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Department of Agriculture, Madras

REPORTS

OF THE WORK OF THE

AGRICULTURAL STATIONS

IN THE

MADRAS PRESIDENCY

FOR

1924-25



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CONTENTS.

Serial number of report.	Name of circle or head of office.	Name of agricultural station.	Page.
1 } 2 }	I Circle	Anakāpalle	1
		Samalkota	15
3	II "	Guntar	48
4 } 5 }	III "	Hageri	51
		Nandyal	85
6	IV "	Pālar	125
7	VI "	Koipatti	161
8 } 9 }	VII "	Coconut stations	175
		Taliparamba	199
10	VIII "	Seed Potato Farm, Nanjanad ...	211
11	Superintendent, Central Farm.	Central Agricultural Station, Coimbatore.	225
12 } 13 } 14 }	Deputy Director of Agriculture, Live-stock.	Central Cattle Farm, Hostr ...	255
		Ongole Cattle Farm, Chintaledevi.	271
		Buffalo Breeding Station, Guntar.	289
15	Curator	Pomological Station, Coonoor ...	295

ANNUAL REPORT OF THE ANAKĀPALLE AGRICULTURAL STATION FOR THE YEAR 1924-25.

Season.—The season on the whole was more favourable than in the previous year, and the rainfall was 11·16 inches in excess of the average of the last six years.

During April and May 1·72 inches was registered against 0·06 inches in the previous year, and these early showers were very beneficial. The south-west monsoon was heavy and well distributed, and water flowed in the irrigation channel early in July. The rains continued into October and November, and later it was possible to irrigate cold-weather crops by means of canal water. The north-east monsoon was earlier and more evenly distributed than in the previous year, the rains lasting from the end of September to the end of November.

A statement of rainfall is given in Table I.

TABLE I.
Statement of rainfall.

Month.	Fort-night.	1919-20.	1920-21.	1921-22.	1922-23.	1923-24.	1924-25.	Number of heavy showers.	Average rainfall for the last 6 years.
April ...	1st.	0'00	0'10	0'95	0'00	0'00	0'32	3	1'6
	2nd.	0'26	0'00	0'00	0'03	0'00	0'00		
May ...	1st.	2'81	5'34	2'93	1'30	0'52	0'06	1'72	...
	2nd.	0'27	2'83	0'00	0'01	0'08	1'40		
June ...	1st.	3'51	0'20	1'74	2'00	0'00	0'47	2	...
	2nd.	0'44	3'20	0'36	1'75	0'78	2'03		
July ...	1st.	1'81	0'48	3'73	1'59	1'62	0'88	3	...
	2nd.	8'04	21'80	0'73	2'00	4'88	10'62		
August ...	1st.	0'58	0'89	4'00	0'69	1'47	2'80	8	19'2
	2nd.	2'83	1'32	2'08	1'93	4'80	9'31		
September.	1st.	1'59	2'08	1'56	1'08	1'87	12'47	11	...
	2nd.	3'09	3'71	5'40	1'37	0'00	7'32		
October ...	1st.	3'58	4'63	7'73	3'59	3'90	5'05	6	...
	2nd.	5'95	1'40	0'00	1'92	13'68	0'73		
November.	1st.	7'51	17'72	7'55	0'00	7'79	11'05	13'57	15'28
	2nd.	0'10	0'00	0'00	4'28	0'83	34'01		
December.	1st.	0'00	0'00	0'00	0'00	0'00	0'00	...	...
	2nd.	0'29	0'00	0'00	0'00	0'00	0'00		
January ...	1st.	0'00	0'00	0'02	0'02	0'02	0'00	3	...
	2nd.	0'15	3'52	0'00	0'00	0'00	0'14		
February ...	1st.	0'03	0'96	0'00	0'00	0'00	0'00	0'29	2'56
	2nd.	0'08	0'00	3'52	0'02	1'43	0'59		
March ...	1st.	0'43	0'00	0'00	0'00	0'00	0'00	...	...
	2nd.	0'27	0'00	0'00	1'14	0'00	0'00		
Total ...	...	43'91	26'61	30'13	26'92	45'30	49'04	77	38.78

PART I.

Paddy.

An average yield of 2,658 lb. grain per acre was harvested; against an average of 2,074 lb. for the last four years.

Navakotisannam gave 3,252 lb., and this variety together with Bangarutheega has given consistently good results.

Co. 1 gave an average yield of 2,520 lb. per acre. G.E.B. 1,303 which was grown on the farm for the first time gave practically the same yield as Co. 1. Table II gives detailed yields of all the varieties grown in bulk on the station.

TABLE II.

No.	Name of variety.	Average duration in days.	Yield in pounds per acre.							
			1921-22.		1922-23.		1923-24.		1924-25.	
			Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
1	Navakotisannam.	157	1,927	2,575	1,727	2,484	2,068	2,506	2,628	3,840
			3,149	4,331	2,018	3,015	1,636	2,137	3,477	4,306
			...	...	1,327	1,655	...	...	...	...
	Average ...	...	2,538	3,453	1,687	2,385	1,852	2,319	3,053	4,073
2	Bangarutheega.	158	2,861	4,923	1,545	2,925	1,750	2,401	2,489	2,992
			2,007	4,370	2,080	2,500	...	...	2,759	5,000
		
	Average ...	...	2,434	4,647	1,813	2,713	1,750	2,401	2,614	3,996
3	G.E.B. Strain No. 1303.	156	...	...	2,368	3,427	1,512	1,520	2,524	3,200
4	Mypali ...	148	1,557	2,245	1,243	1,753	1,565	1,527	2,358	3,109
			1,763	3,188	1,421	2,095	...	...	...	...
			1,637	2,885	...	...	...	...	...	...
	Average ...	...	1,719	2,773	1,832	1,924	1,585	1,527	2,858	3,109

TABLE II—cont.

No.	Name of variety.	Average duration in days.	Yield in pounds per acre.							
			1921-22.		1922-23.		1923-24.		1924-25.	
			Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
5	G.E.B. Strain, No. 24.	149	1,768	2,764	2,400	2,534	1,441	1,830	2,520	2,863
			2,015	2,500	1,701	1,760	...	...	2,512	4,687
			...	...	1,609	2,046	...	...	...	...
	Average ...	...	1,889	2,632	1,903	2,113	1,441	1,830	2,516	3,775
6	Gunuparsannam.	150	1,630	2,290	1,654	2,536	1,360	2,014	2,788	3,404
			1,880	3,167	...	...	...	...	...	...
			Average	1,755	2,729	1,654	2,535	1,360	2,014	2,788	3,404
7	Kanakasompa ..	158	1,916	3,273	1,763	2,562	1,817	2,419	2,704	4,720
			1,761	3,253	1,954	2,482	...	...	2,523	3,175
			Average	1,838	3,263	1,858	2,522	1,817	2,419	2,614	3,948
8	Konamani ...	158	1,277	1,744	...	...	...	...	...	...
9	Co. 1 ...	159	...	...	...	...	...	2,520	3,400	...
10	Bobbili Ganti ...	141	1,778	2,464	1,304	2,992	1,822	2,210	3,820	4,407
			1,805	1,632	1,709	1,988	1,884	2,469	1,712	2,140
			1,998	2,305	1,805	2,378	1,626	1,564	2,572	2,980
			2,078	2,656	1,546	4,304	...	...	2,584	3,143
			...	...	...	..	...	...	2,526	2,859
Average ...	...	1,915	2,264	1,591	3,040	1,777	2,081	2,639	3,106	

Single-plant selections.—The single-plant selections made in the previous year were again planted out; but owing to the farm staff being depleted in the interests of district work, and the management of the agricultural middle school being undertaken by the Farm Manager, the progeny of the individual plants was not studied.

During last season about 80 new selections were made, and these, together with some of those already referred to, will be planted out again during the coming season.

District varieties.—The twelve varieties of paddy collected in the district were again studied, and these have given yields as noted in Table III. Owing to the unevenness of the plots, they cannot be compared in yield, but some of the more promising ones will be retained and compared again this season.

TABLE III.

Statement showing the yields of district varieties grown in Field No. 12.

Serial No.	Variety.	Locality from which obtained.	Duration in days.	Yield per plot of $\frac{1}{4}$ cent.		Yield per acre.				Remarks.
				1924-25.		1924-25.		1923-24.		
				Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	
I	Sunkiannam ...	Bobbili ...	150	18-00	20-50	3,340	3,990	1,720	2,220	Fine.
				15-00	20-00					
				18-00	20-75					
				17-00	19-50					
				15-50	19-00					
	Average	18-70	19-95						
II	Vavilapadusanam.	Vizianagram.	150	17-25	19-00	3,150	3,490	1,820	2,500	Median fine.
				18-25	14-50					
				16-75	18-25					
				16-25	18-00					
				15-25	17-50					
	Average	15-75	17-45						
III	Mypali	Anakapalle ...	165	14-50	17-00	3,680	4,090	2,300	2,560	Coarse.
				20-75	25-50					
				18-25	19-75					
				20-00	22-00					
				18-50	20-00					
	Average	18-40	20-85						

TABLE III—cont.

Statement showing the yields of district varieties grown in Field No. 12—cont.

Serial No.	Variety.	Locality from which obtained.	Duration in days.	Yield per plot of $\frac{1}{4}$ cent.		Yield per acre.				Remarks.
				1924-25.		1924-25.		1923-24.		
				Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	
IV	Bayahunda ...	Berhampur.	165	20.00	21.75	3,910	4,280	2,020	2,440	Medium fine.
				17.75	19.00					
				19.00	21.00					
				20.50	22.25					
				20.50	23.00					
	Average	19.55	21.40						
V	Srikrishnabhogam.	Bobbill ...	165	16.00	17.00	3,400	3,700	2,400	2,800	Fine.
				14.00	15.75					
				17.75	19.00					
				19.00	20.75					
				18.50	20.00					
	Average	17.05	18.50						
VI	Ratanchudi ...	Berhampur.	165	15.50	27.00	2,980	3,260	2,340	2,720	Medium fine.
				17.50	18.75					
				16.25	18.00					
				15.00	17.00					
				14.75	15.75					
	Average	15.80	19.30						
VII	Maharajabhogam.	Vizinnagram.	165	17.00	19.00	3,430	3,740	2,340	2,400	Fine.
				18.25	19.50					
				16.00	17.25					
				17.50	19.25					
				17.00	18.50					
	Average	17.35	18.70						
VIII	Konamani ...	Anakapalle...	170	12.75	13.50	3,240	3,510	2,020	2,440	Coarse.
				18.50	20.00					
				14.00	15.25					
				19.00	21.00					
				16.75	18.00					
	Average	16.20	17.45						

TABLE III—cont.

Statement showing the yields of district varieties grown
in Field No. 12—cont.

Serial No.	Variety.	Locality from which obtained.	Duration in days.	Yield per plot of $\frac{1}{2}$ cent.		Yield per acre.				Remarks.
				1924-25.		1924-25.		1923-24.		
				Grain	Straw.	Grain.	Straw.	Grain.	Straw.	
IX	Akusari ...	Anakapalle ...	180	18.50	19.75	3,640	3,880	2,720	2,880	Medium fine.
				17.25	18.50					
				16.75	17.75					
				17.25	18.00					
				20.25	23.00					
	Average ...	...	18.00	19.40					
X	Vazzanam ...	Vizianagram.	180	17.00	18.50	3,670	3,960	2,680	2,680	Coarse.
				20.75	21.25					
				18.00	19.50					
				17.00	19.00					
				19.00	20.75					
	Average ...	...	18.35	19.80					
XI	Prayaga ...	Yellamanchili.	180	16.75	17.50	3,710	3,940	2,640	2,880	Coarsely fine.
				18.25	19.00					
				19.25	21.00					
				19.50	20.75					
				19.00	20.75					
	Average ...	...	18.55	19.80					
XII	Sanna Akkulla.	Yellamanchili.	180	21.00	22.00	3,990	4,290	2,720	2,800	Medium.
				22.50	23.25					
				14.75	17.00					
				18.50	18.75					
				23.00	25.25					
	Average ...	...	19.95	21.25					

PART II.

Sugarcane.

The new varieties of sugarcane supplied in 1923-24 by the Government Sugarcane Expert were again planted out for multiplication. In addition to these, Co. 8, Co. 12, Fiji B, and J. 247 were included in the plots.

A chemical analysis of some of these was made 9 months and 10 days after planting, the results of which are given in Table IV.

TABLE IV.

Field No. 26.

Particulars.	B 6308.	B 6388.	A 2.	Q 813.	Max- well 10.	J 247.	P.O.J. 1499.	Fiji B.	Co. 12.	D. 234.
Number of canes.	17	9	19	19	21	37	29	17	28	17
Weight of canes.	69.5	29.5	72.0	72.5	95.0	87.0	62.5	47.5	80.0	64.5
Weight of juice.	47.0	20.5	43.5	44.0	60.5	52.5	35.5	28.0	52.0	39.0
Percentage of extraction.	69.1	69.5	60.4	60.7	63.7	60.4	56.8	59.0	65.0	60.5
Top / bottom ratio.	0.92	0.93	0.92	0.97	0.91	0.96	0.92	0.97	0.97	0.94
Brix corrected.	16.03	18.73	18.08	19.07	16.08	17.78	18.84	18.91	17.44	16.91
Sucrose ...	13.32	15.78	15.49	16.96	13.03	15.56	16.80	15.61	15.36	14.76
Purity ...	86.2	84.2	85.7	88.9	81.0	87.5	89.2	87.2	88.1	87.3
Glucose ...	1.79	1.56	1.48	0.75	1.56	0.96	0.48	1.91	1.54	0.89
Glucose ratio.	13.4	9.9	9.2	4.4	12.0	6.2	2.9	9.6	10.0	6.0

A further analysis of a few varieties was made 20 days later and these figures are noted in Table V.

TABLE V.

Field No. 26.

Particulars.	D 1135.	D 625.	Co. 12.	Fiji B.	D 234.	J 247.	Max- well 10.
No. of canes ...	13	15	14	11	12	31	32
Weight of canes .	38.0	63.5	50	44	62.5	114	136
Weight of juice ...	23.0	41.5	38.5	28	34.0	73.5	88.5
Brix ...	15.40	17.03	16.63	18.97	16.88	17.55	17.20
Sucrose ...	12.92	14.26	13.28	16.76	14.14	14.83	14.55
Glucose ...	0.69	1.19	1.92	0.82	0.89	1.25	1.56
Top/bottom ratio ...	1.00	0.95	0.91	0.90	0.95	0.93	0.91
Purity ...	83.9	83.7	79.8	88.4	83.8	84.8	80.40
Glucose Ratio ...	5.3	8.3	14.50	4.9	6.3	10.70	6.3

Maxwell 10 and P.O.J. 2714 are the most promising of the Java varieties. The former is of about the same duration as J, 247 and

shows very vigorous growth. It is remarkably free from aerial roots and abnormal bud development, and has the advantage of being not so tall as J. 247.

B. 6388 and B. 6308 are promising, the former having analysed well, although in view of the small number of canes involved the figures cannot be relied upon. Of the two, B. 6308 has the best vegetative habit besides being more vigorous. The Queensland varieties show more promise than the Demerara canes, Q. 813 having done specially well. This is one of the earliest and similar to B. 208, but its bud development is not so prominent and it is also taller.

Co. 8, D. 1135 and A. 95 have been discarded and the remaining varieties have been planted out again. There will be sufficient material next year to compare the most promising of these varieties on a field scale.

Seedling canes.—Under the instructions and supervision of the Government Sugarcane Expert, a number of cane seedlings were raised from seed supplied from Coimbatore. The varieties included P.O.J. 2725, B. 3412, Red Ribbon and B. 6308. About 4,000 seedlings were raised, 1,000 of which were planted out with other varieties grown on the station.

Towards the end of the year, 15 of the most promising seedlings were selected by the Assistant Government Sugarcane Expert and the Government Sugarcane Expert, and these are now being multiplied.

The success in raising sugarcane from seed is of great importance as it will now be possible, in the event of thick canes being bred at Coimbatore, to germinate seed and to study the seedlings in the district for which such breeding has been done.

The raising of seedlings during the year under report was a preliminary step undertaken for the Government Sugarcane Expert with a view to transferring the promising material to the sugarcane station that is to be shortly opened in the Vizagapatam district.

Sugarcane manurials.—The manurial experiment was continued along the same lines as in the previous year and the results are noted in Table VI.

Field No. 15.

TABLE VI.

Variety—J. 247.

No.	Variety.	No. of series.	Strip.	Treatment.										Area in cents.		
				15 cwt. of groundnut cake.				10 cwt. of groundnut cake and 2,000 lb. of Vempali.				8 cwt. of groundnut cake and 4,000 lb. of Vempali.				
				Number of canes.	Weight of canes.	Weight of juice.	Weight of jaggery.	Number of canes.	Weight of canes.	Weight of juice.	Weight of jaggery.	Number of canes.	Weight of canes.		Weight of juice.	Weight of jaggery.
J. 247	I	{	South ...	411	1,240	774	139-00	866	1,204	674	122-75	887	1,135	705	133-75*	1-20
			North ...	432	1,152	703	135-00	419	1,101	654	125-50	889	1,047	651	116-75	1-20
	II	{	South ...	366	1,089	685	128-00	407	1,173	715	126-00	890	1,129	665	120-50	1-20
			North ...	407	1,095	656	121-00	428	1,063	637	132-25	338	998	551	104-75	1-20
	III	{	North ...	443	1,194	714	134-50	376	949	563	105-75	898	975	561	110-75	1-20
			South ...	393	1,071	607	122-75	378	1,155	703	129-50	358	1,098	668	124-75	1-20
	IV	{	South ...	330	994	598	111-50	365	1,035	630	114-75	888	1,167	707	128-75	1-20
			North ...	362	964	574	108-75	371	988	595	115-25	365	977	564	113-50	1-20
	V	{	South ...	395	1,236	739	131-00	381	1,190	729	134-75	350	1,140	704	127-25	1-20
			North ...	403	1,190	709	135-75	376	976	593	113-75	348	899	551	104-25	1-20
		Average per plot	...	394	1,124	682	126-25	387	1,083	654	121-25	371	1,050	638	118-90	1-20
		Average per acre	...	32,687	93,234	56,542	10,508	32,048	89,334	54,254	10,043-50	30,770	87,085	52,461	9,359-00	...

Yields are in pounds.

A reference to previous reports of the station shows that no conclusive results have been obtained in manurial experiments with ponaos or fish-guano in seasons in which the yields have been poor. Generally it has been necessary to get a yield of not less than 20 candies of jaggery per acre in the series under comparison, in order to obtain an appreciable difference in favour of one or more series.

This year two series, viz., 15 cwt. groundnut cake and 10 cwt. groundnut cake plus 2,000 lb. wild indigo leaf each gave yields of over 10,000 lb. of jaggery per acre.

Each series was put down in two beds of two lines each and repeated four times; and for the purpose of the experiment 10 strips of each series 1·2 cents in area was harvested.

The plot was irrigated from the northern to the southern side, and possibly on this account the southern part of the field, owing to the wash of manurial constituents, showed superior growth to that on the northern half. This appearance of superiority, however, was equally divided in the series as these were planted, as already stated, in lines running north and south. It will be seen that 15 cwt. groundnut cake gave 18 per cent more cane than the 10 cwt. plus 2,000 lb. wild indigo leaf series. If the probable error is calculated according to the formula $P.E. = \sqrt{\frac{Md^2}{N-1}}$ where 'd' is the difference between each result and the mean, and 'n' the number of results in the trial, we get P.E. = ± 5.5 per cent or ± 15.62 per cent for a 10:1 chance.

The increased yield obtained by the application of 15 cwt. groundnut ponaoc may therefore be considered due to heavier manuring, and this has resulted in a net profit of Rs. 38-4-1 per acre.

The economic aspect of the experiment is shown in Table VII from which it will also be seen that the 8 cwt. groundnut series resulted in a loss of Rs. 22-1-2 per acre.

TABLE VII.

Statement showing the economic value of manurial experiment.

Field No. 15.*

Serial No.	Treatment.	Plot Nos.	Yield of jaggery in lb.		Value of		Net profit or loss per acre.
			Per plot.	Per acre.	Yield per acre.	Manure per acre.	
1	15 cwt. groundnut cake per acre.	1, 4, 7, 10, 13.	1,287.25	10,508	Rs. A. P. 1,167 8 2	Rs. A. P. 73 10 1	Rs. A. P. 38 4 3 Profit.
2	10 cwt. groundnut cake plus 2,000 lb. Vempali.	2, 5, 8, 11, 14.	1,211.25	10,044	1,115 15 1	60 5 3	Control.
3	8 cwt. groundnut cake plus 4,000 lb. Vempali.	3, 6, 9, 12, 15.	1,189	9,859	1,095 7 1	61 14 5	22 1 2 Loss.

A chemical analysis of this J. 247 crop was made, the results of which are given in Table VIII.

TABLE VIII.

Results of sugarcane analysis of manurial plots, 1924-25.

Field No. 15.

Variety—J. 247.

Particulars.		Number of canes.	Weight of canes.		Weight of juice.	Degres brix.	Sucrose.	Glucose.	Purity.	Glucose ratio.	Top/bottom ratio.
I	15 cwt. groundnut cake ...	24	63.0	41.0	18.23	15.91	0.74	87.30	4.65	0.98	
II	10 cwt. groundnut cake plus 2,000 lb. Vempali ...	21	56.0	37.0	18.39	16.04	0.70	86.60	4.40	0.97	
	8 cwt. groundnut cake plus 4,000 lb. Vempali ...	28	82.0	52.0	19.04	17.02	0.59	89.40	3.40	0.95	
	15 cwt. groundnut cake ...	20	67.5	39.0	19.02	16.88	0.72	88.70	4.30	0.95	
III	10 cwt. groundnut cake plus 2,000 lb. Vempali ...	21	55.5	34.0	18.48	16.10	1.04	87.10	5.60	0.98	
	8 cwt. groundnut cake plus 4,000 lb. Vempali ...	18	59.0	34.5	18.40	16.07	0.91	87.30	5.70	0.95	
	15 cwt. groundnut cake ...	24	66.5	43.0	18.90	16.60	0.77	87.80	4.60	0.99	
IV	10 cwt. groundnut cake plus 2,000 lb. Vempali ...	16	45.5	33.0	18.37	17.01	0.59	87.80	3.40	0.98	
	8 cwt. groundnut cake plus 4,000 lb. Vempali ...	20	65.5	45.5	19.40	17.25	0.54	88.90	3.10	0.95	
	15 cwt. groundnut cake ...	20	73.5	46.0	18.97	16.73	0.68	88.20	4.10	0.98	
V	10 cwt. groundnut cake plus 2,000 lb. Vempali ...	21	74.5	47.0	18.82	16.52	0.67	87.80	4.10	0.97	
	8 cwt. groundnut cake plus 4,000 lb. Vempali ...	20	73.0	45.5	18.82	16.68	0.64	88.60	4.10	0.96	

Taking the top and bottom halves of a sample of cane and calculating the ratio of total solids contained in the juice of each as an indication of ripeness, it will be seen that the figures in each series approach unity. The series, therefore, on the whole have shown remarkable uniformity in maturing. This is in contrast to the results of similar heavy application of poonac at the Samalkota Station, where the delay in ripening, as a consequence, is very pronounced. At Anakapalle, J. 247, even with the heaviest application of manure, will ripen completely in from 11 to 12 months, whereas a crop of the same variety at Samalkota similarly treated will take at least 14 months.

Milling test.—During last year a three-roller sugarcane mill was supplied for trial by Messrs. Parry & Co. who are Agents for the manufacturers, Messrs. Macbeth & Co., Bombay. During the season

this was tested against the Ram Narayan Banerjee mill which is used extensively in the district. The cost of the local mill at Anakāpalle including frame is Rs. 160, and the latest quotation for No. 12 Chattanooga is the same price f.o.r. Madras or Calcutta. A good uniform crop of J. 247 was selected for the comparison of the two mills, both of which had been used in the previous season. The same four pairs of cattle were employed throughout the experiment and alternated. The same two coolies were used as feeders and they were also alternated. Two millings were made per diem, before each of which the rollers of the mills were carefully adjusted. In this way all controllable errors were as far as possible removed.

There were 20 millings with each mill and the weight of cane in each case was standardized at 1,200 lb. Owing to a mistake, however, two of the millings with each mill fell short of this figure by 200 lb. and these for the purpose of calculating possible errors in the results have not been included. The standard weight used is the quantity of cane usually crushed at one time, and which produces a sufficient quantity of juice that can be conveniently boiled at one time on an improved furnace. The figures showing the amount of juice extracted and the quantity of raw sugar produced are given in Table IX.

TABLE IX.

Trial No.	R.N.B. Three-roller Local Mill.					Chattanooga Plow Mill.				
	of Weight cane.	of Weight juice.	Juice extract- ed.	Time taken for crushing.	Quantity of jaggery ob- tained.	of Weight juice.	Juice extract- ed.	Time taken for crushing.	Quantity of jaggery ob- tained.	
	LB.	LB.	PER CENT.	H. M.	LB.	LB.	PER CENT.	H. M.	LB.	
1	1,200	715	59.6	4-40	123.00	790	65.8	5-17	126.50	
2	1,000	631	63.1	2-59	107.75	660	66.0	3-36	112.75	
3	1,000	625	62.5	3-13	106.50	643	64.35	3-51	111.50	
4	1,200	739	61.5	4-35	122.75	764	63.7	5-20	132.75	
5	1,200	730	60.8	3-11	123.50	8.8	68.2	3-43	132.75	
6	1,200	698	58.9	3-26	114.00	769	64.1	3-58	126.00	
7	1,200	722	60.1	3-7	119.50	8.3	66.9	3-30	136.75	
8	1,200	780	59.8	2-50	121.50	809	67.4	3-12	137.00	
9	1,200	706	58.9	3-4	109.50	774	65.3	3-29	129.75	
10	1,200	704	58.6	3-0	122.25	809	67.4	3-16	134.50	
11	1,300	704	59.0	2-42	135.00	754	63.0	3-11	142.50	
12	1,200	724	60.0	2-52	142.75	768	64.0	3-36	146.25	
13	1,200	707	59.0	2-53	134.25	773	64.0	3-3	150.50	
14	1,200	723	60.0	3-0	138.75	773	65.0	3-33	149.00	
15	1,200	729	60.0	3-13	139.00	789	66.0	3-42	147.75	
16	1,200	733	61.0	3-1	140.50	803	67.0	3-36	155.00	
17	1,200	709	59.0	3-16	136.00	792	66.0	3-38	149.00	
18	1,200	747	61.0	3-30	134.50	806	67.0	3-36	148.75	
19	1,200	718	60.0	3-5	135.00	795	66.0	3-35	148.75	
20	1,200	719	60.0	3-21	143.75	773	64.0	3-58	150.25	
Total	23,600	14,268	...	65-28	2,549.25	15,470	...	74-47	2,767.75	
Average	1,180	713.4	60.04	3-15	127.46	773	65.9	3-44	138.38	

Excluding millings Nos. 2 and 3 in each of the two series, it will be seen that the Chattanooga gave 8.8 per cent more juice than the R.N.B. mill. If the probable error is calculated according to the formula $P.E. = \sqrt{\frac{Md^2}{N-1}}$ we find that probable error = ± 3.3 per cent for the comparison of the extraction of any one milling with the average or ± 9.36 per cent for a 10:1 chance when comparing any two.

The draught of the two mills, which was tested with a spring balance was in favour of the Chattanooga, the variation being from $1\frac{1}{2}$ to $1\frac{3}{4}$ cwt. against $2\frac{1}{4}$ to $2\frac{3}{4}$ cwt. registered for the R.N.B. mill. If all the millings are taken into consideration the average time taken to crush 1,200 lb. was 3 hours 16 minutes in the case of the R.N.B., and with the Chattanooga a period of 3 hours 44 minutes was required to crush a similar quantity.

The Chattanooga is therefore slower than the local mill and this is due to the fact that only two canes can be fed at a time. If, however, we allow the figure for extraction to be considered outside the chances of error, the mill by Messrs. Macbeth & Co. may be considered superior to the local one, provided it gives reasonably long service.

The results of the trial show the extent to which errors are likely to occur in ordinary comparative milling of varieties with three-roller mills such as one used on agricultural stations. It also indicates how impossible it is to rely on a percentage of extraction obtained by milling a small number of samples; and when this is done, as is often the case for trial chemical analyses, errors are inevitable. The probable error in this test is possibly higher than it would ordinarily be as the extraction obtained from the Chattanooga varied from 63.0 per cent to 68.2 per cent. With the R.N.B. mill the range of variation was only from 58.6 per cent to 61.5 per cent. The latter also gave a low average variation from the mean.

Assuming in a variatal test that ten millings are made, and taking the figures for the extractions of milling Nos. 1 and 4 to 12 in the R.N.B. mill for the purpose of calculation, the probable error works out to ± 2.2 per cent of the mean or ± 6.24 per cent for the comparison of any two results based on a 10:1 chance.

There is not a great range of variation under ordinary field conditions in the amount of juice that can be extracted from two different varieties under comparison, and it will not be safe to make less than ten repetitions of each, if the results are to be outside the limits of error.

PART III.

Miscellaneous.

Groundnut is becoming an increasingly important crop in the district, and during the year a small quantity of Mauritius Mozambique, and Mauritius—Mauritius seed was obtained from the Deputy Director of Agriculture, IV Circle. A comparison was made of Mauritius, which is the variety cultivated extensively in South Arcot district, and the local groundnut. The former yielded over 30 per

cent more dried nut than the variety commonly grown in Vizagapatam district. The plots, however, were very uneven, the probable error of the mean yield working out to ± 15.2 per cent. The extent to which the yields from plot to plot varied in the same series makes it impossible to draw any conclusions from this result.

VIZAGAPATAM,
29th April 1925.

A. C. EDMONDS,
Deputy Director of Agriculture, I Circle.

APPENDIX.

English, Vernacular and Botanical names of crops referred to in the report.

English.	Vernacular.	Botanical.
Paddy	Wari	Oryza Sativa.
Sugarcane	Cheruku	Saccharum officinarum.
Groundnut	Verusenaga	Arachis hypogia.

ANNUAL REPORT OF THE AGRICULTURAL STATION, SAMALKOTĀ, FOR THE YEAR 1924-25.

The total rainfall during the year was 44·07 inches, and there was therefore no appreciable difference compared with that of the previous year. During the last two years, however, the rainfall has exceeded the average.

As in the previous year the early hot weather showers were not sufficiently heavy to be of much use; but the south-west monsoon was well distributed and above the average by 5·42 inches. The north-east monsoon was also above the average, and unlike last year there was no cyclone.

A statement of rainfall is given in Table I.

TABLE I.

Rainfall statement.

Months.	Fortnight	1920-21.	1921-22.	1922-23.	1923-24.	1924-25.	No. of rainy days.	Average rainfall for 22 years ending 31st March 1925.
April ...	1st	0·70	0·48	0·00	0·00	0·24	2	0·17
	2nd	0·00						
May ...	1st	0·00	0·54	0·00	0·31	0·00	...	0·61
	2nd	4·23	0·00	0·32	1·15	1·35	3	1·81
June ...	1st	0·65	0·45	0·57	0·00	0·74	2	1·76
	2nd	1·78							1·83	0·14	0·83	3	3·04
July ...	1st	0·80	4·65	1·67	1·98	2·91	7	2·81
	2nd	1·97							3·70	4·83	3·07	7	3·38
August ...	1st	2·38	7·48	0·23	2·51	1·44	7	2·40
	2nd	1·05	0·40	1·61	0·77	5·65	11	2·54
September.	1st	0·15	0·75	1·67	2·14	5·12	10	2·51
	2nd	1·16							1·61	7·57	7·70	11	3·45
October ...	1st	7·31	8·04	0·63	0·96	5·41	6	3·09
	2nd	2·06							3·26	11·54	0·08	1	2·57
November.	1st	0·18	0·92	2·49	2·31	7·18	5	2·56
	2nd	0·00	0·00	2·47	7·57	2·11	3	1·49
December.	1st	0·00	0·00	0·00	0·00	0·00	...	0·28
	2nd	0·00						
January.	1st	0·00	0·00	0·00	0·00	0·00	...	0·09
	2nd	3·33						
February.	1st	0·00	0·00	0·00	0·00	0·00	...	0·04
	2nd	0·00	0·00	2·13	0·00	0·00	...	0·19
March ...	1st	0·00	0·00	0·00	0·00	0·12	...	0·06
	2nd	0·00						
Total ...		27·75	32·76	28·36	43·78	44·07	79	35·91

PART I.

Paddy.

Main Crop.—The transplantation of paddy in the main-crop season was carried out a few days earlier than in the previous year, but later than is usual in the district.

The average yield per acre for the whole area of 36.68 acres compared with that in the two previous years was as follows:—

1922-23.		1923-24.		1924-25.	
Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
lb.	lb.	lb.	lb.	lb.	lb.
3,012	4,444	2,842	3,283	3,069	3,347

The figures show that the season has been favourable, and the permanent unmanured plots also showed the effect of a good season on early-maturing varieties. Early planting is of equal importance if the best results are to be obtained. In the case of later-maturing varieties the beneficial effects of early planting are not so marked, and these, generally speaking, are more dependent on a good uniform season throughout their period of growth.

Single plant selections.—A few selections made in the previous year were planted out for further study. Those isolated in 1922-23 and which were considered the best were compared with bulk seed. The yields of strains that gave an increase of 8 per cent over the bulk seed have been noted in tables II and III.

TABLE II.

Comparison of Punasa Akkullu 2 and 3 with Punasa Akkullu bulk.

Variety and No. of selection.	Number of plot.	Yield in pounds.		Remarks.
		Per plot.		
		Grain.	Straw.	
		LB.	LB.	
Punasa Akkullu bulk (a mixture of several types).	1	17.14	22.00	Not uniform in ripening. Average number of tillers per plant, 8.0.
	2	19.61	24.00	
	3	21.99	24.00	Percentage of rice, 67.75. Do. broken rice, 2.20. Do. bran, 2.85 Do. husk, 27.25.
	4	20.55	30.00	
	5	19.00	29.50	
	6	18.51	31.00	
	7	17.99	23.00	
	8	20.73	25.50	
	9	21.36	24.50	
	10	17.73	25.00	
Average	19.46	25.95	

TABLE II—cont.

Comparison of *Punasa Akkullu 2* and *3* with *Punasa Akkullu bulk*—cont.

Variety and number of selection.	Number of plot.	Yield in pounds.		Remarks.
		Per plot.		
		Straw.	Grain.	
<i>Punasa Akkullu 2</i> ...	1	20·89	20·75	Duration, 168 days (sown in the seed-bed on 5th June 1924). Average number of tillers per plant, 8·2. Percentage of rice, 65·65. Do. broken rice, 3·75. Do. bran, 3·80. Do. husk, 27·75.
	2	21·52	23·00	
	3	23·67	25·00	
	4	23·80	27·00	
	5	22·67	27·25	
	6	24·05	24·00	
	7	23·67	27·50	
	8	22·86	27·75	
	9	21·92	27·75	
	10	22·92	27·00	
Average	22·80	25·40	
<i>Punasa Akkullu 3</i> ...	1	24·30	29·25	Duration, 168 days (sown in the seed-bed on 5th June 1924). Average number of tillers per plant, 8·1. Percentage of rice, 67·40. Do. broken rice, 2·80. Do. bran, 2·85. Do. husk, 27·10.
	2	22·99	26·00	
	3	22·61	25·00	
	4	21·23	27·50	
	5	21·48	27·50	
	6	22·88	28·75	
	7	23·99	27·50	
	8	23·73	31·75	
	9	22·30	25·25	
	10	22·17	25·00	
Average	22·77	27·35	

Each plot is half a cent in area.

It will be seen that *Punasa Akkullu* Nos. 2 and 3 each, gave nearly 17 per cent more grain than the bulk seed. The probable error, however, for the comparison of any two plots is high and works out to 23·6 per cent of the mean for a 30 : 1 chance.

The rice of both these selections is superior to that of the bulk.

TABLE III.

Ratnachudi No. 7e and bulk.

Variety.	Number of plot.	Per plot.		Remarks.
		Grain.	Straw.	
Ratnachudi bulk (a mixture of several types).	1	16.52	33.00	Not uniform in ripening.
	2	15.90	30.75	Average number of tillers per plant, 6.57.
	3	16.70	31.50	
	4	16.30	32.75	
	5	16.48	32.50	
	6	16.61	31.75	Percentage of rice, 64.60.
	7	17.02	31.25	Do. broken rice, 3.15.
	8	16.05	30.75	Do. bran, 3.15.
	9	16.96	32.25	Do. husk, 29.50.
	10	15.61	29.50	
	Average ...		16.42	31.61
Ratnachudi 7 ...	1	18.28	26.25	Duration, 172 days (sown in seed-bed on 5th June 1925).
	2	18.30	26.00	Average number of tillers per plant, 6.55.
	3	17.93	25.75	
	4	17.90	26.00	
	5	18.30	25.00	
	6	18.61	24.50	Percentage of rice, 67.90.
	7	18.67	25.75	Do. broken rice, 2.75.
	8	18.55	24.50	Do. bran, 3.15.
	9	18.96	28.50	Do. husk, 26.65.
	10	18.42	23.50	
	Average	18.19	25.06

This is a fine variety that is grown extensively in the Ganjām district. It was introduced into the Gōdāvāri district several years ago and is gradually gaining popularity. Selection No. 7 gave 10·8 per cent higher yield of grain than the bulk seed, and the probable error of the difference for 30:1 chance is $\pm 14\cdot8$ per cent of the mean. This strain is ten days earlier in maturing than the local seed, but the grain is coarser.

Palagummasari No. 7 gave only $3\frac{1}{2}$ per cent over the bulk seed and this cannot be considered superior to the local seed in yield. The rice of this selection, however, is of excellent quality and as the variety is cultivated on a large scale in the upland taluks there will be a demand for this. In view of this year's results it will not be put out into the district yet.

Some of the other selections were compared with bulk seed and the results were as follows:—

Rasangi No. 21 ...	...	No. 21 gave 6·31 per cent over the bulk.
Do. No. 23 ...	...	Probable error $\pm 10\cdot15$ per cent for 30:1 chance.
Do. Bulk ...	...	.....
Ratnachudi No. 8 ...	...	No. 8 gave 4·9 per cent over the bulk.
Do. No. 9 ...	...	No. 9 gave 5·56 per cent over the bulk.
Do. Bulk ...	...	Probable error ± 21 per cent for 30:1 chance.
Garikasannavari No. 4 ...	...	.....
Do. No. 7 ...	...	No. 7 gave 3·53 per cent over the bulk.
Do. Bulk ...	...	Probable error $\pm 16\cdot1$ per cent for 30:1 chance.

This recent selection work on paddy was started in season 1921-22 and last year. With the exception of a trial of Rasangi Nos. 21, 23 and bulk, no comparisons were made. It will be seen that none of the selections on this year's results can be considered superior to the bulk seed, although last season Rasangi No. 21 gave an increased yield of 7·7 per cent over the bulk. In the coming season the number of selections under trial will be reduced, and these will be confined to the more even plots.

SEEDLING TEST.

"Thick" versus "Thin" sown seedlings.—This comparison of thick and thin sown seedlings was continued with the two varieties Palagummasari and Konamani and another series of each variety was added in which the thick sown seedlings were planted in bunches instead of in singles.

The probable error is calculated according to formula $P.E. = \sqrt{\frac{M d^2}{4-1}}$

The figures are given in Tables IV and V.

TABLE IV.
Seedling test—Palagummasari—1 link spacing.

Number of strip.	Thin sown seedlings.			Thick sown seedlings.			Thick sown seedlings—Bunch planting.		
	Average No. of tillers per plant.	Per plot.		Average No. of tillers per plant.	Per plot.		Average No. of tillers per plant.	Per plot.	
		Grain.	Straw.		Grain.	Straw.		Grain.	Straw.
1	6.25	23.42	21.50	6.58	19.87	18.00	7.56	20.80	21.25
2	6.00	22.93	23.00	6.73	20.23	21.25	8.70	22.48	24.00
3	6.37	24.30	25.00	6.75	21.36	21.75	8.94	21.17	27.00
4	6.18	24.99	26.75	6.60	19.87	22.25	8.65	23.11	23.50
5	6.94	24.17	23.50	7.29	21.11	22.00	8.45	20.99	25.25
6	6.40	24.99	22.75	6.62	21.36	21.25	8.18	22.87	25.25
7	6.93	24.86	25.00	6.85	21.48	21.50	7.87	21.92	25.75
8	6.33	24.17	24.75	6.44	20.11	20.50	8.01	23.61	27.50
9	5.82	23.67	23.75	6.33	20.99	21.75	7.75	23.23	24.75
10	6.10	22.55	21.75	6.53	20.36	19.50	7.43	22.55	24.50
Average ...	6.33	23.96	23.78	6.64	20.67	20.98	8.15	22.27	24.88
Average for 1923-24.	5.97	14.48	11.61	5.84	13.57	11.61	...	...	...
Average for 1922-23.	9.03	20.29	25.65	8.58	19.50	24.73	...	...	...

Yields are in pounds.

Area of plot = $\frac{1}{4}$ cent.

TABLE V.
Seedling test—Konamani—1 link spacing.

Number of strip.	Thin sown seedlings.			Thick sown seedlings.			Thin sown seedlings—Bunch planting.		
	Average No. of tillers per plant.	Per plot.		Average No. of tillers per plant.	Per plot.		Average No. of tillers per plant.	Per plot.	
		Grain.	Straw.		Grain.	Straw.		Grain.	Straw.
1	9.19	22.87	26.50	7.85	20.70	24.50	9.34	20.73	25.50
2	8.65	22.03	25.75	9.42	20.78	25.00	9.92	22.52	27.75
3	8.32	23.17	27.75	8.69	21.23	24.00	8.34	21.87	28.00
4	9.16	23.23	26.75	8.52	21.23	23.50	9.15	21.61	27.00
5	7.13	22.73	26.35	9.36	21.67	24.75	9.42	21.17	28.50
6	8.87	23.11	28.50	8.69	21.64	25.00	7.42	20.61	28.25
7	7.26	22.23	26.25	8.25	21.45	24.50	8.74	20.78	26.75
8	7.74	22.36	26.50	6.81	20.42	21.25	8.49	20.81	26.00
9	7.08	22.78	24.75	7.59	20.81	22.75	8.21	20.73	26.00
10	7.52	21.48	23.50	6.94	20.61	21.75	8.72	20.87	24.50
Average ...	8.13	22.60	25.15	8.22	21.05	23.70	8.78	21.17	26.83
Average for 1923-24	7.18	13.71	15.73	6.58	11.88	14.38	...	..	..
Average for 1922-23	8.51	22.68	27.25	8.87	21.65	26.75	...	...	...

Yields are in pounds.

Area of plot = $\frac{1}{4}$ cent.

It will be seen that with Palagummasari, a medium duration variety, thin sown seedlings gave 16.7 per cent higher yield than seedlings grown in a thickly sown seed-bed. The probable error of the difference works out to 5.3 per cent of the average giving for a 10:1 chance 15.09 per cent.

In the case of Konamani, a later variety, the corresponding difference in yield is 7.4 per cent grain. This figure is within the limits of error. These results again show the advantage of planting an early variety singly, and if the plots had been more even it is probable that an appreciable difference would have been obtained with the later maturing variety Konamani.

Paddy manurial experiment.—This experiment was continued in field No. 9. This year the green-leaf plus bone-meal plots received bone-meal at 2 cwt. per acre and 2,000 lb. green-leaf. The quantity of manure applied per acre in the previous years was as follows:—

Year.	Fish-guano.	Green-manure and bone-meal.	Cyanamide.	Old indigo.
1921-22	3 cwt. ...	2 cwt. bone-meal. 4,000 lb. green-leaf.	2 cwt. ...	492 lb.
1922-23	Do. ...	2,000 lb. green-leaf	...	...
1923-24	Do. ...	Do. ...	...	...

During the previous two years the residual effect of the old indigo seed and cyanamide plots was not appreciable and this year bone-meal and green-leaf were applied separately to these plots, the object being to show the value of these manures when used separately.

The figures are noted in Table VI.

TABLE VI.

Serial number.	Treatment.	Number of plot.	Tiller counts.		Yield in pounds.				Value of extra yield per acre.	Value of manure per acre.	Net profit or loss.
			Number of plants per square yard.	Number of tillers per plant.	Per plot of 2 cents.		Per acre.				
					Grain.	Straw.	Grain.	Straw.			
1	No manure.	1	22 00	9 42	71 00	80 50	3,550	4,025	...	...	...
		2	23 00	9 78	75 00	109 25	3,750	5,463	...	...	...
		3	21 00	11 54	60 00	83 00	3,000	4,150	...	...	...
		4	27 50	6 72	56 00	69 00	2,800	3,450	...	...	...
		5	22 70	9 07	50 00	65 25	2,500	3,263	...	...	...
	Average	...	23 24	9 31	62 40	81 40	3,120	4,070	...	...	...
2	Green-leaf and bone-meal.	1	21 00	10 80	73 00	91 75	3,650	4,588	...	...	...
		2	20 67	12 34	81 00	128 25	4,050	6,413	...	...	...
		3	18 33	13 60	69 00	105 75	3,450	5,288	Grain. 19 14 5	Green-leaf. 5 0 0	...
		4	20 33	11 10	62 00	90 25	3,100	4,513	Straw. 5 10 10	Bone-meal. 8 0 0	...
		5	21 00	10 92	68 25	104 50	3,413	5,225	...	...	...
	Average	...	20 27	11 75	70 65	104 10	3,533	5,205	25 9 3	13 0 0	12 9
3	Green-leaf.	1	20 33	12 00	76 00	102 25	3,800	5,113	...	...	...
		2	19 33	12 56	75 00	125 00	3,750	6,250	...	...	...
		3	18 67	11 41	65 50	100 00	3,275	5,000	...	...	...
		4	18 67	12 05	64 50	98 50	3,225	4,925	Grain. 13 7 11	...	...
		5	20 33	11 89	59 00	77 50	2,950	3,875	Straw. 4 13 0	...	...
	Average	...	19 27	11 98	68 00	100 65	3,400	5,033	18 4 11	Green-leaf. 5 0 0	13 0
4	Bone-meal.	1	23 00	10 29	72 00	81 75	3,600	4,088	...	...	...
		2	19 33	11 43	72 00	111 50	3,600	6,575	...	...	...
		3	19 33	10 67	69 75	100 25	3,488	5,013	...	...	...
		4	23 67	8 32	61 00	81 75	3,050	4,088	Grain. 6 14 3	...	...
		5	21 33	9 78	51 50	66 00	2,575	3,300	Straw. 2 11 5	...	...
	Average	...	21 33	10 50	65 25	88 25	3,263	4,413	9 9 8	8 0 0	1 9
5	Fish guano.	1	21 67	10 34	72 00	96 50	3,600	4,825	...	...	...
		2	18 33	9 58	82 00	123 25	4,100	6,163	...	...	...
		3	21 00	11 63	68 00	101 75	3,400	5,088	...	...	...
		4	17 00	12 63	64 00	90 50	3,200	4,525	Grain. 15 14 6	...	...
		5	22 33	9 85	59 00	79 25	2,950	3,963	Straw. 4 3 4	...	...
	Average	...	20 07	10 80	69 00	98 25	3,450	4,913	20 1 10	18 0 0	2 1 1

It will be seen that the variation in yield from plot to plot is still great and the probable error of the mean yield works out to a figure which makes it impossible to get accurate information on the relative values of the manures applied. The plots as in the previous year have been grouped into 'rich' and 'poor,' and the economic aspect of the yield obtained from these has been worked out separately.

The figures are noted in Table VII.

TABLE VII.

Results obtained from the manurial experiment in Field N. 9
separately for the richer and poorer plots.

