



GOVERNMENT OF KERALA

**REPORT
ON THE
TIMELY REPORTING SURVEY
ON
AGRICULTURAL STATISTICS
KERALA**

1980-81

**DEPARTMENT OF ECONOMICS AND STATISTICS
TRIVANDRUM**



**REPORT
ON THE
TIMELY REPORTING SURVEY
ON
AGRICULTURAL STATISTICS
KERALA**

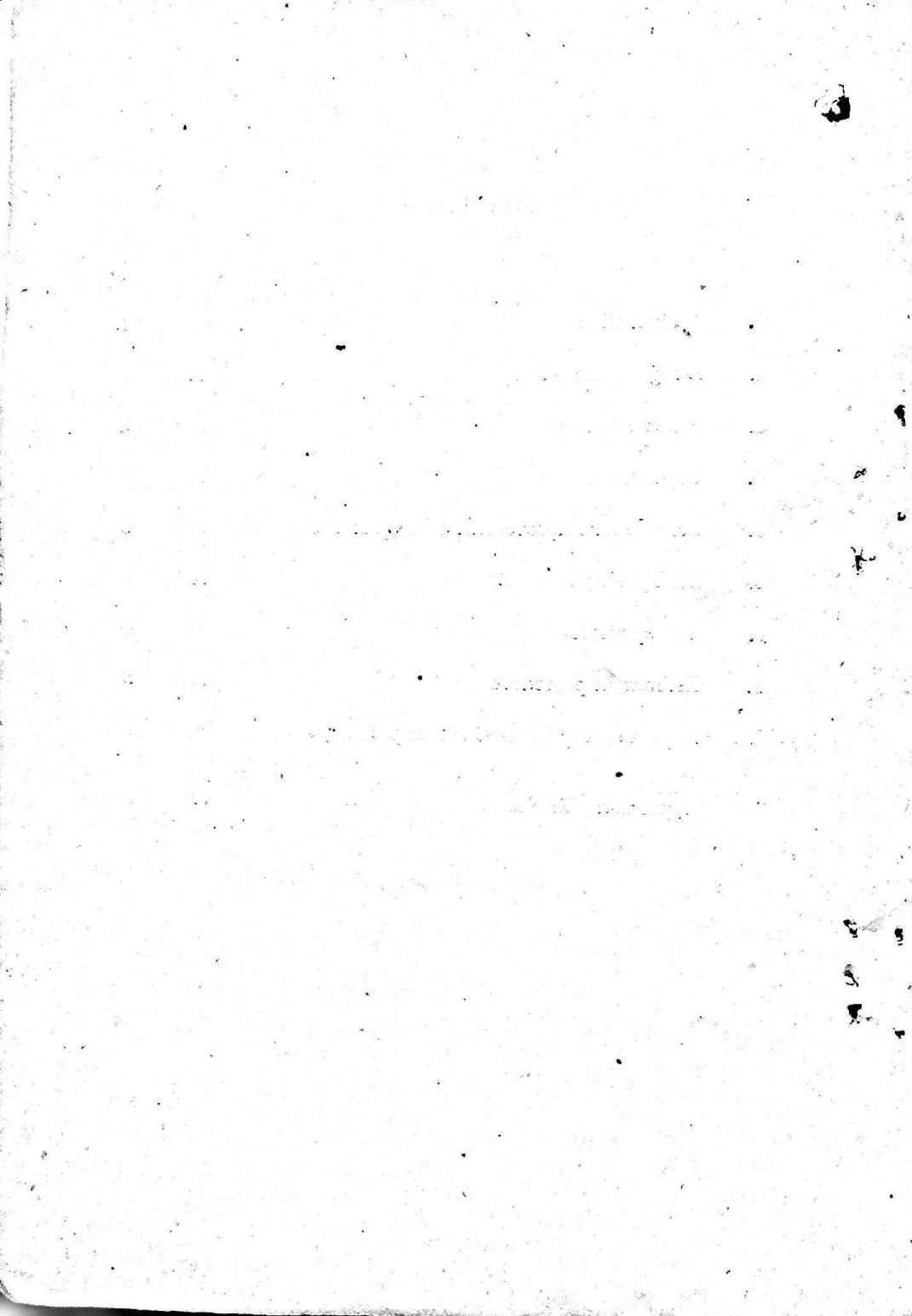
1980-81

**DEPARTMENT OF ECONOMICS AND STATISTICS
TRIVANDRUM**



CONTENTS

	<i>Page</i>
1. Introduction ..	1
2. Design of the Survey ..	1
3. Scheme of work ..	2
4. Supervision ..	3
5. Scheme for improvement of Crop statistics ..	3
6. Staff position ..	4
7. Survey results ..	4
8. Estimation procedure ..	5
9. Repeat survey to assess the crop changes ..	7
Appendix: Tables ..	9



P R E F A C E

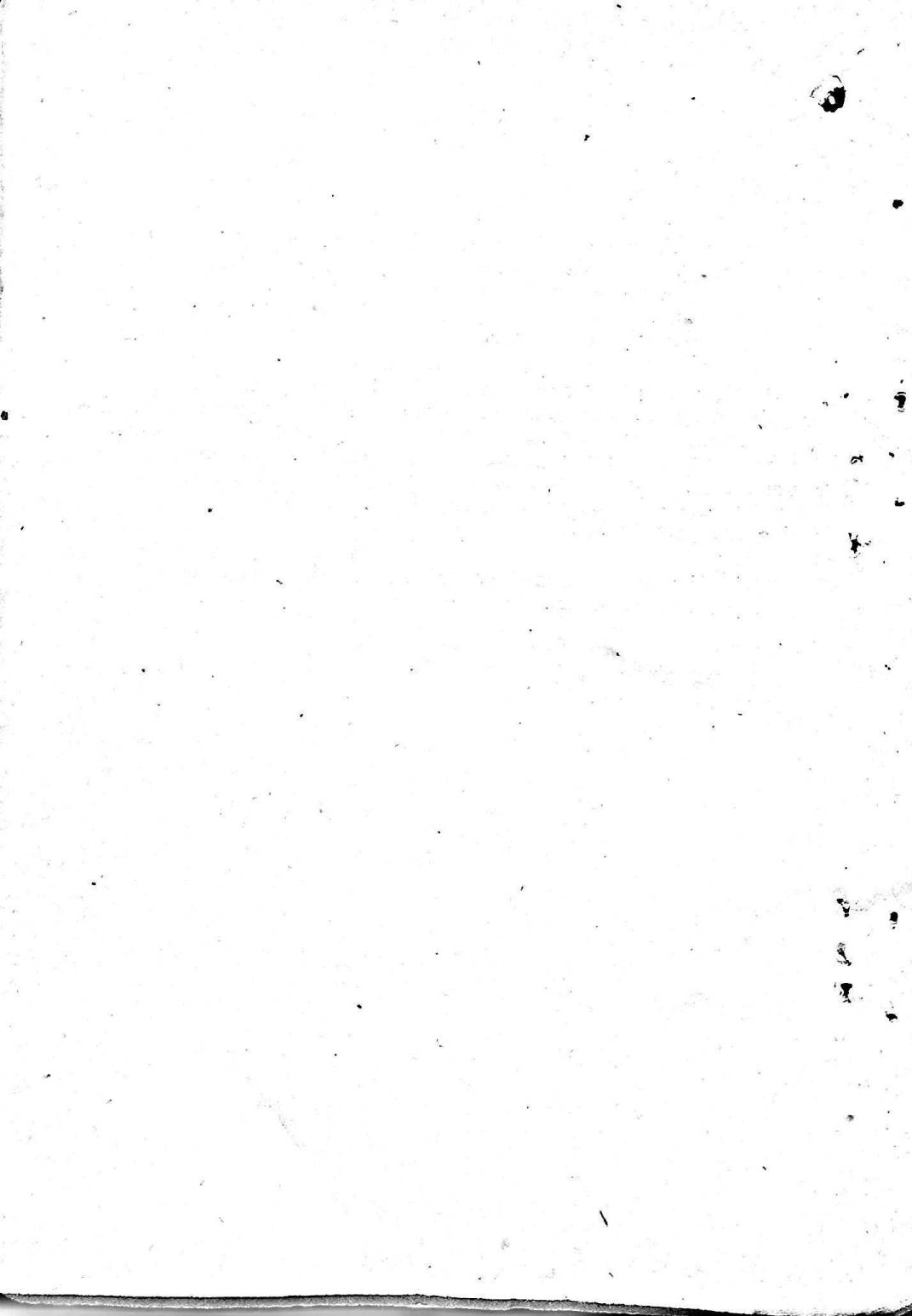
This is the sixth report of the Survey under the scheme of Establishment of an Agency for reporting Agricultural Statistics. It relates to the sixth year of the first round of the survey which was started in the year 1975-76. With this round the complete area of the State was covered for area enumeration for land utilisation and area under different crops.

