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ALL INDIA CO.ORDINATED PROJECT

on

**NATIONAL DEMONSTRATIONS**

TRICHUR DISTRICT-KERALA

**ANNUAL REPORT**

**1982-83**



**DIRECTORATE OF EXTENSION**  
KERALA AGRICULTURAL UNIVERSITY  
VELLANIKKARA TRICHUR

11/11/11

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ANNUAL PROGRESS REPORT OF ALL INDIA CO-ORDINATED PROJECT ON  
NATIONAL DEMONSTRATION FOR THE YEAR 1982-83

DISTRICT - TRICHUR

INTRODUCTION

National Demonstration Project, a nation wide programme of demonstration started during 1964 from the main plank in the transfer of technology from the scientists to farmers. Kerala Agricultural University started implementing this scheme since 1975 with the specific objective of transfer of technology to achieve maximum production and net return per unit area of land per unit period of time. The objectives envisaged by National Demonstration Scheme are as follows:

1. To demonstrate convincingly to farmers the production potentialities of a unit area of land by using high yielding varieties of crops and adopting a multiple cropping programme and package of practices such as balanced use of fertilizers and effective water management techniques.
2. To demonstrate use of improved implements for different operations and use of soil testing laboratories for balanced use of fertilizers.
3. To fully exploit these demonstrations for the purpose of training farmers in improved cultivation practices and to use them as recognised and effective audiovisual aids for the flow of latest research techniques and results to farmers.
4. To provide the research workers a first hand knowledge of the problems faced by farmers in growing high yielding varieties and in following multiple cropping patterns, to identify factors limiting crop yields, the factors contributing towards higher yields.
5. To minimise the time lag between the research generated and its application in the fields.

Work done during the period

Primary selection of 33 plots was made by the subject matter specialist representing all tracts, problem soil area, conventional lands etc. distributed throughout Trichur district. Final selection of 23 plots was made from among the primary selection. The list of farmers selected is appended to page No.

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After selection of relevant information required regarding the cultivation practices adopted by them are detailed for each of them.

#### Collections of soil samples

Representative soil samples were collected from all the plots selected for demonstration before and after cultivation. These samples were got analysed at the Soil Testing Laboratory, Trichur. The fertilizer schedule for each plot was fixed based on the basis of soil test value.

#### Raising Nursery

The seeds required for the demonstration were obtained from the I.P.D. Units of Department of Agriculture. Transplanting was adopted as a general pattern though direct seeding was done in some cases.

As a prophylactic measure the nursery was protected with a spraying of Hinosan combined with Dimecron, 2-3 days before pulling out the seedlings. The method was found to be very useful for the efficient control of pest and diseases which are usually seen in the late nursery stage.

#### Selection of plots in problem area

The Deputy Director of Agriculture, Trichur suggested a demonstration in the problem area of Manakodikayal where farmers could take up only single crop. The cultivators often approached the Agricultural Officer for the remedial measures to get more yield because they are getting poor yield from that area.

The problems identified in this area were Iron toxicity, low fertility status, poor drainage and high acidity. The plot belonging to Sri. Pushpangadan having an area of 0.85 ha was selected. The Second crop was raised with high yielding variety.

#### Soil test data of the problem soil selected

Crop	Area (ha)	O.C. (%)	PH	Conductivity (m.mohs/cm)	P <sub>2</sub> O <sub>5</sub> (kg/ha)	K <sub>2</sub> O (kg/ha)
Paddy	0.85	1.15	5.0	0.25	20.0	65.0

Name of the District and State : Trichur District  
Kerala State

Headquarters of the National Demonstration unit with full postal address:-

Directorate of Extension,  
Communication Centre,  
Kerala Agricultural University,  
Mannuthy P.O.

Staff position during the year under report

Designation of the post	Name of the incumbent worked	Period during which the person was in position	Period during which the position was vacant
a) Subject Matter Specialist (Agro)	Vacant	-	From 1-4-82 to till date
b) S.M.S. (Soils)	R.Raveendran Nair	From 1-4-82 to till date	-
c) S.M.S. (PP)	Sumangala S. Nambiar	From 1-4-82 to 16-8-82	Vacant from 17-8-82 to 24-10-82
d) S.M.S. (Agril. Engineering)	Vacant	-	From 1-4-82 to till date
e) Agril. Farm Asst. Gr.II	1. M.K.Sreedharan 2. T.R. Sudevan	from 1-4-82 to till date from 1-4-82 to till date	- -
f) Jeep Driver	C.N. Soman	From 1-4-82 to till date	-

NUMBER OF DEMONSTRATIONS CONDUCTED

Name of the Block	2 crop sequence rainfed	3 crop sequence rainfed	Single crop rainfed	EFS	Special demonstration	Total
1. Irinjolakuda	1	2				3
2. Kodakara	2	1				3
3. Ollukkara	4	5	1	5		15
4. Puzhokal	1				Single crop rainfed	2
						<u>23</u>

In our locality the cropping pattern is followed in rainfed conditions and there is no irrigated paddy land.

DETAILS OF CROP ROTATION FOLLOWED

Crop rotation followed/ crops included	Number of demonstrations conducted
a) Irrigated (Three crops)	--
b) Irrigated (Two crops)	--
c) Irrigated (Single crop)	--
d) Rainfed (Two crops)	8
e) Rainfed (Single crop)	2
f) Rainfed (Three crops)	8

LIST OF N.E.S. BLOCKS IN TRICHUR DISTRICT

Sl.No.	Code No. of Blocks	Name of Blocks
1	01000	Anthikad
2	02000	Chalakudi
3	03000	Cherpu
4	04000	Chowannur
5	05000	Chowghat
6	06000	Irinjalakuda
7	07000	Kodakara
8	08000	Kodungallur
9	09000	Mala
10	10000	Mathilakom
11	11000	Mullassery
12	12000	Ollukkara
13	13000	Pazhayannoor
14	14000	Puzhakkal
15	15000	Thalikulam
16	16000	Vellangalloor
17	17000	Wadakkanchery



LIST OF FARMERS SELECTED

Sl. No.	Code No.	Name of farmer	Place	Name of Block
1	04179	Kuttan Nair	Kaiparamba	Chowannur
2	05180	Karuputty	Peringankulam	Irinjalakuda
3	06181	C.I. Kumaran	Irinjalakuda	Irinjalakuda
4	06182	P. Rajan	Irinjalakuda	Irinjalakuda
5	07183	Govindan	Kodakara	Kodakara
6	07184	T.K. Madhavan	Kodakara	Kodakara
7	07185	K.V. Subramaniam	Kodakara	Kodakara
8	12186	Balakrishnan	Thanikkudom	Ollukkara
9	12187	Bala Menon	Eravimangalam	Ollukkara
10	12188	Cheriyar	Vellanikkara	Ollukkara
11	12189	George	Pattikkad	"
12	12190	Gopalan Nair	Puthur	"
13	12191	Kochappu	Udayagaram	"
14	12192	Nainan, P.V.	Pattikkad	"
15	12193	Paulose	Chirakakode	"
16	12194	Ramakrishnan	Poovanchira	"
17	12195	Ravi Vakoth	Pananchery	"
18	12196	Sankara Narayanan	Eravimangalam	"
19	12197	Thankappan	Pattikkad	"
20	12198	Unni Chettiyan	Mullakkara	"
21	12199	A.N. Vilasini	Cheruvathussery	"
22	14200	B.D. Paul	Chathankole	Puzhackal
23	14201	Pushpangadan	Manakodikole	Puzhackal

The five digit code constitute the following informations. First two digits stands for the 17 numbers of the blocks in the district. The remaining three digits are representing the total number of farmers selected in the National Demonstration Project from the respective Block areas.