Average for the year. (1)	No manure.				Green-leaf and bone-meal.				Green-leaf.	
	Richer, two plots.		Poorer, three plots.		Richer, two plots.		Poorer, three plots.		Richer, two plots.	
	Grain. (2)	Straw. (3)	Grain. (4)	Straw. (5)	Grain. (6)	Straw. (7)	Grain. (8)	Straw. (9)	Grain. (10)	Straw. (11)
1924-25 ...	LB. 3,750	LB. 3,650	LB. 2,900	LB. 2,767	LB. 3,975	LB. 3,850	LB. 3,467	LB. 3,333	LB. 3,425	LB. 3,775
Extra yield per acre	225	200	567	566	-325	125
Value of extra yield	RS. 10 A. 13 P. 6	RS. 1 A. 1 P. 0	RS. 27 A. 5 P. 2	RS. 2 A. 13 P. 4	RS. 15 A. 10 P. 7	RS. 0 A. 10 P. 0
Cost of manure per acre	11 13 6	80 2 6	13 0 0	13 0 0	-15 0 7	5 0 0
Net profit or loss	-1 2 6	17 2 6	17 2 6	17 2 6	-20 0 7	-20 0 7

Average for the year.	Green-leaf— cont.		Bone-meal.				Fish-guano.			
	Poorer, three plots.		Richer, two plots.		Poorer, three plots.		Richer, two plots.		Poorer, three plots.	
	Grain. (12)	Straw. (13)	Grain. (14)	Straw. (15)	Grain. (16)	Straw. (17)	Grain. (18)	Straw. (19)	Grain. (20)	Straw. (21)
1924-25 ...	LB. 3,250	LB. 3,150	LB. 3,675	LB. 3,600	LB. 3,150	LB. 3,038	LB. 4,000	LB. 3,850	LB. 3,250	LB. 3,183
Extra yield per acre ...	350	483	-75	-5)	250	271	250	200	350	416
Value of extra yield ...	RS. 16 A. 14 P. 0	RS. 1 A. 13 P. 1	RS. -3 A. 10 P. 0	RS. 0 A. 4 P. 0	RS. 12 A. 1 P. 0	RS. 2 A. 4 P. 11	RS. 12 A. 0 P. 9	RS. 1 A. 0 P. 0	RS. 18 A. 0 P. 0	RS. 2 A. 1 P. 4
Cost of manure per acre ...	18 11 1	18 11 1	-3 6 0	-3 6 0	14 5 11	14 5 11	13 0 9	13 0 9	20 1 4	20 1 4
Net profit or loss ...	5 0 0	5 0 0	4 0 0	4 0 0	4 0 0	4 0 0	18 0 0	18 0 0	18 0 0	18 0 0
Net profit or loss ...	13 11 1	13 11 1	-7 6 0	-7 6 0	10 5 11	10 5 11	-4 15 3	-4 15 3	2 1 4	2 1 4

The green-leaf and bone-meal have given the highest yield, but they have not given a higher nett profit than green-leaf alone. The bone-meal plots gave a very small profit; but the residual effect will have to be taken into account.

Both the manure applied and the produce harvested were valued at the same rates as in the previous year.

Farm yard manure—Conservation experiment.

The experiment was continued as in the previous year with slight modification, a no manure series being introduced. During the year under report the "byre pit with soil" method again gave the largest quantity of manure and this was taken as the standard and applied at 10 tons per acre. As in the previous year the manure from the other systems of storage were applied on this basis in proportion to the quantity produced.

The chemical analyses of the manures obtained under the different systems is given in Table X.

In 1923 the manure was analysed about six months after its removal from the byres which thus gave a period of six months for fermentation during storage. In 1924, however, the manure was analysed immediately after the total quantity of manure had been obtained.

It will be seen that the manure this year shows a higher water content than that obtained in the previous season, and the quantity produced in each case was also less. The reduction in the quantity obtained may be due to the bullocks having been given more grazing and this may also have resulted in the excreta being more diluted. It is probable, however, that the shorter period allowed for fermentation also caused a difference in the condition of the manure. The total quantity of nitrogen obtained shows a decrease compared with the previous year, which is greatest under the two systems which gave the highest increase in water content.

The details of the yields obtained by the application of manure conserved under the four systems are given in Table VIII. The figures shown in Table IX are the results of the residual effects of the plots in which the manure was applied in the previous year.

TABLE VIII.

Comparison of farm yard manure.—Storage systems—New series.

System of storage and quantity of litter or earth used.	Manure obtained.	Manure applied per plot of 2 cents.	Plot number.	Tiller counts.		Yield in pounds.		
				Number of plants per square yard.	Number of tillers per plant.	Per plot.		
						Grain.	Straw.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
No manure ... ..	...	...	...	1	21 66	10 30	58 00	85 00
				2	22 00	10 10	58 75	74 00
				3	19 68	11 60	57 50	79 25
				4	21 33	10 90	51 50	76 00
				Average	21 14	10 73	55 94	78 56
Heap	3,834	103	...	1	21 66	10 10	58 50	86 75
				2	19 00	12 00	63 00	92 00
				3	22 00	11 00	56 75	80 50
				4	20 00	11 10	56 25	78 50
				Average	20 67	11 05	58 63	84 44
Byre pit with urine	6,070	163	...	1	21 00	11 30	59 00	83 00
				2	20 00	11 50	61 50	89 00
				3	22 68	10 90	55 50	81 00
				4	21 00	11 10	59 75	81 25
				Average	21 17	11 20	58 94	83 56
Byre pit with soil	16,738	448	...	1	22 00	10 70	61 25	88 75
				2	22 68	10 70	59 25	83 75
				3	20 00	11 40	56 00	89 00
				4	19 68	10 70	58 50	75 50
				Average	21 08	10 88	55 69	84 25
Loose Box	11,189	300	...	1	21 66	11 40	63 25	97 00
				2	20 33	10 90	66 25	102 25
				3	21 00	11 50	57 50	93 75
				4	23 66	10 80	62 50	91 00
				Average	21 66	11 15	62 38	96 00

TABLE IX.

Comparison of farm yard manure—Storage system—Old series.

System of storage.	Tiller counts.		Yield in pounds.	
	Number of plants per sq. yard.	Number of tillers per plant.	Per plot of 2 cents.	
			Grain.	Straw.
Loose box 1	16-33	12-30	65-75	91-25
Do. 2	21-00	11-10	68-25	97-75
Do. 3	16-33	13-00	60-50	90-25
Do. 4	16-00	16-00	60-75	106-00
Average ...	...	...	62-56	96-30
Byre pit with soil 1	17-00	11-20	56-50	79-25
Do. 2	20-33	10-60	56-00	76-75
Do. 3	16-66	12-00	53-50	72-75
Do. 4	20-33	11-50	53-25	84-25
Average ...	...	...	54-81	78-30
Byre pit with urine 1	18-00	13-00	58-50	78-50
Do. 2	23-00	10-40	59-20	73-25
Do. 3	16-00	12-70	56-70	76-75
Do. 4	17-66	13-00	54-25	93-25
Average ...	...	...	57-13	80-44
Heap 1	17-00	10-90	52-00	69-50
Do. 2	19-66	10-70	58-75	76-75
Do. 3	17-00	14-20	56-75	80-25
Do. 4	20-33	11-20	55-75	70-25
Average ...	...	...	55-81	76-40

TABLE X.

Analysis of farm yard manure under different systems of storage.

Serial No.	Head of analysis	Heap.		Loose box.		Byre pit with urine.		Byre pit with soil.	
		1923.	1924.	1923.	1924.	1923.	1924.	1923.	1924.
1	Loss on ignition ...	23.86	39.26	27.51	39.91	36.52	47.30	7.95	9.91
2	Insoluble ...	62.76	49.62	57.45	48.66	51.61	40.87	76.98	77.75
3	Soluble ...	13.88	11.12	15.04	11.43	11.87	11.83	15.07	12.34
	Total ...	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
4	Nitrogen ...	1.03	0.973	1.09	0.915	1.58	1.443	0.31	0.203
5	Phosphoric acid	0.86	0.298	0.65	0.622	1.16	1.433	0.27	0.269
6	Potash ...	1.74	1.935	2.70	2.163	2.10	2.002	0.71	0.488
7	Total weight of manure from a pair of cattle in lb.	4,635	3,834	13,086	11,189	6,440	6,070	23,294	16,738
8	Amount of (H ₂ O) at the time of samp- ling.	46.53	47.97	54.30	55.30	61.45	70.28	12.62	20.57
9	Total quantity of nitrogen obtained.	25.53	19.41	65.24	45.76	39.23	26.03	63.09	26.99
10	Nitrogen added in litter or soil.	...	...	18.43	17.70	...	...	8.86	8.60
11	Net quantity of nitrogen obtained.	25.53	28.54	46.81	28.06	39.23	26.03	54.23	18.39

The differences in yields obtained this year are not so marked, which may be due both to the poorer quality of the manure and the smaller quantities applied.

It will be seen that the manure from the 'loose box' system did not give any appreciable difference in yield over the 'heap' system. Last year an increase of over 29 per cent was obtained in favour of the 'loose box' system. There was also very little difference in the yields obtained in the other plots.

The introduction of the 'no manure' series restricts the number of times each series can be repeated and it is in no way concerned with the object of the experiment. A comparison in the yield of paddy land manured with farm yard manure and unmanured will be found in previous annual reports of the station.

Standardization Plots.—The yields of the plots in Field Nos. 5, 7 and 8 which are under standardization, are given in Tables XI, XII and XIII.

TABLE XI.

Yield of plots under standardization—Field No. 5.

No of plot.	Tiller counts.		Yield in pounds.				Remarks.
	Number of plants per sq. yard.	Number of tillers per plant.	Per plots.		Per acre.		
			Grain.	Straw	Grain.	Straw.	
1	21'00	10'9	71'00	99'50	3,550	4,975	Plots 1 to 18 are 2 cents in area and plots 19 to 24 are 1'6 cents in area
2	21'00	11'6	71'00	102'00	3,550	5,100	
3	21'67	10'4	73'00	104'25	3,650	5,213	
4	21'00	11'5	76'00	110'30	3,800	5,525	
5	21'83	10'9	75'00	105'75	3,750	5,288	
6	23'33	9'9	78'00	115'00	3,900	5,750	
7	24'33	9'8	69'00	103'25	3,450	5,163	
8	22'67	10'4	73'00	114'25	3,650	5,713	
9	21'00	11'4	74'00	114'75	3,700	5,738	
10	23'67	10'5	79'00	127'00	3,950	6,350	
11	26'67	10'5	77'00	124'75	3,850	6,238	
12	22'00	11'5	72'00	114'00	3,600	5,700	
13	22'33	10'7	70'00	107'50	3,500	5,375	
14	21'67	11'6	69'00	109'25	3,450	5,463	
15	23'67	10'2	69'00	102'75	3,450	5,138	
16	24'67	10'7	68'00	115'75	3,400	5,788	
17	26'67	11'2	72'00	119'75	3,600	5,988	
18	24'00	10'4	70'00	115'76	3,500	5,788	
19	19'00	10'7	44'00	66'50	2,750	4,156	
20	20'33	12'0	51'00	76'00	3,888	4,750	
21	22'33	11'2	53'00	68'75	3,313	4,172	
22	24'33	11'0	53'00	79'00	3,313	4,938	
23	21'67	10'7	51'00	73'50	3,188	4,591	
24	21'00	12'0	53'00	76'50	3,313	4,731	

TABLE XII.

Yield of plots under standardization—Field No. 7.

Plot number.	Tiller counts.		Yield in pounds.			
	Number of plants per square yard.	Number of tillers per plant.	Per plot of 3 cents.		Per acre.	
			Grain.	Straw.	Grain.	Straw.
1	21.00	5.5	117.00	136	3,900	4,533
2	29.50	5.6	116.00	136	3,867	4,533
3	27.00	7.0	112.00	149	3,733	4,967
4	21.33	7.0	115.00	145	3,833	4,833
5	18.33	7.3	115.00	130	3,383	4,333
6	18.00	6.8	111.00	135	3,700	4,500
7	19.67	7.0	109.00	110	3,333	3,667
8	13.33	7.5	109.00	120	3,633	4,000
9	16.00	5.6	81.00	73	2,700	2,433
10	17.00	6.0	88.00	80	2,933	2,667
11	19.33	5.5	89.00	85	2,967	2,833
12	18.33	5.7	91.00	86	3,033	2,867
13	21.33	5.0	92.00	90	3,067	3,000
14	18.67	6.3	81.00	83	2,700	2,767
15	17.33	6.3	92.00	92	3,067	3,067
16	16.67	6.1	97.00	100	3,233	3,333

Note.—The variety grown was G.E.B. strain 24.

TABLE XIII.

Yield of plots under standardization—Field No. 8.

Plot number.	Tiller counts.		Yield in pounds.			
	Number of plants per square yard.	Number of tillers per plant.	Per plot of 2 cents.		Per acre.	
			Grain.	Straw.	Grain.	Straw.
1	15.00	8.5	80.00	85.00	4,000	4,250
2	14.67	9.7	81.00	87.00	4,050	4,350
3	14.33	10.1	81.00	86.00	4,050	4,300
4	12.00	10.7	80.00	85.00	4,000	4,250
5	11.67	11.3	81.00	88.00	4,050	4,300
6	16.67	9.0	80.00	84.00	4,000	4,200
7	19.00	8.0	75.00	81.00	3,750	4,050
8	17.33	10.0	77.00	83.00	3,850	4,150
9	15.67	9.1	80.00	85.00	4,000	4,250
10	16.00	9.4	82.00	87.00	4,100	4,350
11	15.33	9.5	83.00	86.00	4,150	4,300
12	18.00	9.8	82.00	88.00	4,100	4,400
13	16.67	8.5	71.00	68.00	3,550	3,300
14	19.00	8.2	67.00	62.00	3,350	3,100
15	16.00	8.0	68.00	62.00	3,300	3,100
16	17.00	9.1	69.00	64.00	3,450	3,200
17	14.33	10.0	67.00	64.00	3,350	3,200
18	14.67	7.6	67.00	63.00	3,350	3,150
19	14.00	9.3	72.00	66.00	3,600	3,800
20	13.33	11.0	71.00	65.00	3,550	3,250
21	14.00	10.9	70.00	64.00	3,500	3,200
22	17.67	9.2	72.00	67.00	3,600	3,350
23	18.00	11.3	71.00	64.00	3,550	3,200
24	14.33	9.6	71.00	65.00	3,550	3,250

Field No. 5.—This field shows much variation from plot to plot. The probable error for the comparison of any two from No. 1 to 18 is ± 4.64 per cent. When an experiment is conducted on this area it will be necessary to get a result of over 9.28 per cent before the differences in yield can be considered due to different treatment.

Field No. 7.—This field shows slightly more variation than plots Nos. 1 to 18 in field No. 5. The probable error for the comparison of any two plots work out to ± 11.9 per cent.

Field No. 8.—This area also varies considerably and the variation is unevenly distributed. The probable error of plots Nos. 1 to 12 is ± 1.8 per cent of the average and working on a 10:1 chance it will be necessary to get a 5.22 per cent increase in an experiment, before errors are eliminated.

Intermediate Season Paddies.—This year the varieties were planted in November only, as in the previous year the earlier series were not promising. These have done moderately well, the figures for which are noted below:—

Statement of yields of Inter-season varieties tried on the Samalkota farm in the year 1924-25 (November series).

Serial number.	Variety.	Area in cents.	Average of four plots.	
			Grain.	Straw.
1	G. S. Vari	0.5	12.58	16.44
2	Red Siramani	0.5	17.40	16.81
3	Kottai Sambal	0.5	13.38	14.69
4	Molakolukulu	0.5	17.83	12.88
5	Iswarakora	0.5	22.06	22.63
6	Pishanam	0.5	19.25	21.69
7	Muthu Samba	0.5	16.38	19.88
8	Masipishanam	0.5	13.00	16.56
9	Sannavari	0.5	14.06	22.00

In addition to the varietal plots all promising varieties were planted in bulk and these did fairly well. Molakolukulu, Korangu Samba, Masipishanam, Iswarakora and Ramagarudan Samba each yielded over 2,500 lb. grain per acre. The planting of the bulk area was done in September and the crops unlike in previous years were on the whole, free from insect attack.

A general comparison of a broadcasted crop and a transplanted one in this season again shows that the former is not so adversely affected by climatic and other conditions that prevail just before and during the north-east monsoon period. Owing to lack of suitable area it was not possible to make this comparison on uniform land. Four

plots, two of which were 22 cents in area and two, 26 cents, were treated as follows:—

3rd week October Broadcasted.
 2nd week November do.
 Do. do. Transplanted.
 4th week do. do.

The results show promise, although the yields cannot be compared. The figures will be noted in next year's report.

Second crop Paddies.—The harvest of second crop varieties planted in 1924 was completed at the beginning of the year. The yields were on the whole fair, 1,654 lb. of grain and 2,017 lb. of straw per acre having been obtained.

Varietal test.—The figures of the varietal test are given in Table XIV.

TABLE XIV.

Variety.	Number of plot.	First Series.		Second Series.		Third Series.	
		1st week of December.		1st week of January.		1st week of February.	
		Per plot of $\frac{1}{4}$ cent.		Per plot of $\frac{1}{4}$ cent.		Per plot of $\frac{1}{4}$ cent.	
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
Garikasannavari ...	1	13.48	11.75	9.78	12.75	9.87	12.50
	2	13.05	11.00	9.97	11.75	8.27	12.50
	3	12.17	10.25	9.97	11.00	8.48	12.25
	4	11.80	11.75	8.69	11.50	9.52	14.00
	5	10.86	7.25	8.88	10.25	10.23	14.75
	6	...	...	8.69	11.00	...	...
Average ...	...	12.27	10.40	9.33	11.38	9.47	13.20
Per acre ...	...	2,454	2,080	1,866	2,276	1,894	2,640
Average per acre for 1922-23.	...	2,048	1,870	2,287	2,120	2,496	3,160
Average per acre for 1921-22.	...	2,716	2,470	2,248	2,164	295	1,070
Punasa Atragada ...	1	11.61	11.00	8.28	11.25	9.67	11.25
	2	11.80	10.00	8.81	11.00	8.52	11.25
	3	11.48	10.00	9.97	13.00	9.30	12.50
	4	10.61	9.75	7.69	10.50	8.58	10.50
	5	10.42	9.25	8.72	11.75	10.73	14.00
	6	...	...	7.72	9.25	...	...
Average ...	...	11.48	10.00	8.53	11.12	9.36	12.00
Average per acre ...	...	2,216	2,000	1,706	2,224	1,872	2,400
Average per acre for 1922-23.	...	1,950	1,610	2,450	2,097	2,410	3,470
Average per acre for 1921-22.	...	...	...	2,212	2,152	370	1,125

TABLE XIV—cont.

Variety.	Number of plot.	First Series.		Second Series.		Third Series.	
		1st week of December.		1st week of January.		1st week of February.	
		Per plot of $\frac{1}{2}$ cent.		Per plot of $\frac{1}{2}$ cent.		Per plot of $\frac{1}{2}$ cent.	
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
Dalwa ...	1	7.73	9.75	7.41	6.50	9.83	9.75
	2	6.17	8.00	6.72	7.50	6.86	9.50
	3	7.11	7.00	7.22	6.50	8.42	8.00
	4	5.67	9.00	6.56	6.75	7.48	8.75
	5	6.05	8.50	5.72	6.25	7.48	10.50
	6	...	...	5.88	6.75	...	...
Average ...	...	6.55	8.45	6.59	6.71	7.81	9.30
Average per acre ...	...	1,810	1,690	1,318	1,342	1,562	1,860
Average per acre for 1922-23.	..	1,286	1,370	1,638	1,533	1,638	1,533
Average per acre for 1921-22.	...	2,243	2,290	1,844	1,700	520	780
Robbiliganti ...	1	3.99	4.50	3.47	4.50	5.69	8.50
	2	3.86	4.50	2.47	4.00	3.33	5.75
	3	3.67	5.75	2.72	2.50	3.05	5.00
	4	3.48	5.50	2.97	3.00	2.42	4.75
	5	2.55	6.25	2.34	2.00	1.23	5.00
	6	...	...	2.09	2.85	...	...
Average ...	...	3.51	5.30	2.68	3.04	3.18	5.80
Average per acre ...	...	702	1,060	532	608	636	1,160
Bobbili Budama ...	1	...	...	...	...	6.97	6.75
	2	...	...	...	...	3.97	4.75
	3	...	...	...	...	3.59	4.75
	4	...	...	...	...	3.09	4.50
	5	...	...	...	...	3.66	5.00
Average ...	...	...	...	...	4.26	5.15	
Average per acre ...	...	...	...	...	852	1,030	

Only five varieties were tried, and Garikasannavari and Punasa Atragada again gave the best yields. In the December planted crop these gave respective yields of 87 per cent and 69 per cent more grain than dalva.

These very big differences are partly due to the plots planted with dalva being poorer in fertility. Some of the later planted plots suffered on account of shortage of water but the results obtained this year confirm those of the previous season, viz. that of the varieties under trial Punasa Atragada and Garikasannavari are the best.

Broadcasting versus Transplanting.—A statement showing the yields obtained in the broadcasted and transplanted plots is given in Table XV.

TABLE XV.

Broadcasting versus Transplanting.

Number of plot.	First Series.						Second Series.					
	Transplanted 1st week of December.		Broadcasted 1st week of December.		Transplanted 1st week of January.		Transplanted 1st week of January.		Broadcasted 1st week of January.		Transplanted 1st week of February.	
	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
1	47.50	42.00	46.25	68.00	33.00	58.00	35.25	57.00	42.50	72.00	32.75	50.00
2	45.00	49.25	40.00	58.00	42.00	45.00	52.00	69.00	57.50	86.25	34.75	44.00
3	35.25	32.50	36.00	53.00	50.25	46.00	47.00	65.00	54.75	78.00	39.50	56.50
4	41.25	38.75	51.00	72.00	54.75	50.00	56.75	63.00	53.00	77.00	39.50	56.50
5	48.50	37.25	50.25	83.00	44.00	66.00	43.00	58.00	46.50	72.00	29.00	56.50
6	52.50	45.00	53.50	84.00	34.50	76.00	48.75	64.00	52.50	79.50	32.50	59.00
Average ...	44.92	39.96	46.17	69.67	43.08	56.83	47.12	62.67	51.12	77.46	34.67	53.75
Average per acre.	1,497	1,332	1,539	2,322	1,436	1,884	1,571	2,089	1,704	2,582	1,156	1,792
Average for 1922-23.	1,471	1,844	1,288	1,263	1,611	1,417	1,494	2,258	1,752	1,828	1,501	2,042
Average for 1921-22.	1,600	2,515	939	1,604	1,548	2,068	2,919	839	1,005	2,100	571	2,220

Note.—Yields are in pounds.

The plots show great variation and the probable error is high. The figures in both series favour a broadcasted crop; but the differences are well within the limits of error.

The plots that were transplanted and broadcasted late suffered for want of water in the latter stages.

PART II.

Sugarcane.

The area under sugarcane this year was 5.41 acres, the greater portion of which was under J-247. The average yield was 6,921 lb. jaggery per acre against 8,893 lb. in the previous year. The demonstration area gave a yield equivalent to 11,110 lb. which raised the average considerably.

The experimental area, which is under a three-year rotation is no longer fit for sugarcane, and next year a part of the experiments will be shifted to the eastern side of the farm.

Sugarcane varieties.—The multiplication of the new varieties was continued and a sufficient quantity of cane was available for a chemical analyses of each to be made. The figures are given in Table XVI:—

TABLE XVI.

Results of Analyses of sugarcane done at Samalkota during February 1925.

Serial number.	Variety.	Number of canes.	Weight of canes.	Weight of juice.	Percentage of extraction.	Brix percentage.	Sucrose.	Glucose.	Glucose ratio.	Co-efficient purity.	Ratio Top Bottom	
1	Purple Mauritius.	Top ...	49.5	29.0	...	18.67	...	...	...	...	...
		Bottom ...	40	55.5	34.0	...	18.97	...	...	...	...
		Mixed ...	...	105.0	63.0	65.0	18.87	16.55	1.44	6.9	87.7	0.98
2	J. 1410 ...	Top ...	...	32.5	25.5	...	15.39	11.65	...	...	75.7	...
		Bottom ...	...	36.5	24.5	...	17.00	13.99	...	...	82.3	...
		Mixed ...	85	69.0	50.0	70.8	16.24	12.93	1.28	9.9	79.6	0.91
3	J. 1499 ...	Top ...	...	38.5	22.0	...	18.95	16.53	...	...	87.2	...
		Bottom ...	...	43.0	27.5	...	20.26	18.42	...	...	90.9	...
		Mixed ...	40	81.5	49.5	60.7	19.66	17.51	0.43	2.5	89.0	0.94
4	Java Heb. bal.	Top ...	...	36.5	22.0	...	19.14	16.87	...	...	88.1	...
		Bottom ...	...	38.0	23.5	...	19.94	17.92	...	...	89.9	...
		Mixed ...	26	74.5	46.5	61.1	19.60	17.41	1.04	6.0	88.8	0.96
5	B. 208 ...	Top ...	...	30.5	19.5	...	19.80	17.82	...	...	89.9	...
		Bottom ...	...	30.0	20.5	...	20.10	18.04	...	...	89.7	...
		Mixed ...	28	60.5	40.0	66.1	20.00	17.95	0.75	4.2	89.8	0.89
6	Red Mauritian.	Top ...	...	28.5	18.0	...	17.73	13.90	...	...	78.4	...
		Bottom ...	...	29.5	19.0	...	19.64	17.03	...	...	86.7	...
		Mixed ...	26	58.0	37.0	63.8	18.79	15.55	1.52	9.8	82.8	0.90
7	Q. 813 ...	Top ...	...	18.0	11.0	...	21.29	19.16	...	...	90.0	...
		Bottom ...	...	17.5	12.0	...	21.72	20.03	...	...	92.2	...
		Mixed ...	15	35.5	23.0	64.8	21.49	19.63	0.42	2.1	91.4	0.98

TABLE XVI—cont.

Serial number.	Variety.		Number of canes.	Weight of canes.	Weight of juice.	Percentage of extraction.	Brix percentage.	Sucrose.	Glucose.	Glucose ratio.	Co-efficient purity.	Ratio	
												Top	Bottom
8	A. 2	Top ...	...	29.5	18.0	..	17.90	14.91	...	...	83.3	...	...
		Bottom ...	...	31.5	21.0	...	18.63	16.29	...	...	87.4	...	...
		Mixed ...	19	61.0	39.0	63.9	18.30	15.69	1.16	7.4	85.7	0.96	...
A. 95	Top ...	...	...	25.0	15.5	..	18.43	15.89	...	...	86.2	...	...
	Bottom ...	...	...	25.5	17.5	...	18.93	16.93	...	...	89.4	...	...
	Mixed ...	21	61.0	33.0	65.3	18.73	16.46	1.28	7.8	87.9	0.97	...	
10	D. 1185	Top ...	...	9.5	5.0	...	17.16	14.40	...	...	83.9	...	...
		Bottom ...	...	10.0	6.0	...	18.67	16.93	...	...	88.3	...	...
		Mixed ...	11	19.5	11.0	56.4	17.86	15.44	0.79	5.1	86.4	0.92	...
11	D. 625	Top ...	...	3.0	2.0	...	17.36	...	...	...	...	...	...
		Bottom ...	...	2.5	1.5	...	19.97	...	...	...	...	...	...
		Mixed ...	3	5.5	3.5	63.6	18.67	16.02	0.67	4.2	85.8	0.87	...
12	P.O.J. 2714.	Top ...	...	17.0	11.5	...	19.73	16.46	...	...	83.4	...	...
		Bottom ...	...	19.0	12.0	...	21.26	19.25	...	...	90.6	...	...
		Mixed ...	11	36.0	23.5	65.3	20.59	18.06	0.91	5.0	87.7	0.93	...
13	B. 6388	Top ...	...	38.0	27.5	...	18.39	15.85	...	...	86.2	...	...
		Bottom ...	...	41.0	30.0	...	19.99	18.00	...	...	90.0	...	...
		Mixed ...	23	79.0	57.5	72.8	19.29	17.01	0.86	5.1	88.2	0.92	...
14	B. 3412	Top ...	...	42.0	29.0	...	18.99	16.53	...	...	87.0	...	...
		Bottom ...	...	45.0	30.5	...	19.69	17.41	...	...	88.4	...	...
		Mixed ...	26	87.0	59.5	68.5	19.23	17.01	1.00	5.9	88.5	0.96	...
15	B. 6308	Top ...	...	34.5	24.00	...	20.24	17.94	...	...	88.7	...	...
		Bottom ...	...	39.0	27.0	...	20.41	18.84	...	...	89.9	...	...
		Mixed ...	28	73.5	51.0	69.4	20.31	18.11	0.71	3.9	89.2	0.99	...
16	B. 6450	Top ...	...	25.0	17.5	...	18.01	14.99	...	...	83.3	...	...
		Bottom ...	...	27.5	18.5	...	18.71	16.23	...	...	86.8	...	...
		Mixed ...	27	52.5	36.0	68.6	18.41	15.90	1.39	8.7	86.4	0.96	...
17	Batjan	Bulk	40	27.0	18.0	66.7	19.77	18.00	0.50	2.8	91.0	...	...
18	B.S.F.	Do.	41	45.5	30.0	65.9	16.30	13.45	1.52	11.3	82.5	...	...
19	Maxwell 10.	Top ...	...	28.0	17.0	...	17.87	14.97	...	...	83.8	...	...
		Bottom ...	...	30.0	18.5	...	19.47	17.13	...	...	88.0	...	...
		Mixed ...	26	58.0	35.5	61.2	18.77	16.15	1.04	6.4	86.0	0.92	...
20	Q. 116	Top ...	...	19.0	10.5	...	20.11	17.97	...	...	89.4	...	...
		Bottom ...	...	20.5	12.0	...	20.91	19.10	...	...	91.4	...	...
		Mixed ...	19	39.5	22.5	57.0	20.61	18.63	0.61	3.3	90.4	0.96	...
21	B. 254	Top ...	...	6.5	4.5	...	18.61	16.13	0.91	5.6	86.7	...	...
		Bottom ...	...	6.5	4.5	...	19.81	18.03	0.39	2.2	91.0	...	...
		Mixed ...	5	13.0	9.0	69.2	...	...	...	...	...	0.94	...
22	J. 247	Top ...	...	33.0	21.0	...	16.85	13.24	2.38	18.0	78.6	...	...
		Bottom ...	...	37.0	23.0	...	18.11	15.01	1.79	11.9	82.9	...	...
		Mixed ...	28	70.0	44.0	62.9	17.57	14.24	2.08	14.6	81.1	0.93	...

The analyses were made just over twelve months after planting. It will be seen that the new Java canes were slightly underripe at the time of analysis and as regards the time taken to mature they may be grouped with the other Java varieties that have been tested on the farm. It has been observed that all these ripen slowly, and J 247 which is possibly the latest of all takes about fourteen months to mature.

Of the new Java varieties J 1499 shows the best analysis and in this respect it is likely to prove as good as Java Hebbal.

The new Barbados varieties show promise, specially B 6308. This is a tall growing variety and somewhat thicker than B 3412.

The Demerara and Queensland canes are in some respects similar to Purple Mauritius, although not so tall. The Queensland varieties have analysed well specially Q 813, which in general habit resembles B 208. The former is a distinctly promising variety which up to the present has done better at this station than at Anakapalle.

There will be sufficient material next season to compare the most promising of these varieties.

Propping and Wrapping Experiment.—This was continued on the same lines as in the previous year. The whole crop was poor although the season was not unfavourable. The yields of the plots are noted in Table XVII from which it will be seen that there was no appreciable difference in favour of any one method. This is in accordance with last year's result.

TABLE XVII.

Propping and Wrapping Experiment, 1924-25

Method of propping and wrapping.	Variety.	Plot number.	Number of canes.	Weight of canes.	Average weight of canes.	Weight of juice.	Weight of jaggery.	Percentage of juice to cane.	Percentage of jaggery to juice.	Percentage of jaggery to cane.
1. Local...	Purple Mauritius.	1	386	1,039	2.66	603	109	58.0	18.0	10.4
		2	364	1,000	2.75	633	113	63.3	17.9	11.3
		3	398	943	2.37	635	115	67.3	18.1	12.2
	Average	...	383	994	2.59	624	112	62.87	18.0	11.3
	Average per acre.	...	15,320	39,760	...	24,960	4,480	2,515	720	452
Average per acre for 1923-24.	...	20,520	88,080	...	52,600	9,160	2,468	684	416	

TABLE XVII—cont.

Propping and Wrapping Experiment, 1924-25—cont.

Method of propping and wrapping.	Variety.	Plot number.	Number of canes.	Weight of canes.	Average weight of canes.	Weight of juice.	Weight of jag-gery.	Percentage of juice to cane.	Percentage of jag-gery to juice.	Percentage of jag-gery to cane.
	J. 247 ...	1	876	1,789	2.03	1,145	205	64.0	17.9	11.5
		2	920	1,920	2.09	1,086	205	61.0	18.3	10.6
		3	857	1,660	1.87	1,061	182	63.9	17.2	11.0
	Average ...	...	884	1,790	2.00	1,097	197	62.97	17.8	11.03
	Average per acre ...	...	35,360	71,600	...	43,880	7,889	...	...	...
	Average per acre for 1923-24.	...	41,240	10,000	...	72,200	11,280	...	...	...
	2. Railing.	Purple Mauritius.	1	439	1,267	2.88	856	150	67.5	17.5	11.8
2			379	883	2.33	568	96	64.3	16.9	10.8
3			358	909	2.54	491	82	60.7	16.7	10.1
Average ...		...	392	1,020	2.58	638	109	64.17	17.03	10.9
Average per acre ...		...	15,680	40,800	...	25,520	4,360	...	...	...
Average per acre for 1923-24.		...	19,360	76,760	...	48,600	7,630	...	...	...
		J. 247 ...	1	894	1,883	2.11	1,200	264	63.7	117.0	10.8
	2		865	1,720	2.00	1,072	194	62.4	18.1	11.3
	3		798	1,618	2.03	1,021	179	63.1	17.5	11.1
	Average ...	...	852	1,740	2.05	1,098	192	63.07	18.2	11.07
	Average per acre ...	...	34,080	69,600	...	43,820	7,680	...	...	...
	Average per acre for 1923-24.	...	39,000	93,120	...	58,960	8,440	...	...	...
	3. Wire ...	Purple Mauritius.	1	390	966	2.48	603	102	62.4	18.0	11.2
2			429	1,114	2.60	623	112	55.9	17.9	10.0
3			395	940	2.40	560	105	59.6	18.7	11.2
Average ...		...	405	1,007	2.49	595	109	59.3	18.2	10.8
Average per acre ...		...	16,200	40,280	...	23,800	4,360	...	...	...
Average per acre for 1923-24.		...	18,760	75,480	...	45,040	7,840	...	...	...
		J. 247 ...	1	863	2,004	2.24	1,235	231	61.6	18.7	11.5
	2		910	1,889	2.08	1,227	203	64.9	16.5	10.8
	3		830	1,665	2.03	1,053	190	63.1	18.3	11.4
	Average ...	...	868	1,853	2.12	1,172	208	63.2	17.83	11.23
	Average per acre ...	...	34,720	74,120	...	46,880	8,320	...	...	...
	Average per acre for 1923-24.	...	43,640	99,520	...	65,000	9,920	...	...	...

Area per plot—2.5 cents.

Line Planting versus Local Method.—This comparison was continued as in the previous year but the results are not conclusive. During the previous two seasons a difference of 11·2 per cent and 12·6 per cent was obtained. The figures for this year are given in Table XVIII.

TABLE XVIII.

System of planting.	Serial No. of plot.	Area of plot.	Number of canes.	Weight of canes.	Average weight of canes.	Quantity of juice obtained.	Quantity of jaggery obtained.	Percentage of juice to cane.	Percentage of jaggery to juice.	Percentage of jaggery to cane.
1. Line planting	1	4	1,504	3,156	2·10	2,057	364	65·07	17·8	11·57
	2	4	1,360	2,876	2·11	1,625	331	63·43	18·20	11·17
	3	4	1,397	2,974	2·13	1,827	333	61·40	18·27	11·20
	4	4	1,335	2,619	1·97	1,688	284	61·87	17·10	10·87
	Average	4	1,407	2,906	2·08	1,849	323	62·94	17·84	11·18
Average per acre ..	...	...	35,175	72,625	...	46,225	8,075	...	...	...
2. Local system (Broad-casting).	1	4	1,450	3,182	2·20	1,982	364	62·13	18·37	13·10
	2	4	1,412	3,042	2·15	1,890	348	62·13	18·40	11·43
	3	4	1,386	2,907	2·10	1,779	321	61·07	17·87	11·23
	4	4	1,356	2,793	2·06	1,754	305	63·73	17·43	10·90
	Average	4	1,401	2,982	2·13	1,851	335	62·96	18·02	11·16
Average per acre...	...	...	35,025	74,550	...	46,275	8,375	...	...	...

The crop was rather poor throughout and the yield per acre averaged 8,225 lb. jaggery against 8,660 lb. in the previous year. These results tend to show that line planting will not give the same differences in a light crop as in a heavy one. In line planting fewer setts are used which last year amounted to 11·5 per cent, and it is obvious that if the number of stools are thus reduced there must be considerably better individual growth of plants to make up for this. The experiment will be continued next season on new cane land of average fertility. In the meanwhile the comparison is being repeated in the old block that is permanently reserved for sugarcane in a three year rotation.

PART III.

Plantain.

The harvest of the previous year's crop was completed at the beginning of the year under report, and a fair yield valued at Rs. 1,149-1-5 per acre was obtained. The figure is high on account of the calculation having been made on produce harvested from 0.78 acre.

Manurial Experiment.—The figures for the comparison of castor cake, castor cake and Kainite and Farm Yard Manure during 1923-24 are noted in Table XIX.

TABLE XIX.

Treatment.	Number of series.	Number of bunches.	Average time taken to bunch	Average time taken to ripen.	Total.	Average number of hands.	Average number of fruits.	Average weight of bunch.
Castor cake.	1	6	242	82	324	4.2	55.0	15.8
	2	6	235	83	318	4.3	54.0	14.6
	3	6	213	86	299	4.5	56.0	16.4
	4	6	218	86	304	4.5	60.0	18.4
	5	6	284	80	314	5.0	65.0	16.1
	6	6	224	83	307	4.5	59.0	18.0
	7	5	236	76	312	4.2	53.0	16.0
	8	6	234	82	317	4.2	52.0	15.3
Average ...	...	5.9	230	82	312	4.4	57.0	16.3
Castor cake plus Kainite.	1	5	268	77	345	4.6	60.0	13.0
	2	5	224	83	307	4.6	51.0	14.0
	3	6	230	72	312	4.5	59.0	17.5
	4	6	232	83	315	4.7	62.0	18.8
	5	6	227	87	308	4.3	55.0	17.0
	6	6	226	87	307	4.8	65.0	20.1
	7	6	232	88	315	4.5	55.0	18.8
	8	6	239	81	320	4.0	48.0	14.1
Average ...	...	5.6	235	80	314	4.5	57.5	16.7
Farm-Yard-Manure.	1	5	230	70	350	4.0	43.0	7.8
	2	6	231	85	316	4.2	49.0	13.0
	3	6	220	92	312	4.3	54.0	14.8
	4	6	230	87	317	4.2	51.0	15.5
	5	5	264	73	337	4.0	47.0	10.7
	6	5	238	73	311	4.0	54.0	15.8
	7	6	256	79	335	4.2	48.0	11.7
	8	3	233	73	362	4.0	40.0	7.0
Average ...	...	5.2	251	79	330	4.2	49.0	12.0

The manures that are being used do not appear to be forcing enough for a crop grown in the early season and it is possible that the substitution of a chemical manure for poonac would give better results.

This experiment is concerned with the question of manuring in relation to the time at which the crop matures; and also the keeping qualities of the fruit grown in the different series. The plots are too uneven for comparison in yield.

• *Mauritius Plantain*.—The crop of 1923-24, which was harvested in the year under report, did very well and gave 33,210 lb. fruit per acre valued at Rs. 1,384. The demand for suckers of this variety is increasing.

VIZAGAPATAM,
Dated 24th April 1925.

A. C. EDMONDS,
Deputy Director of Agriculture, I Circle.

APPENDIX.

English, Vernacular and Botanical names of crops referred to in the report.

English.		Vernacular.			Botanical.
Paddy ...	...	Wari ...	...	...	Oryza Sativa.
Sugarcane ...	...	Cheruku ...	...	...	Saccharum officinarum.
Plantain ...	...	Arati ..	...	...	Musa paradisiaca.

ANNUAL REPORT OF THE GUNTÜR AGRICULTURAL STATION FOR THE YEAR 1924-25.

The Guntür Farm was started in May 1922. It comprises an area of 300 acres, of which one half is reserved for the Buffalo Breeding Station and the other for arable farming. It is conveniently situated at the 5th mile-stone on the main Guntur-Amaravati road. The main object of this farm is to improve the two important crops of Guntur, namely, cotton and tobacco. Attention is also being paid to the study and the improvement of chillies and maize.

2. *Season.*—The season was on the whole favourable during the year. The total rainfall recorded on the farm is 32.79 inches as against 35.25 inches of last year. This is almost the average for the district. The south-west monsoon set in rather late just as it was last year. Only 1.16 inches of rain fell in June and it was distributed over seven days. As the fall was scanty, it was not possible to carry out any agricultural operations. During the first fortnight of July, 2.01 inches of rainfall was distributed over six days and advantage of this was taken for passing guntaka and gorru preparatory to sowing early jonna. Fortunately in the last week of July we had good soaking rains to the extent of 3.66 inches which enabled the sowing of early jonna and sunnhemp for fodder. Again in August there was a good rainfall of 6.15 inches as against 0.83 inches in the corresponding period of last year. These rains were most welcome to the standing punasa crops and also did much good for the chillie and tobacco nurseries. There was a good distribution of rain during the month of September, the aggregate fall being 8.85 inches, unlike the abnormal downpour of double this quantity for the corresponding month of last year. Cotton was sown at the right time and chillies were also transplanted. The paira season commenced along with the north-east monsoon in October which had a rainfall of 2.85 inches distributed over seven days. This facilitated the sowings of late jonna and variga and transplanting of tobacco. The incessant and heavy rains that followed in November to an extent of 4.76 inches proved highly detrimental to the chillie, tobacco and variga crops—the last of which had to be re-sown. Maize was sown in this month. From December onwards there was a fine spell of bright weather which encouraged the growth of all the crops, especially cotton. February and March were rainless. Though early jonna was sown later than usual it had a good stand all through owing to the favourable seasonal conditions after sowing, and good yields were obtained. Cotton has yielded a bumper crop, while the outturn of tobacco was fairly good and that of chillies below the normal.

The rainfall statement is appended,

Statement of rainfall.

Month.	Fort-night.	1922-23.	1923-24.	1924-25.	No. of rainy days in 1924-25.	Average for the last 3 years.
April ...	1st ...	Not recorded.	1.45	0.07	1	
	2nd ..		0.00			
May ...	1st ...	Do.	0.32	2.70	3.35	1
	2nd ...		0.93			
June ...	1st ...	Do.	0.49	0.86	3	5
	2nd ...		0.86			
July ...	1st ...	Do.	4.82	6.62	6.83	4
	2nd ...		0.95			
August	1st ...	0.41	0.54	1.37	5	
	2nd ..		4.55			
September	1st ...	7.06	10.12	17.43	15.00	10
	2nd ...		0.53			
October	1st ...	1.33	0.00	2.48	5	8.33
	2nd ...		1.67			
November	1st ...	8.96	2.69	8.42	7.61	3
	2nd ...		0.75			
December	1st ...	0.00	0.00	0.00	0.00	7
	2nd ...		0.00			
January	1st ...	0.00	0.08	0.00	0.00	0.41
	2nd ...		0.00			
February	1st ...	1.15	0.00	0.08	0.00	...
	2nd ...		1.08			
March ...	1st ...	0.17	0.00	0.00	0.00	
	2nd ...		0.00			
Total ...	...	17.17	35.25	32.79	74	

Notes.—The average rainfall for Guntur (from 1870—1899) is 32.39 inches.

3. *Cotton (Gossypium indicum)*.—An area of 46.75 acres was put under this crop; excepting two one-acre plots which occupied H. 25 and N. 14, the rest of the area was under Cocanadas. The September rains were very favourable and the cottons were sown at the right time. There was some growth of weeds in the fields on account of the rains in October-November and these were controlled by frequent hoeing. The bright weather that prevailed from December onwards did much good to the crop.

H. 25 (a herbacium) was tried for the second time this year in one acre in field No. B, and N. 14 was grown for the first time in the same field on a similar area. The germination of both the varieties was good. H. 25 was badly attacked by the larvæ of the spotted boll-worm (*Earias*) and the plants were consequently stunted in growth. Unripe bolls were bursting and the kappas were stained by the pink boll-worm (*Gelechia*). N. 14 was on the other hand free from any disease but the crop did not come up well, probably due to the heavy nature of the soil. The yields of these two varieties do not compare favourably with those of Cocanadas though the season was very favourable during the year for cotton. However, these will be tried again next year.

The yield of Cocanadas is far more satisfactory than what it was last year and the year previous. No appreciable difference is noticeable in the yield of the fields B and D. Field B received early ploughing, i.e., just after the fodder cholam was harvested without allowing the crop to ratoon; while the latter (No. D), which was under pairu jonna, received late ploughing after the south-west monsoon had set in.

The average yield per acre of Cocanadas for 1922-23 was only 364 lb. The comparative yields of last year and this year are as tabulated below:—

Field No.	1923-24.			Field No.	1924-25.		
	Area.	Yield of kappas per plot.	Yield of kappas per acre.		Area.	Yield of kappas per plot.	Yield of kappas per acre.
	ACS. CENTS.	LB.	LB.		ACS. CENTS.	LB.	LB.
A ...	16 70	7,070	428.4	B ...	26 20	14,256	544.0
C ...	8 83	2,785	316.4	D ...	18 55	9,663	521.0
E ...	41 61	6,030	147.3	...	...	...	...
C ... (H. 25).	1 00	483	483.0	B ...	1 00	455	455.0
				B ...	1 00	428	(H. 25). 428.0
							(N. 14).

The kappas of last year—16,831 lb.—were sold to Messrs. Volkart Brothers at the rate of Rs. 100 per candy of 500 lb., while the stuff marketed by the ryots at the time fetched a maximum value of only Rs. 94 per candy. A premium of Rs. 6 per candy was thus offered by the firm for the farm produce for its clean picking. The samples of ordinary ryots' cotton and the farm cotton were put to spinning test by Messrs. Best & Co., Ltd., Madras, and an extract of their report is appended:—

Spinning test.

“No. 1, Cocanada average quality (ordinary ryots' cotton).

No. 2, Cocanada as grown last season at your farm.

No. 2 spun into 20^s showed a strength of 63 lb. per lea, as against 53 lb. for sample No. 1. The wastage for sample 2 is estimated at 9 per cent which is remarkably low for Cocanadas. Sample No. 1, wastage 15 per cent. Your sample No. 2 has a softer feel than sample 1, and the staple is more silky. The staple of sample No. 2 is good and fairly regular, and the cotton would spin up to 24^s without difficulty.”

The market for cotton is rather dull at present and this year's produce will be sold when it is favourable.

4. Cotton selections (Cocanadas).—The collected individual produce of the 500 plants mentioned in the last report was subjected to laboratory tests, such as counting the locks per boll, ovules and seeds

per lock, seed weight, lint weight and length, ginning percentage, and noting the colour of lint. The minimum, average and maximum results of the laboratory characters studied are tabulated below :—

Laboratory tests of 500 plants studied in 1923-24.

	Minimum.	Average.	Maximum.
Height of plants	2'	3' 6"	4' 10"
Locks per boll	2	3.2	5
Ovules per lock	4.0	6.9	8
Seeds per lock	3.0	6.5	8
Lint length	18 m.m.	21 m.m.	26 m.m.
Seed weight of 100	37.0	49.0	58.5
Lint weight of 100 seeds	6.0	14.75	21.0
Ginning percentage	16 per cent.	23.1 per cent.	30.0 per cent.

After examining the above characters, 13 plants were selected for trial during the year. The results of these selected plants are given in the following table :—

Cocanada Cotton Selections for 1924-25.

