

Report of the
Experimental work of
the Samalkota Agricultural

Station

1912-1913

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Department of Agriculture, Madras

REPORT

OF THE

EXPERIMENTAL WORK OF THE SAMALKOTA AGRICULTURAL

STATION

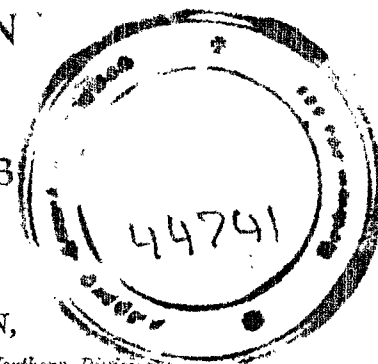
FOR

1912-1913

BY

G. R. HILSON,

Deputy Director of Agriculture, Northern Division.



* செப்பலிடுவதற்காக எடுத்துக் *
* கொள்ளப்பட்ட *
* மாதம் வருடம் 1988 *
* செப்பலிட்டு முடித்த *
* மாதம் வருடம் 1988 *
* ஆராய்ச்சி உதவிபாளரின் *
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REPORT OF THE EXPERIMENTAL WORK OF THE SAMALKOTA AGRICULTURAL STATION FOR 1912-1913.

TABLE I.
Rainfall Table, Samalkota.

Month.	Fort- night.	1908-09.	1909-10.	1910-11.	1911-12.	1912-13.	Aver- age.
April	{ 1st 2nd	{ 0'00 0'00	{ 0'68 7'82	{ 0'00 0'64	{ 0'00 0'62	{ 0'00 0'00	2'40
May	{ 1st 2nd	{ 1'37 1'37	{ 0'58 0'56	{ 0'00 0'14	{ 0'00 1'99	{ 0'00 1'90	
June	{ 1st 2nd	{ 0'30 1'50	{ 1'96 1'64	{ 1'35 5'34	{ 6'29 1'56	{ 0'46 0'12	
July	{ 1st 2nd	{ 1'79 0'75	{ 5'64 4'95	{ 2'88 5'93	{ 5'76 0'71	{ 3'67 4'08	21'96
Aug.	{ 1st 2nd	{ 4'35 2'11	{ 2'51 4'90	{ 2'72 1'82	{ 0'29 1'34	{ 2'71 4'75	
Sep.	{ 1st 2nd	{ 4'13 7'79	{ 6'22 1'36	{ 1'38 9'55	{ 2'48 4'07	{ 2'52 8'83	
Oct.	{ 1st 2nd	{ 1'32 0'03	{ 0'00 0'00	{ 0'55 4'57	{ 2'91 1'66	{ 0'78 1'71	
Nov.	{ 1st 2nd	{ 0'01 0'00	{ 0'00 0'00	{ 7'55 0'00	{ 0'00 4'56	{ 0'06 2'02	14'45
Dec.	{ 1st 2nd	{ 0'00 0'00	{ 1'75 0'00	{ 0'00 0'00	{ 0'64 0'00	{ 0'00 0'00	
Jan.	{ 1st 2nd	{ 0'00 0'00	{ 0'00 0'02	{ 0'00 0'00	{ 0'00 0'00	{ 0'00 0'00	
Feb.	{ 1st 2nd	{ 0'00 0'00	{ 0'00 0'00	{ 0'00 0'00	{ 0'07 0'06	{ 0'00 0'00	1'05
Mar.	{ 1st 2nd	{ 0'00 0'00	{ 0'00 0'00	{ 0'00 0'00	{ 0'00 0'14	{ 0'00 0'00	
TOTAL ...		26'82	40'59	44'42	35'14	23'61	39'60

Season.—The rainfall was considerably below the average and its distribution was on the whole unfavourable. The fall of 1'9 inches at the end of May precipitated, as it was, within a period of twenty-four

hours was of benefit to the sugar-cane crop and to the dry sown paddy seed-beds. The subsequent drought (the total fall of .53 inches recorded for June fell on three separate occasions and was of no benefit) however, which lasted till the 10th of July, affected the sugar-cane adversely and entirely spoilt the paddy seed-beds, necessitating their being re-sown and thus making transplanting very late. Many of the ryot's fields were not planted till late in August. Once started, however, except for a break of twelve days in the middle of August, which again helped to keep the canes back, but which did not affect the paddy which had been transplanted, the South-West Monsoon rains were fairly constant, with the result that sugar-cane, though it did not in general grow so tall as usual yet gave yields well up to the average and paddy yielded above the normal.

PART I.—SUGAR-CANE.