During 1981-82 twentyfive demonstrations were carried out hence the third, fourth and fifth numbers are 2157 to 17181.

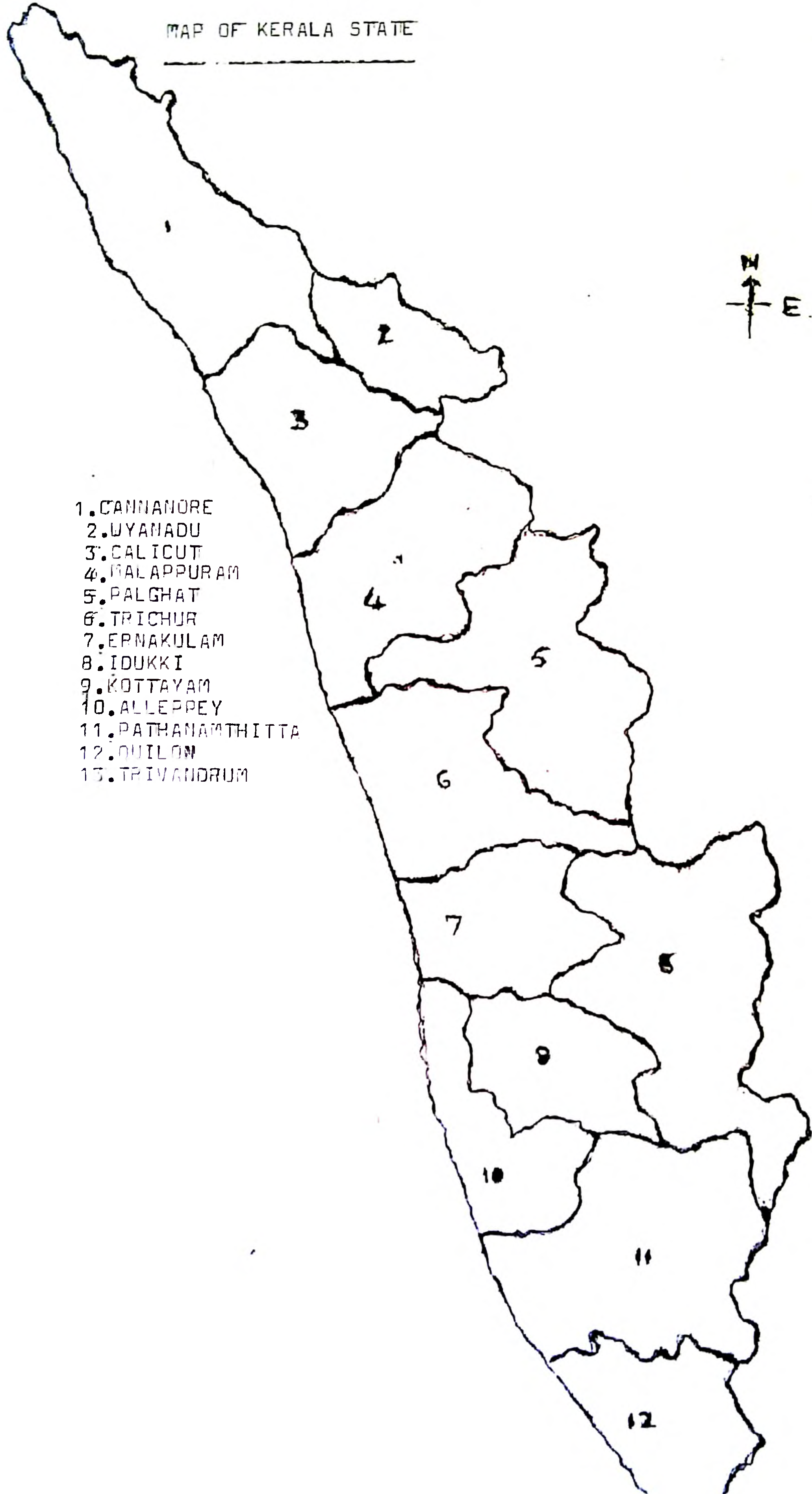
02 - stands for Chalakudi Block area

17 - stands for Wadakkanchery Block area

Out of ten Entire Farming Farmers provisionally selected during 1980-81 were reduced to five during 1982-83. In addition to this 18 farmers were selected for crop demonstration and thus the total number of demonstrations had come to twentythree (23).

