac. of N.
2. 60 lb./ac. of N+45 lb./ac. of P_2O_5 .
3. 60 lb./ac. of N+60 lb./ac. of K_2O .
4. 45 lb./ac. of P_2O_5 +60 lb./ac. of K_2O .
5. 60 lb./ac. of N+45 lb./ac. of P_2O_5 +60 lb./ac. of K_2O .
6. Control.

3. DESIGN :

- (i) 6×6 L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) Gross : 42 plants ; Net : 20 plants. (v) One row around the net plot. (vi) No.

4. GENERAL :

- (i) Satisfactory. (ii) Shoot-borer attacking the tender shoots—controlled by limiting shade, weeding and by removal and burning of attacked branches. (iii) Yield of ripe cherry, floats in the harvest and yield of clean coffee. (iv) (a) 1955—contd. (b) N.A. (v) to (vii) Nil.

5. RESULTS :

1958

- (i) 85.73 lb./plot. (ii) 20.89 lb./plot. (iii) Treatment differences are significant. (iv) Av. yield (adjusted) of coffee in lb./plot.

Treatment	1	2	3	4	5	6
Av. yield	77.39	81.76	97.60	96.11	103.40	58.14
S.E./mean	=8.71 lb./plot.					

1959

- (i) 78.45 lb./plot. (ii) 15.14 lb./plot. (iii) Treatment differences are highly significant. (iv) Av. yield (adjusted) of coffee in lb./plot.

Treatment	1	2	3	4	5	6
Av. yield	88.61	88.82	73.01	85.68	85.15	49.41
S.E./mean	=6.28 lb./plot					

Crop :- Robusta Coffee.

Ref :- K. 56 and 57(10).

Site :- North Carolina Estate, Kalpetta, Wynad.

Type :- 'M'.

Object :- To find out the response of Coffee to manuring with N, P and K.

1. BASAL CONDITIONS :

- (i) N.A. (ii) (a) Reddish coloured lattoisol. (b) N.A. (iii) By seedlings. (iv) Robusta. (v) Date of planting N.A., square method of planting at a spacing of 10'×10'. (vi) N.A. (vii) Nil. (viii) Weeding, suckering, application of manures, shade regulation and scuffling. (ix) Nil. (x) Rainfed. (xi) and (xii) N.A.

2. TREATMENTS :

Same as in expt. no. 56(1) on page 251.

3. DESIGN :

- (i) Split-plot. (ii) (a) 4 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) Gross : 42 plants (70'×60') ; Net : 20 plants (50'×40'). (v) One row around the net plot. (vi) Yes.

4. GENERAL :

- (i) Good. (ii) Nil. (iii) Yield of ripe cherry, floats in the harvest [and] yield of clean coffee. (iv) (a) 1955—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1956

- (i) 8.23 lb./plant. (ii) (a) 4.37 lb./plant. (b) 1.70 lb./plant. (iii) Main effect of M is significant. Main effect of N and interaction N×M are not significant. (iv) Av. yield of coffee in lb./plant.

	N ₁	N ₂	N ₃	N ₄	Mean
M ₁	8.57	8.30	10.37	8.13	8.84
M ₂	7.40	7.20	6.20	9.63	7.61
M ₃	5.80	6.87	7.53	8.20	7.10
M ₄	9.33	7.70	7.67	12.77	9.37
Mean	7.78	7.52	7.94	9.68	8.23

S.E. of difference of two

1. N marginal means = 1.78 lb./plant.
2. M marginal means = 0.69 lb./plant.
3. M means at the same level of N = 1.38 lb./plant.
4. N means at the same level of M = 2.15 lb./plant.

1957

(i) 4.74 lb./plant. (ii) (a) 2.60 lb./plant. (b) 1.53 lb./plant. (iii) Only effect of M is significant. (iv) Av. yield of coffee in lb./plant.

	N ₁	N ₂	N ₃	N ₄	Mean
M ₁	3.97	3.80	5.37	6.23	4.84
M ₂	4.00	3.33	4.17	4.93	4.11
M ₃	3.17	3.33	5.00	5.37	4.22
M ₄	4.97	4.63	6.40	7.20	5.80
Mean	4.02	3.78	5.23	5.93	4.74

S.E. of difference of two

1. N marginal means = 1.06 lb./plant.
2. M marginal means = 0.62 lb./plant.
3. M means at the same level of N = 1.24 lb./plant.
4. N means at the same level of M = 1.51 lb./plant.

Crop :- Robusta Coffee.

Ref :- K. 58 and 59(11).

Site :- North Carolina Estate, Kalpetta, Wynad. Type :- 'M'.

Object :- To determine the response of Coffee to manuring with N, P and K.

1. BASAL CONDITIONS :

(i) N.A., only G.L. was applied occasionally. (ii) (a) Reddish coloured lattsol—Red loam. (b) N.A. (iii) By seedlings. (iv) Robusta—Imported. (v) 6 to 7 years at the beginning of the expt. in 1955; sq. method of planting at 10' × 10' spacing for replication I and II and 9' × 9' for replication III. (vi) 18 months. (vii) Nil. (viii) 2 or 3 weedings 3 scufflings May-June, Sept. and Nov.-Dec. (ix) Pepper vines in few plots. (x) Rainfed. (xi) 110—130°. (xii) Beginning of Jan. to the end of Feb.

2. TREATMENTS :

Same as in expt. no. 56(1) on page 251.

3. DESIGN :

(i) Split-plot. (ii) 4 main-plots/block and 4 sub-plots/main-plot. (iii) 3. (iv) Gross : 42 plants ; Net : 20 plants : (v) One row around the net plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Shoot-borer attacking the tender-shoot—controlled by limiting shade, weeding and by removal and burning of attacked branches Yield of ripe cherry, floats in the harvest and yield of clean coffee. (iv) (a) 1955—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1958

(i) 14.78 lb./plant. (ii) (a) 4.79 lb./plant. (b) 3.37 lb./plant. (iii) None of the effects is significant (iv) Av. yield of coffee in lb./plant.

	N ₁	N ₂	N ₃	N ₄	Mean
M ₁	13.45	15.37	15.58	15.30	14.94
M ₂	10.06	13.32	17.03	16.76	14.29
M ₃	11.30	12.82	16.57	18.57	14.82
M ₄	11.66	13.47	13.65	22.06	15.08
Mean	11.49	13.74	15.71	18.19	14.78

S.E. of difference of two

1. N marginal means = 1.96 lb./plant.
2. M marginal means = 1.38 lb./plant.
3. M means at the same level of N = 2.76 lb./plant.
4. N means at the same level of M = 3.09 lb./plant.

1959

(i) 2.67 lb./plant. (ii) (a) 1.53 lb./plant. (b) 0.92 lb./plant. (iii) None of the effects is significant. (iv) Av. yield (adjusted) of coffee in lb./plant.

	N ₁	N ₂	N ₃	N ₄	Mean
M ₁	3.06	2.44	3.66	2.52	2.92
M ₂	2.54	2.70	3.45	1.98	2.67
M ₃	2.21	3.06	2.34	2.63	2.56
M ₄	3.09	2.31	2.07	2.67	2.73
Mean	2.72	2.63	2.88	2.45	2.67

S.E. of difference of two

1. N marginal means = 0.62 lb./plant.
2. M marginal means = 0.38 lb./plant.
3. M means at the same level of N = 0.75 lb./plant.
4. N means at the same level of M = 0.90 lb./plant.

Crop :- Robusta Coffee.

Ref. :- K. 56 and 57(12).

Site :- Pathiripara Estate, Kalpetta, Wynad.

Type :- 'M'.

Object: - To find out the response of Coffee to manuring with N, P and K.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) Reddish coloured lattosol. (b) N.A. (iii) By seedlings ; square method ; spacing 9' x 9'.
 (iv) Robusta. (v) Date of planting : N.A. (vi) N.A. (vii) Nil. (viii) Weeding, suckering, handling of manures, shade regulation and scuffling. (ix) Nil. (x) Rainfed. (xi) N.A. (xii) 1956.

2. TREATMENTS :

Same as in expt. no. 56(1) on page 251.
 N as A/S, P as Rock Phosphate and K as Mur. Pot.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 4 Sub-plots/main-plot. (b) N.A. (iii) 3. (iv) Gross : 42 plants (63' x 54'). Net : 20 plants (45' x 36'). (v) One row all round the net plot discarded. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of ripe cherry, floats in the harvest and yield of clean coffee. (iv) (a) 1955—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1956

(i) 14.68 lb./plant. (ii) (a) 3.50 lb./plant. (b) 2.30 lb./plant. (iii) Only interaction N×M is significant. (iv) Av. yield of coffee in lb./plant.

	N ₁	N ₂	N ₃	N ₄	Mean
M ₁	11.87	12.37	14.13	15.27	13.43
M ₂	14.30	18.60	13.50	12.43	14.71
M ₃	13.87	15.53	16.47	14.23	15.02
M ₄	12.90	14.80	15.93	18.63	15.57
Mean	13.23	15.32	15.01	15.17	14.68

S.E. of difference of two

1. N marginal means = 1.42 lb./plant.
2. M marginal means = 0.94 lb./plant.
3. M means at the same level of N = 1.88 lb./plant.
4. N means at the same level of M = 2.17 lb./plant.

1957

(i) 5.16 lb./plant. (ii) (a) 1.37 lb./plant. (b) 0.98 lb./plant. (iii) Only interaction N×M is significant. (iv) Av. yield of coffee in lb./plant.

	N ₁	N ₂	N ₃	N ₄	Mean
M ₁	5.13	5.40	5.63	5.50	5.42
M ₂	4.40	4.60	4.27	6.10	4.84
M ₃	5.03	3.80	4.80	4.40	4.94
M ₄	5.80	9.11	5.87	6.37	5.46
Mean	5.09	4.83	5.14	5.59	5.16

S.E. of difference of two

1. N marginal means = 0.56 lb./plant.
2. M marginal means = 0.37 lb./plant.
3. M means at the same level of N = 0.74 lb./plant.
4. N means at the same level of M = 0.85 lb./plant.

Crop :- Robusta Coffee.

Ref :- K. 58 and 59(13).

Site :- Pathiripara Estate, Kalpetta, Wynad.

Type :- 'M'.

Object :- To find out the response of Coffee to manuring with N, P and K.

1. BASAL CONDITIONS :

(i) N.A. Only G.L. (ii) (a) Reddish coloured lattoisol—clayey. (b) N.A. (iii) By seedlings. (iv) Robusta (imported). (v) The trees were 12 to 16 years old at the commencement of the expt. in 1955; square method of planting, with 9'×9' spacing. (vi) 18 months. (vii) Nil. (viii) 2 or 3 weedings, 3 scufflings (May-June, Sept. and Nov.-Dec.). (ix) Pepper vines in a few plots. (x) Rainfed. (xi) 100—110°. (xii) Beginning of Jan. to Feb. end.

2 TREATMENTS :

Same as in expt. no. 56(1) on page 251.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) Gross : 42 plants ; Net : 20 plants (45' x 36'). (v) One row around the net plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Shoot-borer attacking the tender shoots—controlled by limiting shade, weeding and by removal and burning of attacked branches. (iii) Yield of ripe cherry, floats in harvest and yield of clean coffee. (iv) (a) 1955—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

(i) 13.28 lb./plant. (ii) (a) 5.55 lb./plant. (b) 3.45 lb./plant. (iii) Only interaction $N \times M$ is significant. (iv) Av. yield of coffee in lb./plant.

	N ₁	N ₂	N ₃	N ₄	Mean
M ₁	11.39	11.94	16.33	11.47	12.78
M ₂	11.84	13.78	9.45	14.66	12.43
M ₃	10.00	14.41	11.81	15.43	12.92
M ₄	18.32	10.90	9.68	21.10	15.00
Mean	12.89	12.76	11.82	15.66	13.28

S.E. of difference of two

1. N marginal means = 2.26 lb./plant.
2. M marginal means = 1.41 lb./plant.
3. M means at the same level of N = 2.82 lb./plant.
4. N means at the same level of M = 3.33 lb./plant.

5. RESULTS :

(i) 6.70 lb./plant. (ii) (a) 2.39 lb./plant. (b) 2.21 lb./plant. (iii) None of the effects is significant. (iv) Av. yield of coffee in lb./plant.

	N ₁	N ₂	N ₃	N ₄	Mean
M ₁	6.31	7.69	6.04	6.34	6.60
M ₂	5.47	7.75	5.04	8.30	6.64
M ₃	8.89	5.87	6.89	7.35	7.25
M ₄	3.91	8.56	5.60	7.14	6.30
Mean	6.15	7.47	5.89	7.28	6.70

S.E. of difference of two

1. N marginal means = 0.98 lb./plant.
2. M marginal means = 0.90 lb./plant.
3. M means at the same level of N = 1.81 lb./plant.
4. N means at the same level of M = 1.84 lb./plant.