2. Diseases.—(a) Red Rot.

The attack of this disease has this year been practically negligible, Red Mauritius, Fiji C, B. 208 and B.376 being the only varieties affected. No diseased canes were found in the upland nursery, while on the farm on an area of 1.7 acres representing some 18,000 clumps only 70 were found in which some or all of the canes were diseased. But, whether the lightness of the attack this year is due to the method of selecting the canes, or to the seasonal conditions being unfavourable to the disease or to both combined, it is not possible to say. In preparing sets, the canes to be used are first of all harvested clump by clump, and each clump is tied up so that canes from different clumps do not mix. As the canes are cut up, a careful watch is kept for signs of disease or damage, all sets cracked or borer or having broken buds are discarded and if one is found to be diseased the whole clump to which it belongs, including any sets already cut and passed as being sound, are put aside to be crushed. The year under report is the second in which the crop has been grown from sets selected in this manner and it is hoped by continuing on this plan that the disease will be reduced to and kept within reasonable limits.

(b) *Smut*.—This disease was present on a few Java canes, but did not cause any loss.

3. *Varieties*.—The following varieties B. 3412, B. 147, B. 6450, B. 376, J. 247, B. 1529, J. 36, Red Mauritius and B. 1753 were grown on duplicate plots in field No. 28. B. 1753 with the exception of two sets, failed entirely. The results obtained from the other varieties are shown below.

TABLE II.

Varieties	Percentage of failures	Area of plot.	No. of canes per acre.	Weight of canes per acre.	Average weight of canes.	Weight of juice per acre.	Percentage of juice to cane.	Weight of raw-sugar per acre.	Percentage of raw-sugar to cane.
B. 3412	15.6	1.6	30,000	146,437	4.9	109,375	74.6	15,035	10.6
	31	1.28	42,187	135,234	3.2	80,078	59.2		
B. 147	2	1.6	41,250	140,250	3.4	84,583	66.7	16,800	11.8
	11.5	1.28	42,014	142,187	3.3	101,562	71.4		
B. 6450	4	1.6	33,750	148,000	4.3	103,125	69.7	15,833	11.3
	18	1.28	32,812	121,640	3.7	81,034	66.6		
B. 376	18	1.6	26,250	122,125	4.6	87,600	71.6	13,818	11.6
	44	1.28	25,000	97,242	3.8	75,234	77.2	13,435	13.8
J. 247	10.1	1.6	44,375	185,437	4.1	127,312	68.9	22,014	11.7
	15	1.28	60,937	195,703	3.3	124,062	63.4		
B. 1529	13.2	1.6	37,500	99,312	2.6	68,230	63.6	10,382	10.6
	22	1.28	37,500	98,875	2.6	58,593	60.6		
J. 36	7.6	1.6	54,375	185,437	2.9	94,875	61.1	16,771	10.9
	12	1.28	56,328	150,937	2.7	92,422	61.2		
Red Mauritius	15.2	1.6	31,875	101,875	3.2	68,875	65.6	13,333	12.5
	30	1.28	37,187	113,359	3.0	74,219	65.5		

Weights in lbs.

In the Northern half of the field and to a uniform distance from the bund the land did not dry so thoroughly as in the Southern half; it could not, therefore, be crowbarred so deeply as that part of the field and in consequence the canes on this area were grown under less favourable conditions. This was evident from the appearance of the crop while growing, the canes in the Northern half with the exception of J. 247 and J. 36 which were to all appearance practically as good as their duplicates and B. 1529 which was only a little inferior to its duplicate, being considerably poorer up to a late stage in their growth, than those in the Southern half. Red Mauritius, however, made up this difference, the others remained poorer to the end.

Separate results for each plot are not given, as, owing to the smallness of the plots it was necessary in most cases, to mix juice left over from one plot with that of another of the same variety, and because it was found that the percentage of raw-sugar obtained from two consecutive boilings from the same cane varied considerably. Except, therefore, in the case of B. 376 where no such mixing was necessary, the total yields alone have been given.

Analyses of the juice of these varieties were made at the time of crushing and are shown below. The sample was in each case taken from the juice of a full boiling:—

TABLE III.

