REPORT

ON

The Crop Cutting Surveys on the winter (Mundakan) and Summer (Punja) Crops of Paddy 1961

KERALA STATE

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REPORT ON THE CROP CUTTING SURVEYS THE WINTER (MUNDAKAN) AND SUMMER (PUNJA) CROPS OF PADDY 1961 IN KERALA STATE.

1. **Introduction.**—The report relating to the crop-cutting surveys on the first (Autumn) crop of paddy of the agricultural year 1960-61 has already been published. The present report deals with the paddy crop-cutting experiments carried out on the second and third (Winter and Summer) crops of paddy 1960-61. The area covered by the survey, the sampling technique adopted, the method of analysis followed and the reliability of the results arrived at are discussed in the subsequent paragraphs.

2. **Coverage.**—The survey on the winter crop of paddy covered 50 out of the 55 taluks in the State. The survey on the summer crop was conducted in all the 26 taluks where the crop is grown. The harvest seasons of the winter and summer crops are January to February and April to May respectively.

3. **Sampling design.**—The plan of sampling adopted for both the surveys was one of stratified multi-stage random sampling. The taluk was taken as the stratum. The kara/desom was taken as the primary unit of sampling, the survey sub-division as the secondary unit and the square plot of side 16½' as the ultimate unit of sampling. For both the surveys 6 karas/desoms were selected with equal probability from each taluk and in each selected village a systematic sample of 5 paddy fields growing the particular crop were chosen. In each of the selected field a square plot of side 16½' was located at random. The crop in the square plot was harvested and the produce threshed, winnowed and weighed. In order to estimate the loss in weight due to driage a sample of grain from every 10th plot harvested was taken and the initial weight having been noted was despatched to the District Statistical Officer. The reduction due to driage in each taluk was calculated by conducting driage experiments in the District Offices.

4. **Field work.**—The Investigators and Statistical Inspectors attended to the field work relating to both the surveys under the supervision of the District Statistical Officers. Although every attempt was made to conduct the experiments in all the 1,500 plots selected for the winter crop survey and the 780 plots selected for the summer crop, the experiments were actually conducted only in 1,378 plots during the winter season and 631 plots during the summer season. In the taluks where the survey was not conducted the mean yield per acre was estimated by local enquiries.

5. **Results.**—The analysis of the data collected was done in the Office of the Director of Statistics. The results of the land utilisation survey conducted by this department have been utilised to frame the area under paddy in each taluk during each season. The taluk mean yields are the simple arithmetic averages of the corresponding plot yields.

5·1 Estimates of area under paddy, mean yield per acre and its standard error, and the total out-turn of rice in each season are given in Tables I & V. The ratio of cleaned rice to paddy was taken to be 0·657. It may be noted that the standard error of the yield estimate for the State is small compared to the standard errors for each taluk. This is to be expected since the yield estimate for the State is based on more samples than the taluk estimates.

5 2 Separate estimates for irrigated plots, chemically manured plots both irrigated and chemically manured plots and control plots are presented in Tables II and VI. In Trivandrum and Ernakulam Districts for the winter crop and in Trichur District for the summer crop, it is seen that the yield obtained from plots where there is no irrigation and no manuring is better than that obtained from both irrigated and manured plots. Though it may seen contrary to expectation this peculiar behaviour may be due to the variation in natural fertility of the soil in different taluks of a District.

5·3 The frequency distribution of the plot yields is presented in Tables III and VII. The analysis of the variance of plot yields is given in Tables IV and VIII.

6. **Comparison with previous years.**—Acreage, yield rates and total production of rice in respect of autumn, winter and summer crops for 1961 and for the preceding two years are given below :—

Year	Autumn			Winter			Summer		
	Area (acres)	Average yield of dry paddy (lbs)	Production of cleaned rice (tons)	Area (acres)	Average yield of dry paddy (lbs)	Production of cleaned rice (tons)	Area (acres)	Average yield of dry paddy (lbs)	Production of cleaned rice (tons)
1959	964647	1696	479824	728170	1807	385941	188435	1955	108027
1960	978860	1715	492466	749394	1981	435338	186101	1949	106431
1961	..	..	..	758678	1980	440655	187189	2142	117600

8696

Due to unfavourable climatic conditions the yield rates of winter paddy in some of the taluks such as, Chittur, Alathur, Tirur, Ernad, Kozhikode, Taliparamba and Kasargode and the yield rate of summer crop of paddy in Crangannore, Mukundapuram, Trichur, North Wynad and Hosdurg have come down during this year when compared with the corresponding yield rates of previous year. For purposes of comparison the yield rate and production are given below for the three agricultural years, after combining the figures relating to the autumn, winter, and summer crops together.

