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UNIVERSITY OF TRAVANCORE

BUREAU OF STATISTICS

(CENTRAL RESEARCH INSTITUTE)

REPORT

ON

CROP-CUTTING SURVEY ON

KANNI CROP OF PADDY

IN TRAVANCORE

1950

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REPORT ON CROP-CUTTING SURVEY ON
KANNI CROP OF PADDY IN
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I. INTRODUCTION

A. A preliminary crop-cutting survey on paddy was conducted in the Punja fields of Kuttanad and neighbouring areas during March 1950, in order to estimate the yield of paddy and to assess the effect of G. M. F. Aid. But the survey was started late and crop-cutting experiments were done only in 36 Pakuthies out of 47 selected for the survey. All the random plots intended for experiments in the 36 Pakuthies were not available for harvest because a number of them were harvested in February itself. Hence the analysis was confined to the different Pakuthies rather than the Taluks and the overall estimates of yield for the Taluks could not be estimated with sufficient accuracy. Since the survey was of an exploratory character the number of experiments conducted was large but the cost per experiment was very low (Rs. 1-4-7). The preliminary survey was an eye-opener in regard to practical difficulties of the nature indicated above and to avoid such encumbrances a scheme for conducting the crop-cutting survey on Kanni crop of paddy in Travancore was submitted to Government as early as May 1950. Sanctions were received for conducting the survey in Order A1-5045/50/SD, dated 9th August 1950 and the field experiments were started on 13th August 1950. However, harvest had already begun in the Taluks of Quilon, Karthikappally, Karunagappally, Kottarakara, Pathanapuram and Thodupuzha by this time and in these Taluks a few of the random plots selected for experiment had already been harvested.

B. The present report deals with the crop-cutting survey on Kanni crop of paddy (excluding forest cultivation) in 28 Taluks of Travancore. Two Taluks, Deviculam and Peermade, were not considered for the survey as the area under paddy in these Taluks was comparatively small. The object of the survey was two-fold:

1. The estimation of yield of paddy in 28 Taluks of Travancore.

and 2. The estimation of the increase, if any, in the average yield of paddy in Taluks due to Grow More Food Aid.

II. KANNI CROP OF PADDY

There are two major crops of paddy in the State, the Kanni crop and the Kumbham crop. The area under cultivation is usually larger during the Kumbham crop than the Kanni crop and hence the Kanni crop comes only second to the Kumbham crop as regards the total production of paddy.

The sowing season is spread over the three months, May, June and July and harvesting season over August, September and October. The season was not quite favourable for cultivation as there were instances of untimely rainfall all over Travancore and in Kuttanad there were damages to crop due to flood.

III. TECHNIQUE

The method adopted for selecting random plots was sampling proportional to the total area under paddy in each Taluk. The number of karas to be included in the experiment was fixed as 10 per cent of the total number of karas in Travancore. A ten per cent sample of karas was obtained by first fixing the number of karas to be allotted to each Taluk based on the total area under paddy in the respective Taluks and then selecting at random the required number of karas in a particular Taluk from the entire list of karas of that Taluk. This selection was made in the Statistical Bureau and the Statistical Assistants in the different Taluks were directed to forward to the Statistical Bureau a complete list of the survey numbers of plots under paddy in the karas sampled. Based on the list supplied by the Statistical Assistants fifteen survey numbers of plots were selected at random in each kara of which the first five were to be

considered for crop-cutting experiments. A list of fifteen survey numbers was provided since in certain karas there were instances of recent conversion of paddy land into garden land and in rare cases a different crop was found growing in paddy lands. Within the selected plots a cut of size $16\frac{1}{2}' \times 16\frac{1}{2}'$ or $1/160$ of an acre was proposed to be taken at random for experimentation.

IV. FIELD WORK

The field work was carried out under the supervision of three Research Officers of the Statistics Division in the University. The Statistical Assistants in each Taluk visited the field, contacted the owners of the plots and ascertained the date of harvest. For carrying out the crop-cutting experiments the Statistical Assistants were assisted by 25 M.Sc. students in Statistics. In addition to the M.Sc. students twelve Investigators also were employed to assist the Statistical Assistants. The M.Sc. students and the Investigators were deputed for work in each Taluk with due regard to the comparative volume, urgency and difficulty of work in the Taluk so that the number of field staff for the crop-cutting work varied from Taluk to Taluk.

The training of the field staff for conducting the field work was imparted by the Research Officers. After instructing the field staff about location of sampling cut and the measurements to be taken, practical demonstration was made in a few fields. The field staff were supplied with copies of forms for entry, survey numbers of plots selected, random numbers, instruction sheets, and other equipments before they left for field work in the respective Taluks allotted to them.