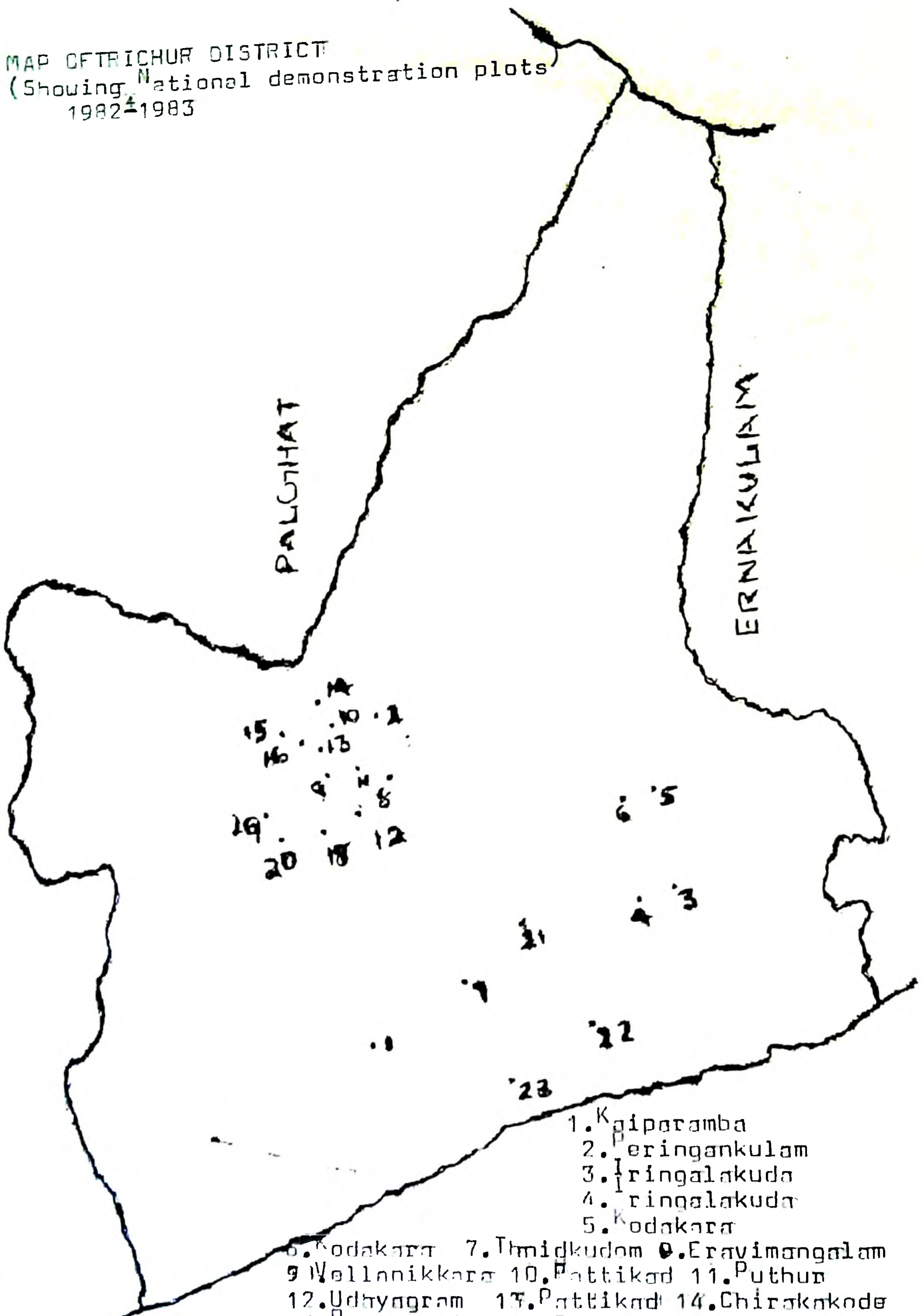


MAP OF KERALA STATE



- 1. CANNANORE
- 2. WYANADU
- 3. CALICUT
- 4. MALAPPURAM
- 5. PALGHAT
- 6. TRICHUR
- 7. ERNAKULAM
- 8. IDUKKI
- 9. KOTTAYAM
- 10. ALLEPPEY
- 11. PATHANAMTHITTA
- 12. QUILON
- 13. TRIVANDRUM

MAP OF TRICHUR DISTRICT  
 (Showing National demonstration plots  
 1982-1983)



1. Kaiparamba
2. Peringankulam
3. Iringalakuda
4. Iringalakuda
5. Kodakara
6. Kodakara
7. Thidukudom
8. Eravimangalam
9. Vellanikkara
10. Pattikad
11. Puthun
12. Udhayagram
13. Pattikad
14. Chirakkode
15. Poovanchira
16. Pananchery
17. Eravimangalam
18. Manakkulangara
19. Pattikadu
20. Mullaikkara
21. Cheruvathussery
22. Chathankola
23. Manakodikola



Details of Soil Analysis (Crop Demonstration)

Sl.No.	Code No.	Name of Farmer	Place	Details of Soil Analysis					
				Area (ha)	PH	TSS	Org.C	P <sub>2</sub> O <sub>5</sub> kg/ha	K <sub>2</sub> O kg/ha
1	2	3	4	5	6	7	8	9	10
1	05180	Karup kutty	Peringankulam	0.64	5.3	0.1	0.60	47.0	20.0
2	06181	C.I. Kumaran	Irinjalakuda	0.66	5.3	0.1	0.45	20.3	30.9
3	06182	P. Rajan	Irinjalakuda	0.60	5.9	0.1	0.49	70.3	18.0
4	07184	Govindan	Kodakara	0.75	5.4	0.1	0.49	72.5	48.0
5	07184	T.K. Madhavan	Kodakara	0.50	5.4	0.1	0.49	72.8	48.1
6	07185	K.V. Subramanyan	Kodakara	0.70	5.7	0.1	0.78	26.0	15.0
7	12185	Balakrishnan	Thanikulom	0.80	6.7	0.1	0.87	30.82	39.0
8	12187	Bala Menon	Eravimangalam	0.80	5.2	0.1	0.50	15.5	32.6
9	12189	George Cyriac	Pattikkad	0.64	5.9	0.1	0.69	12.6	15.0
10	12190	Gopalan Nair	Puthur	0.64	5.4	0.1	0.61	20.5	30.5
11	12192	Ninan, P.V.	Pattikkad	0.75	5.2	0.1	0.30	12.5	30.5
12	12193	Paulose	Chirakakode	0.40	5.7	0.1	0.77	67.2	12.6
13	12194	Ramakrishnan	Poovanchira	0.56	6.3	0.1	0.88	78.4	120.0
14	12196	Sankara Narayanan	Eravimangalam	0.60	5.5	0.1	0.59	74.2	24.0
15	12197	Thankappan	Pattikkad	0.60	5.9	0.1	0.68	12.6	15.0
16	12199	A.N. Vilasini	Cheruvathussery	0.80	6.4	0.1	0.53	36.4	24.0
17	14200	B.D. Paul	Chathankole	0.75	5.2	0.1	0.65	12.5	15.0
18	14201	Pushpangadan	Manakodikole	0.85	5.0	0.25	1.15	20.0	65.0

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INDIVIDUAL PLOTWISE DATA OF NATIONAL DEMONSTRATIONS CONDUCTED

Name of the farmer, Village, Taluk, Block	Crop variety	Season	Nutrients applied(kg/ha)			Yield kg/ha	Gross income Rs/ha	Cost of produc- tion Rs/ha	Net income Rs/ha
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O				
1	2	3	4	5	6	7	8	9	10
Irinjalakuda Block, Peringankulam Village									
1. Karupputty	Paddy Bharathi	I crop	80	35	40	5050	8615	6586	2029
	Triveni	II crop	75	35	35	4400	7500	4605	2995
	Bharathi	III crop	70	35	35	4150	7675	4950	2725
2. C.I. Kumaran	Paddy Jaya	I crop	100	50	60	5000	6540	5027	2613
	Bharathi	II crop	74	30	45	3800	6540	4595	-
3. P. Rajan	Paddy: Jaya	I crop	82	37	58	4800	8200	5397	-
	Annapurna	II crop	70	35	40	5000	8520	4533	3987
	Bharathi	III crop	70	35	45	2850	5100	4099	1001
Kodakara Block, Kodakara Village									
4. Govindan	Groundnut								
	TMV-2	I crop	10	50	40	1200	4200	2344.50	1359.50
	Tapioca M-4	II crop	50	50	50	14000	5740	2476.00	3264.00
5. T.K. Madhavan	Groundnut: TMV-2	I crop	10	50	40	1150	3937	2293.50	1644.50
	Tapioca M-4	II crop	50	50	50	14500	5970	2355.00	3515.00