Plant No.	Yield.	Staple length.	Seed weight of 100.	Lint weight of 100 seeds.	Ginning percentage.	Colour of lint.	Height of plant.
97	56	25 m.m.	62.5	20.5	24.7	Red.	3.10"
98	62	24 "	62.5	19.0	23.3	Do.	3.1"
99	44	23 "	59.0	17.5	22.2	Do.	3.8"
105	48	24 "	62.5	18.5	22.8	Light red.	3.2"
148	91	24 "	56.0	17.5	23.8	Red.	4.5"
171	114	25 "	58.5	16.5	22.6	Light red.	4.3"
252	8	26 "	60.0	16.0	21.1	Do.	2.2"
298	34	22 "	59.0	19.5	24.15	Red.	3.0"
317	15	24 "	46.5	20.0	30.0	Light red.	2.0"
332	34	24 "	57.0	18.0	24.0	Do.	...
336	34	23 "	61.0	18.0	22.8	Do.	4.0"
350	19	22 "	64.0	19.0	22.9	Do.	3.3"
456	34	24 "	57.0	18.5	24.8	Red.	2.10"

No. 252 was selected for its staple length.

The seeds of the selected plants were dibbled in lines 2½' by 2½' apart and with an intervening space of 3' between the plots. The percentage of germination was 73. During the different stages of its growth, the crop was subjected to insect attack and some plants died in consequence. Three thousand plants were finally left in the field.

As the Cotton Assistant arrived only at the time of flowering last year, it was not possible to make a regular study of the vegetative characters (field characters). Vegetative as well as floral characters

were studied for the first time this year, and 3,000 plants were examined for the following :—

- | | |
|--|----------------------------|
| (1) Colour of cotyledonous stem. | (10) Date of first flower. |
| (2) Hairiness of stem. | (11) Colour of flower. |
| (3) Colour of petiole at the base of leaf. | (12) Colour of pollen. |
| (4) Leaf-glands. | (13) Colour of bracts. |
| (5) Leaf-spot. | (14) Size of bolls. |
| (6) Hairiness of leaf. | (15) Shape of bolls. |
| (7) Colour of leaf. | (16) Mode of branching. |
| (8) First sympodial node. | (17) Height of plants. |
| (9) Number of monopodials formed before the appearance of first sympodial. | |

Note.—As for the leaf factor, leaves from each plant were collected and dried and are kept as herbarium specimens.

Records of the above characters reveal that leaf-spot is present in all cases. Stems and leaves are pubescent in the beginning and become glabrous as they develop. Variation in the colour of stems, petioles and bracts was noticed. As for leaf-glands, there are plants with and without glands. Since we have no previous records on the preliminary characters, this year's work will be taken as the basis for future work.

Of the 3,000 plants the daily yields of flowers for 300 were recorded and 1,000 were selfed. After the picking of all the plots is over, the individual produce of the plants will be examined in the laboratory for the other characters before selections for next year are made.

Besides the above, 150 plants were selected at random from the bulk crop and the mixed produce will be sown next year in the mass selection plot for the supply of fresh material.

Systematic study of Cocanadas was started for the first time at this station and five plants from plot 298 were examined and noted down as to the number of squares produced, and squares, buds and bolls shed every day.

Double, treble and quadruple bolls from single stalks were collected from the selection area, and their produce will be sown separately next year to study the behaviour of the progeny. The behaviour of 4 and 5 locked bolls will also be studied.

5. *Tobacco (Nicotiana tabacum).*—Tobacco is one of the main crops of the district. With the introduction of exotic varieties and advent of foreign trade, this crop has of late become very prominent and a favourite with the ryot. The area under this crop has increased enormously, and consequently less attention is being paid to proper rotation and manuring.

(a) *Varietal trials.*—As stated in the last year's report, before starting experiments regarding cultural methods, etc., trials with local and exotic varieties were conducted to find out their comparative yields. American varieties—white stem orenaco, adcock and gold

leaf—and the local variety were grown in three acres in field No. A. Planting of all the varieties was done in October. White stem orenaco grew well but adcock and gold leaf were rather stunted and did not thrive well. Curing was done on the farm. The following were the acre yields of cured leaf:—

White stem orenaco	...	...	856 lb.
Adcock ..	...	...	570 "
Gold leaf	...	...	456 "
Local ...	...	...	865 "

As gold leaf has given very poor yield, it will be discarded next year. Eight individual selections were made in the local variety (broad leaf) with a view to try them on a fairly large scale next year.

(b) *Curing trials*.—Curing was done on up-to-date lines. At the time of harvest, care was taken to cut the leaves from the plant as they ripen, in order to secure a uniform quality in the cured stuff. The whole stuff was sun and air cured and shaded at nights excepting a few strings of white stem orenaco which were cured in the shade alone for comparison of colour. It has been found that there is practically no difference in colour between the two methods.

Unlike last year the yields as well as the quality of the cured stuff (in respect of colour) are quite good and up to the mark. The cured leaf, especially the white stem orenaco, was very much appreciated by the Indian Leaf Tobacco Development Company, Limited, and it was sold to the company at the rate of four annas per pound which is a good price.

6. *Chillie (Capsicum annum)*.—(a) This is another important crop of Guntur. There are two varieties, nallapadu and local, and these occupied three acres in field No. A. The seedlings were transplanted in time and the crop came up well in its early stage but received a set back from the incessant rains of November. The damage due to the root-grubs was rather severe and a number of blanks had to be filled in. Though the yields are much below the normal, they are slightly better than those of the previous two years. The crops of this year suffered from excessive wet, and insect attack in the district. The comparative acre yields of the past three years are tabulated below:—

—			1922-23.	1923-24.	1924-25.
			LB.	LB.	LB.
Nallapadu	...	...	275	372	456
Local	...	...	328	400	420

(b) Of the individual plant selections made last year, 17 were chosen for trial during the year. Of these, 7 were fairly good and the rest not true to type. Typical plants from the 7 selections were again marked for further trial.

(c) An experiment was started this year to test the best number of plants to be put in a hole—singles, doubles, trebles and bunches being contrasted. From the very beginning the single

seedling plot was poor. The crop in trebles and bunches was bushy and green when compared with the other two plots. But all the plants had an attack of root-grub and the singles and doubles plots suffered most. In trebles and bunches, though a few plants died, those that survived came up well. A large number of fruits were seen in trebles and bunches, while it was poor in singles and slightly better in doubles. The results are tabulated below :

Serial No.	Plot.	Area of plot.	Yield per plot.		Total yield per plot.	Yield per acre.
			Good fruits.	Bad fruits.		
		AC. CRT.	LB. OZ.	LB. OZ.	LB. OZ.	LB. OZ.
1	Singles ...	0 12½	26 0	2 5	28 5	226 8
2	Doubles .	0 12½	40 0	4 8	44 8	356 0
3	Trebles ...	0 12½	43 0	6 0	49 0	392 0
4	Bunches ...	0 12½	41 0	6 0	47 0	376 0

7. *Jonna*. (*Andropogon sorghum*).

(a) *Early jonna* (for fodder).—An extensive area of 57·31 acres was placed under this crop in fields Nos. A & E. It was sown in July and the young crop was much benefited by the August showers. The rain received in the succeeding month was rather too much for the crop. It however recovered soon. The average yield per acre was 3,253 lb. against 2,498 lb. of last year. This is a very good yield considering that the land received no manure during the last three years. A total yield of 189,950 lb. of fodder was obtained, of which 50,000 lb. were issued to the Buffalo Breeding Station.

(b) *Late jonna* (i).—This was grown on 12·58 acres in fields Nos. C & F. The sowings were taken up at the end of October. The germination was satisfactory, but the crop suffered from stem borer attack at the early stage. It however recovered in the bright weather of December and January. An acre yield of 513 lb. of grain and 1,718 lb. of straw was obtained as against 306 lb. of grain and 1,310 lb. of straw of last year.

(ii). In the red soil area, jonna was sown after the harvest of sunnhemp in October, with a view to get some fodder instead of leaving the field fallow. The crop was not so good as was expected. It gave an acre yield of 93 lb. of grain and 566 lb. of straw.

8. *Sunnhemp* (for fodder). (*Crotolaria juncea*).—This was sown at the end of July on 1·55 acres in the red soil block. Germination was good and the crop grew luxuriantly as the rains were favourable, and was free from pests. It gave an yield of 1,452 lb. of dry fodder per acre.

An additional area of 4 acres in the tank bed was sown with this crop during the north-east monsoon season. Though the germination was good, the young crop was very badly attacked by caterpillars and consequently failed. The field was then ploughed and left fallow.

9. *Maize (Zea mays)*.—The varietal tests started last year with hickory king and local were continued during the year, each in 50 cents. Hickory king—a foreign variety—was rather bad as compared with the local maize, and the cobs did not fill well. But being a thick stemmed variety, the yield of straw was better. The yields per acre are :

	Grain.	Straw.
	LB.	LB.
Hickory king	442	790
Local	504	640

10. *Bengal Gram (Cicer arietinum)*.—This was sown in three acres in field No. A. Variga was originally sown in this field and a serious attack of stem borers damaged it. Bengal gram was therefore put in. It came up well and the yield was fair in spite of a caterpillar attack in patches. The total yield was 993 lb., i.e., 333 lb. per acre.

11. *Berseem—Egyptian Clover (Trifolium Alexandrinum)*.—With a view to find out if the crop thrives under dry conditions it was tried in a small plot of 6 cents and drilled in the month of November. Though the sowing was rather late in the season the crop came up well and showed a good growth. Two cuttings were taken—one in January and the other in February. It was fed green to cattle. The yield of green leaf was 1,333 lb. per acre. This will be tried again next year.

12. *Potato (Solanum tuberosum)*.—An attempt at growing potatoes in this tract proved unsuccessful.

13. *Manurial experiments*.—Although all the farm lands are reclaimed forest area and were first brought under the plough only in the middle of 1922, the results are very encouraging and considerably better than those obtained in the fields of the ryots in the vicinity. The land has not received any manure except a plot of 9 acres, set apart for the cultivation of tobacco, chillies, etc., which receives cattle manure at 12 cart-loads per acre every year.

14. *Cattle*.—Two old bullocks were sold in auction during the year and these were replaced by a pair of bulls purchased in the Ongole tract.

15. *New works*.—An estimate for constructing a temporary laboratory for the Cotton Assistant at a cost of Rs. 600 was sanctioned and the work was completed before the end of the official year. Drainage channels were dug along the fields Nos. A & B to prevent washes into the fields.

A pucca cotton laboratory and residence for the Cotton Assistant on the farm are urgently required.

B. RAMAIAH,

GUNTUR, Offg. Deputy Director of Agriculture, II Circle.
Dated 2nd May 1925.

REPORT OF THE HAGARI AGRICULTURAL STATION FOR THE YEAR 1924-25.

The site of this station was acquired towards the end of the official year 1905-1906. A short history of the farm showing the aims and objects of its existence when started, together with an account of the local agriculture of the tract of which the station is representative, is given in the appendix to this report.

TABLE I.

Statement of rainfall.

Month.	Portnight.	1919-20.	1920-21.	1921-22.	1922-23.	1923-24.	1924-25.	Number of rainy days in 1924-25.	Average rainy days for the past 18 years.	Average rainfall for the past 18 years.
1924.										
Apr.	1st ...	0'00	0'10	0'10	0'00	0'32	6'42	4	2	2'91
	2nd ...	0'44	0'00	2'45	0'38	0'00	...			
May	1st ...	2'11	0'00	0'00	0'33	4'22	0'12	2'93	5'18	
	2nd ...	0'81	0'97	0'12	3'56	2'49	1'46			
June	1st ...	0'84	0'10	1'60	0'00	0'12	1'13	1	5	
	2nd ...	0'00	0'35	0'00	0'00	0'45	0'03			
July	1st ...	0'39	0'29	2'68	0'95	1'04	0'89	3	8	
	2nd ...	0'40	0'10	0'05	0'26	0'41	0'5			
Aug.	1st ...	0'00	0'00	0'20	0'00	0'32	0'12	1	8	
	2nd ...	0'00	2'94	0'00	1'27	0'00	6'55			
Sep.	1st ...	4'91	0'47	1'25	0'25	2'56	1'34	3	12	
	2nd ...	4'84	4'60	0'08	0'00	1'23	6'86			
Oct.	1st ...	1'26	1'25	10'54	1'81	0'00	7	
	2nd ...	0'68	0'32	0'22	3'29	0'32	0'27			
Nov.	1st ...	4'05	0'02	2'48	4'40	0'00	0'44	2	4	
	2nd ...	0'04	0'07	0'00	0'39	0'00	...			
Dec.	1st ...	0'00	0'00	0'00	0'01	0'00	1	
	2nd ...	0'06	0'00	0'00	0'00	0'00	...			
1925.	1st ...	0'09	0'00	0'55	0'00	
	2nd ...	0'00	0'41	0'00	0'00	...	...	
Feb.	1st ...	0'00	0'00	0'00	0'00	1'24	...	0'23	...	
	2nd ...	0'00	0'00	0'00	0'40	...	...	
Mar.	1st ...	0'00	0'00	0'00	0'69	...	0'23	1	1	
	2nd ...	0'00	0'00	0'00	0'15	...	...	
Total	...	20'87	12'08	23'32	17'40	9'38	26'19	45	54	18'64

The season made a promising start. The total rainfall was much above the average for the past eighteen years. The distribution of rain was, however, very irregular. Mungari (early season) cotton could be sown only by the aid of well irrigation for want of timely rains, but the season proved very favourable after the seed had germinated, and the crop gave an extraordinarily heavy yield. The hingari or the main crop season started, on the other hand, very favourable but after the sowings the rains ceased more or less completely and cotton and sorghum, the two most important hingari crops of the farm, suffered from drought.

2. Cotton selections.—(a) Mungari cotton.—(i) Type M. 247 (*Indicum type*).—Mention was made in last year's report that this selection was pure and likely to be suitable to the Bellary district. All the selfed seed of all individual plants of the selection (with the exception of two plants selected for further trials) which gave an outturn of more than 30 per cent of lint and whose staple length was more than 25 mm. was mixed together and dibbled one link apart in rows apart on an area of 90 cents in the garden land. Dibbling had to be done by the aid of well irrigation for fear of missing the season. The crop grew to a height of more than five feet and gave a record yield of 1,253 lb. of kapas per acre. All this cotton was ginned in the form ginnery and it gave 30 per cent of clean lint. The lint has been sent for spinning tests to Bombay.

(ii) Two plants—M. 274/11 and 274/15—with 32 and 33 ginning percentage, respectively, and staple 26 mm. long were selected out of last year's selection and the seed of each plant was sown separately in rows as usual. The individual plants of these two new selections were examined for number of ovules and seeds per lock length of staple, lint weight and seed weight. All these characters confirm the purity of the strain. The average length of staple of the two strains is, however, scarcely above 25 mm. Their average ginning percentage is 31. Length of staple will be the guiding factor for further improvement of this strain, though ginning percentage will not be altogether lost sight of.

(iii) M. 406. (*Indicum type*).—This was another selection of *indicum* type isolated along with M. 274. It is a poor yielder and its ginning percentage also is as low as 22, but the quality of its lint is much superior to that of M. 274 in every respect. One plant with 25 per cent ginning percentage and staple 28 mm. long was selected from last year's selection with a view to improve, if possible, the ginning percentage and also for crossing with other suitable strains next year. The seed of this plant was sown separately and the kapas of each individual plant has been picked separately. The examination of the kapas will be finished some time before the next sowing season.

(iv) M. 440. (*Hybrid*).—Kapas of all individual plants of this selection was examined in the laboratory early in the year and three plants were selected for trial this year. One of these plants proved a hybrid and was, therefore, discarded in the field itself. Of the other two, one is of *indicum* type and the other *neglectum* type, and both of them seem to be pure so far field characters are concerned. Examination of kapas will soon be taken up.

(b) *Hingari (main season) cotton—Type H. 62. (Herbaciium type).*—The seed of all individual plants of H. 62/1 of last year was mixed together and sown on a plot of 46 cents in a black cotton soil field. The germination of the seed and the growth of crop was as uniform as M. 274, but the crop suffered from drought which seems to have lowered its ginning percentage this year as is the case with all other hingari types. [See Table IV (Bulk yields of cotton).] It gave an acre yield of 567 lb. of kapas and ginning percentage of 26 against 30 of last year. The lint has been sent to Bombay for spinning tests.

All the available seed of H. 62/19 also was sown on a plot of 30 cents in a black cotton soil field. The crop came up in the same way as the above and gave an acre yield of 613 lb. of kapas. Its ginning percentage was 27 against 31 last year.

Further selections from the above two strains.—(i) One plant from H. 62/1 with staple 30 mm. long and 31 ginning percentage, and another from H. 62/19 with staple 27 mm. long and 34 ginning percentage were selected last year, and the seed of each of these two plants was sown separately in lines this year. The individual plants were found to be true to the type so far as the field characters are concerned. Kapas will be examined soon.

(ii) *Fresh hingari selections.*—The seed of hingari cotton which was obtained from different important cotton-growing centres of Bellary district was mixed together and an area of 2½ acres was sown with this mixed seed. The crop was thinned uniformly and 250 plants (every 150th plant) was marked just before flowering. All the marked plants were selfed and their field characters were noted. The kapas of all the promising plants will be examined in the laboratory.

(iii) *Gadag cotton.*—Of the five plants selected last year two were found promising and the seed of each of these plants was sown separately. The individuals of the two selections were found wanting in vigour, and also the quality of their lint was inferior to that of H. 62 in every respect. They will be discarded.

(iv) *Crosses.*—The individuals of F. 1 generation of the three crosses of H. 25 and Cernum of last year were examined in the laboratory. The length of staple in all three crosses was much greater than even that of H. 25, and in some plants it was as long as 31 mm. All other characters were split more or less in Mendelian ratio. Two plants with staple 30 and 31 mm. long and 36 and 33 ginning percentages, respectively, were selected and the seed of each of these plants (F. 2 generation) was sown separate in lines. The important field characters were recorded and almost all plants have split for different characters. There were, however, a few plants somewhat promising and they will be critically examined in the laboratory if time permits.

3. *Comparative trials of H. 62, H. 25 and local cottons.*—The experiment was conducted in field No. 2C₇ on two big parallel plots which were identical in shape and size and close to each other. Each of these big plots was divided into 60 small, narrow plots of 1.5 cents each so that each type of cotton was repeated 20 times

on each big plot. Each small plot carried three rows of cotton. The three types of cotton were repeated in order of H. 62, H. 25 and Local on one big plot and the order was reversed on the other big plot, as seen from the following table:—

TABLE II.

Northern Series.

Type of cotton.	1	2	3	4	5	6	7	8	9	10
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
H. 62	67	56	55	51	65	60	64	65	60	46
H. 25	44	31	41	58	54	55	58	54	61	59
Local	15	12	13	12	12	14	7	14	9	14
—	11	12	13	14	15	16	17	18	19	20
	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
H. 62	59	70	68	56	57	66	51	60	39	40
H. 25	66	62	61	64	62	57	57	53	38	41
Local	15	14	16	11	10	17	17	22	13	39

Southern Series.

Type of cotton.	1	2	3	4	5	6	7	8	9	10
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Local	9	16	16	11	19	12	12	13	13	10
H. 25	33	30	25	31	28	27	31	29	32	32
H. 62	29	44	45	44	43	35	35	25	34	35
—	11	12	13	14	15	16	17	18	19	20
	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
										Average.
										(22)
Local	8	10	11	12	10	14	12	26	25	15
H. 25	43	39	39	31	33	34	49	35	41	44
H. 62	44	34	34	28	44	42	41	48	54	49

Note.—Yields are in ounces.

The big difference between the "Local" and the other two types is more apparent than real, since the crop in all "Local" plots was some what sparse due to poor germination of the seed

when compared with the plots of the other two types which were quite uniform. Local cotton was, therefore, left out of account this year. Taking only the other two types into consideration, it is seen that there is an increase of 5 ounces or 11.4 per cent in favour of H. 62 against H. 25. The highest probable error for comparing two averages works out to 4.2 per cent, and the increase in yield in favour of H. 62 is, therefore, 2.6 times of the probable error which is not sufficient to determine that the increase in yield of H. 62 was not due to normal variation. The increase may, therefore, be due to either normal variation or to the superiority of H. 62. The experiment will continue.

4. *Spacing experiment of cotton.*—The object of this experiment was to ascertain with what distance between one plant and another in the rows the crop would give the highest yield. The arrangement of the plots was similar to the above, but each big plot had only 35 small plots and the area of each small plot was 2.5 cents. There were two rows of cotton in each small plot. Local spacing, 3 inches apart, 6 inches apart, 9 inches apart, 12 inches apart, 15 inches apart and 18 inches apart were repeated in order on one big plot and the same order reversed on the other. The results are shown in the following table:—

TABLE III.

Southern Series.

Spacing.	1	2	3	4	5
Local	197	99	96	109	106
3"	117	114	100	127	117
6"	88	70	69	68	78
9"	82	78	95	74	69
12"	108	99	88	82	77
15"	81	82	88	88	73
18"	78	52	65	69	147

Northern Series.

Spacing.	1	2	3	4	5	Total.	Average.
18"	153	85	65	64	48	821	82
15"	122	81	75	78	69	832	83
12"	87	92	94	81	72	881	88
9"	79	81	89	89	79	815	82
6"	82	89	75	79	71	764	76
3"	105	111	108	108	104	1,104	110
Local	91	89	75	83	181	1,076	108

Note.—Yields are in ounces.

The highest probable error for comparing any two averages works out to 12.6 per cent. The average yields of local spacing and of the plots thinned at 3 inches, 6 inches, 9 inches, 12 inches, 15 inches, and 18 inches apart were 103, 110, 76, 82, 88, 83 and 82 ounces, respectively, per plot, i.e., 42 per cent in favour of local, 44.7 per cent in favour of 3 inches apart, 8 per cent in favour of 6 inches apart, 15.8 per cent in favour of 12 inches apart, 9.2 per cent in favour of 15 inches apart over 6 inches apart. The increase in favour of local spacing and 3 inches apart is, therefore, 3.3 and 3.6 times of the probable error, respectively, and in all other cases the differences are within the limits of probable error. Narrow spacing was, therefore, the best for this year, and the results of the experiment are more or less in conformity with the local belief and with the results of previous trials made when the station was first started.

5. Bulk yields of cotton (non-experimental).

TABLE IV.

	Field No.	Area in acres.	Yield.	Yield per acre.	Average for the year.	Ginning percent- age.	Remarks.
		ACS.	LB.	LB.			
H. 25 ...	3	14.20	2,667½	188	207.4	23	
	2 C 9	5.40	1,075	198			
	8	5.00	1,115	223			
	2 C 10	1.50	208½	139			
	2 C 4	2.00	344½	172½			
	2 C 5	4.00	571	143			
	11 N	2.00	521	260½			
	11 S	2.80	871½	310½			
Mungari 274	2 A N	6.00	1,609	268½	125.3	30	
	G 4	0.60	769½	1,282.5			
	G 3	0.30	358½	1,196			
H. 62 ...	18 South.	1.90	952½	501	501	27	
H. 62/1 ...	G 13 South.	0.48	260½	567	567	26	
H. 62/19 ...	G 11 South.	0.39	184½	613	613	27	
Local ...	5 E	2.50	412	125	125	...	Not yet ginned; percentage not available yet.

6. Sorghum (Jonna).

(a) *Comparative trials of farm types.*—The experiment was conducted in field No. 2 C 3 on two big parallel plots identical in shape and size and close to each other. In one of these plots T. 1, T. 12, T. 14, T. 32, R. 6, R. 19 and R. 22 were repeated 11 times in order on small plots of one cent each, and in the other plot the same was repeated with the above order reversed as seen in the following table.

TABLE V.
Southern Series.

Item No.	Type.	1	2	3	4	5	6	7	8	9	10	11	Total.	Average of both series.
1	T. 1 Jonna.	19	98	52	72	76	49	76	40	72	83	44	681	63
		41	178	112	182	164	96	148	113	128	168	58	1,338	120
2	T. 12 "	11	59	48	57	46	87	39	74	73	55	38	587	53
		35	140	120	144	132	165	70	136	138	120	72	1,278	107
3	T. 14 "	8	16	45	39	43	52	54	47	38	56	26	439	46
		26	58	128	110	138	164	129	100	74	81	76	1,080	108
4	T. 32 "	26	31	40	50	60	62	55	66	49	60	16	515	49
		64	78	106	135	146	160	156	140	88	158	42	1,271	115
5	R. 6 "	19	24	58	57	67	72	74	49	45	87	16	506	56
		58	84	132	148	164	152	166	120	98	138	33	1,291	122
6	R. 19 "	20	48	54	50	68	97	110	105	56	36	20	664	62
		51	104	98	130	164	176	172	172	114	96	92	1,809	125
7	R. 22 "	50	39	46	62	62	81	58	58	48	52	20	574	58
		101	82	104	176	140	158	144	120	80	78	45	1,228	121

Northern Series.

1	R. 22 Jonna.	19	56	41	92	68	56	89	72	82	70	64	703
		56	150	86	156	152	134	164	152	166	148	94	1,448
2	R. 19 "	38	48	58	56	67	79	69	84	72	56	74	699
		74	96	140	148	172	158	146	152	132	104	122	1,442
3	R. 6 "	34	40	62	58	77	67	71	78	64	80	37	672
		76	84	136	150	180	166	176	186	118	124	60	1,396
4	T. 32 "	85	44	46	51	57	68	58	67	54	57	39	576
		90	80	108	122	142	144	176	128	102	124	64	1,275
5	T. 14 "	32	53	47	60	80	65	45	70	64	44	23	588
		80	94	160	144	152	141	112	124	112	92	39	1,206
6	T. 12 "	33	39	50	87	72	66	51	46	54	59	38	594
		89	86	112	170	120	115	106	72	88	80	52	1,089
7	T. 1 "	35	41	43	68	76	83	88	87	79	88	26	713
		72	82	104	156	158	136	160	142	128	124	58	1,320

Note.—Yields are in ounces per plot. Numerator denotes grain, and denominator, straw

The average yields of grain of T. 1, T. 12, T. 14, T. 32, R. 6, R. 19, and R. 22 were 63, 53, 46, 49, 56, 62 and 58 ounces, respectively, i.e., 41 per cent in favour of T. 1, 15.2 per cent in favour of T. 12, 6.5 per cent in favour of T. 32, 22 per cent in favour of

R. 6, 35 per cent in favour of R. 19 and 26 per cent in favour of R. 22 over T. 14. The highest probable error for comparing any two averages is 7.5 per cent. The increase in favour of T. 1, T. 12, T. 32, R. 6, R. 19, R. 22 is, therefore, 5.4 times, 2 times, 0.86 times, 3 times, 4.6 times, and 3.4 times of the probable error, respectively. T. 1 is, therefore, the best as in previous years and R. 19, R. 22, and R. 6 come next in order. These four strains will be retained for further trials, and all the rest will be discarded.

(b) *District varieties of sorghum for grain.*—The same 14 varieties of the previous year, namely, T. 1, Mapillai, Chitrai Vellai, Godavari Patcha, Sholapur White, Chitta Jonna, Vizag. Patcha, Cheruku Patcha, Koilpatti White, Sen Cholam, Chinna Manjal, Narival, Pani Red, and Pani White, were tested again this year in field 2 C 3 in the same way as in the above experiment, but the number of repetitions was only ten. The results are shown below :—

TABLE VI.
Comparative trials.

Item No.	Name of variety.	1	2	3	4	5	Total.	Average of both series.
<i>Southern Series.</i>								
1	T. 1, Jonna ...	98	44	124	100	116	482	105.4
		188	128	248	254	242	1,080	220
2	Mapillai ...	8	35	30	39	36	148	22.9
		44	82	54	80	51	311	54.7
3	Chitrai Vellai ...	12	24	20	35	33	124	22.9
		80	82	98	98	98	456	86
4	Godavari Patcha ...	20	34	33	36	39	162	30
		86	84	104	96	92	442	85
5	Sholapur White ...	82	58	50	80	87	357	68.3
		193	193	184	172	178	920	174.1
6	Chitta Jonna ..	20	37	24	32	17	130	26.6
		90	126	104	80	40	440	84
7	Vizag. Patcha ...	33	39	38	44	37	191	83
		114	84	74	94	70	436	77
8	Cheruku Patcha ...	34	66	54	92	86	332	59.3
		113	144	148	168	132	705	153.7
9	Koilpatti White ...	43	51	39	81	44	263	54.8
		146	95	136	146	88	611	137.6
10	Sen Cholam ...	32	22	30	33	32	149	26.6
		64	68	56	50	54	280	67.1
11	Chinna Manjal ...	22	36	26	40	17	141	25.3
		94	94	88	68	60	404	77.7
12	Narival ...	17	29	42	58	24	190	30.9
		88	125	132	100	57	502	89.5
13	Pani Red ...	32	23	39	30	17	151	23.1
		118	109	98	68	48	431	74.5
14	Pani White ...	20	30	24	32	18	124	23.1
		94	88	86	72	44	384	72.5

TABLE VI—cont.
Comparative trials—cont.

Item No.	Name of variety.	1	2	3	4	5	Total.	Average of both series.
<i>Northern series.</i>								
1	Pani White ...	50 104	13 51	20 88	11 40	14 58	107 341	
2	Pani Red ...	6 34	18 76	17 50	19 98	20 56	80 314	
3	Narival ...	5 36	34 66	18 67	32 122	50 108	129 393	
4	Chinna Manjal ...	13 54	24 104	23 79	27 65	26 71	112 373	
5	Sen Cholan ...	18 68	38 100	22 88	20 68	19 57	117 381	
6	Koilpatti White ...	86 227	47 136	41 120	62 160	49 122	255 765	
7	Cheruku Patcha ...	58 148	27 146	46 178	72 196	64 166	261 832	
8	Vizag. Patcha ...	18 81	25 81	24 98	40 108	32 86	139 354	
9	Chitta Jonna ...	17 58	7 36	18 66	68 188	26 52	136 400	
10	Sholapur White ...	69 191	63 196	67 156	35 104	92 174	326 831	
11	Godavari Patcha ...	14 40	23 88	19 72	44 136	38 72	138 408	
12	Chitra Vellai ...	15 58	24 66	32 104	18 104	16 72	105 404	
13	Mapillai ...	13 32	10 46	21 62	20 56	17 40	81 236	
14	T ₁ Jonna ...	88 200	82 240	148 264	152 264	102 232	572 1,140	

Notes.—Yields are in ounces per plot. Numerator denotes grain, and denominator, straw. Area of each series is one cent.

T. 1 has once again proved to be the best.

The results of the past six years are as follows :—

TABLE VII.

Types.	1919-20.	1920-21.	1921-22.	1922-23.	1923-24.	1924-25.	Average.
T. 1 Jonna	56.5		126	78.6		105.4	91.6
Mapillai	13		37	28		22.9	25.2
Chitrai	7		37	23.6		22.9	22.6
Patocha (Godavari)	11		42	32.6		30	28.9
Sholapur White	7		78	53.5		68.3	51.7
Azhuckku	4		...	...		...	4
Chitta Jonna	11		35	38		26.6	27.6
Patocha (Visagapatam)	5	Crop failed.	53	35	Crop failed.	33	31.5
Pura Kamu	4		...	...		...	4
Cheruku Patocha	14		58	37		59.3	42.1
Koilpatti White	10.5		43	40		54.8	37.1
Sen	12		42	28		26.6	26.9
Chinna Manjal	5.5		36	24		25.3	21.2
Narival	8		...	32.5		30.9	27.1
Pani Bed	8		39	35		23.1	26.3
Pani White ... ..	...		...	22		23.1	22.5

Note.—Yields are in ounces.

Remarks.—T. 1 is undoubtedly the best. The experiment will be discontinued.

(c) *Fodder sorghum (varieties)*.—The same seven varieties of the previous year—Pal Cholam, Pedda Jonna, Peria Manjal, Sattur Irungu, Koilpatti Irungu, Sivappu Mapillai Miniki and Sattur Sen Cholam—were tried this year again on two big parallel plots identical in shape and size and close to each other. In one of these plots each variety was repeated 11 times in small plots of one cent each in the above order, and in the other the same was repeated with the above order reversed.

Peria Manjal is again the best this year.

TABLE VIII.

Southern Series.

Name of variety.	1	2	3	4	5	6	7	8	9	10	11	Total.	Average of both series.
1 Sattur Irungu ...	79½	67	57	63	73½	60½	57	57½	49½	49½	43½	658½	640
2 Koilpatti Irungu ...	75½	61½	48	53	70	58½	54½	52½	52½	50½	44	620½	612
3 Sivappu Mapillai ...	65½	71½	57	63½	70½	61	61½	53½	46½	47½	40½	638½	644½
4 Sattur Sen Cholam ...	62	59½	60½	67	60½	66½	59½	52	55	56	46½	634½	627
5 Pal Cholam ...	81½	68	54½	73	81½	58	61½	60	46½	59½	45½	689½	675
6 Peria Manjal ...	78	7½	68½	74½	74	65½	55	63½	65½	56	54½	729½	685½
7 Pedda Jonna ...	68	55	60	74	61½	54½	51½	54	58	53½	41½	621½	592

Northern Series.

1 Pedda Jonna ..	48½	48	55½	54½	42½	53½	53	57½	56½	46½	46½	562½	
2 Peria Manjal ...	61½	56½	58½	60½	69½	52	53½	67	60½	56	53	648	
3 Pal Cholam ...	41½	60½	65½	60½	68½	60½	45½	68½	72½	64	58	660½	
4 Sattur Sen Cholam ...	59½	51½	60½	55	52½	53	61½	60	55	56½	56	620½	
5 Sivappu Mapillai	59	50½	63	59½	63½	61	58½	60½	71½	57	47	650½	
6 Koilpatti Irungu ...	52½	46	57½	57½	54½	56	59½	63½	60½	52	44	603½	
7 Sattur Irungu ...	54	56½	65½	60½	52½	61½	54	60	65½	52½	40½	623½	

Note.—Yields are in pounds per plot.

The results of the past seven years are as shown below :—

TABLE IX.

Type.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.	1923-24.	1924-25.	Average.
Pal Cholam	87.5	40	18	45	52.5	Crops failed.	61 $\frac{4}{11}$	50.7
Pedda Jonna	85	39	19 $\frac{1}{2}$	47	56		53 $\frac{2}{11}$	50.1
Koipatti Iruuga	69	38	18 $\frac{1}{2}$	48	47.6		55 $\frac{7}{11}$	46.1
Sattur Iruuga	69	37	18 $\frac{1}{2}$	47	46		58 $\frac{1}{11}$	45.9
Sivappu Mapillai Miniki	79	37	22 $\frac{7}{13}$	51	51		58 $\frac{5}{11}$	49.8
Kagai	80.5	34	...	...	...		...	47.2
Peria Manjal ... ..	...	...	21 $\frac{1}{2}$	53	62		62 $\frac{2}{11}$	49.7
Sattur Sen ... ..	...	...	...	43	45		57	48.3

Note.—Yields are in pounds.

Pal Cholam, Pedda Jonna, Sivappu Mapillai Miniki and Peria Manjal are of about equal value. Sorghum is grown very rarely for fodder alone on dry fields in the Ceded districts and there is, therefore, no use of continuing the experiment any further. It will be therefore discontinued.

7. *Sorghum spacing*.—The experiment was conducted in field No. 2c7. There were 25 parallel plots of 7.2 cents each. Sorghum was sown in lines 14" apart on the first plot, 8" apart on the second, 12" apart on the third, 18" apart on the fourth and 24" apart on the fifth, and the same was repeated four more times.

The results are as follows :—

TABLE X.

Series.	14"	8"	12"	18"	24"
First Series	23	20	29	25 $\frac{1}{2}$	29 $\frac{1}{2}$
	105	146	147	136	144
Second Series	20 $\frac{1}{2}$	15 $\frac{1}{2}$	29 $\frac{1}{2}$	27	40 $\frac{1}{2}$
	143	194	178	167	162
Third Series	23	17 $\frac{1}{2}$	32 $\frac{1}{2}$	24 $\frac{1}{2}$	40
	148	183	166	153	163
Fourth Series	20	16 $\frac{1}{2}$	33	21	39 $\frac{1}{2}$
	153	220	200	170	158
Fifth Series	14	9 $\frac{1}{2}$	29 $\frac{1}{2}$	18	45
	158	215	225	210	177
Total ...	100 $\frac{1}{2}$	79	153 $\frac{1}{2}$	115 $\frac{1}{2}$	194 $\frac{1}{2}$
	707	957	916	836	804
Average ...	20.05	15.8	30.7	23.1	38.9
	141.4	191.4	183.2	167.2	160.8

Note.—Yields are in pounds. Numerator denotes grain, and denominator, straw.

The spacing of 24" gave the highest yield, which may be due to insufficient rainfall during the growing period of the crop. The experiment will be repeated.

8. *Bulk yields of sorghum (non-experimental).*

TABLE XI.

Field No.	Area.	Yield in lb.	Yield per acre in lb.	Average for the year.	Remarks.
<i>Jonna pure.</i>					
4	10'00	4975	497.5		Ploughed deep.
		15580	1558		
Do.	11-15	2877	258		6,470 lb. of green fodder pulled out and fed to cattle (or 580 lb. per acre.)
		14430	1294		
				321	
				1102	
7	5'00	1359	272		2,650 lb. of green fodder was pulled out (530 lb. per acre.)
		5160	1032		
5 W.	8'00	2046	255.7		2,020 lb. of green fodder was removed (at 252.5 per acre.)
		4103	513		

9. *Manurial experiments.*

(a) *Ammonium sulphate on cotton.*—The experiment was started in 1921 with the object of finding out the advantages of this manure on cotton and the same was repeated this year. There were 40 plots in all. Each plot was two cents in area and carried three rows of cotton. There was one line of outskirts between one plot and another, and the alternate plots were manured with ammonium sulphate, the other plots being left unmanured. The manure was drilled on both sides of the rows as close as possible to the plants when the plants were about 4" high, at the rate of 100 lb. per acre. The yield of the outskirts rows was not taken into account. The results are as follows.

TABLE XII.

Treatment ...	1	3	5	7	9	11	13	15	17	19	21
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Manured with ammonium sulphate.	66	86	63	65	52	47	63	69	60	80	61
Treatment ...	23	25	27	29	31	33	35	37	39	Total.	Average.
	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
Manured with ammonium sulphate.	69	78	83	75	81	73	72	62	63	1,368	68
Treatment ...	2	4	6	8	10	12	14	16	18	20	22
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
No manure ...	65	79	65	55	52	44	57	66	67	63	67
Treatment ...	24	26	28	30	32	34	36	38	40	Total.	Average.
	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
No manure ...	57	69	80	71	80	84	63	57	69	1,320	66

Notes.—Yields are in ounces.

There was very little rain after the application of the manure. The above results confirm the experience which has been already gained both on this farm and at the Nandyal Farm that ammonium sulphate, as applied at present, has no effect on cotton. The experiment, therefore, will be closed, but ammonium sulphate will be tried by applying it deep in the soil, i.e., by applying it in furrows behind the plough on a small area.

(b) *Sodium nitrate on cotton.*—The arrangement of plots and the method of application of manure were similar to those mentioned in the above experiment.

TABLE XIII.

Treatment ...	1	3	5	7	9	11	13	15	17	19	21
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Manured with sodium nitrate.	41	36	52	47	39	35	39	47	38	38	34
Treatment ...	23	25	27	29	31	33	35	37	39	Total.	Average.
	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
Manured with sodium nitrate.	32	32	32	32	28	29	27	33	29	710	36
Treatment ...	2	4	6	8	10	12	14	16	18	20	22
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
No manure ...	40	37	49	43	50	43	51	37	41	37	30
Treatment ...	24	26	28	30	32	34	36	38	40	Total.	Average.
	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(18)	(20)	(21)	(22)
No manure ...	39	33	28	31	32	24	32	36	30	743	37

Note.—Yields are in ounces.

There is no increase in yield in favour of manure, which is in line with the results of the previous years. The experiment will be closed.

10. *Cattle manure on cotton and sorghum.*—The experiment in duplicate was started in the year 1914 in field No. 2c9 and field No. 5 (middle) with the object of ascertaining the advantages of manuring the field with cattle manure every year or alternate years, and whether manured fields would resist drought any better than the unmanured fields. When cotton was sown on one set of plots, sorghum was sown on the other set and vice versa every year. The results of this year are as follows.

TABLE XIV.

Field No.	Treatment.	Area in cents.	1915-16	1916-17	1917-18	1918-19	1919-20
			Jonna.	Cotton.	Jonna.	Cotton.	Jonna.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2 c 9	Manured every year.	20	240	66	160	543	97½
			1383		630		1050
	Manured every other year.	20	805	96	175	353	161
			1135		330		1215
	No manure	20	285	66	125	420	218
			1210		410		1150
Field No.	Treatment.	1920-21	1921-22	1922-23	1923-24	1924-25	
		Cotton (Kappas per acre.)	Jonna per acre.	Cotton (Kappas per acre.)	...	Cotton (Kappas per acre.)	
		(9)	(10)	(11)	(12)	(13)	
2 c 9	Manured every year.	187½	1350	lb. oz. 405 10	...	208½	
			2750				
	Manured every other year.	107 ² / ₁₆	1190	356 14	...	178½	
			2500				
	No Manure... ..	51 ¹ / ₂	840	296 9	...	200	
			2000				

Note.—Yields are in pounds. Numerator denotes grain, and denominator denotes straw in the case of Jonna.

TABLE XIV—cont.

Field No.	Treatment.	Area in cents.	1914-15	1915-16	1916-17	1917-18	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25.
			Jonna.	Cotton.	Jonna.	Cotton.	Jonna.	Cotton.	Jonna.	Cotton kap. per acre.	Jonna (per acre).	...	Jonna (per acre).
5. Middle.	Manured every year.	20	14	148	1,325	320	540	344	...	218½	30	...	537½
			1,300		2,825		5,040		2,780	4,975	2,695		
	Manured every other year.	20	8	189	1,110	283	310	244	.	160½	5,510	...	420
			930		2,510		4,020		2,370	4,305	3,045		
	No manure.	20	10	175	1,108	173	200	196	...	264½	165	...	232½
			1,050		2,440		2,160		1,685	2,600	2,145		

Notes.—Yields are in pounds. Numerator denotes grain, and denominator denotes straw in the case of Jonna.

The results of the past 11 years are given below :—

TABLE XV.

Year.	Field No. 209						Field No. 5 Middle.					
	Manured every year.		Manured in alternate years.		No manure.		Manured every year.		Manured in alternate years.		No manure.	
	Sorghum.	Cotton.	Sorghum.	Cotton.	Sorghum.	Cotton.	Cotton.	Sorghum.	Cotton.	Sorghum.	Cotton.	Sorghum.
1914-15	Crop failed.											
1915-16	240	...	305	...	285	...	148	...	189	...	175	...
1916-17	...	66	...	96	...	66	...	1,325	...	1,110	...	1,103
1917-18	160	...	175	...	125	...	320	...	283	...	173	...
1918-19	...	543	...	353	...	420	...	540	...	310	...	200
1919-20	97½	...	161	...	218	...	344	...	244	...	196	...
1920-21	...	187½	...	107½	...	51½	...	Crop failed.				...
1921-22	1,850	...	1,190	...	840	...	218½	...	160½	...	264½	...
1922-23	...	405½	...	356½	...	296½	...	80	...	55½	...	165
1923-24	...	Crop failed.										
1924-25	...	208½	...	178½	...	200	...	537½	...	420	...	262½
Average.	461.9	282.1	457.7	218.3	367	206.9	257.6	608.1	219.1	473.9	202	432.6

Note.—Yields are in pounds per acre.

The average acre yields of sorghum and cotton of both fields are as follows :—

	Manured every year.	Manured alternate years.	No manure.
	LB.	LB.	LB.
Sorghum	532	466	400
Cotton	270	219	204

In years of good rainfall the crop in the manured plots, especially sorghum, gave very good results in the order of every year manured plots and alternate year manured plots, but in years of poor rainfall the manured plots fared worse than the unmanured plots. The results of normal years show that manuring in alternate years is more remunerative than manuring every year. The experiment will be discontinued. -

11. *Comparative value of loose box, pit and heap manures.*—The experiment was started as a duplicate to the one started at the Nandyal Farm to ascertain the productive value of cattle manure when prepared under loose box, pit and heap systems. A loose box and two sheds—one with urine trap and another without it—were constructed and two pairs of animals were housed in each of them. Each set of two pairs was shifted in regular

order from one system into another every fortnight. The dung and the waste fodder were collected every day from the shed without a urine trap and stored into a heap on level ground in the open. In the same way the dung and urine, together with any waste fodder, were removed every day from the shed with urine trap and stored in a water-tight pit with some sort of protection against rain and sun and pressed compact. From the loose box the manure was either carted straight to the field, or when the loose box was too full before the manure was required for the field it was stored in a pit of the type mentioned above and pressed compact. The manure thus prepared under each system was applied to the plots in proportion to the amount collected under each system. The experiment was a failure last year owing to the failure of the monsoon. Duplicate plots were opened this year with a view to find out also the residual values of the three manures. There were 16 plots for testing residual value, and the same number of plots were manured this year. Each plot was 10 cents each and had 32 lines of sorghum. The yield of the middle 24 lines and of the remaining 8 lines of each plot are shown under the columns of A and B, respectively, in the following table :—

TABLE XVI.

(Residual.)

No. of series.	Name of product.	No manure.			Box.			Pit.			Heap.		
		A.	B.	Total.	A.	B.	Total.	A.	B.	Total.	A.	B.	Total.
I.	Grain ...	25	14	39	35	23	58	40	20½	60½	31	24	55
	Ear heads ...	4½	20	54½	46	25½	71½	53	28	81	50	31	81
	Straw ...	135	71	206	194	88	282	162	70	232	177	82	259
II.	Grain ...	25½	21	46½	44	28	72	42	31	73	40	3½	63½
	Ear heads ...	45	29	74	56	35	91	55	37	92	56	31	87
	Straw ...	126	72	198	207	105	312	183	94	257	164	79	243
III.	Grain ...	33	25	58	41	26	67	37	25	62	32	22	54
	Ear heads ...	44	31½	75½	55	35½	91	52	35	87	52	29½	81½
	Straw ...	120	36	186	180	99	279	160	92	252	145	79	224
IV.	Grain ...	33	22	55	49	26½	75½	42	32	74	39	27	66
	Ear heads ...	47	29	76	68½	35	101½	60	42	102	53	38½	91½
	Straw ...	110	66	176	185	92	277	199	90	289	176	104	280
Average yield of													
Grain ...		29	20	49	42	26	68	40	27	67	36	24	60
Ear heads ...		43	27	70	56	33	89	55	35	90	53	32	85
and Straw ...		123	69	192	191	96	287	171	86	257	166	86	252
(per plot)													

A.—Yield in pounds of the 24 middle rows of the plot.

B.—Yield in pounds of the remaining 8 rows (4 on each side of the above rows) of the plot.

TABLE XVII.
(Manure applied this year.)

No. of series.	Name of the Product.	Heap.			Pit.			Box.			No Manure.		
		A.	B.	Total.	A.	B.	Total.	A.	B.	Total.	A.	B.	Total.
I.	Grain. ...	7	3	10	22	12½	34½	24½	14½	39	25½	18	43½
	Ear heads.	17	9	26	37	21	58	35	23	58	41	29	70
	Straw ...	90	42	132	157	84	241	184	78	262	132	84	216
II.	Grain ...	34	15½	49½	38	21	59	40	24½	64½	28	21	49
	Ear heads.	47	29	76	54	33	87	56	33	89	42	31	73
	Straw. ...	158	78	236	171	91	262	199	99	298	146	85	231
III.	Grain ...	42	24	66	39	23½	62½	36	23	59	29	18½	47½
	Ear heads.	58	36	94	53	37	90	52	32	84	41	31	72
	Straw ...	179	94	273	173	90	263	185	95	280	141	78	219
IV.	Grain ...	47½	27	74½	47½	28	75½	52	29½	81½	38	25½	63½
	Ear heads.	65	38	103	66	41	107	69	42	111	54	38	92
	Straw ...	197	91	288	200	108	308	213	105	318	166	89	255
Average yield of—													
Grain ...		33	17	50	37	21	58	38	23	61	30	21	51
Ear heads ...		47	28	75	52	33	85	53	32	85	45	32	77
and Straw...		15	76	232	175	91	266	195	94	289	146	84	230
(per plot).													

A.—Yield of the 8 middle rows of the plot.

B.—Yield of the remaining 4 rows (2 on each side of the middle rows of the plots).