Variety.	Brix degrees corrected.	Percentage of sucrose.	Percentage of glucose.	Co-efficient of purity.
B. 3,412 North ...	17.57 } 17.72	14.52 } 14.97	1.30 } 1.35	84.91 } 84.48
" South ...	17.87 }	15.02 }	1.41 }	84.05 }
B. 147 " ...	18.37 } 18.83	15.87 } 16.61	0.90 } 0.75	86.39 } 88.16
" North ...	19.29 }	17.35 }	0.61 }	89.94 }
B. 6,450 South ...	17.67 } 18.53	15.64 } 16.38	0.65 } 0.54	88.51 } 89.42
" North ...	19.39 }	17.13 }	0.44 }	88.34 }
B. 376 South ...	18.17 } 18.91	16.25 } 17.09	0.80 } 0.67	89.43 } 90.09
" North ...	19.65 }	17.94 }	0.54 }	90.76 }
Java, 247 " ...	18.75 } 17.51	16.31 } 14.55	0.60 } 1.25	86.99 } 82.80
" South ...	16.28 }	12.80 }	1.90 }	78.62 }
B. 1529 " ...	21.87 } 21.47	19.95 } 19.70	0.47 } 0.41	91.22 } 91.76
" North ...	21.07 }	19.45 }	0.36 }	92.31 }
Java 36 " ...	19.17 } 19.22	18.49 } 18.02	0.22 } 0.26	93.07 } 92.80
" South ...	19.27 }	17.64 }	0.30 }	91.54 }
Red Mauritius-North.	19.77 } 20.02	17.50 } 17.86	0.93 } 0.90	88.51 } 89.22
" South.	20.27 }	18.23 }	0.88 }	89.93 }

4. CULTIVATION EXPERIMENTS.

(a) *Ridge-planting*.—This method was tried again this year in field No. 28 with very much the same result. Germination was again slow and faulty and most of the canes were short. The yield, as will be seen from the table, was lower than last year:—

TABLE IV.

Weight of cane.	Weight of juice.	Weight of raw-sugar.
Lbs. per acre.	Lbs. per acre.	Lbs. per acre.
27,840	18,000	3,840

Area of plot 2½ cents yields in lbs. per acre.

The experiment has, therefore, been altered. The sets instead of being planted on ridges have been planted at the same distance apart as before, but on the flat. Germination has been quite satisfactory. As before drains will be dug between the rows and the canes earthed up, so that finally they will be growing on ridges. In addition, the canes in part of the field will be wrapped and propped with bamboos, the remainder being left untouched as in the original experiment.

(b) *Flat-bed versus Trench Planting*.—This experiment was tried again in field No. 29. To all appearance there was no difference between the canes grown under these two methods, while they were in the field and the actual difference in yield of raw-sugar is very small, just enough with jaggery at the present price; Rs. 20—Rs. 23 per 500 lbs., to pay the extra cost of trenching. Under normal conditions, the experiment has never afforded definite evidence in favour of trenching and in view of this and considering that the rest of the cane crop on the farm is all planted on the flat and yields satisfactorily, it will be discontinued.

TABLE V.

	1912-1913.			1911-1912.			1910-1911.			1909-1910.		
Method.	Weight of Cane.	Weight of juice.	Weight of raw-sugar.	Weight of Cane.	Weight of juice.	Weight of raw-sugar.	Weight of Cane.	Weight of juice.	Weight of raw-sugar.	Weight of Cane.	Weight of juice.	Weight of raw-sugar.
	lb. per acre.			lb. per acre.			lb. per acre.			lb. per acre.		
Trench ...	71,183	42,759	9,738	41,145	22,814	4,359	52,114	31,572	5,457	72,145	44,679	10,073
Flat-bed.	72,888	49,375	9,438	40,826	23,422	4,431	46,236	22,343	4,257	75,851	44,436	10,500

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TABLE VI.

* The low yield of this plot is probably due to its proximity to the canal.

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TABLE VII.

Variety.		Yield per acre.			
		Number of canes.	Weight of canes.	Weight of juice.	Weight of jaggery.
Red Mauritius unlimed	...	18,410	46,680	29,674	4,269
Do. limed	...	27,280	75,000	50,769	8,560

TABLE VIII.

Particulars.	Brix corrected.	% Sucrose.	% Glucose.	Coefficient of purity.	Glucose ratio.
Red Mauritius unlimed	14.77	9.85	2.11	66.69	21.42
Do. do.	15.27	10.84	1.62	67.71	15.06
Red Mauritius limed	17.98	14.78	.99	82.20	6.49
Do. do.	17.54	14.81	.96	84.43	6.48

PART II.—EXPERIMENTS WITH PADDY.

6. (a) *Varieties*.—Comparative plots of the following varieties Basangi, Banku, Sambalpur, Konamani, Turpu-sanna-Akkalla and Ratnachudi were laid down in field No. 22. This field was in the previous year under cane, which in the Eastern half, except for a small area which fell in the Konamani plot and was harvested only a little earlier than the normal time, became diseased and had to be cleared off. This cleared area was crowbarred and allowed to remain in a rough condition for nearly three months, when the whole field was sown with sesbania for green-manuring.