V. ANALYSIS AND INFERENCES

The analysis of data was conducted in the Statistical Bureau. With a view to studying the effect of G. M. F. Aid the mean yields of paddy in the different Taluks for plots receiving G. M. F. Aid and no G. M. F. Aid have been estimated separately. These mean yields with their respective standard errors are given in Table II. The analysis of variance of yields relating to G. M. F. Aid, no Aid, and yields relating to both are given in

Table III (a), (b), and (c) respectively for the different Taluks. The analysis of variance of yields for the entire Travancore area relating to G.M.F. Aid, no Aid, and both considered together may be observed from Table IV. The difference between mean yields relating to G.M.F. Aid and no Aid in each Taluk was tested separately applying the t-test. The tests showed significant differences in the following Taluks:—

- | | |
|------------------|---------------|
| 1. Agasteeswaram | 5. Thiruvalla |
| 2. Kottarakara | 6. Vaikom |
| 3. Kunnathur | 7. Parur |
| 4. Mavelikara | |

In Parur alone the mean Yield due to no G.M.F. Aid was observed to be significantly greater than that due to G.M.F. Aid. Since significant differences were observed between yields due to G.M.F. Aid and no Aid in seven Taluks mentioned above the yield for G.M.F. Aided Plots and other plots were estimated separately with the help of the estimated areas under G.M.F. Aid and no G.M.F. Aid in these Taluks. Table I gives the details regarding the area under paddy (column 2) number of experiments conducted (col. 3) mean yield per acre (col. 4) standard error (col. 5) percentage standard error (col. 6) total outturn of paddy (col. 7) and total outturn of rice (col. 8) relating to the different Taluks and the Travancore area as a whole. Table V gives the percentage reduction factor for driage for the different Taluks.

VI. SUMMARY

Crop-cutting survey was conducted in 28 Taluks of Travancore area (excluding forest cultivation areas) the total number of experiments done being 1682 of which 347 were relating to paddy receiving G.M.F. Aid and 1335 not receiving G.M.F. Aid. Estimates of mean yield per acre of plots receiving G.M.F. Aid and no G.M.F. Aid for each Taluk were obtained separately with their respective standard errors. Significant differences between mean yields due to G.M.F. Aid and no G.M.F. Aid were observed in seven Taluks, Agasteeswaram Kottarakara, Kunnathur, Mavelikara, Thiruvalla, Vaikom and Parur and in Parur alone the yield due to no G.M.F. Aid was found to be significantly higher than the yield

due to G.M.F. Aid*. The total outturn of paddy and rice in each Taluk and consequently in the Travancore area has been estimated. The estimated total outturn of paddy in the 28 Taluks of Travancore is 152,198 tons.

VII. ACKNOWLEDGEMENTS

It is gratifying to note that the owners of the fields rendered all help for the successful conduct of the crop-cutting experiments. The Tahsildars of the areas and their subordinates gave their whole-hearted support and co-operation, taking active interest in the survey and coming to the field for conducting the experiments.

To estimate the loss of weight due to driage of raw paddy, the sample specimens were sent to the Division of Applied Chemistry. The part played by the Division of Applied Chemistry in promptly drying and weighing the samples has considerably helped in assessing the final estimates with great accuracy.

*In Parur G.M.F. Aid is irrigation alone in most cases.

TABLE I
Estimated total outturn of dried paddy and rice in 28 Taluks of Travancore
(excluding forest cultivation)

Taluk	Area (acres)	No. of expts.	Mean yield per acre (lbs.)	Standard error (lbs.)	Per cent standard error	Total outturn of paddy (Tons)	Total outturn of rice* (Tons)	
	1	2	3	4	5	6	7	8
Thovala	11471	41	2044	72	3.53	10467.29	6878.05	
Agasteeswaram	7374	35	1285	76	5.91	4230.17	2779.64	
"	11279	45	1710	68	3.98	8610.31	5657.83	
Kalkulam	18824	70	2062	86	4.18	17328.16	11386.33	
Vilavancode	7770	20	1191	122	10.23	4131.28	2714.66	
Neyyattinkara	10529	50	1342	119	8.90	6308.00	4144.99	
Trivandrum	8210	40	1056	67	6.31	3870.43	2543.26	
Nedumangad	12440	40	1000	77	7.60	5553.57	3649.25	
Churayinkil	9982	30	938	95	10.14	4179.96	2746.65	
Quilon	8404	29	1324	75	5.69	4967.36	3264.05	
Kottarakara	12292	45	968	33	3.41	5311.90	3490.45	
"	2717	15	1409	60	4.26	1709.04	1123.01	
Kunnathur	1477	6	405	59	14.57	267.05	175.48	
"	9301	39	1440	45	3.13	5979.21	3928.94	
Pathanapuram	10194	28	1120	76	5.38	5097.00	3349.24	
Pathanamthitta	1540	20	1175	76	6.42	807.81	530.81	
Karunagappally	9591	30	670	31	4.60	2868.29	1884.75	
Karthikappally	12072	83	1237	90	7.30	6666.55	4380.59	

*Taking rice as '657' of dried paddy.