Crop :- Coconut.

Site :- Central Coconut Res. Stn., Kasaragod.

Ref :- K. 54 to 58(1).

Type :- 'M'.

Object :- To determine the response of Coconut to combinations of N, P and K with and without a green manure crop grown in between Coconut trees.

1. BASAL CONDITIONS :

(i) Part of the area was under different expt. 5 years prior to this expt. no manuring had been done. (ii) (a) Red loam. (b) Refer soil analysis, Kasaragod. (iii) Acquired plantation—seed propagation. (iv) Ordinary tall variety of the west coast. (v) Plantation was raised by cultivators. Spacings vary from 25' to 30'. (vi) N.A. (vii) Nil. (viii) 2 ploughings and 2 hoeings. (ix) Nil. (x) Unirrigated. (xi) 141.7" in 1954, 158.8" in 1955, 151.5" in 1956, 134.8" in 1957 and 130.5" in 1958. (xii) One harvest each month.

2. TREATMENTS :

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

- (1) 3 levels of N as A/S : $N_0=0$, $N_1=0.75$ lb./tree and $N_2=1.50$ lb./tree per year.
- (2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=0.75$ lb./tree and $P_2=1.50$ lb./tree per year.
- (3) 3 levels of K_2O as Mur. Pot. : $K_0=0$, $K_1=0.75$ lb./tree. and $K_2=1.50$ lb./tree. per year.
- (4) 2 levels of G.M. : $G_0=G.M.$ and $G_1=G.M.$ crop sown and incorporated in the field.

Manure was applied in shallow basins 5' to 6' in radius and 6" to 9" deep dug round the base of the trees and covered with soil.

3. DESIGN :

(i) $3^3 \times 2$ confd. (ii) (a) 6 plots/block ; 9 blocks/replication. (b) N.A. (iii) 2. (iv) Sample of 4 trees randomly selected. (v) No. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Slight attack of rats and rhinoceros beetle. (iii) Yield of nuts, no. of female flowers and leaves. (iv) (a) 1953—contd. (b) N.A. (v) Nil. (vi) In 1954, a few trees died due to lightning in first replication.

5. RESULTS :

1954

(i) 195 nuts/4 trees. (ii) 52.59 nuts/4 trees. (iii) None of the effects is significant. (iv) Av. number of nuts/4 trees.

	N_0	N_1	N_2	P_0	P_1	P_2	K_0	K_1	K_2	Mean
G_0	196	188	189	197	199	176	198	199	176	191
G_1	208	205	186	190	196	213	194	201	204	200
Mean	202	197	188	194	198	195	196	200	190	195
K_0	191	209	189	192	196	201				
K_1	207	187	205	209	188	203				
K_2	207	194	169	180	209	180				
P_0	206	191	184							
P_1	201	203	189							
P_2	198	196	190							

S.E. of marginal mean of N, P or K = 8.8 nuts/4 trees.
 S.E. of marginal mean of G = 7.1 nuts/4 trees.
 S.E. of body of $N \times P$, $N \times K$ or $P \times K$ table = 17.5 nuts/4 trees.
 S.E. of body of $N \times G$, $P \times G$ or $K \times G$ table = 12.4 nuts/4 trees.

1955

(i) 239 nuts/4 trees. (ii) 47.34 nuts/4 trees. (iii) Main effect of N alone is highly significant. (iv) Av. number of nuts/4 trees.

	N ₀	N ₁	N ₂	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	Mean
G ₀	205	248	271	233	263	227	235	253	236	241
G ₁	205	252	252	238	241	231	222	238	250	237
Mean	205	250	262	236	252	229	228	245	243	239
K ₀	201	230	254	225	246	214				
K ₁	206	256	273	250	247	238				
K ₂	209	263	258	232	262	236				
P ₀	193	250	265							
P ₁	224	267	265							
P ₂	199	233	255							

S.E. of marginal mean of N, P or K = 7.9 nuts/4 trees.
 S.E. of marginal mean of G = 6.4 nuts/4 trees.
 S.E. of body of N×P, N×K or P×K table = 15.8 nuts/4 trees.
 S.E. of body of N×G, P×G or K×G table = 11.2 nuts/4 trees.

1956

(i) 235 nuts/4 trees. (ii) 43.44 nuts/4 trees. (iii) Interaction K×G is highly significant and N×P×G is significant. Others are not significant. (iv) Av. number of nuts/4 trees.

	N ₀	N ₁	N ₂	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	Mean
G ₀	220	246	242	231	256	221	241	248	219	236
G ₁	234	238	232	230	242	232	223	224	257	235
Mean	227	242	237	230	249	227	232	236	238	235
K ₀	220	243	233	227	251	217				
K ₁	226	243	240	242	227	239				
K ₂	235	239	240	222	269	224				
P ₀	216	231	244							
P ₁	246	265	237							
P ₂	219	229	231							

S.E. of marginal mean of N, P or K = 7.2 nuts/4 trees.
 S.E. of marginal mean of G = 5.9 nuts/4 trees.
 S.E. of body of N×P, N×K or P×K table = 14.5 nuts/4 trees.
 S.E. of body of N×G, P×G or K×G table = 10.2 nuts/4 trees.

1957

(i) 213 nuts/4 trees. (ii) 44.66 nuts/4 trees. (iii) None of the effects is significant. (iv) Av. number of nuts/4 trees.

	N ₀	N ₁	N ₂	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	Mean
G ₀	196	215	224	207	226	201	199	231	203	211
G ₁	205	219	218	202	230	210	203	214	226	214
Mean	200	217	221	204	228	206	201	222	215	213
K ₀	191	200	212	208	208	186				
K ₁	208	226	233	217	231	220				
K ₂	202	224	219	188	246	210				
P ₀	181	210	222							
P ₁	224	225	236							
P ₂	196	215	206							

S.E. of marginal mean of N, P or K	= 7.8 nuts/4 trees.
S.E. of marginal mean of G	= 6.4 nuts/4 trees.
S.E. of body of N×P, N×K or P×K table	= 15.6 nuts/4 trees.
S.E. of body of N×G, P×G or K×G table	= 11.0 nuts/4 trees.

1958

(i) 236 nuts/4 trees. (ii) 49.40 nuts/4 trees. (iii) Main effects of N and K are highly significant. Main effect of P and interaction N×P×K are significant. (iv) Av. number of nuts/4 trees.

	N ₀	N ₁	N ₂	P ₀	P ₁	P ₂	K ₀	K ₁	K ₂	Mean
G ₀	220	259	218	236	257	206	212	245	240	232
G ₁	219	254	243	233	245	237	217	244	256	239
Mean	220	257	231	235	251	221	215	245	248	236
K ₀	204	229	212	207	234	203				
K ₁	210	276	248	260	248	227				
K ₂	246	266	232	237	273	235				
P ₀	214	266	224							
P ₁	233	283	237							
P ₂	213	221	231							

S.E. of marginal mean of N, P or K	= 8.2 nuts/4 trees.
S.E. of marginal mean of G	= 6.7 nuts/4 trees.
S.E. of body of N×P, N×K or P×K table	= 16.5 nuts/4 trees.
S.E. of body of N×G, P×G or K×G table	= 11.6 nuts/4 trees.

Crop :- Coconut.

Ref :- K. 56 to 58(2).

Site :- Central Coconut Res. Stn., Kasaragod.

Type :- 'M'.

Object :- To study the relative response of the Coconut palms to N applied in different forms.

1. BASAL CONDITIONS :

(i) The trees were under uniform manurial and cultural operations. (ii) (a) Sandy loam. (b) Refer soil analysis, Kasaragod. (iii) By seed-nuts. (iv) Ordinary tall west coast. (v) No systematic method of planting with 30' spacing. (vi) 1 year. (vii) Nil. (viii) 2 ploughings and a junior hoe. (ix) Nil. (x) Unirrigated. (xi) 151", 135", 130" in 1956, 1957, 1958 on 132, 114 and 104 rainy days respectively, (xii) Monthly harvest.

2. TREATMENTS :

9 manurial treatments : M₀=Control (no manure), M₁=No Nitrogen, M₂=A/S, M₃=Urea, M₄=A/S/N, M₅=A/C, M₆=C/A/N, M₇=Cal. Cynamide and M₈=G.N.C. 1 lb./tree of N, 0.5 lb./tree of P₂O₅ as Super and 1.0 lb./tree of K₂O as Mur .Pot. were applied to all (except M₀) plots. Manures applied in Aug.-Sept. in basins of 5"-6" radius and 9" deep dug round the base of trees.

8. DESIGN :

(i) C.R.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) 1 tree. (v) Nil. (vi) No.

4. GENERAL :

(i) Satisfactory. (ii) Rhinoceros beetle ; regularly searched and killed. (iii) No. of nuts, no. female flowers and setting %. No. of leaves on the crown, girth below crown and height measurements. (iv) (a) 1956—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1956

(i) 65.1 nuts/tree. (ii) 27.83 nuts/tree. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/tree.

Treatment	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅	M ₆	M ₇	M ₈
Av. yield	62.2	77.7	74.9	59.0	65.2	62.0	72.8	60.0	51.3

S.E./mean = 11.4 nuts/tree.

1957

(i) 53.0 nuts/tree. (ii) 18.9 nuts/tree. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/tree.

Treatment	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅	M ₆	M ₇	M ₈
Av. yield	63.6	45.1	58.0	54.0	58.5	51.5	43.1	47.5	55.7

S.E./mean = 7.7 nuts/tree.

1958

(i) 68.6 nuts/tree. (ii) 22.9 nuts/tree. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/tree.

Treatment	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅	M ₆	M ₇	M ₈
Av. yield	58.8	82.0	75.2	64.1	65.4	61.8	79.3	70.6	59.9

S.E./mean = 9.4 nuts/tree.

Crop :- Coconut.

Ref :- K. 57 to 59(3).

Site :- Central Coconut Res. Stn., Kasaragod.

Type :- 'M'.

Object :- To study the effect of application of manures to Coconut palms.

1. BASAL CONDITIONS :

(i) The area received uniform manurial and cultural operations. (ii) (a) Red loam. (b) Refer soil analysis, Kasaragod. (iii) By seedlings. (iv) Ordinary tall west coast. (v) No. systematic method of planting; 30' spacing. (vi) 1 year (vii) Nil. (viii) 2 ploughings and 2 intercultivations. (ix) Nil. (x) Unirrigated. (xi) 135°, 131°, 178° in 1957, 1958, 1959 on 114, 104 and 135 rainy days respectively. (xii) Monthly harvest.

2. TREATMENTS :

1. Control
2. Application of manures in basins.
3. Opening basins only.
4. Application of manures in *mummatty* holes.
5. Forming *mummatty* holes alone.
6. Application of manures by broadcasting and covering by ploughing.
7. Ploughing alone.

Manures applied per tree at 1.0 lb. of N as A/S+0.5 lb. of P₂O₅ as Super+1.0 lb. of K₂O as Mur. Pot. Manures applied in August and September.

3. DESIGN :

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

4. GENERAL :

(i) Satisfactory. (ii) Rhinoceros beetle regularly watched and killed. (iii) No. of nuts, no. of female flowers and percentage setting, no. of leaves in the crown, girth below crown and height. (iv) (a) 1957—contd. (b) N.A. (v) to (vi) Nil.

5. RESULTS :

1957

284.3 nuts/5 trees. (ii) 75.4 nuts/5 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/5 trees.

Treatment	1	2	3	4	5	6	7
Av. yield	300.5	218.8	254.5	307.5	256.8	296.5	355.8

S.E./mean = 37.7 nuts/5 trees.

1958

(i) 295.1 nuts/5 trees. (ii) 59.6 nuts/5 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/5 trees.

Treatment	1	2	3	4	5	6	7
Av. yield	301.5	274.0	291.5	315.0	274.5	308.0	301.5

S.E./mean = 29.8 nuts/5 trees.

1959

(i) 299.2 nuts/5 trees. (ii) 72.5 nuts/5 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/5 trees.

Treatment	1	2	3	4	5	6	7
Av. yield	326.8	253.5	231.8	328.8	270.5	313.0	370.0

S.E./mean = 36.3 nuts/5 trees.

Crop :- Coconut.

Ref :- K. 54 to 59 (4).

Site :- Central Coconut Res. Stn., Kayamkulam.

Type :- 'M'.

Object :- To study the effect of application of micro-nutrients in controlling the root and leaf disease of Coconut palm.