While the paddy was growing it was noted that the crop in the Eastern half was thinner and shorter than in the Western half, the plots were, therefore, harvested separately. The results are in accordance with the appearance of the crop and show that the exceptional treatment the Eastern half of the field received has in some way brought about conditions unfavourable to the growth of paddy.

TABLE IX.

Varieties.		Yield per acre in pounds.	
		Grain.	Straw.
Rasangi, E.	...	2,809	2,645
" W.	...	4,481	4,300
Banku, E.	...	1,000	4,773
" W.	...	4,391	5,223
Sambalpur, E.	...	2,842	3,584
" W.	...	4,106	6,065
Konamani, E.	...	4,459	6,811
" W.	...	3,665	5,617
Turpu-sanna-Akkalla, E.	...	1,842	2,818
" W.	...	2,492	4,754
Ratnachudi, E.	...	2,725	8,600
" W.	...	4,016	6,003

(b) *Ratnachudi*.—As stated in last year's report fresh seed was obtained from Gaujam and the original result was tested. To all appearance, the three plots were equally good and as will be seen from the table the yields obtained were not very dissimilar. The question of obtaining seed from one locality for use in another instead of relying on the local supply, is of importance, but in this case as both the local seed and the Gaujam seed could be improved by selection, the question will not be gone into any further at present.

TABLE X.

Ratnachudi.		Grain.				Straw.			
		1912-13.	1911-12.	1910-11.	1909-10.	1912-13.	1911-12.	1910-11.	1909-10.
Gaujam *	...	2,652	2,648	1,523	2,957	2,908	3,935	2,926	1,017
Local	...	2,770	2,740	1,480	2,789	2,608	4,067	3,200	4,452
Gaujam †	...	2,912	...	...	...	3,032	...	...	...

* Seed imported in 1909-10.

† " " in 1911-12.

7. *Selections*.—As stated in last year's report a fresh start was made with this work. In each of the original selections Nos. 1 to 4 of Banku, Nos. 1 and 2 of Rasangi, Nos. 1 and 2 of Sambalpur and Nos. 1 and 2 of Bansmati, twenty plants of one type, viz., that most largely represented, were selected and the produce of each lot used for sowing in plots again this year. In addition to these, six single plant selections Nos. 6 to 10 were made in Banku, one No. 3 in Sambalpur and four Nos. 3 to 6 in Bansmati.

These selections were examined in the field and most of them were found to be impure. Single plant selections representing the different types noted were, therefore, made as follows:—

Banku.—No. 1. Five different types, two having grain of the characteristic Banku shape, two with grain like Rasangi and one like Bansmati.

Banku.—No. 2. Three different types, two with grain of the Banku type and one resembling Bansmati.

Banku.—No. 3. Four different types, all with grain resembling Rasangi.

Banku.—No. 4. Four different types, all with grain resembling Rasangi.

Banku.—No. 5. Two different types, both with grain of the Banku type.

Banku.—No. 6. This type was pure.

Banku.—No. 7. This type was pure.

Banku.—No. 8. Four different types, three of the Banku type and one resembling Rasangi.

Banku.—No. 9. Three different types, all resembling *Rasangi*.

Banku.—No. 10. Six different types, two resembling *Banku*, three *Rasangi* and one *Sambalpur*.

Rasangi.—No. 1. Two different types.

Rasangi.—No. 2. Four different types.

Sambalpur.—No. 1. Two different types.

Sambalpur.—No. 2. Two different types, one resembling *Sambalpur* and the other *Bansmati*.

Sambalpur.—No. 3. Five different types, three resembling *Sambalpur* and two *Bansmati*.

Bansmati.—No. 1. Three different types, two resembling *Bansmati* and one *Rasangi*.

Bansmati.—No. 2. Five different types, four with grain of the *Bansmati* type and one resembling *Rasangi*.

Bansmati.—No. 3. Seven different types, four with *Bansmati* shape of grain and three resembling *Sambalpur*.

Single plant selections were also made in *Konamani*, *Ratnachudi* and *Turpu-Sanna-Akkullu* and from a small plot of *Rasangi*, a short term variety cultivated locally, grown from Bazaar seed, 25 single-plant selections each one different in some point from another, were made.

8. *Dry Paddies*.—A fourth variety, white budama was added to the list of varieties being tested. *Mettabudagalu* has given the best return from the comparative plots, and black budama, contrary to expectation the worst.

The yields are as follows:—

TABLE XI.

