REPORT

ON THE

Crop Cutting Surveys on Winter and Summer Crops of Paddy 1962

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REPORT ON THE CROP CUTTING SURVEYS O. WINTER AND SUMMER CROPS OF PADDY 1962.

1. Three rounds of crop-cutting surveys on paddy have been conducted by this Department during the year 1961-62. The report on the first round of the survey conducted on the Autumn crop of paddy 1961 has already been published. In this report the results of surveys conducted on the Winter and Summer crops of paddy 1962 are presented. The object, the coverage, design of the survey and the reliability of the results arrived at are explained in the subsequent paragraphs.

2. The object of the survey is to estimate the talukwise mean yield of paddy per hectare and the total outturn of rice in the State during each season.

3. The survey on the Winter crop of paddy covered 50 out of the 55 taluks in the State and that of the Summer crop of paddy covered 28 Taluks where the crop was grown. The Winter crop survey was conducted during the months of January to February 1962 and the Summer crop survey during the months of April to May 1962.

4. As usual a stratified multistage random sampling design was adopted for the survey. Taluks were taken as the stratum, villages as the first stage units, sub-division numbers as the second stage units, kandom as the third stage unit and a square plot of side $16\frac{1}{2}'$ as the ultimate sampling unit. With a view to study the seasonal effects the technique of matched sampling was adopted for both the rounds of the survey. According to this plan of sampling, 50% of the villages and plots chosen for the previous year's corresponding survey were retained during the present rounds of the survey. The selected sample in each Taluk comprised the following categories:—

    (i) 3 villages selected with equal probability from the list of villages chosen for the previous year's corresponding survey.

    (ii) Villages selected for the National Sample Survey (Central Sample).

    (iii) Additional villages required to bring the sample size in each Taluk to 6 villages.

In the first category of villages experiments were conducted in the same plots selected in connection with the previous year's survey. From the other two categories of villages 5 plots each were selected by adopting the method of systematic random sampling. In each selected plot a kandom was selected with probability proportional to area and from that a square plot of side $16\frac{1}{2}'$ was located at random. The crop in the square plot was harvested and the produce threshed, winnowed and weighed. As usual a sample of grain from every 10th cut in a Taluk was taken, initial weight noted and then despatched to the District Statistical Officers for the conduct of driage experiments.

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5. The sample list of selected villages in each Taluk was made available to the concerned Statistical Inspectors by the District Statistical Officers, weeks before the commencement of harvests in those Taluks. The field work was done by the Investigators of this Department under the supervision of the Statistical Inspectors and District Statistical Officers.

6. Altogether 1500 experiments were planned for the survey on the Winter crop of paddy and 754 experiments for the survey on the Summer crop of paddy. But the actual number of cuts taken for the former was 1329 and for the latter 661. In most of the cases the reason given for the loss of cuts was prior harvesting in the selected plot by the cultivators without intimation to the Investigators.

7.1. The analysis of the data collected was done in the office of the Director of Statistics. The figures of area under paddy in each Taluk estimated from the Land Utilisation Survey of this Department have been utilised to calculate production figures.

7.2. In tables I & V the taluk-wise figures relating to the number of experiments conducted, the area under paddy, the average mean yield arrived at, and the corresponding standard error and the total outturn of rice are presented. The adjusted taluk mean yield ($\bar{x}a$) is calculated by adopting the following formula:—

n — number of experiments repeated.

n' — number of fresh experiments for year 2

y — taluk mean yield for year 1 based on repeated experiments (n).

x — taluk mean yield for year 2 based on repeated experiments (n).

x' — taluk mean yield for year 2 based on fresh experiments (n').

