



GOVERNMENT OF KERALA

**REPORT ON THE TIMELY REPORTING  
SURVEY OF AGRICULTURAL  
STATISTICS IN KERALA  
1976—'77**

Issued by  
**THE BUREAU OF ECONOMICS  
AND STATISTICS**

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## PREFACE

This is the Second Report relating to E.A.R.C.S. and correspond to the 2nd round of the Survey in the State with reference period 1976-77. The first report had as its reference period the agriculture year 1975-76.

The E.A.R.C.S. introduced in the non reporting State (which is a variant of the T.R.S. carried on in the reporting States of India) was first launched in the State during 1975-76. The Sample design is a uni stage random sample design with Revenue Village as the unit of selection, Taluk is taken as the stratum.

The land use particulars, area under seasonal and perennial crops, data on irrigation, etc. were collected from 10% of the villages in 1975-76. This was increased to 15% in the year under report. Crop estimation surveys. were also conducted on the following crops.

1. Paddy (a) Autumn (b) Winter and (c) Summer
2. Tapioca
3. Coconut
4. Arecanut
5. Cashew.
6. Pepper

The estimates obtained from the Survey for 1976-77 are presented in the report. An additional table giving crop-wise irrigated area has also been added. It is hoped that the present publication will be of use to all those interested in the agriculture development of the State. Any suggestion for the improvement of the technical content will be appreciated.

In this context I will be failing to my duty if my thanks to Sri Ranu Saran, Economic and Statistical Adviser and Sri R. Raghunathan, Dy. Economic Adviser, Ministry of Agriculture and Irrigation, Government of India are not placed on record. During his term of office till he left for taking up assignment elsewhere Dr. Ram Saran showed an abiding interest in the programme of the State. Sri Raghunathan, Dy. Economic Adviser, Government of India has always been associated with the programme at every stage. But for his constant attention and guidance, the Scheme would not have been the success it is.

Trivandrum,  
8-9-1978.

Dr. P. A. NAIR,  
DIRECTOR,  
BUREAU OF ECONOMICS AND  
STATISTICS.

**REPORT ON THE TIMELY REPORTING SURVEY  
OF AGRICULTURAL STATISTICS IN KERALA 1976-77**

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# REPORT ON THE TIMELY REPORTING SURVEY OF AGRICULTURAL STATISTICS IN KERALA 1976-77

## 1. Introduction:

A new scheme for collection of agricultural statistics was implemented in Kerala during 1975-76. The scheme envisages complete enumeration of all plots in the state in the course of six years. The details on land use, area under crops and irrigation particulars are collected.

The scheme is a variant of the Timely Reporting Survey introduced in the reporting States of India. In the reporting states, the data collected in a selected sample of villages are checked and estimates of the various characteristics are estimated.

In the non reporting States of Kerala, West Bengal and Orissa the scheme for 'establishment of an agency for reporting crop Statistics' was introduced. Under the scheme, 10% of the villages were covered during 1975-76 in Kerala. During 1976-77, 200 villages which constitute 15% of the villages were covered.

The data collected during 1975-76 were analysed and the report was published.

This report is the second in the series and presents the results of the survey conducted during 1976-77.

## 2. Design of the Survey:

Stratified unistage sampling design is adopted for the survey. Taluk is the stratum and revenue village is the unit of sampling. During 1976-77, 15% villages in each stratum was selected and the total number of villages selected was 200. The total number of villages and villages selected during the year in each District are given below:

TABLE 1

District	Total number of villages	Number of villages selected
Trivandrum	94	14
Quilon	99	16
Alleppey	99	16

District	Total number of villages	Number of villages selected
Kottayam	74	12
Idukki	42	6
Ernakulam	100	16
Trichur	234	33
Palghat	152	23
Mulappuram	122	13
Kozhikode	123	18
Cannanore	188	28
State	1327	200

### 3. Scheme of work:

The selected villages were divided into as many approximately equal and non-overlapping units as the number of Investigators allotted to the villages. The number of Investigators were allotted to each village in proportion to the total area of the village and the work load.

The Investigators prepared a list of survey subdivision numbers as entered in the basic tax register. With the help of this list and litho-maps the Investigator visited the plots and collected the required details. The wet land plots were visited thrice in the year and dry land plots were visited once in an year. The three visits to the wet lands corresponded to each of the three seasons of the year. During each of the visits, particulars of seasonal crop of each season and annual crops were collected. During the last visit, details of land utilisation and perennial crops were also collected.

Crop Cutting experiments on the following crops were conducted in the villages at the rate indicated.

1. Paddy At the rate of two plots during each of the three seasons in taluks where there are more than 7 Investigators and at the rate of three in other taluks.
  2. Tapioca At the rate of two plots per Investigator unit in Taluks where crop cutting on the crop is planned.
  3. Coconut
  4. Arecanut
  5. Cashew
  6. Pepper
- } At the rate of one plot per investigator unit in taluks where crop cutting on the crop is planned.

The number of crop cutting experiments and number of Taluks in which the experiment was proposed is given below:

TABLE 2

Distribution of the No. of Taluks and No. of experiments proposed

District	No. of Taluks in which experiment was proposed							
	Autumn paddy	Winter paddy	Summer paddy	Tapioca	Coconut	Arecanut	Cashew	Pepper
Trivandrum	4	4	4	4	4	4	4	3
Quilon	6	6	5	6	6	6	6	5
Alleppey	7	7	6	4	7	5	5	3
Kottayam	5	5	4	5	5	5	2	4
Idukki	4	4	..	1	1	1	1	1
Ernakulam	7	7	6	6	7	5	4	5
Trichur	5	5	5	4	5	3	3	3
Palghat	5	5	5	5	5	2	2	2
Malappuram	4	4	3	4	4	4	4	3
Kozhikode	4	4	4	3	3	3	3	3
Cannanore	6	6	6	5	5	3	5	4
STATE	57	57	48	47	52	41	39	36

TABLE 2 (Contd.)

District	No. of Experiments proposed							
	Autumn paddy	Winter paddy	Summer paddy	Tapioca	Coconut	Arecanut	Cashew	Pepper
Trivandrum	80	80	80	80	40	40	40	30
Quilon	121	121	103	114	57	57	57	50
Alleppey	137	137	119	60	49	37	37	24
Kottayam	100	100	82	88	44	44	21	35
Idukki	64	64	..	18	9	9	9	9
Ernakulam	120	120	114	94	49	41	33	39
Trichur	113	113	113	104	55	43	43	43
Palghat	120	120	120	120	60	29	29	29
Malappuram	114	114	96	108	54	54	54	48
Kozhikode	106	106	106	82	41	41	41	41
Cannanore	174	174	174	156	78	47	78	63
STATE	1249	1249	1107	1024	536	442	442	411

#### 4. Organisation of the Survey:

The field work of the survey and analysis of data collected were done by the Bureau of Economics and Statistics. The details of staff engaged in the conduct of the Survey are the following:

##### a. HEADQUARTERS:

<i>Designation</i>	<i>Number</i>
Joint Director	1
Deputy Director	1
Assistant Director	3
Research Officer	3
Research Assistant	6
Compilers	21

##### b. FIELD:

Regional Officers	3
Research Assistant	3
Investigators	554

The Taluk Statistical Inspectors (57) supervised the work at Taluk level and the District Statistical Officers at the District level.

#### 5. Training:

The investigators and Statistical Inspectors in each District were given training for the conduct of the Survey for two days at the District Headquarters. Practical field training was also given to them.

#### 6. Period of Survey and reference period:

The reference period of the Survey was the agricultural year 1976-77. The field work was started during October 1976 and was completed by June 1977.

#### 7. Schedules and Instructions:

The schedules and instructions used for area enumeration was the same as in the previous year. The schedule used is appended.

Separate schedules were prescribed for entering details of crop cutting experiments of different crops.

#### 8. Estimation Procedure:

From the results of area enumeration, the following were estimated.

- (i) area under various land utilisations.
- (ii) area irrigated by different sources.
- (iii) area under each crop.

The procedure of estimation is given below:

(a) LAND UTILISATION AND IRRIGATION

$N$	—	Total number of villages in the stratum
$n$	—	No. of villages selected in the stratum
$A$	—	Total area of stratum
$a$	—	Area of selected villages
$a_j$	—	area of $j$ th selected village
$Y_{ij}$	—	area under the $i$ th utilisation
$Y_i$	—	Estimate of the value
$V(Y_i)$	—	Estimate of the variance of $(Y_i)$

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

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

$$V(Y_i) = \frac{N(N-n)}{n(n-1)} \sum_{j=1}^n (Y_{ij} - R_{iaj})^2$$

$$\text{Where } R_i = \frac{\sum_{j=1}^n Y_{ij}}{\sum_{j=1}^n a_j}$$

(b) AREA UNDER CROPS :

The area under crops is estimated separately for wet lands and dry lands. The total of these estimates give the total area under the crop.

$N$	—	Total villages in a stratum
$n$	—	No. of villages selected in the stratum
$W$	—	Wet land area of stratum
$D$	—	Dry land area of stratum
$w_j$	—	wet land area of $j$ th village
$d_j$	—	Dry land area of $j$ th village
$y_{ij}$	—	Area under the $i$ th crop in the wet land
$x_{ij}$	—	Area under the $i$ th crop in the dry land.
$Y_i$	—	Estimate of $i$ th crop in wet land
$X_i$	—	Estimate of $i$ th crop in dry land
$Z_i$	—	$Y_i + X_i$ — Total area under $i$ th crop

$$Y_i = \frac{\sum_{j=1}^n Y_{ij}}{n} \times W$$

$$X_i = \frac{\sum_{j=1}^n Y_{ij}}{n} \times D$$

$$V(Z_i) = \frac{V(Y_i)}{N(N-n)} + \frac{V(X_i)}{n(n-1)} \left\{ \sum_{j=1}^n (Y_{ij} - R_{i1}W_j)^2 + \sum_{j=1}^n (x_{ij} - R_{i2}d_j)^2 \right\}$$

$$\text{Where } R_{i1} = \frac{\sum_{j=1}^n y_{ij}}{\sum_{j=1}^n w_j} \text{ and}$$

$$R_{i2} = \frac{\sum_{j=1}^n x_{ij}}{\sum_{j=1}^n d_j}$$

(c) The yield rate of crops in a stratum is worked out as the average of the yield of all the experiments in the stratum.

## 9. Results of the survey:

(a) *Land utilisation*:—The District-wise estimates of area under various land utilisations for the year 1976-77 are given in Table I in the appendix. The percentage distribution of the classification for the two years 1975-76 and 1976-77 are given below in Table 3.

TABLE 3  
Land use classification, Kerala

Classification	1975-76		1976-77	
	Area ( <sup>'00</sup> ha.)	Percentage	Area ( <sup>'00</sup> ha.)	Percentage
	1	3	4	5
1 Total geographical area	38855	100.00	38855	100.00
2 Forest	10815	27.83	10815	27.83
3 Land put to non-agricultural uses	2592	6.67	2604	6.70
4 Barren and uncultivable	785	2.02	788	2.03
5 Permanent pastures and grazing land	199	0.51	161	0.42
6 Land under miscellaneous tree crops	842	2.17	727	1.87
7 Cultivable waste	1134	2.92	1157	2.98
8 Fallow other than current fallow	230	0.59	223	0.57
9 Current fallow	366	0.94	374	0.96
10 Net area sown	21892	56.35	22006	56.64

The land use classifications for both the years show more or less the same pattern. About 57% of the area is under cultivation, 28% is forest and 7% is used for non-agricultural purposes. The other important utilisations are cultivable waste (3%), barren and uncultivable and land under miscellaneous tree crops (2% each). Compared to the previous year there is an increase of 11400 hectares in net area sown.

(b) *Area irrigated*.—The estimates of area irrigated are given in Table II of the appendix. It is seen that the area irrigated is 221054 hectares. This is about 10% of the net area sown. The area irrigated was estimated as 228217 hectares for 1975-76. The source wise classification shows that the major source is Government canals which accounts for about 42% area. The next important source is Government minor irrigation schemes which accounts for 21% area. Private tanks and wells is another important source accounting for 19% area. Among the Districts, Palghat accounts for the greater share of irrigated area.

(c) *Area under crops*.—The area under the various crops has been estimated and District-wise estimates are presented in Table III (1) to (III) (10) of the appendix. In tables III (11), III (12) and III (13) the estimated area under paddy classified into H.Y.V, local, irrigated and unirrigated is given.

The total area under the important crops during 1975-76 and 1976-77 are given below in Table 4. It can be seen that more than 50% of the cropped area is under paddy and coconut. The eight crops listed below account for about 82% area.

TABLE 4

## Area under important crops

Crop	Area '00 hectares		Percentage to total cropped area		
	1975-76	1976-77	1975-76	1976-77	
	1	2	3	4	5
1 Paddy A.	375043	363822	12.58	12.26	
W.	396392	381678	13.30	12.87	
S.	104587	108874	3.50	3.67	
T.	876022	854374	29.39	28.80	
2 Coconut	692945	694985	23.24	23.43	
3 Arecanut	76618	68356	2.57	2.30	
4 Cashew	109157	113326	3.66	3.82	
5 Pepper	108250	108666	3.63	3.66	
6 Tapioca	326865	323278	10.96	10.90	
7 Rubber	205383	209723	6.89	7.07	
8 Banana and plantain	52280	51697	1.75	1.74	

The most important crops are paddy, coconut, tapioca and rubber in descending order of area.