Agricultural year	Area (acres)	Average yield (dry paddy) (lb)	Production cleaned rice (tons)	% to 1958-1959
1958-59	1898800	1687	939500	100·00
1959-60	1900100	1833	1021600	108·74
1960-61	1924700	1861	1050700	111·84

Assistant Director-in-charge.

Table I

WINTER (MUNDAKAN) CROP OF PADDY 1961, KERALA STATE

Statement showing the estimated mean yield per acre and the total out-turn of rice in different taluks.

Sl. No.	Taluks and Districts	No. of experiments	Area (acres)	Mean yield of dry paddy in lb./acre	Standard error in lb./acre	Total out-turn of rice (tons)
1	2	3	4	5	6	7
1	Neyyattinkara	25	11695	2118	77	7265
2	Trivandrum	24	11020	1671	273	5401
3	Nedumangad	29	11704	2777	157	9533
4	Chirayinkil	29	11365	2512	202	8373
	TRIVANDRUM DISTRICT	107	45784	2277	..	30572
5	Quilon	30	12181	1395	174	4984
6	Kottarakara	30	14604	2631	109	11270
7	Pathanapuram	30	9073	2671	84	7108
8	Pathanamthitta	30	5880	2477	134	4272
9	Kunnathur	30	12432	2495	85	9098
10	Karunagappally	29	10200	2184	265	6534
	QUILON DISTRICT	179	64370	2292	..	43266

11	Karthigappally	..	23	14701	2343	51	10103
12	Mavelikara	..	29	6560	2382	280	4583
13	Chengannore	..	15	2546	2493	104	1861
14	Thiruvella	..	25	3259	1794	270	1715
15	Ambalapuzha	..	15	1360	1030	195	411
16	Shertalai	..	30	9100	1077	252	2875
17	Kuttanad	..	..	..	..	..	..
	ALLEPPEY DISTRICT		137	37526	1958	..	21548
18	Changanacherry	..	24	3560	2576	91	2690
19	Kottayam	..	25	15630	2561	163	11740
20	Kanjirapally	..	10	11	1305	29	4
21	Peerumade	..	..	..	..	..	..
22	Devicolam	..	..	..	..	..	..
23	Udumbanchola	..	..	..	..	..	..
24	Meenachil	..	29	4929	2286	185	3305
25	Vaikom	..	29	20121	2232	274	13172
	KOTTAYAM DISTRICT		117	44251	2382	..	30911
26	Thodupuzha	..	30	9050	2576	98	6838
27	Moovattupuzha	..	30	18350	2739	139	14742
28	Kunnathunadu	..	30	25877	1842	113	13980
29	Alwaye	..	24	18879	1924	105	10654
30	Cochin	..	..	..	..	..	..
31	Kanayannore	..	30	8989	1805	48	4759
32	Parur	..	30	5064	1471	66	2185
	ERNAKULAM DISTRICT	..	174	86209	2102	..	53158

Table I—(*Concld.*)

Sl. No.	Taluks and Districts	No. of experiments	Area (acre)	Mean yield of dry paddy in lb./acre	Standatd error in lbs./acre	Total outturn of rice (tons)
33	Crangannore	30	4260	1637	92	2045
34	Mukundapuram	30	41105	1820	110	21942
35	Trichur	30	43931	1469	105	18928
36	Talapally	28	32756	1993	115	19148
37	Chowghat	30	22457	1731	86	11402
	TRICHUR DISTRICT	148	144509	1733	..	73465
38	Chittur	29	39870	2461	253	28779
39	Alathur	25	33700	2219	107	21933
40	Palghat	25	33363	2381	126	23299
41	Ottapalam	30	27600	1747	73	14142
42	Perinthalmanna	27	25640	2079	188	15635
43	Ponnani	30	10065	1732	81	.5113
	PALGHAT DISTRICT	166	170238	2181	..	108901

44	Tirur	..	30	18751	1876	177	10317
45	Ernad	..	30	29368	1932	124	16642
46	Kozhikode	..	25	10887	960	138	3065
40	Quilandy	.	30	3861	1356	84	1536
48	Badagara	..	30	1987	1180	61	688
49	South Wynad	..	30	35020	1807	107	18560
	KOZHIKODE DISTRICT	..	175	99874	1734	..	50808
50	North Wynad	..	30	17371	1460	151	7439
51	Tellicherry	..	30	7400	1621	126	3518
52	Cannanore	..	30	4552	1323	126	1766
53	Taliparamba	..	30	15527	1118	99	5092
54	Hosdurg	..	30	9427	1773	147	4902
55	Kasargode	..	25	11640	1555	49	5309
	CANNANORE DISTRICT	..	175	65917	1450	..	28026
	KERALA STATE	..	1378	758678	1980	26	440655
	Rounded to hundred	..	..	758700	..	..	440700

Table—II.