Variety.	Area of plot. Cts.	Grain per acre.		Straw per acre.	
		1912-1913.	1911-1912.	1912-1913.	1911-1912.
		lbs.	lbs.	lbs.	lbs.
<i>Mettabudagalu</i> ...	11	764	673	1,655	2,100
<i>Mett. Coringa</i> ...	10	440	536	970	600
<i>Black Budama</i> ...	5	280	1,290	960	4,172
<i>White Budama</i> ...	9	506	...	1,018	...
" field No. 1.	20	1,805	...	1,900	...

White budama was tried as a mixture with *Cambodia* cotton on an area of 20 cents in field No. 1 and has given the satisfactory yield of 1,805 lbs. grain and 1,900 lbs. straw.

9. *Manurial Experiments*.—(a) *Castor series*:—This experiment was continued in the second crop season of 1911-1912 and in the main crop season of the year under report. The results obtained are in line with those obtained previously and it is to be noted that the difference between the "castor plus supers" plot and the "no manure" varies regularly with the season, being always greater in the second crop than in the main crop season.

TABLE XII.

Manure.	1912-1913.		1911-1912.		1910-1911.		1910-1911.		1909-1910.		1909-1910.	
	Main crop.		Second crop.		Main crop.		Second crop.		Main crop.		Second crop.	
	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
No manure ...	3,524	5,140	1,544	1,728	2,089	2,964	1,320	1,929	2,680	3,280	2,944	3,920
Castor 5 bags per acre ...	3,616	5,204	1,616	2,144	2,242	3,020	2,140	2,569	2,786	3,680	2,944	3,920
Castor 5 bags and Potash 1 cwt. per acre ...	3,380	4,836	1,552	2,384	1,882	2,510	1,966	2,149	2,932	3,550	2,944	3,920
Castor 5 bags and Super 2 cwts. per acre ...	3,736	6,968	2,916	2,879	2,849	3,552	2,944	3,160	2,840	3,920	2,944	3,920

N.B.—Figures = pounds per acre.

The manures have been applied again to the crop now growing and if the results obtained are in accordance with those already recorded the application of the manures will be discontinued and their residual effect tested.

(b) *Green-manure series.*—This experiment was continued in the same field. Sunnhemp was grown in the standing crop but failed, the plots were, therefore, irrigated and sown with Sesbania.

The crop grew well, the best yield being obtained from the Supers' plot; the crop on the other plots was, therefore, supplemented so that each plot received the same quantity of green matter. The results are in favour of "green-manure plus Supers," but it is possible that the great difference between that plot and the "no manure" plot is due to the latter having been irrigated by mistake at the same time as Sesbania was sown in the other plots. There is a wide-spread belief among delta ryots that paddy land which is allowed to become moistened and dried, as happened in this case, never yields so well as if it had been kept dry up to the time for its preparation for the crop and then when once wet, kept so. The results recorded last year for the hot weather cultivation experiment seem to bear this out.

TABLE XIII.

Manure.	1912-1913.		1911-1912.		1910-1911.		1909-1910.		1909-1910.	
	Main crop.		Main crop.		Main crop.		2nd crop.		Main crop.	
	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
Green manure and Super 2 cwt. per acre (Dhaincha 15,660 lbs. an acre.)	4,180	7,110	2,705	4,600	1,855	2,545	1,915	1,600	3,112	4,520
Green manure (Dhaincha 15,660 lbs. an acre.)	3,320	5,850	2,385	3,635	1,425	2,030	1,525	1,920	3,043	4,175
Green manure and Potash 1 cwt. per acre.	3,485	5,400	2,465	4,325	1,540	2,205	1,620	1,540	2,550	8,550
No manure ...	3,085	4,765	2,510	3,475	1,740	2,755	1,810	1,790	2,075	3,400

(c) *Cattle manure and straw.*—This experiment was continued during the second crop season of 1911-12 and the main crop season of the year under report. The results are shown on the page 15:—

TABLE XIV.

Manure.	Grain.				Straw.			
	Main Crop.		2nd Crop.		Main Crop.		2nd Crop.	
	1911-12.	1912-13.	1911-12.	1912-13.	1911-12.	1912-13.	1911-12.	1912-13.
Four cwt. sulphate of ammonia, 2 cwt. each of Super-phosphate and Potassium sulphate.	2,790	3,275	3,235	3,275	4,506	7,000	3,750	5,100 (2,393) top-pings.
	3,120	2,915	2,815	2,915	3,330	8,680	2,910	5,700 (2,500) top-pings.
Four cwt. sulphate of ammonia, 2 cwt. each of Super-phosphate and Potassium sulphate plus 5 tons. of paddy straw.	3,120	2,915	2,815	2,915	3,330	8,680	2,910	5,700 (2,500) top-pings.
	3,120	2,915	2,815	2,915	3,330	8,680	2,910	5,700 (2,500) top-pings.