(d) *Production of important crops.*—Crop cutting surveys were conducted for paddy, tapioca, coconut, arecanut, cashew and pepper during the year. The average yield obtained from these surveys were used to estimate the production of these crops. The details of the crop cutting surveys are given in the consolidated report on crop cutting surveys. The average yield obtained from crop cutting surveys is low compared to figures used during the previous year for pepper, cashew and coconut. In the case of crops for which crop cutting was not conducted, conventional yield rates based on forecast reports were used to estimate production. The production of important crops District-wise is given in Table IV in the appendix.

The total production of 8 important crops for 1975-76 and 1976-77 is given below in table 5.

TABLE 5

## Production of important crops

Crops	Production in '00 tonnes		
	1975-76	1976-77	
1	2	3	
1 Paddy	Autumn	5523	4877
	Winter	5980	5877
	Summer	1809	1786
	Total	13312	12540
2 Coconut (million nuts)	3439	3348	
3 Tapioca	53902	51255	
4 Rubber	1288	1393	
5 Pepper	246	245	
6 Arecanut (million nuts)	11387	11303	
7 Plantain & Banana	3950	3906	
8 Cashew	1224	873	

In the case of all the above crops except rubber, a decline is noticed in production. In the case of paddy and tapioca the decrease in area accounts partially for the reduction in production. For coconut, arecanut, cashew and pepper the yield rate estimates obtained from crop cutting surveys are found to be lower than the yield rates hitherto used.



TABLE II (a)

## Source wise Irrigated Area 1976-77

(Area hectares)

District	Minor & lift irrigation sources							Total
	2	3	4	5	6	7	8	
	Government canal	Private canal	Government tanks & wells	Private tanks and wells	Govt. scheme	Other		
Trivandrum	6544	51	1702	771	1152	482	10702	
Quilon	..	64	2434	1215	2225	4483	10421	
Alleppey	540	..	429	17908	3275	721	22873	
Kottayam	..	..	681	570	4127	4994	10372	
Idikki	..	..	464	19	276	3667	4426	
Ernakulam	18667	55	1775	5105	12820	2610	41032	
Trichur	20380	61	1498	4198	5024	3889	35050	
Palghat	43628	506	287	2374	3651	2218	52664	
Malappuram	..	..	219	6050	5687	3439	15395	
Kozhikode	2366	26	82	784	1071	960	5289	
Cannanore	..	..	367	2430	7188	2845	12830	
State	92125	763	9938	41424	46496	30308	221054	

TABLE II (b)  
Area under Irrigation—Cropwise  
(Area in hectares)

Districts	1	2	3	4	5	6	7	8	9	10	11	12	13
		Paddy	Vegetables	Tubers	Coconut	Areca nut	Clove, Nut-meg & Cinnamon	Other condiments and spices	Banana	Betel leaves	Sugarcane	Others	Total
Trivandrum	17774	239	19	1078	3	1	10	157	153	..	836	20270	
Quilon	12102	152	426	230	1	19	33	72	194	2	3609	16840	
Alleppey	14474	172	272	2200	8	2	40	15	43	40	482	17748	
Kottayam	11075	453	4	51	..	515	17	156	42	5	628	12946	
Idikki	8917	..	..	11	1	100	..	..	..	..	9	9038	
Ernakulam	78861	304	86	3372	437	156	87	37	2	..	761	84103	
Trichur	50485	297	66	12151	2585	20	262	297	24	..	412	66599	
Palghat	89219	372	38	599	95	4	3	20	74	..	815	91239	
Malappuram	18132	905	98	3258	3963	..	22	690	493	..	1916	29477	
Kozhikode	3401	295	18	185	..	..	4	367	26	..	101	4397	
Cannanore	16648	1567	15	10	4	..	6	387	6	..	1542	20185	
State	321088	4756	1042	23145	7097	817	484	2198	983	121	11111	372842	

TABLE III (1)  
Area Under Principal Crops 1976-77—Paddy

District	Area under the crop (hectare)				Total	Percentage sampling error			
	Autumn	Winter	Summer	Total		Autumn	Winter	Summer	Total
1	2	3	4	5	6	7	8		
Trivandrum	16584	17926	3466	37976	4.40	3.60	22.80		
Quilon	23190	25074	1393	49657	3.90	2.90	23.60		
Alleppey	26173	38809	23609	88591	16.70	10.50	12.60		
Kottayam	16366	16204	16677	49247	18.30	11.40	16.20		
Idikki	8147	7087	490	15724	2.10	3.50	1.20		
Ernakulam	41227	41885	16214	99327	5.10	6.10	20.50		
Trichur	42301	54634	21130	118065	11.20	6.60	16.30		
Palghat	88047	78208	4167	171022	3.40	4.20	16.70		
Malappuram	44192	49383	7005	91580	3.10	6.40	13.10		
Kozhikode	12974	31310	7442	51726	8.20	5.10	10.10		
Cannanore	44621	29557	7281	81459	3.80	10.90	16.00		
Total	363822	381678	108874	854374	2.30	2.20	6.00		

TABLE III (2)  
Area Under Principal Crops 1976-77—Tapioca

District	Area under the crop (hectares)					Percentage sampling error				
	Autumn		Winter		Total	Autumn		Winter		Total
	2	3	4	5	6	7	8	9		
1 Trivandrum	23063	20466	23104	66633	12.94	9.46	8.26	8.36		
2 Quilon	27618	40055	18143	85816	19.45	12.08	4.79	4.97		
3 Alleppey	4289	16378	8010	28677	43.64	28.30	6.97	22.43		
4 Kottayam	5707	24765	9790	40262	26.28	14.46	1.96	10.36		
5 Idikki	3807	5214	738	9759	15.25	78.01	35.86	44.74		
6 Ernakulam	3907	8467	1960	14334	17.10	17.14	7.47	9.23		
7 Trichur	2301	4968	1956	9225	36.51	29.02	40.89	30.15		
8 Palghat	4002	3075	877	7954	23.20	12.83	41.76	13.25		
9 Malappuram	8104	6822	14412	29338	19.09	6.50	..	5.95		
10 Kozhikode	1662	2123	4789	8574	21.84	17.40	8.05	9.01		
11 Cannanore	1998	15085	5623	22706	32.49	20.28	..	15.16		
State	86458	147418	89402	323278	10.96	16.08	6.63	9.45		

TABLE III (3)  
Area. Under Principal Crops 1976-77—Coconut

District	No. of trees ('000)			Total	Area (Hectare)	Percentage sampling error			Total
	Bearing	Young	3			Bearing	Young	7	
1	2	3	4	5	6	7	8	8	
Trivandrum	10547	7462	18009	79335	8.56	7.43	7.94	7.94	
Quilon	12976	6932	19908	93465	3.81	5.39	4.25	4.25	
Alleppey	10345	4903	15248	64338	14.94	3.85	4.23	4.23	
Kottayam	8890	3378	12268	56535	6.34	9.91	7.05	7.05	
Idikki	1650	904	2554	14594	29.69	26.18	20.70	20.70	
Ernakulam	7787	4363	12150	53524	6.07	4.65	5.06	5.06	
Trichur	7955	3902	11857	50030	7.21	7.00	6.62	6.62	
Palghat	2250	2093	4343	18325	4.39	5.01	4.20	4.20	
Malappuram	9227	6607	15834	67379	9.66	15.78	11.13	11.13	
Kozhikode	17158	7490	24648	104885	6.70	14.11	7.44	7.44	
Cannanore	14543	8323	22866	92575	13.07	8.09	10.75	10.75	
State	103328	56357	159685	694985	2.76	3.28	2.63	2.63	

TABLE III (4)  
Area Under Principal Crops 1976-77 - Arecanut

District	No. of trees ('000)			Area (hectare)	Percentage sampling error							
	Bearing	Young	Total		Bearing	Young	Total					
								2	3	4	5	6
1												
Trivandrum	6499	2160	8659	4056	9.91	4.35	8.29					
Quilon	9837	5159	14996	6866	7.26	3.22	7.11					
Alleppey	4404	2381	6785	3156	11.26	10.57	9.91					
Kottayam	5635	1595	7230	3285	10.92	6.88	9.22					
Idikki	1741	977	2718	1236	34.60	18.05	21.12					
Ernakulam	9937	4234	14171	6444	8.88	7.47	7.38					
Trichur	15218	6041	21259	9668	10.56	9.41	9.65					
Palghat	2405	1718	4123	1936	15.29	7.61	11.05					
Malappuram	16974	6327	23301	10934	17.15	17.63	17.10					
Kozhikode	12633	3956	16589	7781	8.44	8.66	7.96					
Cannanore	17113	6523	23636	12994	10.59	6.34	8.11					
State	102396	41071	143467	68356	4.15	3.66	3.79					

TABLE III (5)  
Area Under Principal Crops 1976-77—Cashew

District	No. of trees ('000)	Area (hectare)	Percentage Sampling error
1	2	3	4
Trivandrum	1668	5560	19.11
Quilon	2680	8933	25.19
Alleppey	860	2867	19.60
Kottayam	324	1080	12.35
Idikki	241	803	65.52
Ernakulam	1002	3340	18.27
Trichur	1711	5703	16.83
Palghat	3436	11453	14.41
Malappuram	7268	24227	11.77
Kozhikode	1332	4440	23.46
Cannanore	13476	44920	8.82
State	33998	113326	5.27

TABLE III (6)  
Area Under Principal Crops 1976-77—Pepper

District	No. of standards ('000)	Area (hectare)	Percentage sampling error
1	2	3	4
Trivandrum	3153	5630	14.12
Quilon	6550	11696	19.93
Alleppey	2832	5057	34.45
Kottayam	8122	14504	13.72
Idi*ki	4608	8229	30.24
Ernakulam	4125	7366	7.83
Trichur	1336	2386	35.43
Palghat	801	1430	47.10
Malappuram	2983	5327	9.64
Kozhikode	9328	16657	7.25
Cannanore	17015	30384	11.06
State	60853	108666	5.34

TABLE III (7)  
Area Under Plantation Crops 1976-77- (Area in Hect.)

District	Rubber	Tea	Coffee	Cardamom
1	2	3	4	5
Trivandrum	7907	1070	15	164
Quilon	33500	2021	78	149
Alleppey	3847	..	6	..
Kottayam	55291	2333	1305	..
Idukki	15614	24663	3546	43075
Ernakulam	20558	30	280	..
Trichur	8924	438	24	7
Palghat	8970	662	1965	3455
Malappuram	17569	174	..	182
Kozhikode	16984	3885	24339	3384
Cannanore	20559	1485	8944	1265
State	209723	36161	40502	51621

TABLE III (8)  
Area Under Annual Crops 1976-77—(Area in Hect.)

District	Banana	Plantain	Sugarcane	Pine-apple	Betel leaves
1	2	3	4	5	6
Trivandrum	710	4283	30	541	191
Quilon	1553	4963	1315	962	399
Alleppey	827	3236	1785	456	118
Kottayam	1546	4258	174	432	224
Idukki	106	2131	2505	380	15
Ernakulam	1149	3159	62	847	109
Trichur	1175	4296	15	975	64
Palghat	585	2806	1255	264	55
Malappuram	1162	3414	15	406	510
Kozhikode	738	3201	6	1228	33
Cannanore	1611	4488	10	1664	36
State	11162	40535	7172	8245	1754

TABLE III (9)

## Area under Other Seasonal Crops 1976-77

(Area in hectares)

District	Pulses including Tur										
	Autumn			Winter			Summer		Total		
	1	2	3	4	5	6	7	8	9	10	11
Trivandrum	211	216	2836	3263	..	19	..	..	..	37	17
Quilon	1211	2148	137	3496	..	14	..	..	..	491	93
Alleppey	137	413	264	814	..	44	..	..	..	187	26
Kottayam	80	123	1547	1750	..	..	..	..	..	3207	631
Idukki	25	555	1726	2306	5	79	10	..	..	918	125
Ernakulam	1019	185	546	1750	7	..	157	..	..	1665	541
Trichur	163	30	3198	3391	3	11	100	..	..	38	45
Palghat	6829	2670	310	9809	1978	2212	3150	267	267	210	244
Malappuram	726	301	1392	2419	..	29	77	331	331	765	49
Kozhikode	684	130	1040	1854	..	12	..	495	495	1692	339
Cannanore	7	2758	2912	5677	..	36	246	1796	1796	1137	245
State	11092	9529	15908	36529	1993	2456	3740	2889	2889	10347	2355

TABLE III (9)

## Area under Other Seasonal Crops 1976-77 (Contd.)

(Area in hectares)

District	Sweet potato	Tubers	Lemongrass	Vegetable	Sesamum	Groundnut	Cotton	Tobacco
1	2	3	4	5	6	7	8	9
Trivandrum	188	1887	..	381	29	..	..	..
Quilon	101	6292	5	538	3055	..	..	..
Alleppey	53	4817	..	1183	6448	..	..	..
Kottayam	179	4425	42	1013	230	..	..	..
Idukki	205	1040	907	915	406	..	..	..
Ernakulam	164	3700	938	1714	1840	..	..	..
Trichur	111	2090	9	717	1555	..	..	..
Palghat	452	2635	..	1289	928	16622	7249	..
Malappuram	881	1630	18	1131	1156	..	..	..
Kozhikode	229	1614	267	361	21	..	..	..
Cannanore	3400	1678	146	1792	302	..	..	539
State	5963	31808	2332	11034	15970	16622	7249	339

TABLE III (10)

## Area under Other Perennial Crops

(Area in Hectares)

District	(Area in Hectares)										
	1	2	3	4	5	6	7	8	9	10	11
	Palmyrah	Mango	Jack	Tamarind	fruit crops	Other oil seed trees	Fodder grass	Green manure crops	Other condiments & spices	Other non-food crops	
Trivandrum	873	8229	6448	2001	2259	760	88	241	88	..	..
Quilon	100	7828	6587	1390	2319	186	116	675	284	..	..
Alleppey	15	4348	2505	288	1457	316	65	87	102	..	..
Kottayam	506	6094	4584	520	1727	389	286	298	707	..	..
Idukki	242	1636	1400	85	2855	42	325	136	177	..	..
Ernakulam	365	5472	3769	671	1350	224	20	384	1278	..	..
Trichur	938	4572	2098	1010	2809	88	10	112	230	..	..
Palghat	5053	6689	2972	1831	4434	650	..	2802	650	..	..
Malappuram	1803	6486	4371	1132	2182	28	..	2843	145	..	..
Kozhikode	838	8083	8632	623	3102	20	..	1913	244	..	..
Cannanore	189	7561	7286	351	4346	19	75	2079	1663	..	..
State	10922	67098	50652	9902	28840	2722	985	11570	5568	..	..