WINTER (MUNDAKAN) CROP OF PADDY 1961 IN KERALA STATE

Estimated District-wise yield rate from irrigated, chemically manured, combined and control plots.

Districts	Irrigated Plots		Chemically manured plots		Irrigated and manured plots		Neither irrigated nor manured plots	
	No. of experiments	Mean yield of dry paddy in lb/acre	No. of Experiments	Mean yield of dry paddy in lb./acre	No. of experiments	Mean yield of dry paddy in lb./acre	No. of experiments	Mean yield of dry experiments
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Trivandrum	1	3262	47	2479	36	1932	23	2482
Quilon	..	..	65	2395	72	2615	42	1650
Alleppey	..	..	59	1856	..	..	78	1611
Kottryam	6	2188	64	2274	37	2497	10	1681
Ernakulam	8	2352	52	2276	56	1739	58	2113
Trichur	32	1775	3	1557	4	2421	109	1697
Palghat	38	2172	39	1798	44	2407	45	1980
Kozhikode	7	1851	90	1376	10	1848	66	1707
Cannanore	6	1753	17	1852	50	1719	102	1287
KERALA STATE	98	..	438	..	309	..	533	..

Table III

WINTER (MUNDAKAN) CROP OF PADDY 1961 IN KERALA STATE

Sl. No.	Range-yield of dry paddy in lb./acre.	Frequency distribution.	%
1	Below 500	23	1.67
2	500— 699	21	1.52
3	700— 899	57	4.13
4	900—1099	58	4.21
5	1100—1299	87	6.31
6	1300—1499	170	12.34
7	1500—1699	115	8.37
8	1700—1899	147	10.68
9	1900—2099	157	11.39
10	2100—2299	123	8.94
11	2300—2499	122	8.87
12	2500—2699	100	7.26
13	2700—2899	86	6.17
14	2900—3099	39	2.84
15	3100—3299	39	2.84
16	3300—3499	15	1.09
17	3500—3699	10	0.73
18	3700—3899	5	0.36
19	3900—4099	1	0.07
20	4100 and above	3	0.21
	Total	1378	100.00

Table IV

WINTER (MUNDAKAN) CROP OF PADDY 1961 IN KERALA STATE

Analysis of variance of plot yields pooled for the State in (lbs) 2 per plot of 1/160 of an acre.

Source.	Sum of squares.	Degrees of freedom.	Variance.
(1)	(2)	(3)	(4)
Between Taluk ..	14846.80	49	303.00*
Between Kara within Taluk ..	6665.51	238	28.01*
Within Kara within Taluk ..	8584.82	1090	7.85
Total ..	30097.13	1377	..

* Significant at 1% level.

Table V

SUMMER (PUNJA) CROP OF PADDY 1961 IN KERALA STATE

Statement showing the estimated mean yield per acre and the total out-tern of Rice in different Taluks

Sl. No.	Taluks and Districts.	No. of experiments.	Area (acres)	Mean yield of dry paddy (in lbs/acre)	Standard error (in lbs/acre)	Total out-turn of rice (tons)
1	2	3	4	5	6	7
1	Quilon ...	20	321	1556	65	146
2	Karunagapally ..	10	170	2238	204	112
	QUILON DISTRICT ..	30	491	1792	..	258
3	Karthigapally ..	26	9364	2348	73	6449
4	Mavelikara ..	30	10397	3053	142	9310
5	Chengannore ..	25	4840	2318	238	3291
6	Thiruvalla ..	30	7850	2269	138	5224
7	Ambalapuzha ..	30	10947	1959	91	6290
8	Kuttanadu ..	30	55685	2329	229	38039

Table V—(*contd.*)