12. *Calcium cyanamide and super-phosphate on Jonna.*—(Sorghum.) The experiment was started last year at the instance of the Government Agricultural Chemist and was continued this year. There were 30 plots of five cents each, and each plot had 12 rows of sorghum, and between every two plots there was an outskirt of five links. The manures were applied to the plots in the order of no-manure, one cwt. of nitrolim, two cwt. of nitrolim, one cwt. of super-phosphate, one cwt. of nitrolim and one cwt. of super-phosphate, and two cwt. of nitrolim and one cwt. of super-phosphate per acre.

The yields of the middle eight lines and the remaining four lines of each plot are shown under the columns of A and B, respectively, of the table below.

TABLE XVIII.

No. of series.	Name of product.	No manure.			1 cwt. of nitrolim per acre.			2 cwt. of nitrolim per acre.			1 cwt. of super per acre.			1 cwt. of super and 1 cwt. of nitrolim per acre.			2 cwt. of nitrolim and 1 cwt. of super per acre.		
		A.	B.	Total.	A.	B.	Total.	A.	B.	Total.	A.	B.	Total.	A.	B.	Total.	A.	B.	Total.
I	Grain	LB. 21	LB. 16	LB. 87	LB. 20	LB. 14	LB. 34	LB. 18	LB. 17½	LB. 85½	LB. 20½	LB. 16	LB. 86½	LB. 20½	LB. 18	LB. 88½	LB. 21	LB. 19½	LB. 40½
	Ear heads	27½	21½	49	26	18	44	25	28	48	29	28	59	27	22	49	28	25	53
	Straw	80	48	128	70	42	112	71	49	120	88	58	146	94	50	144	81	45	126
II	Grain	18½	16	34½	16	13	29	17	16½	83½	25	19	44	22½	14	36½	20	18	38
	Ear heads... ..	25	17	42	25½	17½	43	25	21	46	31	24½	55½	31½	21½	53	29	23	52
	Straw	60	40	100	72	45	117	60	44	104	76	51	127	81	45	126	80	58	138
III	Grain	25	19	44	21	16	37	21	18	39	25	18½	43½	24	18½	37½	23½	18	41½
	Ear heads... ..	31	24	55	27	20	47	27½	22	49½	34	24	58	30½	18	48½	30	22	52
	Straw	78	49	127	70	42	112	69	46	115	76	52	128	76	48	124	81	56	137
IV	Grain	24	16	40	18	15	33	17½	14½	32	24	16	40	15½	15	30½	20	12	32
	Ear heads... ..	33	22	55	24	19	43	23	18	41	31	21	52	21	19½	40½	27	15	42
	Straw	72	44	116	70	57	127	60	48	108	80	60	140	72	52	124	76	48	124

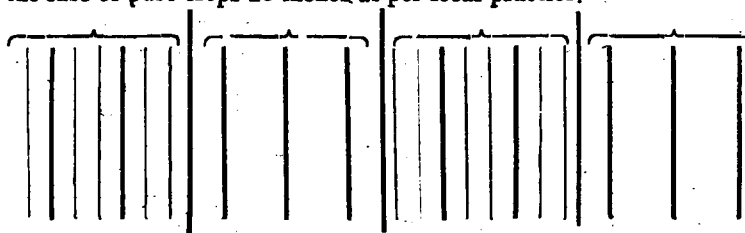
TABLE XVIII—cont.

No. of series.	Name of product.	No manure.			1 cwt. of nitrolim per acre.			2 cwt. of nitrolim per acre.			1 cwt. of super per acre.			1 cwt. of super and 1 cwt. of nitrolim per acre.			2 cwt. of nitrolim and 1 cwt. of super per acre.		
		A.	B.	Total.	A.	B.	Total.	A.	B.	Total.	A.	B.	Total.	A.	B.	Total.	A.	B.	Total.
V	Grain	19	14	33	17	12	29	14	14	28	19	11	30	19	14	33	16	14	30
	Ear heads	25	18	43	21½	16	37½	19	17	36	27½	17	44½	25	18½	43½	27½	19	46½
	Straw	62	48	110	68	49	117	65	52	117	91	55	146	85	52	137	79	60	139
	Total weight of grain	107	81	188	92	70	162	87	80	167	118	80	193	102	74	176	100	81	181
	Ear heads... ..	141	102	243	124	90	214	119	101	220	152	109	261	135	99	234	135	104	239
	Straw	352	229	581	350	235	585	325	239	564	411	276	687	408	247	655	397	267	664
	Average weight of grain	21	16	37	18	14	32	17	16	33	23	16	39	20	15	35	20	16	36
	Ear heads... ..	29	20	48	25	18	43	24	20	44	30	22	52	27	20	47	27	21	48
	Straw per plot	70	45	116	70	47	117	65	48	113	82	55	137	82	49	131	79	53	132

A.—Yield of 8 middle rows of the plot.

B.—Yield of the remaining 4 rows (2 on each side of the middle rows) of the plot.

13. *Cultural experiment—Korra-pathi (mixed crop of Italian millet and cotton against Boda-pathi (Pure cotton).*—The experiment was started in the year 1918-19 with the object of finding out which of the two methods was more profitable. The arrangement of the experiment was the same as in previous years. There were 36 plots of 2·6 cents each and korra-pathi and boda-pathi were repeated in order 18 times each. The mixed plot (Korra-pathi) consisted of one line of millet, one line of cotton, two lines of millet, one line of cotton and one line of millet, and on each plot of pure crop there were three lines of cotton. One line of millet and one line of cotton between the two plots, not included in the bracket of the diagram below, were treated as outskirts of the experimental plots and their yields were not therefore taken into account. The distance between two lines of the mixed crop was 14 inches, and in the case of pure crops 28 inches as per local practice.



The results are shown in the table:—

TABLE XIX.

Nature of cultivation.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
Korra	96	158	168	124	150	136	152	134	136	148	170	150	152
Cotton kappas	196 171	264 156	368 144	174 136	326 144	296 142	240 139	268 118	312 123	252 131	260 117	340 122	236 119
Boda-pathi cotton kappas.	143	136	167	152	130	119	131	131	116	110	116	125	148

Nature of cultivation.	(14)	(15)	(16)	(17)	(18)	Total.	Average.	—	—
	LB.	LB.	LB.	LB.	LB.	LB.	LB.	RS. A. P.	
Korra	158	142	130	190	102	2,596	144	0 5 9	Korra grain valued at 25 pounds per rupee. Korra straw valued at 200 pounds per rupee.
Cotton kappas	276 122	212 111	194 107	326 90	196 102	4,736 2,284	263 127	0 1 4 1 5 1	
Boda-pathi cotton kappas...	135	141	129	148	117	2,394	133	1 12 2 1 6 2	Kappas valued at Rs. 52 per 312 pounds.

Note.—Yields are in ounces per plot. In the case of Korra, numerator denotes grain, and denominator denotes straw.

The results of the past six years are as follows:—

TABLE XX.
Cultural experiments (results).

Year.	Korra-pathi.			Boda-pathi.	
	Yield of cotton.	Yield of korra.	Money value of cotton and korra.	Yield of cotton.	Money value of cotton.
	OK.	OS.	RS. A. P.	OS.	RS. A. P.
1919-20	823	Failed.	0 15 10	98·5	1 3 0
1920-21	2819	1894	0 6 0	48·41	0 5 7
1921-22	93	70	1 2 8	110	1 0 11
1922-23	107	108	1 10 10	138	1 11 8
1923-24 ... ..	...	Crop failed.	...	...	...
1924-25	127	144	1 12 2	133	1 6 2
Average money value of the crop per year ...	...	...	1 3 1	...	1 2 3

14. *Miscellaneous rain-fed crops—Bengal gram.*—This crop was sown as a mixed crop with jonna (sorghum) on an area of 17·04 acres and as a pure crop on 34·15 acres. The mixed crop gave 246 lb. of jonna and 49 lb. of Bengal gram; and pure crop 174 lb. Bengal gram per acre. In some fields the Bengal gram crop was affected by fungoidal disease and every affected field gave a poor yield as all the affected plants had to be removed.

Horse gram.—This was grown on two acres. The crop came up satisfactorily in the early stages but owing to lack of rain in the end it gave only at the rate of 183 lb. of grain per acre.

Korra.—Three varieties of korra were sown this year. Local korra gave a satisfactory yield of 895 lb. of grain per acre over 40 cents. Mondri korra and Adoni korra gave at the rate of 662 lb. and 440 lb. of grain per acre over 20 and 40 cents, respectively.

Garden land—Onions.—The crop was raised both for seed and bulbs. Seed was obtained at the rate of 57 lb. per acre on an area of 1·15 acres. The yield of bulbs was 2,370 lb. per acre.

Type 8 ragi.—This was grown on an area of 1·30 acres, and an average yield of 2,230 lb. per acre was obtained. The season was favourable for the crop all through.

Fodder jonna.—There was much scarcity of fodder on the farm owing to the failure of all crops last year, and fodder jonna was, therefore, sown on an area of 3·2 acres to save the situation. The crop came up well and gave at the rate of 14,390 lb. of fodder per acre.

Wheat Pusa No. 12.—This gave a poor yield of 450 lb. of grain per acre which may be due to either late sowing or change of locality, or both. The seed reached the farm from Pusa as late as December and it was sown immediately after its receipt. It will be tried again next year.

A large part of garden land was occupied this year by cotton selections.

15. *Sheep.*—The year commenced with 15 rams, 97 ewes, 17 ewe hogs, 6 wether hogs, 53 ram lambs and 38 ewe lambs. There were 85 births during the year.

Matings.—Matings were commenced in the second week of July as usual but they continued till October, an unusually long period. One hundred and four ewes were mated with six rams, and thirteen of them failed to conceive.

Lambings.—Of the 91 ewes that were successfully served, six died before lambing and the remaining 85 produced 48 ram lambs and 37 ewe lambs.

Clipping.—The flock was clipped in the third week of February, about a month earlier than last year. The average clip was 1 lb. 9·5 oz. of clean wool per head against 1 lb. 5 oz. of last year. The black wool was disposed of at Rs. 9-8-0 and the white wool at Rs. 16-8-0 per maund when the local wool was selling at Rs. 7 per maund.

Condition of the flock.—The condition of the flock was anything but satisfactory throughout the whole year. In the first place there was very little grazing for full ten months, and secondly a new contagious disease, *haemonchus contortus*, broke out in the flock in about the middle of the year. As a result of poor feeding on one hand and the necessity to drench every sheep with copper sulphate solution once every month as a preventive against the disease on the other, the condition of the sheep went down miserably low and more than half the number of ewes that lambed became dry soon after lambing. The lambs also weighed only 4·4 lb. each on the average against 5·1 lb. of last year, which was not also a favourable one for the sheep. All the lambs that were deserted by their mothers had to be fed with goats' milk. There were 67 deaths in all during the year, the death-rate being very high during the second half of the year; and of those that died 47 belonged to the old flock and 20 to this year's crop.

In consideration of scarcity for grazing, and also of heavy death-rate at the Hagari Farm, it was resolved to transfer the sheep breeding to Hosur Farm where the conditions seem to be better than at the Hagari Farm. The flock was accordingly removed to the Hosur Farm towards the end of the year.

Statement of receipts and charges of Hagari Agricultural Station for the year 1924-25.

Receipts.

XXIV. A. Agriculture—Agricultural Receipts.

	RS.	A.	P.
By sale of farm produce	1,704	10	10
Miscellaneous receipts	94	7	5
XXIV. B. Stationery and Printing.			
By sale of calendars and bulletins	0	2	0
Total	1,799	4	3

Charges.

34 a. Agriculture—Agriculture—III. Agricultural Stations and District Work.

	RS.	A.	P.
III (1) Contingencies	199	7	6
III (2) Agricultural Stations	7,714	8	8
Pay of executive subordinates	3,961	0	0
Pay of clerks	860	8	0
Pay of servants	300	0	0
Travelling allowances	546	11	0
Total	13,582	3	2

GLOSSARY OF CROPS.

<i>English name.</i>	<i>Botanical name.</i>
Sorghum	Sorghum vulgare.
Bengal gram	Cicer arietinum.
Horse gram	Dolichos biflorus.
Korra	Setaria italica.
Onions	Allium sepa.
Ragi	Eleusine coracana.
Wheat	Triticum spelta.
H. 25 cotton	Gossypium herbaceum.
Cotton	Gossypium.

P. H. RAMA REDDI
Deputy Director of Agriculture,
Third Circle.

APPENDIX I.

The following extract from Mr. Wood's report for 1906-07, i.e., the first year of the station's existence, gives a short account of the farm and the reasons for starting it:—

“In sanctioning the establishment of five pumping stations in different parts of the Presidency, Government laid down that one should be on the banks of the Hagari in order that the water so raised might be used to irrigate black cotton soil, so large an area of which was to be commanded by water from the proposed Tungabhadra reservoir. Though the success or otherwise of this scheme probably does not depend directly on the possibility or otherwise of profitably irrigating such heavy black soils, yet numerous questions relating to cropping, the duty of water, the yield and assessment will, it is hoped, be answered directly by experiment. Briefly, it is the object of the station to discover the most profitable method of applying water to black cotton soil, subject to the limitation that the knowledge will be applicable to the treatment of the lands under the Tungabhadra project. The two crops which it is at present proposed to study with due regard to the conditions mentioned above are paddy, grown as a wet crop, and cotton, grown as an irrigated dry crop. The determination for paddy of the best methods of applying water, the most economical amounts, the best manures, the varieties of paddy most suitable, the best seasons of sowing and the length of time necessary for the conversion of dry land into wet land; and similarly the response of the local cotton to light irrigations, the possibility of introducing fresh varieties which will, with the assistance of water, prove more profitable, and the methods and times of irrigation are all problems which will be studied. The whole forms a comprehensive scheme of work, which at present has hardly been touched and about which little previous information is on record. Besides these, an experiment in ‘warping’ the black cotton soil by means of the deposition of silt obtained from the Hagari is in progress.

“Accordingly, a site was chosen about a mile, south of the station of Hagari on the Southern Mahratta Railway, occupying lands in the villages of Paramadevanahalli and Kaggal. The whole area amounts to 225.16 acres, which may be roughly divided into black soil (regada) 100 acres, mixed soil 80 acres and dunes 40 acres. These latter are caused by the accumulation of sand blown from the dry river-bed during the prevalence of the strong winds of the south-west monsoon.

“*Soils.*—The whole of the eastern block, fields Nos. 1, 2 and 3 are practically pure regada. In appearance this is a black clay loam very friable when dry, cracking deeply in the hot weather and very sticky and adhesive when wet.

“Of the other fields, Nos. 9, 11 and 13 are, though black in colour, largely admixed with sand, the western portions of fields Nos. 6, 7 and 8 and the southern part of field No. 13, and the whole of fields Nos. 10 and 12 are distinctly sandy.

“The sand dunes themselves are partly underlain by black cotton soil, and towards the west beds of dark alluvial sandy loam are found with thin beds of clay, at distances varying from 2 to 15 feet below the surface.”

After four years' experiment, it was found that, if paddy was to be grown generally, the demand for manure would be very much greater than under ordinary dry-farming conditions and very much in excess of the supply, that the exotic cottons tried did not thrive and that the amount of

water that could be got from the river-bed was not sufficient for the small area under wet cultivation on the farm. The irrigation experiments were therefore abandoned and, since the beginning of 1910-11, the station has been utilized for the purpose of working out the solution of local agricultural problems.

The station as now constituted consists of 154.2 acres cropped entirely with rain-fed crops and devoted to the solution of problems connected with the cultivation, manuring and cropping of black cotton soil, and to the improvement of the more important of the crops locally cultivated, viz., cotton, Italian millet and sorghum; 8.6 acres of the more mixed soil, commanded by a well and devoted to the cultivation of "garden" crops, e.g., sugarcane, ragi, onions, tobacco, chillies, groundnut, Cambodia cotton, maize, etc., with the object of showing local cultivators that garden cultivation can be very profitable if properly attended to and so inducing them to pay more attention to the present area so cultivated and to extend it; and 62.36 acres uncultivated, including the area occupied by buildings and taken up in roads and bunds. Of this, some 55 acres can be grazed and most of this lies in the dune area referred to above. This dune area from being an almost bare sandy waste has been converted into moderate pasture land providing grazing from July to December sufficient for about 50 sheep, and carries a small top of casuarina trees, a few mango and cashew-nut trees and number of babool trees, which number is gradually being increased by planting, as it has been found that this tree, besides providing timber for implements and keep in the shape of pods, greatly improves the quality of grazing.

Local agriculture.—Most of the black cotton soil of Bellary district is to be found in the eastern half of the district and of this tract the first of the abovementioned areas can be taken as representative.

Soil.—The black cotton soil of this tract possesses the usual qualities of that soil, cracking deeply in the dry weather and becoming very sticky and adhesive when wet and being retentive of moisture; it, however, varies in depth and fertility. On the farm it is from 5 to 10 feet deep and is underlain by a bed of reddish earth (vide Appendix II).

Rainfall and seasons.—The average annual rainfall of this tract is smaller than that of any other district in the Presidency, and, at the station which is located in the driest part of this tract, the average rainfall since its opening has been only 19 inches.

From the point of view of rainfall, the year can be divided into four main periods; January to March, when there is practically no rain; April and May, the hottest period of the year, when usually one or two sharp showers are received; June to September, the period of the south-west monsoon when most rain is received, and the last month of which is the wettest in the year—it is on the rain which falls in this period that most dependence has to be placed; and October to December, the period of the north-east monsoon. The rains in this period are very variable and, if the south-west rains have been good and these rains are also good, the result is apt to be more harmful than beneficial, more particularly if they last on until November. In the case of both cotton and sorghum, the most satisfactory returns are obtained if good rains are received from July up to the middle or, at latest, the end of October and if, thereafter, no rain falls until the crop is harvested. More particularly is this the case with cotton, which, if sown at the proper time is usually coming into flower in November, all of which along with a large proportion of the leaf, falls if rains are received in that month.

The sowing periods are also four in number and run roughly as follows.—

July 16 to August 15, August 16 to September 15, September 16 to October 15 and October 16 to November 15.

In the first period, Italian millet is sown pure and mixed with cotton, but chiefly as a pure crop; in the second period, cotton as a pure crop, and mixed with Italian millet, safflower and coriander are sown; in the third period, sorghum usually as a mixture with Bengal gram and safflower is sown and sometimes the last named crop is sown pure in this period; and in the last period, Bengal gram is sown as a pure crop.

Rotation and crops.—With the exception of chillies, tobacco and a few vegetables usually cultivated on small well-manured areas for home consumption, wheat and linseed grown on small areas when water accumulated during the monsoon, the crops cultivated on the black soil have already been mentioned.

The common rotation is sorghum mixed with Bengal gram and a little safflower in one year, followed by a mixture of Italian millet and cotton the next, but the cropping actually carried out varies from year to year with the rainfall and to some extent on the status of the ryot.

If good rains are received in July and the ground is thoroughly soaked—for until that happens it is useless to sow—then Italian millet is sown over as large an area as possible, both on these lands intended to be cropped later the same year with cotton and those intended for sorghum. This millet is usually sown with a six-tyned drill (gorru) and a well-to-do cultivator will leave the second and fifth lines blank when he intends to sow cotton later, while a poor cultivator will sow all the six lines. The cotton is then sown with an akkadi (a bamboo tube with a hopper attached) behind either a plough or a drill in August-September in the blanks left for the purpose, or after every two lines of millet when the whole field is sown.

In the case of the land intended for sorghum, Italian millet is sown mixed with a varying proportion of an early variety of sorghum which is cut before it has formed head and a little before the Italian millet. Late sorghum is then sown in September-October between each line of Italian millet and the next or after every two lines. The reason for sowing the early sorghum is that it provides some fodder early on and helps to fill the blanks which may occur in the late-sown crop. The early and late-sown sorghum mature together and are harvested together. Where a ryot has a large holding, he will limit the admixture of early sorghum with the Italian millet to a small amount in part of the area so sown, and in this he will sow no late sorghum but will cut the early sorghum as usual, harvest the Italian millet, and then sow Bengal gram, taking care as he sows not to damage the stubble of the early sorghum.

If good soaking rains are not received until August, then korra-pathi, i. e., korra (Italian millet) and pathi (cotton) is sown.

Either a three-tyned or a six-tyned drill is used for sowing the korra. In the first case, the middle line; and in the second case, the second and fifth lines will not be sown. The tynes, however, are not removed but are left to mark out the lines along which a woman guides an akkadi which is attached by a length of rope to the drill by means of which she sows the cotton.

Sorghum and Bengal gram will then usually be sown in September-October.

Usually with the sorghum seed, a little safflower seed is mixed, and the mixture of Bengal gram is obtained by sowing it behind the drill with an akkadi. Usually, every sixth line is sown with Bengal gram but

sometimes every third line is sown. Thus every third or sixth line of a sorghum crop may be a mixture of the three crops, safflower, sorghum and Bengal gram, and will certainly be a mixture of the two last named. When the rains are late, cotton is, as a rule, sown pure, though there are always some ryots who will try to grow the mixture, and sorghum is mixed with a greater proportion of Bengal gram and safflower. A late-sown sorghum crop is, as a rule, a poor stand; hence the heavier sowing of the other constituents of the mixture.

In such years, as regards cotton, the ryots prefer to sow a mixture of clean and fuzzy seeds, as they say the crop does better—a belief that actual test does not bear out—and, as regards sorghum, they prefer to sow a mixture of an early maturing and a late maturing variety. This latter action is more reasonable than the former; as, if more rain is received after sowing, then both varieties will mature; if not, then at least the early maturing variety will give some crop.

Safflower and Bengal gram, except as mixtures with other crops and coriander, are not largely grown. A few large holders grow the last mixed with the first named, or as a pure crop, but only on a small scale.

Manuring.—This is confined to the application of cattle-manure and to the penning of sheep.

As the usual ratio of animals to area cultivated in this tract is one pair of bullocks to forty acres, as cattle breeding is not carried on to any extent and as cattle-manure is an important fuel, it is obvious that only a small area can be manured in this way. What usually happens is that a small part of the holding near the village is manured in rotation and the rest of the holding never receives any.

In nearly every village there is a flock of sheep or a mixed flock of sheep and goats usually owned by four or five shepherds. These are allowed to graze on the black soil fields after the harvest of sorghum and cotton, and theoretically a certain proportion of each man's holding so grazed should be penned for one night. Actually, however, only one or two of the more influential ryots manage to have this done. Penning over and above this extent has to be paid for at the rate of As. 4 per 100 sheep per night, but on dry land this practice is not much resorted to.

Very little care is taken in preserving cattle manure. Usually it is thrown down in a heap in some odd corner in the village, and is left fully exposed to all the varying conditions of weather and to the attacks of the thrifty pig and its no less economically minded sister, the milking mainstay of the village, the buffalo.

Cultivation.—In April-May after the harvesting, threshing, etc., of the previous season's crop are over and after a shower has fallen, preparatory cultivation for the next season's crop is begun, the clearing of the stubble from the sorghum fields being the first operation, and after this is over, the cotton stubble is attacked and removed. For these operations a blade harrow (guntaka) is usually the only implement, but sometimes the cotton stubble is cut before being uprooted. Usually three cultivations are given prior to sowing and, in the case of the land intended to be cropped with cotton, one of these cultivations may be done with a country plough. This is done with the idea of exposing a greater surface so that more moisture may be absorbed.

After cultivation is done by bullock power. When the lines of the crop are close together as in the case of sorghum and mixed crop of cotton and Italian millet, three small hoes (dantulu) are attached to the yoke of a pair of bullocks. Each of these is worked by one coolie and can be lifted over obstructions, moved to one side or the other when the line is crooked, or pressed into the ground where it happens to be hard,

independently of the other two. In a crop of pure cotton and after the Italian millet has been harvested in the case of a mixed crop, a single blade harrow (guntaka) of the requisite width is worked between the lines. Usually three such inter-cultivations are given, but sometimes when the crop is young and there is a likelihood of its being smothered if bullock power is used, a hand hoeing is given.

Every fifth or sixth year this land is ploughed with a heavy iron plough drawn by six pairs of bullocks. This operation is usually done in February-March immediately after the harvest of the sorghum crop. The land is turned up in huge clods and is left in that condition through the hot weather and until rain falls, when a specially heavy guntaka is dragged over the field to break down the clods. The object of this operation is to clean the land of hariali grass and other deep-rooted weeds. When land is very foul it is cropped with Italian millet (pure) and is ploughed in December, thus giving the land a longer period to lie in a rough condition and dry out, besides being easier to plough.

Garden cultivation.—In the tract in which the farm is situated, most of the garden cultivation is to be found along the banks of the Hagari river and the conditions under which this is carried out are fairly represented by the small area devoted to this sort of cultivation on the farm. The soils are for the most part black cotton soils with varying admixture of sand and modified by the system of cultivation, but light sandy soils are also to be found. The cultivation of these lands is in no way remarkable except perhaps for the fluctuation it undergoes.

The commonest crop grown is ragi and after it, chillies, tobacco, onions, sweet potato, 'neer-jonna' (i.e., irrigated sorghum) and wheat. Maize is grown only to a small extent. No definite rotation is adopted, and in a year of good rainfall the whole area will be cropped with korrapathi and garden cultivation abandoned. As in the case of dry cultivation, manuring is limited to the application of cattle manure and the penning of sheep, which latter is, however, more frequently resorted to than is the case in dry lands, though the cost is twice as great, viz., Rs. 8 per 100 sheep per night. The use of oil-cake is unknown, and if green manuring is known to any of these cultivators it is not resorted to. With the exception of wheat and neer-jonna which are drilled, and maize which is dibbled, all the crops mentioned above are transplanted and usually into flat beds, i.e., small squares of lands with small bunds on all sides to retain water. In a few rare cases, onions and ragi are planted on ridges. Usually transplanting does not begin till August, and, as a rule, to save an irrigation, a heavy shower is awaited before it is begun. This practice is apt to be carried a little too far sometimes and the proper season is lost. Wheat, brinjals and maize are, however, grown as cold weather crops, while onions and ragi are grown both during the monsoon period and in the hot weather.

Latterly, groundnut as a rain-fed crop has begun to encroach on the lighter garden lands, and Cambodia cotton is coming into cultivation on the heavier soils.

Waste land.—The dune area of the farm is typical of a long tract lying on the eastern bank of the Hagari river. This waste land is chiefly utilized as a grazing ground—exercising ground would perhaps be a more appropriate term—for the flocks of sheep maintained in practically every village and for the village cattle. Cattle are not bred, they are allowed to be born and to grow up if they can, and, as regards sheep, though the method of breeding is not quite so hap-hazard, it is very nearly so. The size of the flocks varies from village to village and from about two hundred up to as many thousands, and in a few cases more. Usually

(practically always) the sheep in a village are owned by four or five shepherds and are treated as one flock.

From February to May, inclusive, they are grazed on the black soils of the village after the crops have been harvested when, as the shepherds say, "there is good grazing." In the jonna fields, however, there is not much to be got, as these are harvested too cleanly by their owners who want all the fodder they can get, but in the cotton fields, the grazing is better. During this period the sheep are at their best.

From June to February again, they are grazed on the waste lands and as no one thinks of doing this judiciously and in rotation these are kept as are as it is possible to be, with the result that, with the cessation of the rains, the sheep begin to lose condition and rapidly become emaciated.

No fodder is ever fed to the sheep and no shepherd ever dreams of growing a crop for the express purpose of feeding his flock. The only form of concentrated food they get is babool pods, which had to be had during the same period that the sheep are grazed on the black soils.

In most cases black sheep are preferred as they are supposed to keep the condition better when food is scarce, i.e., when it is a little more scarce than usual, and are also supposed to withstand heat and cold better than white sheep. Also in some cases, it is easier to get a market for black wool than for white wool though the latter usually brings about As. 8 per maund (26 lb.) more than black wool. As regards the first point, the assertion may be true, but that the white sheep manage to keep alive and put on a certain amount of condition when there is something to eat shows that they are neither sickly nor fastidious, while, with regard to the second point, it has been noticed on the farm that the black lambs feel the heat more than the white ones. In spite, however, of this preference, there is hardly a pure black flock to be seen anywhere. The ram lambs kept in the flock are for the most part black, but the desire to have a large flock prevents the shepherds ruthlessly discarding all white lambs whether ewe or ram.

The usual proportion of 1 ram to about 40 ewes is maintained, but as no trouble is taken with the mating and as the rams are usually chosen from the flock itself, the members must be fairly closely related. The rams are kept in the flock till useless and the ewes till they have dropped five lambs. The two chief mating seasons are June and November, but lambs are dropped all the year round. Three lambs are said to be obtained in two years but this does not appear to be true for all the ewes. Clipping is done twice a year, in June and December, as it is the belief that sheep allowed to carry their wool for a whole year lose condition. The shears used are of soft iron and of similar pattern to English shears, and the average annual clip per sheep is about one pound of coarse wool. The sheep are always washed the day before clipping, as they are usually so dirty and the wool is so coarse that it is almost impossible to clip them unless this is done.

Lambs are sold when the grazing on the black soils is finished, and usually bring Rs. 1-8-0 to Rs. 3 according to size.

APPENDIX II.

Elutriation analyses of soils from the Hagari Farm.

Diameter of particles.				I. Field No. 2-A.			
				0"—9".	9"—19".	19"—29".	29"—30".
		MM.	PER CENT.	PER CENT.	PER CENT.	PER CENT.	
Clay	...	... '002 ...	6'00	7'36	9'26	10'52
Sand	...	... '002—'004	12'61	14'50	13'56	19'14
"	...	... '004—'008	8'94	11'20	13'36	19'13
"	...	... '008—'016	8'25	9'09	11'69	9'60
"	...	... '016—'032	14'10	17'35	20'64	19'33
"	...	... '032—'140	34'40	29'10	22'66	15'64
"	...	... '140 ...	15'55	11'40	8'81	6'37
II. Field No. 2-B.							
Clay	...	... '002 ...	7'75	7'74	12'49	12'88
Sand	...	... '002—'004	10'88	10'92	16'96	22'65
"	...	... '004—'008	5'70	6'77	9'31	12'54
"	...	... '008—'016	6'53	7'76	8'89	8'98
"	...	... '016—'032	13'45	17'18	15'85	15'52
"	...	... '032—'140	31'93	30'03	22'37	16'83
"	...	... '140 ...	23'40	19'42	14'20	10'48
III. Field No. 3.							
Clay	...	... '002 ...	6'95	9'53	11'42	4'86
Sand	...	... '002—'004	12'41	15'21	15'28	12'93
"	...	... '004—'008	9'65	11'52	7'97	8'65
"	...	... '008—'016	8'63	9'12	7'67	9'28
"	...	... '016—'032	17'39	17'32	14'42	17'44
"	...	... '032—'140	33'76	26'29	21'08	27'93
"	...	... '140 ...	11'44	10'56	21'72	18'64

Vertical section through soil, sub-soil, etc.

I.		FEET.	II.		FEET.
Black soil	...	10	Black cotton soil	...	5
Reddish clay	...	6.5	Red loam clay	...	3.5
			Loam, sand and pebbles, red, black and yellow.	...	6.5
			White sand	...	8.0
Stiff dark clay	...	6.5	Clay	...	5
			Sand	...	5.5
Rock reached at	...	26.5	Rock reached at	...	27.5

Water level at 16 feet in both cases.

REPORT OF THE NANDYAL AGRICULTURAL STATION FOR 1924-25.

An account of the local agriculture of the neighbourhood of this station is given in the appendix to the report for 1923-24.

TABLE I.

Rainfall statement.

Month.	Fernight.	1919-20.	1920-21.	1921-22.	1922-23.	1923-24.	1924-25.	Number of rainy days in 1924-25.	Average rainy days for the past 18 years.	Average rainfall for the past 18 years.	
1924.											
April	1st	0'00	0'01	0'00	0'00	0'55	0'35	1	1	1'70	
	2nd	1'02	0'02	1'55	0'07	0'11	0'00	...	1		
May	1st	0'58	2'37	0'10	1'55	0'21	4'85	0'31	1'51	2	
	2nd	0'77	1'38	0'00	4'57	0'54	0'61	5	5	3	
June	1st	2'06	0'13	2'16	0'30	0'13	0'90	5	5	3	
	2nd	3'38	1'14	0'16	3'00	5'22	0'19	6	6	3	
July	1st	3'38	0'73	3'65	0'77	2'86	3'79	6	6	6	
	2nd	2'09	3'26	4'87	4'30	3'46	5'31	7	7	7	
Aug.	1st	0'92	0'15	1'62	16'13	0'30	13'70	0'82	24'25	10'65	20'33
	2nd	1'15	5'01	0'58	4'68	0'63	1'62	5	5	7	
Sep.	1st	3'69	0'90	1'46	0'44	3'62	2'12	6	6	6	
	2nd	4'36	3'11	1'63	0'94	7'51	3'97	7	7	8	
Oct.	1st	3'38	1'61	2'94	1'05	0'00	0'45	8	8	4	
	2nd	0'74	0'00	0'00	0'17	0'30	0'25	9	9	2	
Nov.	1st	2'13	5'18	0'91	3'18	0'14	1'85	3	3	2	
	2nd	0'00	0'32	2'13	0'00	3'85	0'18	0'47	0'28	2'78	4'70
Dec.	1st	0'00	0'00	0'00	0'00	0'00	0'00	...	...	...
	2nd	0'01	0'00	0'00	0'00	0'00	0'00	...	...	...
1925.	1st	0'50	0'00	0'22	0'00	0'00	0'00	...	...	...
Jan.	2nd	0'04	0'00	0'00	0'00	0'00	0'00	...	...	...
Feb.	1st	0'00	0'54	0'00	0'00	0'00	0'00	...	...	...
	2nd	0'00	0'00	0'00	0'23	0'00	1'24	0'21	0'00	0'00	0'78
Mar.	1st	0'00	0'00	0'00	1'21	0'00	0'00	...	...	...
	2nd	0'00	0'00	0'00	0'03	0'31	0'00	...	...	...
Total ...	...	29'53	18'07	21'76	23'35	26'44	93'39	63	64	279

The total rainfall for the year was 23'39 inches against an average of 27'59 inches for the past 18 years. The number of rainy days was about normal, but the distribution of rainfall was irregular.

The rains commenced somewhat late, and in addition the amount of rainfall received in June was so small that no early crop of any kind could be sown in time. The rainfall was almost continuous from early July to the end of September, and the sowings of all crops had to be done only during the short spells of bright weather. But the continuous rains had very bad effect on germination of seed. Green manure crop (sunhemp) failed completely and korra (Italian millet) had to be sown twice. October was almost dry and there was only one rain in early November. This rain, though helpful to some extent to dry crops, was very harmful to paddy crop which was then in full flower. From the middle of November the rains practically ceased.

All dry crops, with the exception of korra (Italian millet) came up unusually well till about December when they began to fall off for want of sufficient moisture in the soil. In addition the continuous cloudy weather in the flowering season and the early appearance of the boll-worm in a severe form affected considerably the yield of the early maturing varieties of cotton, particularly, No. 54 cotton. The late maturing varieties fared a little better as the boll-worm disappeared later on in the season. Sorghum (jonna) gave comparatively better yield as it came to maturity when there was still sufficient moisture in the soil.

There was enough water-supply in the tank for the first-crop paddy whose yield was affected by the heavy rain in November. The second-crop paddy suffered, as usual, for want of sufficient water-supply from the tank, especially in the later stages.

Cotton selections—(a) Type No. 54.—The two selections—54/11 and 54/16—that were mentioned in last year's report were examined in the laboratory. 54/16 was rejected as the average length of its staple was only 25 m.m. Out of 54/11 whose average staple-length was 26 mm., two plants—54/1 and 54/2—with staple 23 and 27 mm. long and 30 and 32 ginning percentage respectively were selected for further trials. The seed of each of these two plants was sown, as usual, separately in lines and all the plants were examined in the field for the number of main monopodial and sympodial branches, the node at which the first sympodial branch arises, the date of first flowering, the leaf factor, the size of boll and the number of locks per boll. All the above characters go to prove that the two selections are true to the type. The examination of kappas is in progress.

A separate record was maintained for the daily production of flowers and the daily shedding of bolls for 50 plants selected at random early in the season from each of the above selections.

The self-fertilized seed of all other plants of 54/11 having ginning percentage of more than 29 and staple length of more than 25 mm. was mixed together and sown on a separate plot for seed next year.

(b) Type N. 14. The two selections—14/111 and 14/120—of the previous year were examined for seed weight, lint weight and staple-length. One plant (14/2) with staple 27 m.m. long and 26 ginning percentage out of 14/111 and one plant (14/1) with 28 m.m. of staple-length and 25 ginning percentage out of 14/120 were selected and the seed of the two plants was sown in separate lines for further examination. The individual plants were examined for the field characters and the examination of kappas will soon be taken up.

All the self-fertilized seed of all the other plants of N. 14/111 and N. 14/120 was mixed together and sown on a separate plot with a view to purify N. 14 cotton.

(c) Fresh selections from the Northerns.—Out of 250 plants selected last year, only three were found to be fit for further trials. The seed of each of these three plants—No. 50, No. 141 and No. 190—was sown separately and all the individual plants were examined for field characters. No. 50 belongs to herbaceum type and the other two strains proved to be hybrids. Further examination will continue.

(d) *Crosses*—(i) *N. 14 and Roseum crosses*.—The individuals of F. 2 generation were examined for seed weight, length of staple and number of ovules per lock and two plants—22/1 and 22/2—were selected for further trials. All individual plants of the two strains have white flowers and uniform shape of bolls. The shape of leaf of each type is also uniform so that the two strains are pure for shape of leaf, colour of flower and shape of boll. Kappas will be examined soon.

(ii) *N. 14 and Cernum crosses*.—All the plants of F. 1 generation were examined for seed weight, lint weight, length of staple and fineness of lint and one plant—cross No. 4—was selected for further trial. It has split for various characters.

(iii) *N. 14* was crossed artificially with *Roseum*, *Cernum* and *H. 62* this year and the crosses will be tried next year.

Comparative trials of cotton.—As mentioned in the last year's report Company No. 2 and Company No. 3 cottons were given up and Gadag, H. 25, No. 54 and N. 14 were compared this year in field No. 3-B. They were repeated 23 times each on small plots of 2 cents each in the above order and the yield of kappas per plot is shown in the following table:—

TABLE II.

Comparative trials of cotton.

		Series.												
Serial No.	Kind of cotton.	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Gadag	4.0	4.5	4.9	3.15	3.2	4.2	3.11	3.11	3.12	3.8	3.5	2.14	3.14
2	H. 25	3.9	4.8	4.4	4.11	4.0	4.11	3.13	4.9	4.6	3.7	4.1	3.6	3.13
3	No. 54	3.5	4.0	3.6	3.1	3.8	3.14	2.15	2.8	2.15	2.15	2.13	2.10	2.12
4	N. 14	4.5	5.6	4.11	4.6	5.0	5.1	4.11	4.9	5.4	4.0	3.13	4.6	4.6

Serial No.	Kind of cotton.	14	15	16	17	18	19	20	21	22	23	Total.	Average in ounces.
1	Gadag	3.7	3.1	3.2	3.7	3.1	3.9	2.8	2.8	2.14	2.8	78.13	54.8
2	H. 25	4.4	3.9	3.8	4.0	3.10	4.2	3.0	3.1	3.3	3.4	68.11	61.7
3	N. 54	2.14	2.12	2.4	2.5	2.3	2.0	1.11	1.15	2.4	2.0	63.4	44.0
4	N. 14	4.5	4.6	3.9	3.10	3.13	3.13	3.8	3.8	3.4	2.9	96.3	66.9

Notes.—Yields are in pounds and ounces.

The increase in favour of Gadag, H. 25 and N. 14 over No. 54 is 5.87, 9.62 and 12.45 times the probable error. N. 14 is, therefore, decidedly superior to all the rest, but the results of this year cannot be taken seriously. No. 54 was the earliest to flower and therefore suffered the most from the boll-worm which did unusually heavy damage to the cotton crop this year on the farm. N. 14 suffered the least being late flowering variety as by the time that it was in full flower the attack of boll-worm was on decline. The experiment will continue.

TABLE III.

Percentage of lint to kappas.

Serial No.	Kind of cotton.	1907-08.	1908-09.	1909-10.	1910-11.	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.	1923-24.	1924-25.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1	No. 2	26.0	30.0	32.9	28.9	31.4	31.1	28.9	29.2	30.5	30.6	31.4	..	..	..	..	..	..	..	..
2	N. 14 ... ..	..	..	..	..	..	..	..	25.9	24.1	24.0	25.1	22.8	22.2	23.9	25.8	21.25	23.5	23.2	..
3	No. 50 ... ..	..	..	30.0	28.4	29.9	26.4	28.9	29.3	28.8	29.1	29.0	..	..	..	..	..	..	..	..
4	Pulichai ... ..	..	..	..	..	..	..	..	..	..	..	27.0	..	..	..	..	..	..	..	..
5	Company No. 2. ... ..	..	..	..	..	..	..	..	..	..	..	33.3	33.4	33.8	28.2	31.25	28.13	31.8	..	..
6	„ No. 3. ... ..	..	..	..	..	..	..	..	..	..	..	38.3	32.2	33.6	35.1	31.03	33.13	33.8	..	..
7	Gadag ... ..	..	..	..	..	..	..	..	..	..	..	..	..	..	26.4	25.5	25.63	28.0	28.4	..
8	Local ... ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	24.9	..
9	No. 54 ... ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	27.7
10	H. 62 ... ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	28.9

TABLE IV.

Yields of cotton (kappas) in non-experimental fields.

Serial No.	Kind of cotton.	Field No.	Area.	Yield of kappas		Remarks
				Per plot.	Per acre.	
1	N. 14 cotton ...	2-B	4.53	653-11	144-5	Average for the whole farm 107 lb. of kappas per acre.
	Do. ...	3-A	1.45	80-0	55-4	
	Do. ...	3-B	4.50	364-14	81-3	
	Do. ...	New area ...	4.81	1,008-1	308-8	
	Do. ...	Do. ...	3.10	270-0	273-3	
2	No. 54 cotton ...	E. H.C. dry lands, New area (big field).	2.20	263-5	119-11	Average of both 131 lb. of kappas per acre.
		Do. ...	New area (small plot).	0.30	63-9		211-14
3	Gadag ...	New area ...	1.89	173-12	125-0	Produce of comparative trial experiment.
4	H. 62 ...	Do. ...	0.40	45-11	114-3	
5	Mixture kappas ...	3-B	2.50	374-5	149-12	

Manurial experiments.

(a) *Ammonium sulphate on cotton.*—The experiment was repeated this year in field No. 3-B. There were 40 plots of 2 cents each. Each plot had three rows and every alternate plot was manured with ammonium sulphate leaving the other plots unmanured. There was one row of outskirt between each manured and unmanured plot. The manure was drilled at the rate of 100 lb. per acre on both sides of the rows as close as possible to the plants when the plants were about 6 inches high. The results are as follows :—

TABLE V.

Treatment.	Yield recorded in ounces.													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Manured	2.8	2.9	2.5	2.6	2.11	2.10	2.7	2.11	3.2	3.5	2.3	2.6	2.1	3.2
No manure ...	2.6	2.8	2.9	2.13	2.9	3.3	2.10	2.14	2.15	2.13	2.10	2.5	2.8	2.10

Treatment.	Yield recorded in ounces.						Total.	Average.	Remarks.
	15	16	17	18	19	20			
Manured	2.3	2.2	2.7	2.6	2.1	2.1	48.10	2.7	Yields are given in pounds and ounces per plot.
No manure ...	2.7	2.10	2.2	2.3	2.9	3.1	52.5	2.10	

There were rains after the application of manure unlike the previous year and the crop in manured plots assumed dark green colour after these rains. The difference, however, disappeared soon and the manured plots actually gave less yield than the unmanured plots on the average. The manure does not seem to sink deep enough into the soil to be utilized by the plants after the rains. It seems to be utilized by the plants, only so long there is enough moisture in the surface layers of the soil, but when the moisture in the upper layers becomes inadequate the roots cease to absorb the manure. The experiment will be discontinued, but the effect of the manure will be examined by applying it in the deep furrows at the time of ploughing the soil.

(b) *Sodium nitrate on cotton*.—The arrangement of plots and the method of application of manure were similar to those in the above experiment, but the manured and the unmanured plots were repeated only ten times against twenty times in the above experiment. The results are shown in the table below :—

TABLE VI.

Treatment.	Yield recorded in ounces.										Total.	Average	Remarks.
	1	2	3	4	5	6	7	8	9	10			
Manured ...	4.4	4.1	4.4	3.12	3.13	4.2	3.12	3.11	3.9	3.10	38.14	3.14	Yields are given in pounds and ounces per plot.
No manure...	4.5	4.6	3.12	3.11	4.2	3.15	4.1	3.14	3.6	3.4	38.12	3.14	

The same remarks that were made about the above experiment hold good to this experiment also.

(c) *Comparative trials of castor cake and cattle manure on dry crops (cotton and sorghum)*.—

TABLE VII.

Statement showing average gain in the experiment.

Year.	Crop.	Castor cake at 300 lb. per acre.			Cattle manure at 20 cart-loads per acre.			No manure.
		Yield in lb. per acre.	Cost of manure per acre.	Net gain or net loss.	Yield in lb. per acre.	Cost of manure per acre.	Net gain or net loss.	Yield in lb. per acre.
1920-21	Sorghum.	287/1,497	Rs. 15	Rs. A. P. + 4 0 1	...	Rs. ...	Rs. A. P. ...	247/1,417
1921-22	Cotton.	273½ (kaps)	15	+ 17 4 0	186½ (kaps)	20	- 1 7 4	193½ (kaps)
1922-23	Sorghum.	767/1,337	15	+ 7 14 4	1,240/2,320	20	+ 28 9 6	553/1,183
1923-24	Ground-nut.	565 (pods)	15	+ 4 8 2	697 (pods)	20	+ 6 12 9	413 (pods)
1924-25	Sorghum.	607/1,380	15	+ 10 4 1	1,087/1,943	20	+ 34 14 9	893/1,270
Average gain ...	...	...	...	+ 8 5 1	...	...	+ 17 3 5	...

Each plot was 30 cents in area and sorghum was raised on all plots.

(d) *Poudrette on dry crops.*—

TABLE VIII.

Poudrette plot (50 cents).*			Poudrette residual plot (50 cents).			No-manure plot (50 cents).		
Year.	Crop.	Yield in lb. per acre.	Year.	Crop.	Yield in lb. per acre.	Year.	Crop.	Yield in lb. per acre.
1918-19	Sorghum.	298/514	...	...	...	1918-19	Sorghum.	344/616
1919-20	Cotton.	256	...	...	...	1919-20	Cotton.	245
1920-21	Sorghum.	456/1,866	...	...	...	1920-21	Sorghum.	308/1,194
1921-22	Cotton.	164	1921-22	Cotton.	208	1921-22	Cotton.	180
1922-23	Sorghum.	1,174/1,716	1922-23	Sorghum.	944/1,606	1922-23	Sorghum.	646/1,002
1923-24	Groundnut.	448 (pods)	1923-24	Groundnut.	424 (pods)	1923-24	Groundnut.	350 (pods)
1924-25	Sorghum.	1,368/2,046	1924-25	Sorghum.	692/1,550	1924-25	Sorghum.	434/1,188

From the above table it is seen that this manure has got very good effect on Sorghum and Groundnut, both shallow rooted crops, while it has little or no effect on cotton, a deep rooted crop. The experiment will be discontinued.

(e) *Comparative value of loose box, pit and heap manures.*—The experiment was started at the instance of the Government Agricultural Chemist to ascertain the productive value of cattle manure as prepared under loose box, pit and heap systems. A small loose box and two sheds, one with and another without urine trap arrangement, were constructed, and one pair of animals was housed in each of these buildings. Each of these three pairs was shifted in regular order from one system into another once every week. The dung and the waste fodder, if any, were collected every day from the shed without urine trap and stored into a heap on open level ground. In the same way the dung and urine together with any waste fodder were collected every day from the shed with urine trap and stored in a water-tight pit with some sort of protection against rain and sun and pressed compact. The manure from the loose box was either carted straight to the field or when the loose box is too full before the manure is required for the field it is stored in a pit of the type mentioned above and pressed compact. The manure thus prepared under each system was applied to the plots in proportion to the amount collected under each system.