1. BASAL CONDITIONS :

(i) The area (a diseased coconut garden) was acquired in 1947. There was no regular manuring and cultivation till then. (ii) (a) Sandy. (b) Refer soil analysis, Kayamkulam. (iii) Naturally cross pollinated seed. (iv) Ordinary tall west coast. (v) N.A. Av. spacing 25'. (vi) N.A. (vii) For the years 1954, 1955 and 1959 : 0.75 lb./tree per year of N as G.N.C., 0.75 lb./tree per year of P_2O_5 as ground B.M., 1.50 lb./tree per year of K_2O as Pot. Sul. ; 224 lb./ac. of lime per year and sannhemp as G.M. raised *in situ*. G.M. sown sufficiently early and lime applied during preparatory cultivation. G.M. crop is pulled out, chopped and N, P and K broadcast uniformly and then ploughed in. For other years : Nil. (viii) Two ploughings with country plough, piling up mounds and strengthening bunds and to control weeds. (ix) Nil. (x) Unirrigated. (xi) 90°. (xii) Eight harvests in a year at intervals of 45 days.

2. TREATMENTS :

All combinations of (1), (2), (3), (4), (5), (6) and (7)

- (1) 2 levels of Mg. as Mg. Sul. : $A_0=0$ and $A_1=0.100$ lb./tree.
- (2) 2 levels of B as Sod. Bor. : $B_0=0$ and $B_1=0.057$ lb./tree.
- (3) 2 levels of Cu as C/S : $C_0=0$ and $C_1=0.128$ lb./tree.
- (4) 2 levels of Mn as Mn. Sul. : $D_0=0$ and $D_1=0.123$ lb./tree.
- (5) 2 levels of Fe as Ferrous Sul. : $E_0=0$ and $E_1=0.123$ lb./tree.
- (6) 2 levels of Mo as Amm. Molybdate : $F_0=0$ and $F_1=1.000$ gms/tree.
- (7) 2 levels of Zn as Zn. Sul. : $G_0=0$ and $G_1=0.133$ lb./tree.

The salts were powdered, mixed and broadcast uniformly in shallow belt $1\frac{1}{2}'$ away from the trunk of trees upto a radius of 5' and the area is forked well.

3. DESIGN :

(i) 2⁷ conf'd., with interactions ABC, CDE, ADF, BEF, BDG, AEG, CFG, ABDE, BCDF, ACEF, ACDG, BCEG, ABFG, DEFG and ABCDEFG. (ii) (a) 8 plots/block and 16 blocks/replication. (b) N.A. (iii) and (iv) 1. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of rhinoceros beetle, red palm weevil and rephantis cater-piller—control measures N.A. (iii) There were 3 categories of trees i.e. healthy trees and trees in early and advanced stages of disease. Observations made : area no. and measurement of leaves, no. of flower bunches and female flowers, shedding of buttons, yield of good and barren nuts. (iv) (a) 1953—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1954

(i) (h) 63.30 nuts/tree ; (e) 33.71 nuts/tree ; (a) 21.33 nuts/tree. (ii) (h) 28.86 nuts/tree ; (e) 21.41 nuts/tree ; (a) 13.61 nuts/tree. (iii) (h) Interaction B×D×G is highly significant. (e) Main effect of C and interaction B×G are significant ; (a) Main of effect A is highly significant. Interactions B×D, B×E, A×D×E, A×C×G and B×E×G are significant. (iv) Mean and differential responses in nuts/tree.

		Mean response	A		B		C		D		E		F		G	
			-	+	-	+	-	+	-	+	-	+	-	+	-	+
A	h	+0.32	—	—	2.12	- 1.31	-4.71	5.37	2.50	- 1.84	2.50	- 1.84	-1.06	1.72	-4.65	5.31
	e	4.45	—	—	3.56	5.34	2.46	6.43	4.50	4.41	5.81	3.09	3.37	5.53	4.75	4.15
	a	7.91	—	—	8.03	7.78	6.31	9.50	6.66	9.16	6.94	8.87	10.87	4.94	10.53	5.28
B	h	-9.73	-6.53	-11.37	—	—	-0.84	-18.62	-8.56	-10.90	-10.50	- 8.96	-3.56	-15.90	-12.36	- 7.12
	e	-1.70	-2.59	- 0.81	—	—	3.34	- 6.75	-2.62	- 0.78	-2.31	- 1.09	2.25	- 5.65	7.25	10.65
	a	1.75	1.87	1.62	—	—	3.55	- 0.05	-5.09	8.59	8.81	- 5.31	0.87	2.62	3.22	0.28
C	h	-4.17	-9.21	0.87	4.71	-13.06	—	—	-4.93	- 3.40	-0.93	- 7.40	-4.68	- 3.65	-6.03	- 2.31
	e	7.58	5.59	9.56	12.62	2.53	—	—	7.75	7.41	8.94	6.22	3.31	11.84	13.56	1.59
	a	-0.66	-2.25	0.94	1.14	- 2.45	—	—	3.37	- 4.69	-5.62	4.31	-0.50	- 0.81	0.41	- 1.72
D	h	+6.36	8.67	4.18	7.53	5.11	5.59	7.12	—	—	9.25	3.47	9.31	3.41	4.84	7.87
	e	3.17	3.22	3.12	2.25	4.09	3.34	3.00	—	—	7.44	- 1.09	3.62	2.72	0.18	6.15
	a	-2.75	-4.00	- 1.50	-9.59	4.09	1.28	- 6.78	—	—	-1.25	- 4.25	-1.00	- 4.50	-2.72	- 2.78
E	h	+3.29	5.46	1.13	2.53	4.06	6.53	0.06	6.19	0.40	—	—	-1.62	8.21	0.15	6.43
	e	2.42	3.78	1.06	1.81	3.03	3.78	1.06	6.69	- 1.84	—	—	-1.69	6.53	1.75	3.09
	a	-1.41	-2.37	- 0.45	5.66	- 8.47	-6.37	3.56	0.09	- 2.91	—	—	-2.50	- 0.31	-2.59	- 0.22
F	h	-2.45	-3.84	- 1.06	3.72	- 8.62	-2.97	- 1.93	0.50	- 5.40	-7.37	2.46	—	—	-7.19	2.28
	e	6.42	5.34	7.48	10.37	2.47	2.16	10.69	6.87	5.97	2.31	10.53	—	—	4.25	8.59
	a	-1.34	1.62	- 4.31	-2.22	- 0.47	-1.19	- 1.50	0.41	- 3.09	- 2.44	- 0.25	—	—	-4.09	1.41
G	h	-4.35	-9.34	0.62	-6.97	- 1.75	-6.22	- 2.50	-5.87	- 2.84	-7.50	- 1.22	-9.09	0.37	—	—
	e	2.17	2.46	1.87	11.12	- 6.78	8.15	- 3.81	-0.81	5.16	1.50	2.84	0.00	4.34	—	—
	a	-2.94	-0.31	- 5.56	-1.47	- 4.41	-1.87	- 4.00	-2.91	- 2.97	-4.12	- 1.75	-5.69	- 0.19	—	—

h=healthy ; e=Early stage disease ; a=advanced stage disease

(h) S.E. of mean response = 3.61 nuts/tree. ; S.E. of differential response = 5.10 nuts/tree.
 (e) S.E. of mean response = 2.67 nuts/tree. ; S.E. of differential response = 3.78 nuts/tree.
 (a) S.E. of mean response = 1.70 nuts/tree. ; S.E. of differential response = 2.40 nuts/tree.

5. RESULTS : (Contd.)

1955

(i) (h) : 58.59 nuts/tree ; (e) 33.59 nuts/tree ; (a) : 19.63 nuts/tree. (ii) (h) : 26.49 nuts/tree ; (e) 24.81 nuts/tree ; (a) 17.52 nuts/tree. (iii) (h) : Interaction A×F and B×C×F are significant ; (e) : Main effect of C and interaction E×F×G are significant ; (a) : Main effect of A alone is highly significant. (iv) Mean and differential responses in nuts/tree.

Differential responses

		Mean response	A		B		C		D		E		F		G	
			-	+	-	+	--	+	-	+	-	+	-	+	-	+
A	h	-4.18	—	—	-5.10	-3.26	-7.50	-0.87	-11.66	3.28	-0.18	-8.18	-14.47	6.09	-3.96	-4.40
	e	5.75	—	—	5.34	6.15	1.00	10.50	10.56	0.94	4.71	6.78	4.43	7.06	5.81	5.68
	a	8.95	—	—	8.00	9.91	6.58	11.31	6.81	11.09	3.16	14.75	7.72	10.19	10.00	7.91
B	h	-2.54	-3.46	-1.65	—	—	0.96	-6.06	-7.72	2.62	-0.21	-4.87	-4.00	-1.09	-7.59	2.50
	e	-6.15	-6.56	-5.75	—	—	0.00	-12.31	-8.56	-3.75	-7.66	-4.66	-2.56	-9.75	-3.81	8.50
	a	0.08	-0.87	1.03	—	—	2.22	-2.06	-2.50	2.66	4.41	-4.25	0.34	-0.19	1.87	-1.72
C	h	4.04	0.57	7.20	7.41	0.37	—	—	3.72	4.06	8.46	-0.69	4.44	3.34	4.66	3.12
	e	10.56	5.81	15.31	16.71	4.41	—	—	12.50	8.62	16.53	4.59	4.00	17.12	15.93	5.19
	a	1.61	-0.75	3.97	3.75	-0.53	—	—	-2.62	5.84	-1.28	4.50	4.09	-0.87	1.50	1.72
D	h	4.33	-3.14	11.80	-0.84	9.50	4.15	4.50	—	—	10.41	-1.75	12.75	-4.09	4.59	4.06
	e	6.43	11.25	1.62	4.03	8.84	8.37	4.50	—	—	9.90	2.96	7.18	5.69	5.69	7.18
	a	1.26	-0.87	3.41	-1.31	3.84	-2.97	5.50	—	—	-1.03	3.56	2.09	0.44	0.00	2.53
E	h	9.01	13.01	5.02	11.34	6.69	13.59	4.43	15.09	2.93	—	—	2.18	15.84	10.40	7.62
	e	-3.90	-4.93	-2.87	-5.40	-2.40	-2.06	-9.87	-0.44	-7.37	—	—	-8.25	-0.44	-2.43	-5.38
	a	-0.83	-6.62	4.97	3.50	-5.16	-3.72	2.06	-3.12	1.47	—	—	-3.34	1.69	-2.69	1.03
F	h	-8.82	-19.10	1.45	-10.28	-7.37	-8.28	-9.37	-0.40	-17.25	-15.65	-2.00	—	—	-13.53	-4.12
	e	6.62	5.31	7.94	10.21	3.03	0.06	13.18	7.37	5.87	2.28	10.97	—	—	5.75	7.50
	a	1.55	0.31	2.78	1.81	1.28	4.03	-0.94	2.37	0.72	-0.97	4.06	—	—	0.56	2.53
G	h	2.07	2.30	1.85	-2.97	7.12	2.84	1.31	2.34	1.81	3.47	0.68	-2.62	6.78	—	—
	e	-0.37	-0.31	-0.44	1.96	-2.71	5.03	-5.75	-1.12	0.37	1.09	-1.84	-1.25	0.50	—	—
	a	-5.30	-4.25	-6.34	-3.50	-7.09	-5.41	-5.19	-6.56	-4.03	-7.16	-3.44	-6.28	-4.31	—	—

(h) S.E. of mean response = 3.31 nuts/tree. ; S.E. of differential response = 4.68 nuts/tree.
 (e) S.E. of mean response = 3.10 nuts/tree. ; S.E. of differential response = 4.39 nuts/tree.
 (a) S.E. of mean response = 2.19 nuts/tree. ; S.E. of differential response = 3.10 nuts/tree.

5. RESULTS : (Contd.)

1956

(i) (h) : 61.85 nuts/tree ; (e) : 37.76 nuts/tree ; (a) : 23.01 nuts/tree. (ii) (h) : 27.45 nuts/tree ; (e) : 23.34 nuts/tree ; (a) : 18.72 nuts/tree. (iii) (h) : Interaction C×E is highly significant. Interaction A×G is significant ; (e) : None of the effects is significant ; (a) Main effect of A is highly significant. (iv) Mean and differential responses in nuts/tree.