TABLE III (11)

## Irrigated and unirrigated area under High Yielding and other varieties—Autumn 1975—77

(Hectares)

District	Total								
	High yielding			Other varieties			Total		
	Irrigated	Unirrigated	Total	Irrigated	Unirrigated	Total	Irrigated	Unirrigated	Total
1	2	3	4	5	6	7	8	9	
Trivandrum	700	1420	2120	6317	8147	14464	7017	9367	
Quilon	959	1267	2226	4432	16532	20964	5391	17799	
Alleppey	120	15591	15711	18	10444	10462	123	26735	
Kottayam	104	11298	11402	103	4861	4964	207	16159	
Idukki	2492	2085	4577	1934	1636	3570	4426	3721	
Ernakulam	15454	5999	21453	12045	7729	19774	27499	13728	
Trichur	1851	9821	11672	1325	29303	30629	3177	39121	
Palghat	15795	17715	33510	18277	36260	54537	34072	53975	
Malappuram	2313	5407	7720	2899	33573	36472	5212	36980	
Kozhikode	22	1203	1225	11	11738	11749	53	12941	
Cannanore	66	4082	4148	453	40020	40473	519	44102	
State	39876	75883	115764	47815	200243	248058	87691	276131	

TABLE III (12)

## Irrigated and unirrigated area under High Yielding and other varieties

(Hectares)

Winter Paddy 1976-77

District	High yielding				Other varieties				Total		
	Irrigated	Unirrigated	Total	4	Irrigated	Unirrigated	Total	7	Irrigated	Unirrigated	Total
Trivandrum	997	1297	2294	7981	7651	15632	8978	8948			
Quilon	217	562	779	5548	18747	24295	5765	19309			
Alleppey	1337	22639	23976	109	14724	14833	1446	37363			
Kottayam	4938	5175	10113	1311	4780	6091	6249	9955			
Idukki	606	153	759	3536	2792	6328	4142	2945			
Ernakulam	1835	130	1965	33669	6252	39921	35504	6382			
Trichur	8426	3110	11536	18531	24567	43098	26957	27677			
Palghat	9179	3671	12850	43008	22950	65958	52187	26621			
Malappuram	1279	3081	4360	4939	31084	36023	6218	34165			
Kozhikode	47	2658	2705	305	28300	28605	32	30958			
Cannanore	1667	1799	3466	9569	16522	26091	11236	18321			
State	30528	44275	74803	128506	178369	305875	159034	222614			

TABLE III (13)

**Irrigated and unirrigated area under High Yielding and other varieties**  
 Summer Paddy 1976-77 (Hectares)

District	Total								
	High yielding varieties			Other varieties			Total		
	Irrigated	Unirrigated	Total	Irrigated	Unirrigated	Total	Irrigated	Unirrigated	Total
1	2	3	4	5	6	7	8	9	
Trivandrum	1192	1130	2322	587	557	1144	1779	1687	
Quilon	188	42	230	758	405	1163	946	447	
Alleppey	11302	10251	21553	1538	468	2056	12890	10719	
Kottayam	3483	10965	14448	1136	1093	2229	4619	12058	
Idukki	280	24	304	69	117	186	349	141	
Ernakulam	6615	90	6705	9243	266	9509	15858	356	
Trichur	13712	22	13734	6639	757	7396	20351	779	
Palghat	1715	664	2379	1245	543	1788	2960	1207	
Malappuram	5554	132	5686	1148	171	1319	6702	303	
Kozhikode	2205	1812	4017	811	2614	3425	3016	4426	
Cannanore	882	1147	2029	4011	1241	5252	4893	2388	
State	47128	26279	73407	27235	8232	35467	74363	34511	

TABLE III (14)

## District-wise Area under Single, Double and Triple Crop of Paddy 1976-77

District	Area under Paddy (Hectares)			Total
	Single Crop	Double Crop	Triple Crop	
1	2	3	4	5
Trivandrum	2611	13619	2709	18939
Quilon	3503	22819	172	26494
Alleppey	28031	30225	20	58276
Kottayam	21529	13556	202	35287
Idukki	2294	6613	68	8975
Ernakulam	9695	22853	14642	47190
Trichur	17822	40802	6213	64837
Palghat	12072	72953	4348	89373
Malappuram	17765	31086	3881	52732
Kozhikode	19188	14277	1328	34793
Cannanore	22001	22565	4776	49342
State	156561	291368	38359	486288

TABLE IV

## District wise production of important crops

(in tonnes)

District	Rice					Jowar	Ragi	Other cereals & millets	Pulses
	Autumn	Winter	Summer	Total					
1	2	3	4	5	6	7	8	9	
Trivandrum	23304	26857	2875	53036	..	16	..	1613	
Quilon	22211	43294	1144	66649	..	12	..	1609	
Alleppey	38949	71894	51182	162025	..	38	..	354	
Kottayam	24762	24955	23421	78138	..	..	..	646	
Idukki	12311	10886	591	23788	2	68	6	1536	
Ernakulam	57607	57353	21753	137213	3	..	101	718	
Trichur	41096	73120	33956	148172	1	10	64	1096	
Palghat	151411	144084	5813	301308	886	1958	2022	3785	
Malappuram	44018	53227	12805	110050	..	26	49	872	
Kozhikode	8410	38001	8574	54985	..	11	..	603	
Cannanore	63568	49566	11505	118639	..	53	158	3438	
State	487647	587737	178619	1254003	892	2192	2400	16270	

TABLE IV (Contd.)

## District wise production of important crops

(in tonnes)

District	Sugarcane (gur)	Black pepper	Dry chillies	Dry Ginger	Cured tur- meric	Process- ed carda- mom	Betelnuts (million nuts)	Banana	Other plantain
	10	11	12	13	14	15	16	17	18
Trivandrum	148	1295	..	87	17	4	481	5173	32679
Quilon	6487	3661	..	1367	109	4	753	11315	37868
Alleppy	9098	657	..	439	26	..	311	6026	24691
Kottayam	963	2176	..	9686	528	..	289	11264	32489
Idukki	15376	732	..	2075	126	1184	113	772	16200
Ernakulam	252	1444	..	4119	533	..	994	8372	26392
Trichur	61	525	..	38	36	..	1883	8561	32778
Palghat	7907	296	235	338	179	95	333	4262	21410
Malappuram	95	1199	256	992	39	5	2293	8466	26049
Kozhikode	38	5463	397	3356	327	93	1677	5377	24424
Cannanore	35	7049	1633	2450	293	35	2176	11738	34243
State	40460	24497	2531	25447	2213	1420	11303	81326	309283

TABLE IV (Contd.)

## District wise production of important crops

(in tonnes)

District	Raw cashew nut	Tapioca	Sweet potato	Ground nut	Sesamum	Coconut (million nuts)	Cotton Bales of 170 Kg.	Tobacco	Tea	Coffee	Rubber		
												19	20
Trivandrum	2658	946189	846	..	14	402	..	..	804	3	5373		
Quilon	8272	1414248	455	..	693	391	..	..	851	16	26032		
Alleppey	2612	433596	239	..	1657	334	..	..	..	1	2468		
Kottayam	410	812487	806	..	83	228	..	..	664	259	35340		
Idukki	643	184933	923	..	138	50	..	..	34340	705	10842		
Ernakulam	3390	215010	738	..	633	2510	..	..	..	55	13443		
Trichur	2469	134224	500	..	788	342	..	..	913	5	7833		
Palghat	7261	130605	2034	17453	167	67	9876	..	1275	788	4453		
Malappuram	18631	344722	3965	..	193	345	..	..	133	..	10696		
Kozhikode	3672	96715	1031	..	6	575	..	..	1214	9651	11126		
Cannanore	37239	412795	15300	..	78	363	..	1047	1450	3547	11743		
State	87257	5125524	26837	17453	4450	3348	9806	1047	41644	15030	139349		

# BUREAU OF ECONOMICS AND STATISTICS KERALA

## Collection of Agricultural Statistics 1976-77

### INSTRUCTIONS FOR FIELD WORK

#### PART—A GENERAL

#### I. Introduction:

A new scheme (Timely Reporting Scheme) for collection of agricultural statistics was implemented in the State during 1975-76, with the aim of collecting reliable data on land use, irrigation particulars and area under crops. The scheme envisaged complete enumeration of all the plots in ten percent of the revenue villages in the State and the field work has been completed in the 134 selected villages. It has been decided to continue the scheme during 1976-77 by increasing the number of revenue villages to 200 out of the 1327 villages in the State. As in the previous year details of land utilisation and data on perennial crops will be collected only once in an year while information on area under seasonal crops will be collected separately for each season. In order to get complete coverage of all seasonal and short duration crops, the wet land plots are proposed to be visited three-times and the dry land plots two times during the year. Crop-cutting experiments on Paddy, Tapioca, Coconut, Arecanut, Cashew and Pepper will be conducted in all (or in a sub sample of) villages selected for area enumeration. The detailed procedure to be adopted for field work is given below. :

#### II. Workload and allotment of Investigators:

The number of villages selected for area enumeration is 200 which forms 15 percent of the total number of villages in the State. Experience has shown that in order to complete the area enumeration in time the full time services of 518 Investigators are required. In addition the services of 57 Investigators (at the rate of one per taluk) are necessary for conducting crop cutting experiments on the crops mentioned earlier. Thus the total number of Investigators, available to work under the scheme during 1976-77 will be 575. The posts of these 575 Investigators are distributed among the districts by taking into consideration.

- i. the number of villages selected in the district;
- ii. the area of wet land and dry land in the selected villages;
- iii. the natural region in which the village falls; and
- iv. the number of crop cutting experiments to be conducted in each selected village.

The details regarding the selected villages are given separately and the district-wise details are given below:

District-wise details of villages, investigators and crop cutting experiments.

Sl. No.	District	No. of villages			No. of plots to be selected for crop cutting experiments on								
		Total	Selected	No. of Investigators	Paddy			Tapioca	Coconut	Arecanut	Cashew	Pepper	
					A	W	S						
1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Trivandrum	94	14	40	80	80	80	80	40	40	40	30	
2	Quilon	99	16	57	121	121	103	114	57	57	57	50	
3	Alleppey	99	16	49	137	137	119	60	49	37	37	24	
4	Kottayam	74	12	44	100	100	82	83	44	44	21	35	
5	Idikki	42	6	27	64	64	..	18	9	9	9	9	
6	Ernakulam	100	16	49	120	120	114	94	49	41	33	39	
7	Trichur	234	33	55	113	113	113	104	55	43	43	43	
8	Palghat	152	23	60	120	120	120	120	60	29	29	29	
9	Malappuram	122	18	54	114	114	96	108	54	54	54	48	
10	Kozhikode	123	18	53	106	106	106	82	41	41	41	41	
11	Cannanore	188	28	87	174	174	174	156	78	47	78	63	
State		1327	200	575	1249	1249	1107	1024	536	442	442	411	

Further adjustments regarding the number of Investigators in each village will be done, if necessary, by the District statistical officers at the district level under intimation to the Directorate and the concerned Regional officers (TRS).

### III Preliminary work :

(a) *Allocation of Area.*—In the case of villages with more than one investigator the total area of the village will be divided into as many approximately equal and non-overlapping units as the number of investigators. The area enumeration as well as the conduct of crop-cutting experiments will be done by the investigators to whom the unit is allotted. An investigator-unit will therefore be the area allotted to an investigator. The allocation of villages into different investigator units should be done by the statistical Inspector himself by visiting the village office and by assessing the work load in each portion for both area enumeration and yield estimation surveys. A statement showing the details of allocation of work in each village should be

sent to the concerned District Statistical Officers immediately after the allocation is over. The District Statistical Officer will send the consolidated statement in respect of his district to the Directorate and the concerned regional officers (TRS) before the end of August, 1976.