Details of land use, area under seasonal, annual and perennial crops, irrigation etc., were collected from 20% of the villages during the year. 25% of the Investigator units which were covered during 1979-80 were selected for repeat survey to assess the crop changes. Crop estimation surveys were conducted on paddy, (Autumn, Winter & Summer) Tapioca, Coconut, Areca nut, Cashew, Pepper, Pappaya, Lemongrass, Cocoa & Cardamom during the year 1980-81.

The estimates obtained from the survey conducted during 1980-81 are presented in the report.

Trivandrum,
1-3-1984.

K. RAMAVARMA,
Director.



REPORT ON THE TIMELY REPORTING SURVEY ON AGRICULTURAL STATISTICS — 1980-81

Introduction

This is the report of the sixth year of the survey under the scheme for Establishment of an Agency for Reporting Crop Statistics in Kerala. This scheme which was started in 1975-76 in the State is implemented as a variant of the All India Scheme of Timely Reporting Survey on Agricultural Statistics since Kerala is a non reporting State under the scheme of Timely Reporting Survey. In the scheme it is envisaged to conduct the area enumeration as a phased programme by completing the enumeration of the selected villages each year and conduct crop cutting experiments for estimating the yield of specified crops.

When the scheme was introduced in 1975-76; ten per cent of villages (134) were selected and completely enumerated. During 1976-77, fifteen per cent (200) of villages were covered and during subsequent three years twenty per cent of the villages (265) were taken up each year. During the year under report remaining fifteen per cent (200) villages were enumerated.

Crop cutting experiments to estimate the mean yield and production were conducted on six major crops namely paddy (during the three seasons of autumn, winter and summer) tapioca, coconut, arecanut, cashew and pepper and four minor crops in rotation every year.

This report gives the details of land utilisation, area under crops, area under irrigation and production of crops during 1980-81.

2. Design of the survey

Each of the 57 taluks of the State was taken as stratum and the revenue villages, the smallest well defined unit of revenue administration, as the first and last stage unit of sampling. During the year 200 villages were selected for area enumeration and crop cutting experiments were conducted in these villages. The statement showing the number of revenue villages in the State

and number of villages selected for area enumeration during 1980-81 is given in the statement below.

District-wise statement showing the number of villages in each district and the number of villages selected

<i>District</i>	<i>Number of village Total</i>	<i>Selected for area enumeration</i>
Trivandrum	94	14
Quilon	99	14
Alleppey	99	16
Kottayam	74	10
Idukki	42	6
Ernakulam	100	16
Trichur	234	34
Palghat	152	23
Malappuram	122	20
Kozhikode	123	18
Cannanore	188	29
	1327	200

3. Scheme of work

To facilitate smooth conduct of field work each of the selected revenue villages was divided into a number of investigator units depending upon the area under wet and dry lands the terrain of the locality etc. The area enumeration was done by the investigators based on the litho subdivisions marked in village maps in Travancore Cochin area and the subdivisions in the field measurement book in Malabar area. They visited the wet lands

three times during the agricultural year to collect data on seasonal and annual crops corresponding to autumn, winter and summer. The data on land use, irrigation and perennial crops were collected during the third visit. In dry lands two visits were conducted corresponding to kharif and rabi seasons; the first for collection of data on seasonal and annual crops and the second for perennial crops.

Crop cutting experiments were conducted on six major crops namely paddy (autumn, winter and summer) tapioca, coconut, arecanut, cashew and pepper and four minor crops namely papaya, lemongrass, cocoa, and cardamom:

The number of experiments in a taluk for each crop was fixed by the State headquarters. Maximum number of experiments fixed is 30 for paddy and 40 for tapioca during the year subject to a minimum of two experiments in a village. The experiments for the investigator units were fixed by the Deputy Director of the Regional Tabulation centre in consultation with the District Officers and Statistical Inspectors. The number of taluks where experiments were conducted and the number of experiments on various crops allotted and done during the year are given in Table No. 1. Table No. 2 gives the number of experiments planned and analysed district-wise and crop-wise. The number of experiments missed in paddy and tapioca according to the reasons for missing is given in Table No. 3. The number of investigators according to the number of crop cutting experiments on paddy done by them is given in Table number 4.

4. Supervision

Supervision of work in the field was done by the Statistical Inspectors/Additional Statistical Inspectors at the taluk level, by district Statistical Officers/Additional District Statistical Officers at the district level and Deputy Directors of Regional Tabulation Centres at the regional level. At State level the Director, Additional Director and Joint Director conducted supervision.

5. Scheme for improvement of crop statistics

Under the scheme of improvement of statistics, the Additional District Officers (TRS) of the Directorate of Economics and Statistics and the Assistant Superintendents of National Sample Survey Organisations undertook the work of sample check on 50:50 basis. They undertook sample check on area enumeration and also on crop cutting according to predetermined programme. The number of villages for area enumeration and number of experiments for crop cutting planned and conducted are given in Table number 5.

6. Staff position

The implementation of the programme was attended to by the staff sanctioned for the scheme by Government of India under the scheme and also by the staff sanctioned by the State Government for land utilisation survey. The details of staff are given below.

Staff pattern for the scheme

Headquarters	Staff sanctioned		
	Under L.U.S. by State Government	Under EARCS by Govern- ment of India	Total
(i) Joint Director	..	1	1
(ii) Assistant Director	1	..	1
(iii) Research Officer	3	..	3
(iv) Research Assistant	4	..	4
(v) Compiler	2	6	8
<i>Field Staff</i>			
(i) Deputy Director	..	3	3
(ii) Assistant Director	..	3	3
(iii) Regional Officer	..	3	3
(iv) Additional District Statistical Officer	..	11	11
(v) Research Assistant	..	5	5
(vi) Statistical Inspectors	51	74	125
(vii) Compilers	9	2	11
(viii) Investigators	159	721	880

7. Survey results

(a). *Land utilisation*.—The estimated area under various land utilisation for the year under report together with the details from the year of starting of the survey i.e., 1975-76 to 1980-81 is given in Table No. 6. The pattern has not shown any abnormal change except in the case of permanent pastures and grazing land and the land under miscellaneous tree crops which showed lesser area during the year under report as compared to 1975-76. In the case of cultivable waste land and fallow land; there is increase in the area. Net area sown also has decreased to a little extent. The district-wise distribution of land utilisation is given in Table number 7.