Y — taluk mean yield for year 1 from total sample i.e. (n + n') experiments.

x — taluk mean yield for year 2 from total sample i.e. (n + n') experiments.

$$xm = \frac{n(x-y + y) + n' x'}{n + n'}$$

The ratio of cleaned rice to paddy was taken to be 0·657. In Devicolam, Peermade and Udumbanchola Taluks the dry land paddy cultivated is considered as Punja crop since the harvest period of this crop is the same as that of the Punja crop. The yield rates for these taluks are based on local enquiries.

7.3. In table II & VI the estimates of mean yield from irrigated plots, chemically manured plots, irrigated and manured plots, neither irrigated nor manured plots are presented. In table III & VII the frequency distribution of plot yields is given. The analysis of variance of plot yields is presented in tables IV & VIII.

8. For the purpose of comparison the area under paddy, yield rate and total production of rice in each season for the four years from 1959 onwards are given on the next page.

Total production of rice in each season for the four years from 1959.

Year.	Autumn			Winter			Summer		
	Area (hectares)	Mean yield kgm./hectare	Production Metric tonnes.	Area (hectares)	Mean yield kgm./hectare	Production Metric tonnes	Area (hectares)	Mean yield kgm./hectare	Production Metric tonnes.
1959	390379	1901	487525	294680	2025	392135	76257	2191	109761
1960	396131	1922	500370	303269	2220	442325	75312	2184	108139
1961	365959	1749	420453	307026	2219	447728	75753	2401	119487
1962	..	..	..	312241	2253	462112	74487	2481	121433

Total production of rice during the winter season 1962 is 4·62 lakhs metric tonnes and during the summer season 1962 is 1·21 lakhs metric tonnes. As pointed out in the earlier report the heavy rains during the Autumn season caused substantial damage to the Autumn crop of paddy 1961. Therefore there is a decrease in the area under Autumn crop of paddy 1961 when compared with the previous years area under the crop and the yield rate is also low when compared to the previous year's figures. This has largely affected the total production of rice during the year 1961-62. Yield rate and production figures for the 4 years are presented.

Agriculture year	Area	Mean yield of dry paddy (kgms./hectare)	Production of cleaned rice (Metric tonnes)	Percentage to 1958-59 production
1958-59	768418	1891	951498	100·00
1959-60	768960	2055	1037989	108·74
1960-61	778910	2086	1067585	111·84
1961-62	752687	2030	1004008	105·17

Table—I

MUNDAKAN (WINTER) CROP OF PADDY 1962 IN KERALA STATE

STATEMENT SHOWING THE ESTIMATED MEAN YIELD PER HECTARE AND TOTAL OUT-TURN OF RICE IN DIFFERENT TALUKS.

Taluk and District.	No. of experiments.	Net area harvested (hectares).	Mean yield of dry paddy in kgm./hectare	Standard error in *kgm./hectare.	Production of rice (Metric tonnes)
(1)	(2)	(3)	(4)	(5)	(6)
1. Neyyatinkara	28	4733	2151	304	6689
2. Trivandrum	30	4617	2310	290	7007
3. Nedumangad	30	4839	3060	92	9728
4. Chirayinkil	29	4527	2317	321	6891
TRIVANDRUM DISTRICT	117	18716	2465	..	30315
5. Quilon	29	4623	2454	368	7454
6. Kottarakkara	30	6243	2735	142	11218
7. Kunnathur	30	5394	2819	111	9990
8. Pathanapuram	29	3893	2652	200	6783
9. Pathanamthitta	30	2401	3226	156	5089
10. Karunagappally	30	4528	2354	236	7003
QUILON DISTRICT	178	27082	2672	..	47537

Table I—(*Contd.*)