Differential responses

		Mean response	A		B		C		D		E		F		G	
			-	+	-	+	-	+	-	+	-	+	-	+	-	+
A	h	1.20	—	—	1.87	0.53	-0.34	2.75	3.78	-1.37	-2.68	5.09	-3.09	5.50	-10.34	12.75
	e	8.98	—	—	7.81	10.15	5.50	12.47	12.12	5.84	7.37	10.59	7.44	10.53	9.06	8.91
	a	11.98	—	—	11.00	12.97	8.34	15.62	10.37	13.59	5.87	18.09	16.41	7.56	16.00	7.97
B	h	-4.79	-4.12	-5.46	—	—	1.28	-10.87	-6.21	3.37	-4.43	-5.15	-3.59	-6.00	-2.96	-6.62
	e	-3.02	-4.19	-1.84	—	—	-3.19	-2.84	-6.22	0.19	-7.56	1.53	-0.88	-5.16	2.94	-8.97
	a	0.64	-0.34	1.62	—	—	-0.53	1.81	-4.19	5.47	5.50	-4.22	-1.09	2.37	4.81	-3.53
C	h	-2.82	-4.37	-1.28	3.25	-8.90	—	—	-5.28	-0.37	10.18	-15.84	-4.28	-1.37	-0.71	-4.93
	e	5.64	2.16	9.12	5.47	5.81	—	—	8.47	2.81	5.50	5.78	1.25	10.03	13.50	-2.22
	a	0.05	-3.59	3.69	-1.12	1.22	—	—	-1.81	1.91	-4.19	4.28	4.66	-4.56	0.56	-0.47
D	h	7.79	10.37	5.21	6.37	9.21	5.34	10.25	—	—	10.50	5.09	12.59	3.00	16.03	-0.43
	e	7.80	10.94	4.66	4.59	11.00	10.62	4.97	—	—	10.19	5.41	9.25	6.34	8.56	7.03
	a	2.83	1.22	4.44	-2.00	7.66	0.97	4.69	—	—	2.75	2.91	-0.22	5.88	2.56	3.09
E	h	-2.54	-6.43	1.34	-2.19	-2.90	10.46	-15.56	0.15	-5.25	—	—	-8.90	3.81	-1.40	-3.68
	e	-4.55	-6.16	-2.94	-9.09	0.00	-4.69	-4.41	-2.16	-6.94	—	—	-12.25	3.16	-2.50	-6.59
	a	1.83	-4.28	7.94	6.69	-3.03	-2.41	6.06	1.75	1.91	—	—	0.78	2.87	1.87	1.78
F	h	-3.89	-8.18	0.40	-2.69	-5.09	-5.34	-2.44	0.91	-8.68	-10.25	2.46	—	—	-5.40	-2.37
	e	1.64	0.09	3.19	3.78	-0.50	-2.75	6.03	3.09	0.19	-6.06	9.34	—	—	-2.00	5.28
	a	1.73	6.16	-2.69	0.00	3.47	6.34	-2.87	-1.31	4.78	0.69	2.78	—	—	2.06	1.41
G	h	-5.70	-17.25	5.84	-3.87	-7.53	-3.59	-7.81	2.53	-13.93	-4.56	-6.84	-7.22	-4.18	—	—
	e	-2.48	-2.41	-2.56	3.47	8.44	5.37	-10.34	-1.72	-3.25	-0.44	-4.53	-6.12	1.16	—	—
	a	-1.17	2.84	-5.19	3.00	-5.34	-0.66	-1.69	-1.44	-0.91	-1.12	-1.22	-0.84	-1.50	—	—

(h) S.E. of mean response = 3.43 nuts/tree ; S.E. of differential response = 4.85 nuts/tree.
 (e) S.E. of mean response = 2.92 nuts/tree ; S.E. of differential response = 4.13 nuts/tree.
 (a) S.E. of mean response = 2.34 nuts/tree ; S.E. of differential response = 3.31 nuts/tree.

5. RESULTS : (Contd.)

1957

(i) (h) 56.04 nuts/tree ; (e) : 33.07 nuts/tree ; (a) : 20.38 nuts/tree. (ii) (h) : 26.06 nuts/tree ; (e) : 22.66 nuts/tree ; (a) : 17.24 nuts/tree. (iii) (h) Interaction B × D × G is highly significant. Interaction A × C, B × D and A × F × G are significant. (e) : None of the effects is significant ; (a) : Main effect of A is highly significant. Interactions A × G, A × B × E and B × C × G are significant. (iv) Mean and differential responses in nuts/tree.

Differential responses

		Mean response	A		B		C		D		E		F		G	
			-	+	-	+	-	+	-	+	-	+	-	+	-	+
A	h	0.61	—	—	0.50	0.71	-11.46	12.68	-6.34	7.56	-0.53	1.75	-1.50	2.71	-2.75	3.96
	e	7.39	—	—	6.81	7.97	2.59	12.19	6.56	8.22	7.59	7.19	5.53	9.25	10.12	4.66
	a	9.33	—	—	9.47	9.19	11.12	7.53	8.22	10.44	7.03	11.62	12.03	6.62	15.94	2.72
B	h	2.39	2.28	2.40	—	—	4.59	0.17	-6.96	11.75	3.28	1.50	2.13	2.66	-5.37	10.16
	e	-4.36	-4.94	-3.78	—	—	-3.78	-4.94	-4.94	-3.78	-7.09	-1.62	-1.47	-7.25	0.50	-2.97
	a	1.14	1.28	1.00	—	—	-1.59	3.87	-4.34	6.62	6.91	-4.62	0.59	1.69	2.75	-0.47
C	h	2.48	-9.59	14.44	4.69	0.28	—	—	5.65	-0.69	6.16	-1.19	-6.31	11.28	3.44	1.53
	e	4.80	0.00	9.59	5.37	4.22	—	—	8.56	1.03	12.53	-2.94	-0.66	10.25	12.56	-2.97
	a	0.95	2.75	-0.84	-1.78	3.69	—	—	-0.47	2.37	-2.22	4.12	4.22	-2.31	0.62	1.28
D	h	2.67	-4.28	9.62	-6.68	12.03	5.84	-0.50	—	—	5.59	-0.25	8.56	-3.22	3.25	2.09
	e	4.58	3.75	5.41	4.00	5.16	8.34	0.81	—	—	9.66	-0.50	2.34	6.81	5.43	3.72
	a	-1.26	-2.37	-0.16	-6.75	4.22	-2.69	0.16	—	—	-2.03	-0.50	-0.72	-1.81	-1.06	-1.47
E	h	4.54	3.40	5.69	5.44	3.65	8.22	0.87	7.46	1.62	—	—	0.31	8.78	4.12	4.96
	e	-5.01	-4.81	-5.22	-7.75	-2.28	2.72	-12.75	0.06	-10.09	—	—	-8.84	-1.19	-2.12	-7.91
	a	0.30	-2.00	2.59	6.06	-5.47	-2.87	3.47	-0.47	1.06	—	—	-2.72	3.31	-2.69	3.28
F	h	-7.23	-9.34	-5.12	-7.50	-6.96	-16.03	1.56	-1.34	-13.12	-11.47	-3.00	—	—	-11.81	-2.65
	e	7.23	5.37	9.09	10.12	4.34	1.78	12.69	5.00	9.47	3.41	11.06	—	—	8.25	6.22
	a	2.92	5.62	0.22	2.37	3.47	6.19	0.34	3.47	2.37	-0.09	5.94	—	—	0.31	5.53
G	h	0.76	-2.59	4.12	-7.00	8.53	1.72	-0.18	1.34	1.18	0.34	1.18	3.81	5.34	—	—
	e	-0.36	2.37	-3.09	4.50	-5.22	7.41	-8.12	0.50	-1.22	2.53	3.25	0.66	-1.37	—	—
	a	-2.67	3.94	-9.28	-1.06	-4.28	-3.00	-2.34	-2.47	-2.87	-5.66	0.31	-5.28	-0.06	—	—

(h) S.E. of mean response = 3.26 nuts/tree. ; S.E. of differential response = 4.61 nuts/tree.
 (e) S.E. of mean response = 2.83 nuts/tree. ; S.E. of differential response = 4.00 nuts/tree.
 (a) S.E. of mean response = 2.16 nuts/tree. ; S.E. of differential response = 3.05 nuts/tree.

5. RESULTS : (Contd.)

1958

(i) (h) : 55.22 nuts/tree ; (e) : 30.95 nuts/tree ; (a) : 17.49 nuts/tree (ii) (h) : 30.51 nuts/tree ; (e) : 23.88 nuts/tree ; (a) : 16.38 nuts/tree (iii) (h) : Interaction A×G is significant. (e) : Interactions B×G and E×F×G are significant ; (a) : Main effect of A alone is highly significant. (iv) Mean and differential responses in nuts/tree.

Differential responses

		Mean response	A		B		C		D		E		F		G	
			-	+	-	+	-	+	-	+	-	+	-	+	-	+
A	h	2.15	—	—	-0.93	5.25	5.57	-1.43	2.62	1.69	2.62	1.69	6.50	-2.18	-9.56	13.87
	e	4.11	—	—	1.59	6.62	-0.72	8.94	3.75	4.47	0.56	7.66	3.66	4.56	4.59	3.63
	a	10.80	—	—	10.56	11.03	11.44	10.16	7.50	14.09	10.31	11.28	11.28	10.31	14.37	7.22
B	h	-7.68	-10.78	-4.59	—	—	0.37	-15.75	-16.12	0.75	-11.43	-3.93	-10.00	-5.37	-11.25	-4.12
	e	2.61	0.09	5.12	—	—	-1.53	6.75	-0.50	5.72	-3.06	8.28	5.66	-0.44	11.91	-6.69
	a	1.05	0.81	1.28	—	—	1.62	0.47	-1.75	3.84	6.12	-4.03	1.47	0.63	2.31	0.22
C	h	-4.18	-0.59	-7.78	3.87	-12.25	—	—	-10.37	2.00	3.62	-12.00	-5.12	-3.25	-1.00	-7.37
	e	7.26	2.44	12.09	3.12	11.41	—	—	7.59	6.94	12.19	2.34	5.50	9.03	13.16	1.37
	a	-2.86	-2.22	-3.50	-2.28	-3.44	—	—	-5.28	-0.44	-2.72	-3.00	-1.41	-4.31	-2.66	-3.06
D	h	4.37	4.84	3.91	-4.06	12.81	-1.81	10.56	—	—	11.12	-2.37	9.06	-0.31	3.62	5.12
	e	3.61	3.25	3.97	0.50	6.72	3.94	3.28	—	—	3.03	4.19	2.78	4.44	3.47	3.75
	a	1.11	-2.19	4.41	-1.69	3.91	-1.31	3.53	—	—	-0.37	2.59	1.84	0.37	0.25	1.97
E	h	-1.31	-0.84	-1.78	-5.06	2.44	6.50	-9.12	5.44	-8.06	—	—	-4.37	1.75	5.25	-7.87
	e	-1.48	-5.03	2.06	-7.16	4.19	3.44	-6.41	-2.06	-0.91	—	—	-6.03	3.06	-1.72	-1.25
	a	2.61	2.12	3.09	7.69	-2.47	2.75	2.47	1.12	4.09	—	—	-2.59	7.81	1.12	4.09
F	h	-5.31	-0.96	-9.66	-7.62	-3.00	-6.25	-4.37	-0.62	-10.00	-8.37	-2.25	—	—	-5.06	-5.56
	e	1.55	1.09	2.00	4.59	-1.50	-0.22	3.31	0.72	2.37	-3.00	6.09	—	—	-0.59	3.69
	a	2.64	3.12	2.16	3.06	2.22	1.19	4.09	3.37	1.91	-2.56	7.84	—	—	2.31	2.97
G	h	-7.43	-19.15	4.28	-11.00	-3.87	-4.25	-10.62	-8.19	-6.69	-0.87	-14.00	-7.19	-7.69	—	—
	e	0.55	1.03	0.06	9.84	-8.75	6.44	-5.34	0.41	0.69	0.31	0.78	-1.59	2.69	—	—
	a	-2.89	0.69	-6.47	-1.62	-4.16	-2.69	-3.09	-3.75	-2.03	-4.37	-1.41	-3.22	-2.56	—	—

(h) S.E. of mean response = 3.81 nuts/tree ; S.E. of differential response = 5.39 nuts/tree
 (e) S.E. of mean response = 2.98 nuts/tree ; S.E. of differential response = 4.22 nuts/tree
 (a) S.E. of mean response = 2.05 nuts/tree ; S.E. of differential response = 2.90 nuts/tree

5. RESULTS: (Contd).

1959

(i) (h) : 59.78 nuts/tree ; (e) : 36.34 nuts/tree ; (a) : 23.02 nuts/tree. (ii) (h) : 34.18 nuts/tree ; (e) : 24.69 nuts/tree ; (a) : 21.81 nuts/tree. (iii) (h) : Interactions E×F and C×D×F are significant ; (e) : Main effect F is highly significant. Interactions B×F and C×G are significant ; (a) : Main effect A alone is highly significant. (iv) Mean and differential responses in nuts/tree.