(b) *Area under different crops.*—The estimated area under important crops are given in Table No. 8 for the years 1975-76 to 1980-81. It shows that there is decrease in the area under paddy, coconut, arecanut, pepper, tapioca and banana but there is increase in the area under cash crops such as cashew and rubber. The area under principal crops district-wise and the percentage of standard error are given in Table No. 9 to 14. Area under plantation crops, annual crops, seasonal crops, other seasonal crops and other perennial crops are given in Tables 15 to 19 respectively.

(c) *Area under irrigation.*—The estimated net area under irrigation and gross area crop-wise are given in Tables No. 20 & 21.

The district-wise distribution of area for high yielding and local varieties under irrigated and unirrigated stages for three seasons are given in tables No. 22a, b & c.

(d) *Production.*—The estimated production of important crops for the years 1975-76 to 1980-81 is given in table 23. The production in 1980-81 is seen reduced in the case of crops except rubber, pepper, plantain and banana as compared to 1975-76 even though small reduction is seen in production in the case of pepper from the previous year.

The district-wise production of different crops are given in Table No. 24

8. *Estimation procedure*

The following estimates were prepared from the data collected in area enumeration.

1. Area under different utilisation
2. Source-wise area irrigated
3. Area under crops

The estimates were prepared as follows:—

(a) *Land utilisation & Irrigation*

Notations used:— N=No. of villages in the stratum (taluk)

n=No. of villages selected for area enumeration in the stratum

A=Area of stratum

a=Area of selected village

aj=area of jth selected village

yij=area under ith utilisation in jth selected village

yi=estimates of the ith utilisation

V(yi)=estimate of the variance of yi.

The area cultivated with major crops have been considered here.

Paddy:—

Autumn.—A marginal change is noticed in the districts of Quilon, Alleppey, Trichur, Palghat and Cannanore, Kottayam and Idukki districts showed more than 5 per cent difference in the succeeding year.

Winter.—Alleppey and Idukki districts showed more than 25% of increase during 1980-81 as compared to the previous year.

Summer.—Except Ernakulam, Trichur, Malappuram districts other districts showed difference between the two years.

Tapioca.—Trivandrum, Ernakulam & Trichur districts had an increase or decrease of more than five per cent in the area under cultivation of Tapioca.

Coconut.—The districts of Alleppey, Kottayam, Ernakulam, Trichur and Cannanore did not show much difference on the area under cultivation in the year 1980-81 as compared to the previous year. Palghat and Kozhikode districts had shown more than 5% difference.

Arecanut.—In the case of Arecanut Malappuram district alone had shown more than 5% difference.

Cashew.—Idukki showed more than 5% and Trivandrum more than 10% difference from the previous year.

Pepper.—Palghat and Malappuram had more than 5% difference from the previous years area.

The district-wise statement showing the percentage of area of 1980-81 to the area of 1979-80 is given in the table below

The estimate of average yield is obtained as the simple average of the yield obtained from all the experiments in the stratum.

9. Repeat survey to assess the crop changes

During the year a repeat survey of the area was done to assess the changes in the crop pattern in the State. 25% of the investigator units which were covered during the year 1979-80 for area enumeration were selected for this purpose. The result of the survey is detailed below.

A marginal change is observed in the case of utilisation of land. The following table gives the percentage of area during 1980-81 to the area of 1979-80, under different utilisation.

<i>Utilisation</i>	<i>Percentage of area of 1980-81 to the area of 1979-80</i>
Net area sown	100.29
Non-agricultural uses	98.78
Barren and uncultivable land	100.53
Miscellaneous tree crops	99.36
Pastures and Grazing land	82.89
Cultivable waste	100.08
Fallow other than current fallow	97.93
Current fallow	97.05

The percentage of Net area sown among the districts also did not reveal abnormal changes. The following table gives the position.

Table showing district-wise change as percentage of area of 1980-81 to the area of 1979-80 (Net area sown)

<i>District</i>	<i>Percentage of area (1980-81 to area 1979-80)</i>
Trivandrum	98.15
Quilon	99.22
Alleppey	99.80
Kottayam	102.51
Idukki	97.96
Ernakulam	102.29
Trichur	101.85
Palghat	104.05
Malappuram	100.07
Kozhikode	101.20
Cannanore	99.66
State	100.29

Then y_i is given by

$$y_i = \frac{\sum_{j=1}^n y_{ij}}{\sum_{j=1}^n a_j} \times A = \frac{A}{a} \sum_{j=1}^n y_{ij}$$

$$v(y_i) = \frac{N(N-n)}{n(n-1)} \sum_{j=1}^n (y_{ij} - R_{iaj})^2$$

$$\text{where } R_i = \frac{\sum_{j=1}^n y_{ij}}{\sum_{j=1}^n a_j}$$

(b) *Area under crops*

The area under various crops are estimated as follows:

N =No. of villages in a stratum

n =No. of villages selected for area enumeration

W =Wet land area of the stratum

D =Dry land area of the stratum

w_j =Wet land area of the j th selected village

d_j =Dry land area of the j th selected village

y_{ij} =Area under i th crop in the wet land of j th selected village

x_{ij} =Area under i th crop in the dry land of j th selected village

y_i =estimate of the area under i th crop in wet land

x_i =estimate of the area under i th crop in dry land

$$y_i = \frac{\sum_{j=1}^n y_{ij} \times W}{\sum_{j=1}^n w_j} \quad x_i = \frac{\sum_{j=1}^n x_{ij}}{\sum_{j=1}^n d_j} \times D$$

$$v(y_i + x_i) = v(y_i) + v(x_i)$$

$$= \frac{N(N-n)}{n(n-1)} \left\{ \sum_{j=1}^n (y_{ij} - R_{i1} w_j)^2 + \sum_{j=1}^n (x_{ij} - R_{i2} d_j)^2 \right\}$$

$$\text{where } R_{i1} = \frac{\sum_{j=1}^n y_{ij}}{\sum_{j=1}^n w_j} \quad \text{and } R_{i2} = \frac{\sum_{j=1}^n x_{ij}}{\sum_{j=1}^n d_j}$$

Table showing the Percentage of area of 1980-81 to the area of 1979-80 for major crops

District	Autumn	Winter	Summer	Tapioca	Coconut	Arecanut	Cashew	Pepper
Trivandrum	96.40	99.40	87.5	109.47	102.74	100.26	111.36	99.44
Quilon	102.05	97.10	93.4	100.87	97.51	101.89	96.50	98.94
Alleppey	100.24	129.24	82.9	101.58	101.42	180.82	97.72	104.73
Kottayam	106.10	104.62	96.1	100.01	99.93	104.08	95.93	100.50
Idukki	107.26	127.50	111.5	96.45	103.01	103.51	94.97	104.97
Ernakulam	99.09	101.32	101.3	93.46	99.19	96.81	102.54	97.16
Trichur	101.68	104.70	100.4	91.91	101.73	98.71	101.29	103.20
Palghat	102.11	103.70	109.4	99.01	107.10	101.83	99.52	107.90
Malappuram	95.20	102.70	100.8	99.44	104.73	105.27	97.76	109.90
Kozhikode	102.90	98.72	92.4	99.68	94.86	100.75	101.13	95.50
Cannanore	100.10	101.12	112.3	98.04	99.96	100.55	97.72	102.66
State	99.63	99.89	97.72	102.66	101.13	101.69	98.32	104.18

TABLE I

Distribution of the number of Taluks in each District and the number
in which experiments were planned crop-wise

District	Number of Taluks where experiments were planned for each crop													Minor Crops		
	No. of Taluks		PADDY		Tapioca		Areca		Cashew		Papaya		Coconuts	Lemon	Carambola	
	Taluks	Autumn	Autumn	Winter	Summer	coconut	nut	canistel	nut	peach	grass	peach	grass	peach	grass	damson
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)*	(12)	(13)	(14)			
Trivandrum			4	4	4	4	4	4	4	4	1	4	..	..	..	..
Quilon	6	6	6	6	5	6	6	6	3	5	2	5	..	..	..	..
Alleppey	7	7	7	6	6	7	4	3	3	3	6	..	..	..	..	..
Kottayam	5	5	5	4	5	5	4	1	5	4	4	4	..	..	..	..
Idukki	4	4	4	4	4	2	1	1	2	2	1	..	3	..	..	..
Ernakulam	7	7	7	6	5	6	6	3	5	4	5	3	..	..	..	..
Trichur	5	5	5	4	5	4	4	3	3	2	3	..	..	..	..	..
Palghat	5	5	5	5	5	5	2	3	2	1	4	..	1	..	..	..
Malappuram	4	4	4	4	4	4	3	3	4	3	2	4	..	..	..	..
Kozhikode	4	4	4	4	4	3	3	3	4	1	3	1	1	..	..	..
Cannanore	6	6	6	6	5	5	6	5	5	2	5	3	2	..	..	..
State	57	57	57	49	53	52	42	35	41	24	44	7	7	..	..	..