TABLE I—(cont.)

Taluk	Area (acres)	No. of expts.	Mean yield (lbs.)	Standard error (lbs.)	Percent standard error	Total outturn of paddy (Tons)	Total outturn of rice (Tons)
1	2	3	4	5	6	7	8
Mavelikara No aid	6133	74	1002	39	3.89	2743.42	1802.70
" Aid	2692	14	1410	57	4.04	1694.52	1113.47
Thiruvalla No aid	7817	84	691	26	3.76	2411.40	1584.53
" Aid	2282	21	1351	62	4.59	1376.33	904.39
Shenkottah	3833	25	1997	141	7.07	3417.19	2245.44
Ambalapuzha	4159	80	960	46	4.75	1782.43	1171.23
Sherthala	8824	55	1014	39	3.84	3994.44	2624.75
Changanacherry	3397	55	1300	41	3.17	1971.47	1295.45
Kottayam	3030	72	1339	39	2.94	1811.24	1190.16
Meenachil	4247	30	1020	42	4.09	1933.90	1270.76
Vaikom	6608	71	806	34	4.22	2377.70	1562.39
" No aid	460	9	1226	175	14.27	251.77	165.44
" Aid	11664	130	1019	20	1.97	5306.08	3486.62
Moovattupuzha	9267	15	973	47	4.78	4025.35	2645.06
Thodupuzha	28231	178	865	31	3.60	10901.70	7163.51
Kunnathunad	10045	83	1504	33	2.19	6744.50	4431.81
Parur	2341	20	1054	53	5.03	1101.52	723.81
"							
STATE	280497	1682	1216	13	1.07	152198.34	100011.50

TABLE II

Estimates of average yields in lbs. 2 per acre and the corresponding Standard Errors for plots receiving G. M. F. Aid and no G. M. F. Aid in 28 Taluks of Travancore

Taluks	G. M. F. Aid			No. G. M. F. Aid		
	No. of experiments	Mean yield per acre (lbs.)	Standard error (lbs.)	No. of experiments	Mean yield per acre (lbs.)	Standard error (lbs.)
Thovala	28	2190	87	13	1728	119
Agasteeswaram	45	1710	68	35	1285	76
Kalkulam	45	2235	119	25	1750	124
Vilavancode	7	931	90	13	1244	175
Neyyattinkara	8	1409	132	42	1330	136
Trivandrum	1	1207	..	39	1046	69
Nedumangad	2	1101	..	38	994	82
Chirayinkil	4	1305	185	26	882	105
Quilon	10	1584	89	19	1188	93
Kottarakara	15	1409	25	45	968	33
Kunnathur	39	1440	54	6	405	59
Pathanapuram	7	1366	56	21	1038	54
Pathanamthitta	13	1205	78	7	1120	158
Karunagappally	..	..	..	30	670	31
Karthikappally	..	..	..	83	1237	90
Mavelikara	14	1410	57	74	1002	39
Thiruvalla	21	1351	62	84	691	26
Shenkottah	1	3767	..	24	1924	119
Ambalapuzha	4	671	..	76	975	47
Shertallai	1	1039	..	54	1013	40
Changanacherry	14	1463	77	41	1245	46
Kottayam	3	1283	52	69	1341	41
Meenachil	5	982	52	25	1027	41
Vaikom	9	1226	175	71	806	34
Moovattupuzha	14	1145	61	116	1009	20
Thodupuzha	..	..	..	15	973	47
Kunnathunad	17	1034	145	161	847	32
Parur	20	1054	53	83	1504	33
STATE	347	1344	24	1335	1107	12

TABLE III (a)

Analysis of Variance of Plot Yields in lbs. 2 per plot of
(1/160)th of an acre

Plots which received G. M. F. Aid

Taluk	Between Karas		Within Karas	
	Degrees of freedom	Variance	Degrees of freedom	Variance
Thovala	5	157.674*	22	11.161
Agasteeswaram	7	63.483*	37	10.703
Kalkulam	6	90.735*	38	35.663
Vilavancode	1	16.230	5	3.408
Neyyattinkara	3	8.240	4	7.573
Trivandrum	..	..	..	..
Nedumangad	1	0.030	..	..
Chirayinkil	..	..	3	8.690
Quilon	2	83.265*	7	4.663
Kottarakara	4	12.103*	10	0.577
Kunnathur	7	15.027	31	6.713
Pathanapuram	3	24.580*	3	1.377
Pathanamthitta	2	1.915	10	4.446
Karunagappally	..	..	..	..
Karthikappally	..	..	..	..
Mavelikara	8	23.752*	5	2.550
Thiruvalla	10	19.536*	10	5.000
Shenkottah	..	..	..	..
Ambalapuzha	2	3.375	1	..
Shertallai	..	..	..	..
Changanacherry	6	17.288*	7	4.423
Kottayam	1	24.000	1	0.500
Meenachil	..	..	3	0.767
Vaikom	4	16.010	4	14.758
Moovattupuzha	5	6.736	8	2.913
Thodupuzha	..	..	..	..
Kunnathunad	8	9.498	8	21.986
Parur	4	44.148*	15	3.399

*Significant at 5% level.