A duplicate experiment was started this year with a view to study the residual value of these three kinds of manures. The results are as shown in Table IX.

TABLE IX.
(Manure applied this year.)

Serial No.	Manure.	Series 1.		Series 2.		Series 3.		Total.		Average for 1924-25.		Results of 1923-24.		Average of 2 years.		Yields of manure.		Rates of application of manure per plot.	
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	1923-24.		1924-25.	
																LB.	LB.	LB.	LB.
1	Loose box	730	2,210	810	2,080	870	2,860	2,210	6,800	737	2,200	943	2,303	840	2,252	5,085	5,071	1,400	1,320
2	Byre	640	2,000	810	1,980	800	2,070	2,250	6,050	750	2,017	943	2,270	847	2,144	3,596	3,841	1,000	1,000
3	Heap	710	2,000	790	1,970	730	2,170	2,230	6,140	743	2,047	890	2,050	817	2,049	4,897	4,598	1,400	1,320
4	No manure	490	1,460	660	1,700	720	1,930	1,870	5,090	623	1,697	840	1,887	732	1,792	...	...	...	...

Note.—Yields are in pounds per acre; area of each plot is 10 cents.

TABLE X.
(Residual.)

Serial No.	Manure.	Series 1.		Series 2.		Series 3.		Total.		Average.		Remarks.
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	
1	Loose box ...	80	226½	108	277	113	272	301	775½	100½	258½	Yields are given in pounds per plot of 10 cents in area.
2	Byre ...	89	256	91	223	88	247	268	726	89½	243	
3	Heap ..	97	237½	95	234	99	245	294	716½	98	236½	
4	No manure ...	57	192	65	180	43	177	168	549	56	183	

The experiment will continue.

Sorghum.

(a) *Comparative trials of sorghum types.*—T. 6, the best of the farm types, was compared in field No. 2-A with the 8 types—A.S. 213, A.S. 221, A.S. 224, A.S. 225, A.S. 241, A.S. 252, A.S. 276 and A.S. 278—of the Government Millets Specialist and the results are given in Table XI:—

TABLE XI.

Serial No.	Type.	Series 1.		Series 2.		Series 3.		Series 4.		Series 5.		Series 6.		Series 7.		Series 8.		Total.		Average.		Remarks.
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	
1	Type 6 ...	7-15	20½	8-14	22½	8-6	30½	5-13	25	5-0	24½	4-10	21½	8-8	27	9-9	28½	58-12	199½	7-6	24-15	Yields are in pounds and ounces per plot of 2 cents in area.
2	A.S. 213 ...	4-4	29	5-12	88	5-11	41½	8-12	28	8-3	27	2-5	23½	6-4	37	5-1	42½	38-4	266	4-9	33-4	
3	" 221 ...	7-14	19½	10-7	26½	8-10	26½	5-8	21½	5-3	21½	4-14	18	9-8	29½	8-15	81	60-15	193½	7-10	24-3	
4	" 224 ...	7-8	22½	9-10	81½	7-4	23½	4-7	25½	4-13	21½	5-5	19½	9-7	25½	8-13	28	56-14	197½	7-2	24-12	
5	" 225 ...	8-2	16½	12-1	26½	8-6	21	6-2	18½	6-12	20	6-7	16½	Not sown for want of seed.			48-14	116½	8-2	19-7		
6	" 241 ...	6-18	16½	9-5	41½	7-2	19½	5-18	22	5-1	19	6-16	21½	10-10	26	9-1	35	67-12	201	7-10	25-2	
7	" 252 ...	5-15	22½	8-9	40½	5-6	29½	4-5	22	8-7	22	6-6	25½	8-10	30½	8-7	82½	51-1	224½	6-8	28-1	
8	" 276 ...	7-3	18½	11-3	32½	7-2	24½	5-15	25½	5-10	19½	9-14	25	11-1	28	10-5	82½	68-5	205½	8-9	25-12	
9	" 278 ...	7-2	18	7-18	22½	5-2	18½	4-18	13	3-13	15½	5-14	18½	5-15	17	7-7	21½	47-15	144	6-0	18-0	

There were only eight repetitions and the field also was not uniform. Probable error is not therefore worth calculating.

(b) *Spacing experiment of sorghum.*—Three lines of 28 inches apart were compared in field 2-B with five lines of 16 inches apart and local spacing of eight narrow lines of $10\frac{1}{2}$ inches apart on plots of equal areas, each plot being 2 cents in area.

TABLE XII.

Serial No.	Kind of spacing.	Series.																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Narrow 10½" ...	8	8	9	8	12	12	10	7	11	8	12	10	8	11	12	8	10	12
		42	32.5	34.25	29.5	39	34.5	33	31	30.5	26	23	25	28	34	31.5	28.25	33	41
2	Intermediate 16½"	9	10	10	10	13	11	9	8	12	9	10	11	12	13	13	8	13	12
		29	30.75	28.75	27.5	37.25	30.75	32	25.5	29.25	27	24	28	31	29.5	27	22.5	31.5	32.25
3	Broad, 28" ...	9	12	6	8	10	11	11	9	11	9	8	9	12	9	6	7	10	10
		25	30.5	22.5	23.75	30.75	27.5	30.75	26	25	24.25	19.5	23	27.25	24	20	20	26	27.5

Serial No.	Kind of spacing.	Series.						Total.	Average.	Year-war average yields.				Remarks.
		19	20	21	22	23	24			1921-22.	1922-23.	1923-24.	1924-25.	
1	Narrow 10½" ...	13	13	13	13	12	8	248	10.5	6.13	6.1	16.7	10.31	Yields are in pounds per plot of 2 cents in area.
		51.5	37.5	48	41	33.75	35	824½	34.6	28	23	54.2	34.38	
2	Intermediate 16½"	13	15	11	10	11	10	268	10.15	7.4	4.15	14.9	10.94	
		31	33.75	37	28	29.75	26.5	709½	29.9	28	20	45.8	29.56	
3	Broad, 28" ...	12	13	13	9	10	10	234	9½	7.9	5.5	15.5	9.75	
		29.25	30.75	31.5	26.5	28	25.75	623	25.15	23	18	45	25.44	

Note.—Numerator denotes grain; Denominator denotes straw.

The yields recorded are the produce of 8 lines of Narrow (10½") spacing.

5 " Intermediate (16½") spacing.
and 3 " Broad (28") spacing.

The highest probable error for comparing any two averages is 3.85 per cent. The increase in yield of grain narrow and intermediate spacings over from broad spacing was 5.7 per cent and 12.2 per cent, i.e., 1.5 and 3.1 times of the probable error. Intermediate spacing is, therefore, superior to the rest this year. Only grain is taken into consideration.

Yield of sorghum in non-experimental fields.

TABLE XIII.

Field No.	Area in acres.	Yield per plot.		Yield per acre.		Remarks.
		Grain.	Straw.	Grain.	Straw.	
2-A ...	3.80	1,632	4,113	429	1,082	Yield are in pounds.
2-B ...	4.75	1,476	3,750	311	789	
3-A ...	3.80	1,811	3,350	477	882	
N.A. ...	17.45	4,954	13,800	284	791	
Average for the whole farm				Per acre.		
				331	839	

Miscellaneous rain-fed crops.

(a) *Bengal gram.*—It was sown on an area of 4.90 acres in field No. 3-B and on 75 cents in the new area. The crop in the new area was fair and gave at the rate of 233 lb. per acre. The average yield in field No. 3-B was only 99 lb. per acre which was due to poor and alkaline nature of the soil and also to the attack of Bengal gram caterpillar.

(b) *Fodder sorghum.*—This was grown on 5 acres in the new area. The crop received a severe setback during the first two months after sowing due to continuous rainfall and gave a poor average yield of 1,200 lb. of green fodder and 712 lb. of dry fodder per acre.

Wet lands.

Paddy manurial.—The experiment was started in 1918 with a view to find out (1) how often it is possible to grow green manure crops, (2) whether a green manure crop grown on the land itself is as good as green leaf brought from elsewhere, (3) what the effect of cattle manure is in the local method of manuring and (4) a system of manuring which will obviate (either wholly or partly) the necessity to use either leaf manure or cattle manure. The first three points are aimed at in the first series of experiments where plots manured with green manure alone (all the quantity grown in the field itself), green leaf manure alone at the rate of 4,000 lb. per acre, and green leaf plus cattle manure at the rate, 4,000 lb. and 3,000 lb., respectively, per acre are compared with one another. The arrangement of the plots is green manure, green leaf manure and green leaf manure and cattle manure repeated four times in three different fields. A second crop also was raised on these plots in second crop season without applying any manure to ascertain the residual values of these manures under experiment. The results of the two crops are shown in Table XIV.

TABLE XIV.

First crop. (Paddy manurial).

Green manure vs. Green leaf manure vs. Local manure.

Kind of manure.	Series.	Field No.	Area of plots in cents.	1918-19.		1919-20.		1920-21.		1921-22.		1922-23.		1923-24.		1924-25.	
				Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
(1) Green manure (Sunnhemp*) (All the quantity grown in the field itself).	I ...	A	3-44	1,962	1,715	2,854	2,848	2,703	2,558	1,977	2,326	1,483	2,151	2,288	3,547	1,076	1,977
		C	2-54	2,401	2,008	2,322	2,952	1,968	2,087	1,535	1,890	1,535	2,332	1,929	3,110	866	1,496
		G	1-90	2,131	2,105	2,579	2,684	1,684	2,000	1,211	1,895	1,816	2,053	1,684	2,842	684	1,368
	II ...	A	2-96	2,702	2,804	2,365	3,378	3,175	3,648	2,635	3,041	3,041	3,345	2,568	4,324	1,318	2,230
		C	2-36	2,457	2,288	2,161	3,813	2,767	3,051	2,119	2,584	2,161	3,347	2,246	3,475	1,224	1,864
		G	2-10	2,333	1,953	2,428	3,285	2,667	2,881	1,476	2,048	1,667	2,571	1,762	2,762	905	1,571
	III ...	A	3-12	2,115	1,923	2,753	3,397	3,269	3,846	2,628	3,301	2,179	3,109	2,506	3,878	1,250	2,019
		C	2-20	2,363	2,000	2,954	3,636	2,818	3,000	2,091	2,500	1,955	3,409	2,136	3,182	1,091	1,818
		G	2-21	2,171	1,979	2,262	2,941	2,760	3,032	1,312	1,991	1,855	2,986	1,584	2,715	789	1,312
	IV ...	A	2-34	2,222	1,975	2,561	3,262	2,409	2,866	2,408	3,018	1,890	3,567	2,315	3,518	1,235	2,130
		C	2-00	1,400	1,375	2,350	3,550	1,950	2,300	1,000	1,750	1,700	3,200	1,750	2,900	650	1,350
		G	2-30	2,065	1,695	1,864	2,956	2,607	2,836	1,000	1,609	1,348	2,652	1,565	2,522	783	1,522
	Average for four series ...	...	...	2,193	1,985	2,438	3,225	3,569	2,800	1,791	2,329	1,844	2,896	2,026	3,231	988	1,721

Notes.—Yields are in pounds per acre.

* This year (1924-25) Sunnhemp green manure crop failed.

TABLE XIV—cont.

First crop (Paddy manurial)—cont.

Green manure vs. Green leaf manure vs. Local manure—cont.

Kind of manure.	Series.	Field No.	Area of plots in cents.	1918-19.		1919-20.		1920-21.		1921-22.		1922-23.		1923-24.		1924-25.	
				Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
(2) Green leaf manure at 4,000 lb. per acre.	I ...	A	8-15	2,396	2,571	2,949	3,142	2,540	3,111	2,825	3,810	2,082	2,952	2,190	3,270	1,865	2,444
		C	2-51	2,211	1,912	2,191	2,868	2,789	3,187	2,390	3,064	1,633	2,749	1,673	2,351	1,155	2,082
		G	1-94	2,242	2,100	2,525	2,938	2,216	2,526	1,804	2,062	1,287	2,113	1,495	2,474	1,082	2,010
	II ...	A	3-00	2,468	2,300	2,800	2,200	2,933	3,433	3,067	3,800	1,867	2,600	1,933	2,967	1,233	2,100
		C	2-83	2,510	2,403	2,875	3,918	3,133	3,263	2,146	2,661	1,681	2,575	1,845	2,575	1,116	1,888
		G	1-16	2,013	2,060	2,268	2,685	2,778	2,685	1,852	2,824	1,204	1,806	1,481	2,315	926	1,806
	III ...	A	1-14	2,484	2,611	2,770	3,284	2,739	3,758	2,771	3,471	1,942	2,611	1,815	2,420	1,242	2,393
		C	2-12	2,051	2,122	2,928	3,349	3,113	3,207	1,273	2,500	1,698	2,630	1,792	2,858	1,132	2,123
		G	2-21	2,262	2,285	2,488	2,760	2,850	3,258	1,584	2,443	1,176	2,579	1,493	2,126	950	1,810
	IV ...	A	3-18	2,343	2,040	2,893	3,257	3,899	3,302	2,358	3,019	1,761	2,547	1,918	2,452	1,195	2,264
		O	1-91	1,910	1,859	2,565	3,455	3,037	2,880	2,513	3,298	2,094	3,455	2,408	3,114	1,257	2,518
		G	2-34	2,414	2,179	1,581	2,584	2,521	2,696	1,867	2,584	1,111	2,397	1,154	1,880	901	1,752
Average for four series ...			...	2,275	2,203	2,444	3,036	2,879	3,109	2,188	2,960	1,615	2,601	1,766	2,532	1,130	2,086 ^d

Note.—Yields are in pounds per acre.

TABLE XIV—cont.

First crop (Paddy manurial)—cont.

Green manure vs. Green leaf manure vs. Local manure—cont.

Kind of manure.	Series.	Field number.	Area of plots in cents.	1918-19.		1919-20.		1920-21.		1921-22.		1922-23.		1923-24.		1924-25.		
				Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	
				LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	
(3) Local manure (i.e. Green leaf manure at 4,000 lb. and cattle manure at 8,000 lb. per acre)	I ...	A	2.93	2,798	2,161	2,491	3,583	3,242	3,652	3,008	3,959	2,014	3,072	2,297	3,311	1,365	2,457	
		C	2.42	2,585	2,896	2,603	3,223	2,709	2,938	2,686	3,349	1,694	3,617	1,983	2,510	1,198	2,149	
		G	2.00	2,100	2,150	2,800	3,350	3,000	3,100	2,200	2,750	1,650	2,700	1,950	2,900	1,150	2,150	
	II ...	A	3.08	2,357	2,777	2,824	3,181	3,182	3,864	2,922	3,831	1,948	2,727	3,045	2,890	1,234	2,240	
		C	2.27	2,907	2,818	2,422	2,813	2,775	3,304	2,641	3,392	1,850	2,996	2,335	3,216	1,145	1,674	
		G	2.15	2,813	2,394	2,279	2,930	2,930	3,349	2,326	3,163	1,767	2,558	1,814	2,384	1,023	2,000	
	III ...	A	3.20	2,619	2,562	2,687	3,125	3,159	3,625	2,438	3,750	2,000	2,844	1,844	2,500	1,250	2,188	
		C	2.10	1,640	1,595	2,338	3,285	2,286	2,584	2,143	3,190	1,905	3,095	1,667	2,333	1,095	1,905	
		G	2.40	2,564	2,410	2,375	3,041	3,250	3,291	2,292	2,750	1,833	2,500	1,875	2,083	1,083	1,917	
	IV ...	A	3.00	1,733	1,900	2,300	2,333	2,333	2,667	2,233	2,667	1,467	1,967	1,767	2,333	1,067	1,938	
		C	1.85	2,351	2,069	2,432	2,351	3,338	3,676	2,324	2,919	2,216	3,351	2,486	3,405	1,243	2,432	
		G	2.46	1,747	1,778	1,585	2,317	2,236	2,723	1,514	2,479	1,260	2,195	1,545	2,353	935	1,789	
Average for four series	2,353	2,247	2,428	3,048	2,958	3,226	2,396	3,183	1,800	2,752	1,925	2,752	1,149	2,070

Note.—Yields are in pounds per acre.

TABLE XV.

Second crop (Residual).

Paddy manure—Green manure vs. Green leaf manure vs. Local manure.

Kind of manure.	Series.	Field No	Area of plots in cents.	1918-19.		1919-20.		1920-21.		1921-22.		1922-23.		1923-24.		1924-25.		
				Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	
				LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
(1) Green manure alone (Suntemp). All the quantity grown in the field itself.	I	...	A C G	3.44	487	1,047	1,425	1,627	640	2,093	316	1,744	581	1,512	233	1,250	727	1,744
				2.54	909	1,252	984	1,299	591	1,181	315	1,814	687	1,457	236	1,024	413	1,544
				1.90	882	1,315	842	1,315	105	1,168	197	1,105	842	1,737	105	626	688	1,684
	II	...	A C G	2.96	684	1,081	1,351	2,123	1,115	2,568	946	1,959	1,115	2,095	710	1,324	844	2,091
				2.36	709	1,366	887	1,652	720	1,525	636	1,610	911	1,653	551	1,323	551	1,864
				2.10	523	952	1,142	1,666	524	1,429	310	1,381	1,024	1,310	143	1,048	571	1,619
	III	...	A C G	3.12	438	898	1,570	1,955	833	1,442	641	1,538	833	1,955	737	1,669	897	2,019
				2.20	643	1,272	1,136	1,591	318	1,136	500	1,409	932	1,682	227	909	545	1,636
				2.21	565	1,086	950	1,333	333	2,036	113	864	690	1,584	498	1,584	452	1,629
	IV	...	A C G	3.24	308	864	1,280	1,707	945	1,890	671	1,616	302	1,852	648	1,512	772	1,320
				2.00	700	800	300	1,500	250	750	25	250	488	1,250	150	650	300	1,000
				2.30	892	1,043	782	1,308	87	869	65	609	398	1,166	130	652	435	1,304
Average for four series	...	...	603	1,076	1,054	1,640	647	1,673	378	1,304	775	1,645	864	1,208	591	1,621		

TABLE XV—cont.

Second crop (Residual)—cont.

Paddy manure—Green manure vs. Green leaf manure vs. Local manure—cont.

Kind of manure.	Series.	Field No.	Area of plots in cents.	1918-19.		1919-20.		1920-21.		1921-22.		1922-23.		1923-24.		1924-25.	
				Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
(2) Green leaf manure at 4,000 lb. per acre.	I ...	A	3-15	825	1,143	1,537	1,373	984	2,508	603	2,190	952	2,095	603	1,683	794	2,032
		C	2-51	538	956	740	1,139	793	1,713	637	1,434	717	1,633	598	1,554	637	1,514
		G	1-94	709	1,237	922	1,566	206	1,546	335	1,186	773	1,495	155	1,082	670	1,856
	II ...	A	3-00	591	933	1,333	1,933	1,867	2,533	800	1,733	1,000	2,000	600	1,500	900	2,133
		C	2-33	578	1,029	1,287	1,873	713	1,674	644	1,631	858	1,845	601	1,674	642	1,673
		G	2-16	637	1,111	972	620	324	1,523	266	1,157	648	1,713	231	1,065	509	1,389
	III ...	A	3-14	477	1,019	1,369	1,815	796	2,102	637	1,656	908	1,815	701	1,561	796	1,879
		C	2-12	353	1,132	1,132	1,462	943	1,557	330	991	767	1,415	524	1,557	613	1,608
		G	2-21	690	1,367	543	1,674	543	1,584	57	498	724	1,584	80	724	543	1,493
	IV ...	A	3-13	293	755	1,352	1,761	818	1,572	786	1,730	896	1,730	849	1,604	849	1,887
		C	1-91	538	1,257	1,099	1,861	785	1,780	549	1,623	890	1,597	733	1,780	1,047	2,304
		G	2-34	353	1,025	399	1,410	214	641	64	593	662	1,496	214	940	885	1,325
Average for four series ..			...	553	1,081	1,053	1,524	666	1,723	476	1,369	816	1,702	492	1,394	399	1,744

TABLE XV—cont.

Second crop (Residual)—cont.

Paddy manure—Green manure vs. Green leaf manure vs. Local manure—cont.

Kind of manure.	Series.	Field No.	Area of plots in cents.	1918-19.		1919-20.		1920-21.		1921-22.		1922-23.		1923-24.		1924-25.	
				Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
(S) Local manure (i.e., green leaf manure at 4,000 lb. and cattle manure at 2,000 lb. per acre).	I ...	A	2-98	568	1,092	1,365	1,911	1,057	2,662	751	1,536	1,059	2,150	648	1,843	854	2,116
		C	2-42	517	992	1,280	1,611	1,039	1,860	744	1,694	785	1,612	868	1,694	744	1,818
		G	2-00	1,050	2,000	1,300	1,550	600	1,850	288	1,200	975	1,700	850	1,550	650	1,660
	II ...	A	3-08	538	909	1,428	1,850	1,007	2,175	844	1,818	825	1,916	909	1,888	812	2,148
		C	2-27	506	1,057	1,233	1,718	749	1,762	661	1,410	798	1,680	749	2,115	749	1,850
		G	2-16	697	1,802	1,162	1,720	512	1,767	279	1,163	660	1,767	283	1,347	698	1,670
	III ...	A	3-20	219	500	1,250	1,625	844	1,781	594	1,581	887	1,906	656	1,556	781	2,000
		C	2-10	500	761	761	1,619	857	1,429	286	1,048	881	1,809	524	1,571	667	1,714
		G	2-40	437	833	833	1,416	760	1,542	125	917	708	1,588	833	1,250	587	1,687
	IV ...	A	3-00	350	800	900	1,333	567	1,233	367	1,100	825	1,667	800	1,500	733	1,538
		C	1-85	689	1,081	1,185	1,945	919	1,898	514	1,676	1,027	1,865	1,185	2,000	1,185	2,432
		G	2-46	329	976	487	1,260	285	1,016	20	325	671	1,528	244	1,138	285	1,260
Average for four series ...			...	532	1,026	1,094	1,629	765	1,743	456	1,285	865	1,761	621	1,629	725	1,621

The results of the past seven years are as follows :--

TABLE XVI.

Year.	Green manure.				Green leaf manure at 4,000 lb. per acre.				Green leaf at 4,000 lb. and cattle manure at 3,000 lb. per acre.			
	1st crop.		Residual.		1st crop.		Residual.		1st crop.		Residual.	
	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
1918-19 ...	2,198	1,985	603	1,076	2,275	2,203	558	1,081	2,358	2,247	523	1,026
1919-20 ...	2,436	3,225	1,054	1,640	2,444	3,036	1,658	1,524	2,428	3,048	1,094	1,629
1920-21 ...	2,569	2,800	647	1,373	2,879	3,109	666	1,728	2,958	3,226	765	1,743
1921-22 ...	1,791	2,329	878	1,804	2,188	2,960	476	1,369	2,396	3,183	456	1,285
1922-23 ...	1,844	2,896	775	1,645	1,615	2,601	816	1,702	1,800	2,752	865	1,761
1923-24 ...	2,026	3,331	864	1,208	1,766	2,532	492	1,394	1,925	2,752	621	1,629
1924-25 ...	988	1,721	591	1,621	1,130	2,086	699	1,744	1,149	2,070	725	1,621
Average for seven years.	1,973	2,600	630	1,452	2,042	2,647	679	1,506	2,144	2,754	723	1,528

Note.—Yields are in pounds per acre.

From the above it is seen that local manure and green leaf manure gave 26½ lb. and 118 lb. of grain respectively more than green manure per acre taking the residual yields also into consideration but the increase of yield in either case is not more than the extra cost of the manures.

To solve the fourth point, the local method of manuring (4,000 lb. of leaf manure plus 3,000 lb. of cattle manure per acre) was compared with (1) groundnut cake plus super to give 25 lb. of nitrogen and 16 lb. of phosphoric acid per acre and (2) with fishgnano to give 25 lb. of nitrogen per acre. The manures were applied only to the second crop paddy as per local custom and the residual value of these manures was tested during the following first crop season by raising the crop on these plots without the application of any manure. The following tables show the residual effects and the results of direct application of the manures.

TABLE XVII.
First crop (Residual).

No. of series.	Field No.	Local manure. (4,000 lb. of green leaf + 8,000 lb. of cattle manure per acre.)						Groundnut and super. (To give 25 lb. of nitrogen and 16 lb. of phosphoric acid per acre.)						Fish guano. (To give 25 lb. of nitrogen per acre.)												
		Area of plots in cents.		1922-23.		1923-24.		1924-25.		Area of plots in cents.		1922-23.		1923-24.		1924-25.		Area of plots in cents.		1922-23.		1923-24.		1924-25.		
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	
I ...	B	2-70	1,704	2,704	1,926	2,704	1,333	2,222	2-70	1,407	1,852	1,667	2,222	1,222	1,889	2-74	1,529	2,190	1,825	2,492	1,814	2,190				
	D	2-11	1,564	2,132	1,991	2,407	1,185	1,943	2-20	1,545	1,864	1,409	1,909	955	1,455	2-54	1,378	1,772	1,378	1,429	984	1,496				
	H	2-74	1,825	2,226	1,898	2,409	1,022	2,153	2-85	1,579	2,000	1,754	2,351	1,158	2,070	2-91	1,718	2,137	1,753	2,302	1,100	1,856				
II ...	B	2-87	1,808	2,230	2,155	2,718	1,429	2,369	2-90	1,621	2,103	1,724	2,177	1,310	2,103	2-98	1,689	2,264	1,622	2,196	1,149	1,892				
	D	2-48	1,585	1,951	1,748	2,197	1,057	1,789	2-50	1,520	1,600	1,560	1,830	1,000	1,560	2-79	1,900	2,401	2,007	2,616	1,218	2,222				
	H	2-98	1,858	2,230	2,162	2,534	1,385	2,499	3-06	1,667	2,091	1,961	2,386	1,176	2,222	3-15	1,614	2,000	1,650	2,222	1,208	2,068				
III ...	B	3-00	1,833	2,167	1,500	2,033	1,267	2,100	3-03	1,749	2,046	1,584	2,112	1,287	1,980	3-24	1,821	1,668	1,858	1,784	1,019	1,574				
	E	2-94	1,939	2,551	1,987	2,559	1,549	2,694	3-03	1,947	2,419	1,914	2,475	1,419	2,244	3-24	1,888	2,222	1,512	2,037	1,173	2,160				
	H	3-18	1,730	2,138	1,887	2,233	1,258	2,170	3-24	1,605	2,006	1,790	2,130	1,204	2,130	3-41	1,672	2,023	1,872	2,082	1,202	2,493				
IV ...	F	3-60	1,944	2,555	1,833	2,558	1,500	2,639	3-71	2,102	2,561	2,448	2,695	1,402	2,345	3-77	2,122	2,891	2,069	2,865	1,406	2,861				
	I	4-44	2,252	2,658	2,072	2,748	1,441	2,410	4-48	2,051	2,500	1,888	2,350	1,410	2,244	4-79	1,921	2,311	1,733	2,338	1,420	2,276				
	Average ...	...	1,803	2,322	1,921	2,481	1,311	2,283	...	1,709	2,095	1,750	2,244	1,231	2,022	...	1,705	2,171	1,689	2,559	1,199	2,053				

Note.—Yields are in pounds per acre.

TABLE XVIII.

Second crop (Manured).

Kind of manure.	Series.	Field No.	Area of plots in cents.	1918-19.		1919-20.		1920-21.		1921-22.		1922-23.		1923-24.		1924-25.		
				Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	
(1) Local manure, 4,000 lb. of green leaf and 8,000 lb. of cattle manure per acre.	I ...	B	2.70	833	1,519	1,558	2,000	1,704	3,333	778	2,259	1,333	2,630	1,296	1,704	1,481	2,815	
		D	2.11	604	1,185	1,990	1,990	1,423	2,512	758	2,275	1,091	2,370	1,374	1,754	1,375	2,607	
		H	2.74	685	1,314	1,459	1,897	1,314	2,336	693	2,117	1,241	2,810	1,496	1,898	1,350	2,920	
	II ...	B	2.87	688	1,568	1,824	1,951	1,468	2,787	871	2,265	1,080	2,613	1,359	1,986	1,150	2,474	
		D	2.46	549	1,146	1,585	1,788	1,183	2,033	772	2,154	1,087	2,368	1,301	1,870	1,320	2,642	
		H	2.98	600	1,250	1,655	2,432	1,824	3,108	887	2,331	1,419	3,007	1,655	2,182	1,622	3,007	
	III ...	B	3.00	766	1,200	900	1,600	1,333	2,333	700	1,733	800	1,567	1,133	1,633	1,133	2,533	
		H	2.97	726	1,361	1,428	1,972	1,905	2,993	918	2,177	1,897	1,953	1,582	1,818	1,565	2,823	
		H	3.18	684	1,384	1,475	2,160	1,447	2,283	881	2,201	1,572	2,201	1,384	1,981	1,352	2,704	
	IV ...	F	3.60	868	1,556	1,277	2,111	1,750	2,611	1,083	2,417	1,819	2,167	1,639	1,833	1,399	2,222	
		I	4.44	664	1,351	1,419	1,983	1,396	2,140	856	2,432	1,577	1,847	1,667	2,050	1,306	2,368	
	Average for four series	693	1,353	1,460	1,989	1,513	2,584	836	2,215	1,311	2,320	1,444	1,881	1,358	2,646

Note.—Yields are in pounds per acre.

TABLE XVIII—cont.
Second crop (Matured)—cont.

Kind of manure.	Series.	Field No.	Area of plots in cents.	1918-19.		1919-20.		1920-21.		1921-22.		1922-23.		1923-24.		1924-25.		
				Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	
				LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	
(2) Groundnut-cake and super to give 25 lb. of nitrogen + 16 lb. of phosphoric acid per acre.	I	...	B	2-70	833	1,407	2,000	2,740	1,259	2,338	815	2,259	1,195	2,852	1,159	1,852	1,259	2,383
			D	2-20	511	1,091	1,638	1,909	1,955	1,318	773	1,909	1,205	2,500	1,227	1,782	1,273	2,636
			H	2-85	698	1,868	1,684	2,631	1,930	3,158	737	1,965	1,860	2,807	1,544	2,035	1,438	2,787
	II	...	B	2-90	431	1,414	1,379	2,000	1,621	2,968	1,034	2,241	1,052	1,862	1,448	2,084	1,069	2,552
			D	2-50	550	1,230	1,360	2,040	1,400	2,440	840	2,000	1,380	2,800	1,800	2,040	1,860	2,800
			H	3-06	515	1,471	2,222	2,679	1,928	3,072	1,817	2,288	1,667	3,104	1,601	2,059	1,536	2,778
	III	...	B	3-03	743	1,254	1,386	1,848	1,188	2,244	825	1,881	1,419	1,818	1,320	1,861	1,452	2,541
			E	3-03	602	1,320	1,551	2,376	1,320	2,310	858	2,277	1,584	2,178	1,353	1,716	1,023	2,376
			H	3-24	617	1,265	1,851	2,160	1,204	1,852	928	2,215	1,468	2,037	1,512	2,037	1,358	2,968
	IV	...	F	3-71	863	1,644	1,432	2,495	1,644	2,318	1,024	2,372	1,753	2,237	1,752	1,995	1,563	2,584
			I	4-68	542	1,239	1,816	2,393	1,868	2,367	1,090	2,393	1,560	1,854	1,325	1,731	983	2,244
	Average for four series	630	1,342	1,669	2,291	1,520	2,571	885	2,173	1,421	2,353	1,449	1,915	1,301	2,382

Note.—Yields are in pounds per acre.

TABLE XVIII—cont.

Second crop (Manured)—cont.

Kind of manure.	Series.	Field No.	Area of plots in cents.	1918-19.		1919-20.		1920-21.		1921-22.		1922-23.		1923-24.		1924-25.		
				Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	
(S) Fish guano—25 lb. of nitrogen per acre.	I ...	B	2-74	812	1,459	1,715	2,043	1,423	2,482	912	2,117	949	2,399	1,168	1,784	985	2,263	
		D	2-54	527	1,063	1,102	1,653	1,378	2,283	591	1,654	1,024	2,008	984	1,878	1,024	2,362	
		H	2-91	541	1,134	1,615	2,005	1,615	2,680	550	1,684	1,375	2,506	1,237	1,684	1,134	2,439	
	II ...	B	2-98	380	1,186	1,182	2,080	1,419	2,534	541	1,520	963	1,852	946	1,622	1,047	2,331	
		D	2-79	542	1,434	2,150	2,297	1,541	2,683	753	1,971	1,147	1,900	1,362	1,756	1,398	2,724	
		H	3-15	468	1,395	1,460	2,381	1,587	2,667	698	2,000	1,048	1,810	1,333	1,746	1,143	2,222	
	III ...	B	3-24	417	864	987	1,604	586	1,543	463	1,451	694	1,369	525	1,111	617	1,883	
		E	3-24	779	1,358	1,680	2,180	1,049	1,852	710	2,099	1,019	1,667	1,111	1,512	926	2,099	
		H	3-41	579	1,437	1,788	2,053	1,282	2,199	792	2,053	1,056	1,877	1,349	1,642	1,056	2,375	
	IV ...	F	3-77	1,041	1,565	1,879	2,387	902	1,879	822	2,228	1,419	1,963	1,879	1,532	1,698	3,050	
		I	4-79	858	1,503	1,169	1,544	980	1,470	835	2,025	1,503	1,775	1,086	1,441	1,232	1,818	
	Average for four series	600	1,297	1,473	2,053	1,245	2,162	697	1,891	1,109	1,914	1,135	1,572	1,114	2,324

Note.—Yields are in pounds per acre.

The results of the past seven years are shown in the table below :—

TABLE XIX.

Year.	Local manure.				Groundnut-cake and Super.				Fish guano.			
	2nd crop.		Residual.		2nd crop.		Residual.		2nd crop.		Residual.	
	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
1918-19	698	1,358	...	...	630	1,342	...	...	600	1,297	...	...
1919-20	1,460	1,989	...	...	1,669	2,291	...	...	1,473	2,053	...	...
1920-21	1,518	2,584	...	...	1,529	2,571	...	...	1,245	2,182	...	...
1921-22	836	2,215	...	...	885	2,173	...	...	697	1,691	...	...
1922-23	1,311	2,320	1,803	2,322	1,421	2,353	1,709	2,095	1,109	1,914	1,705	2,191
1923-24	1,444	1,881	1,921	2,431	1,449	1,915	1,750	2,244	1,135	1,572	1,689	2,559
1924-25	1,358	2,646	1,811	2,263	1,301	2,382	1,231	2,022	1,114	2,324	1,199	2,053
Average for seven years ...	1,231	2,141	1,678	2,355	1,269	2,147	1,563	2,120	1,053	1,868	1,531	2,268

Notes.—Yields are in pounds per acre.

Taking the residual results also into account local manure and the mixture of groundnut and super gave 2,909 lb. and 2,832 lb. per acre respectively while fish guano gave only 2,548 lb. per acre. That is local and mixture manures gave 315 lb. and 248 lb., respectively, more than fish guano per acre. Local manure is, therefore, the best. The cost of the three manures is about equal.

In the second series of the experiment green leaf manure at the rate of 4,000 lb. per acre was compared with green leaf manure at the rate of 4,000 lb. plus super-phosphate to give 16 lb. of phosphoric acid per acre. The manures were applied to the second crop paddy and its residual value was tested in the following first crop season. The results are shown below:—

TABLE XX.

First crop—Residual.

No. of series.	Field No.	Green leaf alone at 4,000 lb. per acre.						Green leaf at 4,000 lb. per acre + super to give 16 lb. of Phosphoric acid per acre.							
		Area in cents.	1922-23.		1923-24.		1924-25.		Area in cents.	1922-23.		1923-24.		1924-25.	
			Grain.	Straw.	Grain.	Straw.	Grain.	Straw.		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
I	N	3.14	1,879	2,293	2,134	2,739	1,306	2,516	3.08	1,916	2,305	2,143	2,916	1,429	2,597
	O	2.75	2,073	2,400	2,073	2,764	1,382	2,544	2.82	1,702	2,194	2,234	2,979	1,454	2,680
II	N	3.03	2,046	2,475	2,079	2,904	1,452	2,640	3.03	2,145	2,541	2,112	2,805	1,584	2,937
	O	2.79	1,885	2,115	2,115	2,790	1,577	2,867	2.78	2,122	2,410	2,230	3,020	1,403	2,842
III	N	3.00	2,107	2,867	2,000	2,733	1,800	2,700	2.97	2,020	2,357	2,054	2,694	1,515	2,761
	O	2.79	2,157	2,652	2,115	2,864	1,613	3,011	2.78	2,158	2,590	2,302	3,094	1,690	3,058
IV	N	2.99	2,040	2,308	2,141	2,943	1,405	2,676	3.00	1,933	2,333	2,100	3,067	1,567	2,862
	O	2.76	2,065	2,428	2,138	2,869	1,558	2,809	3.00	1,767	2,187	1,867	2,733	1,200	2,338
Average.	...	...	2,029	2,417	2,099	2,830	1,449	2,695	...	1,970	2,383	2,130	2,914	1,480	2,757

Notes.—Yields are in pounds per acre.

TABLE XXI.

Paddy manurial—Green leaf vs. Green leaf and super-phosphate, Second crop—(manured).

Kind of manure.	Series.	Field No.	Area of plots in cents.	1918-19.		1919-20.		1920-21.		1921-22.		1922-23.		1923-24.		1924-25.	
				Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
Green leaf manure alone at 4,000 lb. per acre.	I	N	314	979	2,138	1,114	1,751	1,720	1,879	1,147	2,420	1,433	2,054	1,688	2,548	1,301	2,675
		O	275	933	2,036	1,309	1,745	1,782	1,891	1,418	2,545	1,564	2,000	1,709	2,436	1,055	2,764
	II	N	303	961	2,211	1,287	1,683	1,749	1,881	1,221	2,211	1,595	2,079	1,881	2,338	1,485	2,673
		O	279	865	1,792	1,862	1,792	1,685	1,756	1,326	2,222	1,237	2,115	1,756	2,545	1,577	2,617
	III	N	300	887	1,833	1,133	1,733	1,733	1,900	1,033	2,333	1,450	1,933	1,767	2,400	1,500	2,600
		O	279	838	1,792	1,326	1,577	1,792	1,935	1,254	2,294	1,470	1,953	1,720	2,222	1,810	2,154
	IV	N	289	953	1,706	1,070	1,672	1,706	1,940	1,037	2,174	1,304	1,773	1,672	2,575	1,605	2,742
		O	278	824	1,739	1,304	1,811	1,739	2,029	1,123	2,283	1,640	1,684	1,694	2,391	1,522	2,717
Average ...				905	1,905	1,233	1,720	1,738	1,901	1,195	2,310	1,453	1,974	1,723	2,494	1,482	2,993

TABLE XXI—cont.

Paddy manurial—Green leaf vs. Green leaf and super-phosphate, Second crop (manured)—cont.

Kind of manure.	Series.	Field No.	Area of plots in cents.	1918-19.		1919-20.		1920-21.		1921-22.		1922-23.		1923-24.		1924-25.	
				Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
Green leaf and super-phosphate at 4,000 lb. and to give 16 lb. of phosphoric acid per acre.	I	N	3-08	888	2,148	1,233	1,883	1,851	2,143	1,201	2,435	1,510	2,159	1,948	2,857	1,526	2,727
		O	2-82	1,064	2,057	1,134	1,716	1,844	2,128	1,418	2,376	1,525	2,092	1,879	2,376	1,560	2,660
	II	N	3-03	1,187	1,848	1,320	1,815	1,716	2,152	1,221	2,508	1,502	1,947	1,782	2,343	1,650	2,871
		O	2-78	1,007	2,086	1,428	1,870	1,763	2,518	1,867	2,590	1,511	1,978	1,691	2,518	1,871	2,986
	III	N	2-97	901	1,852	1,212	1,683	1,751	2,121	1,145	2,424	1,246	1,717	1,818	2,391	1,751	2,997
		O	2-78	1,029	1,798	1,866	1,798	1,691	2,122	1,295	2,697	1,709	1,978	1,871	2,482	1,655	2,878
	IV	N	3-00	1,084	2,238	1,238	1,733	1,800	2,200	1,100	2,487	1,577	1,900	1,533	2,333	1,717	2,833
		O	3-00	1,104	2,467	1,200	1,866	1,833	2,300	1,167	2,300	1,333	1,633	1,466	2,100	1,533	2,867
Average ...				1,024	2,019	1,267	1,795	1,781	2,211	1,239	2,475	1,482	1,926	1,749	2,425	1,659	2,853

Note.—The yields are in pounds per acre.

TABLE XXII.

Year.	Green leaf only.				Green leaf + super.			
	2nd Crop.		1st Crop.		2nd Crop.		1st Crop.	
	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
1918-19 ...	905	1,905	...	...	1,024	2,019	...	...
1919-20 ...	1,238	1,720	...	...	1,267	1,705	...	...
1920-21 ...	1,738	1,901	...	...	1,781	2,221	...	...
1921-22 ...	1,195	2,310	...	...	1,249	2,475	...	...
1922-23 ...	1,453	1,974	2,029	2,417	1,482	1,926	1,970	2,868
1923-24 ...	1,723	2,494	2,099	2,830	1,749	2,425	2,130	2,914
1924-25 ...	1,482	2,993	1,449	2,695	1,659	2,852	1,480	2,757
Average for seven years.	-1,391	2,185	1,859	2,647	1,458	2,247	1,890	2,678

Note.—Yields are in pounds per acre.

From the above, it is seen that green manure and super-phosphate gave better yields than green leaf alone. From the money point there is no gain over the cost of super-phosphate.

In the third series green manure (all the quantity grown in each plot plus super-phosphate, to give 16 lb. of phosphoric acid per acre) was compared with green manure (all the quantity grown in each plot plus super-phosphate and nitrolim—to give 16 lb. of phosphoric acid and 20 lb. of nitrogen per acre). The manures were applied to the first crop. The results are given below:—

TABLE XXIII.

First Crop.

No. of series.	Field No.	Areas of plots in cents.	* Green manure (all the quantity grown in the field) and super (to give 16 lb. of phosphoric acid per acre).							
			1918-19.		1919-20.		1920-21.		1921-22.	
			Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1 in U ...	U & V	6-87	4,278	4,003	3,085	3,959	3,100	3,668	2,999	5,036
2 in U ...	Do.	7-26	3,299	3,182	3,057	3,457	3,017	3,693	2,810	4,021
3 in V ...	V & V	7-74	3,175	2,829	2,553	3,074	2,610	2,894	2,855	3,282
Average ..			3,584	3,338	2,908	3,496	2,909	3,418	2,888	4,113

* Green-manure crop (sunnhemp) in 1924-25 failed.

TABLE XXIII—cont.

First Crop—cont.

No. of series.	Field No.	* Green manure (all the quantity grown in the field) and super (to give 16 lb. of phosphoric acid per acre).					
		1922-23.		1923-24.		1924-25.	
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
		(12)	(13)	(14)	(15)	(16)	(17)
1 in U ...	U & V	2,824	4,672	2,649	3,639	1,310	3,348
2 in U ...	Do.	2,259	5,110	2,713	4,036	1,240	3,223
3 in V ...	V & V	2,248	4,767	1,860	2,597	1,240	2,817
	Average.	2,444	4,850	2,407	3,424	1,263	3,129

No. of series.	Field No.	Areas of plots in cents.	* Green manure (all the quantity grown in the field itself) and super (to give 16 lb. of phosphoric acid per acre) + nitrolim (to give 20 lb. of nitrogen per acre).							
			1918-19.		1919-20.		1920-21.		1921-22.	
			Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
		(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
1 in U ...	U & V	7.38	2,988	3,320	3,175	3,956	3,114	3,643	3,117	4,770
2 in U ...	Do.	7.02	3,290	3,333	3,091	3,606	3,063	4,160	3,248	4,859
3 in V ...	V & V	8.75	2,800	2,441	2,194	2,720	2,617	3,223	2,720	3,154
	Average ...		3,026	3,048	2,820	3,427	2,941	3,675	3,028	4,094

No. of series.	Field No.	* Green manure (all the quantity grown in the field itself) and super (to give 16 lb. of phosphoric acid per acre) + nitrolim (to give 20 lb. of nitrogen per acre).					
		1922-23.		1923-24.		1924-25.	
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
		(27)	(28)	(29)	(30)	(31)	(32)
1 in U ...	U & V	2,547	5,312	2,927	4,187	1,396	3,279
2 in U ...	Do.	2,593	5,741	3,276	4,786	1,453	3,462
3 in V ...	V & V	2,046	3,840	1,966	2,617	1,109	2,423
	Average.	2,395	4,964	2,723	3,863	1,319	3,055

* Green-manure crop (sunbemp) in 1924-25 failed.

TABLE XXIV.

Paddy manurial—Green manure + Super vs. Green manure + Super + Nitrolim.

First-crop—Yearwar results.

Year.	Green manure + super		Green manure + super + Nitrolim.		Remarks.
	Grain.	Straw.	Grain.	Straw.	
1918-19	3,584	3,388	3,026	3,048	Yields are in pounds per acre.
1919-20	2,903	3,496	2,820	3,427	
1920-21	2,909	3,418	2,941	3,675	
1921-22	2,888	4,113	3,028	4,094	
1922-23	2,444	4,850	2,395	4,964	
1923-24	2,407	3,424	2,723	3,863	
1924-25	1,263	3,129	1,319	3,055	
	18,403	25,813	18,252	26,126	
Average	2,629	3,688	2,607	3,732	

The above table shows that nitrolim has not got any beneficial effects.

Another experiment of the same type as the above was repeated again this year. The only difference between the two sets of experiments was that green manure was substituted by green leaf manure and the concentrated manures were applied to second crop paddy instead of first crop paddy.

TABLE XXV.

Second crop—(manured).

Kind of manure.	Series.	Field No.	Area of plots in cents.	1918-19.		1919-20.		1920-21.		1921-22.		1922-23.		1923-24.		1924-25.	
				Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
Green leaf manure and super.	I	U & V	687	1,630	2,329	1,441	2,343	1,441	1,805	1,252	3,100	2,209	2,911	2,052	2,606	1,863	3,485
	II	U & V	726	1,033	1,763	1,157	2,011	1,612	1,804	1,010	2,493	1,722	2,259	1,736	2,342	1,804	3,719
	III	V & V	774	978	1,628	1,290	2,312	1,563	1,810	963	2,442	1,629	2,196	1,899	2,468	1,641	2,894
Average ...				1,214	1,907	1,286	2,222	1,539	1,806	1,077	2,678	1,787	2,455	1,896	2,472	1,769	3,349
Green leaf manure + super + nitrolim.	I	U & V	788	1,300	2,005	1,707	2,168	1,572	1,734	1,220	2,845	2,019	2,534	2,060	2,453	1,409	3,022
	II	U & V	702	1,107	1,937	1,552	2,307	1,439	1,709	1,382	3,091	1,895	2,507	1,920	2,607	1,838	3,718
	III	V & V	875	1,017	1,371	1,417	1,851	1,623	1,726	1,063	1,989	1,520	1,943	1,817	2,343	1,371	2,686
Average ..				1,141	1,771	1,559	2,109	1,545	1,723	1,222	2,642	1,811	2,328	1,952	2,468	1,589	3,142

Note.—Yields are in pounds per acre.

TABLE XXVI.

Year-wise results of the above experiment.

Year.	Green leaf and Super.		Green leaf + Super + Nitrolim.		Remarks.
	Grain.	Straw.	Grain.	Straw.	
1918-19	1,214	1,907	1,141	1,771	Yields are in pounds per acre.
1919-20	1,286	2,222	1,559	2,109	
1920-21	1,539	1,806	1,545	1,723	
1921-22	1,077	2,678	1,222	2,642	
1922-23	1,787	2,455	1,814	2,428	
1923-24	1,896	2,472	1,952	2,468	
1924-25	1,769	3,349	1,539	3,142	
Total	10,568	16,889	10,769	16,183	
Average	1,510	2,413	1,538	2,312	

There is a slight difference in favour of nitrolim but this difference in yield does not pay the cost of nitrolim.

In the fourth series, groundnut cake plus bonemeal at the rate of 320 lb. and 100 lb. per acre, respectively, were compared with local method of manuring. The manures were applied to the first crop. The results are given in the table below :—

TABLE XXVII.