TABLE 2

Number of experiments planned in each district for each crop and
number of experiments analysed (1980-81)

District	Number of experiments planned and analysed under each crop											
	Paddy						Other Crops					
	Autumn		Winter		Summer		Tapioca		Coconut		Arecanut	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Trivandrum	114	114	114	112	96	92	126	126	50	50	25	23
Quilon	152	150	152	151	45	45	144	144	60	60	31	31
Alleppey	180	174	180	176	132	128	82	81	45	45	21	20
Kottayam	104	102	104	101	30	30	108	106	40	40	25	25
Idukki	42	42	66	66	..	..	56	56	20	20	10	10
Ernakulam	200	194	180	180	130	128	100	100	40	39	52	51
Trichur	140	139	140	137	134	130	106	106	45	45	50	50
Palghat	150	142	150	147	129	124	90	90	28	28	16	16
Malappuram	114	88	114	109	105	101	128	127	55	55	58	58
Kozhikode	84	83	96	96	100	96	110	110	75	75	40	37
Cannanore	150	149	162	161	180	179	180	180	60	60	72	70
State	1430	1377	1458	1436	1081	1053	1230	1226	518	517	400	391
	A	Planned										
	B	Analysed										

TABLE 2 (Contd.)

District	Number of experiments planned and analysed under each crop											
	Casuarina		Pepper		Cocoa		Papaya		Lemongrass		Cardamom	
	A	B	A	B	A	B	A	B	A	B	A	B
(1)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
Trivandrum	21	21	23	23	5	5	20	20	..	..	..	..
Quilon	25	25	30	30	20	20	30	30	..	..	..	..
Alleppey	15	15	20	20	25	25	25	25	..	..	..	..
Kottayam	5	5	35	35	40	40	20	20	..	..	..	..
Idukki	5	5	65	65	15	15	5	5	3	3	40	40
Ernakulam	18	18	27	27	40	40	25	25	10	10	..	..
Trichur	21	21	18	18	20	20	15	15	..	..	..	..
Palghat	41	41	10	10	10	10	20	20	..	..	..	..
Malappuram	75	75	20	20	20	20	20	20	..	..	..	..
Kozhikode	19	10	71	71	10	10	15	15	10	2	14	14
Cannanore	145	140	75	75	15	15	25	25	30	30	15	15
State	390	376	394	394	220	220	220	220	68	45	69	69

TABLE 3
Number of experiments missed in paddy and tapioca by reason
District-wise (1980-81)

District	Paddy (Autumn)				Paddy (Winter)				Paddy (Summer)				Tapioca			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Trivandrum	2	..	..	..	..	..	..	4	..	..	..	..
Quilon	..	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..
Alleppey	..	4	..	2	..	4	..	..	4	..	..	..	..	..	..	..
Kottayam	2	..	3	..	..	..	..	..	..	..	1	..	..	..
Idukki	1	..	..	1
Ernakulam	..	1	..	5	..	..	..	..	..	..	..	..	..	..	..	..
Trichur	..	1	..	..	..	2	..	1	..	1	..	..	..	..	..	..
Palghat	8	..	3	..	..	..	..	1	..	4	..	..	..	..
Malappuram	..	1	..	25	..	5	..	..	..	..	..	4	..	..	..	..
Kozhikode	1	..	..	..	..	..	..	..	..	4	..	..	..	1
Caunanoor	..	1	..	..	1	..	..	..	..	1	..	..	..	..	..	..
State	..	9	..	44	..	21	..	1	..	8	..	20	..	2	..	2

(1) Primary workers absence, leave etc.

(2) Prior harvest by cultivator

(3) Rejected at the analyses stage

(4) Other reasons.

TABLE 4

Number of investigators according to number of Crop cutting experiments on paddy conducted by them 1930-31

Number of experiments	Number of investigators			
	Autumn (1)	Winter (2)	Winter (3)	Summer (4)
4 experiments or less	336	334	334	240
5 to 8 experiments	82	74	74	88
More than 8 experiments	2	..	..	..
All	420	408	408	328

TABLE 5

Number of villages experiments supervised by Addl. District Statistical Officers under the scheme I.C.S. the due date of completion, the actual date of completion (1980-81)

Season	Area Enumeration			Due date of completion			Crop cutting exps on paddy			Remarks	
	No. of clusters for inspection	No. of clusters inspected	Wet land	Dry land	Actual date of completion		No. of exps. allotted	No. of exps. supervised			
					Wet land	Dry land					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
Autumn	131	131	10-10-1980	30-6-1981	24-10-1980	30-9-1981	160	141	31-10-1980		
Winter	132	132	15-1-1981	30-6-1981	29-1-1981	30-9-1981	154	154	28-2-1981		
Summer	131	131	30-4-1981	30-6-1981	30-5-1981	30-9-1981	118	97	30-6-1981		
All	394	394					432	392			

Land use classification 1975-76 to 1980-81

16

Classification	Area in Hectares ('000)						Percentage					
	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81
Total Geographical area	38856	38855	38855	38855	38855	38855	100.00	100.00	100.00	100.00	100.00	100.00
Forest	10815	10815	10815	10815	10815	10815	27.83	27.83	27.83	27.83	27.83	27.83
Land under non-Agricultural uses	2532	2604	2572	2604	2635	2698	6.67	6.70	6.62	6.70	6.78	6.94
Barren & uncultivable land	785	788	753	746	782	858	2.02	2.03	1.94	1.72	2.01	2.21
Permanent pastures and grazing land	199	161	106	63	56	54	0.51	0.41	0.27	0.16	0.14	0.14
Land under Miscellaneous tree crops	842	727	680	664	655	639	2.17	1.87	1.75	1.71	1.69	1.64
Cultivable waste land	1134	1157	1183	1233	1250	1290	2.92	2.98	3.04	3.17	3.22	3.32
Fallow other than current fallow	230	223	271	266	277	269	0.59	0.57	0.70	0.68	0.71	0.69
Current fallow	356	374	461	423	434	436	0.92	0.96	1.91	1.09	1.12	1.12
Net area sown	21892	22006	22013	22041	21951	21796	56.34	56.64	56.66	56.73	56.50	56.10

(12,68)
32331

TABLE 7
Total area and classification of area in each district 1980-81 (Area in Hectares)

District	Total according to village papers	Forest	Land put to non-agricultural uses	Barren and Uncultivable land	Permanent Pastures and grazing land	Land under miscellaneous tree crops
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Trivandrum	218600	49861	17346	2229	34	216
Quilon	474290	236048	24822	2361	37	331
Alleppey	182270	518	30338	576	15	192
Kottayam	219550	8141	19065	2050	86	331
Idukki	515048	260933	15566	17442	2215	16189
Ernakulam	235319	8123	32752	2649	198	1343
Trichur	291390	103619	21642	2492	187	1307
Palghat	438980	136257	31351	14101	341	8247
Malappuram	363230	103417	18603	7770	439	3664
Kozhikode	371150	90876	22483	3727	271	16869
Cannanore	567670	83666	35356	30373	1609	15186
State	3885497	1081509	269824	85770	5432	63875

TABLE 7 (contd.)