N.B.—Figures = Pounds per acre.

The figures obtained for the 2nd crop season are quite in accordance with the cultivation notes, while those for the main crop season are at variance with these notes. In the former case the plot without straw was all through considerably better than the straw plot, and in the latter case the position was reversed, though in this case there was never very much difference at any time. The straw plot lodged badly and this partly accounts for the difference, though it has to be noted that the amount of chaff obtained per acre from this plot is only 20 lbs. greater than in the case of the plot without straw.

(d) *Ammonium Sulphate series.*—This experiment was continued, with the same result. During the last three years, Ammonium Sulphate is the only manure which has given an increase in yield and as this has not been sufficient to pay for the manure, the experiment will be discontinued.

TABLE XV.

Manure.	1912-1913.		1911-1912.		1910-1911.		1909-1910.	
	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
No manure	3,816	5,506	2,640	3,320	2,133	2,813	3,090	5,173
Ammonium sulphate 200 lbs.	4,363	6,360	2,853	3,880	2,580	4,033	3,597	6,497
Potassium sulphate 100 lbs.	3,623	4,660	2,567	2,907	1,540	1,980	3,470	2,800
Ammonium sulphate (200 lbs.) and potash (100 lbs.)	3,563	5,393	2,560	3,687	2,006	2,866	3,435	3,600

N.B.—Figures=ounds per acre.

(e) Comparison of green-manure crops. The three green manure crops Sesbania, Sunnhemp (*Crotalaria juncea*) and Teegapessala (*Phaseolus Mungo* var.) were tried again this year. All grew well and yielded respectively 16,340, 20,500 and 13,740 lbs. of green matter all of which was in each case worked into the land. The resulting yields are all high, but not in favour of any particular manure.

TABLE XVI.

	1912-1913.	1911-1912.	1912-1913.	1911-1912.
	Per acre.	Per acre.	Per acre.	Per acre.
Teegapessala	lbs. 4,033	lbs. 3,194	lbs. 5,240	lbs. 4,294
Sesbania	4,070	2,993	5,790	4,950
Sunn hemp	3,992	5,425	..	..

10. *Cultural Experiments*—(a) *Spacing.*—These experiments were carried out for Konamani in fields Nos. 17 and 18 and for Rasangi in fields Nos. 10 and 11. Spacing was done by actual measurement, and it will be seen that the actual spacing gauged just before harvest very closely approximates to the theoretical. The grain yields, with the exception of the Rasangi 4" singles, are all fairly uniform, the low yield from the duplicate plot in that instance being due to the fact that the crop on that plot lodged badly at the time of flowering.

TABLE No. XVII.

	Area per plant, square inch.	YIELD.					Tillers per plant.			
		Grain.								
		1912-13.	1911-12.	1910-11.	1909-10.	1908-09.				
RASANGI.										
Singles 4"	166	243	23	25	16	1808-09.	1908-10.	1910-11.	1911-12.	1912-13.
" 6"	85.2	41.2	...	...	...	1912-13.	1909-10.	1910-11.	1911-12.	1912-13.
" 9"	79.1	68.5	59	86	56	...	...	...	...	...
Doubles 4"	...	...	19	12	9.5	...	...	...	...	...
" 6"	180	19.5	...	...	...	...	...	...	...	...
" 9"	41.4	39.5	30.5	38	24	...	...	...	...	...
KONAMANI.										
Singles 4"	167	27.9	18	30	16	...	...	...	...	...
" 6"	86.5	55.8	...	...	...	...	...	...	...	...
" 9"	77.6	103.8	61	86	44	...	...	...	...	...
Doubles 4"	...	...	11	18.5	9.5	...	...	...	...	...
" 6"	177	29.2	...	...	...	...	...	...	...	...
" 9"	58.5	40.9	30.5	46	24	...	...	...	...	...

Yield in lbs. per acre.

TABLE XVIII.