(1)		(2)	(3)	(4)	(5)	(6)
11.	Karthigappally	29	5949	2412	188	9427
12.	Mavelikkara	23	3468	2775	167	6323
13.	Chengannur	25	2058	2347	195	3173
14.	Thiruvalla	20	2010	2664	289	3518
15.	Kuttanad	..	..	..	..	..
16.	Ambalapuzha	28	1244	1399	108	1143
17.	Shertallai	5	2362	1894	..	2939
	ALLEPPEY DISTRICT	130	17091	2362	..	26523
18.	Changanacherry	30	1441	2949	109	2792
19.	Kanjirappally	19	4	2087	194	5
20.	Peermade	..	..	..	..	..
21.	Kottayam	28	6690	2513	238	11045
22.	Vaikom	20	8143	2059	149	11016
23.	Meenachil	28	1995	1894	114	2482
24.	Devicolam	..	..	..	..	..
25.	Udumbanchola	..	..	..	..	..
	KOTTAYAM DISTRICT	125	18273	2277	..	27340

Table I—*(Contd.)*

(1)		(2)	(3)	(4)	(5)	(6)
26.	Thodupuzha	27	3576	2932	117	6889
27.	Muvattupuzha	24	8375	2568	100	14130
28.	Cochin	..	..	..	..	..
29.	Kanayannur	29	3638	1439	81	3439
30.	Kunnathunad	30	10171	2408	150	16091
31.	Alwaye	30	7640	1949	76	9783
32.	Parur	10	2049	1771	240	2384
	ERNAKULAM DISTRICT	150	35449	2263	..	52716
33.	Crangannore	29	1621	1624	112	1730
34.	Mukundapuram	23	15211	1486	236	14851
35.	Trichur	18	17659	1262	151	14642
36.	Thalappilly	10	16843	2225	335	24622
37.	Chowghat	26	7724	1421	151	7211
	TRICHUR DISTRICT	106	59058	1625	..	63056
38.	Chittur	30	16135	3261	75	34569
39.	Alathur	30	13638	4018	192	36002
40.	Palghat	29	13751	2739	154	24745
41.	Ottappalam	28	11169	2293	158	16826
42.	Perinthalmanna	28	10376	1945	113	13259
43.	Ponnani	25	4073	2621	138	7014
	PALGHAT DISTRICT	170	69142	2915	..	132415

Table I—(*Contd.*)

(1)		(2)	(3)	(4)	(5)	(6)
44.	Tirur	30	7513	2010	182	9221
45.	Ernad	29	12563	1885	149	15559
46.	Kozhikode	30	4406	1491	251	4316
47.	Quilandy	30	2038	1454	201	1947
48.	Badagara	25	1439	1557	129	1283
49.	South Wynad	30	12755	2651	207	22215
	Kozhikode District	174	40714	2065	..	55241
50.	North Wynad	29	7030	1745	94	8060
51.	Tellicherry	30	2995	1494	160	2940
52.	Cannanore	30	2078	1548	146	2113
53	Taliparamba	30	6087	958	156	3831
54.	Hosdurg	30	3815	1725	151	4324
55.	Kasargod	30	4711	1842	113	5701
	Cannanore District	179	26716	1536	..	26969
	State	1329	312241	2253	41	462112
	Rounded to Hundred	..	312200	..	..	462100

Table II

WINTER (MUNDAKAN) CROP OF PADDY 1962 IN KERALA STATE

ESTIMATED DISTRICT-WISE YIELD RATE FROM IRRIGATED, CHEMICALLY MANURED, COMBINED AND CONTROL PLOTS

Districts	Irrigated plots		Chemically manured plots		Irrigated & manured plots		Neither irrigated nor manured plots	
	No. of experiments	Mean yield of dry paddy in kgms/hectare	No. of experiments	Mean yield of dry paddy in kgms/hectare	No. of experiments	Mean yield of dry paddy in kgms/hectare	No. of experiments	Mean yield of dry paddy in kgms/hectare
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Trivandrum	5	2873	23	2765	59	2280	30	2628
Quilon	1	..	94	2957	45	2999	39	2030
Alleppey	..	..	76	2423	10	2856	44	1884
Kottayam	1	2850	80	2208	23	2912	21	2149
Ernakulam	15	2609	45	2401	49	2577	41	1546
Trichur	14	1456	19	1564	17	1508	56	1661
Palghat	15	2877	4	1949	58	3471	93	2140
Kozhikode	15	1406	57	1938	31	1727	71	1948
Cannanore	57	1756	7	1551	3	1836	112	1391