1	2	3	4	5	6	7
	ALLEPPEY DISTRICT ..	171	99083	2361	..	68603
9	Changanacherry ..	27	8710	2113	145	5398
10	Kottayam ..	30	27369	2123	39	17042
11	Devicolam, Peerumade and Udumbanchola..	..	2550	1876	..	1403
12	Meenachil ..	13	285	2149	416	180
13	Vaikom ..	10	1943	2407	118	1372
	KOTTAYAM DISTRICT ..	80	40857	2119	..	25395
14	Moovattupuzha ..	30	575	1916	65	323
15	Kunnathunadu ..	30	2020	1805	96	1069
16	Alwaye ..	30	1554	1739	68	793
17	Parur ..	30	9200	1554	43	4193

Table V—*(concld.)*

1	2	3	4	5	6	7
	ERNAKULAM DISTRICT ..	120	13349	1629	..	6378
18	Crangannore ..	10	80	1987	371	47
19	Mukundapuram ..	30	4713	2078	204	2873
20	Trichur ..	28	11220	1300	110	4278
21	Talapally ..	23	1878	2380	112	1307
22	Chowghat ..	23	2767	2457	168	1994
	TRICHUR DISTRICT ..	114	20653	1733	..	10499
23	Ponnani ..	28	7000	1756	137	3605
	PALGHAT DISTRICT ..	28	7000	1756	..	3605
24	Tirur ..	30	3000	2076	120	1827
	KOZHIKODE DISTRICT ..	30	3000	2076	..	1827
25	North Wynadu ..	30	1086	1025	52	326
26	Hosdurg ..	8	1020	1544	209	462
27	Kasargode ..	20	650	1295	84	247
	CANNANORE DISTRICT ..	58	2756	1280	..	1035
	KERALA STATE ..	631	187189	2142	71	117600
	Rounded to hundred ..	..	187200	..	..	117600

Table VI

SUMMER (PUNJA) CROP OF PADDY 1961 IN KERALA STATE

Estimated district-wise yield rate from irrigated, chemically manured combined and control plots

Districts	Irrigated plots		Chemically manured plots		Irrigated and Manured plots		Neither irrigated nor manured plots	
	No. of experiments	Mean yield of dry paddy in lb/acre	No. of experiments	Mean yield of dry paddy in lb/acre	No. of experiments	Mean yield of dry paddy in lb/acre	No. of experiments	Mean yield of dry paddy in lb/acre
1	2	3	4	5	6	7	8	9
Quilon ..	19	1625	..	..	11	2071	..	..
Alleppey ..	18	2789	100	2197	38	2828	15	2054
Kottayam ..	4	2426	29	2040	47	2206	..	..
Ernakulam ..	19	1838	1	2424	100	1724	..	..
Trichur ..	65	1858	15	2018	5	2213	29	2334
Palghat ..	13	1950	..	..	..	..	15	1588
Kozhikode ..	30	2076	..	..	..	..	..	..
Cannanore ..	..	..	..	..	28	1376	30	1011
KERALA STATE ..	168	..	145	..	229	..	89	..

Table VII

SUMMER (PUNJA) CROP OF PADDY 1961 IN KERALA STATE

Sl. No.	Range yield of dry paddy in lbs/ acre	Frequency distribution	%
1	2	3	4
1	Below 500 ..	..	..
2	500— 699 ..	9	1·42
3	700— 899 ..	20	3·17
4	900—1099 ..	24	3·80
5	1100—1299 ..	35	5·55
6	1300—1499 ..	54	8·56
7	1500—1699 ..	68	10·78
8	1700—1899 ..	69	10·93
9	1900—2099 ..	85	13·47
10	2100—2299 ..	73	11·57
11	2300—2499 ..	67	10·62
12	2500—2699 ..	48	7·61
13	2700—2899 ..	29	4·59
14	2900—3099 ..	19	3·01
15	3100—3299 ..	20	3·17
16	3300—3499 ..	8	1·27
17	3500—3699 ..	2	0·32
18	3700—3899 ..	..	..
19	3900—4099 ..	1	0·16
20	4100 and above ..	..	..
	Total ..	631	100·00

Table VIII

SUMMER (PUNJA) CROP OF PADDY 1961 IN KERALA STATE

Analysis of variance of plot yields pooled for the State in (lb) 2 per plot of 1/60 of an acre.

Source	Sum of squares	Degrees of freedom	Variance
1	2	3	4
Between Taluk ..	5914·15	25	236·57*
Between Kara within Taluk ..	2131·54	105	20·60*
Within Kara within Taluk ..	3664·79	500	7·33
Total ..	11710·48	630	..

* Significant at 1% level.