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**Report on the Crop Cutting Surveys on the
Winter (Mundakan) and Summer (Punja)
Crops of Paddy in 1959 in
Kerala State**

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**REPORT ON THE CROP CUTTING SURVEYS
THE WINTER (MUNDAKAN) AND SUMMER
(PUNJA) CROPS OF PADDY IN 1959
IN KERALA STATE.**

1. Introduction.

Prior to 1959, Punja (Summer) crop of paddy was considered along with the Mundakan (Winter) crop for the purpose of crop cutting survey and estimation of production. Separate crop cutting experiments were not being conducted with a view to provide separate estimates. But, since for many purposes the area, yield rate and production during each one of the seasons are necessary for framing successful food policy of the Government, it was decided to have separate estimates for Winter and Summer crops and hence crop-cutting surveys were conducted separately during the two crops. This report presents the results of analysis of the two surveys on the Winter and Summer crops of paddy in Kerala State during 1959.

2. Coverage and Sampling Design.

Both the surveys were conducted throughout the State. There is no punja crop of paddy in many taluks of the State. The harvest seasons of the Winter and Summer crops are January-February and April-May respectively. A stratified three stage random sampling design was adopted for both the surveys, the taluk being taken as the stratum. During each season, six karas/villages were selected at random from each one of the taluks and from each selected village, a systematic sample of 5 paddy fields growing the particular crop was chosen. From each selected field, one of the Kandoms was selected with probability proportional to area and from that a square plot of side 16½ ft. located at random was harvested. The harvested produce was winrowed and weighed correct to the nearest quarter of a pound.

3. Field work.

The field works of both the surveys were done by the Investigators and Statistical Inspectors. Their work was supervised by the District Statistical Officers. Altogether 1,000 experiments were conducted during the Winter season and 427 during the Summer. In certain taluks where no crop cutting experiments could be conducted, reliable estimates of mean yield were taken based upon careful local enquiries.

4. Analysis of data and the results.

The analysis of the data collected was done in the Head Office. The estimated mean yield per acre, its standard error and the out-turn of rice for each one of the taluks and for the

State as a whole for each of the seasons are presented in the Tables. Separate estimates for irrigated plots, chemically manured plots, and irrigated and chemically manured plots and control plots are also given in Table II. The analysis of variance of plot yields are given in Table IV.

5. Precision

The total production of rice for the crops under reference are estimated as 3,86,000 tons and 1,08,000 tons respectively. These estimates have standard errors of 81 lb. per acre and 65 lb. per acre. The weight of rice is reckoned as 65.7% of the weight of paddy. For the purpose of comparison, the acreage, yield rate and production for the corresponding crop of the previous year for Kerala are also given below:

Year and Season.	Area under Paddy (acres)	Average yield of dry paddy in lb. per acre.	Standard error		Production of Rice. (tons)
			(lb.)	%	
1958 Kumbhom					
Winter-Summer	924300	1776	29	1.6	481600
1959 Winter	728200	1807	81	4.5	386000
1959 Summer	188400	1955	65	3.3	108000
1959 Winter } Summer }	916600	1837	66	3.6	494000

Though there is slight decrease in the area, the yield rate has increased by 61 lb./acre and the total production is 2.6% greater than that of the corresponding season in 1958. In this connection, it has to be pointed out that the acreage under dry land paddy in Devicolam, Peermade and Udumbanchola taluks is grouped as punja crop since the harvest period is more or less that of the punja in the Kuttarad region and the yield rate also for these taluks is not based upon actual crop cutting experiments but on careful local enquiries.

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TABLE I.

Winter (Mundakan) crop of Paddy 1959 in Kerala State.
Statement showing the estimated mean yield per acre
and the total out-turn of Rice in different taluks.