Differential responses

		Mean response	A		B		C		D		E		F		G	
			-	+	-	+	-	+	-	+	-	+	-	+	-	+
A	h	-2.48	—	—	-3.41	-1.56	-9.16	4.19	-12.81	7.84	-5.66	0.69	-6.84	1.88	-12.00	7.03
	e	7.71	—	—	5.47	9.97	4.53	10.91	9.31	6.12	6.00	9.44	5.78	9.66	14.19	1.25
	a	14.02	—	—	14.03	14.00	12.00	16.03	11.44	16.59	10.84	17.19	15.34	12.69	17.94	10.09
B	h	-3.89	-4.81	-2.97	—	—	-0.91	-6.88	-12.72	4.94	-5.84	-1.94	-8.47	0.69	-3.69	-4.09
	e	3.03	0.78	5.28	—	—	6.81	-0.75	5.84	0.22	0.53	5.53	14.88	-8.81	5.56	0.50
	a	5.52	5.53	5.50	—	—	9.00	2.03	-0.12	11.16	11.34	-0.31	3.59	7.44	13.62	-2.59
C	h	9.98	3.31	16.66	12.97	7.00	—	—	6.25	13.72	19.16	0.81	9.91	10.06	8.19	11.78
	e	3.38	0.19	6.56	7.16	-0.41	—	—	10.10	-3.34	9.69	-2.94	-5.88	12.62	13.75	-7.00
	a	0.30	-1.72	2.31	3.78	-3.19	—	—	-4.56	5.16	-4.47	5.06	3.91	-3.31	0.19	0.41
D	h	-0.67	-11.00	9.66	-9.50	8.16	-4.41	3.06	—	—	0.84	-2.19	3.22	-4.56	5.75	-7.09
	e	-0.28	1.31	-1.88	2.53	-3.09	6.44	-7.00	—	—	1.41	-1.97	0.12	-0.69	2.38	-2.94
	a	2.11	-0.47	4.69	-3.53	7.75	-2.75	6.97	—	—	1.15	3.06	1.59	2.62	3.56	0.66
E	h	1.80	-1.38	4.97	-0.16	3.75	10.97	-7.38	3.31	0.28	—	—	-10.28	13.87	-0.50	4.09
	e	-3.53	-5.25	-1.81	-6.03	-1.03	2.78	-9.84	-1.84	-5.22	—	—	-7.44	0.38	-4.81	-2.25
	a	1.27	-1.91	4.44	7.09	-4.57	-3.50	6.03	0.31	2.22	—	—	-1.03	3.56	-1.75	4.28
F	h	2.08	-2.28	6.44	-2.50	6.66	2.00	2.16	5.97	-1.81	-10.00	14.16	—	—	1.78	2.38
	e	13.62	11.69	15.56	25.47	1.78	4.38	22.88	14.03	13.22	9.72	17.53	—	—	10.25	17.00
	a	2.96	4.28	1.62	1.03	4.88	6.56	-0.66	2.44	3.47	0.66	5.25	—	—	3.25	2.66
G	h	-4.54	-14.06	4.97	-4.34	-4.75	-6.34	-2.75	1.88	-10.97	-6.85	-2.25	-4.84	-4.25	—	—
	e	-1.94	4.53	-8.41	0.59	-4.47	8.44	-12.31	0.72	-4.59	-3.22	-0.66	-5.31	1.44	—	—
	a	-0.33	3.59	-4.25	7.78	-8.44	-0.44	-0.22	1.12	-1.78	-3.34	2.69	-0.03	-0.62	—	—

(h) S.E. of mean response = 4.27 nuts/tree. ; S.E. of differential response = 6.04 nuts/tree.
 (e) S.E. of mean response = 3.09 nuts/tree. ; S.E. of differential response = 4.36 nuts/tree.
 (a) S.E. of mean response = 2.73 nuts/tree. ; S.E. of differential response = 3.86 nuts/tree.

Crop :- Coconut Palm.

Ref :- K. 54 to 59(5).

Site :- Reg. Coconut Res. Stn., Kumarakom.

Type :- 'M'.

Object :- To find the optimum dose of manure on reclaimed clayey soil of the back water area for Coconut.

1. BASAL CONDITIONS :

(i) The area was standardised for three years prior to the expt. and during this period 280 cubic ft./ac. of sand and 10 lb./ac. of ash was applied uniformly. Age of trees range from 20 to 50 years. (ii) (a) Clayey loam. (b) N.A. (iii) By seedlings. (iv) Tipica (ordinary tall). (v) Trees stand on long and narrow bunds with channels. Spacing between 25' to 30'. (vi) N.A. (vii) 280 cubic ft./ac. of river sand 1120 lb./ac. of lime spread uniformly during Oct.-Nov. (viii) Digging the area with local *mummatty*. (ix) Nil. (x) Unirrigated. (xi) 113.4" in 1954, 134.7" in 1955, 117.9" in 1956, 137.6" in 1957, N.A. in 1958 and 143.6" in 1959. (xii) 8 harvests in a year at an interval of 45 days.

2. TREATMENTS :

1. Control.
2. 0.25 lb. of N+0.25 lb. of P+0.50 lb. of K per tree.
3. 0.25 lb. of N+0.25 lb. of P+1.00 lb. of K per tree.
4. 0.50 lb. of N+0.25 lb. of P+1.00 lb. of K per tree.
5. 0.50 lb. of N+0.75 lb. of P+1.00 lb. of K per tree.
6. 0.50 lb. of N+0.75 lb. of P+1.50 lb. of K per tree.

N as A/S, P₂O₅ as B.M. and K₂O as Mur. Pot. were applied.

Manures applied during August-September in long line trenches of dimensions 10' x 3' x 1'.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) 8 effective trees. (v) Two guard trees are left. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of rhinoceros beetles, leaf-rot, wilt disease and stem bleeding—beetles were picked out and bordeaux mixture sprayed. (iii) No. of nuts and female flowers, height of trunk and girth of collar and no. of leaves per tree. (iv) (a) 1952—1959. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1954

(i) 466 nuts/8 trees. (ii) 67 nuts/8 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2	3	4	5	6
Av. yield	446	432	436	472	494	514

S.E./mean = 27 nuts/8 trees.

1955

(i) 670 nuts/8 trees. (ii) 52 nuts/8 trees. (iii) Treatment differences are significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2	3	4	5	6
Av. yield	540	647	640	703	738	752

S.E./mean = 21 nuts/8 trees.

1956

(i) 557 nuts/8 trees. (ii) 63 nuts/8 trees. (iii) Treatment differences are significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2	3	4	5	6
Av. yield	450	508	590	562	621	609

S.E./mean = 26 nuts/8 trees.

1957

(i) 526 nuts/8 trees. (ii) 63 nuts/8 trees. (iii) Treatment differences are highly significant. (iv) Av. yield of nuts/8 trees.

275

Treatment	1	2	3	4	5	6
Av. yield	404	500	524	554	573	599

S.E./mean = 23 nuts/8 trees.

1958

(i) 583 nuts/8 trees. (ii) 99 nuts/8 trees. (iii) Treatment differences are significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2	3	4	5	6
Av. yield	470	543	564	577	687	659

S.E./mean = 40 nuts/8 trees.

1959

(i) 546 nuts/8 trees. (ii) 64 nuts/8 trees. (iii) Treatment differences are highly significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2	3	4	5	6
Av. yield	478	508	526	534	611	617

S.E./mean = 26 nuts/8 trees.

Crop :- Coconut.

Ref :- K. 54 to 59(6).

Site :- Reg. Coconut Res. Stn., Neyyathinkara.

Type :- 'M'.

Object :- To find the optimum dose of manure for Coconut trees in red loamy soils.

1. BASAL CONDITIONS :

(i) The area was receiving *mummaty* diggings since 1948. Sannhemp was raised and buried in this area. (ii) (a) Red loam. (b) Refer soil analysis. Neyyathinkara. (iii) Seed nuts. (iv) Ordinary tall variety of west coast. (v) Date of planting N.A. Spacing irregular. (vi) N.A. (vii) 50 lb./tree of G.M. was given at the time of applying N and K in shallow trenches. (viii) Making basins around the tree to a radius of 6' and giving *mummaty* digging. (ix) Nil for 1954 to 1957 and tapioca for the years 1958 and 1959. (x) Unirrigated. (xi) 75" in 1954 to 1956, 60" in the years 1957 to 1959. (xii) 7 harvests in a year at intervals of 45-50 days.

2. TREATMENTS:

M₀ = N₀ manure (control).

M₁ = 0.25 lb. of N + 0.25 lb. of P₂O₅ + 0.50 lb. of K₂O per tree.

M₂ = 0.25 lb. of N + 0.25 lb. of P₂O₅ + 1.00 lb. of K₂O per tree.

M₃ = 0.50 lb. of N + 0.25 lb. of P₂O₅ + 1.00 lb. of K₂O per tree.

M₄ = 0.50 lb. of N + 0.75 lb. of P₂O₅ + 1.00 lb. of K₂O per tree.

M₅ = 0.50 lb. of N + 0.75 lb. of P₂O₅ + 1.50 lb. of K₂O per tree.

N as A/S, P₂O₅ as Super and K₂O as Mur. Pot. were applied.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) Sample of 8 trees selected randomly. (v) Sufficient number of guard rows left. (vi) Yes.

4. GENERAL :

(i) Satisfactory. Drought conditions in 1958. (ii) Nil. (iii) No. of nuts, leaves, female flowers and bunches per tree. (iv) (a) 1952—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1954

(i) 537.5 nuts/8 trees. (ii) 74.6 nuts/8 trees. (iii) Treatment differences are highly significant. (iv) Av. yield of nuts/8 trees.

Treatment	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅
Av. yield	374.2	502.7	596.2	617.3	525.2	609.5

S.E./mean = 30.4 nuts/8 trees.

1955

(i) 641.5 nuts/8 trees. (ii) 87.8 nuts/8 trees. (iii) Treatment differences are highly significant. (iv) Av. yield of nuts/8 trees.

Treatment	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅
Av. yield	418.5	581.5	715.3	753.8	678.8	700.8

S.E./mean = 35.9 nuts/8 trees.

1956

(i) 472 nuts/8 trees. (ii) 80 nuts/8 trees. (iii) Treatment differences are highly significant. (iv) Av. yield of nuts/8 trees.

Treatment	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅
Av. yield	291	476	502	530	482	549

S.E./mean = 32.0 nuts/8 trees.

1957

(i) 530.3 nuts/8 trees. (ii) 81.5 nuts/8 trees. (iii) Treatment differences are highly significant. (iv) Av. yield of nuts/8 trees.

Treatment	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅
Av. yield	297.0	517.7	577.0	630.0	559.5	600.7

S.E./mean = 33.3 nuts/8 trees.

1958

(i) 484.2 nuts/8 trees. (ii) 46.0 nuts/8 trees. (iii) Treatment differences are highly significant. (iv) Av. yield of nuts/8 trees.

Treatment	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅
Av. yield	271.0	461.3	503.5	557.0	487.0	625.3

S.E./mean = 18.8 nuts/8 trees.

1959

(i) 638 nuts/8 trees. (ii) 83.3 nuts/8 trees. (iii) Treatment differences are highly significant. (iv) Av. yield of nuts/8 trees.

Treatment	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅
Av. yield	375	607	583	767	691	802

S.E./mean = 34.0 nuts/8 trees.

Crop :- Coconut.

Ref :- K. 54 to 58(7).

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

Type :- 'M'.

Object :- To find out the best potassic fertilizer that can effectively replace ash.

1. BASAL CONDITIONS :

(i) An experimental area from 1942 to 1948 to study the effect of G.N.C. and A/S. (ii) (a) Gravelly laterite. (b) Refer soil analysis, Pilicode. (iii) By seed nuts. (iv) Tall west coast. (v) Triangular method with 30' spacing. Surface planting on 23.5.1918. (vi) One year old. (vii) 4 lb./tree of A/S and 100 lb./tree of G.L. in addition to scheduled dose of potassic manure per year broadcast and ploughed in. (viii) 3 ploughings. (ix) Nil. (x) Unirrigated. (xi) 174.3" in 1954, 137.6" in 1955, 120.2" in 1956, 174.2" in 1957, and 114.8" in 1958. (xii) Monthly harvests.