1	2	3	4	5	6	7	8	9	10
6. K.V.Subramanian	Paddy Jyothi	I crop	70	30	50	4400	9500	4520.00	2980.00
	Jyothi	II crop	85	40	45	3650	6235	4430.00	1805.00
	Sesamum: Local	Summer	30	15	30	300	1179	1560.00	381.00
Ollukkara Block, Thanikudom Village:-									
7. Balakrishnan	Paddy: Jyothi	I crop	90	30	45	5100	8710	6191.50	2218.50
	Jyothi	II crop	68	35	45	3550	6085	4847.00	1235.00
	Jyothi	Summer	70	35	35	3800	6100	3716.00	2384.00
Ollukkara Block, Eravimangalam Village:									
8. Bala Menon	Paddy: Bharathi	I crop	90	50	50	4350	7425	5105.00	2320.00
	Triveni	II crop	64	30	36	4000	6000	5723.00	1077.00
Ollukkara Block, Pattikkad Village:									
9. George Cyriac	Paddy: Jaya	I crop	90	45	45	5800	9800	6959	2691
	Jaya	II crop	82	38	45	3800	6520	5910	6610
	Cowpea C-152	Summer	20	30	10	580	2420	851	1569
Ollukkara Block, Puthur Village:									
10. Gopalan Nair	Paddy: Mashuri	I crop	75	35	40	4580	7825	5955	1070
	Pankaj	II crop	95	35	60	3850	6575	4991	1624
11. Ninan	Groundnut: TMV-2	I crop	25	40	40	1100	3625	2269	1555
	Tapioca M-4	II crop	50	50	50	19500	6175	3019	3156

1	2	3	4	5	6	7	8	9	10
<b>Chirakkal Village:</b>									
12. Paulose	Groundnut: TMV-2	I crop	15	40	50	1050	3622.50	22.80	1542.50
<b>Pavanchira Village:</b>									
13. Rameshkrishnan	Paddy: Trivani	I crop	70	35	35	4200	7711	5225	1995
	Jaya	II crop	80	63	45	4050	6877.50	5552	1325.50
<b>Eravinmalan Village:</b>									
14. Sankara Narayanan	Paddy: Bharathi	I crop	68	33	33	5200	8860	6365	2545
	Bharathi	II crop	74	35	37	4600	7840	5630	2010
	Cowpea:	Summer	20	30	10	600	2540	1376	1164
<b>Pattikkal Village:</b>									
15. Thankappan	Paddy: Jaya	I crop	90	40	50	4900	8390	6120	2280
<b>Cheruvathussery Village:</b>									
16. M.N. Vilasini	Paddy: IR-3	I crop	95	35	50	5200	8850	6320	2530
	Bharathi	II crop	70	37	45	3600	6160	4862	1298
	Sesamum Local	Summer	30	15	30	280	1480	1131	349
<b>Puzhakkal Block, Chathankole:</b>									
17. B.D. Paul	Paddy: Bharathi	I crop	85	40	45	4000	6840	4175	2665
	Bharathi	II crop	70	35	35	3500	6760	3644	3124
<b>Manakolikole Village:</b>									
18. Pushpangadan	Paddy: Annapurna	Summer	70	35	35	3900	9030	6230	1800

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PARTICULARS OF THE BEST FARMER

1. PADDY

State	: Kerala	District	: Trichur
Name of farmer			: George Cyriac
Village			: Pattikkad
Yield in kg/ha			: 5800 kg/ha - Grain 5800 kg/ha - Straw
Season			: First crop
Seed rate			: 62.5 kg/ha
Variety			: Jaya
FYM			: 5000 kg/ha
N kg/ha			: 90
P <sub>2</sub> O <sub>5</sub> kg/ha			: 45
K <sub>2</sub> O kg/ha			: 45
Date of sowing nursery			: 26-5-82
Date of harvesting			: 18-9-82
No. of irrigation			: Rainfed
No. of sprays as plant protection measures			: Three
Gross return			: Rs.9800/-
Operating cost			: Rs.6759/-
Return over operating cost			: Rs.2891/-

Soil Data

Texture	: Loam	PH	: 5.90
Conductivity			: 0.1 m.mohs
Available P <sub>2</sub> O <sub>5</sub>			: 126 kg/ha
Available K <sub>2</sub> O			: 15 kg/ha
Organic carbon			: 0.689 percent

Details of plant protection measure

Spraying with Ekalux 1000 ml and Malathion 1000 ml.

Name of the pest and disease - Case worm and rice bug.

Crop stages at the time of spraying:

1. DAT : 25 days
2. DAT : 50 days

Insecticide used:-

1. Ekalux : 1000 ml
2. Malathion : 1000 ml

Remarks

Inspite of poor rainfall the farmer could obtain the maximum yield among the ND farmers. Less rainfall is also the cause for the comparatively less pest incidence. Hence the far-

2. TAPIOCA INTERCROPPED WITH GROUNDNUT

State : Kerala District : Trichur  
 Name of farmer : Ninnu, P.V.  
 Village : Pattikkal  
 Yield : Tapioca 19.5 ton/ha  
 Groundnut 11.5 kg/ha

## Variety:-

Tapioca

M-4

Groundnut

TMV-2

## Seed rate:

12000 setts/ha

30 kg/ha

## FYM:-

5000 kg/ha

5000 kg/ha

N kg/ha 50

25

P<sub>2</sub>O<sub>5</sub> kg/ha 50

40

K<sub>2</sub>O kg/ha 50

40

## Lime and ash:-

-

300 kg

-

Date of planting 5-7-82

Date of sowing -

5-7-82

Date of harvest 25-3-82

7-10-82

No. of irrigations Rainfed

Rainfed

Plant protection : Nil

Gross return per hectare : Rs.10,000

Operating cost per ha. : Rs.5279

Return over operating cost : Rs.4721/-

Soil test data

Texture : Loam

PH : 5.2

Conductivity : 0.1 m.mohs.