District	Calculable waste land	Fallow other than current fallow	Current fallow	Net area sown	Area sown more than once	Total cropland area
1	(8)	(9)	(10)	(11)	(12)	(13)
Trivandrum	2154	1703	1301	143756	84169	227925
Quilon	1493	1190	1853	206155	88106	294261
Alleppey	2000	1092	2067	144972	73332	218324
Kottayam	1739	2237	3736	182165	48024	230189
Idukki	38776	1208	1739	160920	9786	170706
Ernakulam	5304	3079	3714	178157	80658	258815
Trichur	5452	3021	4860	156810	74645	231455
Palghat	25271	3117	6547	213748	123304	336557
Malappuram	14337	4039	9787	201174	51398	255572
Kozhikode	5510	2010	2801	226603	53811	280414
Cannanore	26996	4190	5174	365130	18092	383222
atc	129032	26886	43579	2179590	703250	2884840

TABLE 8

Area under important crops 1975-76 to 1980-81

Crop	Area in hectares					Percentage to total cropped area					
	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1975-76	1976-77	1977-78	1978-79	1979-80
<i>Paddy</i>											
Autumn	375043	363822	365111	346827	343373	349243	12.58	12.26	12.49	12.02	12.21
Winter	396392	381678	370859	345727	339608	354132	13.30	12.87	12.68	11.98	11.90
Summer	104587	108874	104404	106684	105285	98324	3.51	3.67	3.57	3.70	3.69
Total	876022	854374	840374	799238	793266	801699	29.39	28.80	28.74	27.70	27.79
Coconut	692945	694985	673479	660628	602657	651370	23.24	23.43	23.03	22.89	23.22
Arecanut	76618	68356	62427	62317	60858	61242	2.57	2.30	2.14	2.16	2.13
Cashew	109057	113326	126963	136552	139917	141277	3.66	3.82	4.34	4.73	4.90
Pepper	108251	108666	101045	106743	105817	108073	3.63	3.66	3.46	3.70	3.71
Tapioca	326865	323278	289722	273483	243763	244990	10.96	10.90	9.91	9.48	8.54
Rubber	206686	219723	212271	214415	215474	237769	6.93	7.07	7.26	7.43	7.55
Banana and Plantain	52280	51697	50100	53342	49558	49262	1.75	1.74	1.71	1.85	1.74
											1.71

TABLE 9

Area under principal crops—District-wise 1980-81 (Paddy)

District	Area under the crop (in hectares) ✓				Percentage sampling error			20
	Autumn	Winter	Summer	Total	Autumn	Winter	Summer	
Trivandrum	15361	16115	1107	32583	3.99	3.24	1.43	7.45
Quilon	24142	25090	823	50055	4.14	4.50	..	6.88
Alleppey	33019	25372	24075	82466	8.17	3.18	22.85	8.27
Kottayam	13485	10799	7664	31948	12.54	1.82	14.50	3.58
Idukki	3862	5100	299	9261	9.94	..	1.96	..
Ernakulam	43174	39719	19607	102500	7.74	7.38	8.68	6.70
Trichur	40584	49168	20562	110314	6.10	5.76	17.89	6.76
Palghat	89762	89550	4322	183634	4.14	4.83	20.13	4.15
Malappuram	38603	36012	5407	80022	9.16	3.66	16.67	11.67
Kozhikode	9826	28461	7164	45451	12.42	5.93	13.40	10.79
Cannanore	37425	28746	7294	73465	5.81	8.88	6.46	1.64
State	349243	354132	98324	801699	2.51	2.05	7.24	2.34

TABLE 10

Area under principal crops—District-wise 1980-81 (Tapioca)

District	Area under crop (Hectares)						Percentage sampling error		
	Autumn (1)	Winter (2)	Summer (3)	Total (4)	Autumn (5)	Winter (6)	Autumn (7)	Winter (8)	Total (9)
Trivandrum	23161	25140	8244	56545	7.11	12.41	17.96	11.90	
Quilon	17428	41409	260	59097	13.05	10.01	17.17	8.90	
Alleppey	3497	15421	674	19592	3.36	7.39	2.41	8.76	
Kottayam	1435	21034	534	23003	6.09	10.75	24.41	10.12	
Idukki	1525	9125	174	10824	..	24.61	31.25	17.46	
Ernakulam	1621	9975	866	12462	15.85	9.11	15.64	12.80	
Trichur	2661	3313	217	6191	8.66	9.62	8.55	7.59	
Palghat	5780	6144	720	12644	6.99	4.07	8.52	2.55	
Malappuram	8697	8110	1304	18111	10.93	13.59	16.81	8.12	
Kozhikode	2831	4004	921	7756	22.56	23.69	10.03	18.14	
Cannanore	2939	15089	737	18765	7.21	5.33	17.92	3.78	
State	71575	158764	14651	244990	4.16	4.09	10.27	3.81	

TABLE 11

Area under principal crops—District-wise 1980-81 (Coconut)

District	No. of Trees in '000			Area (Hectares)			Percentage sampling error		
	Bearing	Young	Total	(5)	Bearing	Young	Total	(8)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
Trivandrum	9835	6911	16746	73771	18.64	19.39	16.95		
Quilon	10215	7201	17416	81765	11.09	6.61	7.67		
Alleppey	10324	4634	14958	63114	4.04	8.12	6.63		
Kottayam	8478	2614	11092	51115	7.01	10.05	7.70	22	
Idukki	1863	1045	2908	16617	1.36	2.53	10.39		
Ernakulam	8616	5204	13820	60881	5.18	10.41	11.74		
Trichur	8218	4587	12805	54030	9.43	7.93	7.51		
Palghat	2968	2572	5440	22954	7.39	9.04	8.41		
Malappuram	8414	5610	14024	59677	16.38	17.50	17.74		
Kozhikode	15442	7891	23333	94466	9.10	9.56	13.14		
Cannanore	10522	8104	18626	72980	15.64	6.97	10.63		
State	94795	57183	151978	651370	3.74	3.62	3.90		

TABLE 12
Area under principal crops—District-wise 1980-81 (Arecanut)

District	Number of Trees in '000			Area (Hectares)			Percentage of sampling error			
	Bearing	Young	Total	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trivandrum	5639	1390	7029	3292	17.6	9.19	14.10			
Quilon	6678	2603	9281	4250	..	21.57	18.68			
Alleppey	4019	2141	6160	2865	7.77	7.39	7.78			
Kottayam	4453	1105	5558	2525	8.86	15.71	8.97			
Idukki	3847	1650	5497	2500	..	..	6.48			
Ernakulam	11092	2435	13527	6151	18.3	7.34	2.59			
Trichur	12259	2326	14585	6633	21.32	39.80	16.93			
Palghat	3608	1401	5009	2352	12.24	7.60	8.12			
Makappuram	14704	4051	18755	8801	20.63	50.89	9.67			
Kozhikode	11569	2867	14436	6771	5.99	18.76	10.99			
Cannanore	19542	7928	27470	15102	5.37	11.26	6.46			
State	97410	29897	127307	61242	4.50	7.89	3.22			

Table 13

Area under principal crops—District-wise 1980-81 (Cashflow)