TABLE III (b)

Analysis of Variance of Plot Yields in lbs. 2 per plot of (1/160)th
of an acre

(Plots which did not receive G. M. F. Aid)

Taluk	Between Karas		Within Karas	
	Degrees of freedom	Variance	Degrees of freedom	Variance
Thovala	3	123·640*	9	9·516
Agasteeswaram	7	35·456*	27	10·258
Kalkulam	4	44·648	20	21·390
Vilavancode	2	66·005	10	23·880
Neyyattinkara	9	61·473	32	42·188
Trivandrum	7	30·696*	31	11·457
Nedumangad	7	32·310	30	15·472
Chirayinkil	5	16·228	20	18·037
Quilon	5	20·646	13	9·665
Kottarakara	10	3·030	34	2·913
Kunnathur	1	1·410	4	1·200
Pathanapuram	5	17·714	15	3·803
Pathanamthitta	2	9·255	4	9·895
Karunagappally	5	69·566*	24	1·802
Karthikappally	16	37·842	66	39·704
Mavelikara	22	20·574*	51	6·146
Thiruvalla	19	8·552	64	3·588
Shenkottah	4	33·438	19	19·422
Ambalapuzha	15	21·424*	60	10·335
Shertallai	9	59·233*	44	5·676
Changanacherry	10	39·801*	30	4·546
Kottayam	14	6·868	54	7·030
Meenachil	5	24·480*	19	2·413
Vaikom	15	21·503*	55	4·326
Moovattupuzha	24	7·183*	91	2·688
Thodupuzha	2	2·995	12	2·804
Kunnathunad	40	9·708	120	9·795
Parur	18	114·746*	64	14·131

*Significant at 5% level.

TABLE III (c)

Analysis of Variance of Plot Yields in lbs. 2 per plot of
(1/160) th of an acre.

Plots of both kinds

Taluk	Between Karas		Within Karas	
	Degrees of freedom	Variance	Degrees of freedom	Variance
Thovala	5	236.720*	35	11.623
Agasteeswaram	8	57.829*	71	15.373
Kalkulam	6	148.668*	63	28.979
Vilavancode	3	48.133	16	17.901
Neyyattinkara	9	44.949	40	38.908
Trivandrum	7	30.876*	32	11.099
Nedumangad	7	32.400	32	14.526
Chirayinkil	5	18.586	24	17.267
Quilon	6	46.277*	22	9.550
Kottarakara	11	13.856*	48	3.402
Kunnathur	8	44.512*	36	7.222
Pathanapuram	6	21.241*	21	6.333
Pathanamthitta	3	1.883	16	6.416
Karunagappally	5	69.566*	24	1.802
Karthikappally	16	37.842	66	39.204
Mavelikara	22	19.121*	65	10.094
Thiruvalla	20	21.078*	84	7.789
Shenkottah	4	26.823	20	28.669
Ambalapuzha	15	21.213*	64	10.181
Shertalai	9	61.044*	45	5.631
Changanacherry	10	48.072*	44	4.882
Kottayam	14	7.886	57	6.841
Meenachil	5	26.756*	24	3.017
Vaikom	15	30.088*	64	4.802
Moovattupuzha	25	8.359*	104	3.053
Thodupuzha	2	2.995*	12	2.804
Kunnathunad	42	10.499	135	10.430
Parur	20	119.389*	82	12.295

*Significant at 5 % level.

TABLE IV

Analysis of Variance of Plot Yields pooled in the State
(in lbs. 2 per plot of (1/160)th of an acre)

(a) Plots which receive no G. M. F. Aid

Source	Sum of squares	Degrees of Freedom	Variance
Between Taluks ..	5380.26	27	199.27*
Between Karas within Taluks ..	8355.98	285	29.32*
Within Karas ..	11463.05	1022	11.22

(b) Plots which received G. M. F. Aid

Source	Sum of squares	Degrees of Freedom	Variance
Between Taluks ..	3241.83	24	135.08*
Between Karas within Taluks ..	3121.24	90	34.68*
Within Karas ..	2780.97	232	11.99

(c) Plots of both kinds

Source	Sum of squares	Degrees of Freedom	Variance
Between Taluks ..	9515.28	27	352.42*
Between Karas within Taluks ..	11545.27	308	37.48*
Within Karas ..	16465.41	1346	12.23

*Significant at 5 % level.