Organic carbon : 0.3%

Available P<sub>2</sub>O<sub>5</sub> : 12.5 kg/haAvailable K<sub>2</sub>O : 30.5 kg/ha



Details of plant protection measures

Since there was no major attack of pests & diseases he hardly took any control measures.

Name of pest and disease : Nil  
 Crop stage at the time of spraying : Not applicable  
 Pesticides used : Nil

Remarks

By utilising the interspace available in the tapioca by growing groundnut, a practice widely recommended by the University, he could realise an additional return of Rs.1555/-. In the meantime the main crop of Tapioca is not seemed to be affected by this and the main crop yields a maximum yield of 19.5 tons. Incidentally the two crops are not affected by pests and disease and save the cost for plant protection. So by intercropping the farmer got a total net profit of Rs.4721/ha. This may be due to the complementary effect of groundnut to tapioca.

DETAILS OF RAINFED DEMONSTRATIONS CONDUCTED

	<u>Crop season</u>	<u>No. of Demonstrations conducted</u>	<u>Main yield in Q/ha</u>
a) Single crop	Summer First crop	1	37
b) Double crop	First and second crop season	8	1) Paddy-paddy 41.31 Q/ha ii) Groundnut-Tapioca a) Groundnut 10 Q/ha b) Tapioca 16 Q/ha

DETAILS OF DEMONSTRATIONS CONDUCTED ON OIL SEEDS

	<u>Crop</u>	<u>Season</u>	<u>No. of demonstrations conducted</u>	<u>Main yield in Q/ha</u>
a) Rainfed	Sesamum	Summer	2	2.90
b) Irrigated	Groundnut	Kharif	3	10

DETAILS OF DEMONSTRATIONS CONDUCTED ON PULSES

	<u>Crop</u>	<u>Season</u>	<u>No. of demonstrations conducted</u>	<u>Main yield in Q/ha</u>
a) Rainfed	Cowpea	Summer	2	5.9

PERFORMANCE OF CROP VARIETIES USED IN DEMONSTRATIONS

Name of the crop	Name of the variety	Season	No. of demonstrations conducted using the variety	Mean yield in Q/ha
Paddy	1. Jaya	I crop	4	47.25
		II crop	2	
		Total	6	
	2. Bharathi	I crop	3	42.88
		II crop	4	
		III crop	2	
		Total	9	
	3. Jyothi	I crop	2	42.10
		II crop	2	
		III crop	1	
		Total	5	
	4. Mashuri	I crop	1	45.50
		II crop	Nil	
		Total	1	
	5. Annapurna	I crop	1	37.50
		II crop	1	
		Total	2	
	6. Pankaj	I crop	Nil	38.50
		II crop	1	
		Total	1	
	7. Triveni	I crop	1	41.75
II crop		2		
III crop		1		
Total		4		
Pulses	C-152	III crop	2	5.90
Sesamun	Local	III crop	2	2.90
Groundnut	TMV-2	I crop	4	10.10
Tapioca	M-4	I & II crop	3	160.00

SPECIAL DEMONSTRATION ON PROBLEM SOILSIntroduction

In Trichur district about 15,000 ha of paddy land is classified as 'Kole area' which is considered as problem soils of the District. In this area only one paddy crop is generally taken and in a limited area where permanent reclamation is completed two crops are taken. The Kole area is low lying and covered with water to a depth upto 2 M for about 5 to 8 months in an year. For raising crop the water is pumped out and a short duration paddy crop is grown. The dewatering, maintenance of bunds and drainage channels and such other works of general nature are carried out by the farmers Co-operative Societies the expenses of which will be met by the farmers. The details of demonstration are given below:

a) Name of farmer : Pushpangadan, Manakody Kayal, Puzhackal Block.

b) Nature of problem:

1. Low pH
2. High soluble iron
3. Lack of drainage
4. Low available phosphorus

c) Intensity of problem

A total area of 15,000 ha were affected by the above problem, the intensity varies from block to block. A total number of about 300 farmers were affected.

d) Reclamation measures suggested

1. Providing sufficient drainage channels
2. Application of lime on the basis of soil test data
3. Timely plant protection measures.

Additional drainage channels were provided to the field of N.D. farmer selected in the area. Lime @ 600 kg/ha were also applied.

e) Details of crops grown

The varieties generally recommended are short duration. The N.D. farmer selected raised Annapurna on 4-2-33, a short duration variety. He has applied 600 kg of lime 2/3 as basal and 1/3 as top dressing. Fertilizer dose as recommended in the package of practices for the 'Kole area' namely 70 kg N, 35 kg P<sub>2</sub>O<sub>5</sub> and 55 kg K<sub>2</sub>O per hectare were applied. Single basal application is difficult in this area and the fertilizer was applied



in 2 split doses, one 10 days after sowing and the 2nd 40 days after sowing.

f) Yield obtained before reclamation

The farmer Sri. Pushpangadan has got an yield of only 2000 kg per ha in the same field when our demonstration was laid out, he said that he had to incur loss during that year. Bad soil condition and great pest incidence were the cause for the low yield.

g) Yield obtained by the farmer after reclamation

The crop was harvested on 5-5-83 and the yield recorded was 3.9 tonnes/ha. Due to shortage of summer showers the last stage of the crop suffered water shortage. The farmer has specially given two irrigation. In the Kole area some of the farmers has completely lost the crop due to shortage of water in the earliest stage.

h) Total return

The farmer got an yield of 3900 kg grain and 4100 kg straw which fetched a total income of Rs.9030.00 for that season. The expenditure for the crop was Rs.5555/-. The farmer obtained a net profit of Rs.3975/- for the season.

i) Condition after reclamation

The field will be completely submerged under water for about 6 months. Hence whatever reclamation we have done will not be there when the next crop stands. Some 'Kole area' has been reclaimed permanently where two crops can be raised. Only such reclamation measures will have permanency.

j) Reaction of other farmers

They have appreciated the effect on the crop attained by the reclamation measures, such as additional drainage channel, application of lime and timely plant protection measures followed by the N.D. farmer.

k) Any other information : Nil

FIELD DAYS CONDUCTED AND REACTIONS OF THE FARMERS

Name of the Block	No. of field days conducted	Salient points discussed during F.D.	No. of farmers participated	Important reactions of farmers
Ollukkara	9	General aspects of cultivation of paddy, coconut, banana and arecanut. Raising of a pulse or oil seed was stressed in all the field days	240	The raising of a pulse and oilseed crop during summer was appreciated by the farmers
Kodakara	5	Mixed cropping of groundnut with tapioca and general aspects of cultivation of common field crops were discussed	180	Tapioca-groundnut mixed cropping was greatly appreciated by the farmers. This cropping pattern was introduced through N.D.Scheme
Irinjalakuda	4	Paddy, coconut and banana are major crops discussed with field days	125	Raising of high yielding paddy during second crop also was stressed and the reaction was good.
Chowanur	1	Homestead development was the main aspect discussed. The crops dealt were arecanut, coconut, banana and pulses	50	The reaction of farmers to intercropping in coconut and arecanut gardens was very good
Puzhakkal	2	The problem area namely Kole comes under the block. Methods to reclaim the kole area was discussed in detail. Raising coconuts in the main field bunds were also discussed.	120	The reclamation measures and the ways to raise economic paddy crop was greatly appreciated by the farmers.
Total	21		710	-