(b) *Preparation of the list of plots.*—The investigator will prepare a list of survey sub-division numbers (plots) as entered in the basic tax register in the village (or its portion) allotted to him. With the help of the list of plots and litho maps the investigator will visit the plots and collect the required details.

(c) *Selection of plots for crop cutting experiments.*—Immediately after the preparation of the list of plots in the unit allotted to him, the investigator under the guidance of the Statistical Inspector, should select the required number of plots for conducting crop cutting experiments on the various crops mentioned earlier. The number of plots to be selected for crop cutting experiments on the different crops is as follows :

1. Paddy : At the rate of two plots (during each of the three seasons) per Investigator unit in those taluks where there are more than seven investigator units and at the rate of three plots per investigator unit in the case of other taluks.

*Note.*—If there are no wet land plots having paddy during any season in any Investigator unit in a village, then the number of crop cutting experiments on paddy to be conducted from that unit should be conducted from the other investigator-units in the same selected village so that the total number of experiments planned for the village is conducted. This procedure is to be adopted only in the case of paddy as taluk-wise estimates of average yield are to be estimated.

2. Tapioca : At the rate of two plots per investigator unit in all taluks where crop cutting experiment on tapioca are to be conducted. (see appendix III).

3. Coconut } At the rate of one plot per investigator unit in the  
4. Arecanut } taluks where crop cutting experiments on the crop is to  
5. Cashew } be conducted (see appendix III)  
6. Pepper }

If a survey sub-division number, as in the basic tax register selected for crop cutting experiment is found on observation, to be further sub divided and is in the possession of more than one owner cultivator, then one holding from among the holdings in the selected plot may be selected by simple random sampling method and crop cutting experiments should be conducted in the selected holdings.

The following points should be borne in mind when the selection of plots for crop cutting experiments is made.

In the case of paddy plots for crop cutting experiments should be selected independently for each of the three seasons viz. Autumn, Winter and Summer from among the wet land survey sub division in the Unit.

2. In the case of other crops the required number of plots for each crop should be selected from among the dry land sub divisions in the unit.

3. Plots selected for crop cutting experiments on coconut, arecanut, cashew and pepper should have at least five bearing trees or standards as the case may be.

4. The selection of plots for crop cutting experiments is to be made simple random sampling method.

5. If any of the plot selected for crop cutting experiments does not satisfy the required condition (viz. not having cultivation of the crop in the case of paddy and tapioca or not having the required number of bearing trees or standards in the case of other crops) another plot should be selected afresh from the frame, using the next random number in order.

6. Random columns to be used:—The random columns for selection of plots, trees, etc. for conducting crop cutting experiments should be used as given below for each Investigator unit.

- |                            |                        |
|----------------------------|------------------------|
| 1. Autumn paddy — col. (1) | 5. Coconut — col. (5)  |
| 2. Winter paddy — col. (2) | 6. Arecanut — col. (6) |
| 3. Summer paddy — col. (3) | 7. Cashew — col. (7)   |
| 4. Tapioca — col. (4)      | 8. Pepper — col. (8)   |

7. The selection of plots should be done by the investigator under the guidance of the statistical inspector. A list of plots selected for crop cutting experiments on the various crops should be prepared and kept in the Taluk Statistical Offices. The entire responsibility in the selection of the plots for crop cutting experiments will be vested with the statistical investigator.

8. The selection of plots for crop cutting experiments on all crops except winter paddy and summer paddy should be completed before the 15th of August 1976. The selection of plots for crop cutting experiments on paddy during winter and Summer seasons should be completed at least one month before the commencement of harvest in the respective seasons.

#### IV. Programme of field work

##### (a) AREA ENUMERATION

*Wet lands:*—The agricultural year 1976-77 (July 1976 to June 1977) is divided into three seasons of four months each. The different seasons are

- (i) Autumn : July 1976 to October 1976
- (ii) Winter : November 1976 to February, 1977
- (iii) Summer : March 1977 to June 1977

The wet land plots will be visited once during each of the three seasons and the details of seasonal and annual crops cultivated during each season will be collected and recorded in the prescribed forms. The details of land utilisation particulars and data on perennial crops cultivated in wet land will be collected only during the last visit, the visits of wet lands each season should be conducted as per time schedule given below :

Season	Completion of field work	Due date of receipt of the village abstract report at the Headquarters
Autumn	August 1976	30-9-1976
Winter	November 1976	5-2-1977
Summer	March 1977	15-5-1977

## (II) DRY LANDS

As per the programme of work the dry land plots in the unit are to be visited twice during the year—the first for collecting the details of seasonal crops cultivated during Autumn season and second for collecting the details of land utilisation, perennial crops and seasonal crops not covered during the first visit. But since the field work could not be started from 1st July 1976 as programmed, it would be possible to visit the dry land plot only once, during this year. The visit of dry land plots should be started immediately after completion of the first visit of wet land plots. During this visit of dry lands data on land utilisation, irrigation particulars, perennial crops and details of seasonal crops cultivated during each season should be collected and recorded in the prescribed forms.

The crop abstract report in respect of the dry land area covered till the end of January 1977 should be forwarded to the head office before 5-2-1977 in the prescribed forms.

*Note* :—Wet lands converted to dry lands will be considered as dry lands for area enumeration. Similarly dry lands converted to wet lands should be considered as wet lands and should be visited thrice.

### (b) YIELD ESTIMATION

#### (I) PADDY

Crop cutting experiments on paddy will be conducted in the plots selected for this purpose during each of the three seasons viz. Autumn, Winter and Summer. Immediately after the final selection of the plot, the investigators will visit the plot, collect the required preliminary details and ascertain from the owner/cultivator the probable date of harvest in the selected plot. He should also collect by enquiry and observation the anticipated yield of the crop in the selected plot at the appropriate time and send the details to the headquarters in the pre-harvest schedule.

On the day fixed for harvest, the investigator should visit the plot and conduct the crop cutting experiments as per the procedure given below. The details of harvest in the plot should be entered in the prescribed form and should be sent to the headquarters by the Statistical Inspector immediately after completion of the harvest in all the plots selected for crop cutting experiments in the selected villages in the taluk.

The pre-harvest schedules relating to all the selected plots in the taluk should be sent as per the following time schedule:

Autumn	—	15th August 1976
Winter	—	15th December 1976
Summer	—	15th March 1977

### **Procedure for conducting crop cutting experiment on paddy.**

#### **1. CONSTRUCTION OF CROP CUTTING FRAME.**

Construct the crop cutting frame with pegs and strings supplied. Four pegs are needed for the frame for fixing at each corner of the square with side 5 metres. Tie the string to the pegs such that distance between two adjacent pegs is 5 metres. At the second peg measure 150 cm. along the string tied to the first peg and mark the point. Similarly from the 2nd peg measure 200 cm. along the string tied to the third peg and mark the point. Tie a string 250 cm. connecting the above two points. Similar arrangements may be made in the opposite corner also. This completes the frame.

#### **2. IDENTIFICATION OF PLOTS**

The first step in the field work is the identification of the plots selected with the help of the survey map and the address of the owner taken from the basic tax register or other records and by local enquiry. Note the boundaries of the survey numbers or subdivision as the case may be after correct identification. Meet the cultivator and fix up the suitable dates of harvest and collect the pre-harvest details.

#### **3. SELECTION OF KANDOM.**

If the selected survey or sub division number has more than one kandom (sub plot) all the kandoms growing the crop have to be serially numbered beginning from the south-west corner and proceeding anti-clock wise. One kandom may be selected by simple random sampling method.

#### **4. LOCATION AND MARKING OF AN EXPERIMENTAL CUT.**

(a) *Fixing the starting point of the kandom:*—In each selected kandom, a square cut of size 5 metres is to be located at random. After fixing the starting point as described below and measure the length and breadth in uniform steps.

(i). Rectangular shape: If the kandom is approximately rectangular in shape, stand at the south-west corner of the kandom facing north with the kandom in front and to the right side. This corner of the kandom (south west corner) is the starting point.

(ii) Irregular shape: If the kandom is not rectangular, enclose it in the least rectangle whose larger side is parallel to the larger side of the kandom meeting at the south-west corner. Stand facing north keeping the rectangle in front and to the right side. This corner (south west corner) of the rectangle should be considered as the starting point of the kandom.

(b) *Procedure to locate 5 metre square.*— The length and breadth of the rectangle should be measured from the starting point of the kandom. Make a rough sketch of the kandom and the rectangle enclosing it on a piece of paper. This sketch will enable to locate the starting point of the experimental cut, and to judge whether the experimental cut will actually be accommodated within the selected kandom.

Beginning from the south west corner (starting point) of the kandom measure in uniform steps the side X towards the right (east) and Y perpendicular to the side towards left (north). Deduct seven steps from both x and y and obtain the respective remainders.

If  $x-7$  is a two digit number, then from the random number column allotted choose a two digit random number equal to or less than  $x-7$ . Let the random number be 'a'. Similarly choose a random number less than or equal to  $y-7$  and let this be 'b'. Then 'a' and 'b' can be used for locating the south-west corner of the experimental cut.

Number '0' occurring while selecting a one digit random number for  $x-7$  or  $y-7$  need not be rejected. Similarly if  $x-7$  or  $y-7$  is a two digit number the occurrence of '00' while selecting a random number less than or equal to  $x-7$  or  $y-7$  need not be rejected. It may be taken as '0'. It may also be noted that if  $x-7$  or  $y-7$  is 10, then a two digit number has to be taken and if it is 100 then a three digit number has to be taken.

Let the random numbers for the x axis and y axis be 36 and 23. Measure 36 steps from the starting point (south-west corner) towards east and then 23 steps in the vertical direction inside the field. This point will fix the starting point (south west corner) of the experimental cut.

The marking of plots should be done only on the harvesting day. Fix a peg at the south west corner of the experimental cut already determined. Take the peg already tied to it at a distance of 5 metres and fix it so that the string is parallel to the side towards east. Fix the third peg already tied to the 2nd peg at a distance of 5 metres at right angle to the first string observing the right angle with the help of the 250 cm. string connecting the two strings at points 150 cm. in one direction and 200 cm. in the other direction. Observe again by the same method the right angles at the third peg and fix the fourth peg already tied at a distance of 5 metres from the first and third pegs. Observe whether the angle at the fourth peg is a right angle. Check by measuring the diagonal of the experimental cut which should be 7.07 metres.

See that all the 4 pegs are vertical and firmly fixed to the ground, and that the string is stretched tightly on all the four sides. Lower the string to the level of the ground, separating the bunches of the plants which lie on the boundary of the cut thus marked. Include a bunch within the cut, if half or more than half of its base falls inside the cut and reject the bunch if otherwise.

If the cut does not fall, entirely within the kandom owing to irregular shape of the kandom, reject the random number and mark the cut once again by taking the next random number. If however, the located cut falls wholly within the kandom take the position as fixed, notwithstanding whether the crop inside it is poor or good. If the crop in the selected cut is completely destroyed or damaged, then another cut need not be selected. The yield of that cut should be recorded as zero in the final schedules giving specific reasons for the same.

#### 5. HARVESTING, THRESHING, etc

Harvesting is to be done on the date already fixed unless the crop is not fully ripe. Harvest the plants which are within the boundary of the 5 metre square located. If a bunch lies on the boundary and if half or more than half of it lies inside the plot, harvest the whole of it, otherwise exclude it

The produce should be threshed, winnowed and cleaned properly. Particular care should be taken to see that the grain is fully separated from the earheads and is free from dust. Care should also be taken to see that there is no loss at any stage viz. harvesting, threshing, winnowing, cleaning and weighing. Weight of the grain may be recorded in kg. correct to two decimal places.

6. At the time of harvest samples weighing 250 gms. of wet paddy are to be collected from three cuts during each season in a taluk for conducting dridge experiments. The first sample is to be collected towards the beginning, the second towards the middle and the third towards the end of the harvesting season in a taluk. The Statistical Inspector may fix the village, investigator unit and the survey number of the plot from which the samples are to be collected by ascertaining the probable dates of harvest well in advance and instruct the concerned investigator to collect the samples from the respective plots. The samples collected should be sent to the Statistical Inspector within 24 hours for conducting dridge experiments. The statistical Inspector should weigh each sample received immediately on receipt, and again on alternate days after drying till two consecutive weights are the same. The details relating to dridge experiments should be sent to the headquarters along with the final schedules.

#### 7. PROGRESS REPORT:

The monthly progress reports relating to the District should be sent to the headquarters and the concerned Regional Office (TRC) not later than 10 days after each month.

## 8. HARVEST STAGE INSPECTION:

All the Inspecting Officers at the district level should conduct harvest stage inspection at the rate of one experiment in each taluk. The Statistical Inspectors should conduct harvest stage inspections in at least one randomly selected plot in each Investigator unit during each season subject to a maximum of six experiments in a taluk. These six expts. will include the experiments to be inspected at harvest stage under the parallel supervision scheme. Instructions regarding parallel supervision on yield estimation survey will be sent separately.