24

District (1)	No. of trees '000 (2)	Area (Hectares) (3)	Percentage sampling error
			(4)
Trivandrum	1891	6303	16.43
Quilon	2602	8673	15.42
Alleppey	1159	3863	8.69
Kottayam	401	1337	21.86
Idukki	359	1197	9.19
Ernakulam	1220	4067	25.00
Trichur	2149	7163	15.69
Palghat	3986	13287	7.46
Malappuram	6377	21257	7.99
Kozhikode	1564	5213	14.59
Cannanore	20675	68917	8.32
State	42383	141277	4.62

TABLE 14

Area under principal crops—District-wise 1980-81 (Pepper)

District	No. of standards ('000)	Area in acres	Percentage sampling error
(1)	(2)	(3)	(4)
Trivandrum	3003	5362	13.03
Quilon	5506	9832	8.45
Alleppey	2712	4843	2.70
Kottayam	7160	12786	29.44
Idukki	6868	12264	..
Ernakulam	3725	6652	10.14
Trichur	2246	4010	27.92
Palghat	858	1532	9.27
Malappuram	2257	4030	30.30
Kozhikode	11303	20184	14.18
Cannanore	14884	26578	10.41
State	60522	108073	4.69

TABLE 15

Area under plantation crops—District-wise 1980-81 (Area in Hectares)

26

District	Rubber		Tea	Coffee	Cardamom
(1)	(2)		(3)	(4)	(5)
Trivandrum	8735		1072	48	104
Quilon	38890		2004	378	149
Alleppey	4273		..	63	..
Kottayam	63322		2268	902	22
Idukki	17449		24156	5134	45170
Ernakulam	23334		30	172	..
Trichur	9386		441	33	..
Palghat	11084		665	2264	3366
Malappuram	19281		174	10	184
Kozhikode	18171		3899	30204	3783
Cannanore	23934		1455	18741	1286
State	237769		36164	57949	54044

TABLE 16

Area under annual crops—District-wise 1980-81 (Area in Hectares)

District	Banana	Plantain	Sugarcane	Rainapple	Betel leaves
(1)	(2)	(3)	(4)	(5)	(6)
Trivandrum	942	5591	21	327	150
Quilon	1687	3221	328	718	184
Alleppey	770	3567	2408	318	66
Kottayam	1161	3398	272	595	71
Idukki	205	3023	2560	345	6
Ernakulam	1312	3245	80	586	94
Trichur	1549	3259	4	434	75
Palghat	1385	2357	2324	150	4
Malappuram	2598	1929	6	239	416
Kozhikode	1204	2293	3	435	56
Cannanore	1505	3056	35	1272	31
State	14318	34944	8041	5419	1153

TABLE 17

Area under seasonal crops—District-wise 1980-81 (Area in Hectares)

District	Pulses		Total	Jowar	Ragi	Other Cereals & Millets	Chillies	Ginger	Turmeric		
	Kharif pulses	Rabi Pulses									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)		
Trivandrum	83	3157	3240	..	19	32602	..	183	13		
Quilon	1119	1049	2168	..	7	50062	..	1278	74		
Alleppey	90	944	1034	..	8	82474	..	276	35		
Kottayam	308	1808	2116	..	4	31952	..	3418	601		
Idukki	199	1709	1908	25	375	9911	..	958	189		
Ernakulam	825	690	1515	5	4	102699	..	2162	789		
Trichur	2447	866	3313	11	34	110462	..	168	169		
Palghat	3699	7031	10730	1839	968	188503	181	410	375		
Malappuram	834	1334	2168	..	8	80075	83	451	108		
Kozhikode	340	1025	1365	..	28	45482	75	2132	348		
Cannanore	50	4252	4302	..	16	73589	826	1226	569		
State	9994	23865	33859	1880	1471	307811	1167	12662	3270		
								2761			

TABLE 18
Area under other seasonal crops 1980-81 (Area in hectares)

District	Sweet potatoes	Tubers	Lemon-grass	Vegetables	Sesamum	Groundnut	Cotton	Tobacco	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Trivandrum	100	2348	53	573	15	7	..	..	29
Quilon	40	6448	45	329	2186	..	..	..
Alleppey	60	5380	8	908	5300	..	..	..
Kottayam	26	3694	58	879	43	..	..	..
Idukki	171	1740	1020	1079	210	..	..	..
Ernakulam	66	3048	483	2199	2482	..	..	..
Trichur	140	2474	36	1153	1446	..	..	..
Palghat	1794	2175	103	2336	1003	9309	6223	..	
Malappuram	1464	2435	109	1524	1587	3	..	..
Kozhikode	89	3105	913	384	70	..	..	..
Cannanore	1104	1342	3070	1995	410	80	..	551	
State	5054	34189	5898	13359	14752	9399	6223	551	

TABLE 18

Area of other perennial crops district-wise 1980-81 (Area in Hectares)

District	Jack	Mango	Tamarind	Papaya	Drumstick	Palmyra	Clove	Nutmeg
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Trivandrum	7425	7588	1531	783	3422	698	98	76
Quilon	6758	6201	769	573	1335	56	71	166
Alleppey	4279	4999	236	893	1078	29	15	167
Kottayam	4385	4568	448	1034	1785	476	298	510
Idukki	2154	2094	152	749	321	276	31	191
Ernakulam	4811	5369	806	1754	1155	369	87	1334
Trichur	3784	4973	1468	1618	837	940	9	352
Palghat	4431	5365	3084	523	706	8020	3	59
Malappuram	5623	6211	1180	1495	885	1415	23	125
Kozhikode	9435	7198	693	1144	3164	431	1	3
Cannanore	8833	8008	650	1043	714	239	7	525
State	61918	62574	11017	11609	15402	12949	643	3508

TABLE 19

Area under other Perennial Crops district-wise 1980-81 (Area in hectares)

District	Cinnamon	Cocoa	Other fruit crops	Oil seed trees	Fodder grass	Green-Manure Crops	Other Non-foodcrops
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trivandrum	14	699	1227	247	335	265	2120
Quilon	32	1099	650	90	301	849	1505
Alleppey	16	3094	856	111	188	214	932
Kottayam	89	6995	957	155	577	325	2113
Idukki	38	1890	1191	74	522	226	2161
Ernakulam	63	3988	787	160	89	248	3286
Trichur	63	1330	1040	171	90	480	1679
Palghat	218	368	2370	590	30	1383	10297
Malappuram	..	422	802	35	31	3527	4078
Kozhikode	149	2103	1620	122	178	1383	4384
Cannanore	300	1468	2120	62	245	1421	14826
State	1042	23506	13620	1817	2586	10321	47381

TABLE 20

Net Area Irrigated — Source-wise 1980-81

District	Government Canal	Private Canal	Government Tanks & Wells	Private Tanks & Wells	Minor & Lift irri- gation	Other Sources	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trivandrum	6544	15	804	586	2122	1294	11365
Quilon	176	250	134	562	497	758	2377
Alepppey	2667	4	213	13825	3890	4493	25092
Kottayam	113	20	553	995	387	1157	3225
Idukki	63	84	206	114	108	1102	1677
Ernakulam	18039	137	1240	8080	14292	5747	47535
Trichur	20752	504	989	5960	4620	5888	38713
Palghat	45622	315	353	7925	1407	3290	58962
Malappuram	835	881	167	7498	4012	7937	21330
Kozhikode	4392	151	137	782	1733	1419	8614
Cananore	144	2938	252	4595	634	10521	19084
State	99397	5299	5048	50922	33702	43606	237974