Sl. No.	Districts and taluks	No. of experiments	Net area harvested (acres)	Mean yield of paddy (lb. per acre)	Standard error (lb.)	Total out-turn of Rice (Tons)
1	2	3	4	5	6	7
1	Neyyattinkara	30	10632	2146	160	6692
2	Trivandrum	28	10911	2134	413	6829
3	Nedumangal	28	11111	2473	146	8059
4	Chirayinkil	18	11511	2464	333	8319
	TRIVANDRUM DISTRICT	104	44165	2308	..	29899
5	Quilon	20	12367	2056	77	7458
6	Kottarakara	30	14923	2932	144	13096
7	Pathanapuram	29	8456	2648	207	6568
8	Pathanamthitta	30	5490	2708	93	4361
9	Kunnathur	28	10528	1818	73	5614
10	Karunagappally	30	10159	2235	50	6660
	QUILON DISTRICT	167	61923	2409	..	43757
11	Karthikappally	14	14556	1928	308	8231
12	Mavelikara	13	3755	1744	398	1921
13	Chengannoor	..	863	2658	151	673
14	Thiruvalla	20	3364	1689	151	1666

TABLE I—(contd.)

1	2	3	4	5	6	7
15	Kuttanad	..	..	..	..	..
16	Ambalapuzha	..	..	..	..	..
17	Sherthalai	30	9193	1072	157	2890
	ALLEPPEY DISTRICT	77	31731	1653	..	15381
18	Changanacherry	29	3669	1738	190	1819
19	Kottayam	24	16247	1750	154	8339
20	Kanjirappally	..	11	1540	190	5
21	Peermade	..	..	..	..	..
22	Deviculam	..	..	..	..	..
23	Udumbanchola	..	..	..	..	..
24	Meenachil	28	5524	1649	147	2672
25	Vaikom	29	17580	1796	313	9250
	KOTTAYAM DISTRICT	110	42911	1755	..	22085
26	Thodupuzha	30	7187	2080	111	4385
27	Moovattupuzha	25	10539	1315	277	4065
28	Kunnathunad	30	28000	1597	99	13115
29	Alwaye	18	23384	2065	440	14163
30	Cochin	..	..	..	..	..
31	Kanayannore	26	12379	1694	148	6151
32	Parur	21	3218	1603	95	1513
	ERNAKULAM DISTRICT	150	84707	1747	..	43392

TABLE I.—(contd.)

1	2	3	4	5	6	7
33	Crangannore	22	4059	1590	88	1893
34	Mukundapuram	7	40110	1709	644	20105
35	Trichur	14	45632	1567	200	20973
36	Talapally	13	26516	1513	128	11764
37	Chowghat	18	22017	1161	180	7497
	TRICHUR DISTRICT.	74	138334	1534	..	62232
	Travancore- Cochin Region	682	403771	1830	..	216746
38	Chittur	..	36743	2399	..	25854
39	Alathur	29	32843	2336	191	22503
40	Palghat	25	32415	1927	296	18321
41	Ottappalam	30	27575	2109	184	17057
42	Ponnani	5	10956	1052	346	3381
43	Perinthalmanna	21	25640	2427	143	18252
	PALGHAT DISTRICT.	110	166172	2162	..	105368
44	Tirur	..	16861	1401	..	6929
45	Ernad	..	29177	1974	..	16893
46	Kozhikode	10	10466	504	22	1547
47	Quilandy	23	3785	699	91	776
48	Badagara	30	1978	888	145	515
49	South Wynad	..	32223	1029	..	9725
	KOZHIKODE DISTRICT	63	94490	1313	..	30385

TABLE I—(concl'd.)

1	2	3	4	5	6	7
50	North Wynnad .	38	15538	1607	152	7324
51	Tellicherry .	14	7247	1468	220	3120
52	Cannanore .	27	4331	990	138	1258
53	Taliparamba .	30	15222	1146	39	5117
54	Hosdurg .	16	9523	1914	187	5346
55	Kasaragode .	20	11876	1515	104	5277
	CANNANORE DISTRICT .	145	63737	1468	..	27442
	Malabar Region .	318	324399	1778	..	169195
	Keraia State .	1000	728170	1807	81	385941
	Rounded to hundreds .	..	728200	..	..	386000

TABLE II.

Mundakan (Winter) Crop of paddy in Kerala 1959
 Estimated District-wise area and yield rate of paddy in lbs. per acre under Irrigated, Chemically manured, combined and control plots.