Paddy manurial—Local manure vs. groundnut cake and bone-meal. First crop.

No. of series.	Field No.	Local manure.					
		1922-23..		1923-24.		1924-25.	
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I	S	1,950	2,721	2,063	3,220	1,224	2,653
...	T	2,058	2,783	1,855	2,725	1,217	2,986
II	S	2,150	3,068	1,981	2,995	1,329	3,227
...	T	2,054	2,738	1,875	2,827	1,220	2,827
	Average ...	2,053	2,828	1,944	2,942	1,248	2,926

TABLE XXVII—cont.

*Paddy manurial—Local manure vs. groundnut cake and bone-meal
First crop—cont.*

No. of series.	Field No.	Groundnut cake and bone meal [at 320 lb. and 100 lb. respectively per acre].					
		1922-23		1923-24.		1924-25.	
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
		(9)	(10)	(11)	(12)	(13)	(14)
I	S	2,251	2,854	1,972	3,179	1,230	2,891
...	T	2,212	2,625	1,858	2,891	1,298	2,891
II	S	2,304	2,987	1,975	3,013	1,215	2,911
...	T	2,308	2,751	1,761	2,806	1,254	2,687
	Average ...	2,269	2,804	1,892	2,972	1,249	2,795

Note.—Yields are in pounds per acre.

TABLE XXVIII.

*Paddy manurial—Local manure vs. groundnut cake and bone-meal.
Second crop—Residual.*

Kind of manure.	Series.	Field No.	1921-22.		1922-23.		1923-24.		1924-25.	
			Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
			Local from manure 1922-23.	I	S	590	1,814	1,247	1,746	1,111	1,451	728	1,565
...	T	646		1,913	1,243	1,754	1,043	1,565	696	1,710
II	S	749		1,739	1,359	1,787	990	1,401	1,063	2,101
...	T	506		1,726	1,131	1,756	952	1,310	804	2,024
Average ...	...	...	623	1,798	1,245	1,761	1,024	1,432	823	1,850
Groundnut cake and bone-meal.	I	S	673	1,663	1,299	1,786	974	1,392	767	1,647
	...	T	531	1,888	1,842	1,917	1,062	1,445	798	1,711
	II	S	658	1,696	1,367	1,848	987	1,367	1,114	2,202
	...	T	415	1,761	1,239	1,776	799	1,361	985	2,089
Average ...	...	...	569	1,752	1,312	1,832	956	1,391	915	1,912

Note.—Yields are in pounds per acre.

The results of the past three years are given below:—

TABLE XXIX.

Year.	Local manure.				Groundnut cake and bone-meal.			
	First Crop.		Second Crop.		First Crop.		Second Crop.	
	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
1922-23 ...	2,053	2,828	1,245	1,761	2,269	2,604	1,312	1,832
1923-24 ...	1,944	2,942	1,024	1,432	1,892	2,972	956	1,891
1924-25 ...	1,248	2,926	823	1,850	1,249	2,795	915	1,912
Average ...	1,748	2,899	1,030	1,681	1,803	2,857	1,061	1,712

Note.—Yields are in pounds per acre.

The above results show that the mixture of groundnut cake and bone-meal is better than local manure. The cost of the two manures is about the same.

Time of application of bone-meal.—The experiment was started in 1922 with the object of finding out the effect of (1) applying bone-meal to the soil at the time of sowing green-manure crop and groundnut-cake to be applied at the time of transplanting of paddy and (2) applying bone-meal and groundnut-cake to the soil at the time of transplanting of paddy green-manure being raised without the application of any manure and (3) applying green-manure alone. Sowing of green-manure and transplanting of paddy were done at the same time in all plots. The manures were applied to the first crops. The results are given in Table XXX.

TABLE XXX.

Time of application experiment with bone-meal and groundnut cake—First crop.

Field No.	Series.	Area in cents.	Bone-meal application before sowing green-manure crop and groundnut cake just before transplanting of paddy.						Sowing green-manure crop first and then applying bone-meal and groundnut cake to paddy just before transplanting.						Green manure alone.					
			1922-23.		1923-24.		1924-25.		1922-23.		1923-24.		1924-25.		1922-23.		1923-24.		1924-25.	
			Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
P.	Original ...	5	1,700	2,000	2,060	3,280	1,140	2,580	1,640	2,080	1,920	2,960	1,180	2,440	1,860	1,980	1,580	3,160	1,000	2,080
	Duplicate ..	5	2,120	2,640	1,820	2,880	1,200	2,440	2,060	2,500	1,960	3,040	1,260	2,700	1,560	2,000	1,240	2,060	900	2,020
	Average ..	...	1,910	2,320	1,940	3,080	1,170	2,510	1,850	2,290	1,940	3,000	1,220	2,570	1,610	1,990	1,410	2,810	950	2,050

Note.—Yields are in pounds per acre. Bonemeal was applied at 100 lb. and groundnut at 300 lb. per acre.

TABLE XXXI.

Time of application experiment with bone-meal and groundnut cake and green manure—Second crop—Residual.

Field No.	Series.	Area of plots in cents.	Bone-meal application before sowing green-manure crop and groundnut cake just before transplanting paddy.						Sowing green-manure crop and application of bone-meal and groundnut cake mixture just before transplanting paddy.						Green-manure alone.					
			1922-23.		1923-24.		1924-25.		1922-23.		1923-24.		1924-25.		1922-23.		1923-24.		1924-25.	
			Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
F.	Original ...	5	860	1,600	1,040	1,680	820	1,760	980	1,615	1,080	1,620	1,060	1,960	1,100	1,480	1,000	1,460	900	1,780
	Duplicate ...	5	1,150	1,700	1,000	1,480	1,150	2,020	1,245	1,820	1,160	1,680	1,170	2,220	1,100	1,740	960	1,840	1,000	1,780
	Average ...	...	1,005	1,650	1,020	1,580	985	1,890	1,108	1,718	1,110	1,650	1,115	2,090	1,100	1,585	980	1,410	950	1,780

Note.—Yields are in pounds per acre.

TABLE XXXII.

Field No.	Treatment.	Area of plots in cents.	1922-23.		1923-24.		1924-25.	
			Grain	Straw.	Grain.	Straw.	Grain.	Straw.
P.	Bone-meal application before sowing green-manure crop and groundnut cake just before transplanting paddy.	5 cents.	1,005	1,650	1,020	1,580	985	1,890
...	Sowing green manure crop and applying bone-meal and groundnut cake mixture just before transplanting paddy.	Do.	1,103	1,718	1,110	1,650	1,115	2,090
	Green-manure alone ...	Do.	1,100	1,585	980	1,410	950	1,780

Note.—Yields are in pounds.

Potassium sulphate.—It was tried on a small plot of 4 cents as last year to observe its general effects. The yields of check plot and the manured plot are shown below:—

TABLE XXXIII.

Experiment on the application of Potassium Sulphate to paddy—First crop.

Field No.	Treatment.	Area in cents.	1923-24.		1924-25.	
			Grain.	Straw.	Grain.	Straw.
I.	Manured with potassium sulphate at 100 lb. per acre.	4	1,650	2,200	1,275	2,225
...	No manure ...	4	1,775	2,530	1,800	2,225

Note.—Yields are in pounds per acre.

TABLE XXXIV.

Experiment on the application of Potassium Sulphate to Paddy crop.

Field No.	Area in cents.	Treatment.	1922-23.		1923-24.		1924-25.		Total of three years.		Average.	
			Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
I	4	Manured with Potassium sulphate at 100 lb. per acre.	1,325	1,825	1,100	1,350	800	2,225	3,225	5,300	1,075	1,767
	4	No manure ...	1,800	1,775	1,225	1,550	975	3,325	3,500	5,650	1,167	1,883

Note.—Yields are in pounds per acre.

Economic transplanting vs. Local method of bunch planting :

TABLE XXXV.

Economic bunch method of planting paddy—First crop.

Year.	Economic planting.				Bunch planting.				Remarks.
	Field No.	Area in cents.	Grain.	Straw.	Field No.	Area in cents.	Grain.	Straw.	
1923-23 ..	Q & R	27	1,740	2,535	X & Y	32	1,697	2,528	
1923-24 ...	Q & R	27	2,344	3,989	X & Y	32	1,956	2,625	
1924-25 ...	Q & R	27	1,230	2,141	X & Y	32	1,172	2,109	
Total ...	...	...	5,314	8,065	...	...	4,825	7,262	
Average ...	...	...	1,771	2,688	...	...	1,608	2,421	

Notes.—Yields are in pounds per acre.

TABLE XXXVI.

Economic vs. local method of bunch planting of paddy—Second crop.

Year.	Economic planting.				Bunch planting.				Remarks.
	Field No.	Area in cents.	Grain.	Straw.	Field No.	Area in cents.	Grain.	Straw.	
1923-23 ...	Q & R	27	1,321	2,273	X & Y	32	1,280	1,854	
1923-24 ...	Q & R	27	970	1,385	X & Y	32	844	1,384	
1924-25 ...	Q & R	27	981	2,270	X & Y	32	797	1,834	
Total ...	...	...	3,272	5,928	...	...	2,871	5,072	
Average ...	...	...	1,091	1,976	...	...	957	1,691	

Notes.—Yields are in pounds per acre.

The results are undoubtedly in favour of economic transplanting.

NAMES OF CROPS.

English.	Botanical.
Sunn hemp	Crotolaria juncea.
Paddy	Oryza sativa.
Korra	Setaria italica.
Cotton-Tellapathi	Gossipium herbaceum.
Yerrapathi	Gossipium indicum.
Jonna	Sorghum vulgare.
Groundnut	Arachis hypogea.
Bengal gram	Cicer arietinum.
Horse gram	Dolichos biflorus.
Green gram	Phaseolus mungo.
Indigo	Indigofera tinctoria.
Safflower	Carthamus tinctorius.
Linseed	Linum usitatissimum.
Wheat	Triticum spelta.

Statement of receipts and charges of Nandyal Agricultural Station for the year 1924-25.

Budget head.	Amount.		
RECEIPTS.			
XXIV-A. Agriculture—Agriculture—			
By sale of farm produce	2,605	4	8
Miscellaneous receipts	251	14	11
Green-manure seeds	0	0	10
XXXIV-B. Stationery and Printing.			
By sale of Calendars and Publications.	0	14	0
Total ...	2,858	2	5
CHARGES.			
34-A. Agriculture—Agriculture—			
III. Agricultural Stations and District works.			
111. (1) Contingencies	199	10	6
(2) Agricultural stations	9,376	13	11 9,576 8 5
Pay of Executive Subordinates	4,238	15	0
Do. Clerks	492	0	0
Do. Servants	156	0	0
Travelling allowance	225	3	0 5,112 0 0
Total ...	14,688	10	5

BELLARY,
11th May 1925.

P. H. RAMA REDDI,
Deputy Director of Agriculture, III Circle.

REPORT OF THE WORK OF PALUR AGRICULTURAL STATION FOR 1924-25.

An account of the local conditions and agricultural practices in the vicinity of the farm is printed in appendix I to the report.

2. *Season.*—This year 46.26 inches of rainfall was received, which was certainly better than its predecessor, but below the average of the past ten years, viz., 53.61 inches. The details of the rainfall for fortnightly periods are recorded in Table No. 1. The larger amount of rainfall received this year was not so beneficial to the crops as it would have been had the distribution been more uniform.

As last year, the summer months of April and May were practically dry preventing summer fallow cultivation in dry lands. The newly planted crop of sugarcane had a set-back in its early stages. Deep ploughing was practically out of the question and even the showers received in July could not be taken advantage of for this operation owing to the season having too far advanced. With the scanty rainfall of July cumbu sowings were accomplished. Groundnut sowings took place in August. September was the rainiest month of the year recording nearly 15 inches of rain. Although all the standing crops were benefited, it interfered seriously with the harvest of cumbu, and intercultivation of dry land crops. The first fortnight of November was also rainy after which conditions were practically similar to those of last year. Poovasi ragi, a variety always cultivated dry, had to be saved by irrigations. Paddy and sugarcane suffered almost as badly as they did last year. The month of March was unusually wet, there being a precipitation of 5.55 inches. It helped to increase the subsoil water, and encouraged a free growth of weeds. It was also useful in carrying out the preliminary cultivation of dry land. The year, on the whole was better than last year.

TABLE No. I.

Months.	Years.																Average for ten years.						
	1915-16.		1916-17.		1917-18.		1918-19.		1919-20.		1920-21.		1921-22.		1922-23.		1923-24.		1924-25.		No. of rainy days.	Inches.	
	No. of rainy days.	Inches.	No. of rainy days.	Inches.	No. of rainy days.	Inches.	No. of rainy days.	Inches.	No. of rainy days.	Inches.	No. of rainy days.	Inches.	No. of rainy days.	Inches.	No. of rainy days.	Inches.	No. of rainy days.	Inches.	No. of rainy days.	Inches.	No. of rainy days.	Inches.	
April ...	1st half	...	...	...	...	...	...	...	...	...	...	1	0.07	1	0.03	2	1.25	...	...	0.4	0.13		
	2nd half	1	0.23	1	0.03	...	...	...	1	0.11	1	1.85	...	...	...	...	...	...	...	0.5	0.23		
May ...	1st half	3	0.62	...	...	1	0.07	...	2	2.09	1	1.46	...	1	0.65	...	...	...	...	0.8	0.39		
	2nd half	...	...	1	0.05	1	0.09	3	1.45	3	0.61	2	3.23	...	4	0.90	1	0.67	2	0.30	1.7	0.73	
June ...	1st half	1	0.03	3	0.46	6	1.82	3	3.13	6	0.92	2	0.25	5	2.06	2	0.61	1	0.32	...	...
	2nd half	1	0.01	3	0.13	5	2.95	4	1.03	3	0.63	4	0.75	...	1	2.22	5	0.91	3	0.77	2.9	0.86	
July ...	1st half	5	2.25	2	0.83	3	0.51	...	2	0.20	4	1.26	4	5.13	4	1.77	1	0.21	7	1.78	3.2	1.34	
	2nd half	4	1.44	7	2.12	3	1.06	3	1.92	5	3.20	7	2.22	3	0.61	4	1.39	5	1.07	3	0.80	4.4	1.57
August	1st half	3	0.63	4	2.33	5	4.13	...	4	1.46	5	5.20	7	4.20	3	1.29	4	1.54	1	2.04	3.6	2.28	
	2nd half	5	3.07	9	4.29	4	3.14	3	0.74	6	4.78	2	0.24	4	1.61	6	3.77	...	...	6	2.34	4.4	2.40
September	1st half	2	1.32	4	1.38	4	1.39	4	2.47	5	2.36	4	4.41	3	1.00	5	1.03	4	2.35	5	4.29	4.0	2.20
	2nd half	10	5.14	2	0.08	4	4.33	4	1.85	9	2.71	3	2.73	3	0.33	5	3.56	2	1.39	9	10.65	5.6	3.22
October	1st half	...	...	6	8.45	1	0.21	...	6	1.40	5	1.77	6	5.49	6	2.97	6	3.53	3	1.36	4.1	6.32	
	2nd half	3	2.10	9	11.87	6	3.79	3	0.75	6	1.56	9	3.77	11	13.35	9	9.50	14	15.58	7	3.14	7.6	6.44
November	1st half	7	5.39	5	9.56	5	2.98	11	13.44	11	12.90	7	9.13	4	0.91	10	12.29	3	1.20	9	8.38	7.2	7.62
	2nd half	6	3.69	8	5.47	11	10.32	7	9.95	4	4.26	14	25.62	...	4	10.86	1	0.02	2	0.30	5.7	7.05	
December	1st half	...	...	6	1.81	4	1.16	6	3.72	5	6.83	...	...	1	0.80	2	1.80	3	2.43	5	2.96	3.9	2.14
	2nd half	5	3.37	...	...	...	...	2	1.41	6	4.42	...	...	3	2.65	1	0.71	6	1.71	...	...	2.3	1.43
January	1st half	...	...	1	0.03	4	2.67	...	6	12.99	7	11.57	...	...	...	...	...	...	...	1.60	3.7	4.84	
	2nd half	...	...	1	0.43	2	0.11	...	...	5	0.43	...	...	3	2.72	...	...	...	...	...	1.1	0.37	
February	1st half	1	0.46	2	0.30	...	...	...	...	...	...	1	0.15	...	...	...	...	...	...	...	0.4	0.09	
	2nd half	1	0.57	...	...	1	0.64	...	...	...	...	...	...	...	...	...	...	...	...	4	4.25	0.2	0.12
March ...	1st half	...	...	...	...	...	...	...	...	...	...	...	...	1	1.59	...	...	...	...	4	4.25	0.5	0.58
	2nd half	...	...	...	...	1	0.38	...	...	...	...	...	...	...	...	3	0.45	3	1.30	...	...	0.4	0.16
Total		58	30.82	74	49.72	71	41.75	53	41.86	90	63.43	85	73.19	63	43.19	79	70.90	71	88.15	72	46.26	71.5	53.61

Dry lands.

3. *Korai (Cyperus rotundus) eradication experiment.*—This is the fourth year of experiment. The experiment was modified in 1922–23. As in the year previous, the cropping followed was cumbu followed by ragi. The latter crop had to be irrigated because of insufficiency of rain during its growing period.

(1) *Cultural operations and cropping.*—These were performed by (a) monsoon and victory ploughs in fields 11 and 12, (b) bakhar in fields 4 and 5 and (c) junior hoe in fields 6 and 7. Unfortunately owing to the very droughty weather, the fields had to be irrigated. Counts of korai nuts taken in pits dug to various depths of 6", 9", 12" and 18" before cultural operations, and before and after cropping, do not give any clear indications that we are at the beginning of the end of our troubles. Invariably the total number of nuts after cultural operations was more than before cultural operations, a state which is not easily explainable. The nuts naturally begin to increase considerably during the cropping period. Among the various cultural operations themselves, the ploughed fields were better than the shallow cultivated ones; of the latter, cultivation with bakhar seems to mitigate the evil as it cuts the plants at a depth of 3" to 4", so that by frequently working it the chances for the nuts to multiply become small.

(2) *The effect of shade on crops (Fields 8 and 21).*—Field 8 which was under Mauritius plantains last year came under paddy twice. In this case the effect of shade is not so marked as that of the operation of puddling which perhaps chokes the korai. In field 21, owing to a change in the period of planting plantains, the crop is still on the ground and korai counts could not be made.

(3) *Continuous cropping experiment (Fields 68, A, 70 and 71).*— This experiment was given up even last year and crops were grown after cultivating the fields with all the above implements. Field 71 has become frightfully foul again, which is attributed to the alkaline nature of the field. Added to this, fodder cholam grown on it did not permit any intercultivation. Of the other two, 68A seems to be much freer from the weed.

Table No. III gives the cost of cultivation and net income obtained by each of the operations. The following general conclusions may therefore be drawn:—

(a) Shallow ploughing in early stages and deep ploughing in the final stages, with an interval between each operation, for drying is efficacious but tends to become expensive.

(b) Cultivating by bakhar alone is almost equally efficacious because it attacks the weed at its growing point and thus weakens it.

(c) A combination of the above two seems to be the most suitable. It is therefore intended in future to lay out a general policy: namely, to tackle fields immediately after the harvest of a crop with monsoon plough setting it shallow, and gradually increasing the depth at each operation: to alternate this by working bakhas as deeply as it would go. Between each operation sufficient time must be given to dry the nuts so exposed. During the cropping season, as far as possible, crops should be grown in lines and intercultivation by bullock power given frequently till the crop shades the field.

TABLE No. II.

Statement showing the number of korai bulbs at various depths.

Field No.	Experi- ment.	Up to 6"				6"-9"				9"-12"				12"-18"			
		Before cultural operations.	After cultural operation.	After cumbu. After poovasi ragi.	After poovasi ragi.	Before cultural operation.	After cultural operation.	After cumbu. After poovasi ragi.	After poovasi ragi.	Before cultural operation.	After cultural operation.	After cumbu. After poovasi ragi.	After poovasi ragi.	Before cultural operation.	After cultural operation.	After cumbu. After poovasi ragi.	After poovasi ragi.
4 } 5 }	Bakhar	6	8	9	9	2	3	4	9	...	1	2	3	...	...	1	2
6 } 7 }		Junior hoe.	7	8	12	21	3	5	9	12	2	3	4	7	...	...	1	2
11 } 12 }	Monsoon and Victory plough.		4	4	8	23	2	2	4	7	2	1	2	2	1	1	1	...
68-A		Monsoon and Victory plough and Guntaka.	1	1	9	7	...	...	5	4	...	...	1	2

TABLE No. III.

Economic aspect of different methods of cultivation for eradication of korai for 1924-25.

Field No.	Cultural operations.	Area.	Cultivation expenses.		Yield per acre in lb.		Value.		Profit per acre.		Total profit. From two crops.
			1st crop Cumbu.	2nd crop Ragi.	Cumbu.	Ragi.	Cumbu.	Ragi.	Cumbu.	Ragi.	
4 and 5	By Bakhar...	1-00	Rs. 24	Rs. 28	989	725	Rs. 52	Rs. 48	Rs. 28	Rs. 20	Rs. 46
6 and 7	By Junior hoe.	"	27	27	942	982	52	44	25	17	42
11 and 12	By Monsoon and Victory plough.	"	31	39	996	976	55	69	25	40	64
68 A	By all the above implements.	"	24	28	652	970	36	63	12	34	47
						1,040					

Numerator indicates grain and denominator indicates straw.

4. *Groundnuts*.—The season for sowing was late, and the heavy rains of September interfered with pod formation, the plants rushing into leaf and stem. The dry months of November and December prevented proper development of pods, the net result being a reduction in yield.

Field 1 was exclusively reserved for the Government Mycologist for his experiments on *Rhizoctonia Destruens* on groundnut.

(a) *Groundnut varieties*.—These may be divided into two main classes, those that spread and form pods all along the reproductive branches and those that do not spread but form pods in bunches at the base. The former are long duration varieties, the period ranging from 5 to 5½ months, while the latter are 3 to 3½ months in duration. The spreading varieties are generally heavier yielders and the bunch varieties are not so heavy. Last year 16 varieties were grown. In addition to these five more varieties were added. All these belong to the "bunch" variety. Spanish Nos. 9 and 10 were introduced here from the sub-station where they had passed the stage of "row" trials. A bunch variety named at present "Gudiyattam bunch" largely grown in that vicinity was another. This is very promising. "Anamalai" mentioned in last year's report and 'Small Japanese' obtained this year from Central Provinces were the other two. All the 21 varieties were grown in strips, each being 1½ cents in area and triplicated.

Although varietal tests have been carried out for the past 16 years, it cannot be definitely said that certain varieties are outstandingly superior to Local Mauritius. In former years some of the varieties were grown both under rain-fed and irrigated conditions, and for a year or two the rain-fed crop was given up. Hitherto the rain-fed crop was being compared with that grown under irrigated conditions which does not seem to be quite correct. The number of varieties have been considerably increased and since 1922-23 the varieties are being raised in strips under rain-fed conditions only. It is proposed to compare these, ignoring the previous trials. The soil at the main station not being typical for groundnut cultivation it is proposed to transfer all experiments to the new station recently sanctioned.

The first twelve varieties were tried for three years, while the next four for two years and the last five only for one year. "Madagascar" was tried some years ago, but for some reason or other was temporarily given up. This has always had a good record and it is proposed to grow it on a field scale. Carolina, Senegal and Barbados Ceylon are also good varieties which await further test under field conditions.

The oil contents of the varieties are recorded for two years only as the results of analysis for 1924-25 have not yet been received.

TABLE No. IV.

Groundnut varietal tests.—Acre yields of groundnut varieties in pounds and oil contents.

No.	Variety	Yield of groundnut pods in lb. per acre.			Average of 3 years.	Yield of oil in lb. per acre.		Average of 2 years.
		1922-23.	1923-24.	1924-25.		1922-23.	1923-24.	
1	West African	1,008	1,850	1,293	1,334	365	616	490
2	Mauritius Mauritius	900	1,850	1,373	1,374	317	638	477
3	Barbados Ceylon	1,133	2,050	1,400	1,528	412	713	562
4	Senegal	1,633	1,900	1,220	1,584	589	657	623
5	Carolina	1,142	2,250	1,433	1,608	405	724	564
6	Transvaal	1,150	1,900	1,213	1,421	417	637	527
7	Local Mauritius	1,033	1,950	1,347	1,460	391	688	539
8	Rufisque Senegal	1,108	1,750	1,480	1,416	409	587	498
9	Virginia Bunch	1,042	1,950	1,333	1,442	378	670	524
10	Virginia Runner	1,292	2,050	1,120	1,497	434	720	602
11	Mosambique Mauritius	843	1,750	1,400	1,331	312	606	459
12	Virginia Mauritius	1,075	2,400	1,260	1,578	326	822	604
13	Madagascar ... ..	...	2,400	1,480	1,940	...	864	864
14	Big Japanese ... ..	...	1,650	1,180	1,415	...	553	553
15	Raipur ... ..	...	1,950	1,380	1,665	...	...	...
16	Tatas ... ..	...	2,000	773	1,387	...	...	...
17	Gudiyattam Bunch ... ..	...	...	1,200	1,200	...	...	...
18	Small Japanese ... ..	...	...	1,000	1,000	...	...	...
19	Spanish No. 10 ... ..	...	...	800	800	...	...	...
20	Spanish No. 8 ... ..	...	...	840	840	...	...	...
21	Anamalai ... ..	...	...	480	480	...	372	372

(b) *Manurial experiment.*—Popular opinion has it that ashes are very beneficial to the groundnut crop. To test this, it was compared with equal quantities of farm-yard manure at 15 cartloads per acre in field 15. Local Mauritius was grown in duplicate plots of 2½ cents each. There was no marked difference in the standing crop, and the yields too do not vary much.

The difference in yield in favour of ashes is very little, but we can assume that ashes can be safely substituted for farm-yard manure whenever there is a deficiency of the latter.

TABLE NO. V.

Plots.	Treatment.	Yield per	Yield per	Average
		plot.	acre.	per acre.
1 and 3.	Farm-yard manure	LB.	LB.	LB.
		35½	1,420	1,270
2 and 4.	Ashes	28	1,120	
		55½	1,420	1,330
		81	1,240	

(c) *Cultural experiment.*—In order to see whether deep ploughing encourages pod formation at lower depths, a small test was made in duplicate plots in fields 22—27 by digging the plots 3" and 9" deep. The seeds were sown at an uniform depth. At the harvest time it was observed that no pods formed below 3" in both cases.

(d) *Spacing experiment.*—The effect of spacing on the yield was tested in the same field. By giving sufficient spacing it was thought the soil could be intercultivated and the land kept free of weeds. The trial was made with Local Mauritius and Spanish No. 10. Local Mauritius was spaced 9", 1', 1' 6" and 2' while in the case of the Spanish variety only the first three spacings were adopted, it being a non-spreading variety. It was possible to intercultivate only once with bullock power in addition to two hand hoeings. In the case of Local Mauritius 9" spacing gave the best yield, while with Spanish No. 10, 1' spacing did better than the others.

(e) *Harvesting trails.*—These are found necessary owing to the peculiarity of the crop which ripens its nuts underneath. Besides this when a large number of varieties are being grown side by side it is essential that their correct period of ripening be known as by harvesting all varieties at the same time it is quite possible that some will be harvested too late and others too early. These experiments were tried with both the spreading and bunch varieties. The varieties selected were Anamalai, Spanish No. 10, Local Mauritius, Barbados Ceylon, Senegal and Transvaal. Each variety was sown in eight rows, each row being harvested once a week and the number of mature and immature pods counted and the percentage worked out.

From the results obtained it was found that Senegal is definitely longer in duration than Local Mauritius. The other two spreading varieties are nearly of the same age. With regard to the two bunch varieties results are rather conflicting but it is presumed that they are ready at about the ninetieth day.

All the above experiments will be continued.

(f) *Groundnut studies.*—These began last year and were continued in a systematic way this year, as it was possible to place a full time assistant for this important work. A study in regard to the relation

between flowering and pod bearing capacity of a plant, revealed that over 80 per cent of the flowers formed come to nothing. A deal of attention was also paid to the study of the plant with special reference to hybridization. A beginning was also made in this direction by attempting to obtain reciprocal crosses between spreading and bunch varieties. It is found that flowers begin to grow after eight at night so that all crossing work has to be done before seven the next morning.

(y) *Singee plant selections*.—One hundred plants were selected in Local Mauritius in 1923–24 in fields 28 to 34 with special reference to their pod bearing capacity, spreading habit, weight of pods and kernels and so forth. Of these only 20 were finally selected and the produce of each was sown in field 1 spaced 2' apart in and between rows under irrigation. Unfortunately the severe attack of *Rhizoctonia* made it very difficult to procure finally more than one or two plants in each row. In fact selection No. 33 died out altogether. The rest were however carefully preserved and they were sown again in field 15 this year as a rain-fed crop along with five more selections made from the summer crop. The produce of each of these 24 selected plants namely, Nos. 26, 27, 31, 36, 43, 46, 60, 63, 65, 69, 70, 76, 80, 81, 84, 86, 88, 94, 100, 102, 103, 104, 105 and 107 has been separately harvested and will be transferred to the new experimental station.

5. *Cumbu*.—This is the most important cereal of the locality. Last year owing to the very unfavourable season it could not be sown at all. Although conditions were not ideal, cumbu was sown over an area of 4 acres. It did best in field 43 which is under rotational experiment, where it gave a yield of 1,142 lb. per acre.

6. *Ragi*.—Dry ragi is usually grown in October, but owing to delay on the part of the farm staff in getting the land ready for sowing after the harvest of cumbu, it was sown in November. Want of rains in December and January necessitated irrigating the crop. In several fields the yields were below 1,000 lb. but in 35–37 it gave an acre-yield of 1,104 lb.

Dry ragi varieties.—Reference was made in last year's report to the bad management of the experiment. This year it was conducted in a slightly better way in fields 49 and 50. Three selections, namely, H₂, H_{2,2}, H_{2,3} from Hebbal farm were tried in comparison with the local dry (Poovasi) ragi. The varieties were repeated 12 times in 1½ cent plots. The straw was allowed to remain too long in the field which consequently decayed in some cases: the figures for straw are therefore unreliable. The table below gives the yields in pounds. The numerator indicates grain and the denominator straw.

TABLE No. VI.

Variety.	1	2	3	4	5	6	7	8	9	10	11	12	Yield for 15.6 cents.	Yield per acre.
Poovasi ragi.	23.5	20	23.5	23	20	20	22	20.5	17	20	20	16.5	246	1,577
	36	38	36	42	39	36	41	43	35	41	41	36	464	2,974
H ₁	21.5	20	18.5	20	18	19	20	20	18.5	18	18	22.5	234	1,500
	38	40	33	61	32	31	39	41	31	36	42	36	460	2,948
H ₂₂	18.5	20.5	19	20	18	19	20	22	19	21	22	24	243	1,558
	40	41	40	64	36	34	38	41	31	36	31	63	495	3,173
	14	15	14	14	14.5	14.5	14	14.5	15	15.5	17	17	179	1,154
	40	37	40	51	33	32	36	42	32	38	37	33	451	2,884

Ragi in fields 35 and 37 was divided into 2½ cents each and harvested separately recording the yields with a view to find out how far these fields are suitable for starting experiments. In field 35, where there were 17 plots, 10 came within the probable error and out of 18 plots in field 37, 11 plots were within the probable error.

Dry lands (irrigated).

7. *Paddy*—(a) *Semi-dry paddy varieties*.—The fourteen varieties grown last year were brought down to 10, and grown in fields 2 and 3. Owing to bad season and disease the varieties failed miserably: those that survived produced just enough seed for next season's sowings. In a few cases fresh seed has to be obtained again.

(b) *Paddy under well irrigation*.—The number was reduced from 19 to 13. In order to plant them early in the season a dry nursery was raised and transplantation took place in July. These were grown in fields 13 and 14 and repeated 4 times each plot being 1¼ cent in area. Precautions were taken to see that both the fields were similarly irrigated. Although the crops started with vigour, it was unfortunate that irrigation was not copiously given even at the time when the crops were in shot blade, which must have affected the yields. Certain varieties, e.g., Thellavadu and Nellore Samba in field 14 were exceedingly patchy and appeared to be diseased which told on the yield. In addition to this, Nellore Samba being the last to ripen suffered from the attacks of birds. Senthulukai was discarded and cut when the crop was still in shot blade as it was found to be a very long duration variety. The yields are conflicting compared with those of previous years. This experiment will be repeated again.

TABLE NO. VII.

Detailed statement showing the yields of the irrigated paddy varieties grown in Fields 13 and 14.

No.	Variety.	Date of sowing nursery.	Date of maturing.	Age of the crop in days.	Repetition. 1		Repetition. 2		Repetition. 3		Repetition. 4		Total for 5 cents.		Acre yield.	
					Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
					LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
1	Swornavari	5 June 1924	15 Sep. 1924	100	22	34	22½	36	31	32	22	33	87½	135	1,750	2,700
2	Koda Swornavari	Do.	10 Oct. 1924	103	19	32	18	31	19	32	18	31	74	126	1,480	2,520
3	Virali Samba	Do.	15 Sep. 1924	100	21	34	22	36	22	36	20	33	85	139	1,700	2,780
4	Chitrakali	Do.	Do.	100	20	34	19½	33	17	33	16	27	72½	124	1,450	2,490
5	Jaramanakattai	Do.	18 Sep. 1924	110	25	42	24	38	26	42	25	40	100	162	2,000	3,240
6	Manavari	Do.	7 Oct. 1924	121	24	44	22	41	30	40	24	32	90	177	1,800	3,540
7	Basangi	Do.	10 Oct. 1924	127	25	43	24	43	20½	35	27	43	98½	167	1,930	3,340
8	Theilavadi	Do.	25 Sep. 1924	121	15	41	14	29	12	29	12	25	53	124	1,060	2,480
9	Basangi	Do.	12 Oct. 1924	127	26	43	26½	48	25	47	26	49	103½	192	2,070	3,340
10	Veellaikar	Do.	Do.	125	26½	45	30	52	31	54	32	53	119½	209	2,390	4,180
11	Vellaikattai	Do.	6 Oct. 1924	125	19	43	30	54	30	52	29½	52	108½	201	2,170	4,020
12	Nellore Samba	Do.	22 Oct. 1924	140	18	59	13	49	10	30	12	23	53	168	1,060	3,320

TABLE No. VIII

Consolidated statement of the yields of irrigated Paddy varieties.

No.	Variety.	District.	1922-23.				1923-24.				1924-25.			
			Area in cents.	Age of the crop.	Yield per plot.	Yield per acre.	Area in cents.	Age of crop.	Yield per plot.	Yield per acre.	Area in cents.	Age of the crop.	Yield per plot.	Yield per acre.
1	Swornavari	South Arcot	17	130	184	1,082	4.5	110	90	2,000	5.0	100	87½	1,750
2	Koda Swornavari	Coimbatore	4.8	92	8	78	4.5	110	90	2,133	5.9	108	74	1,480
3	Virali Samba	Madura	3.0	111	26	866	4.5	110	106½	2,367	5.0	100	85	1,700
4	Chitrakali	Tinnevely	17	130	212	1,247	4.5	110	100½	2,288	5.0	100	72½	1,450
5	Jaramanakattai	North Arcot	2.0	111	22	1,466	4.5	110	120	2,667	5.0	110	100	2,000
6	Manavari	Do.	1.5	111	21	1,400	4.5	110	104½	2,317	5.0	121	90	1,800
7	Basangi	Gōdāvari	17	143	252	1,482	4.5	120	89½	1,983	5.0	127	96½	1,930
8	Thellavadlu	Chittoor	2.0	111	38	1,900	4.5	120	129	2,567	5.0	121	58	1,080
9	Rasangi	Gōdāvari	17	143	182	1,070	4.5	120	108	2,400	5.0	127	108½	2,070
10	Vellaikar	North Arcot	1.5	111	22	1,466	4.5	120	102	2,267	5.0	125	119½	2,330
11	Vellaikattai	Madura	17	143	182	1,070	4.5	120	122½	2,717	5.0	125	108½	2,170
12	Nellore Samba ... ..	.....	...	...	...	...	...	...	...	...	5.0	140	58	1,080

(c) *Chitrakali and G.E.B. 24 under well irrigation.*—These two were grown under wells according to the korai eradication experimental scheme. Chitrakali as a first crop did very well yielding 3,478 lb. per acre. G.E.B. 24 which followed it in August yielded at 2,923 lb. to the acre, a considerable loss having occurred by the attack of the crop by birds owing to there being no other crop in the neighbourhood. Both the crops have proved very expensive to grow under well irrigation.

8. *Sugarcane.*—During the early stages it suffered owing to the drought, but it was greatly benefited by the rains of September to November. During the dry period that followed, as luck would have it, an important part of the engine broke and the delay in getting it repaired seriously interfered with the uniform distribution of water to all the experimental plots and it is feared that the great unevenness of yields in some of the plots is largely due to this mishap. Another mistake was made and that is with regard to propping. Instead of propping manurial plots as was done last year, propping was started with varieties and by the time these finished, it was too late and further propping had to be abandoned. A few plots in the manurial area lodged.

(a) *Manurial Experiments. (Fields 28--31).*—This is the third year of the experiment. It consisted in testing the value of nitrogen present in castor-cake, castor-cake in combination with ammonium sulphate, groundnut cake and fish-guano. Each was applied in such rates as to supply 100 lb. of nitrogen to the acre. Each manure was applied to four rows of cane and repeated thirteen times. Only the two middle rows in each repetition were harvested for the experiment the outside two rows being treated as non-experimental. Each plot was 1.3 cents in area. Fiji B was the variety planted. Field observation showed that all the eastern plots representing a plot each in two series was much poorer in growth. This was mostly confirmed in the yields. Slight unevennesses were observed in the northern and southern strips also which were not as good as those in the central strips through which the main irrigation channels flowed. The three end plots Nos. 1, 5 and 9 which were badly affected are omitted from the calculations.

The probable error was worked out for the three years of the experiment and it is found that it is greater than the differences between the individual manures. Taking 100 as the yield of jaggery of groundnut cake, the statement below shows the differences in yield between it and other manures for each year and the probable error for each manure.

It is not possible to come to any conclusions from the result obtained by working out the probable error of the plots of this year.

TABLE No. IX.

Manure.	Average jag- gery yield.	Probable error per cent.	Increase or decrease per cent. over groundnut cake.
1922-23.			
Groundnut cake	100	± 8	...
Castor cake	98	± 9.9	-2
Fish guano	104	± 7.5	+4
Castor cake plus ammonium sulphate.	104	± 7.3	+6
1923-24. (Good plots)			
Groundnut cake	100	± 14.7	...
Castor cake	115	± 17.4	+15
Fish guano	108	± 18.3	+8
Castor cake plus ammonium sulphate	118.5	± 17.4	+16.5
1924-25. (10 plots omitting plots 1, 8, 9).			
Groundnut cake	100	± 10	...
Castor cake	101.5	± 9	+1.5
Fish guano	102	± 7	+2
Castor cake plus ammonium sulphate.	101.5	± 7.9	+1.5

TABLE No. X .

*Detailed statement of the manurial experiment on sugarcane,
Fiji B Fields 28—31.*

Manure.	Groundnut cake I.				Castor cake II.			
Sub-plot Nos	Number of canes.	Weight of canes.	Weight of jaggery.	Percentage of jaggery to cane.	Number of canes.	Weight of canes.	Weight of jaggery.	Percentage of jaggery to cane.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		LB.	LB.			LB.	LB.	
2	335	955	125	13.1	346	984	130½	13.3
3	278	945	125	13.2	294	817	113	13.8
4	297	863	119	13.8	303	789	113	14.3
6	864	1,130	144	12.7	324	1,002	135	13.5
7	303	850	119	14.0	395	1,270	155	12.2
8	292	1,025	134	13.1	305	1,095	145	13.2
10	325	838	126	15.0	307	935	123½	13.2
11	337	1,003	145	14.5	345	1,081	143	13.2
12	292	753	93	12.4	248	616	88½	14.4
13	341	804	104½	13.0	329	808	106½	13.2
Total ...	3,154	9,166	1,234½	13.4.8	3,196	9,397	1,253	13.4.8
Average ...	315.4	916.6	123.45	13.48	319.6	939.7	125.3	13.43
Manure.	Castor cake plus ammonium sulphate III.				Fish guano IV.			
Sub-plot Nos.	Number of canes.	Weight of canes.	Weight of jaggery.	Percentage of jaggery to cane.	Number of canes.	Weight of canes.	Weight of jaggery.	Percentage of jaggery to cane.
(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(17)
		LB.	LB.			LB.	LB.	
2	321	952	126½	13.3	336	962	121	12.6
3	296	849	115	13.5	341	983	130	13.2
4	306	868	119	13.7	317	1,012	141	13.9
6	329	1,107	153	13.8	300	945	131½	13.9
7	255	812	119	14.7	307	872	108	12.4
8	281	999	133	13.3	302	1,062	188	13.0
10	283	769	101	13.1	294	762	111	14.8
11	350	934	140	14.2	338	954	146	15.3
12	315	839	132	15.7	273	846	112	13.2
13	327	837	114½	13.7	275	930	125	13.4
Total ...	3,063	9,016	1,253	13.9.0	3,082	9,318	1,263½	13.5.7
Average ...	306.3	901.6	125.3	13.9	308.2	931.8	126.35	13.57

The averages of the ten plots show that fish guano takes the lead giving 9,719 lb. of jaggery as the yield per acre, while castor cake plus ammonium sulphate and castor cake alone take the second rank yielding 9,633.5 lb. per acre. Groundnut cake similar to last year is at the bottom yielding 9,496 lb. per acre.

On looking through the various plots in each manurial treatment, it is observed that there are great variations in the number of canes even after eliminating the three plots referred to above. The differences between the maximum and minimum number of canes in the plots in each manurial treatment is as follows :—

Castor cake	...	...	...	...	147
Groundnut cake...	...	...	...	...	86
Castor cake plus ammonium sulphate	...	...	...	...	95
Fish guano	...	...	...	...	69

If we take the weight of canes into consideration matters are still worse. In these circumstances it is difficult to say how far the results deduced from the averages are correct.

It may be argued that owing to these differences by taking a unit number of canes and calculating the quantity of jaggery obtained it would give a more accurate idea. However, on taking 100 canes under each manure and calculating the jaggery obtained therefrom the following is the order of merit, which is practically the same as that obtained by taking the averages of the plots.

Fish guano	...	...	...	...	41.0 lb.
Castor cake plus ammonium sulphate	...	...	...	...	40.9 "
Castor cake	...	...	...	...	39.2 "
Groundnut cake	...	...	...	...	39.1 "

The differences between one manure and another are so slight that they may be considered negligible. It was thought, before this year's results were known that it may be possible to come to some conclusions on the result of the three years' experiment. That does not seem to be the case.

Taking the money value of these manures into account from the prices paid this year, it is found that unlike last year fish manure which was then the cheapest is the dearest; as before castor cake alone is dearer than it in combination with ammonium sulphate.

TABLE No. XI.

Consolidated statement showing yields of canes and jaggery in years 1922-23, 1923-24 and 1924-25—Sugarcane manurials. (Dry lands).

	1922-23. Acre yield.		1923-24. Acre yield.		1924-25. Acre yield.		Average for 3 years acre yield.	
	Tons of canes.	Jaggery in candies.	Tons of canes.	Jaggery in candies.	Tons of canes.	Jaggery in candies.	Tons of canes.	Jaggery in candies.
Groundnut cake	37.80	21.61	19.06	11.06	29.19	17.72	28.68	16.80
Castor cake	37.66	21.15	21.31	12.56	30.16	18.03	29.71	17.25
Castor cake + ammonium sulphate	39.47	22.97	22.43	13.36	28.64	17.64	30.18	17.99
Fish guano	37.74	22.47	19.11	11.68	29.26	17.61	28.70	17.25

(b) *Varietal experiment*:—The following varieties were grown this year in varietal strips: Fiji B, B 147, B 208, B 1529, B 3412, B 6450, Mauritius 55, Java Hebbal, J 247, Red Mauritius, Chittoor Poovan and Striped Mauritius. The last two were introduced this year just as a demonstration to show how they stand in comparison with our best canes. Chittoor Poovan does exceedingly well in its native habitat but here it is subject to red rot and is found to badly lodge. Striped Mauritius is practically the local variety throughout the circle. Purple Mauritius and Fiji C which were rejected last year from the varietal test were grown just to keep up the varieties. Besides these, the seven varieties received last year from the Government Sugarcane Expert were grown in bigger plots for seed multiplication. Of these P.O.J. 2714, Bhatjan, Q 116 and D 1135 gave enough material from which to make jaggery and some of them give promise.

The tabulated statement below gives the plotwar yields, which are certainly better than last year. J 247 continues to be an exceedingly good cane: Mauritius 55 and Java Hebbal closely following it. Fiji B takes the fourth rank though it is still the standard cane of the farm and the district.

TABLE NO. XII.

Detailed statement of the merits of sugarcane varieties (Fields 31-34).

Repetitions.	I.				II.				III.			
	No. of canes.	Weight of canes.	Weight of jaggery.	Percentage of jaggery to cane.	No. of canes.	Weight of canes.	Weight of jaggery.	Percentage of jaggery to cane.	No. of canes.	Weight of canes.	Weight of jaggery.	Percentage of jaggery to cane.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
B. 208 ...	331	735	84	11.4	337	808	101	12.5	888	1,276	116	9.1
B. 1529 ...	277	377	53	14.1	376	539	75	13.9	856	653	86½	13.2
Chittoor Poovan ...	259	410	44	10.7	256	466	66	14.4	268	619	52	8.4
Red Mauritius ...	347	646	77	12.0	330	750	91	12.1	360	881	104	11.8
B. 147 ...	198	448	59	13.2	245	544	75	13.8	268	1,145	131	11.5
Java Hebbal ...	375	791	93	11.8	445	1,209	123	10.2	396	1,272	121½	9.4
B. 3412 ...	352	768	98	12.8	353	1,030	110	10.7	265	887	92	10.4
M. 55 ...	322	812	110	13.6	361	1,018	118	11.6	260	853	101	11.8
B. 6450 ...	283	584	65	11.1	339	822	95	11.6	390	1,160	142½	12.3
Striped Mauritius ...	278	293	31	10.6	379	767	88	11.5	340	768	77½	10.1
J. 247 ...	367	700	84½	12.1	428	1,012	127	12.5	365	1,248	170½	13.7
Fiji B. ...	261	400	50	12.5	261	796	115	14.4	369	958	142½	14.9

Repetitions.	IV.				V.			Average (13 cents).			Acres yield of jaggery.	
	No. of canes.	Weight of canes.	Weight of jaggery.	Percentage of jaggery to cane.	No. of canes.	Weight of canes.	Weight of jaggery.	Percentage of jaggery to cane.	No. of canes.	Weight of canes.		Weight of jaggery.
(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	
B. 208 ...	292	968	111	11.5	312	670	84½	12.6	332	891.4	99.3	7,638
B. 1529 ...	202	235	24	10.2	242	392	56½	14.4	291	439.2	59	4,538
Chittoor Poovan ...	...	...	...	...	...	...	...	...	240	4.5	54	4,154
Red Mauritius ...	312	651	84½	13.0	342	737	94	12.8	338	73.8	90.1	6,931
B. 147 ...	202	442	52½	11.9	142	345	44	12.8	211	58.4	72.3	5,562
Java Hebbal ...	345	1,046	121	11.6	381	826	105	12.7	388	1,028.8	112.7	8,669
B. 3412 ...	282	730	89	12.2	312	738	83½	11.3	313	850.6	94.5	7,269
M. 55 ...	362	1,069	127	12.0	332	991	118	11.9	327	946.6	114.8	8,831
B. 6450 ...	312	975	119	12.2	382	893	117	13.1	341	886.8	107.7	8,285
Striped Mauritius ...	...	...	...	...	...	...	...	...	332	609.3	65.5	5,088
J. 247 ...	292	929	112½	12.1	280	865	106	12.3	342	950.8	120.1	9,238
Fiji B ...	332	826	120	14.5	262	823	116	14.1	285	760.6	108.7	8,362

The results tabulated for the three years are also recorded below which shows that the following are the best six varieties: J. 247, B. 6450, Mauritius 55, Fiji B, B. 208 and Java Hebbal. Of these J. 247 stands far ahead of others.