Variety and Method.	Theoretical.		Actual.						Number of tillers per square yard.										
	Number of holes per square yard.	Square inches per hole.	Number of holes per square yard.						Square inches per hole.										
			1912-13.	1911-12.	1910-11.	1909-10.	1908-09.	1912-13.	1911-12.	1910-11.	1909-10.	1908-09.							
RASANGI.	Singles 4"	81	16	78	54	55	51	80	16.6	24.3	23	25	16	139	128	119	102	132	1908-09.
	" 6"	36	36	39.8	32	22	15	23	35.2	41.2	59	86	56	188.8	113	94	90	96	1909-10.
	" 9"	16	81	19.4	19	22	54	68	79.1	68.5	38	24	19	144.3	120	137	103	151	1910-11.
	Doubles 4"	81	16	36	27	48	36	39	36	39	61	75	48	160.9	125	116	85	90	1911-12.
	" 6"	36	36	36	17	21	17	27	82.8	78.9	61	75	48	148	132	116	85	90	1912-13.
KONAMANI.	Singles 4"	81	16	77.5	47	71	43	81	16.7	27.9	18	30	16	169.5	115	162	129	113	1908-09.
	" 6"	36	36	35.43	24	21	15	29	36.5	55.8	61	86	44	139.1	109	118	90	81	1909-10.
	" 9"	16	81	16.7	13	21	43	74	77.6	103.8	22	27	17	122.5	93	173	141	163	1910-11.
	Doubles 4"	81	16	36.9	24	58	21	43	35.3	51.4	61	92	48	166.4	98	127	93	118	1911-12.
	" 6"	36	36	36.9	13	21	14	27	77	93.7	61	92	48	154.9	104	127	93	118	1912-13.

It will be seen that during the five years this experiment has been carried on, the yields obtained from the plots planted with two seedlings per hole have never been commensurate with the extra number of seedlings required for this method, that is that single seedlings are in fact more economical. The "doubles" plots will therefore be discontinued and the experiment cut down to a comparison of different spacing for single seedlings.

As, however, it seems not at all unlikely that the optimum spacing will vary with the fertility of the land one series in each case will be manured and the other unmanured, in order to test this point.

(b) *Thick versus thin seed-beds.*—Three plots, planted from seed-beds sown at the rate of 50, 40 and 30 kunchams per acre, respectively, were laid out this year in field No. 15.

The results are shown below :—

TABLE XIX.

Method.	Area of seed-bed Required to plant 1 acre.	Grain.				Straw.			
		1912-1913.	1911-1912.	1910-1911.	1909-1910.	1912-1913.	1911-1912.	1910-1911.	1909-1910.
50 Kunchams per acre ...	4.5	3,670	3,169	2,856	2,990	6,360	3,863	4,541	3,304
40 Kunchams per acre ...	5.5	3,640	3,329	3,008	...	6,935	...	...	...
30 Kunchams per acre ...	7	4,054	...	...	...	6,225	...	...	...

Yield in pounds per acre, one Kuncham=7 lbs.

(c) *Age of seedlings.*—This experiment was continued in field No. 16 two series being laid down. In one, a large seed-bed was sown on one day and from this seedlings were transplanted at the respective ages required for the experiment; in the other, three beds were sown at intervals of ten days and the seedlings transplanted on the same date. The first method was the one adopted in 1909-1910 and the second in 1908-1909, 1910-1911 and 1911-1912.

TABLE XX.

	Grain.				Straw.			
	192-1913.	1911-1912.	1910-1911.	1909-10.	1912-13.	1911-1912.	1910-1911.	1909-10.
45 days { Sown on the 24th Mar 1912 ... } Transplanted on the 8th July 12.	3,295	{ 2,560 } { 3,205 }	{ 2,893 } { 2,887 }	...	4,825	{ 4,015 } { 3,975 }	{ 4,872 } { 4,547 }	...
35 days { Sown on the 3rd June 1912 ... } Transplanted on the 8th July 12.	3,640	{ 2,880 } { 3,170 }	{ 3,025 } { 2,278 }	...	4,875	{ 4,325 } { 3,415 }	{ 4,015 } { 3,329 }	...
25 days { Sown on the 12th June 1912 ... } Transplanted on the 8th July 12.	4,190	{ 2,680 } { 2,355 }	{ 2,218 } { 1,892 }	...	6,075	{ 3,175 } { 3,375 }	{ 3,555 } { 3,214 }	...
45 days { Sown on the 31st May 1912 ... } Transplanted on the 16th July 12.	3,821	...	...	3,916	6,271	...	...	4,325
35 days { Sown on the 31st May 1912 ... } Transplanted on the 6th July 12.	3,700	...	...	3,279	5,865	...	...	4,715
25 days { Sown on the 31st May 1912 ... } Transplanted on the 26th June 12.	4,050	...	...	3,220	5,300	...	...	4,845

N.B.—Yields in pounds per acre.

The 45 days' old seedlings were a little longer in establishing themselves, but did not wither so badly as in last year. There was no difference in the time of flowering.