Table III

WINTER (MUNDAKAN) CROP OF PADDY 1962 IN KERALA STATE

FREQUENCY DISTRIBUTION OF PLOT YIELDS

Sl. No.	Range of yield of dry paddy in kgms./hectare.	Frequency distribution.	Percentage.
1	Below 560	13	0.98
2	560—783	22	1.66
3	784—1007	58	4.36
4	1008—1231	67	5.12
5	1232—1455	128	9.63
6	1456—1680	107	8.05
7	1681—1904	123	· 9.26
8	1905—2128	152	11.44
9	2129—2353	108	8.13
10	2354—2577	125	9.41
11	2578—2801	114	8.52
12	2802—3025	86	6.47
13	3026—3249	88	6.62
14	3250—347+	52	3.98
15	3475—3698	40	3.01
16	3699—3922	12	0.90
17	3923—4146	9	0.65
18	4147—4370	10	0.68
19	4371—4594	2	0.15
20	4595 & above	13	0.98
21	Total	1329	100.00

Table IV

MUNDAKAN (WINTER) CROP OF PADDY 1962 IN KERALA

ANALYSIS OF VARIANCE OF PLOT YIELDS POOLED FOR THE STATE IN (KGM.) 2 PER PLOT OF 1/395 OF AN HECTARE.

Source	Sum of squares	Degrees of freedom	Variance
(1)	(2)	(3)	(4)
Between Taluk	3678.25	49	75.07*
Between kara within Taluk	1599.10	228	7.01*
Within Kara within Taluk	1822.07	1051	1.73
Total	7099.42	1328	..

*Significant at 1% level.

Table V

SUMMER (PUNJA) CROP OF PADDY 1962 IN KERALA STATE.

STATEMENT SHOWING THE ESTIMATED MEAN YIELD PER HECTARE AND THE TOTAL OUT-TURN OF RICE IN DIFFERENT TALUKS.

Sl. No.	Taluks & Districts.	No. of experiments.	Net area harvested (hectare).	Mean yield of dry paddy in kgm./hectare.	Standard error in kgms./hectare.	Production of rice in Metric tonnes.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Quilon	25	190	2095	326	262
2	Karunagapally	15	202	2311	328	307
3	Kunnathur	5	28	3109	..	57
	QUILON DISTRICT.	45	420	2267	..	626
4	Karthigapally	29	3754	2870	212	7079
5	Mavelikara	14	4366	3635	332	10427
6	Chengannore	30	2206	2479	230	3593
7	Thiruvalla	30	3177	2901	206	6055
8	Ambalapuzha	15	3737	2115	156	5193
9	Kuttanadu	25	22535	2332	54	34526
	ALLEPPEY DISTRICT.	143	39775	2559	..	66873
10	Changanacherry	28	3525	2680	159	6207
11	Kottayam	29	10073	2572	203	17021
12	Meenachil	5	115	2911	..	220
13	Vaikom	28	443	1883	91	548
14	Devicolam, Peermade & Udumbanchola	..	1032	2267	..	1537
	KOTTAYAM DISTRICT.	90	15188	2559	..	25533

Table V—(contd.)