2. TREATMENTS :

3 sources to supply 1 lb./tree of K₂O per year : S₁=Pot. Sul., S₂=Mur. Pot. and S₃=Ash.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) Sample of 6 trees selected randomly. (v) Yes. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Girth, height, no. of leaves and yield of nuts. (iv) (a) 1951—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1954

(i) 265.3 nuts/6 trees. (ii) 62.39 nuts/6 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/6 trees.

Treatment	S ₁	S ₂	S ₃
Av. yield	262.8	299.4	233.8

S.E./mean = 27.9 nuts/6 trees.

1955

(i) 289.5 nuts/6 trees. (ii) 66.34 nuts/6 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/6 trees.

Treatment	S ₁	S ₂	S ₃
Av. yield	279.8	287.0	301.8

S.E./mean = 29.67 nuts/6 trees.

1956

(i) 330.2 nuts/6 trees. (ii) 56.48 nuts/6 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/6 trees.

Treatment	S ₁	S ₂	S ₃
Av. yield	335.6	366.2	288.8

S.E./mean = 25.26 nuts/6 trees.

1957

(i) 254.5 nuts/6 trees. (ii) 57.16 nuts/6 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/6 trees.

Treatment	S ₁	S ₂	S ₃
Av. yield	240.0	293.8	229.8

S.E./mean = 25.56 nuts/6 trees.

1958

(i) 223.0 nuts/6 trees. (ii) 36.35 nuts/6 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/6 trees.

Treatment	S ₁	S ₂	S ₃
Av. yield	221.2	235.4	212.4

S.E./mean = 16.26 nuts/6 trees.

Crop :- Coconut.

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

Ref :- 54 to 57(8).

Type :- 'M'.

Object :- To find out the effect of applying lime to Coconut.

1. BASAL CONDITIONS :

(i) Usual manurial and cultural operations—3 ploughings and one intercultivation. 3 lb./tree of A/S+2 lb./tree of B.M.+20 lb./tree of A/S/N+100 lb./tree of G.M. (ii) (a) Gravelly laterite. (b) Refer soil analysis, Pilicode. (iii) By seedlings. (iv) Ordinary tall west coast. (v) 1929, in 3' cube pits—3' spacing. (vi) One year. (vii) Nil. (viii) One ploughing and two diggings. (ix) G.M. crop raised. (x) Unirrigated. (xi) N.A. (xii) Monthly harvests.

2. TREATMENTS :

2 levels of lime applied at the time of digging : L₀=0 and L₁=5 lb./tree.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) 1. (v) Nil. (vi) No.

4. GENERAL :

(i) Satisfactory. (ii) Rhinoceros beetle regularly searched and killed. (iii) No. of leaves and female flowers and yield of nuts. (iv) 1954—1957 (Residual effects studied in 1955, 1956 and 1957). (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1954

(i) 52.66 nuts/tree. (ii) 14.49 nuts/tree. (iii) Treatment difference is not significant. (iv) Av. yield of nuts/tree.

Treatment	L ₀	L ₁
Av. yield	56.66	48.66

S.E./mean = 4.18 nuts/tree.

1955

(i) 55.16 nuts/tree. (ii) 24.73 nuts/tree. (iii) Treatment difference is not significant. (iv) Av. yield of nuts/tree.

Treatment	L ₀	L ₁
Av. yield	45.00	65.33

S.E./mean = 7.14 nuts/tree.

1956

(i) 35.29 nuts/tree. (ii) 12.89 nuts/tree. (iii) Treatment difference is not significant. (iv) Av. yield of nuts/tree.

Treatment	L ₀	L ₁
Av. yield	34.33	36.25

S.E./mean = 3.72 nuts/tree.

1957

(i) 42.08 nuts/tree. (ii) 18.19 nuts/tree. (iii) Treatment difference is not significant. (iv) Av. yield of nuts/tree.

Treatment	L ₀	L ₁
Av. yield	44.16	40.00

S.E./mean = 5.25 nuts/tree.

Crop :- Coconut.

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

Ref :- K. 54 to 58(9).

Type :- 'M'.

Object :- To find out the best method of applying manures to Coconut in gravelly laterite soils.

1. BASAL CONDITIONS :

(i) Husks and leaves buried in trenches 6' wide and 1' deep. Expt. started in 1937 but discontinued in 1942. 3 ploughings annually with iron plough. (ii) (a) Gravelly laterite. (b) Refer soil analysis, Pilicode. (iii) By seed nuts. (iv) West coast tall. (v) Planted on 23.5.1918 in pits of size 3' x 3' x 3' by triangular method with a spacing of 30'. (vi) One year. (vii) 4½ lb./tree of A/S+30 lb./tree of Ash+100 lb./tree of G.L. applied per year. (viii) 5 ploughings and 1 intercultivation. (ix) G.M. raised and applied. (x) Unirrigated. (xi) 174.3° in 1954, 137.6° in 1955, 120.2° in 1956, 174.2° in 1957 and 114.8° in 1958. (xii) Monthly harvests.

2. TREATMENTS :

3 methods of application of manures : M₁—In circular basins round each tree to a radius of 8' and depth of 1', M₂—Broadcast over entire area and ploughed in and M₃—In linear trenches 2' wide and 1' deep in between rows of trees.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) Sample of 4 trees selected randomly. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Minor attack of rhinoceros beetle. (iii) No. of leaves and female flowers and yield of nuts. (iv) 1948—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1954

(i) 210.5 nuts/4 trees. (ii) 45.21 nuts/4 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/4 trees.

Treatment	M ₁	M ₂	M ₃
Av. yield	195.8	221.2	214.6

S.E./mean = 20.2 nuts/4 trees.

1955

(i) 176.7 nuts/4 trees. (ii) 43.60 nuts/4 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/4 trees.

Treatment	M ₁	M ₂	M ₃
Av. yield	192.2	164.6	173.4

S.E./mean = 19.5 nuts/4 trees.

1956

(i) 218.2 nuts/4 trees. (ii) 38.34 nuts/4 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/4 trees.

Treatment	M ₁	M ₂	M ₃
Av. yield	214.8	211.2	228.6

S.E./mean = 17.1 nuts/4 trees.

1957

(i) 149.9 nuts/4 trees. (ii) 41.48 nuts/4 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/4 trees.

Treatment	M ₁	M ₂	M ₃
Av. yield	142.8	158.8	148.2

S.E./mean = 18.5 nuts/4 trees.

1958

(i) 161.4 nuts/4 trees. (ii) 44.89 nuts/4 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/4 trees.

Treatment	M ₁	M ₂	M ₃
Av. yield	197.4	129.6	157.2

S.E./mean = 20.1 nuts/4 trees.

Crop :- Coconut.

Ref :- K. 54 to 58(10).

Site :- Reg. Coconut Res. Stn., Thodupuzha.

Type :- 'M'.

Object :- To find out the optimum doses of N, P and K for Coconut palms in laterite gravelly soil.

1. BASAL CONDITIONS :

(i) Uneven and undulating hilly slopes. Woodash and G.M. applied in 1949, 1950 and 1951. (ii) (a) Laterite gravelly. (b) N.A. (iii) By raising seedlings from naturally cross pollinated seed. (iv) Tall west coast (local). (v) Planted in 1915, 1916 and 1919. Triangular method with 30' spacing. (vi) N.A. (vii) 3000 lb./ac. of G.M.+1 ton/ac. of lime broadcast. G.L. applied in basins of radius 6' around trees and then covered. (viii) Opening basins for application of manures and digging. (ix) Nil. (x) Un-irrigated. (xi) 125°. (xii) Harvest at intervals of 1½ months.

2. TREATMENTS :

1. Control.
 2. 0.25 lb. of N+0.25 lb. of P_2O_5 +0.50 lb. of K_2O per tree.
 3. 0.25 lb. of N+0.25 lb. of P_2O_5 +1.00 lb. of K_2O per tree.
 4. 0.50 lb. of N+0.25 lb. of P_2O_5 +1.00 lb. of K_2O per tree.
 5. 0.50 lb. of N+0.75 lb. of P_2O_5 +1.00 lb. of K_2O per tree.
 6. 0.50 lb. of N+0.75 lb. of P_2O_5 +1.50 lb. of K_2O per tree.
- N as A/S, P_2O_5 as B.M. and K_2O as Mur. Pot. were applied.

3. DESIGN :

- (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) Sample of 8 trees randomly selected. (v) Sufficient guard rows left. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Slight attack of beetles ; bud-rot and leaf disease—beetles picked off ; spraying of bordeaux mixture. (iii) No. of nuts, female flowers and leaves. (iv) 1953—contd. (b) N.A. (v) Nil. (vi) Severe nut fall noticed in 1956.

5. RESULTS :

1954

- (i) 409 nuts/8 trees. (ii) 33.9 nuts/8 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2	3	4	5	6
Av. yield	404	406	399	388	436	421

S.E./mean = 13.8 nuts/8 trees.

1955

- (i) 494 nuts/8 trees. (ii) 78.0 nuts/8 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/8 trees

Treatment	1	2	3	4	5	6
Av. yield	436	493	468	524	480	562

S.E./mean = 31.8 nuts/8 trees.

1956

- (i) 283.0 nuts/8 trees. (ii) 40.9 nuts/8 trees. (iii) Treatment differences are significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2	3	4	5	6
Av. yield	239	260	327	278	305	291

S.E./mean = 16.7 nuts/8 trees.

1957

- (i) 405 nuts/8 trees. (ii) 79.6 nuts/8 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2	3	4	5	6
Av. yield	388	404	432	350	436	419

S.E./mean = 32.5 nuts/8 trees.

1958

- (i) 261 nuts/8 trees. (ii) 59.6 nuts/8 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2	3	4	5	6
Av. yield	250	236	244	231	319	287

S.E./mean = 24.4 nuts/8 trees.

Crop :- Coconut.

Ref :- K. 54 to 58(11).

Site :- Central Coconut Res. Stn., Kasaragod.

Type :- 'C'.

Object :- To compare the effect of different cultural practices on the yield of Coconut.

1 BASAL CONDITIONS:

(i) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Kasaragod. (iii) Acquired plantation-seed propagation. (iv) Ordinary west coast tall. (v) Date of Planting N.A. Spacing irregular. (vi) N.A. (vii) Nil. (viii) As per treatments. (ix) Nil. (x) Unirrigated. (xi) 142" in 1954, 158" in 1955, 152" in 1956, 135" in 1957 and 131" in 1958 (xii) Monthly harvests.

2. TREATMENTS :

5 cultural operations : C₁=No intercultural operations (control), C₂=2 ploughings with iron plough, C₃=1 digging, C₄=Piling mounds and levelling and C₅=Forming basins and covering.

The operations were done between July-August and November-December depending upon rainfall distribution.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) Sample of ten trees selected randomly. (v) Sufficient guard rows left. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) No. of nuts, female flowers and leaves. (iv) (a) 1952—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS:**1954**

(i) 463.4 nuts/10 trees. (ii) 79.42 nuts/10 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/10 trees.

Treatment	C ₁	C ₂	C ₃	C ₄	C ₅
Av. yield	444.0	440.2	488.2	479.8	464.8

S.E./mean = 39.7 nuts/10 trees.

1955

(i) 410 nuts/10 trees. (ii) 73.89 nuts/10 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/10 trees.

Treatment	C ₁	C ₂	C ₃	C ₄	C ₅
Av. yield	397.8	375.2	412.5	426.5	437.8

S.E./mean = 36.9 nuts/10 trees.

1956

(i) 435.6 nuts/10 trees. (ii) 74.17 nuts/10 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/10 trees.

Treatment	C ₁	C ₂	C ₃	C ₄	C ₅
Av. yield	416.5	434.5	409.2	461.8	456.2

S.E./mean = 37.1 nuts/10 trees.

1957

(i) 400.2 nuts/10 trees. (ii) 71.04 nuts/10 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/10 trees.

Treatment	C ₁	C ₂	C ₃	C ₄	C ₅
Av. yield	400.5	372.5	415.2	390.2	400.5

S.E./mean = 35.5 nuts/10 trees.

1958

(i) 393.4 nuts/10 trees. (ii) 85.32 nuts/trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/10 trees.

Treatment	C ₁	C ₂	C ₃	C ₄	C ₅
Av. yield	378.5	346.2	394.0	410.5	438.0

S.E./mean = 42.8 nuts/10 trees.

Crop :- Coconut.

Ref :- K. 54 to 59(12).

Site :- Agri. Coconut Res. Stn., Kumarakom.

Type :- 'C'.

Object :- To determine suitable intercultural operations for Coconut.