Name of District.	Irrigated Plots (I)			Chemically Manured Plots (M)		
	Area (acre)	Yield of paddy lb./ac.	No. of sample plots.	Area (acre)	Yield of paddy lb./ac.	No. of sample plots.
1	2	3	4	5	6	7
Trivandrum	2544	2870	6	20382	2423	48
Quilon	2888	1728	7	49548	2500	125
Alleppey	2763	1762	9	24717	1564	60
Kottayam	1667	1643	5	19503	1669	61
Ernakulam	9605	1758	9	25161	1973	63
Trichur	11989	2301	8	47711	1443	27
Palghat	25971	1562	30	60266	1969	34
Kozhikode				27473	764	28
Cannanore				17572	1346	82
STATE	57427	1827	74	292333	1800	528

TABLE II—(contd.)

Mundakan (Winter) crop of paddy in Kerala 1959
 Estimated District-wise area and yield rate of paddy in lb. per acre under Irrigated, Chemically
 manured, combined and control plots.

Name of District.	Irrigated & Chemically manured plots (I & M)			Neither Irrigated or Manured (O)			Total area acre.
	Area (acre)	Yield of paddy lb./ac.	No. of sample plots.	Area (acre.)	Yield of paddy, lb./ac.	No. of sample plots.	
	8	9	10	11	12	13	14
Trivandrum	13590	2420	32	7649	1461	18	44165
Quilon	2509	2487	9	9866	2229	33	61923
Alleppey ^a	1238	1981	3	2888	1309	7	31731
Kottayam	11084	1958	25	9561	2321	15	42911
Ernakulam	31653	1839	50	26226	1653	32	84707
Trichur	17801	1550	10	63217	1578	28	188334
Palghat	79686	2347	60	14231	253	8	166172
Kozhikode	22002	923	14	45015	640	21	94490
Cannanore	5539	1742	16	14655	914	17	63737
STATE	185102	1987	219	193308	1423	179	728170

TABLE III
Mundakan (Winter) crop of Paddy, 1959 in Kerala State

Sl. No.	Range of yield Paddy in lbs. per acre.	Frequency Distribution.
1	Below 500	28
2	500— 699	38
3	700— 899	46
4	900—1099	73
5	1100—1299	78
6	1300—1499	96
7	1500—1699	99
8	1700—1899	103
9	1900—2099	97
10	2100—2299	90
11	2300—2499	66
12	2500—2699	43
13	2700—2899	50
14	2900—3099	31
15	3100—3299	22
16	3300—3499	18
17	3500—3699	7
18	3700—3899	4
19	3900—4099	6
20	4100—above	5
	TOTAL	1000

TABLE IV

Winter crop of Paddy, 1959 in Kerala State

Analysis of variance of plot yields pooled for the state in
(lbs.)² per plot of $\frac{1}{160}$ of an acre.

Source.	Sum of squares	Degrees of freedom	Variance.
Between Taluks ..	19052	41	433.0*
Between Karas within Taluks ..	7521	188	40.0*
Within Karas within Taluks ..	3761	797	4.7
Total ..	30334	1029	...

* Denotes significance at 1% level.

TABLE I
Punja (Summer) crop of Paddy, 1959 in Kerala State.
 The Statement showing the estimated mean yield per acre and the total outturn of Rice in different Taluks.

Sl. No.	Districts & Taluks.	Number of experiments.	Net area harvested.	Mean yield of dry paddy (lbs./acre.)	Standard error (lbs.)	Total out-turn of Rice (Tons)
1	2	3	4	5	6	7
1	Karunagapally	20	370	2035	352	221
	QUILON DISTRICT	20	370	2035	..	221
2	Karthikapally	17	11109	2191	198	7139
3	Mavelikara	20	10397	2128	194	6489
4	Chengannoor	27	5951	2658	289	4639
5	Thiruvalla	27	10400	2037	217	6214
6	Kuttanad	30	41020	2103	166	25362
7	Ambalapuzha	30	1304	2058	151	787

TABLE I—(concl'd.)