TABLE 21

Gross area under irrigation—Crop-wise 1980-81

District	Paddy	Vegetables	Tubers	Coco-nut & Areca-nut	Gloves, nutmeg & cinnamon	Other condiments & spices	Banana	Betal leaves	Sugar cane	Others	Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Trivandrum	9290	405	43	9152	3	18	1	180	136	3	1222	12283
Quilon	871	191	6	62	3	11	..	28	78	..	1470	2720
Alleppey	11935	127	200	13159	53	90	94	289	..	169	1605	27721
Kottayam	1328	258	..	14	..	234	..	103	24	..	1654	3615
Idukki	2472	..	..	52	3	29	1	5	..	..	18	2580
Ernakulam	70100	6	..	7046	696	437	32	664	11	1	2780	81773
Trichur	48409	330	77	29717	6242	106	609	660	45	5	1374	87575
Palghat	91461	273	..	1972	774	5	166	582	4	659	1540	97436
Malappuram	16899	955	921	1203	1821	..	813	380	..	1240	24142	
Kozhikode	7219	157	35	45	58	3	1	753	23	..	1040	8334
Cannanore	16969	1177	15	5829	5209	..	93	900	..	17	1538	31747
State	276863	3879	1297	60091	14863	933	997	4977	701	854	15481	380926

TABLE 22(a)

**Irrigated and unirrigated area under high yielding and other varieties
Autumn paddy 1980-81 (in Hectares)**

District	High yielding			Other varieties			Total		
	Irrigated	Unirrigated	Total	Irrigated	Unirrigated	Total	Irrigated	Unirrigated	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Trivandrum	178	1516	1694	3643	10024	13667	3821	11540	
Quilon	76	12280	12356	114	11672	11786	190	23952	
Alleppey	..	16062	16062	..	16957	16957	..	33019	
Kottayam	6	11552	11558	1	1926	1927	7	13478	
Idukki	47	2533	2580	28	1254	1282	75	34	3787
Ernakulam	7059	6060	13119	15356	14699	30055	22415	20759	
Trichur	636	6665	7301	1733	31550	33283	2369	38215	
Palghat	16007	46178	62185	1050	26527	27577	17057	72705	
Malappuram	120	1945	2065	490	36048	36538	610	37993	
Kozhikode	3	170	1773	2	8051	8053	5	3821	
Cannanore	..	5543	5543	9	31873	31882	9	37416	
State	24132	112104	13236	22426	190581	213007	46538	302685	

TABLE 22 (B)
Irrigated and Unirrigated area under high yielding and other varieties—winter paddy 1980-81 (in hectares)

District (1)	High yieldings			Other varieties			Total	
	Irrigated (2)	Unirrigated (3)	Total (4)	Irrigated (5)	Unirrigated (6)	Total (7)	Irrigated (8)	Unirrigated (9)
Trivandrum	100	689	789	4745	10581	15326	4845	11270
Quilon	6	1157	1163	675	23252	23927	681	24409
Alleppey	1661	3346	5007	295	20070	20365	1956	23416
Kottayam	1244	8555	9799	77	923	100	1321	9478
Idukki	625	1264	1889	1765	1446	3211	2390	2710
Ernakulam	3132	949	4081	25497	10141	35638	28629	11090
Trichur	2712	5067	7779	22776	18613	41389	25488	23680
Palghat	50882	5253	56115	19337	14098	33335	70199	19351
Malappuram	385	1111	1496	10558	23958	34516	10943	25069
Kozhikode	35	2137	2172	608	25681	26289	643	27818
Cannanore	1529	572	2101	9692	16953	26645	11221	17525
State	62291	30100	92391	96025	165716	261741	158316	195816

TABLE 22 (c)

Irrigated and unirrigated area under high yielding and other varieties summer paddy 1980-81 (in hectares)

District	High yielding			Other varieties			Total		
	Irrigated	Unirrigated	Total	Irrigated	Unirrigated	Total	Irrigated	Unirrigated	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Trivandrum	408	51	459	216	432	648	624	483	36
Quilon	..	94	94	..	729	729	..	823	
Alleppey	9882	10792	20674	97	3304	3401	9979	14096	
Kottayam	..	4565	4565	..	3099	3099	..	7664	
Idukki	..	86	86	7	206	213	7	292	
Ernakulam	4888	159	5047	14168	392	14560	19056	551	
Trichur	9901	5	9906	10651	5	10656	20552	10	
Palghat	2584	103	2687	1621	14	1635	4205	117	
Malappuram	1802	43	1845	3454	108	3562	5256	151	
Kozhikode	4149	209	4358	2422	384	2806	6571	593	
Cannanore	1067	310	1377	4672	1245	5917	5739	1555	
State	34681	16417	51098	37308	9918	47226	71989	26335	

TABLE 23
Production of Important Crops 1975-76 to 1980-81

Crop	Production in tonnes ('000s)						Percentage of increase or decrease to previous year				
	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1976-77	1977-78	1978-79	1979-80	1980-81
Rice Autumn	5523	4877	5518	5448	5677	5537	-11.70	13.40	-1.27	4.20	-2.47
Winter	5980	5877	5592	5300	5265	5485	-1.72	-4.85	-5.22	-1.04	4.18
Summer	1809	1786	1836	1986	2055	1697	-1.27	2.80	8.17	3.47	-17.42
Total	13312	12540	12946	12734	12997	12720	-5.80	3.24	-1.64	2.07	-2.13
Coconut (million nuts)	3439	3348	3053	3211	3032	3008	-2.63	-8.81	5.18	-5.57	-0.79
Arecanut (million nuts)	11387	11303	10548	10919	10829	10805	-0.74	-6.08	3.52	-0.82	-0.22
Cashew	1224	873	847	842	828	819	-29.82	-2.89	-0.59	-1.06	-1.09
Pepper	246	245	201	263	289	205	-0.41	-17.96	30.85	9.89	-1.38
Tapioca	53902	51253	41886	40440	40889	40609	-4.91	-18.28	-3.45	1.11	-0.68
Rubber	1288	1393	1359	1237	1366	1403	8.15	-2.44	-8.95	10.43	2.71
Banana & Plantain	2510	2157	2720	3229	3059	3174	-14.06	26.10	18.71	-5.26	3.76
Cardamom	..	14	29	29	33	32	..	107.14	..	13.7	-3.03

TABLE 24

District-wise production of important crops (in tonnes)

District	Rice						Jowar	Ragi	Other cereals & Millets	Pulses
	Autumn	Winter	Summer	Total	(5)	(6)				
(1)	(2)	(3)	(4)							
Trivandrum	22685	22352	949	45986	..	..	16	..	..	774
Quilon	39743	41863	583	82189	..	..	6	..	..	1724
Alleppey	56167	36741	51950	144258	144258	..	7	..	..	843
Kottayam	23301	19324	15853	58478	..	..	3	..	..	1515
Idukki	5848	9353	302	15503	11	..	323	160	..	1549
Ernakulam	59764	57161	27676	144601	2	3	122	122	1085	38
Trichur	49477	62382	35712	147571	..	5	38	66	..	2365
Palghat	190593	176176	7013	373782	827	..	678	1320	..	6620
Malappuram	48128	50547	8813	107488	..	..	7	29	..	1609
Kozhikode	8372	35549	10223	54144	..	..	26	2	..	1039
Cannanore	49670	37052	10640	97362	..	..	24	69	3356	..
State	553748	548500	169714	1271962	845	1131	1768	22479	..	..

TABLE 24 (Contd.)