1. BASAL CONDITIONS :

(i) Standardisation of area three years prior to the expt. with uniform treatment. Age of trees varied from 20 to 50 years. (ii) (a) Clayey loam. (b) N.A. (iii) By seedlings. (iv) Tipica-ordinary tall west coast. (v) Trees stand on long and narrow bunds with channels in between. Spacing 25' to 30'. (vi) N.A. (vii) 280 cubic ft./ac. of river sand, $\frac{1}{2}$ ton/ac. of lime and 10 lb./ac. of ash were broadcast uniformly. (viii) As per treatments. (ix) Nil. (x) Unirrigated. (xi) 113.4" in 1954, 134" in 1955, 118" in 1956, 138" in 1957, N.A. in 1958 and 144" in 1959. (xii) 8 harvests at an interval of 45 days each.

2. TREATMENTS :

T₁ = Uncultivated.

T₂ = Forming mounds on the bunds around trees in Aug.-Sept. and levelling in Dec.-Jan.

T₃ = Shallow diggings with local *mummatties*.

T₄ = Deep diggings with *koordalies*.

Treatments T₃ and T₄ given in Oct.-Nov.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) 8 effective trees. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Severe attack of leaf-rot, wilt and stem bleeding diseases and rhinoceros beetle. (iii) No. of nuts, female flowers and leaves and setting %. (iv) (a) 1952-1939. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1954

(i) 374 nuts/8 trees. (ii) 69.8 nuts/8 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/8 trees.

Treatment	T ₁	T ₂	T ₃	T ₄
Av. yield	364	388	394	350

S.E./mean = 25 nuts/8 trees.

1955

(i) 439 nuts/8 trees. (ii) 56.8 nuts/8 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/8 trees.

Treatment	T ₁	T ₂	T ₃	T ₄
Av. yield	424	467	451	413

S.E./mean = 20 nuts/8 trees.

1956

(i) 369.4 nuts/8 trees. (ii) 61.3 nuts/trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/8 trees.

Treatment	T ₁	T ₂	T ₃	T ₄
Av. yield	388.5	402.6	385.9	350.8

S.E./mean = 21.7 nuts/8 trees.

1957

(i) 313.8 nuts/8 trees. (ii) 58.43 nuts/8 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/8 trees.

Treatment	T ₁	T ₂	T ₃	T ₄
Av. yield	312.9	313.9	333.1	295.2

S.E./mean = 20.7 nuts/8 trees.

1958

(i) 396.5 nuts/8 trees. (ii) 64.54 nuts/8 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/8 trees.

Treatment	T ₁	T ₂	T ₃	T ₄
Av. yield	422.2	395.6	395.9	372.2

S.E./mean = 22.8 nuts/8 trees.

1959

(i) 382 nuts/8 trees. (ii) 53.74 nuts/8 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/8 trees.

Treatment	T ₁	T ₂	T ₃	T ₄
Av. yield	332	403	412	380

S.E./mean = 19.0 nuts/8 trees.

Crop :- Coconut.

Ref :- K. 54 to 58(13).

Site :- Reg. Coconut Res. Stn., Neyyathinkara.

Type :- 'C'.

Object :- To find out suitable and economical cultural operations in the Coconut gardens of red loamy soils.

1. BASAL CONDITIONS :

(i) Digging the area, raising G.M. and then burying G.M. in *situ* in trenches. (ii) (a) Red loam. (b) Refer. soil analysis, Neyyathinkara. (iii) By seed nuts. (iv) Ordinary tall west coast. (v) Date of planting N.A. Spacing irregular. (vi) N.A. (vii) 0.50 lb. of N as A/S+0.25 lb. of P₂O₅ as B.M. and 1 lb. of K₂O as Mur Pot. per tree given as B.D. (viii) As per treatments. (ix) Very often Tapioca grown. (x) Unirrigated. (xi) 75° in 1954, 1955 and 1956, 60° in 1957, 1958 and 1959. (xii) 6 harvests at intervals of two months.

2. TREATMENTS :

1. Making basins round the trees to a radius of 5' from the base.
2. Ploughing the entire area without basins.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 7. (iv) 8 effective trees. (v) Sufficient guard rows left. (vi) No.

4. GENERAL :

(i) Good. (ii) Nil. (iii) No. of nuts/tree, no. of leaves, bunches and female flowers and setting percentage. (iv) (a) 1952—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1954

(i) 595.0 nuts/8 trees. (ii) 34.78 nuts/8 trees. (iii) Treatment difference is not significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2
Av. yield	591.7	598.3

S.E./mean = 13.1 nuts/8 trees.

1955

(i) 726.7 nuts/8 trees. (ii) 26.57 nuts/8 trees. (iii) Treatment difference is not significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2
Av. yield	758.4	695.0

S.E./mean = 10.0 nuts/8 trees.

1956

(i) 451.6 nuts/8 trees. (ii) 42.90 nuts/8 trees. (iii) Treatment difference is not significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2
Av. yield	458.1	445.0

S.E./mean = 16.2 nuts/8 trees.

1957

(i) 637.1 nuts/8 trees. (ii) 31.62 nuts/8 trees. (iii) Treatment difference is not significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2
Av. yield	670.4	603.9

S.E./mean = 12.0 nuts/8 trees.

1958

(i) 529.8 nuts/8 trees. (ii) 45.54 nuts/8 trees. (iii) Treatment difference is not significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2
Av. yield	517.0	542.9

S.E./mean = 17.2 nuts/8 trees.

Crop :- Coconut.

Ref :- K. 54 to 58(14).

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

Type :- 'C'.

Object. — To find out the proper depth at which Coconut seedlings should be planted in pure littoral sand.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) Pure sandy. (b) Refer soil analysis, Nileshwar. (iii) By seed-nuts (iv) Tall west coast. (v) 1939, Triangular method of planting at 25' spacing. (vi) One year. (vii) 3 lb. A/S, 5 lb. F.M., 20 lb. ash and 100 lb. G.L. or C.M. per tree per year applied during June and Nov. (viii) 2 ploughings with iron plough. (ix) Nil. (x) Unirrigated. (xi) 177.3" in 1954, 147.2" in 1955 and 1956, 142.0" in 1957 and 156.9" in 1958. (xii) Nil.

2. TREATMENTS :

2 depths of planting seedlings in pits : $D_1=3'$ and $D_2=6'$.

3. DESIGN :

(i) L. Sq. (ii) (a) 2. (b) N.A. (iii) 6. (iv) 12. (v) Nil. (vi) No.

4. GENERAL :

(i) Normal. (ii) Rhinoceros beetle was periodically looked and killed. (iii) Rate of production of leaves and no. of functioning leaves. (iv) (a) 1939—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1954

(i) 7.27 leaves/tree. (ii) 0.05 leaves/tree. (iii) Treatment difference is highly significant. (iv) Av. no. of leaves/tree.

Treatment	D_1	D_2
Av. no. of leaves	7.49	7.05

S.E./mean = 0.02 leaves/tree.

1955

(i) 8.01 leaves/tree. (ii) 0.18 leaves/tree. (iii) Treatment difference is highly significant. (iv) Av. no. of leaves/tree.

Treatment	D ₁	D ₂
Av. no. of leaves	8.58	7.44

S.E./mean = 0.08 leaves/tree.

1956

(i) 8.24 leaves/tree. (ii) 0.60 leaves/tree. (iii) Treatment difference is not significant. (iv) Av. no. of leaves/tree.

Treatment	D ₁	D ₂
Av. no. of leaves	8.61	7.88

S.E./mean = 0.25 leaves/tree.

1957

(i) 8.81 leaves/tree. (ii) 0.08 leaves/tree. (iii) Treatment difference is not significant. (iv) Av. no. of leaves/tree.

Treatment	D ₁	D ₂
Av. no. of leaves	8.83	8.79

S.E./mean = 0.03 leaves/tree.

1958

(i) 9.68 leaves/tree. (ii) 0.44 leaves/tree. (iii) Treatment difference is not significant. (iv) Av. no. of leaves/tree.

Treatment	D ₁	D ₂
Av. no. of leaves	9.76	9.60

S.E./mean = 0.18 leaves/tree.

Crop :- Coconut.

Ref :- K. 54 to 58(15).

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

Type :- 'C'.

Object :- To find out the correct depth to which the soil should be tilled in a Coconut garden.

1. BASAL CONDITIONS :

(i) 3 ploughings annually. 3 lb. of A/S+2 lb. of B.M.+100 lb. of G.L. compost per tree per year. Two cultivations annually. (ii) (a) Gravelly laterite. (b) Refer soil analysis, Pilicode. (iii) By seedlings. (iv) West coast exotic and selfed progenies of Kasaragod parents. (v) 1926—27 triangular method of planting with 30' spacing. (vi) One year. (vii) In 1954, 100 lb./tree of G.L. and compost applied in circular basins. 3 lb./tree of A/S was also applied. Application of ash restricted to the quantity obtained by burning of coconut leaves etc. In 1955, 1000 lb. of G.M. was applied to the trees, 30 lb./tree of Nitro. Phos. was broadcast. For other years—N.A. (viii) As per treatments. (ix) G.M. crop raised. (x) Unirrigated. (xi) 174" in 1954, 138" in 1955, 120" in 1956, 174" in 1957 and 115" in 1958. (xii) Monthly harvest.

2. TREATMENTS :

1. Digging 5" deep with *mummatty*, forming mounds in Aug.-Sept. and levelled in Dec.-January.
 2. 3 ploughings 4" deep with monsoon plough.
 3. 3 ploughings 6" deep with Cooper—34 plough.
- Ploughings given roughly at intervals of two months beginning from July.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) Sample of 4 trees randomly selected. (v) Sufficient guard rows left. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) No. of leaves, female flowers and yield of nuts. (iv) (a) 1948—contd. (b) N.A. (v) Nil. (vi) Yield data for 1957 was not available.

5. RESULTS :

1954

(i) 161.9 nuts/4 trees. (ii) 41.60 nuts/4 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/4 trees.

Treatment	1	2	3
Av. yield	142.7	173.0	170.0

S.E./mean = 17.0 nuts/4 trees.

1955

(i) 203.6 nuts/4 trees. (ii) 61.79 nuts/4 trees. (iii) Treatment differences are highly significant. (iv) Av. yield of nuts/4 trees.

Treatment	1	2	3
Av. yield	127.8	293.8	189.2

S.E./mean = 25.2 nuts/4 trees.

1956

(i) 202.9 nuts/4 trees. (ii) 49.90 nuts/4 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/4 trees.

Treatment	1	2	3
Av. yield	197.2	190.3	221.2

S.E./mean = 19.2 nuts/4 trees.

1958

(i) 136.2 nuts/4 trees. (ii) 25.53 nuts/4 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/4 trees.

Treatment	1	2	3
Av. yield	127.5	131.5	149.5

S.E./mean = 10.4 nuts/4 trees.

Crop :- Coconut.

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

Ref :- K. 54 to 58(16).

Type :- 'C'.

Object :- To find out the effect of ploughing with different ploughs and digging the soil on the yield of Coconut.

1. BASAL CONDITIONS :

(i) 3 lb. of A/S, 2 lb. of B.M. and 100 lb. of G.L. compost per tree every year. The field ploughed twice and harrowed once or twice yearly. (ii) (a) Laterite gravelly. (b) Refer soil analysis, Pilicode. (iii) Seedlings. (iv) Ordinary tall west coast variety. (v) One year old seedlings planted on 9.6.1919 before the south west monsoon in pits of size 3'x3'x3' by triangular method with 30' spacing. (vi) One year. (vii) 100 lb. of G.L., 3 lb. of A/S applied in basins around the trees during August. Ash applied. (viii) As per treatments. (ix) G.M. crop raised. (x) Unirrigated. (xi) 174° in 1954, 138° in 1955, 120° in 1956, 174° in 1957 and 116° in 1958. (xii) Monthly harvest.

2. TREATMENTS :

- 1 ploughing with monsoon plough in August and September.
- 2 ploughings with monsoon plough in June and September.
- 3 ploughings with monsoon plough in June, September and November.
- 1 digging with *mummatty* 9" deep in August and September.

3. DESIGN :

(i) R.B.D. (ii) 4. (b) N.A. (iii) 5. (iv) Sample of 4 trees randomly selected. (v) Sufficient guard rows left. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of nuts/tree. (iv) (a) 1942—contd. (b) N.A. (v) and (vi) N.A.

5. RESULTS :

1954

(i) 158.2 nuts/4 trees. (ii) 35.35 nuts/4 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/4 trees.

Treatment	1	2	3	4
Av. yield	169.8	164.6	149.7	149.2

S.E./mean = 15.8 nuts/4 trees.

1955

(i) 156.5 nuts/4 trees. (ii) 33.04 nuts/4 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/4 trees.

Treatment	1	2	3	4
Av. yield	167.6	138.6	168.4	149.6

S.E./mean = 15.2 nuts/4 trees.