## 9. SPECIAL REPORT OF THE DISTRICT STATISTICAL OFFICER:—

Within one week after the harvest during each season, the District Statistical Officers may forward a detailed report to the headquarters on the basis of personal enquiry describing the salient features of the crop with special mention of percentage of the crop damage (both area and production) due to drought, pest and other diseases, flood etc. in each taluk separately.

## II. Tapioca:

The procedure for conducting crop cutting experiment on tapioca in the plots selected for the purpose is detailed below:

From the list of dry land survey subdivision numbers allotted to each Investigator five (5) dry land survey subdivision numbers should be selected by simple random sampling method and the Investigator should visit these plots in the order of selection, for getting 2 plots where crop cutting experiments on tapioca can be conducted during 1976-77. It is essential that in each selected plot, there should be a minimum area of 2x2 metres under tapioca in one patch. If any plot does not satisfy this condition it may be rejected and a fresh plot selected. If a selected plot contains more than one patch under tapioca satisfying the above requirements, then one patch should be selected by simple random sampling method for conducting the experiment.

If the required number of cuts are not obtained from among the five plots selected, either due to the non-availability of the crop or due to the unsuitability of conducting crop cutting experiments, another set of five dry land subdivisions may be selected as before to get the required number of experiments. If necessary, this process is to be repeated until two plots suitable for conducting the experiment are obtained or all the dry land plots in the unit are exhausted.

In the selected plot/patch a square out of 2x2 metres will be selected at random for conducting the experiment.

Location of cut in the selected plot/patch: Starting from south west corner of the patch/plot, measure the side x towards the right (east) and the side y perpendicular to x towards the left (north) of the patch (plot) in steps. Let the measurements be 25 and 18 respectively.

From the two digit random number table, select two random numbers less than or equal to 25 and 18 respectively. Let the chosen numbers be 05 and 10. Locate the random point (5, 10) which determines the location of cut to be taken. With this random point as the south-west corner, a square cut of side 2- metres will be located. If the square cut falls wholly or partly outside the selected plot (patch), it may be rejected and a fresh selection made.

Recording of weight of Tapioca: All tapioca plants inside the square cut will be harvested. The produce will be cleaned by removing the soil sticking to the tubers and then weighed correct to the nearest half kgs. The corresponding entries will be made in the prescribed forms.

Progress report: The monthly progress reports relating to the survey should be forwarded regularly to this office in the prescribed pro forma so as to reach here not later than 10 days after the month.

Despatch of schedules: The filled-in-schedules should reach the headquarters within a week after the survey is completed in each taluk.

III. Coconut:—From each plot selected for crop cutting experiments five bearing coconut trees should be randomly selected for recording the yield during each harvest. For this purpose the bearing coconut trees in the selected plots should be serially numbered starting from the south west corner and proceeding anti clockwise direction. Five trees among the bearing trees should be selected by sample random sampling method. These five trees will be those selected for recording the harvest details and these five should be given some permanent identification mark (preferably the order of selection) for easy identification during future visits. The following example will make the method clear.

*Example.*—Let the total number of bearing coconut trees in a plot selected for crop cutting experiments be 28. From the random column allotted take five two digit random numbers less than or equal to 28. Let them be 27, 02, 09, 15 and 19 in order. Then the tree with serial number 27 will have order of selection 1, that with serial number 2 will have order of selection 2 and so on.

After the selection of trees the Investigator should collect the details of all cuts harvested from the selected trees in each harvest during the agricultural year 1976-77 and record the details in the prescribed form. The Investigator should invariably be present in the plot on each harvest date to record the details of each harvest without any omission.

IV. Areca nut, cashew and pepper: The procedure for selection of trees (or standards in the case of pepper) is the same as that of coconut. The details of the harvest of each crop should be entered in the form prescribed.

The filled-in-schedules recording the details of harvest should be kept ready at the taluk statistical office for inspection of superior officers and sent to the headquarters soon after all the harvest in the selected trees (or standards) during the year are completed.

V. Supervision:—The field work of the Investigators will be supervised by the Statistical Inspectors at the taluk level. They should inspect the work of each Investigator under them at least once during each season, in addition to the inspection work under the parallel supervision scheme. The work of area enumeration as well as the yield estimation will be inspected by the N. S. S. O. of the Government of India. The details of procedure to be adopted under the system of parallel supervision will be sent separately.

## PART—B—FORMS FOR FIELD WORK

### I. Area enumeration.

There will be six forms for collection and compilation of data on area enumeration. They are discussed below:—

#### 1. Form A—Basic details of the selected villages

The details given in this form are to be collected from the village office records and by local enquiry in the village. These details should be collected by the Statistical Inspector himself and the form completed by the end of the survey.

Items 1 to 3 : Self explanatory

Item 4 (a) : Natural Region: The natural region (low land, mid land and high land) to which the village is classified in the census or village records should be clearly noted.

Item 4 (b) : Soil Type:— The predominant type of soil found in the village should be noted here. The important soil types found in the State are the following:

1. Sandy Soil:—Found as a strip in the coastal areas which varies from sandy loam to pure sand in texture.
2. Alluvial soil:—Found on river banks mainly in parts of Devicolam, Vaikom, Alwaye, Kunnathunad and Chowghat taluks.
3. Laterite Soil:—Found in nearly one third of the area in the State and is predominant in the mid land region.
4. Forest Soil:—Found mainly in the hilly regions in Trivandrum, Quilon, and Kottayam Districts.
5. Peaty Soil or Kari Soil:—Mainly found in Kuttanad region and the surrounding areas of Vembanad Lake.
6. Black Soil:—Confined to Palghat District. Cotton is the main crop grown in these areas.
7. Red Soil:—Found mainly in Trivandrum and Neyyattinkara Taluks.

*Item 5 and 6.*—To be collected from the Basic Tax and other Registers kept in the village offices. All the items are self explanatory.

*Item 7.*—The month (s) in which the major portion of the sowing/planting and harvesting operations of important seasonal crops grown in the village, were carried out during the agricultural year 1976-77 should be recorded in this block. The name of the crop, its code number (given in Appendix II) and the month(s) in which the operations were carried out will be noted. The months may be given in code numbers given below:

January	01	May	05	September	09
February	02	June	06	October	10
March	03	July	07	November	11
April	04	August	08	December	12

The Form A should be prepared in duplicate by the end of May 1977. One copy should be attached as a facing sheet to Form II Register and one copy should be sent to the headquarters by the end of June, 1977.

## 2. Form I—Field Diary of the Investigator

This is the basic record to be used for collection of data on area enumeration. The details required in all the remaining forms will have to be copied from this record. This will be supplied as registers containing 400 forms and should invariably be carried (by the Investigator during field work. The following points should be strictly adhered to in filling up this form.

- (a) The entries should be made in ink.
- (b) The entries should be clear and legible as the register is to be kept as a permanent record.
- (c) All Inspecting Officers should make it a point to verify the entries made in this form, along with their regular inspections.
- (d) The names of taluk, village, Investigator unit and the Investigator should be entered on the first page of the register.
- (e) When an Investigator is transferred or retrenched from service the Statistical Inspector should see that the field diary is obtained from the Investigator before his relief. The period during which each Investigator made entries in the diary should be noted on the 1st page of the register.
- (f) One form is to be used for one plot (or a group of plots). Experience has shown that in the Travancore—Cochin area where the village lithomaps are available, identification is easier for a subdivision as shown in the map than for a sub division in the Basic Tax Register. In such cases the survey number (or the

subdivision number) as in the lithomap may be considered as a unit for area enumeration, provided the entire areas of the survey (or subdivision) number as in the lithomap is classified either as wet or as dry (note that dry land includes purampoke and tarisu) as per the basic tax register. In other cases the subdivision number as in the basic tax register should be considered as the unit of observation.

*Exceptions 1.*—In the case of minor circuit survey numbers the unit of observation is considered as the entire land in possession of one cultivator and in such cases one form should be used for one cultivator.

2. In the case of plots selected for crop cutting experiments the survey subdivision number as entered in the basic tax register should be identified clearly and area enumeration conducted in that area.

The various items in the form are discussed below:

1. *Survey number.*—The survey (or the subdivision) number(s) of the unit as identified by the Investigator should be entered here. It may be a survey subdivision number as in the lithomap or as in the basic tax register. In the case of M. C. numbers the major survey number and the serial number of the cultivator should be entered here. In the case of amalgamated plots all the survey numbers comprising the unit should be entered.

*Item 2. Area (Cents):* The area of the unit entered against item 1 should be noted correct to the nearest cent. The area as per the basic tax register should be entered here. At the time of identification if it is found that there is change in the area due to sea erosion or adverse possession the actual change in the area should also be noted in brackets with a (+) or (−) sign. For example: The survey sub No. 364/4 owned and possessed by 'A' has an area of 185 cents as per the basic tax register. At the time of identification it is found that the actual area of the plot is only 160 cents and the remaining area of 25 cents is amalgamated with the plot bearing survey sub number 364/5. The survey sub No. 364/5 is owned and possessed by 'B' and its area according to basic tax register is 210 cents. The entry relating to survey sub No. 364/4 against item 2 will be 185 (−25), 185 cents being the area as per basic tax register and (−25 cents) being the area not actually included in the plot at present which has to be subtracted. Similarly in the entry relating to survey sub No. 364/5 against item 2 will be 210 (+ 25) 210 cents the area as per the basic tax register and (+ 25 cents) the area excess of the recorded area which is to be added.

*Item 3. (Type of land):*—The classification of the survey number (W for wet and D for other than wet) as in the records should be entered against (R) and the type of land at the time of observation should be noted against (O). In the case of partial conversions, the entry against 'O' will be W + D or D − W, the first letter denoting the type as in records and the second relating to the type of land partially converted.

*Item 4—Date of Visit.*—The date, and month in which the plot was visited during each visit should be noted.

*Item 5—Area Converted.*—The area of the converted land should be noted both in the case of partial or complete conversions. Please note that if the type of land is the same against 'R' and 'O' in item 3 then there will not be any entry against this item.

### Block A.—Area under seasonal crops

This block is for recording the area under seasonal crops cultivated in the plot during each season. During each visit the Investigator will record the details of crops harvested, or will be harvested during the season under the corresponding columns. The name of the crop and the area under crop split into irrigated and unirrigated should be entered in the respective columns. In the case of paddy the variety of seed, whether high yielding variety or local, should also be noted by the letter HY for High Yielding and L for Local along with the name. The names of high yielding varieties of paddy cultivated in the State are given below:

#### List of High Yielding Varieties of Paddy in Kerala

1. I.R. 8	6. Padma	11. Triveni
2. I.R. 5	7. Pankajam	12. Bharathi
3. I.R. 20	8. Annapoorna (Culture 28)	13. Taichung (TNI)
4. Tainan 3	9. Aswathi	14. Taichung
5. Jaya	10. Rohini	15. Sabari
		16. Jyothi

Paddy raised and harvested in punja lands in Kuttanad region and Kole lands in Trichur regions will be entered under 'Winter season' in Form I, if the crop is harvested during the period from November 1976 to February 1977. The area under paddy in such cases was treated as summer paddy till now. In order to identify these areas separately, the letter 'S' also may be entered along with the name of crop in Block 'A' of form I under winter season. These areas may be shown separately in Form III-A also under winter season in column '19'.

At the time of first visit, in August 1976 some of the standing crops in the field will be harvested during the Autumn season (July—October) while some others will be harvested only in winter season (November—February). The area under those crops harvested or will be harvested during July—October will be entered under 'Autumn' while those crops which will be harvested during November—February will be entered under 'Winter'.

During the subsequent visits the Investigators need enumerate the details of these seasonal crops which were not covered in the previous visit (s).

Since the interval between two visits in a plot is about three to four months it is possible that some of the short duration crops like pulses are missed by the Investigator at the time of his visit. Therefore, it is suggested that during each visit the details may be collected by observation as well as by enquiry wherever possible.

During the first visit the Investigator may come across the following situations in the case of seasonal crops.

1. There was crop in the field which was harvested during the season prior to his visit, but no crop at present. This may happen rarely in the case of Autumn paddy, Ragi first crop, sweet potato first crop, pulses first crop and tapioca.
2. There is standing crop which will be harvested during the season. All the crops mentioned under item 1.
3. There is standing crop which will be harvested only during the next season or the season subsequent to the next season. (Ginger, Turmeric Cotton and Tapioca)
4. There is no seasonal crop at the time of visit and no crop was harvested during the season.

The area under the first and second categories will be entered under the same season in which he visits the plot with the name of the crop.

The area under the third category will be entered under the corresponding season when it is harvested, with the name of the crop.

The area under the fourth category will be entered under the season of visit against 'No crop' indicating that there was no crop during the season.

#### **Recording area under 'No crop'**

The wet land plots in the selected villages are being visited three times during the year, to record the details of crops, grown and harvested during each season. If there is no crop in the plot or its portion, such areas are to be entered against 'No crop' in Block A of Form I during the respective season. It may some times happen that in a plot, the same patch (or different patches with approximately equal area) is left uncultivated during the different seasons. In order to identify the portions left as 'No crop' during each season, it is instructed to draw a rough sketch of the plot on the top of Form I itself and mark the portion left as fallow during each season at the time of each visit.