REASONS FOR LOW YIELDS

Crop	Yield	Reasons
<u>Paddy</u>		
1. Jaya	3800 kg/ha	The yield reduction may be contributed to the heavy incidence of stem borer and earhead bug in the later stages. Moreover the rainfall distribution is low and not uniform during this season. Among the plots of low yields some are raised as direct seeded crops.
2. Jyothi	3550 kg/ha	
3. Pankaj	3850 kg/ha	
4. Bharathi	3600 kg/ha	
5. Jyothi	3650 kg/ha	
6. Bharathi	3800 kg/ha	
<u>Pulses</u>		
Cowpea -C-152	6 quintals/ha	General
	5.8 quintals/ha	Yield reduction is due to poor residual moisture and poor germination and pest attack.
<u>Sesamum</u>		
Local	280 kg/ha	Because of the absence of summer rainfall the germination and crop stand was very poor. The variety is a local and the yield potential in adverse conditions is very low.
	300 kg/ha	

REASONS FOR HIGH YIELDS

<u>Paddy</u>		
Bharati	5200 kg/ha	The high yields from three trials are seasonal effects. This year the rainfall is comparatively less leading to less floods and less incidence of pests. Moreover timely operations were given.
Jaya	5800 kg/ha	
Jyothi	5100 kg/ha	
IR-8	5200 kg/ha	
<u>Tapioca intercropped with groundnut</u>		
Tapioca	19.50 tons/ha	The heavy yield of tapioca may be due to the complimentary effect of groundnut and favourable season. Without any additional expenditure the total production is high due to less additional expenditure through less pest attack and increased fertility. In addition to this the delayed planting of tapioca during July got the benefit of delayed onset of monsoon which is an additional factor for the high yield compared to other N.D. farmers.
Groundnut	1100 kg/ha	

ENTIRE FARMING SYSTEM DEMONSTRATIONType of Demonstration

In Kerala the houses are scattered and each farmer will have a house and his field will be surrounded to his house. The per capita holding of Kerala farmer is only 30 cents which is far below the Indian average. Due to the limited land holding and the scattered nature of houses, the only way to improve the living standard of a Kerala farmer is to develop the homestead. Invariably in Kerala these homesteads will be either a multi-cropped or mixed farmed or the combination of both. So the economic improvement of the people of Kerala lies in the improvement of these homesteads. With these objectives we have selected 5 farmers under Entire Farming System.

<u>Multilevel cropping</u>	<u>Area</u>	<u>Details</u>
1. Kuttan Nair	0.4 ha	Areca nut, Banana, Vegetables & coconuts.
2. Vakath Revi	0.65 ha	Areca nut, Coconut, Banana, Vegetables & Paddy
<u>Crop livestock system</u>		
1. Unnichettiar	0.2 ha	Areca nut, coconut, 3 cows
2. Kochappu	0.1 ha	2 Buffaloes, coconut and Banana
3. Cheriyar	0.5 ha	Coconut, Banana, Vegetables and paddy, cow.

Details of Entire Farming FarmersKuttan Nair

The farmer owns a total area of 0.4 ha of which 0.2 ha is areca nut garden and the rest young coconut seedlings. The entire area is irrigated by pumpset. From areca nut he could get a net profit of Rs.4800/-. In the remaining 0.2 ha he raised banana and vegetables in the inter space of coconut which was supplied through our scheme. From the intercrops he could get a net return of Rs.2500/-.

Unnichettiar

The farmer is having only 0.1 ha of land. Excluding the house area he is having only very limited space for cultivating field crops. His main income is from raising cattle and earnings as labourer in others field. From the crops he gets Rs.400/- net profit in an year while he gets Rs.1600/- from cattle. In addition, he gets Rs.2100/- as wages from other farmers.



This farmer is also having only 0.1 ha of land and his main income is from raising of buffaloes and wages obtained for work done on other fields. His net income comes to Rs.5300/- per year.

Ravi Vakath

The farmer is having only crop enterprises and he owns an area of 0.5 ha. The farm is an irrigated one. From 0.2 ha paddy he gets a net income of Rs.1800/- from 2 seasons. In the rest of the area he cultivate 0.2 ha of arecanut and 0.1 ha of vegetables. From these crops he gets Rs.4300/- as profit and thus the farmer gets a net return of Rs.6100/-.

Cheriyar

The farmer is having the maximum area of 0.75 ha among the selected farmers under the system. The farmer cultivate paddy in 0.25 ha and the rest of the land he utilise for raising crops like, coconut, banana and vegetables. He is having a pumpset also. From 2 crops of paddy in 0.25 ha he is getting a net profit of Rs.2500/-. In the rest of the area he has planted coconut seedlings on borders supplied by our Scheme, the trees have just started flowering. In the interspace he has cultivated according to our instruction, banana and vegetables from which he could get a net return of Rs.2300/-. In addition, he raised vegetables in paddy field during summer season, which has provided him an additional income of Rs.1900/-. He used to work on other farms on daily wages. From this he got an amount of Rs.1500/- and from raising milch cow another Rs.1500/-

Details of soil analysis - Entire Farming System

Sl.No.	Code No.	Name of farmer	Place	Details of soil analysis						Details of farming
				Area	PH	TSS	Org.C	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
1	0159	Kuttan Nair	Puthur	0.40	5.1	0.1	0.54	26	87	Banana, Vegetables, Arecanut, Colocasia and coconut
2	12166	Cheriyar	Vellanikkara	0.50	4.2	0.2	1.40	15	95	Banana, Paddy, Vegetables, Coconut and Livestock
3	12169	Kochappu	Udayagram	0.10	5.7	0.2	0.50	6	8.3	Coconut, Banana, Fish culture
4	12175	Ravi Vakath	Pananchery	0.40	5.9	0.3	0.80	36	11.3	Banana, Vegetables, Paddy, Arecanut and coconut
5	12177	Unnichettiayar	Mullakkara	0.2	4.8	0.2	0.70	20.3	80	Arecanut, Coconut, Livestock and Poultry

Details of Economics of Entire Farming

Code No.	Name of farmer	Area (ha)	Receipts			Expenditure			Net profit		
			Crop	Livestock	Earnings as labourer	Total	Feed	Ferti-lizer		Labour Total	
04179	Kuttan Nair	0.40	12,500	-	-	12,500	3200	4700	-	7900	5200
12198	Unnichettiyar	0.10	400	3500	2100	6,000	3100	200	-	3300	3700
12191	Kochappu	0.10	750	3400	2800	6,950	2000	400	-	2400	4550
12195	Ravi Vakath	0.50	14,800	-	-	14,800	-	3950	4700	8050	6150
12188	Cheriyar	0.75	9,300	2900	1500	13,700	1400	3800	1100	6300	7400



OPERATIONAL PROBLEMS

1. Kerala Agricultural University is not doing reappropriation of funds among sub-budget head without according the total allotment. If a standing order is given for the above will greatly facilitate the use of funds.
2. The petrol jeep now used become very old and require often repair. This jeep may be replaced by a diesel one which will reduce the expenditure at the same time the Scheme can be operated more efficiently.
3. The allotment for T.A. may be enhanced since the present allotment will be sufficient only for 8-9 months.