(d) *Puddling and non-puddling*.—This experiment was continued in field No. 14. At the beginning the crop in the non-puddled plot was much poorer than the comparative plot and contained very many more weeds. As the season progressed the difference between the plots became less marked, and as will be seen from the table there was little difference between the yields.

TABLE XXI.

Method.	Grain.				Straw.			
	1912-13.	1911-12.	1910-11.	1909-10.	1912-13.	1911-12.	1910-11.	1909-10.
Puddled ...	3,877	{ 3,304 } { 2,950 }	{ 3,127 } { 2,951 }	{ 3,097 } { 3,039 }	3,866	6,356	{ 4,750 } { 4,152 }	{ 3,977 } { 4,633 }
Non-puddled ...	3,544	{ 2,705 } { 3,471 }	{ 2,568 } { 3,239 }	{ 3,123 } { 3,180 }	3,175	4,304	{ 3,450 } { 3,231 }	{ 5,547 } { 4,354 }

N.B.—Area of plot 48 cents; yield in pounds per acre.

The average result from the point of view of yield is in favour of puddling, and as regards cultivation the fields are kept cleaner if the land is puddled before transplanting is done. The experiment will therefore be discontinued.

(e) *Ploughed v. Unploughed fallow*.—This experiment was tried again in fields Nos. 12 and 4; the variety sown in both fields was konamani.

TABLE XXII.

System.	Field number.	1912-13.		1911-12.	
		Grain.	Straw.	Grain.	Straw.
Unploughed fallow ...	12	3,297	7,236	2,264	3,311
Ploughed fallow ...	12	3,726	6,184	1,965	2,745
Unploughed fallow ...	4	5,515	4,756	3,091	3,800
Ploughed fallow ...	4	3,287	5,709	2,516	2,856

N.B.—Yields in pounds per acre.

The season was very dry and the cultivation given was very poor. The results are in favour of ploughing. As regards field No. 12 the results obtained are at variance with the appearance of the crop. The ploughed plot was distinctly poorer than the unploughed up to quite a late stage in the growth of the crop. In the case of field No. 4 there

was never very much difference between the plots. As the cultivation that can be given with the local country plough is very shallow and unsatisfactory, both plots were allowed this dry weather (1913-1914) to lie uncultivated until they dried and cracked; the plot to be cultivated was then crowbarred to a depth of 9 inches and will lie in that condition all through the hot weather.

Drainage experiment.—In order to test the effect of drainage on paddy a plot was laid out in field No. 4, and a deep trench dug all round it. Water was let in over the trench and was allowed to drain through into it and so be carried away. Until the seedlings were established water was kept standing in the field, but afterwards as long a time as possible was allowed to pass between successive waterings. The plot was divided by a bund and one half received a dressing of sesbania at the rate of 30,000 lbs. per acre. The water was measured by means of a miner's inch and for purposes of comparison the water received by another plot in the same field, but treated normally, was also measured. The results are shown in the table given below :—

TABLE XXIII.

	Yield lbs. per acre.		No. of waterings.	Quantity of water in c.ft. per acre.
	Grain.	Straw.		
Unmanured ...	2,350	3,240	15	793467.36
Manured ...	2,592	5,120	14	652850.36
Check plot ...	...	...	16	378478.00

The plots are naturally not very fertile and the excessive cracking of the land which occurs as a result of the treatment may also affect the yields which are low.

Turmeric.—Comparative tests of the Nandyal and local systems of cultivation were continued in field No. 3.

The results for the last four years are as follows :—

TABLE XXIV.

System.	1912-1913.	1911-1912.	1910-1911.	1909-1910.
Local (original) ...	9,450	9,195	16,200	6,104
„ (duplicate).	8,940			
Nandyal (original).	10,410	10,625	17,000	5,728
„ (duplicate).	10,840			

N.B.—Yield in pounds per acre.

Cambodia Cotton.—This crop was tried at this farm last year (1911-12); small plots being sown at different dates to obtain some idea of the best time for sowing.

The results were as follows :—

TABLE XXV.

Date of sowing.	Area of plot.	Yield of kappas per acre.
1911.	Cts.	Pounds.
22nd May ...	3	1,670
1st June ...	1	1,956
8th June ...	1	1,257
18th June ...	1	1,144
2nd July ...	1	747
12th July ...	1	616
18th July ...	1	1,100
30th July ...	1	1,053
7th Aug. ...	2	384
26th Aug. ...	2	775
2nd Sep. ...	4	1,223
7th Nov. ...	10	206

Another series have been sown this year, but the results are not yet to hand.

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May 1913.