In the case of Tapioca, it is possible that the crops during a particular year will be harvested only during the next year and as such along with the

name of crop, the letters 'A' 'B' or 'C' may also be used to identify the period of sowing also. These letters indicate the following:—

- A. Sown during the previous year and harvested during this year.
- B. Sown and harvested during the same year.
- C. Sown during this year and harvested during next year.

During the subsequent visits, care should be taken (1) to record the seasonal crop which were raised and harvested during the previous season, if the same has been missed and (2) to avoid duplication of the entries regarding crops which will be harvested during the next season entered in the last visit.

During the second time the Investigator will be visiting the plots along with the details entered in the field diary, during the first visit. If the crops which will be harvested during the second season have already been noted in the diary, the corresponding entries are to be ticked (✓) to indicate that these details were noted during the previous visit. He will then record the details of other crops, if any cultivated in the plot after his first visit. The same procedure is to be followed during the third visit.

In the case of tapioca, since the harvest is spread over all the 12 months of the year, only the area under the plants which were or will be harvested during each season need be entered under the respective seasons. The standing crop which will not be harvested during the current agricultural year will be noted under the summer season with the letter C along with the name.

*Exceptions:*—In the case of tubers (like yam, colocasic, chenai etc. and other vegetables) the area under the standing crops should be entered during the first visit itself under 'Autumn season' irrespective of the season in which the same is harvested.

### **Recording area under vegetables etc.**

If vegetables and other tuber crops of short duration are cultivated and harvested during winter or summer season then the details of such crops need be entered under the respective seasons. Care should be taken to see that these details are not noted during earlier visits.

2. Ginger and turmeric usually harvested during November to January, will be standing crops during the Autumn season, and hence they should be entered during the first visit itself under 'Winter Season'.

### **B. Block B—Annual crops**

Sugarcane, Banana, Plantain, Pineapple and Betal leaves are treated as annual crops since the period extends to two or more seasons. For these five crops the area (or number as the case may be) under the standing crops at the time of the first visit will have to be entered under this block,

irrespectively of whether the same will be harvested during the season or not. This is to avoid duplication of entries in successive visits since these crops will be harvested only once in an year from the same plot.

Columns under sugarcane, banana and plantain may be divided into two each and give letter A for the first and letter C for the second. For sugarcane and banana, under, A area planted during the previous year and harvested or will be harvested during the current year will be recorded and the area planted during the current year and will be harvested during the next year will be noted under C.

In the case of plantain the number of plants harvested during the year will be entered under A and the number of young pits be entered under C.

*Note:*—For pineapple and banana the area under the plants corrected to the nearest cent should be noted. If there are only a few plants, the area under which is less than half a cent, then put 'zero' under the corresponding column indicating that there are a few plants the area under which is negligible.

For Banana and Pineapple only the area is to be given in the forms. In cases where there are only a few plants, the area under which is less than half a cent, then it has been instructed to put 'zero' '(0)' under the corresponding columns. Care should be taken to see that these plants for which the area has been entered as zero are not omitted. The following procedure should be adopted for this. The number of plants in such two or three plots should be pooled together till the area becomes at least one cent and entered against last plot in the group. The average stand per acre may be taken as 5,000 for pine apple and 800 for Banana. The following example will make this procedure clear.

*Example:*—Suppose the number of pineapples in five plots are as follows:—

Plots No.	No. of pineapple	Entry to be made (Cents)
1	10	0
2	30	1
3	14	0
4	20	1
5	70	1

The entry against plot No. 4 is the area corresponding to the total number of plants in plot numbers 1, 3 and 4.

**Block (c)—Irrigation**

Three columns are provided under this Block to give (1) the net area under irrigation in the field, (2) the source of irrigation and (3) the number of units in the case of tanks and wells. The net area of the plot irrigated will be entered under the column 'area irrigated' and the source of irrigation will be entered in the next column. The different sources of irrigation are:

1. Government Canals.
2. Private Canals.
3. Government tanks.
4. Private tanks
5. Government wells.
6. Private wells.
7. Other minor and lift irrigation.
8. Pumps from rivers and lakes.
9. By country wheels from rivers and lakes.
10. By other means from rivers and lakes.

In cases where the source of irrigation is tanks or wells (i.e. codes 3, 4, 5 and 6) the number of wells or tanks situated in the plot and used for irrigation purpose should also be noted in the columns provided. This information is for estimating the number of tanks and wells used for irrigation purposes.

**Block (d) and (e)**

Normally these two blocks need be filled-in only during the last visit to the plot.

Block D is for recording the number of perennial trees grown in the field. Only these crops which are given in appendix need be enumerated and the classification of the trees/standards to bearing and young is to be entered in the case of coconut, arecanut cashew and pepper. The names of these crops have been printed in Block D and 5 columns have been left blank. The blank columns are provided for entering the details of other perennial crops grown in the plot. In the case of other perennial crops included in the list (Appendix I) the name of the crop should be entered clearly in the blank columns provided and the number (or area as the case) is to be noted in the space provided for entering the details of other perennial crops. In the case of plantation crops viz. Tea, Coffee, Rubber and Cardamom only the area need be entered except in the case of stray coffee plants.

Block E is for recording the classification of area and will be filled in only during the last visit. It should be noted that the sum of the entries

in the 9 columns should be equal to the total area of survey number as found on observation entered against item 3 of the form. The concepts and definitions to be used are given in Appendix.

## FORM II—LAND UTILISATION AND IRRIGATION

This will be supplied in registers of 100 sheets each and should be completed and kept in the Statistical Offices. The totals of each-column in respect of village should be sent to the headquarters after completion of field work.

The details regarding each village will be entered in separate registers. If there are more than one Investigator units in a village, the details of each unit will be written separately in the same register. The entries of survey numbers in column '2' should be in the same order as followed in the basic tax register for each Investigator unit. As these registers are to be kept permanently, entries should be clear and legible.

The columns in the register have been explained earlier. The details required will be available from block C and E of Form I. One line is to be used for entering the details of one unit as entered in Form I. The entries are to be totalled for each page columns 3 to 24. Please note that the total of column '3' for each Investigator unit will be the total area allotted to the Investigator. This will be true in the case of village totals also. Further the sum of columns 4 to 12 should be equal to the total area in column 3 for an Investigator unit or a village as the case may be, since forest area included in the revenue records will be excluded from the purview of the survey.

The entry in column (3) in respect of each plot (or the unit of enumeration) should be the area of the plot (or unit) as in the records and not the area as per observation.

## FORM IIIA—AREA UNDER CROPS—WET LANDS

The details required in this form are to be copied from Blocks A and B of Form I. The details are to be entered separately for each season, immediately after the visits to the wet land plots during each season.

One line is to be used for each unit of observation as entered in Form I. The plots classified as wet lands in the basic tax register will be entered first, in the same order as they appear in the basic tax register in respect of each Investigator Unit. Separate sets of forms should be used for each Investigator unit and the sets relating to all the Investigator units in the selected villages should be tied together and kept as one bundle.

If any of the plot (or unit) classified as wet in the Basic Tax register is found on observation to be dry land, then only columns 1, 2, and 3 in form III A need be filled-in. In such cases the words 'converted to dry land-see Form III B' may be entered, preferably in the last three columns.

If a portion of the plot (or unit of observation) is found to be converted to dry on observation, the entire area of the plot (or unit) should be noted in column 3. The particulars of the unconverted portion should be noted in the respective columns under each season. The area converted as obtained from item 5 of Form I should be noted at the end of the line.

The particulars of the unconverted portion are to be recorded in columns 4 to 37 of the form against the corresponding line. The area converted to dry in the plot (or unit) should be noted as (... ..cent/s converted) after that and the details of crops grown in the converted portion should be entered in Form III B at the appropriate place. Please note that the area converted can be obtained from item 5 of the Form I.

After entering the details of all Survey Numbers classified as wet in the records, the details of dry lands converted to wet lands should be entered leaving four or five blank lines in the last page. Thus the complete set of Form III A for each revenue village will contain the details of all plots classified as wet in the records as well as the details of plots converted to dry, separately. Further, the village total of column 3 in Form III A will give separately the total wet land area of the village as per records and the total area converted to wet in the village.

The various columns in the schedule are discussed below:—

The form contains 39 columns numbered 1 to 39. Columns 1, 2, and 3 relate to the serial number, survey number and area as per records as entered in Form I.

**Column 4 to 13:—**These columns relate to the area under crops harvested during the autumn season. Information on crops harvested or will be harvested during each season is available in Block A of Form I. The details of Autumn season will have to be copied from this block and entered in the respective columns. In the case of paddy details are to be given separately for high yielding variety and local variety as well as for irrigated and unirrigated area. The headings of columns 9 to 13 are left blank. The names of seasonal crops cultivated in each village during the season together with its code number should be entered in these columns. One column should be used to record the details of area with 'No crop' during the season.

**Column 14-23.**—These columns relate to the crops grown and harvested during winter season as entered in Block A of Form I. The instructions for filling up these columns are the same as for columns 4 to 13 given above except in the change of season from Autumn to Winter. These columns can be filled in only after completing the second visit of wet land plots.

*Column 24—33.*—The details of crops harvested or will be harvested during summer season will be copied in those columns immediately after the third visit of wet lands.

*Column 34—37.*—The details of annual crops are to be copied under these columns. As the annual crops will be enumerated during the first visit these columns can be filled in immediately after the first visit.

*Column 38 and 39.*—It may some time happen that in wet land plots perennial crops like coconut, arecanut, palmyrah etc. are grown possibly on the bunds. Two columns are provided for entering the details of such crops grown in wet lands without any conversion. If, however, patches/ portions of wet land plot has been converted to dry lands, the details are to be entered separately in Form III B as stipulated earlier.

*Page Total.*—The total of each column (from 3 to 39) are to be entered at the bottom of each page in the line provided as soon as the entries in each column are completed. The extracts of these page total are to be forwarded to the Directorate as per time schedule mentioned earlier.

### FORM III B—AREA UNDER CROPS—DRY LAND

This form is intended to copy the details of crops grown in the dry land plots in the village. As in the case of Form III A, the details are to be copied from Form I field diary of the Investigator. The general instructions in respect of Form III A will be followed in the case of Form III B also. For the purpose of this form plots classified as purampoke and Tarisu will be treated as dry lands. The individual columns are discussed below:

*Column 1 to 3.*—The serial number, survey number and the area of the unit as per records entered in Form I are to be entered in these columns.

*Column 4 to 18.*—The number of perennial tree crop is to be entered under these columns. In the case of coconut, arecanut, cashew and pepper the number of trees/standards is to be given separately for bearing and young. The headings of seven columns are left blank to enter the details of these perennial crops grown in the village. Only those perennial crops given in the list of crops covered by the survey (see appendix) are to be considered.

*Column 19 to 21.*—Are for recording the details of plantation crops. The names of plantation crops with the code numbers are to be entered in the column headings left blank and the area under each plantation crop is to be noted under the respective columns.

*Column 22 to 24.*—These columns are for recording the details of annual crops.

*Column 26 to 39.*—These columns are for recording the details of crops grown during each season. The details are to be copied from Block A of Form. I. in respect of dry land plots.

**Page Total** :—As in the case of Form III A the page totals of each column are to be entered at the bottom of line. The extract of the total in respect of the seasonal crops are to be forwarded to the Directorate as per time schedule.

#### Form IV—Crop abstract report

This form is meant for forwarding the report of the crops harvested during each season. The details are to be copied from the page totals of Form III A and III B. This form is to be prepared by the Statistical Inspector. No office copies of these forms need be kept in the statistical offices as the details will be available in Form III A or III B. The abstract should be prepared separately for Form III A and III B and should be sent to headquarters as per time schedule prescribed earlier.

Column—1 : Serial number is to be entered.

Column—2 : Here enter the page number as in Form III A or III B

Column—3 : The page total of column (3) in Form III A or III B may be entered here.

**Column 4 to 7** :—These four columns relate to the area under paddy during the season. The corresponding centres in the page totals of Form III A or III B are to be copied.

**Column 8** :—is for entering the details of tapioca harvested during the season.

**Column 9 to 14** :—are for entering the details of other seasonal crops harvested during each season. The name of the crop and its code number should be entered in the column headings left blank and the relevant details should be entered under the respective columns.

**Column 15 and 16** :—These two columns are provided for entering the details of land left as 'No crop' during the season and land cultivated with crops to be harvested in other seasons. These two columns are provided for accounting the net area under cultivation with seasonal crops during each season.

#### II. Yield estimation survey

The following seven forms will be used for the yield estimation surveys on the various crops mentioned earlier.

- |              |   |  |
|--------------|---|--|
| 1. Form V    | — | List of plots selected for crop cutting experiments. |
| 2. Form VIA  | — | Crop cutting experiments on paddy.                   |
| 3. Form VIB  | — | " " on tapioca                                       |
| 4. Form VIIA | — | " " on coconut                                       |
| 5. Form VIIB | — | " " on arecanut                                      |
| 6. Form VIIC | — | " " on cashew  |
| 7. Form VIID | — | " " on pepper  |

In addition the pre-harvest schedules are to be canvassed in respect of the plots selected for crop cutting experiments for paddy and tapioca during each season.