1956

(i) 152.5 nuts/4 trees. (ii) 32.63 nuts/4 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/4 trees.

Treatment	1	2	3	4
Av. yield	150.8	160.8	174.4	124.4

S.E./mean = 14.6 nuts/4 trees.

1957

(i) 120.8 nuts/4 trees. (ii) 31.19 nuts/4 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/4 trees.

Treatment	1	2	3	4
Av. yield	117.2	140.8	129.8	95.6

S.E./mean = 14.0 nuts/4 trees.

1958

(i) 103.2 nuts/4 trees. (ii) 28.53 nuts/4 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/4 trees.

Treatment	1	2	3	4
Av. yield	115.8	104.2	106.6	86.2

S.E./mean = 12.8 nuts/4 trees.

Crop :- Coconut.

Ref :- K. 54 to 58(17).

Site :- Reg. Coconut Res. Stn., Thodupuzha.

Type :- 'C'.

Object :- To find the best cultural operation in laterite gravelly soil for Coconut.

1. BASAL CONDITIONS :

(i) Uneven and undulating hilly slopes. (ii) (a) Laterite gravelly. (b) N.A. (iii) By seedlings from naturally cross pollinated seed. (iv) Tall west coast. (v) Planting in 1915, 1916 and 1919. Triangular method with 30' spacing. (vi) N.A. (vii) 0.5 lb. of N as A/S, 0.25 lb. of P_2O_5 as B.M. and 1.00 lb. of K_2O as Mur. Pot. were applied per tree in circular trenches at a distance of 6' from the tree. (viii) As per treatments. (ix) Nil. (x) Unirrigated. (xi) 125". (xii) 8 harvests at intervals of 1½ months.

2. TREATMENTS :

1. Control.
2. Digging with *Koorthalies* to a radius of 6' around the trees.
3. Digging with *Koorthalies* to a radius of 6' around the trees and a light hoeing after the north-east monsoon.
4. Forting around the trees to a radius of 6'.
5. Forting around the trees to a radius of 6' and a light hoeing after the north-east monsoon.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) 8. (v) Sufficient guard rows left. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Slight attack of beetles, bud-rot and leaf disease—beetle picked and Bordeaux mixture sprayed. (iii) No. of leaves, tender nuts, buttons and yield of nuts. (iv) 1953—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1954

- (i) 344.2 nuts/8 trees. (ii) 53.70 nuts/8 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2	3	4	5
Av. yield	346.2	336.3	334.7	332.2	381.5

S.E./mean = 21.9 nuts/8 trees.

1955

- (i) 344 nuts/8 trees. (ii) 49.0 nuts/8 trees. (iii) Treatment differences are significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2	3	4	5
Av. yield	343	361	309	314	392

S.E./mean = 20.0 nuts/8 trees.

1956

- (i) 221.9 nuts/8 trees. (ii) 39.75 nuts/8 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2	3	4	5
Av. yield	234.8	222.0	211.0	194.2	247.3

S.E./mean = 16.2 nuts/8 trees.

1957

- (i) 364.3 nuts/8 trees. (ii) 59.06 nuts/8 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2	3	4	5
Av. yield	366.2	358.3	378.2	339.8	379.2

S.E./mean = 24.1 nuts/8 trees.

1958

- (i) 199.6 nuts/8 trees. (ii) 48.74 nuts/8 trees. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/8 trees.

Treatment	1	2	3	4	5
Av. yield	206.8	213.0	169.3	189.0	219.8

S.E./mean = 19.9 nuts/8 trees.

Crop :- Coconut.

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

Ref :- K. 58 and 59(18).

Type :- 'CM'.

Object :- To find out suitable manure and cultural operations for Coconut.

1. BASAL CONDITIONS :

(i) 3 lb. of A/S, 20 lb. of ash and 100 lb. of G.L. per tree per year broadcast and ploughed in till July, 1957. The block was ploughed and worked in. Burying of husk in 1942 and 1943. (ii) (a) Gravelly laterite. (b) Refer soil analysis, Pilicode. (iii) By seedlings. (iv) West coast tall. (v) Surface planting on 24.10.1922 and the palms lowered in June, 1926 by 3'. Triangular method with 30' spacing. (vi) Three month old seedlings. (vii) 100 lb. of G.L. and C.M. each and 30 lb. of A/S per tree per year broadcast in Aug.-Sept. (viii) As per treatments. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Monthly harvests.

2. TREATMENTS :

(1) 3 ploughings in July, September and November [and applying 1 lb. of K_2O as Mur. Pot. per tree per year.
 (2) Cultural operations as in (1) and applying 2 lb. of K_2O as Mur. Pot.
 (3) 5 ploughings in July, August, September, October and November and applying 1 lb. of K_2O as Mur. Pot. per tree per year.
 (4) Cultural operations as in (3) and applying 2 lb. of K_2O as Mur. Pot.
 (5) 1 digging in July-August. Raking soil in October and applying 1 lb. of K_2O as Mur. Pot. per tree per year.
 (6) Cultural operations as in (5) and applying 2 lb. of K_2O as Mur. Pot.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) 1. (v) Sufficient guard rows left. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Constant watch over pests and diseases. (iii) Yield of nuts. (iv) (a) 1957—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1958

(i) 32.90 nuts/tree. (ii) 15.93 nuts/tree. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/tree.

Treatment	1	2	3	4	5	6
Av. yield	31.20	39.40	33.00	32.00	33.60	28.20

S.E./mean = 7.1 nuts/tree.

1959

(i) 52.03 nuts/tree. (ii) 24.44 nuts/tree. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/tree.

Treatment	1	2	3	4	5	6
Av. yield	53.60	52.40	53.60	46.00	51.20	55.40

S.E./mean = 10.9 nuts/tree.

Crop :- Coconut.

Ref :- K. 56 to 58(19).

Site :- Central Coconut. Res. Stn., Kasaragod.

Type :- 'IM'.

Object :- To determine the response of Coconut to irrigation and manuring in summer months.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) Laterite and Clayey. (b) Refer soil analysis, Kasaragod. (iii) By seed-nuts. (iv) Ordinary tall west coast. (v) Date of planting N.A. No systematic method of planting ; spacing 30'. (vi) One year. (vii) Nil. (viii) 2 ploughings and 2 diggings. (ix) Nil. (x) As per treatments. (xi) 121.5" in 1956, 134."8 in 1957 and 130.5" in 1958. (xii) Monthly harvests.

2. TREATMENTS :

1. Control.
 2. Manuring in August-September.
 3. Irrigation in summer.
 4. Manuring in August-September+irrigation in summer.
 5. Manuring in summer+irrigation in summer.
 6. Manuring half-dose in August-September and manuring other half in summer+irrigation in summer.

Manures applied in basins of 6' radius and 9" depth at 1.0 lb./tree of N as A/S, 0.5 lb./tree of P_2O_5 and 1.0 lb./tree of K_2O as Mur. Pot. 8 gallons of water given twice a week in basins round the tree; from 1st. week of December. Irrigation stopped with the commencement of monsoon in May-June.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) 1. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Rhinoceros beetle regularly searched and killed. (iii) No. of nuts, female flowers, leaves and setting %. (iv) (a) 1956—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

1956

(i) 44.1 nuts/tree. (ii) 23.81 nuts/tree. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/tree.

Treatment	1	2	3	4	5	6
Av. yield	36.9	30.4	56.5	34.4	44.1	62.1

S.E./mean = 10.6 nuts/tree.

1957

(i) 47.0 nuts/tree. (ii) 12.88 nuts/tree. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/tree.

Treatment	1	2	3	4	5	6
Av. yield	40.3	44.8	53.3	49.0	43.3	51.5

S.E./mean = 5.8 nuts/tree.

1958

(i) 43.8 nuts/tree. (ii) 21.27 nuts/tree. (iii) Treatment differences are not significant. (iv) Av. yield of nuts/tree.

Treatment	1	2	3	4	5	6
Av. yield	27.7	47.9	62.2	32.4	49.8	42.5

S.E./mean = 9.5 nuts/tree.

Crop :- Coconut.

Site :- Central Coconut Res. Stn., Kasaragod.

Ref :- K. 57(20).

Type :- 'D'.

Object :- To find out a suitable substitute for Coconut milk.

1. BASAL CONDITIONS :

(i) The area was under uniform manurial and cultural operations. (ii) (a) Red loam. (b) Refer soil analysis, Kasaragod. (iii) By seed-nuts. (iv) Ordinary tall west coast. (v) Date of planting N.A. No systematic method of planting; 30' spacing. (vi) One year. (vii) 3 lb. of A/S+3 lb. of Mur. Pot.+2 lb. of B.M. per tree applied in Aug. (viii) 2 ploughings and 2 interculturings. (ix) Nil. (x) Unirrigated. (xi) 134.8". (xii) Monthly harvests.

2. TREATMENTS :

1. Control.
2. 2, 4-D, 30 ppm+IP/A, 40 ppm.
3. 2, 4-D, 30 ppm+Coconut water.
4. 2, 4-D, 30 ppm+IB/A, 40 ppm.

Treatment given against button shedding four times at intervals of one week after fertilization of female flowers.

3. DESIGN :

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

4. GENERAL :

(i) Satisfactory. (ii) Rhinoceros beetle regularly searched and killed. (iii) As per I, II, III, and IV below. (iv) (a) and (b) N.A. (v) and (vi) Nil.

5. RESULTS :

I. % of nuts set :

(i) to (iv) Refer below

Treatment	1	2	3	4	Mean	S.E./plot	S.E./mean	Significance
Mean	29.71	52.54	50.85	45.50	44.65	7.20	3.22	Highly significant

II. No. of nuts set :

(i) to (iv) Refer below

Treatment	1	2	3	4	Mean	S.E./plot	S.E./mean	Significance
Mean	21.20	45.40	41.40	37.40	36.35	7.23	3.23	Significant

III Copra content/nut (gms) :

(i) to (iv) Refer below

Treatment	1	2	3	4	Mean	S.E./plot	S.E./mean	Significance
Mean	159.2	125.1	135.8	129.8	137.5	16.41	7.34	Significant

IV. Copra content/bunch (gms) :

(i) to (vi) Refer below

Treatment	1	2	3	4	Mean	S.E./plot	S.E./mean	Significance
Mean	3498.0	5438.7	5279.8	4709.2	4731.4	844.6	377.71	Significant

Crop :- Coconut.

Ref :- K. 57(21).

Site :- Central Coconut Res. Stn., Kasaragod.

Type :- 'D'.

1. BASAL CONDITIONS :

(i) The area was under uniform manurial and cultural operations. (ii) (a) Red loam. (b) Refer soil analysis, Kasaragod. (iii) By seed-nuts. (iv) Ordinary tall west coast. (v) Date of planting N.A./No systematic method of planting; 3' spacing. (vi) One year. (vii) 3 lb. of A/S+3 lb. of Mur. Pot.+2 lb. of B.M. per tree applied in Aug.-Sept. A.G.M. crop also applied. (viii) 2 ploughings and 2 interculturings. (ix) Nil. (x) Unirrigated. (xi) 133". (xii) Monthly harvest.

2. TREATMENTS :

1. Control.
2. 2, 4-D, 30 ppm + IP/A, 30 ppm.
3. 2, 4-D, 30 ppm + Coconut water.
4. 2, 4-D, 30 ppm + IB/A, 30 ppm.

Treatments given against button shedding four times at intervals of one week immediately after fertilization of female flowers.

3. DESIGN :

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

4. GENERAL :

(i) Satisfactory. (ii) Rhinoceros beetle regularly searched and killed. (iii) As per I, II, III and IV below. (iv) (a) 1957-N.A. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

I. % of nuts set :

(i) to (iv) Refer below

Treatment	1	2	3	4	Mean	S.E./plot	S.E./mean	Significance
Mean	29.48	60.96	54.30	62.29	51.76	7.86	3.52	Significant

II. No. of nuts set:

(i) to (iv) Refer below

Treatment	1	2	3	4	Mean	S.E./plot	S.E./mean	Significance
Mean	20.6	45.4	41.2	54.8	40.5	3.84	1.72	Significant

III Copra content/nut (gms) :

(i) to (iv) Refer below

Treatment	1	2	3	4	Mean	S.E./plot	S.E./mean	Significance
Mean	172.3	118.3	132.0	122.6	136.3	11.60	5.19	Significant

IV. Copra content/bunch (gms) :

(i) to (iv) Refer below

Treatment	1	2	3	4	Mean	S.E./plot	S.E./mean	Significance
Mean	3339.4	5030.5	5243.7	6319.4	4983.2	639.3	285.9	Significant