1	2	3	4	5	6	7
	ALLEPPEY DISTRICT	151	80181	2150	..	50570
8	Changanacherry	..	7273	1863	..	3974
9	Kottayam	..	14049	1791	109	7380
10	Vaikom	..	5753	1796	21	3031
11	Meenachil	..	168	1688	136	83
	DEVICOLAM, PEERMADAM AND UDUMBAN- CHOLA	..	23000	1876	..	15957
	KOTTAYAM DISTRICT	..	56243	1844	..	30425
12	Moovattupuzha	30	95	1315	136	37
13	Kanayannoor	..	956	1694	..	475
14	Kunnathunad	..	2360	1965	159	1360
15	Alwaye	29	1944	2065	80	1177
16	Parur	13	3040	1685	161	1502
	ERNAKULAM DISTRICT	97	8395	1849	..	4552
17	Cranganore	7	80	2218	39	52
18	Mukundapuram	21	4713	1767	105	2443
19	Trichur	27	7333	1590	167	5420
20	Talappally C.L.	13	1613	1838	287	870
21	Chowghat	11	2061	2331	38	1409

22	TRICHUR DISTRICT	..	79	15800	1768	..	8193
23	Travancore-Cochin Region	..	397	160989	1990	..	93961
24	Ottapalam	..	..	2500	2312	..	1695
25	Perinthalmanna	..	..	6100	2696	..	4824
26	Ponnani	..	..	7000	1211	..	2486
27	PALGHAT DISTRICT	..	..	15600	1968	..	9005
28	Tirur	..	..	4800	1563	..	2200
29	North Wynaad	..	30	2414	769	74	545
30	Kasargode	..	..	4632	1705	..	2316
31	CANNANORE DISTRICT	..	..	7046	1384	..	2861
32	MALABAR DISTRICT	..	30	27446	1747	..	14066
33	KERALA STATE	..	427	188435	1955	65	108027
34	Rounded to hundreds	..	..	188400	..	..	108000

TABLE II

Summer (Punja) crop of Paddy, in Kerala 1959.

Estimated District-wise area and yield rate of paddy in lbs./acre under Irrigated, Chemically manured, combined and control Plots.

Name of District	Irrigated plots (I)						Chemically manured plots (M)			I and M		Neither I or M (O)		
	Area (ac.)	Yield (lbs./ac.)	No. of expts.	Area (ac.)	Yield (lbs./ac.)	No. of expts.	Area (ac.)	Yield (lbs./ac.)	No. of expts.	Yield (lbs./ac.)	No. of expts.	Area (ac.)	Yield (lbs./ac.)	No. of expts.
Trivandrum	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Quilon	..	..	..	370	2035	20	..	..	..	..	..	..	..	..
Alleppey	12428	1817	22	35407	2112	62	30266	2385	60	2212	2371	7	..	..
Kottayam	1185	1801	4	8515	1623	14	1754	1806	32	..	..	..	..	..
Ernakulam	259	1981	3	1301	2198	14	6318	1570	75	517	1611	5	..	..
Trichur	8347	1656	39	..	..	..	6125	1625	33	1328	1341	7	..	..
Palghat	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Kozhikode	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cannanore	..	..	..	847	743	5	6200	804	25	..	..	..	..	..
Total	22219	1758	68	46440	1999	115	50663	1978	225	4057	1937	19	..	..

TABLE III.

Punja (Summer) crop of Paddy, 1959 in Kerala State.

Sl. No.	Range of yield Paddy in lbs. per acre.	Frequency Distribution.	Percentage.
1	Below 500	3	0.70
2	500— 699	11	2.58
3	700— 899	12	2.81
4	900—1099	15	3.51
5	1100—1299	35	8.19
6	1300—1499	49	11.51
7	1500—1699	37	8.67
8	1700—1899	62	14.52
9	1900—2099	60	14.05
10	2100—2299	42	9.83
11	2300—2499	47	11.00
12	2500—2699	20	4.68
13	2700—2899	12	2.81
14	2900—3099	8	1.87
15	3100—3299	6	1.40
16	3300—3499	5	1.17
17	3500—3699	1	0.23
18	3700—3699	0	0
19	3900—4099	0	0
20	4100 and above	2	0.47
	TOTAL	427	100.00

TABLE IV

Summer (Punja) crop of Paddy, 1959.

Analysis of variance of plot yields pooled for the State
in (lbs.)² per plot of $\frac{1}{160}$ of an acre.

Source	Sum of squares	Degrees of Freedom	Variance
Between Taluks	6135	18	340.8*
Between Karas within Taluks	2360	74	31.9*
Within Karas within Taluks	9286	324	28.7*
Total	17781	416	..

* Denotes significance at 1% level.

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