The various forms are discussed below:

### **Form V—List of plots selected for crop cutting experiments**

This form gives the details of the plots selected for conducting crop cutting experiments in the various crops in each Investigator unit. This should be prepared immediately after the selection of plots is over and be kept in the Statistical Inspectors' office till the end of the survey. The Inspecting Officers will verify the selection procedures whenever they visit the respective offices. All the items of this form are self explanatory.

### **Form VI A—Crop cutting Experiments on Paddy**

The details of the plots selected for crop cutting experiments on paddy as well as the results of experiments are to be recorded in this form. One form should be used for each Investigator Unit during each season. The code numbers to be used in filling up the form are given at the bottom of the form itself. All other items are self-explanatory. The filled-in forms should be sent to the headquarters immediately after the harvest is over in the selected village.

### **Form VII—Crop cutting experiments on tapioca**

This form is for recording the details of crop cutting experiments on tapioca. One form is to be used for one Investigator unit. All the items are self explanatory.

### **Form VII A—Crop cutting experiments on coconut**

The details of the harvests conducted in all the five selected trees in a plot are to be entered in one form.

The number of harvest in the case of coconuts will vary from 6 to 12 and the details of each harvest are to be noted separately in the form. During each harvest the number of nuts plucked as tender; ripe, over ripe, barren and the number of nuts fell down after the previous harvests should be noted separately. The details of all the harvests conducted during the agricultural year 1976-77 should be collected and recorded. Extract of the details of each harvest in the selected plots should be sent to the Directorate immediately after each harvest.

### Form VII B—Crop cutting experiments on arecanut

The details of crop cutting experiments on arecanut are to be entered in this form. As in the case of coconut there will be more than one harvest during each year. The details of the number and weight of nuts plucked as ripe and as tender are to be noted separately for each selected tree and for each harvest. Extracts of the details of each harvest should be sent to the Directorate immediately after each harvest.

### Form VII C Crop cutting experiments on cashew

The harvest details of the selected cashew trees should be collected and recorded in this form. During the peak period of harvest, cashewnuts are plucked from the trees at an interval of two to three days. Care should be taken to see that no harvest of the selected trees is missed and that complete details are collected and entered in the form. The number as well as the weight of nuts plucked during each day of harvest are to be noted separately for each tree. The filled in forms should be sent to the Directorate immediately on completion of the two harvests in the selected trees in the village.

### Form VII D—Crop cutting experiments on pepper

The peak period of harvest of pepper will be from November to January. The produce from each pepper standard will be harvested once or twice. The weight of berries with spikes and without spikes are to be collected and recorded. The completed form should be sent to the Directorate immediately after completion of harvest in the selected pepper standards.

## PART C

### Appendix I—Concepts and definitions

1. *Agricultural year 1976-77.*—is defined as the period of 12 months from 1st July 1976 to 30th June 1977.

2. *Season:*—The agricultural year 1976-77 is divided into three non-overlapping seasons of four months duration each. They are:—

- (a) Autumn — July 1976 to October 1976.
- (b) Winter — November 1976 to February 1977.
- (c) Summer — March 1977 to June 1977.

3. *Seasonal crops:*—Crops which are harvested during the period of four months in the season are defined as the seasonal crops of the respective season. Thus paddy, pulses, tapioca etc. which are harvested during different periods of the year will have to be classified as Autumn Paddy, Autumn Pulses etc. according to the period of harvest. The seasonal crop for which the major period of harvest in that village falls within July to October will be Autumn crop, November to February—Winter Crop and March to June—Summer crop.

4. Annual crops :—Banana, Sugarcane, Plantain, Pineapple and Betel leaves are to be considered as annual crops for the purpose of this survey.
5. Perennial crops :—Crops which are standing for more than an year will be treated as perennial crops. Most of the perennial crops are tree crops. In the case of sugarcane cultivated in Devicolam taluk, even though the period exceeds 12 months it will be treated as annual crops and not perennial.
6. Plot :—A plot is defined as a patch or piece of land which has a separate survey sub division number, in the basic tax register.
7. Unit of observation :—A unit of observation is defined as the area identified separately for area enumeration as entered in Form I. It shall be a plot or a group of plots (in case of a survey subdivision number as in lithomap) or the land in possession of one cultivator.
8. Investigator Unit :—The area allotted to one Investigator will be treated as an investigator unit. It shall be a village, a portion of village or portions of two villages.
9. Irrigation :—Irrigation is here defined as the process of letting water inside the plot, for the benefit of the crops grown which involves some artificial, either mechanical or manual effort. Thus rainfed areas will not be considered as irrigated.
10. Irrigated area (Net) :—Irrigated area is defined as the area which receive irrigation at least once during the agricultural year.
11. Area under irrigated crops :—The area under a crop will be treated as irrigated if irrigation facilities are available and used for cultivating the crop.
12. Plantation crops :—They are Rubber, Tea Coffee and Cardamom.
13. Building and Courtyard :—The area exclusively used for building and courtyard will come under this category.
14. Other non-agricultural areas :—This stands for all lands occupied by roads, and railways or under water, rivers and canals and other lands put to uses other than agricultural.
15. Barren and uncultivable lands :—This covers all barren and uncultivable lands like mountain deserts etc. Land which cannot be brought under cultivation unless at a high cost shall be classed as unculturable whether the land is in isolated blocks or within cultivated holdings.
16. Miscellaneous tree crops and groves not included in the net area sown :—Area occupied by casurina trees, thatching grass bamboo bushes and other groves for fuel etc. will come under this category. It may be noted that the above trees and groves do not come under the category of crops and hence they are not included under net area sown.
17. Permanent pastures and other grazing lands :—These cover all grazing lands, whether they are permanent pastures and meadows or not.

18. Culturable Waste :—These include lands available for cultivation whether not taken up for cultivation or abandoned after a few years for one reason or the other. Such lands may be either fallow or covered with shrubs and jungles which are not put to any use. They may be assessed or unassessed and may lie in isolated blocks or with the cultivated holdings. Land once cultivated but remaining uncultivated for five years or more in succession shall also be included in this category.

19. Current Fallow :—This class comprises cropped areas which are kept fallow during the current year. If any seedling area is not cropped again in the same year it may be treated as current fallow.

20. Other fallows :—This implies all lands which are taken up for cultivation but are temporarily out of cultivation for a period of not less than one year and not more than five years. The reasons for keeping such lands as fallow may be one of the following.

1. Poverty of cultivators
2. In-adequate supply of water
3. Malarial climate
4. Silting of canals and rivers and
5. Un-remunerative nature of farming

21. Net area sown :—In calculating the net area sown, area sown more than once will be count only once. Hence, the net area sown will exceed the geographical area.

### Appendix II

#### Crops to be covered by T. R. S. in Kerala

Sl. No.	Crop	Code	Period
1	2	3	4
A.	SEASONAL CROPS		
1	Autumn paddy	01	July—October
2	Winter paddy	02	November—February
3	Summer paddy	03	March—June
4	Autumn pulses	04	July—October
5	Winter pulses	05	November—February
6	Summer pulses	06	March—June
7	Autumn tapioca	07	July—October
8	Winter tapioca	08	November—February
9	Summer tapioca	09	March—June
10	Autumn sweet potato	10	July—October
11	Winter sweet potato	11	November—February
12	Summer potato (sweet)	12	March—June
13	Tubers	19	July—December
14	Other vegetables	20	July—December

1	2	3	4
15	Autumn sesamum	13	July—October
16	Winter sesamum	14	November—February
17	Summer sesamum	15	March—June
18	Jowar	16	July—October
19	Ragi	17	July—October
20	Other cereals and millets	18	July—October
21	Groundnut	21	July—October
22	Ginger	22	November—February
23	Turmeric	23	November—February
24	Cotton	24	November—February
25	Lemongrass	25	July—October
26	Tobacco	26	July—October
27	Chillies	27	July—October
<b>B. ANNUAL CROPS</b>			
28	Betel leaves	28	July—October
29	Banana	29	July—October
30	Plantain	30	November—February
31	Sugarcane	31	November—February
32	Pineapple	32	November—February
<b>C. PERENNIAL CROPS</b>			
33	Coconut	33	
34	Arecanut	34	
35	Palmyra	35	
36	Cashew	36	
37	Mango	37	
38	Jack	38	
39	Tamarind	39	
40	Pepper	40	
41	Rubber	41	
42	Tea	42	
43	Coffee	43	
44	Cardamom	44	
45	Cloves	45	
46	Nutmeg	46	
47	Cinamon	47	
48	Fodder grass	48	
49	Green manure crops	49	
50	Other oil seed trees	50	
51	Other fruit trees (areas)	51	
52	Other trees included under net area sown (areas)	52	

Appendix III No. of crop cutting Experiments to be conducted on Each crop (Taluk-wise)

Taluk and District	No. of No. of plots to be selected for C. C. on								
	Invr. unit	Paddy A	Paddy W	Paddy S	Tapi-oca	Coco-nut	Areca-nut	Cas-hew	Pep-per
	1	2	3	4	5	6	7	8	9
1 Neyyattinkara	9	18	18	18	18	9	9	9	9
2 Trivandrum	10	20	20	20	20	10	10	10	..
3 Nedumangad	13	26	26	26	26	13	13	13	13
4 Chirayinkil	8	16	16	16	16	8	8	8	8
<b>TRIVANDRUM DISTRICT</b>	40	80	80	80	80	40	40	40	30
5 Quilon	9	18	18	18	18	9	9	9	9
6 Kottarakkara	13	26	26	26	26	13	13	13	13
7 Kunnathur	9	18	18	18	18	9	9	9	9
8 Pathanapuram	9	18	18	..	18	9	9	9	9
9 Pathanamthitta	10	20	20	20	20	10	10	10	10
10 Karunagappally	7	21	21	21	14	7	7	7	..
<b>QUILON DISTRICT</b>	57	121	121	103	114	57	57	57	50
11 Karthigappally	7	21	21	21	..	7	7	7	..
12 Mavelikkara	7	21	21	21	14	7	7	7	7
13 Chengannur	7	21	21	21	14	7	7	7	7
14 Thiruvalla	10	20	20	20	20	10	10	10	10
15 Kuttanad	5	15	15	15	..	5	..	..	..
16 Ambalapuzha	7	21	21	21	..	7	..	..	..
17 Sherthallai	6	18	18	..	12	6	6	6	..
<b>ALLEPPEY DISTRICT</b>	49	137	137	119	60	49	37	37	24
18 Changanacherry	6	18	18	18	12	6	6	..	6
19 Kanjirappally	6	18	18	..	12	6	6	..	6
20 Kottayam	12	24	24	24	24	12	12	12	12
21 Vaikom	9	18	18	18	18	9	9	9	..
22 Meenachil	11	22	22	22	22	11	11	..	11
<b>KOTTAYAM DISTRICT</b>	44	100	100	82	88	44	44	21	35
23 Peermedu	6	18	18	..	..	..	..	..	..
24 Devikulam	4	12	12	..	..	..	..	..	..
25 Udumbanchola	8	16	16	..	..	..	..	..	..
26 Thodupuzha	9	18	18	..	18	9	9	9	9
<b>IDIKKI DISTRICT</b>	27	64	64	..	18	9	9	9	9

	1	2	3	4	5	6	7	8	9
27 Kothamangalam	8	16	16	16	16	8	8	8	8
28 Muvattupuzha	11	22	22	22	22	11	11	11	11
29 Cochin	2	6	6	..	..	2	..	..	..
30 Kanayannur	6	18	18	18	12	6	..	..	6
31 Kunnathunad	7	21	21	21	14	7	7	7	7
32 Alwaye	7	21	21	21	14	7	7	7	7
33 Parur	8	16	16	16	16	8	8	..	..
<b>ERNAKULAM DISTRICT</b>	<b>49</b>	<b>120</b>	<b>120</b>	<b>114</b>	<b>94</b>	<b>49</b>	<b>41</b>	<b>33</b>	<b>39</b>
34 Crangannore	3	9	9	9	..	3	..	..	..
35 Mukundapuram	17	34	34	34	34	17	17	17	17
36 Trichur	12	24	24	24	24	12	12	12	12
37 Thalappally	14	28	28	28	28	14	14	14	14
38 Chowghat	9	18	18	18	18	9	..	..	..
<b>TRICHUR DISTRICT</b>	<b>55</b>	<b>113</b>	<b>113</b>	<b>113</b>	<b>104</b>	<b>55</b>	<b>43</b>	<b>43</b>	<b>43</b>
39 Chittur	11	22	22	22	22	11	..	..	..
40 Alathur	8	16	16	16	16	8	..	..	..
41 Palghat	12	24	24	24	24	12	..	..	..
42 Ottappalam	19	38	38	38	38	19	19	19	19
43 Mannarghat	10	20	20	20	20	10	10	10	10
<b>PALGHAT DISTRICT</b>	<b>60</b>	<b>120</b>	<b>120</b>	<b>120</b>	<b>120</b>	<b>60</b>	<b>29</b>	<b>29</b>	<b>29</b>
44 Perinthalmanna	13	26	26	26	26	13	13	13	13
45 Ponnani	6	18	18	..	12	6	6	6	..
46 Tirur	17	34	34	34	34	17	17	17	17
47 Ernad	18	36	36	36	36	18	18	18	18
<b>MALAPPURAM DISTRICT</b>	<b>54</b>	<b>114</b>	<b>114</b>	<b>96</b>	<b>108</b>	<b>54</b>	<b>54</b>	<b>54</b>	<b>48</b>
48 Kozhikode	14	28	28	28	28	14	14	14	14
49 Quilandy	14	28	28	28	28	14	14	14	14
50 Badagara	13	26	26	26	26	13	13	13	13
51 South wynad	12	24	24	24	..	..	..	..	..
<b>KOZHIKODE DISTRICT</b>	<b>53</b>	<b>106</b>	<b>106</b>	<b>106</b>	<b>82</b>	<b>41</b>	<b>41</b>	<b>41</b>	<b>41</b>
52 North Wynad	9	18	18	18	..	..	..	..	..
53 Tellicherry	17	34	34	34	34	17	..	17	17
54 Cannanore	14	28	28	28	28	14	..	14	14
55 Taliparamba	20	40	40	40	40	20	20	20	20
56 Hosdurg	12	24	24	24	24	12	12	12	12
57 Kasargode	15	30	30	30	30	14	14	14	..
<b>CANNANORE DISTRICT</b>	<b>87</b>	<b>174</b>	<b>174</b>	<b>174</b>	<b>156</b>	<b>78</b>	<b>47</b>	<b>78</b>	<b>63</b>
<b>STATE</b>	<b>575</b>	<b>1249</b>	<b>1249</b>	<b>1107</b>	<b>1024</b>	<b>536</b>	<b>442</b>	<b>442</b>	<b>411</b>