TABLE No. XIII.

Consolidated statement showing yields of cane and jaggery during years 1922-23, 1923-24 and 1924-25—Dry land varieties.

Serial number.	Variety.	1922-23.				1923-24.				1924-25.				Average yield of jaggery for three years in lb. per acre.			
		Area in cents.	Cane yield in lb.		Jaggery yield in lb.		Area in cents.	Cane yield in lb.		Jaggery yield in lb.		Area in cents.	Cane yield in lb.		Jaggery yield in lb.		
			Per plot.	Per acre.	Per plot.	Per acre.		Per plot.	Per acre.	Per plot.	Per acre.		Per plot.		Per acre.	Per plot.	Per acre.
1	B. 208 ...	12	8,622	71,850	921½	7,679	3.6	1,644	45,660	184	5,111	1.3	891	68,538	99.3	7,688	6,809
2	B. 1529 ...	8	3,900	65,000	486½	8,112	...	1,398	38,830	186	5,166	...	439	33,769	59.0	4,538	5,939
3	Red Mauritius.	12	...	...	...	...	...	1,415	39,305	153	4,250	...	733	56,385	90.1	6,931	5,590
4	B. 147 ...	12	8,417	70,142	950½	7,921	...	1,576	43,770	171	4,750	...	584	44,923	72.3	5,592	6,078
5	Java Hebbal	12	3,437	28,642	498½	4,154	...	2,335	64,860	259	7,194	...	1,029	79,154	112.7	8,669	6,872
6	B. 3412 ...	12	5,039	62,987	558½	6,781	...	1,846	51,523	197	5,472	...	831	63,923	94.5	7,269	6,507
7	M. 55 ...	12	9,283	77,358	863	7,192	...	1,984	55,110	208	5,777	...	947	72,846	114.8	8,831	7,287
8	B. 6450 ...	12	9,291	77,425	979½	8,162	...	1,853	51,470	204	5,666	...	887	68,231	107.7	8,285	7,871
9	J. 247 ...	12	9,390	73,250	1,017	8,475	...	2,088	58,000	254	7,055	...	951	73,164	120.1	9,238	8,256
10	Fiji B ...	12	8,653	72,108	1,053½	8,779	...	1,246	34,610	146	4,055	...	761	58,538	108.7	8,362	7,065
11	Chittoor Poovan.	...	...	...	...	...	...	...	...	...	...	...	495	38,077	54.0	4,154	4,154
12	Striped Mauritius.	...	...	...	...	...	...	...	...	...	...	...	609	46,846	65.5	5,038	5,038

(c) *Seasonal*.—The normal planting is in March and April. "Late planting" canes were planted in July and the crop was stunted and poor throughout. When milled the jaggery did not set well. The three years' experience has not been in favour of late planting. The experiment will be given up.

(d) *Liming the soil*.—It is quite a common thing in parts of Chittoor district to produce excellent jaggery without liming. It was assumed that this might be due to the presence of lime in the soil in an available form. To test this a small plot of 7 cents of cane was limed at 1 ton per acre and jaggery was made without liming it. The jaggery produced was as good as that obtained from a sample which was limed. The keeping qualities will be studied. The result is encouraging and the experiment will be continued. The seven cents produced only 224½ lb. of jaggery.

9. *Irrigated ragi varieties*.—Local ragi compared with two irrigated ragi selection, H₁₁ from Hebbal and H₂ from Hagari, were grown in fields 9 and 10. The experiment was repeated six times in plots of 3 cents each. It was found that local ragi was the earliest and yielded better than the other two. The Hebbal selection seems to be very poor in grain in spite of its large sized ear-heads. It seems however to be prolific in straw. These will be continued again to which will be added the ragi from Coimbatore.

TABLE No. XIV.

Variety.	1	2	3	4	5	6	Total.	Yield per acre.
	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
Local ragi	61	64	68	60	60	48	361	2,000.
	60	60	63	61	54	56	353	1,966
H ₂	47	46	53	45	45	50	286	1,600
	46	49	74	70	55	76	370	2,066
H ₁₁	15	17	16	12	16	16	93	533
	71	67	69	59	67	68	398	2,200

Notes.—The numerator refers to grain and denominator to straw.

10. *Cambodia cotton*.—This was grown in 1.25 acres in fields 35—37. It was intended to sow after the heavy rains in December. But it was delayed till February 1924 owing to the delay in the harvest of the previous crop. The crop put forth a deal of vegetative growth, but flowering and consequent boll formation were poor. It yielded at 491 lb. per acre. The probable error worked out indicated that 21 plots out of 43 came within the error.

TABLE No. XV.

*Probable error statement for Cambodia cotton fields 35—37.
1924-25.*

Plot No.	Yield in lb.	Plot No.	Yield in lb.
1	12.03	26	10.38
2	12.00	27	15.00
3	9.75	28	12.25
4	9.81	29	11.06
5	9.75	30	9.81
6	9.84	31	9.44
7	9.25	32	9.38
8	8.50	33	10.31
9	10.40	34	7.06
10	10.83	35	6.75
11	10.66	36	7.50
12	11.47	37	8.44
13	12.50	38	8.12
14	11.81	39	8.75
15	12.44	40	7.06
16	11.94	41	6.47
17	11.81	42	7.75
18	12.25	43	6.31
19	13.31		
20	13.19		
21	11.00		
22	9.56		
23	11.50		
24	10.63		
25	13.50		
		Total ...	440.87
		Average yield ...	10.25
		Probable error... ±	1.39

Each plot = 2½ cents.

This crop was grown again in fields 51 and 52 in October 1924 and in January 1925, respectively, to see the differences in yields, from which it would be possible to judge whether Cambodia cotton will suit the climatic conditions of the district and if so which season is the better one.

11. *Fodder cholam—Varietal Test.*—It is becoming increasingly difficult to depend upon other circles for fodder cholam seed; attempts made in the past to grow a grain cholam crop have failed. It is easier to get fodder varieties in the circle, and enquiries went to show that Chittóor district produces some good varieties. These were obtained and compared with periamanjál cholam of Coimbatore; unfortunately the only field (field 46-A and B) available for this test was alkaline in patches and therefore the results are not very conclusive though it must be said that the yields were good considering the nature of the field. But an attempt will be made to grow these and other varieties collected from within the circle on a larger scale.

The yields are tabulated below :—

TABLE NO. XVI.

Variety.	Area. Cents.	Plot 1.	Plot 2.	Total.	Yield (dry) in lb. per acre.
Periamanjal cholam ...	5	LB. 561	LB. 698	LB. 1,259	12,590
Kaki jonna ...	..	.. 651	.. 1,080	.. 1,731	17,310
Patcha jonna ...	..	.. 588	.. 738	.. 1,321	13,210

12. *Rotational experiments.*—The object of starting this series of experiments was already explained in the report of last year. They were continued in the same blocks. The details of the experiment are—

Field No.	1923-24.	1924-25.	1925-26.	1926-27.
<i>2 year rotation.</i>				
45	Groundnut ...	Sugarcane.	Groundnut.	Sugarcane.
46	Sugarcane ...	Groundnut.	Sugarcane.	Groundnut.
<i>3 year rotation.</i>				
38	Dry paddy ...	Ragi, groundnut— January—July and paddy.	Sugarcane.	Cumbu.
39	Sugarcane ...	Cumbu.	Ragi, groundnut— January—July and paddy.	Sugarcane.
40	Groundnut ...	Sugarcane.	Cumbu.	Ragi, groundnut— January—July and paddy.
<i>4 year rotation.</i>				
42	Sugarcane ...	Cumbu.	Ragi, groundnut— January—July and paddy.	Cumbu and paddy.
44	Paddy ...	Sugarcane.	Cumbu.	Ragi, groundnut— January—July and paddy.
43	Groundnut ...	Cumbu and paddy.	Sugarcane.	Cumbu.
41	Cholam ...	Ragi, groundnut— January—July and paddy.	Cumbu and paddy.	Sugarcane.

This is the second year of the initiation of the scheme. The season being more favourable than last year, it was possible to follow the cropping indicated in the scheme. The sugarcane, unlike last year, was converted to jaggery on the farm. It was noticed that all the crops to the western boundary of the farm suffer from the effects of thieves, or of roots of trees; precautions will be taken this year to remedy these as far as possible.

The net returns per acre of the rotations for last year are as follows :—

	ES.	A.	P.
2 year rotation ...	209	4	2
3 year rotation ...	136	1	8
4 year rotation ...	49	9	2

The present year's yields, cost of cultivation and net profit under each rotation are detailed in Table No. XVII. In field 39 in the 3rd year rotation and in field No. 42 in the 4th year rotation, the yields of ragi are not recorded as the harvests are not complete. These will be included in next year's statement. It is too early to comment on the returns.

TABLE No. XVII.

Statement showing the money value realized per acre in the rotational series, 1924-25.

Field No.	Crops grown.	Area in cents.	Yield in lb. per plot.	Rate.	Total value per plot.	Total value per acre.	Cost of cultivation per acre.	Net profit per acre.	Net profit per acre by each rotation.
2. year rotation.					per rupee.	Rs.			
45	Sugarcane ..	50	4,254 lb. jaggery 11,000 setts.	12½ lb. Rs. 4 per 1,000.	340 44	769	392	377	373
46	Groundnut ...	"	312 lb. pods. 650 lb. haulms.	11 lb. 250 lb.	28 3				
3. year rotation.									
88	Ragi ...	"	108 lb. grain. 175 lb. straw.	18 lb. 300 lb.	119	238	172	67	
86	Groundnut ...	"	1,209 lb. pods. 675 lb. haulms.	11 lb. 250 lb.					
88	Poombalai ...	"	1,476 lb. grain. 1,835 lb. straw.	17½ lb. 100 lb.	101	201	136	65	
39	Cumbu ...	"	528 lb. grain.	18 lb.					
40	Sugarcane ...	"	3,094 lb. jaggery. 8,000 setts.	12½ lb. Rs. 4 per 1,000	280	559	408	151	210
4 year rotation.									
41	Ragi ...	"	228 lb. grain. 220 lb. straw.	18 lb. 300 lb.	103	201	163	38	
41	Groundnut ...	"	981 lb. pods. 600 lb. haulms.	11 lb. 250 lb.					
41	Poombalai ...	"	1,179 lb. grain. 1,281 lb. straw.	17½ lb. 100 lb.	80	160	130	30	
42	Cumbu ...	"	416 lb. grain.	18 lb.					
43	Cumbu ...	"	571 lb. grain.	18 lb.	32	68	38	25	384
43	Poombalai ...	"	1,008 lb. grain. 1,175 lb. straw.	17½ lb. 100 lb.	70	139	187	3	
44	Sugarcane ...	"	5,413 lb. jaggery. 10,000 setts.	12½ lb. Rs. 4 per 1,000.					473	946	19	555

Wet lands.

13. *Green-manures*.—Dhaincha was grown in fields 16, 61, 63, 67 and 69 over an area of 4 acres yielding on an average 14,093 lb. per acre. In field 16, it gave a phenomenal yield of 22,150 lb. per acre. In some fields it became woody.

14. *Paddy*.—The absence of rain in the latter stages considerably interfered with the proper maturation of the crop, and the yields are therefore not as good as anticipated. Silt was not cleared in time, which delayed the preparation of the nursery for first crop. This meant also a deal of delay in the planting of both first and second crop paddies.

The average acre yields of paddy on the farm this year compared with last are as follows:—

	1922-23.	1923-24.
	LB.	LB.
Kar paddy	2,242	3,077
Samba paddy	2,238	3,107
Second crop paddy	1,602	1,898

Varietal tests—(1) (a) *Short duration Kar paddy varieties*.—In addition to the usual three short duration varieties, namely, Chitrakali, Swornavari and Vellai Manakattai, another, Kuruvai No. 18, a strain obtained from Aduthurai, was tried in comparison. They were repeated nine times in fields 55 and 56 in plots of 2 cents each. The crop grew uniformly well and on the whole yielded satisfactorily. Kuruvai is the shortest of the varieties, being 107 days in duration. Chitrakali and Swornavari ripen off three days later, while Vellai Manakattai took five days more. This year Chitrakali headed the list with 3,856 lb. of grain per acre. Vellai Manakattai and Swornavari yielded nearly equally giving 3,372 lb. and 3,350 lb. per acre, respectively. In comparison with these three, Kuruvai 18 yielded low at 2,572 lb per acre. In all cases the straw yields were poor.

TABLE No. XVIII.

Yield of Kar paddy varieties (plotwar) grown in fields 55 and 56.

Plot No.	Area in cents.	Chitrakali.					Vellai Manakattai.				
		Age of crop.	Weight of grain per plot.	Weight of grain per acre.	Weight of straw per plot.	Weight of straw per acre.	Age of crop.	Weight of grain per plot.	Weight of grain per acre.	Weight of straw per plot.	Weight of straw per acre.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		DAYS.	LB.	LB.	LB.	LB.	DAYS.	LB.	LB.	LB.	LB.
1	2	110	66	3,300	44	2,200	115	67	3,350	49	2,450
2	"	"	77	3,850	47	2,350	"	68	3,400	50	2,500
3	"	"	77	3,850	46	2,300	"	73	3,650	51	2,550
4	"	"	79	3,950	47	2,350	"	68	3,400	50	2,500
5	"	"	78	3,900	47	2,350	"	73	3,850	51	2,550
6	"	"	81	4,050	49	2,450	"	63	3,150	46	2,300
7	"	"	78	3,800	46	2,300	"	65	3,250	43	2,150
8	"	"	79	3,950	48	2,400	"	63	3,150	48	2,400
9	"	"	81	4,050	50	2,501	"	67	3,350	49	2,450
Total ...	18	...	694	...	424	...	...	607	...	437	...
Average ...	...	...	77	3,856	47	2,356	...	67	3,372	49	2,428

TABLE No. XVIII—cont.

Yield of Kar paddy varieties (plotwar) grown in fields 55 and 56
—cont.

Plot No.	Area in cents.	Swornavari.					Kuruvai 18.				
		Age of crop.	Weight of grain per plot.	Weight of grain per acre.	Weight of straw per plot.	Weight of straw per acre.	Age of crop.	Weight of grain per plot.	Weight of grain per acre.	Weight of straw per plot.	Weight of straw per acre.
		(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
		DAYS.	LB.	LB.	LB.	LB.	DAYS.	LB.	LB.	LB.	LB.
1	2	110	64	3,200	41	2,050	107	54	2,700	38	1,900
2	"	"	71	3,550	44	2,200	"	56	2,800	47	2,350
3	"	"	67	3,350	38	1,900	"	55	2,750	44	2,200
4	"	"	64	3,200	43	2,150	"	47	2,350	38	1,900
5	"	"	69	3,450	47	2,350	"	56	2,800	40	2,000
6	"	"	66	3,300	43	2,150	"	46	2,300	37	1,850
7	"	"	66	3,300	43	2,150	"	48	2,400	37	1,850
8	"	"	66	3,300	42	2,100	"	53	2,650	32	1,600
9	"	"	70	3,500	46	2,300	"	48	2,400	40	2,000
Total ...	18	...	603	...	387	...	...	463	...	353	...
Average ..	...	...	67	3,350	43	2,150	...	51	2,572	39	1,961

Taking the average grain yields of four years, it is seen from the consolidated statement below that Chitrakali has done best giving over 3,000 lb. to the acre followed closely by Vellai Manakattai.

TABLE No. XIX.

Consolidated statement of yields per acre of short duration
Kar paddy varieties.

Variety.	1921-22.	1922-23.	1923-24.	1924-25.	Average.
	LB.	LB.	LB.	LB.	LB.
Swornavari	2,317	2,234.5	2,862	3,350	2,691
Chitrakali	2,336	2,679.5	3,155	3,856	3,019
Vellai Manakattai	2,208	2,765.5	3,441	3,372	2,946
Kuruvai No. 18 ... ..	...	...	...	2,572	2,572

(b) G.E.B. 24.—This variety was grown as a first crop in the kar season in fields 67 and 69 in order to see if a second crop of Chitrakali or Swornavari could be raised as practised in some of the southern districts. G.E.B. 24 yielded fairly at 2,744 lb. to the acre, but those that followed failed miserably.

(2) Main Samba paddy varieties.—As indicated last year, Nellore samba was shifted to the well-irrigated varieties and Coimbatore

No. 1 and Coimbatore No. 2 were included this year, so that there were ten varieties against nine of last year. The other varieties were G.E.B. 24, Poombalai, Aduturai Nos. 1 and 2, Red and White Sirumani, Ramagarudan Samba and local Garudan Samba. These were grown in fields 61 and 62 in one and a half cent plots, respectively, six varieties being repeated 14 times and four 12 times. It was a mistake to have tried in such small plots, and the spacing given between each plot was more than usual. This resulted in inflating the yields per acre and outside plants of each strip grew more vigorously than those inside. Aduturai No. 1, a selection from Red Sirumani did exceedingly well, giving 5,543 lb. per acre followed by local Garudan Samba which gave 5,456 lb. Red Sirumani giving 5,307 lb. and Ramagarudan Samba 4,971 lb. follow next. The others do not come any where near these. G.B.E. 24 and Coimbatore No. 1 are no doubt the shortest of these but it is not certain whether these should be compared with main samba varieties or not. These will be repeated again before coming to a decision.

TABLE No. XX.

*Detailed plotwar yield of main samba paddy varieties in field No. 16.
Area of each plot 1 cent.*

No.	G.E.B. 24.				Coimbatore No. 1.				Poombalai.				Coimbatore No. 2.			
	Weight per plot.		Weight per acre.		Weight per plot.		Weight per acre.		Weight per plot.		Weight per acre.		Weight per plot.		Weight per acre.	
	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
1	18	29	1,800	2,900	30	34	3,000	3,400	29	47	2,900	4,700	34½	57	3,450	5,700
2	31	37	3,100	3,700	35	41	3,500	4,100	33	50	3,300	5,000	39	55	3,900	5,500
3	26	34	2,600	3,400	33	37	3,300	3,700	38	51	3,800	5,100	41	46	4,100	4,600
4	29	36	2,900	3,600	35	41	3,500	4,100	40	49	4,000	4,900	38	50	3,800	5,000
5	26	34	2,600	3,400	34	38	3,400	3,800	41	48	4,100	4,800	39	53	3,900	5,300
6	28	35	2,800	3,500	31	35	3,100	3,500	34	49	3,400	4,900	36	50	3,600	5,000
7	26	33	2,600	3,300	28	34	2,800	3,400	34	47	3,400	4,700	33	55	3,300	5,500
8	34	40	3,400	4,000	34	38	3,400	3,800	36	51	3,600	5,100	38	51	3,800	5,100
9	31	38	3,100	3,800	36	40	3,600	4,000	35½	47	3,550	4,700	38	45	3,800	4,500
10	28	34	2,800	3,400	32	34	3,200	3,400	35	46	3,500	4,600	40½	47	4,050	4,700
11	26	33	2,600	3,300	32	35	3,200	3,500	38½	45	3,850	4,500	39	50	3,900	5,000
12	26	32	2,600	3,200	31	33	3,100	3,300	37	42	3,700	4,200	38	53	3,800	5,300
Total.	329	415	...	...	391	440	..	...	431	572	...	...	454	612	...	...
Ave- rage.	27	35	2,742	3,458	33	36	3,258	3,667	36	47	3,592	4,767	38	51	3,783	5,100

TABLE NO. XXI.

*Yields of main samba varieties grown in field No. 62.
Area of each plot $\frac{1}{2}$ cent.*

No.	Adaturai No. 1 152 days.				Adaturai No. 2 149 days.				Red Siramani 152 days.			
	Weight per plot.		Weight per acre.		Weight per plot.		Weight per acre.		Weight per plot.		Weight per acre.	
	Grain. (1)	Straw. (2)	Grain. (3)	Straw. (4)	Grain. (5)	Straw. (6)	Grain. (7)	Straw. (8)	Grain. (9)	Straw. (10)	Grain. (11)	Straw. (12)
	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
1	28½	42	5,650	8,400	20	23	4,000	4,600	26½	31	5,300	6,200
2	27½	37	5,500	7,400	21	28	4,200	5,600	27	39	5,400	7,800
3	28	32	5,600	6,400	17½	30	3,450	6,000	27	39	5,400	7,800
4	23½	36	4,750	7,200	19	29	3,800	5,800	26	34	5,200	6,800
5	28½	41	5,650	8,200	20½	39	4,050	7,800	27½	39	5,550	7,800
6	28½	42	5,750	8,400	19½	42	3,850	8,400	26½	37	5,300	7,400
7	29½	39	5,900	7,800	20½	47	4,050	9,400	29½	33	5,900	6,600
8	29½	35	5,950	7,000	20½	29	4,050	5,800	29½	35	5,900	7,000
9	28½	35	5,750	7,600	15½	53	3,050	10,600	20½	37	4,100	7,400
10	30½	41	6,150	8,200	18½	36	3,650	7,200	28½	38	5,700	7,600
11	30½	42	6,150	8,400	15½	51	3,150	10,200	29½	39	4,700	7,800
12	26	39	5,200	7,800	16	32	3,200	6,400	24	37	4,800	7,400
13	30½	39	6,050	7,800	20	38	4,000	7,600	27	39	5,400	7,800
14	29½	35	5,950	7,000	20½	36	4,100	7,200	28½	35	5,650	7,000

No.	Vellai Siramani 149 days.				Ramagarudan Samba 157 days.				Local Garudan Samba 157 days.			
	Weight per plot.		Weight per acre.		Weight per plot.		Weight per acre.		Weight per plot.		Weight per acre.	
	Grain. (13)	Straw. (14)	Grain. (15)	Straw. (16)	Grain. (17)	Straw. (18)	Grain. (19)	Straw. (20)	Grain. (21)	Straw. (22)	Grain. (23)	Straw. (24)
	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
1	22½	36	4,500	7,200	24½	32	4,950	6,400	26½	32	5,300	6,400
2	20½	34	4,050	6,800	23½	29	4,750	5,800	25½	38	5,100	7,600
3	22	32	4,400	6,400	27½	36	5,450	7,200	28½	36	5,700	7,200
4	18	33	3,600	6,600	24½	35	4,850	7,000	23½	35	4,700	7,000
5	19½	37	3,850	7,400	24½	39	4,450	6,000	28½	39	5,700	7,800
6	20	36	4,000	7,200	26½	30	5,300	6,000	27½	34	5,500	6,800
7	21½	38	4,800	6,600	24½	32	4,900	6,400	28½	35	5,700	7,000
8	19½	34	3,950	6,800	23	37	4,600	7,400	29½	37	5,950	7,400
9	18½	36	3,700	7,600	25½	36	5,050	7,200	29½	34	5,750	6,800
10	19½	34	3,950	6,800	25½	37	5,150	7,400	27½	38	5,450	7,600
11	16½	35	3,300	7,000	21½	35	4,300	7,000	27½	36	5,500	7,200
12	20½	34	4,100	6,800	24	38	4,800	7,600	25½	35	5,150	7,000
13	19½	32	3,800	6,400	26½	36	5,350	7,200	27½	34	5,650	6,800
14	21	36	4,200	7,200	26	37	5,200	7,400	26½	32	5,350	6,400

(3) *Short duration samba paddy varieties*.—(Second crop varieties). As stated already in the report these were planted late. The yields are however better than those of the previous two years. As stated in the previous report Jeeragasamba was given up and Coimbatore No. 1 and Coimbatore No. 2 were added to the list. These were grown in fields 55-56 in strips of 1 cent and repeated 10 times. Poombalai ordinary is the best this year yielding a little over 3,000 lb. per acre.

Coimbatore No. 1 and Coimbatore No. 2 come close to each other.

TABLE No. XXII.

Consolidated statement showing the yield of paddy varieties (second crop)—Fields 55 and 56.

No.	Name of variety.	Area in cents.	Age of crop.	Yield per plot.		Yield per acre.	
				Grain.	Straw.	Grain.	Straw.
				LB.	LB.	LB.	LB.
1	Coimbatore No. 1	10	137	278	245	2,780	2,450
2	Cross 1303	10	137	255	275	2,550	2,750
3	Poombalai	10	147	301	295	3,010	2,950
4	Poombalai 91	10	147	269	220	2,690	2,200
5	Coimbatore No. 2	10	147	273	285	2,730	2,850
6	Sadaisamba	10	149	257	812	2,570	3,120

A tabular statement giving the yields of the last three years is given below. Of the four varieties that were tried in all these years Poombalai ordinary ranks first. It will be interesting to see how the strain selected from it will behave in future.

TABLE No. XXIII.

Consolidated statement of yields of short duration samba paddy varieties—Fields 55 and 56.

Variety.	1922-23.				1923-24.				1924-25.				Average per acre.
	Area in cents.	Age in days.	Yield.		Area in cents.	Age in days.	Yield.		Area in cents.	Age in days.	Yield.		
			Per plot.	Per acre.			Per plot.	Per acre.			Per plot.	Per acre.	
Coimbatore No. 1 ... ..	...	...	...	...	...	...	...	...	...	...	...	...	2,780.0
Cross 1303	14	144	227	1,621	12½	135	186	1,488	10	137	255	2,550	1,888.3
Poombalai (bn'k)	14	145	264	1,886	12½	135	250	2,000	10	147	301	3,010	2,398.7
Poombalai 91	14	147	240	1,714	12½	135	244	1,952	10	147	269	2,690	2,118.7
Coimbatore No. 2 ... ..	...	...	...	...	...	...	...	...	...	...	...	...	2,730.0
Sadaisamba	14	148	278	1,986	12½	146	225	1,800	10	149	257	2,570	2,118.7

In order to study their general behaviour when cultivated on a large scale and to be able to produce enough seed for supply to ryots, Red Sirumani, White Sirumani, Aduturai No. 1 and 2 were grown in field 63 in 25 cent plots. These have done fairly well. The yields obtained here are not comparable with those grown under strips tests in field 62, because not only is the soil different, but Aduturai No. 2 was grown in plots which are low and also shaded by trees which tended to bring down the yield.

TABLE No. XXIV.

Statement showing the yield of paddy varieties—Field 63.

No.	Variety.	Area in cents.	Age in days.	Yield per plot.		Yield per acre.	
				Grain.	Straw.	Grain.	Straw.
				LB.	LB.	LB.	LB.
1	Red Sirumani	25	152	877	850	3,508	3,400
2	White Sirumani	25	149	949	1,220	3,796	4,880
3	Aduturai No. 1	25	152	928	865	3,712	3,460
4	Aduturai No. 2	25	149	682	748	2,728	2,992

A test was made in field 16 to compare ganja cake with castor cake for the first crop paddy. Previous to this the field had grown a heavy crop of Dhaincha. The field was divided into two halves, the northern being treated with castor cake and the southern with ganja cake at 500 lb. per acre. The castor cake plot yielded better than the ganja cake by 315 lb. per acre. Their yields and their financial aspects are given below:—

TABLE No. XXV.

Manure.	Area in cents.	Yield per plot.		Yield per acre.		Value per acre.		Total value of produce per acre.	Cost of manure per acre.	Net profit per acre.
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.			
		LB.	LB.	LB.	LB.	RS.	RS.	RS.	RS.	RS.
Castor cake ...	16½	497	406	3,012	2,461	201	25	226	16	210
Ganja	16½	445	361	2,697	2,206	180	22	202	23	179

A second crop of Sadaisamba was raised in the same field after applying 3 cwt. of fish guano per acre. The stand was gappy and the crop yielded poorly.

15. *Standardization plots.*—This is the third year of standardization. The following were the fields standardized: 54, 57, 58, 59, 60, 65 and 66. The plots were permanently laid to measure 2½ cents for standardization and future experimental work. Out of 173 plots 92 came within the probable error as detailed below:—

TABLE No. XXVI.

Field.	Probable error.	Total number of plots.	Number comes within probable error.
	PER CENT.		
54	± 5.1	35	21
57	± 3.1	29	14
58	± 4.6	28	9
59	± 5.3	32	15
60	± 6.2	30	20
65	± 7.8	15	8
66	± 3.9	9	5

Some of the fields that were being standardized were omitted this year for various reasons. It is gratifying that there has been a considerable improvement in the plots and it is likely that some of the fields are good enough on which experiments may be started.

16. *Sugarcane varietal test.*—The following ten varieties were grown repeated four times, each consisting of 3 rows covering an area of 1.7 cents. Fiji B, J 247, Java Hebbal, B 147, B 208, B 1529, B 3412, B 6450, Mauritius 55 and Red Mauritius. The canes did not lodge, but all the Barbados varieties were noticed to be suffering from smut. The yields are on the whole better than last year. Mauritius 55 has done very well and was followed by J 247. B 3412 and Java Hebbal have also done well. Taking the average of three years, J 247 heads the list at 7,865 lb. per acre followed by B 3412 giving 7,637 lb. per acre and Java Hebbal at 7,336 lb. per acre. It is unfortunate that B 1529 and B 147 are occupying very low positions. The statements are recorded below:—

TABLE No. XXVII.

Yields of cane and jaggery obtained from Field 17.

No.	Variety.	Area of each series.	I series.		II series.		III series.		IV series.	
			Cane.	Jaggery.	Cane.	Jaggery.	Cane.	Jaggery.	Cane.	Jaggery.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		CRNT.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
1	Fiji B ...	1.7	946	130	708	101	87½	102	662	62
2	J 247 ...	"	1,146	121	1,176	126	1,583	163	1,310	161
3	J Hebbal ...	"	966	105½	976	125	1,436	163	1,214	141
4	B 1529 ...	"	240	24	280	30½	405	59	270	36
5	B 3412 ...	"	1,182	143½	1,204	153	1,187	128	1,134	139½
6	B 6450 ...	"	1,000	123	780	100½	1,156	148	1,136	136
7	B 147 ...	"	394	44	465	52½	769	97	646	72
8	M 55 ...	"	940	127	1,124	155	1,609	197	1,264	154
9	B 208 ...	"	894	118	673	76½	1,352	181½	1,052	132
10	Red Mauritius.	"	829	100	510	66	405	59	443	55½

No.	Variety.	Total weight of cane.	Total weight of jaggery.	Average weight of cane.	Average weight of jaggery.	Acres yield of cane.	Acres yield of jaggery.
		(12)	(13)	(14)	(15)	(16)	(17)
		LB.	LB.	LB.	LB.	LB.	LB.
1	Fiji B ...	3,188	415	797	108.75	46,882	6,108
2	J 247 ..	5,215	571	1,308.75	142.75	76,691	8,397
3	J Hebbal ...	4,592	534½	1,148	133.62	67,529	7,860
4	B 1529 ...	1,195	149½	298.75	37.37	17,578	2,198
5	B 3412 ...	4,707	564	1,176.75	141.00	69,221	8,294
6	B 6450 ...	4,072	506½	1,018	126.62	59,882	7,448
7	B 147 ...	2,394	265½	573.5	68.37	33,735	3,904
8	M 55 ...	4,987	683	1,243.25	158.25	72,602	9,309
9	B 208 ..	3,971	503	992.75	125.75	58,397	7,397
10	Red Mauritius.	2,192	280½	548	70.12	32,235	4,125

TABLE No. XXVIII.

Consolidated statement showing yields of cane and jaggery in 1922-23, 1923-24 and 1924-25 (Wet lands).

No.	Variety.	1922-23. Fields 19 and 20.				1923-24. Field 18.					
		Area in cents.	Cane yield		Jaggery yield		Area in cents.	Cane yield		Jaggery yield	
			Per plot.	Per acre.	Per plot.	Per acre.		Per plot.	Per acre.	Per plot.	Per acre.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
			LB.	LB.	LB.	LB.		LB.	LB.	LB.	LB.
1	Fiji B ...	5½	3,212	57,102	409½	7,280	7.2	2,419	33,597	307	4,264
2	J 247 ...	"	4,325	78,889	474½	8,435	"	4,307	69,819	481	6,763
3	Java Hebbal ...	"	3,941	70,082	420	7,467	"	4,446	64,527	481	6,680
4	B 1529 ...	"	1,727	46,053	212½	2,667	"	1,378	19,139	165	2,291
5	B 3412 ...	5½	4,210	34,844	480	8,533	"	3,829	53,180	438	6,083
6	B 6450 ...	"	4,655	82,755	547½	9,733	"	3,388	47,055	378	5,250
7	B 147 ...	"	3,968	70,458	420½	7,587	"	2,205	30,825	241	3,347
8	M 55 ...	"	3,887	69,100	387½	6,889	"	3,232	44,888	379	5,541
9	B 208 ...	"	3,266	58,062	408½	7,262	"	3,735	51,875	428	5,944
10	Red Mauritius	"	"	"	"	"	"	2,507	34,819	261	3,625

No.	Variety.	1924-25. Field 17.				Average acre yield.		
		Area in cents.	Cane yield		Jaggery yield		Cane.	Jaggery.
			Per plot.	Per acre.	Per plot.	Per acre.		
(13)	(14)	(15)	(16)	(17)	(18)	(19)		
			LB.	LB.	LB.	LB.	LB.	
1	Fiji B ...	6.8	3,188	46,882	415	6,103	45,860	5,882
2	J 247 ...	"	5,215	76,691	571	8,397	71,800	7,865
3	Java Hebbal ...	"	4,592	67,529	534½	7,881	67,373	7,386
4	B 1529 ...	"	1,195	17,573	149½	2,198	27,588	2,385
5	B 3412 ...	"	4,707	69,221	56½	8,294	42,415	7,637
6	B 6450 ...	"	4,072	59,882	506½	7,443	63,231	7,477
7	B 147 ...	"	2,294	33,735	265½	3,904	44,938	4,946
8	M 55 ...	"	4,937	72,604	633	9,309	62,197	7,246
9	B 208 ...	"	3,971	58,397	504	7,897	56,111	6,868
10	Red Mauritius.	"	2,192	32,235	280½	4,125	33,527	3,875

17. *Naduveerapet Groundnut Sub-station.*—The rainfall for the year was 46.40 inches against 40.19 inches last year. In the beginning the season was unfavourable as there was no sowing rain till the third week of June.

18. *Cumbu.*—This was sown with the aid of rain received at the beginning of July. After this there was a break in the weather. Insufficiency of moisture in the young stages caused a had set-back to the crop and rains received later did not benefit it. The north-west

block which was more sandy loam in nature gave a better crop than the south-east block. The former yielded 727 lb. per acre, while the latter 579 lb. per acre. The average yield of 653 lb. is lower than the previous two years, but the land has not been manured for the last two years.

19. *Groundnut varieties.*—These occupied the north-east and south-west blocks. They were sown in the first week of July. The heavy rains in their early growth were favourable but their deficiency in the later stages affected the crop. The south-west block was badly affected by "clump" disease and could not therefore be taken for comparison. The yields of the north-east block alone are taken into consideration. The varieties continue to be erratic in their behaviour. Barbados Ceylon stands first in the average although this year it had done poorly.

TABLE No. XXIX.

*Consolidated statement of yield in lb. per acre of groundnut varieties—
Naduvesrapet sub-station for 1921—25.*

No.	Variety,	1921-22.	1922-23.	1923-24.	1924-25.	Average.
1	Local Mauritius ...		1,472	1,130	1,010	1,214
2	Transvaal		1,599	1,288	1,176	1,354
3	Carolina		1,515	1,276	1,230	1,340
4	Senegal		1,380	1,362	1,056	1,266
5	Mauritius Mauritius		1,494	1,131	1,200	1,275
6	West African ...		1,464	1,103	1,140	1,236
7	Virginia Mauritius ...		1,404	1,306	1,230	1,313
8	Virginia Runner ...		1,578	1,219	1,206	1,334
9	Virginia Bunch ...		1,416	1,500	1,200	1,372
10	Barbados Ceylon ...		1,665	1,490	1,032	1,396
11	Mozambique Mauri- tius.		1,320	1,181	924	1,142
12	Rufisque Senegal ...		1,458	1,476	1,248	1,394

Note.—In 1922-23 the yields represent the average of four repetitions while in the next two years they represent the averages of two repetitions, except in the case of local Mauritius which was repeated six times in the first year and four times in the next two years.

Similarly to last year the following varieties were grown on a plot scale and compared with each other. To these were added two bunch varieties. In 1923-24 the plots were 5 cents each repeated twice and this year they were 3 cents each repeated twice. It is unfortunate that local Mauritius was not grown along with them for comparison.

The yields per acre are recorded below :—

TABLE No. XXX.

Variety.	1923-24.	1924-25.
Local Mauritins	520	...
Madagascar	573	933
Raipur	547	866
Tatas	583	667
Big Japanese	658	483
Spanish No. 10 ... ..	...	1,167
Spanish No. 9 ... ..	...	1,333

The Spanish varieties though shorter in duration have done by far the best.

For seed multiplication purposes, Anamalai, bunch Mozambique, Spanish No. 8, Gudiyattam bunch and Small Japanese were grown; their yields are recorded below :—

TABLE No. XXXI.

Variety.	Area in cents.	Yield of plot.
Anamalai	2	14
Bunch Mozambique	3	12
Spanish No. 8	5	42
Gudiyattam bunch	7	66
Small Japanese	7	70

A trial was made last year to harvest groundnut with ploughs and it was recorded in the report that it was found to be more expensive than the local method of harvest with spades. This year's trial too has confirmed the same opinion, and yet in Chittoor district, ryots find the former method much cheaper. The question will have to be considered again in the light of further study of local conditions more thoroughly.

In the western outskirts cumbu was raised which yielded 543 lb. After this an attempt was made to raise a crop of horse-gram which however failed yielding only 39 lb. Sunnhemp sown as green manure was destroyed by caterpillars.

20. *General.*—This sub-station was started in 1917 for groundnut work. Unfortunately the soil is so uneven that the results so far obtained are very inconclusive. It has been decided to abandon this station and to establish another near Tindivanam in the same district. It is therefore proposed to start work afresh in the coming year and transfer all groundnut experiments from here and the main station to the new experimental station.

21. *Farm Receipts.*

	1923-24.			1924-25.		
	RS.	A.	P.	RS.	A.	P.
By sale of farm produce ...	6,739	6	0	7,050	11	4
By remittance into treasuries.	153	7	4	197	12	8
By book adjustment ...	51	11	8	68	12	7
By sale of green manure seeds ...	73	10	6	23	10	4
By sale of ploughs and their parts ...	27	4	10	...	...	...
By sale of fish guano ...	176	0	0	316	9	6
By fines and recoveries ...	26	4	0	34	8	8
By XXXIV-B. Stationery and Printing ...	1	4	0	0	15	1
House rent recovered from farm staff ...	...	...	...	290	4	0
By bull service ...	...	...	...	0	12	0
By sale of cotton seeds ...	...	...	...	18	12	0
Total ...	7,249	0	4	8,007	12	2

19th May 1925.

D. ANANDA RAO,
Deputy Director of Agriculture, IV Circle.

APPENDIX I.

An account of the local agriculture of the neighbourhood of the Agricultural Station, Palur.

The Palur Agricultural Station is fairly typical of a strip of alluvial soil, which lies between the Ponnaiyar and the Gadilam rivers. It is a very fertile country with a high water level. The dry lands in consequence are mainly commanded by wells, and very intensive cultivation is practised. The wet lands are irrigated from channels which are supplied from the Gadilam river, by means of anicuts built across the river to supply these. The supply is perennial and the channels are closed for only one month in the year for silt clearance, though much of the wet land is at too high a level to benefit by the channel's supply except in the rainy season when these are running full.

The agriculture of the tract has seen many vicissitudes. Indigo was at one time very extensively cultivated as is evidenced by the numerous indigo vats dotted all over the tract. The area now is insignificant, though during the last ten years this again extended, partly as a dry crop and partly as a green manure crop.

Sugarcane was at one time an important wet-land crop, but the irregularity of the water-supply owing to the silting up of the channels, the clearance of which was in the hands of the villagers, as well as the low price obtained for sugar and the trouble entailed in its cultivation caused this area to dwindle to 200 to 300 acres. Introduction of more profitable varieties obtained and the great impetus given to cane cultivation by the East India Distilleries and Sugar Factory, Ltd., Nellikuppam, who, in addition to growing vast areas of sugarcane themselves, give material help to cane growers by way of supplying setts, advance money and purchase the whole crop, relieving the ryots of the trouble in jaggery making, has now led to a very rapid revival of sugarcane crop. Wells are being sunk in dry lands, and all available land is being used for cane growing. The use of oil cakes for manuring cane is almost universal, and it has been found to pay well to manure canes heavily with oil cakes.

The groundnut crop also has seen its vicissitudes. The original or country groundnut gradually went out of favour and the crop was gradually disappearing until the Mauritius groundnut was introduced some twenty years ago, which being an earlier, more prolific variety and containing more oil, rapidly found favour and was not only grown as a rainfed crop, but owing to its early maturity was and is extensively cultivated as a hot weather irrigated crop.

As can be expected, such a rich tract of country as this is densely populated, rents are high, and holdings, especially on dry lands under well irrigation, are small. With the extensive cultivation of commercial crops very intensive cultivation is necessary in order to maintain the grain supply and this is specially the case on garden lands which are mostly in the hands of petty cultivators. In these parts groundnut is very seldom grown as a pure crop. It is almost invariably interplanted in some cereal for the groundnut rainfed crop, while on lands, commanded by wells, tenai or ragi may take its place. For the hot weather irrigated groundnut crop, ragi is almost invariably sown, and the groundnut subsequently dibbled in. Occasionally varagu (*Paspalum scrobiculatum*) precedes an irrigated

groundnut crop, in which case the latter is grown pure. So great has the value of such lands become that contrary to what one would expect and what one usually finds, practically all the available cattle manure finds its way to these and not to the wet lands. Dry land cultivation, whether irrigated from wells or purely rainfed is very intense. All crops receive two or three hand hoeings and it is thus possible to understand how, in spite of large area under commercial crops, the tract is able to maintain its food supply. The yields of dry lands cereals are very much above the average dry land yields in spite of the fact that the land has to carry a crop of groundnut as well.

Since the whole tract is alluvial, it can be readily understood that there is little difference in level between the wet and dry lands, and the former are found wherever levels permit of water being led to them. Often the dry lands adjoining have been converted into wet land by lowering their level for raising paddy and sugarcane. An interest has, however, been created in the cultivation of green-manure crops, and an increasing area of such may shortly be expected. One sees a fairly large extension of indigo from which one or two cuttings are usually taken for dye, while the subsequent growth is ploughed in as green-manure.

As far as dry land crops are concerned, the scope of the Agricultural Department is limited. The bulk of such land is cultivated on rent by the petty ryot, who cannot be blamed for not trying new methods and new crops, when one considers the high rent which he has to pay. It is only by approaching the limited number of well-to-do cultivators of such land that any improvement can be introduced.

With wet land cultivation, the matter is simpler, since large areas of this are either let on share rent or cultivated by larger land-owners who can afford to try new methods in their own interest.

The tract depends on both the south-west and north-east monsoons for its rainfall, and it seldom happens that both fail. Sowing rains usually fall at the end of June or the beginning of July, and subsequent rainfall gradually increases as the monsoon weakens, so that the bulk of the south-west monsoon rains usually falls in August and September. The rainfall of the north-east monsoon is cyclonic and is therefore much more uncertain than that of the south-west, though the total average of the former is considerably greater.

The wet lands have two seasons—May to August for the first crop and September to February for the second crop, while sugarcane is usually planted as soon as the channels are opened after silt clearance in April or May. This is possible since Gadilam, fed as it is from the Ponnaiyar which rises in Mysore, is a perennial stream.

ANNUAL REPORT OF THE KOILPATTI FARM FOR 1924-25.

I. *Season*.—Unlike the previous year which was characterized by scanty rains amounting to 23·65 inches only, this year the season has been good. From April onwards there was a fair amount of rain each month. As the rain was well distributed, all the preliminary operations were done at the proper time and the sowings were finished in season. Showers were received at fair intervals during the growing period of all the crops except cotton. This crop suffered from excess of rain in the month of March. The total precipitation for the year is 86·80" and 84·01" for black and red blocks, respectively, the average for the previous ten years being 33·06 and 83·52, respectively, for the two blocks. The total number of rainy days were also about normal, viz., 51, the average number being 55 for the two blocks taken together.

A rainfall statement giving the fortnightly totals with the average for the previous ten years is annexed. (See Statement No. 1)

II. *Black cotton soil block*.—The usual crops of this black soil tract—cumbu, fodder cholam and cotton—have been grown this year also in the customary four-course rotation, cotton occurring every alternate year in the rotation. In the year under report there were 27·78 acres under cumbu, 28·41 acres under fodder sorghum and 50·01 acres under cotton.

(i) *Cumbu*.—Cumbu has given a record yield of about 550 lb. per acre. The fields have received a dose of 140 lb. of fish-guano in addition to 12 cart-loads of farmyard manure and village ash per acre. On an average a net profit of Rs. 8 per acre, which is a fair margin for a rain-fed crop, was obtained. Unless subsequent years' results support this, fish-guano cannot be recommended for rain-fed crops on the strength of the results of this year which, as has been noted above, has been exceptionally favourable with regard to rainfall which is practically the limiting factor.

(ii) *Manurial experiments in cumbu*—(a) *Farmyard storage experiments*.—Farmyard manure collected under different methods as per the scheme of the Government Agricultural Chemist was applied to cumbu in about 2 acres, and the results are shown in Statement No. II.

The respective differences amongst the methods noted last year are practically kept up though the yields have almost doubled in every case, due obviously to very good rainfall. Although the loose box system tops the list the difference in favour of it is not great.

The experiment will be continued next season.

STATEMENT No. I.

Rainfall statistics.

Month.	Average for ten years 1914-15 to 1923-24.				Rainfall for 1924-25.				
	Black soil.		Red soil.		Black soil.		Red soil.		
	Inches.	Number of rainy days.	Inches.	Number of rainy days.	Inches.	Number of rainy days.	Inches.	Number of rainy days.	
April	First half	1.43	2.40	1.49	2.30	0.49	1	0.52	2
	Second half	1.00	1.90	0.87	2.10	...	...	...	...
May	First half	1.56	1.90	1.43	2.40	0.78	1	0.70	1
	Second half	1.05	2.30	0.96	2.20	2.11	3	2.04	3
June	First half	0.27	0.50	0.88	0.60	0.74	2	0.66	2
	Second half	0.12	0.30	0.26	0.70	...	...	0.32	1
July	First half	0.84	1.10	0.36	0.80	...	...	...	...
	Second half	0.25	0.90	0.23	1.00	2.85	3	2.80	3
August	First half	0.78	1.30	0.63	1.40	0.72	1	0.60	1
	Second half	0.90	2.00	0.91	1.90	3.00	3	1.78	3
September	First half	0.87	2.00	0.96	2.30	0.85	1	0.58	2
	Second half	0.99	2.30	1.49	2.60	4.01	5	5.08	6
October	First half	3.26	4.60	2.78	5.00	...	...	...	...
	Second half	4.36	6.80	4.57	7.10	4.63	9	3.88	7
November	First half	3.80	5.80	3.73	6.00	3.21	5	3.11	5
	Second half	4.85	5.30	4.25	5.00	4.27	2	3.88	2
December	First half	1.81	3.00	2.01	3.00	1.85	2	1.10	3
	Second half	1.84	2.00	1.93	2.40	0.35	1	0.81	1
January	First half	1.76	2.60	1.79	2.70	2.31	1	2.08	1
	Second half	0.98	1.50	0.91	1.90	...	...	0.64	2
February	First half	0.31	0.60	0.81	0.70	0.42	2	...	...
	Second half	0.18	0.50	0.17	0.50	...	...	...	...
March	First half	0.23	0.60	0.43	0.70	1.22	5	1.12	4
	Second half	0.52	1.30	0.67	1.60	2.99	2	2.81	2
Total		33.06	53.50	33.52	58.90	36.80	49	34.01	51

STATEMENT NO. II,

Statement showing the yield of cumbu from farmyard manure storage experimental plots.
1923-24 and 1924-25.