State and District, Mean and highest, Lowest yields, Frequency distribution of yields and return over operating cost in Rs/ha in rotation in ND plots

State & District	No. of demonstration	Yield in kg/ha			Average return (Rs/ha)			Average nutrients applied (kg/ha)			Range in yield (quintal/ha)				Percentage cases exceeding target
		Mean	Highest	Lowest	Gross return	Cost of production	of Return over operating cost	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Below 70	70-80	81-90	91 and above	
<u>1. Paddy-paddy-paddy</u>															
Kerala, Trichur 1592	4	4337	5100	3550	7221.90	5011.92	2209.98	74.2	37.3	41.1				4	100%
<u>2. Paddy-paddy-pulses</u>															
1592	2	4850	5800	3800	8255	6261	2024	78.5	37.8	40.0				2	Nil
<u>3. Paddy-paddy-sesamum</u>															
a) <u>Paddy</u>															
1592	2	4432.50	5200	3600	7186.25	5033	2153.25	80	35.5	47.5				2	Nil
b) <u>Sesamum</u>															
	2	290	300	280	1520.00	1155	365	30	15	30					Nil
<u>4. Paddy-paddy rotation</u>															
1592	4	4062.5	5000	3500	7163.13	5004.38	2158.75	81.60	38.13	46.4		1	3		Nil
<u>5. Tapioca-Groundnut</u>															
a) <u>Tapioca</u>															
	3	16000	19500	14000	5961.67	2617.00	3344.67	50	50	50				3	100%
b) <u>Groundnut</u>															
	3	1150	1200	1100	3987.84	2302.37	1684.97	15	46.7	40.0				3	100%



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Preparatory cultivation

Prepare the land and form ridges or mounds depending upon the soil type and topography of the land in order to ensure good drainage. The ridges may be prepared at a distance of 1 metre apart and 0.75 metre from top to top in the case of mounds.

Sowing

Tapioca stems may be planted 0.5 metre apart on the ridges on the top of the mounds. Groundnut seeds are dibbled on the same day on both sides of the ridges in two rows at a distance of 20 cm between plants and 20 cm between rows. 16 to 20 seeds are to be planted in case of mounds i.e., 6 seeds at 20 cm below the top of mounds and 10 to 14 seeds at the lower circles. Sufficient space has to be left at the lower side of the mounds as well as at the top portion of the ridges and mounds. Decorticated groundnut seeds of 65-75 kg are necessary to dibble one hectare.

Quality seeds should be used in order to ensure early establishment of groundnut.

Manures and fertilizers

At the time of preparation of land organic manure at the rate of 5 tonnes and fertilizers at the rate of 34 kg each of N, P and K per hectare are added before the ridges or mounds are formed for tapioca.

Season

May to June is the best time for planting tapioca and groundnut.

Varieties

- A. Tapioca: M-4 is highly suited for this cropping pattern.
- B. Groundnut - Errect varieties such as TMV-2, TMV-7, Pollachi-1 and Pollachi-2 are suited for dibbling.



At the time of flowering groundnut, i.e., 30 days after sowing apply 500 kg each of fresh lime and ash per hectare and earth up. Weeding may also be done, if necessary. Do not disturb the soil 45 days after sowing.

2nd top dressing (for tapioca alone)

After the harvest of groundnut, tapioca may be earthed up incorporating N, P and K at the rate of 17 kg each per hectare.

Pest and disease of groundnut

Pest control: Incidence of leaf caterpillar may occur. The pest can be controlled by dusting Lindane. For the control of rodents, bait with zinc phosphide or any other rodenticide. When it is mixed with fresh coconut kernel peelings, zinc phosphide is an excellent rat killer.

Disease control

Tikka leaf spot may appear at the late maturity period of nut. Usually, no control measures are taken as this disease generally is noted towards the time of maturity.

Harvest

Groundnut can be harvested when the foliage turns yellow. The crop should be harvested within a period of 100 days from sowing. Otherwise the crop will be affected by tikka disease or the pods may be attacked by pod borers.

Immediately after the harvest the nuts should be dried in the sun for five to six days.

Haulms

The Haulms are nutritive fodder for cattle.

Yield

An average yield of 1250 kg of groundnut pods as well as 2000 kg of fodder can be obtained from the intercrop. The yield and quality of tapioca has not been found to deteriorate due to this intercropping pattern.

PACKAGE OF PRACTICES OF COWPEA

1. The field is ploughed twice when the field attain field capacity. The lime is applied at the rate of 150 to 250 kg/ha depending upon the PH of the soil.
2. Urea, superphosphate and Muriate of Potash are applied as basal at the rate of N:P:K 10:30:10 kg per hectare..
3. Cowpea seeds at the rate of 25 to 30 kg per hectare are broadcast over the ploughed field.
4. A wooden plank is drawn out to level the ploughed surface.
5. Irrigation channels are to be provided 2 metre apart, to serve as efficient water course for irrigation.
6. Urea solution within 2% strength and Dimecron 250 ml in 500 litres of water per hectare are sprayed twice during the growth period of the crop. First spray is given within 20 days after sowing and the second just before flowering (10 litre water + 200 g urea + 5 ml Dimecron). This method of application of urea and insecticide has found to help in increasing the leaf area of the pulse crop quickly and thereby resulted in smothering the weeds. The systemic insecticide Dimecron control the sucking insects and to an extent solved the stray cattle problems. The cattle owners were reluctant to send out their cattle due to fear of food poisoning from the sprayed fields.

7. Choice of the varieties

In cowpea, different duration groups are now available according to the soil type and its moisture retention capacity the choice of the best suited varieties can be made.