District	Sugarcane (gur)	Black pepper	Dry Chillies	Dry Ginger	Cat's Turmeric	Processed cinnamon	Betel Nuts (Nos. in million)	Banana	Other plantation	Jack (No. in thousand)
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Trivandrum	104	2027	..	447	25	6	327	10795	30024	24540
Quilon	1443	3441	..	3474	139	9	541	16999	11947	25092
Alleppey	12498	1007	..	680	68	0	366	9346	10794	17895
Kottayam	1504	1777	..	9608	1133	1	370	17631	17897	17084
Idukki	15693	1852	..	2289	335	2665	..	462	2253	15916
Ernakulam	495	1264	..	5474	1462	..	1098	15017	12617	23261
Trichur	17	690	2	182	264	..	1483	24536	8773	14742
Falghat	16245	170	161	439	602	198	354	18855	4745	19071
Malappuram	38	1108	73	810	163	11	1544	35580	6188	27761
Kozhikode	19	7529	60	5341	802	261	1817	13882	7834	43118
Cannanore	122	7654	768	3295	1148	93	2443	11789	13987	42169
State	48178	28519	1064	32039	6141	3244	10805	176683	140722	261764

TABLE 24 (Concl'd.)

District	Mango	Raw cassiau nuts	Tapioca	Sweet potato	Ground nut	Sesamum	Coconut (million chales of 170 Kg.)	Cotton	Tobacco	Tea	Coffee	Rubber
(1)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)
Trivandrum	24509	3025	965789	603	6	4	354	..	..	894	28	5933
Quilon	27328	6982	989875	241	..	547	344	..	..	875	220	25561
Alleppey	9998	2013	272917	362	..	954	294	..	..	..	23	2771
Kottayam	25567	727	408993	157	..	9	188	..	..	367	525	36145
Idukki	3252	863	234881	1069	..	48	43	..	..	37460	2895	11140
Ernakulam	33164	2103	240267	398	..	769	327	..	..	..	..	..
Trichur	21354	1934	92555	845	..	405	347	..	..	1002	20	6739
Palghat	15022	3920	177648	11302	8145	301	80	9847	..	1219	656	4516
Malappuram	53856	6887	228742	9951	3	540	264	..	..	92	3	10571
Kozhikode	25164	2925	99277	567	..	22	456	..	..	6953	11768	10730
Cannanore	42659	50516	349967	7472	71	234	311	..	1015	1854	7302	12298
State	281873	81900	4066911	32967	8225	3833	3008	9847	1015	50716	23540	140333

TABLE 25

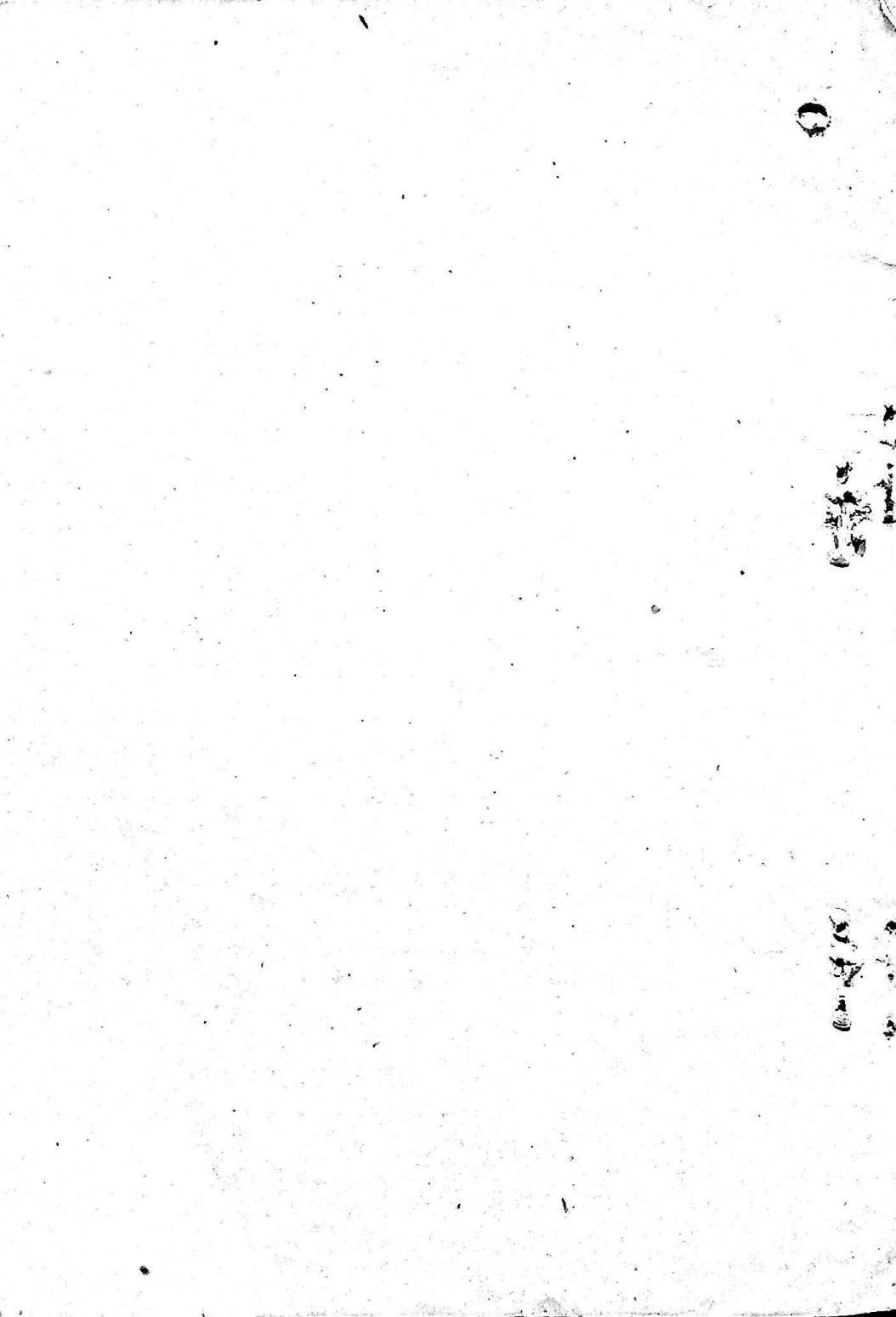
Statement showing the mean yield of crops obtained through crop cutting experiments
1980-81

(in Kg./Hectare)

District	Autumn	Winter	Summer	Tapioca	Coconut	Arecanut	Cashew	Pepper	Cocoa	Cardamom	Lemongrass	Paithaya
----------	--------	--------	--------	---------	---------	----------	--------	--------	-------	----------	------------	----------

Paddy					*	*						
Trivandrum	2248	2111	1305	17080	4800	99354	480	378	84	59	69	19130
Quilon	2506	2539	1078	16750	4205	127251	805	350	68	59	69	9139
Alleppey	2589	2204	3284	13930	4656	127673	521	208	136	..	69	4285
Kottayam	2630	2724	3148	17780	3675	146412	544	139	168	59	69	4340
Idukki	2304	2791	1536	21700	2577	184680	725	151	129	59	69	2049
Ernakulam	2107	2190	2148	19280	5365	178497	517	190	131	..	117	3995
Trichur	1855	1931	2694	14950	6424	223608	270	172	100	..	117	3813
Palghat	3232	2994	2470	14050	3480	150332	295	111	42	59	117	8861
Malappuram	1893	2136	2481	12630	4416	175455	324	275	77	59	31	5723
Kozhikode	1297	1901	2172	12800	4822	268313	561	373	102	69	16	5134
Cannanore	2020	1962	2220	18650	4252	161750	733	288	56	74	31	3552
State	2413	2357	2627	16576	4618	176431	579	263	128	60	45	5803

* Coconut & Arecanut in numbers.



1498

©
Government of Kerala
1984

PRINTED BY THE S.G.P. AT THE GOVERNMENT PRESS,
TRIVANDRUM, 1984.