## APPENDIX IV—RANDOM NUMBERS

1	2	3	4	5	6	7	8	9	10	11	12	13
1370	4369	3881	8742	1220	4115	7696	8527	8121	7539	4377	8081	7255
2699	8278	9905	2299	5232	8091	3851	0917	4185	1320	6659	2220	9315
7253	9581	0798	1474	5258	7310	4091	9051	7423	5488	8412	1677	0189
2208	0868	3716	3662	2002	3598	4453	2387	9153	8697	4280	8337	3197
2161	9053	8572	8694	8718	5011	3125	2230	1617	3234	0007	2552	7977
4738	5566	5096	9678	3445	5278	3435	2092	8112	1528	4298	6752	3830
9668	1307	3129	7009	1666	8109	3612	1703	8393	4864	5032	5794	6487
4592	9344	8772	2675	8231	7269	2551	4074	8516	8609	2262	0638	1674
7885	7145	3216	5791	5205	9320	7238	3397	3658	9091	2391	1904	1631
5199	5088	6254	9051	0139	1870	1720	7503	8553	0641	2978	5115	4901
6762	3002	8317	3725	4286	0032	7557	3777	6760	7044	5691	0319	6619
0308	8977	1241	1525	5230	9311	1347	3537	1517	9624	9508	3955	1538
4510	0466	9470	3374	9723	4097	7367	5564	1638	5874	2971	4962	1329
6248	4697	0436	3127	2984	8535	1602	2914	1678	4449	3405	4696	8874
5959	3363	5343	6030	1581	6759	4898	1329	1971	9871	1951	8682	9593
7263	6717	2455	6832	2480	1392	7365	4209	3992	5668	3654	5546	1358
4628	1570	2898	5336	0389	8374	2296	0641	5575	0862	5519	1575	7774
2103	0916	3148	0510	9662	1415	5726	1128	9816	8539	6749	0230	4755
8482	5339	9214	0784	0401	6617	4776	6092	2279	7066	7813	9742	8154
7568	4990	3395	4610	9468	3910	3180	3086	0854	3988	3846	7421	1374
4277	2980	7338	9211	8172	5088	9155	4836	2640	1770	3994	0576	1298
6355	0984	6656	9213	9714	8727	8370	1091	2064	1233	1559	4328	7588
5429	7014	8595	7972	7748	5792	2835	5317	3057	0734	0956	2681	4114
297	5061	4955	3855	8557	8508	8691	6294	8396	9617	0210	8971	7653
5230	4773	2654	1805	7592	9508	2486	8652	6759	6322	2876	4245	9787
8617	9862	4462	6718	0213	7936	9021	6025	1917	5050	4626	9262	4127
3417	1017	4368	4709	6606	9696	1897	0254	6141	4191	8883	3032	7559
2383	2522	3125	0932	5752	8805	9582	5697	5071	3565	6715	4573	0917
6442	0746	1956	2748	2287	4190	4781	7496	1727	3582	8077	2896	1126
2801	5252	2490	6859	7066	7313	2550	7021	4884	4972	9348	6675	8236

1	2	3	4	5	6	7	8	9	10	11	12	13
7327	4930	7193	5423	8640	5313	3309	7985	1209	3672	8106	7304	0203
6896	8212	7061	5703	2755	7207	8782	4749	5740	5464	8897	6903	1294
4927	3017	9245	9675	0525	1097	5241	8507	4379	3760	9675	3946	3342
8191	8643	1760	7659	9638	9650	3560	9080	0751	1559	5524	8049	1261
7011	9078	5431	7514	3849	9176	1439	0040	7181	9303	0360	0242	5338
7660	3552	4778	4974	5995	1400	9870	6650	2444	8414	0213	9571	1746
3204	4057	0572	1619	5478	6103	9831	0851	3608	0299	6546	5184	5120
2804	3297	3225	4751	2149	4526	1795	1562	8128	5690	8119	9558	4150
8723	3482	0205	6510	6708	6272	3316	6683	3385	6591	6833	1785	7715
1641	5873	7651	3753	2255	4189	5621	5224	0575	4693	0564	3909	2073
0113	3072	0334	3008	2967	5800	6594	0028	4031	4553	9636	8457	6099
0466	4907	8083	5328	7726	7561	1920	8821	2347	3868	5319	5006	5428
6372	2344	9197	5405	8816	4544	1117	8700	7878	5153	7274	9079	0363
0581	8156	0493	9192	9429	4960	1373	466	9671	7061	0598	6467	4135
1880	7451	5388	5390	8697	5559	5801	7546	2417	9211	0492	1717	8952
2264	4610	2205	3798	7778	8369	3173	9055	6947	1910	3647	6323	3515
5248	3116	6939	7694	2169	9025	9640	5075	1781	2131	8498	9977	9671
5885	0634	6982	1868	6529	9078	2964	8335	0466	6483	3475	1840	5865
8704	0458	0078	0982	5719	4305	4599	2105	8368	5563	7235	5351	5826
8596	6147	2603	4329	1172	7348	0829	4145	4817	4846	2144	1899	4151

## THE DECISIONS TAKEN AT THE TRAINING CONFERENCE OF THE STATISTICAL INSPECTORS

### 1. Selection of Plots for Crop Cutting Experiments (Page 34—After Item 6)

If a survey subdivision number, as in the basic tax register selected for crop cutting experiments is found on observation, to be further subdivided as is in the possession of more than one owner/cultivator, then one holding from among the holdings in the selected plot may be selected by simple random sampling method and crop cutting experiments should be conducted in the selected holdings.

### 2. Random columns to be used (Page 35—Replace Item 6)

The random columns for selection of plots, trees etc. for conducting crop cutting experiments should be used as given below, for each Investigator Unit.

1. Autumn Paddy ..	Col. 1	5. Coconut ..	Col. 5
2. Winter Paddy ..	Col. 2	6. Arecanut ..	Col. 6
3. Summer Paddy ..	Col. 3	7. Cashew ..	Col. 7
4. Tapioca ..	Col. 4	8. Pepper ..	Col. 8

### 3. Recording area under 'No Crop' (Page 46 After Para 6)

The wet land plots in the selected villages are being visited three times during the year, to record the details of crops grown and harvested during each season. If there is no crop in the plot or its portion such areas are to be entered against 'No crop' in Block A of Form I during the respective season. It may some times happen that in a plot, the same patch (or different patches with approximately equal area) is left uncultivated during the different seasons. In order to identify the portions left as 'No crop' during each season, it is instructed to draw a rough sketch of the plot on the top of Form I itself and mark the portion left as fallow during each season at the time of each visit.

### 4. Recording area under vegetables etc. (Page 47 Exception 1 Continued)

If vegetables and other tuber crops of short duration are cultivated and harvested during winter or summer season then the details of such crops need be entered under the respective seasons. Care should be taken to see that these details are noted during earlier visits.

### 5. Recording area under Banana, Pineapple etc.

(Page 48 Note Addition)

For Banana and Pineapple only the area is to be given in the forms. In cases where there are only a few plants, the area under which is less than half a cent, then it has been instructed to put 'zero (0)' under the corresponding columns. Care should be taken to see that those plants for which the areas has been entered as zero are not omitted. The following procedure should be adopted for this. The number of plants in such two or three plots should be pooled together till the area becomes at least one cent and entered against last plot in the group. The average stand per acre may be taken as 5000 for Pineapple and 800 for Bananas. The following example will make this procedure clear.

*Example:*—Suppose the number of pineapples in five plots are as follows:—

Plot No.	No. of Pine apples	Entry to be made (Cents)
1	10	0
2	30	1
3	14	0
4	20	1
5	70	1

The entry against plot No. 4 is the area corresponding to the total number of plants in plot numbers 1, 3 and 4.

## BUREAU OF ECONOMICS &amp; STATISTICS

**T. R. S. Supplementary Instructions (2)**

The following supplementary instructions are issued as clarifications in regard to the various points raised during the T. R. S. training conference.

**I. Form I.**

Only one form need be used for one unit of enumeration (plot survey subdivision number or a cultivator's holding as the case may be). Separate forms need not be used for the same unit even if there is conversion.

**II. Unit of observation.**

A survey subdivision number as in the litho map is to be treated as a unit of observation (in old Travancore Region) only if all the sub plots in that group are either wet or dry as per records.

**III. Area Enumeration.**

For Block A, B and D where the area or the number of trees is to be given, gross area concept is followed. As such the total area under all the crops can exceed the geographical area. It is not necessary to allocate the area under different crops so as to limit it within the geographical area. The net area under cultivation to be shown under col. 9 in Block E, will be item 2 (Area of the plot) minus sum total of entries in columns 1 to 8 in Block E.

According to the present practice, the area of the bund is included in the crop area. The number of trees grown in the bund will be recorded, and the entire area will be assigned for crop area. The same procedure is to be followed even if seasonal crops are raised on the bund. The area of seasonal crops on the bund will be shown. In this case, the total crop area may exceed the geographical area.

Question 1:—The seasonal crops raised in a season are found damaged due to flood, drought etc. at the time of visit. Eg. Paddy, Pulses  
How the area is to be accounted?

The area of the crop, though the yield is nil, should be recorded under the respective season.

Question 2:—Whether 'o' is to be shown in Form I in the case of L and Utilisation particulars and crop area if the area is less than  $\frac{1}{2}$  cent?

Yes—The area of such utilisation in plots visited subsequently may be pooled together till the area becomes at least one cent and entered against

the last plot in the group. The same procedure was suggested in the case of recording area under Banana, Pineapple etc. (Vide supplementary instructions—1).

#### IV. Irrigation.

Question 1:—If the plot under the survey subdivision number is itself a tank or well and neighbouring plots are irrigated from the source how it should be accounted ?

The number of units in the case of tanks and wells used for irrigation purpose should be shown in a plot, only if the source is located in that plot. If the plot itself happens to be a tank or well, then source (code) and number will be noted in Block C of Form I, pertaining to that plot. The area irrigated and source of irrigation (code) will be noted in the neighbouring plots irrigated by this.

Question 2:—Whether details of irrigation are to be noted for crop recorded in Blocks D and E ?

Such cases of irrigation should also be accounted and the entries to be circled as was done in the last round.

#### V. Crop Cutting Experiments.

Question 1:—Bearing coconut trees given for tapping, if selected for crop cutting should be included or not ?

Bearing coconut trees if selected happen to be those given for tapping need not be substituted. The remarks, tapping, will also be entered against the tree number.

Question 2:—For arecanut crop cutting experiments, can patch selection be done in the case of large number of arecanuts grown in different patches ?

Yes—In such cases, one patch may be selected by simple random method.

## Form 1. Field Diary of the Investigator

1. Survey No. .... 4. Date of visit(1).. (2)....(3)....  
 2. Area (Cents)..... 5. Area converted.....  
 3. Type of land (R).....(O).....

### A. Area under seasonal crops

S. No.	AUTUMN			WINTER			SUMMER			
	Crop	Area (cents)		Crop	Area (cents)		Crop	Area (cents)		
		Name	I		UI	Name		I	UI	Name
1										
2										
3										
4										
5										

### B. Area under annual Crops

Banana (cents)	Sugarcane (cents)	Plantain (No.)	Pineapple (cents)	Betel leaves (cents)	Net area Irrigated (cents)	Source of Irrigation Code No.

### C. Irrigation

### D. Perennial trees (in numbers)

Coconut		Arecanut		Cashew		Pepper					
B	Y	B	Y	B	Y	B	Y				

### E. Land utilisation (in cents)

Building and courtyard (1)	Other non-agri. uses (2)	Barren and uncultivable (3)	Miscellaneous tree crops (4)	Pastures and grazing land (5)	Cultivable waste (6)	Current fallow (7)	Other fallow (8)	Net area under cultivation (9)

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