PACKAGE OF PRACTICES OF SESAMUM IN RICE FALLOWS

- Season : December-April
- Seed rate : 4-5 kg/ha
- Sowing : Broad cast seeds evenly, preferably mixed with sand 2-3 times its volume to ensure uniform coverage. Work with harrow followed by pressing with wooden plank so as to cover the seeds in the soil.

Manures and fertilizers

Apply manures and fertilizers at the following rates.

N = 30 kg/ha

P<sub>2</sub>O<sub>5</sub> = 15 kg/ha

K<sub>2</sub>O = 30 kg/ha

Apply cattle manure/compost as basal dressing and incorporate into the soil along with last ploughing. Apply fertilizers as basal dose when there is enough moisture in the soil. Urea is preferable to Ammonium sulphate. Nitrogen may be applied in split doses, 50% as basal and the balance as foliar spray of Urea at 1-2 per cent concentration 20-35 days after sowing.

Interculture

Interculture the crop twice, the first 15 days after sowing and the next 25-35 days after sowing. When the plants are about 15 cm in height, thin the crop so as to give a spacing of 15-25 cm between plants.

Plant protection

For control of leaf and pod caterpillar remove affected leaves and shoots and dust with BHC 10%.

For control of gall fly give preventive spray with 0.2% BHC suspension.

Remove plants affected with Phyllody and destroy them. Do not use seeds from affected plants for sowing.



BASIC STATISTICS

Location	: North latitude between $8.18^{\circ}$ and $2.48^{\circ}$ East longitude between $74.52^{\circ}$ and $77.22^{\circ}$ .
Area	: 38855 sq. KM.
Length coastal line	: 580 KM.
Rivers:-	
West flowing	: 41
East flowing	: 3
District	: 12
Taluk	: 58
Revenue Villages	: 1335
Panchayats	: 1005
Corporations	: 3
Municipalities	: 42
Annual rainfall	: 3000 mm
Per capita land	: 0.18 ha
Per capita cultivated land	: 0.10 ha
Per capita food grain production	: 465 g/day
Population	: 25.40 (1981) millions

ESTIMATED AREA, MEAN YIELD AND PRODUCTION OF HIGH YIELDING  
VARIETIES OF PADDY - 1979-80 in TRICHUR/KERALA

District	Area(ha)		Main yield		Production		
	1978	1979	1978	1979	1978	1979	79-80
<u>1st crop</u>							
Trichur	11661	11471	1977	2336	15146	17759	50067
Kerala	122129	144909	3081	3063	287710	291604	567708
<u>2nd crop</u>							
Trichur	8648	6675	1739	2358	9880	17759	65850
Kerala	89505	77906	2831	2643	166549	291604	526457
<u>3rd crop</u>							
Trichur	9502	5854	2743	2432	17268	9356	38592
Kerala	61599	56416	3039	3414	123036	126544	205531

STATISTICS OF PADDY IN KERALA  
1978-79

Total area	: 793266.00 ha
Production	: 1299695 tonnes of rice
Average yield of rice	: 1592 kg/ha
Area under high yielding varieties	: 279231 ha
Average yield of paddy	: 3017 kg/ha
Area under paddy in wet lands	: 486288 ha
Total irrigated area	: 255266 ha.

ECONOMIC ANALYSIS OF VARIOUS CROPPING SEQUENCE  
(1982-1983)

Sl. No.	Cult. No.	Crop	Season	Yield of grains kg/ha	Yield of straw kg/ha	Gross return Rs.	Cost of production Rs.	Net pro- fit Rs.	Total profit for the sequence Rs.
1	2	3	4	5	6	7	8	9	10
<u>I. Paddy</u>									
1	14201	Paddy (Cul-28)	Summer	3800	4100	9030	6230	1800	
2	12197	Jaya	I crop	4900	5200	8390	6120	2280	4080
								Average profit	2040
<u>II. Paddy-paddy sequence</u>									
1	06181	Jaya	I crop	5000	5200	8540	5927	2613	
2	12187	Bharathi	II crop	3800	4200	6540	4595	1983	
3	12190	Mashuri	I crop	4350	4500	7425	5105	2320	17276
		Triveni	II crop	4000	4100	6000	5723	1077	
								Average profit	4319
		Mashuri	I crop	4550	500	7825	5955	1870	
		Pankaj	II crop	3850	4000	6575	4991	1624	
4	14200	Bharathi	II crop	4000	4200	6840	4175	2665	
		Annapurna	Summer	3500	3600	6760	3644	3124	

(contd.)



1	2	3	4	5	6	7	8	9	10
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III. Rapioaca-Groundnut sequences

1	0783	Groundnut (TMV-2)	I crop	1200	3000	4200	2344.50	1859.50
		Tapioca (M-4)	II crop	14000	7000	5740	2476.00	3264.00
2	07184	Groundnut (TMV-2)	I crop	1150	3200	3937	2293.50	1644.50
		Tapioca(M-4)	II crop	14500	8500	5970	2355.00	3615.00

IV. Paddy-paddy-pulses sequences

1	12189	Paddy (Jaya)	I crop	5800	5500	9800	6959	2891
		"	II crop	3800	4100	6520	5910	610
		Pulses (Cowpea C-152)	Summer	580	1050	2420	851	1569
2	12196	Paddy (Bharathi)	I crop	5200	5300	3860	6365	2545
		Bharathi	II crop	4600	4700	7840	5630	2010
		Pulses (Cowpea C-152)	Summer	600	1400	2540	1376	1164

V. Paddy-paddy-sesamum sequence

1	07185	Paddy(Jyothi)	I crop	4400	4500	9500	4520	2980
		"	II crop	3650	3800	6235	4430	1805
		Sesamum Local	Summer	300	1800	1179	1560	381
2	12199	Paddy IR-8	I crop	5200	5250	8850	6320	2530
		Bharathi	II crop	3600	3800	6160	4862	1298
		Sesamum Local	Summer	280	1800	1480	1131	349

VI. Groundnut alone

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1            2            3            4            5            6            7            8            9            10

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VII. Paddy-sally-sally sequence

1	5131	Bharathi	I crop	5450	5200	3615	6586	2029
		Triveni	II crop	4400	4500	7500	4605	2995
		Bharathi	III crop	4150	4200	7675	4950	2720
2	6132	Jaya	I crop	4300	5000	3200	5397	2803
		Annapura	II crop	5000	5100	3520	4533	3987
		Bharathi	III crop	2850	4050	5100	4099	1001
3	12186	Jyothi	I crop	5100	5300	3710	6191.5	2218.5
		"	II crop	3550	3300	6085	4847	1235
		"	III crop	3800	4000	6100	3716	2384
4	12194	Triveni	I crop	4200	4400	7711	5225	1995
		Jaya	II crop	4050	4200	6377.5	5552	1825.5
		Triveni	III crop	4100	4200	6570	4442	2128

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