Sl. No. (1)	Taluks & Districts. (2)	No. of experiments. (3)	Net area harvested (hectare). (4)	Mean yield of dry paddy in kgm/hectare. (5)	Standard error in kgms/hectare. (6)	Production of rice in Metric tonnes. (7)
15	Moovattupuzha ::	27	186	2771	194	339
16	Alwaye ::	30	629	2365	57	977
17	Kunnathunad ::	30	817	2378	50	1276
18	Parur ::	26	3723	2294	244	5611
	ERNAKULAM DISTRICT.	113	5355	2332	::	8203
19	Cranganore ::	9	51	2959	864	99
20	Mukundapuram ::	27	2819	2316	132	4289
21	Trichur ::	30	3476	2544	87	5810
22	Talappilly ::	27	1121	2355	159	1734
23	Chowghat ::	25	1120	2135	143	1571
	TRICHUR DISTRICT.	118	8587	2394	::	13503
24	Ponnani ::	28	2833	1883	102	3505
	PALGHAT DISTRICT	28	2833	1883	::	3505
25	Tirur ::	30	1214	2448	90	1953
	KOZHIKODE DISTRICT	30	1214	2448	::	1953
26	North Wynadu ::	30	439	1330	36	384
27	Kannanore & Hosdurg ::	34	413	1688	56	458
28	Kasargode ::	30	263	2284	48	395
	CANNANORE DISTRICT	94	1115	1689	::	1237
	STATE ::	661	74487	2481	36	121433
	ROUNDED TO HUNDRED	::	74500	::	::	121400

Table VI

SUMMER (PUNJA) CROP OF PADDY 1962 IN KERALA STATE

ESTIMATED DISTRICT-WISE YIELD RATE FROM IRRIGATED, CHEMICALLY MANURED, COMBINED AND CONTROL PLOTS.

District.	Irrigated plots		Chemically manured plots		Irrigated and manured plots		Neither irrigated nor manured plots	
	No. of experiments.	Mean yield of dry paddy in kgms./hectare.	No. of experiments.	Mean yield of dry paddy in kgms./hectare.	No. of experiments.	Mean yield of dry paddy in kgms./hectare.	No. of experiments.	Mean yield of dry paddy in kgms./hectare.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Quilon	15	1610	8	3160	15	2393	7	1953
Alleppey	..	..	80	2650	43	3053	20	2161
Kottayam	9	1945	5	1631	66	2536	10	2126
Ernakulam	27	1666	4	2656	77	2582	5	1846
Trichur	46	2353	5	2637	52	2618	15	2039
Palghat	5	2260	23	1765	..	..	..	..
Kozhikode	30	2426	..	..	..	..	..	..
Cannanore	37	2010	17	1634	8	2438	32	1237

Table VII.

SUMMER (PUNJA) CROP OF PADDY 1962 IN KERALA STATE.

FREQUENCY DISTRIBUTION OF PLOT YIELDS.

Sl. No.	Range of yield of paddy in kgms./hectare.	Frequency distribution.	Percentage.
(1)	(2)	(3)	(4)
1	Below— 560	..	..
2	560 — 783	2	0.3
3	784—1007	12	1.8
4	1008—1231	12	1.8
5	1232—1455	32	4.8
6	1456—1680	52	7.9
7	1681—1904	57	8.6
8	1905—2128	104	15.8
9	2129—2353	105	15.9
10	2354—2577	75	11.3
11	2578—2801	49	7.4
12	2802—3025	49	7.4
13	3026—3249	61	9.2
14	3250—3474	18	2·7
15	3475—3698	14	2·1
16	3699—3922	11	1·7
17	3923—4146	2	0.3
18	4147—4370	3	0.5
19	4371—4594	1	0·2
20	4595 & above	2	0.3
	Total	661	100.00

Table VIII.

SUMMER (PUNJA) CROP OF PADDY 1962 IN KERALA STATE.

ANALYSIS OF VARIANCE OF PLOT YIELDS POOLED FOR THE STATE IN (KGMS.) 2 PER PLOT OF 1/395 OF AN HECTARE.

Source.	Sum of squares.	Degrees of freedom.	Variance.
(1)	(2)	(3)	(4)
Between Taluk ..	797.82	24	33.24*
Between Kara within Taluk ...	658.22	110	5.98*
Within Kara within Taluk ..	638.46	512	1.25
Total ..	2094.50	646	..

*Significant at 1% level