	No manure.				Byre pit with urine trap.				Byre pit with soil.				Heap & stem.				Loose box system.				Remarks.
	1923-24.		1924-25.		1923-24.		1924-25.		1923-24.		1924-25.		1923-24.		1924-25.		1923-24.		1924-25.		
	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	
Series I ...	39	117	71	271	54	168	98.5	410	56	157	98	405	54	148	99	411	55	169	111	457	Area of each plot is 10 cents.
Do. II ...	42	129	71.5	267	62	191	103	428	54	183	100.5	423	55	172	92	875	57	176	101	420	
Do. III ...	42	125	67	251	57	170	104	394	55	180	106	389	54	165	94	352	56	181	97.5	380	
Do. IV ...	87	121	64.5	230	50	156	91	341	51	155	88	536	52	157	91	343	52	162	103	404	
Average yield per plot.	40	123	68.6	254.75	55.75	171.25	98.6	393.45	54	168.75	98.1	388.25	53.75	160.5	94	370.25	55	172	103.1	415.25	
Average yield per acre.	400	1,230	685	2,547	557	1,712	986	3,932	540	1,687	981	3,882	537	1,605	940	3,702	550	1,720	1,031	4,162	

(b) *Cyanamide experiments.*—The cyanamide experiment started last year was continued this year. The difference noted last year among the different experiments practically agrees with this year's. As in last year, super by itself seems to have a depressing effect on the crop yield in spite of the favourable rainfall of this year, i.e., it has given yields less than that of the no-manure check plot. When super is applied in conjunction with cyanamide it has a good effect on the crop yield. The yield varies directly with the dose of cyanamide, i.e., an increase in the dose of cyanamide shows a proportionate increase in the yield. The highest yield has been obtained when 2 cwt. cyanamide is applied in conjunction with $\frac{1}{4}$ cwt. of super.

The results are shown in Statement No. III.

(iii) *Fodder sorghum.*—This crop was sown in 28.40 acres towards the end of September. It had the benefit of early sowing and an ideal season all through. An acre yield of 5,000 lb. was got in an area of 28.40 acres against 2,090 lb. last year. All the fields were manured with 146 lb. of fish-guano per acre. As usual the seed did not set properly owing to the peculiar weather conditions which prevail here when the grain is in the milky stage causing sugary disease.

(iv) *Cotton.*—For an area of 51.14 acres an aggregate yield of 29,037 lb. of kapas was obtained during 1923-24. The average yield per acre works out to 557 lb. From this 9,642 lb. of lint was got. The ginning percentage was therefore 33.20.

(a) *Manurial experiments on cotton, 1923-24.*—The results of the experiment with ammonium sulphate for cotton referred to in last year's report is given below.

Both the manured and unmanured plots have given the same yield. There is a slight difference in the ginning percentage in favour of the check.

1922-23. Absence of rain after the application of manure to the rain-fed crop probably accounts for the manure not showing itself. Probably it might be possible to make the fertilizer show itself to better advantage by applying it at a still earlier stage.

	1-21-1922.		1922-1923		1923-1924.	
	Yield in lb.	Ginning percentage.	Yield in lb.	Ginning percentage.	Yield in lb.	Ginning percentage.
Manured ...	482.0	31.5	488.00	32.9	557.9	31.9
Unmanured ...	433.50	31.5	380.00	32.9	556.9	32.3

STATEMENT No. III.

Statement showing the yield of cumbu from the cyanamide experimental plots for 1923-24 and 1924-25.

	No manure.				Cyanamide 1 owt. per acre.				Cyanamide, 2 owt. per acre.				Super $\frac{1}{2}$ owt. per acre.				Super $\frac{1}{2}$ owt. plus cyanamide, 1 owt. per acre.				Super $\frac{1}{2}$ owt. plus cyanamide, 2 owt. per acre.				Remarks.
	1923-24.		1924-25.		1923-24.		1924-25.		1923-24.		1924-25.														
	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.			
Series I ...	81	118	43	147	87	120	46	149	40	142	49.5	164	30	114	36	130	33	134	45.5	178	44	167	55.5	205	
Do. II ...	80	106	31.5	134	85	128	38	138	41	145	45	139	29	108	34.5	155	32	129	48	185	41	151	50.5	197	
Do. III ...	29	111	31.0	126	84	129	37.5	153	88	138	43.5	177	25	106	29.0	133	37	141	43.5	174	39	147	47.5	188	
Do. IV ...	26	109	29	124	84	130	36.5	144	87	141	41.5	171	26	103	31.0	129	28	114	46.5	186	37	149	47.5	181	
Do. V ...	25	100	27	123	83	125	35	139	34	127	37.5	155	25	107	31.5	140	34	134	40.5	159	42	155	44.0	197	
Average yield per plot.	28.2	107.8	32.96	130.8	84.6	128.4	38.6	144.6	38	138.6	44	161.2	27	107.6	32.4	137.4	32.8	130.4	44.8	178.4	40.6	153.8	49	163.6	
Average yield per acre.	564	2,158	659	2,616	692	2,528	772	2,892	760	2,772	880	3,224	540	2,152	648	2,748	656	2,608	896	3,528	812	3,076	980	3,872	

Area of each plot is 5 cents.

(b) *Sheep-penning experiment.*—In this 1,000 sheep per acre per night were penned at a cost of Rs. 8 per acre. The extra yield got over the check is 87 lb. per acre. A statement is given below:—

Statement showing the yield, etc., in the sheep-penning experimental plots, 1923-24.

Series.	Yield per plot 2 acres.	Yield per acre.	Ginning percentage.
Sheep penned	LB. 1,045	LB. 523	33.0
No manure	870	435	33.9

The statement below shows the acre yield and ginning percentage of the several selected tested strains sown on a field scale, both of which are quite satisfactory. On the whole the C type seems to be more promising both in lint outturn and yield than A. These fields are the source of supply for all seed farms.

Type.	Strain.	Total yield of kaps in lb. per acre.	Ginning per- centage.	Average yield per acre of ori- ginal and du- plicate plots.	Average ginning percentage of original and du- plicate plots.
A-3	{ Original ...	534	32.43	LB. 551	31.8
	{ Duplicate ...	568	31.09		
A-4	{ Original ...	539	33.58	536	33.6
	{ Duplicate ...	533	33.21		
A-5	{ Original ...	532	33.43	551	33.2
	{ Duplicate ...	570	32.99		
A-7	{ Original ...	515	33.13	535	33.1
	{ Duplicate ...	555	33.10		
A-8	{ Original ...	518	33.78	537	33.5
	{ Duplicate ...	556	33.21		
C-3	{ Original ...	514	33.40	542	33.0
	{ Duplicate ...	570	32.63		
C-4	{ Original ...	579	33.61	615	33.7
	{ Duplicate ...	650	33.87		
C-5	{ Original ...	534	33.91	579	34.6
	{ Duplicate ...	624	35.21		
C-6	{ Original ...	506	34.52	611	34.5
	{ Duplicate ...	716	34.47		

Originals mean—cotton plots following fodder cholam. Duplicates—Cotton after oombu. Plots are 25 cents each and are repeated five or six times according to area available.

Type.	Total yield of kaps in lb. per acre.	Ginning percentage.	Type.	Total yield of kaps in lb. per acre.	Ginning percentage.
F.C.A.-1 ...	575	33.6	F.C.C.-1 ...	703	31.5
C.F.C.A.-1 ...	613	33.1	C.F.C.C.-1 ...	738	32.0
F.C.A.-2 ...	591	32.4	F.C.C.-2 ...	671	33.3
C.F.C.A.-2 ...	601	33.3	C.F.C.-2 ...	775	33.8

III. *Red soil block*.—As reiterated in previous years' reports this piece of land is mainly intended for buildings. The nature of the soil does not allow of any special experiments being conducted. The following crops were, however, grown in the year under review:—

Field No. 2 (a), area 1.50 acres.—Cambodia cotton standing. At the early stage the crop was attacked by green caterpillars (*cosmopholia erosa*) which disappeared after completely defoliating the crop. By subsequent treatment the crop revived and bore. Again at a later stage mealy bug was also in evidence. The crop is standing and a fair yield is expected.

Field No. 5 (a), Guavas.—The orchard is receiving better attention. Cultivated and green fallows are practised in order to improve the soil and its moisture contents. The guava fruits were exceptionally good, partly due to the better treatment and better rainfall. They were big-sized and pulp.

Field No. 5 (b), area 83 cents.—Chitrai cholam sown on 1st April 1924 harvested on 19th July 1924. Gave an acre yield of 743 lb. of grain and 4,086 lb. of straw.

Field No. 5 (b), area 80 cents.—Cambodia standing. Same as Field No. 2 above.

Field No. 6 (a), 80 cents—Tiruppur cambodia which was standing at the time of last year's report has yielded 590 lb. of kapas per acre. This was followed by maize.

Field No. 6 (b), area 70 cents.—Kullan cumbu was raised as a summer catch crop, having succeeded within two months chillies, which yielded heavily and thus exhausted the soil. The earheads were small and not properly filled. The land had no rest. This gave an acre yield of 1,050 lb. of grain per acre. This was followed by season ragi which was sown on 8th September 1924.

Field No. 7 (a), area 73 cents.—Cambodia which was standing at the time of last year's report gave an acre yield of 425 lb. of kapas. This crop was followed by Periyamanjal cholam. As usual this was affected by sugary disease when the crop was in the milky stage. However it has yielded plenty of straw—6,884 lb. of straw and 205 lb. of grain.

Field No. 7 (b), area 73 cents—Bengal daincha. Somehow daincha did not set seed properly.

Field No. 9 (a), area 64 cents—Guinea grass. This is kept as a nursery to supply green slips to applicants to grow green fodder crop.

Field No. 9 (b), area 1.04 acres—Periyamanjal cholam for fodder. This gave an acre yield of 8,450 lb. of straw.

Field No. 10, area 2.64 acres.—This was cropped with Irungu cholam. It has given an acre yield of 2,194 lb. It will be seen from the above that Irungu cholam is decidedly a lower yielder than the Coimbatore Periyamanjal cholam. Periyamanjal cholam never succeeds as a grain crop during the monsoon as it gets affected with sugary disease when grains are being formed. This accounts for its not replacing Irungu cholam rapidly.

IV. *Livestock*.—There were four pairs of animals at the beginning of the year under report. One pair died early in April 1924. Two pairs of animals were bought in the course of the year. The health of these five pairs of animals was good throughout.

The breeding bulls (three bulls and two buffaloes) were active throughout. From the statement of the services appended below, it will be seen that the Ongole bull had not been popular in the tract, while other bulls have been made the full use of in this tract. The total receipts got from bull service is Rs. 357.

*Statement showing the services of the farm stud bulls during
1924-25—Kovilpatti Agricultural Station.*

Months.	Mannan.	Krishnan.	Ongole.	Buffalo No. 1.	Buffalo No. 2.
1924.					
April	5	3	...	10	16
May	12	14	...	8	6
June	6	9	1	16	13
July	2	6	2	7	16
August	9	4	2	10	7
September	7	1	...	9	10
October	4	...	3	4	5
November	7	5	3	11	13
December	3	5	...	20	20
1925.					
January	8	6	5	19	25
February	8	8	2	15	11
March	18	4	6	17	10*
Total	89	65	24	146	152

The receipts of the farm amounted to Rs. 9,227.

An account of the local agriculture of the tract is appended as Appendix I of the report.

A glossary of English, Vernacular and Botanical names of crops referred to in this report is enclosed as Appendix II.

A. V. TIRUMURUGANATHAM,
Assistant Director of Agriculture,

19th May 1925.

in charge, VI Circle

APPENDIX I.

An account of the local agriculture of the tract.

The Koilpatti Agricultural Station consists of two blocks, one on the black cotton soil and the other on the red soil, a coarse gritty loam consisting of decomposed gneiss and quartzite. Each of these blocks is meant to represent a distinct agricultural tract with different seasons crops and agricultural practices.

1. *The black cotton soil tract.*—The block cotton soil of the Tinnevely district varies considerably both in depth and colour. The best quality is known as 'Karisal' (black soil) and is represented on the agricultural station. On the farm this varies in depth from about 5 to 7 feet and rests on a bed of canker and nodular limestone which in its turn rests on a rotten garnetiferous gneiss. Small nodules of canker and some garnetiferous sand are found in the soil itself. Other inferior black cotton soils are represented in the tract, such as 'veppal,' a grey coloured soil, which is shallower, and contains much more canker, and 'pottal,' which is a shallow slightly alkaline soil.

2. *Rainfall and season.*—The total rainfall of the district is fairly typical of the cotton-growing tracts. The sowing season commences with the setting in of the north-east monsoon, i.e., the end of September to October. It is later in the south and earlier in the north of the district. The average rainfall from October to December for the whole district is 16.34 inches. This gradually diminishes in December, and January to March are usually dry with occasionally a heavy rain, the average for these three months being 3.35 inches, though in the cotton tracts it is only about 2.50. During this time south-easterly breezes are usually experienced which materially assist in ripening the cotton and in bursting the bolls. In the north of the district, cotton picking may commence in January, though more often in February, and lasts for about one month. In the south with its later sowing, it seldom commences before March, and as karunganni is the predominating variety here, picking may last from 2 to 5 months, according to the April and May rainfall. In these two months heavy showers or summer rains are usual, which give the cotton a second flush or summer picking. The average fall of these summer rains is 3.58, though this varies from season to season. Occasionally they fail together, while in other years there are often 5 to 6 inches; in 1907-08, 11.25 inches were recorded in the agricultural station. Light showers or heavy mist at this time are most unwelcome as they cause buds and young bolls to shed. From June to September occasional light showers occur, averaging 3.53 inches, which are usually only utilized for ploughing the land in preparation for the sowing season.

3. *Rotations and crops.*—The common rotation is cotton one year and cumbu (*Pennisetum typhoides*), the principal food-grain of this tract, the next, with an occasional crop of 'chola nattu' or fodder cholam (*Andropogon sorghum irungu* var.) in place of the cumbu. This rotation, of course, varies with each cultivator. Poorer ryots often grow cotton year after year on the same land, while richer ryots either increase the cereal, or in some cases grow a three-course rotation of cotton, cumbu and Bengal gram (*Cicer aristinum*); pulse such as cow-gram (*Vigna catiang*) and mochai (*Dolichos lablab*) are usually mixed with the cumbu, but there is really no suitable pulse crop for the black soil in the district.

Many rich ryots pride themselves on their 'cumbu-adi,' i.e., land cropped year after year with cumbu. Such lands receive an undue proportion of manure and are usually very rich, too rich in fact for cotton which tends to run to leaf if grown. If a sowing rain chances to occur in August, red gram (*Cajanus indicus*) is occasionally sown as a pure crop, but with this exception all the other crops are sown with the north-east monsoon rains. Fodder cholam is usually sown first in the season and then cumbu mixed with pulses. After this is completed, cotton is sown. Occasionally even the season for cotton is lost and then Bengal gram (*Cicer arietinum*) or horse-gram has to take its place. The seed rate for fodder cholam is very high, 120 to 150 lb. of seed per acre against 10 to 25 lb., the ordinary seed rate for fodder sorghum in other countries. As a consequence the crop seldom grows more than three feet high, but gives a very fine leafy straw and excellent fodder. This is usually bundled and stacked with the cumbu straw, thus giving a fairly good composite fodder for the dry months or for times when the cattle are at hard work. This cholam cannot in any way be considered as a grain crop, as the seed obtained is seldom more than sufficient for sowing during the next season. Cotton being the most important crop of the black soil, it is with this that most of the experimental and demonstrational work on the agricultural station had been done, and it is necessary that a more detailed account of the Tinnevely cottons should be given. Of these there are two varieties found in the district, usually sown mixed together, viz., uppam (*Gossypium herbaceum*) and karunganni (*Gossypium obtusifolium*). Of recent years a very inferior cotton known as pulichai or mailam cotton, the jari of the United Provinces, has managed to establish itself on account of its high ginning outturn. The karunganni is generally supposed to be the original 'tinnies' cotton of commerce. Old men will tell one that this was the only variety grown when they were young. The 'tinnies' of to-day consists of a mixture of the two varieties, though that of the north contains as much as 70 to 95 per cent of uppam, and that of the south is sometimes pure karunganni. Quantities of cotton are also brought in from the adjoining district of Madura as well as from Coimbatore and Trichinopoly which are classed as tinnies. The value of cotton exported in 1912-13 from Tuticorin was Rs. 203 lakhs out of a total of Rs. 407 lakhs for the whole of the Presidency, i.e., about 50 per cent. Of this, Rs. 125 lakhs went to Japan, Rs. 30 lakhs to the United Kingdom, Rs. 49 lakhs to Germany and Rs. 3.7 lakhs to Belgium.. 'Tinnies' on the Liverpool market usually valued second and sometimes highest of the Indian cottons, and when one compares the pure lint of each of the two varieties; it is difficult to understand why such a high price is paid for a mixed lint. Uppam has a short, harsh, but very white staple, while the karunganni is much finer, longer and stronger and a pale cream colour. As regards the plant itself, the uppam is a pure black cotton soil variety and is of a tall straight habit with short 'boll bearing' branch. It comes to maturity a little later than the karunganni, but as the picking lasts for only one month it will often give a crop when the karunganni would fail. The bolls open well and the kapas holds together and is easy to pick. The ordinary type of karunganni plant, on the other hand, branches freely and forms a smaller and more bushy plant. The bolls begin to burst earlier than the uppam, but do not ripen all at one time. The picking lasts much longer—and probably for this reason the plant can, if rain occurs, recover more easily than the uppam and gives therefore a much heavier 'summer' picking. The karunganni is not a pure black cotton soil variety, but will often give fair crops on red soil. Cotton is very seldom grown mixed with cereals. Very occasionally one sees a thin sowing of tenai (*Setaria Italica*), but this is rare. In the south of the cotton tract

coriander is often sown broadcast with cotton, and of recent years, owing to the high price of the commodity its cultivation has extended northward and it has become a much more prominent subsidiary crop. Throughout the tract either horse-gram (*Dolichos biflorus*), cow-gram (*Vigna catiang*) or Bengal gram (*Cicer arietinum*) are sown behind the plough in furrows about eight feet apart. In a few places one also sees castor and pulichai (*Hibiscus cannabinus*) sparsely sown with cotton either broadcast or in plough furrows.

4. *Manuring and soil improvement*.—During the dry months the ryot's time is employed in carting silt from the beds of rain-fed tanks on to his lands. Thus red sandy silt is usually carted on to black cotton soil, and black silt on to red soil. This soil mixing is carried on to such an extent that when freshly ploughed it is often possible to distinguish separate fields by the colour of the newly turned soil. The usual method of manuring is that of folding sheep on to the land. The ryots of a village usually join together and keep a common flock which are folded on to each man's land in turn. One thousand sheep for one night is considered sufficient for one acre. Manuring with cattle dung is also practised and is chiefly applied to the cumbu crop; though, if the cultivator possesses land under wells, he is inclined to apply the manure here by preference. Good cultivators take great care to preserve the dung heaps properly. Each man has his own pit in the village, in which cattle droppings and refuse from the house and fields are put. A heap of tank silt is often seen near the manure pit, and some of this is, from time to time, thrown over the surface of the manure. Even when manure is carted on to the fields it is often neatly heaped in one large heap and covered over with soil or silt until the time comes for it to be ploughed in.

5. *Cultivation*.—Unlike the practice in many black cotton soil tracts of India, the ryot, as soon as the crop is harvested, takes advantage of the first ploughing rain to plough his lands. This practice is probably the result of experience; the black soil of the district, being shallow, cannot crack to such an extent as deep black soil would. Thus land cropped with cumbu has often received its first ploughing before the cotton picking has commenced; that under cholam is usually ploughed up in April and May, and that under cotton after the cotton stalks have been pulled up, which may be any time from June to September. On the black soil the only bullock power implement is the country plough, and seed of the main crop is always sown broadcast and ploughed in, though secondary crops such as cow-gram and mochai are usually sown in lines, the seed being dropped behind the plough. After-cultivation in the case of the cereals consists of ploughing through the crop. This is seldom done with the cotton which is hand-hoed three times instead. Of recent years the seed drill and implements for inter-cultivation have been introduced by the department and their use is becoming common.

6. *Red soil tract*.—This covers a large area of the district and is usually found on slightly raised elevations as if the black soil had filled up the shallow valleys between. It is a coarse gritty soil full of angular fragments of quartzite. It sets hard when dry and very easily cakes on the surface after rain. The seasons are not so well defined as on the black soil and crops are usually sown either with the summer rains of April and May or with the showers of the south-west monsoon from June to September. On unirrigated land only the hardiest of cereal crops such as varagu (*Paspalum scrobiculatum*), samai (*Panicum miliare*), kudiraivali (*Panicum frumentaceum*), cumbu and cholam are grown, while pulses always form a prominent part of the mixture. These include *Vigna catiang*, *Phaseolus radiatus*, *Phaseolus mungo*, *Phaseolus aconitifolius*, *Dolichos*

lablab, *Dolichos biflorus*. On the very poorest land only samai (*Panicum miliare*) and horse-gram (*Dolichos biflorus*) and occasionally senna (*Cassia senna*) are grown, and these only as pure crops. Karunganni cotton is sometimes grown as a north-east monsoon crop; and in certain confined tracts where the south-west monsoon comes through gaps in the ghats, groundnuts have, of recent years, been introduced. As can be expected the ryots do not as a rule depend entirely on these lands. Their object is to possess a well and to improve the land by carting on to it tank silt in very large quantities and by heavy manuring. Many of such garden lands, though lying entirely within an area of red soil, are now dark rich loams. Here valuable garden crops are grown, such as tobacco, onions, sweet potatoes, chillies and brinjals and, within the recent years, cambodia cotton. This has now become a regular rotation crop, especially on land where the water-supply may prove to be scarce. These are grown in rotation with cereals, while occasionally a catch crop between seasons of kadaikanni (*Panicum, milliaceum*), a six-week crop, is taken. Of the cereals, ragi (*Eleusine coracana*) is perhaps the commonest and can be grown both in the monsoon and in the hot weather season. Cumbu and cholam are grown only as hot-weather crops. Of the other crops, tobacco, chillies, brinjals and sweet potatoes are grown as monsoon crops, while onions are grown in both seasons. The usual mixture of gourds, pumpkins, spices and curry-stuffs are also seen.

7. *Dry cultivation*.—The ground is ploughed when a ploughing rain falls and seed is sown broadcast and ploughed in. Red gram and *Dolichos lablab*, if sown, are put in lines by dropping the seed behind the plough. Occasionally, if rain occurs when the crop is young, an implement resembling a large wooden rake, drawn by a pair of bullocks, is used to break the crust on the surface. When the crop is well established it is ploughed through and left to ripen.

8. *Garden cultivation*.—The cultivation of garden lands is much more intense: after manuring and ploughing the land is laid out into small square beds with necessary supply channels and the whole surface is flooded. Into this the seedlings, cuttings or sets, as the case may be, raised previously on a nursery, are planted. Kadaikanni (*Panicum milliaceum*) is the only crop which is sown *in situ*, and this is sown before flooding. This transplanting of all cereals in garden lands is peculiar to this district. The after-treatment consists in hoeing, weeding and irrigating. Tobacco receives the special treatment usually given to this crop, such as topping, and suckering as well as a top dressing of the salt earth which is collected in certain villages at the base of walls and houses. The tobacco is always sold by weight and is used only for chewing, so ryots prefer the plants with the coarsest leaves and thickest ribs.

APPENDIX II.

Glossary of crops mentioned in the Report.

English name.	Vernacular name.	Botanical name.
Tinny cotton ...	Karunganny paruthi.	Gossypium obtusifolium
Spiked millet ...	Cumbu ...	Pennisetum typhoideum.
Fodder sorghum ...	Cholanathu ...	Andropogon sorghum.
Tobacco ...	Pukayilai ...	Nicotiana tobacum.
Cambodia cotton ...	American paruthi, London paruthi or Peria paruthi.	Gossypium hirsutum.
Ragi ...	Keppai ...	Eleusine coracana.
Cholam ...	Cholam ...	Andropogon sorghum.
Chillies ...	Milakoy ...	Capsicum annum.
Guinea grass ...	Guineapul ...	Panicum maximum.
Maize ...	Maccacholam ...	Zea mays.

**ANNUAL REPORT OF THE COCONUT STATIONS
IN THE KASARAGOD TALUK OF SOUTH
KANARA DISTRICT FOR THE YEAR 1924-25.**

An account of the local agriculture in the neighbourhood of the coconut stations with special reference to coconuts is printed as an appendix to this report.

2. *The season.*—The season was almost similar to that of last year. In April and May 8·81 inches of rain were recorded at Nileshwar and 5·91 inches at Kasaragod. This rainfall was quite refreshing to the coconuts young and old after a long drought due to the failure of the north-east monsoon of the previous year.

The south-west monsoon fall was the heaviest on record. The concentrated and heavy down pour kept the soil too wet to allow any growth and encouraged leaf-rot disease and surface wash. The former was controlled by spraying with Bordeaux mixture and the latter to some extent by deep ploughing and bunding. The north-east monsoon rains again failed. The subsequent hot weather was severe and the heat was increased considerably by the cloudy weather that prevailed during February and March. The resultant ill-effects were greatly minimized by repeated cultural operations. The season was on the whole abnormal and far from conducive to the welfare of coconuts in general. For further details vide the rainfall statement below :—

TABLE I.

Statement of rainfall.

Month.	Average rainfall at Kasaragod for 40 years.	Rainfall for 1923-24.		Rainfall for 1924-25.	
		Kasaragod.	Nileshwar.	Kasaragod.	Nileshwar.
April	1·64	0·12	1·29	2·70	4·42
May	6·78	3·18	0·94	3·21	4·39
June	38·03	35·50	32·95	38·73	48·85
July	38·70	39·05	45·93	45·76	50·10
August	24·00	37·15	46·62	31·47	33·13
September	9·85	8·81	7·81	9·67	12·50
October	6·82	0·95	0·84	1·43	1·43
November	2·78	1·80	1·83	1·50	0·69
December	0·58	0·60	0·88	...	0·12
January	0·23	...	0·15	...	...
February	0·04	...	...	...	...
March	0·13	2·44	0·27	1·20	...
Total	129·53	129·60	139·50	135·67	155·82

3. *Pilicode No. I Station.*—The station was further extended by 7·70 acres.

(i) *Planting*.—On account of the fact that the red laterite soil which this station represents constitutes the largest area available for coconuts in the West Coast districts, a plot has been set apart for the trial of the world varieties of coconuts. Planting was done one foot deep with five world varieties—122 seedlings in all—with a manuring of 2 lb. fish-guano, 1½ lb. lime and 7½ lb. ashes per tree in twelve rows in Block H as detailed below :—

Fiji variety.	{	Damy Dina	13 plants.	} These 52				
		Niu Damu	11 do.		} plants were			
		Medium dwarf	12 do.			} planted in		
		Ringed nut... ..	3 do.				} three rows	
		Rotuma nut	4 do.					} of 10 and
		Long Tongan green	3 do.						} two rows of
Round long pointed	4 do.	} 11 each.						
Variety marked X	2 do.		} 31 plants in					
Straits Settlements.	{			Apricot	10 do.	} three rows.		
				Green	11 do.		}	
				Ivory	10 do.			}
Laccadives	21 plants in two rows.							
Andamans marked GH and BH	9 plants in one row.							
Bengal Barisal	8 plants in one row.							

Blanks were filled up with Nanminda seedlings as follows :—

- 12 in surface planting plot.
- 8 one foot deep planting plot.
- 1 two feet deep do.
- 4 three feet deep do.
- 1 each in Chingleput and Indupalli lines.
- 1 in Block C.
- 2 in D and 3 in E of the general planting.

The last set alone from the trial plot with seedlings of the same age.

(ii) *Cultivation*.—Before the monsoon, the guntaka or cultivator was worked in all the blocks followed by the Monsoon plough during rains to aid the soaking in of as much of the rain water as possible and to minimize surface wash. Subsequently either the cultivator or the guntaka was again worked once in every month in all the blocks during the dry months and the surface was kept perfectly loose to conserve moisture.

(iii) *Depth of planting*.—The death-rate in different sets of this experiment started in 1923-24 was as below :—

Description of planting.	Date of planting.	Number of seedlings planted.	Death observed in 1923-24.	Death observed in 1924-25.
Surface planting	4th June 1923.	31	12	...
1 foot deep planting	Do.	32	8	1
2 feet do. do.	Do.	31	1	...
3 feet do. do.	Do.	32	4	...
Total		126	25	1

The death-rate in the surface planting was the highest. The plants in 2 and 3 feet deep pits look healthier. As the seedling trees have advanced in growth the death-rate in general is low. One in each died in the following varieties: Laccadives, Andamans BH, Fiji, Kasaragod irregular, Barisal and Nanminda.

(iv) *Flowering*.—The following statement shows the rate at which the seedling trees are flowering:—

TABLE II.

Date of planting.	Number planted.	Treatment.	Number of flowers.		Remarks.
			1923-24.	1924-25.	
May 1918	356†	Manured with fish-guano ashes and lime as detailed in Appendix A.	2*	23	* In the trial plot. † Including 20 in the trial plots.

(v) *Manuring*.—All the manurial experiments started last year and as detailed below were continued:—

TABLE III.

Plot.	Treatment.	Manures.
I	Mineral nitrogen	2 lb. ammonium sulphate per tree.
II	Organic nitrogen	5 lb. fish-guano per tree.
III	Mineral nitrogen plus phosphoric acid (Total P ₂ O ₅ content equal to plot II.)	2 lb. ammonium sulphate plus 2½ lb. superphosphate per tree.
IV	Mineral nitrogen plus potash.	2 lb. ammonium sulphate plus 1 lb. potassium sulphate per tree.
V	Common salt plus ashes ...	2 lb. sodium chloride plus 10 lb. coconut ash per tree (salt applied in 2 doses, May and November 1 lb. each time).
VI	Mineral nitrogen plus ashes ...	2 lb. ammonium sulphate plus 10 lb. coconut ash per tree.
VII	Organic nitrogen plus ashes ...	5 lb. fish-guano plus 10 lb. ashes per tree.
VIII	No manure	
IX	Complete mineral manure ...	1 lb. potassium sulphate plus 2 lb. ammonium sulphate plus 2½ lb. superphosphate per tree.
X	Ashes	10 lb. coconut ash per tree.
XI	Cattle manure	100 lb. of cattle manure per tree.

As it is not time yet, no appreciable difference is noticeable among plants under different treatments. Further all the remaining trees were manured with the usual dose of 3 lb. fish-guano and 10 lb. ashes per tree.

(vi) The general condition of trees is on the whole satisfactory. The two-year old seedlings of the Presidency varieties planted one foot deep during the previous year are in very good condition.

4. *Nileshwar No. II Station*—(i) *Planting*.—There was no fresh planting in the year except filling up blanks as below :—

1 in Block I.
14 do. VII.
17 do. VIII.

—
32
—

Seedling trees planted on the surface in 1918 and 1919 in Blocks I to VI have mostly formed stems and there is a prominent bulging of the bole just above surface. They are all leaning to one side in the direction of the wind. They seem to require more anchorage. As a trial, therefore, one row of 11 trees in Block I, 1918 planting, was lowered this year by 2 feet. Their growth was checked but no tree has died

Depth of planting.—In this station also surface planting is compared with one foot deep planting. Pit planted seedlings look slightly better than the others.

(ii) *Early and late germinated* seedlings planted during last year for comparison have not shown any marked difference.

(iii) Cultivation and manuring were given as in Station No. I described above.

(iv) The manuring experiment giving 100 lb. cattle manure per tree started last year was repeated.

(v) The flowering statement is appended.

TABLE IV.

Date of planting.	Number planted.	Treatment.	Number of flowers.		Remarks.
			1923-24.	1924-25.	
May 1918 ...	516	Manured with fish-guano, ash and lime as detailed in Appendix D.	16	145	
June 1919 ...	237		...	18	

(vi) The general condition of the trees in the station continues to be the best of all the three stations and a larger number of trees have flowered, as will be seen from the flowering statement above.

(vii) The study of the green-manure crops was continued and the following varieties were tried in the outskirts: "*Tephrosia* from Cocraft's Estate," *Tephrosia candida*, *Tephrosia pumpure*, *Centrosema plumieri* and *Crotalaria striata*. Seeds of these have been collected for further trial.

5. *Nileshwar Station No. III (Sands)*—(i) *Planting*.—No fresh planting was done except filling up four blanks in Block IV.

(ii) *General manuring*.—As the soil is a barren sand, double the dose of manure applied in other stations is given here.

Cattle manure experiment.—The first three rows of Block I was treated with 100 lb. cattle manure per tree.

(iii) *Cultural treatments* were the same as in other stations.

The condition of seedlings is generally good but they have not grown as fast as in the first two stations. Very few trees have formed stems and none has flowered so far though they were planted at the same time.

(iv) *Nursery*.—2,225 seed nuts from selected trees of Nanminda village and 950 from Kasaragod farm were planted in the nursery in addition to the following world varieties and also 145 nuts from Kasaragod from trees of different ages for comparative study :—

Nanminda...	...	...	...	...	...	2,225
Kasaragod...	...	...	...	...	...	950
Bombay ...	...	...	...	...	...	132
Mysore RH 3	..	..	...	...	...	} 6
GH 3	...	...	...	...	...
Philippine 1st set	...	...	...	...	...	23
Chowghat dwarf ...	...	...	...	...	...	16
Kasaragod different aged trees ...	...	...	...	...	...	145
Andamans...	...	..	...	...	...	36
Cochin-China	...	...	...	...	...	40
Philippines 2nd set	...	...	...	...	...	24
Siam	...	...	...	...	...	23
Java	...	...	...	...	...	49
						Total ... 3,669

Out of these the following were discarded as they failed to germinate:—

Nanminda	...	...	...	...	...	83
Kasaragod...	...	...	...	...	...	72
Bombay ...	...	...	...	...	...	123
Chowghat ...	...	...	...	...	...	8
Philippines 1st set	...	...	...	...	...	21
						Total ... 307

6. *Coconut Station No. IV, Kasaragod*.—(i) *The general condition* of trees continues to be good. There has been beetle attack as usual but attention paid to kill beetles every month during harvest has

greatly reduced the damage. Thirteen young trees planted in 1917 started flowering, as shown in the flowering statement below :—

TABLE V.

Year of planting.	Number planted.	Treatment given.	Number flowered.		Remarks.
			1923-24.	1924-25.	
1917 ...	341	(1) Ploughing and hoeing round.	6	13	(1) Main planting.
1918 ...	156	(2) General manuring at 2½ lb. fish-guano + 3 lb. lime + 10 lb. ashes.	...	...	(2) Under planting.
1919 ...	139	.	...	...	Do.

The growth of under-plantings has not improved. They remain shaky and are lodging. To prevent this a few of them were lowered last year and they do well now. Encouraged by this all the seedlings of Block I except those of alternate rows in the west-end plot were lowered. The lowered ones had a depression of growth but none have died so far.

(ii) *Yield*.—The harvest was done regularly every month and Table VI shows the monthly outturn of nuts of various blocks and the average yield for the past six years :—

TABLE VI.
Yield statement.

Block No.	Monthly harvests.												Average for the past six years.			Total for 1924-25.	No. of trees harvested, 1924-25.	Average per tree . 1924-25.
	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	No. of trees harvested.	Total yield.	Average per tree harvested.			
I	952	1,370	1,369	691	667	423	501	285	245	310	347	672	133	7,771	58.42	7,332	142	55.15
II	1,212	1,607	1,275	992	677	441	487	345	270	287	532	936	193	7,965	41.26	9,061	181	50.06
III	378	397	224	77	42	58	60	34	19	45	94	257	61	1,502	24.62	1,685	75	22.46
IV	1,100	1,547	773	570	161	335	832	321	284	275	272	675	93	4,833	51.96	6,645	100	66.45
V	463	564	347	227	155	148	122	113	100	41	324	460	75	2,962	39.36	3,064	86	35.50
VI	1,082	1,488	906	583	452	368	246	224	217	161	578	808	121	6,961	57.52	7,109	123	56.79
VII	412	418	324	275	165	187	127	78	60	74	271	401	89	2,789	31.34	2,792	101	27.64
Office pound. VIII	544	466	327	245	183	167	143	119	116	93	322	252	...	...	...	2,977	85	85.06
IX	1,267	1,660	1,145	932	604	568	418	398	187	240	666	1,008	162	9,143	56.43	9,093	141	64.49
X	1,087	1,310	765	889	270	324	380	133	141	271	561	874	126	5,569	44.20	6,455	140	46.11
X	423	315	142	91	117	150	118	33	104	109	179	337	34	2,243	65.97	2,118	35	60.51
Total ...	8,920	11,142	7,597	5,072	3,493	3,169	2,384	2,083	1,743	1,906	4,144	6,678	...	...	...	58,831	1,159	50.76

The total number of nuts obtained during the year was 58,831 against 61,054 of last year. The decrease in the yield might probably be due to the failure of the north-east monsoon of 1923-24 and to the depression of trees on account of the heaviest crop yielded in the preceding year.

(iii) The experiment started in 1918 for the purpose of determining the influence of manure application to adjacent rows of trees gives the following results (vide statement below) :—

TABLE VII.

Particulars.	No. of bearing trees	1918.		1919.		1920.		1921.		1922.		1923.		1924.	
		Nuts.	Percentage of increase.	Nuts.	Percentage of increase.	Nuts.	Percentage of increase.	Nuts.	Percentage of increase.	Nuts.	Percentage of increase.	Nuts.	Percentage of increase.	Nuts.	Percentage of increase.
Manured rows ...	6	88	177	201	218	282	265	289	339	385	291	331	317	360	
Two adjacent rows ...	14	256	501	196	497	194	590	280	711	274	582	227	542	312	
Two rows, one next adjacent row ...	13	293	380	129	412	161	565	186	642	219	566	190	436	149	

The manurial experiments started in 1922-23 and 1923-24 as detailed below were continued :—

Series I—Blocks IV and VI.

		LB. PER TREE	
Block IV.	Plot I.	Nitrogen = Ammonium sulphate	... 3
		P ₂ O ₅ = Superphosphate	... 5
		K ₂ O = Potassium sulphate	... 1
" "	Plot II.	Nitrogen = Ammonium sulphate	... 3
		P ₂ O ₅ = Superphosphate	... 5
		No manure.	...
Block VI.	Plot IV.	Nitrogen = Ammonium sulphate	... 3
		P ₂ O ₅ = Superphosphate	... 5
		K ₂ O = Potassium sulphate	... 1
" "	Plot V.	C ₂ O = Lime	... 3
		P ₂ O ₅ = Superphosphate	... 5
		K ₂ O = Potassium sulphate	... 1
Plot VI.		C ₂ O = Lime	... 3
		Nitrogen = Ammonium sulphate	... 3

Series II—Block IX.

Plot I	...	20 lb. coconut ash per tree.
" II	...	20 lb. ash. and 3 lb. ammonium sulphate per tree.
" III	...	100 lb. farm yard manure.
" IV	...	No manure.

Series III—Block V.

Plot I	...	Fish-guano 10 lb. per tree.
" II	...	Fish-guano 10 lb. and 20 lb. ashes per tree
" III	...	Copra cake (20 lb.) per tree.

Series IV—Block VII.

- Plot I ... Salt 5 lb. plus 10 lb. ash per tree.
 Plot II ... 10 lb. ash alone per tree.

Series V—Block II.

- Plot (1) ... 10 lb. lime per tree plus green manure.
 Plot (2) ... 10 lb lime per tree.
 Plot (3) ... No manure.

The yields of the middle row of trees under manurial trials were recorded in the statement below :—

TABLE VIII.

Block and plot numbers.	Nature of treatment.	Number of trees in the plot.	Bearing summary.												Remarks.		
			1918.		1919.		1920.		1921.		1922.		1923.			1924.	
			Number of nuts.	Average per tree.	Number of nuts.	Average per tree.	Number of nuts.	Average per tree.	Number of nuts.	Average per tree.	Number of nuts.	Average per tree.	Number of nuts.	Average per tree.		Number of trees in the plot.	Number of nuts.	Average per tree.
<i>Block IV. Series I.</i>																	
Plot (1) ...	N + P ₂ O ₅ + K ₂ O ...	8	115	14	189	24	526	66	500	63	561	70	443	55	10	647	65
" (2) ...	N + P ₂ O ₅ ...	9	89	10	232	23	439	54	460	51	651	72	430	53	9	746	83
" (3) ...	No manure ...	10	290	29	488	49	558	56	578	58	630	63	622	62	10	454	45
<i>Block VI.</i>																	
Plot (4) ...	N + P ₂ O ₅ + K ₂ O + Cao.	8	401	50	342	43	472	59	454	57	497	62	459	57	10	493	49
" (5) ...	P ₂ O ₅ + K ₂ O + Cao.	11	265	24	306	28	654	59	410	37	618	56	559	51	12	550	46
" (6) ...	Nitrogen (Ammonium sulphate).	11	322	29	527	48	645	59	786	71	601	55	852	77	12	510	43
<i>Block V.</i>																	
Plot (7) ...	N + K ₂ O ...	4	60	15	86	22	143	36	124	31	181	45	172	43	5	126	21
<i>Block IX. Series II.</i>																	
Plot (1) ...	Ash alone ...	6	60	10	159	26	184	31	222	37	242	40	228	38	6	119	19
" (2) ...	Farm yard manure ..	8	181	23	283	35	248	31	293	37	359	45	278	35	8	389	49
" (3) ...	Ash + Ammonium sulphate.	8	95	12	147	18	171	21	232	29	388	48	261	33	8	294	37
" (4) ..	No manure ...	6	165	28	195	33	232	39	319	53	267	45	290	48	6	224	37
<i>Block V. Series III.</i>																	
Plot (1) ...	Fish-guano ...	4	53	13	130	33	78	18	127	32	104	26	141	35	5	105	21
" (2) ...	Fish-guano + coconut ash.	4	8	2	58	15	120	30	85	21	132	33	126	32	5	87	17
" (3) ..	Copra cake alone ...	7	60	9	157	22	156	22	193	28	244	35	223	32	9	180	20
<i>Block VII. Series IV.</i>																	
Plot (1) ...	Salt + ash ...	5	46	9	87	17	136	27	184	37	129	26	180	36	8	113	14
" (2) ..	Coconut ash alone ...	5	19	4	125	25	142	28	146	29	149	30	187	37	6	142	24
<i>Block II. Series V.</i>																	
Plot (1) ...	Green manure + lime.	19	108	6	428	23	751	40	892	47	1,022	54	1,354	66	19	812	43
" (2) ...	Lime alone ...	11	60	5	187	15	285	26	318	29	458	42	491	45	11	286	26
" (3) ...	No manure ...	13	316	24	542	49	534	41	659	51	720	55	668	51	13	326	25

Started in 1922-23.

Started in 1923-24.

It is too early to draw any conclusions. The nuts of the trees of the middle row of manurial plots were stored and milled separately in the iron mills at Kasaragod, and the following statement shows the results of milling :—

TABLE IX.

Series No.	Block No.	Plot No.	Nature of treatment.	Percentage of		
				Copra to 100 nuts.	Oil to copra.	Cake to copra.
I	IV	1	N + P ₂ O ₅ + K ₂ O	32.25	61.11	37.07
		2	N + P ₂ O ₅	34.48	58.91	35.59
		3	No manure	32.33	62.09	38.47
	VI	4	N + P ₂ O ₅ + K ₂ O + CaO	32.77	61.69	37.84
		5	P ₂ O ₅ + K ₂ O + CaO	34.21	55.20	40.49
		6	Nitrogen	34.50	62.00	34.76
II	V	7	N + K ₂ O	36.20	57.25	36.87
		1	Coconut ash	34.72	58.33	37.05
	IX	2	Coconut ash + nitrogen	35.38	60.74	37.85
		3	Farmyard manure	35.21	59.34	35.68
III	V	4	No manure	34.72	59.77	34.64
		1	Fish-guano	30.87	54.28	40.12
		2	Fish-guano + ash	37.52	55.05	38.64
		3	Copra cake	33.06	53.06	37.14
IV	VII	1	Coconut ash + salt	26.97	55.44	36.27
		2	Ash alone	32.78	56.63	35.19
V	II	1	Green manure + lime	36.30	61.64	35.31
		2	Lime alone	34.82	62.68	35.31
		3	No manure	32.72	55.18	43.06

Samples of copra and oil are being analysed by the Government Agricultural Chemist from each of the monthly harvests from each manurial tree and the results will be compared in the next report. The three sets of experiments started in Block III were continued. The results with the economic aspect are given below :—

TABLE X.

Nature of treatment.	Cost of harvest and cleaning crowns per tree.	Cost of cultivation per tree.	Cost of manure per tree.	Total expenses per tree.	Average value of produce per tree.	Net income per tree.
	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
1. 10 One head-load of green leaves plus 40 lb. of ash, 5 lb. of fish-guano in pits 4 feet round.	0 2 9	...	0 9 2	0 11 11	2 3 0	1 7 1
2. 7 Digging to a depth of 6 inches and to a radius of 4 feet.	0 2 9	0 0 4	...	0 3 1	0 10 0	0 6 11
3. 7 No treatment	0 2 9	...	...	0 2 9	0 7 0	0 4 3

Comparative results of milling 1/50 nuts of the various harvests are given below.

TABLE XI.

Months.	Number of nuts.	Weight of copra.	Percentage of copra to nuts.	Weight of oil, lb.	Percentage of oil to copra.	Weight of cake, lb.	Percentage of cake to copra.
March ...	89	31.50	35.89	17.13	54.36	12.75	40.48
April ...	171	65.75	38.46	36.75	55.89	27.50	41.82
May ...	218	85.25	39.10	44.00	51.61	39.50	46.33
June ...	149	50.00	33.56	27.00	54.00	20.75	41.05
July ...	100	30.00	30.00	14.88	49.58	14.00	48.68
August ...	89	19.00	27.53	9.89	50.98	9.00	47.38
September ...	63	18.50	29.36	9.69	52.86	7.63	41.10
October ...	58	17.50	30.17	9.56	54.64	7.63	43.56
November ...	42	12.75	30.03	7.38	57.04	5.38	42.15
December ...	35	11.31	32.32	6.31	55.80	4.81	43.54
January ...	40	13.25	33.15	7.19	54.25	6.03	45.75
February ...	88	27.50	33.13	16.50	60.00	10.75	39.10

The country mill was used.

The copra was milled in the country mill immediately after harvest. In addition to this the produce of every month was separately stored to determine the wastage of nuts and the percentage of oil, etc., of the preserved nuts. The results are as tabulated below:—

TABLE XII.

Month.	Number of nuts out.	Barren and spoilt.	Good nuts obtained.	Weight of copra in lb.	Percentage of copra to 100 nuts.	Percentage of	
						Oil to copra.	Cake to copra.
March ...	4,127	78	4,049	1,526	37.69	54.50	43.00
April ...	6,077	128	5,949	2,172	36.51	54.50	41.00
May ...	7,635	165	7,470	2,890	38.69	52.00	46.50
June ...	5,539	157	5,382	1,812	33.87	55.25	44.25
July ...	3,968	321	3,647	1,072½	29.41	54.00	46.00
August ...	2,659	168	2,491	717½	28.81	55.25	44.00
September ...	2,387	82	2,305	676½	29.36	55.50	43.00
October ...	2,051	42	2,009	599½	29.82	54.75	43.25
November ...	1,370	17	1,553	407	30.16	57.50	41.50
December ...	867	20	847	255	30.10	57.50	39.50
January ...	685	14	671	213	31.74	56.50	38.50
February ...	2,700	8	2,692	904	33.59	52.50	39.50

This indicates that there appears to be a higher percentage of wastage when the nuts are stored for a longer period and that nuts harvested in the rainy months from May to August suffer wastage most. In this case the copra was milled in the iron mill which expressed the oil better. The samples of oil cakes obtained are being analysed by the Government Agricultural Chemist, and the above figures have to be corrected to the same standard of oil content in cakes before any inference can be drawn.

(iv) *Shedding of buttons.*—As a matter of fact a comparatively small number of matured nuts are harvested from any coconut tree irrespective of the fact that the inflorescence contains a very large number of female flowers. The percentage of female flowers to nuts harvested from each bunch has been actually counted and recorded ever since the work on the farm was started. But it is not known at what stage buttons are shed most, and why. To obtain some data of the latter for further investigation, the number of buttons shed every month by 18 marked trees is recorded from 1923. Details are as given in Table XIII.

TABLE XIII.

Block No.	Tree No.	1924.												1925.											
		May.		June.		July.		August.		September.		October.		November.		December.		January.		February.		March.		April.	
		Female flowers shed.	Nuts har-vested.	Female flowers shed.	Nuts har-vested.	Female flowers shed.	Nuts har-vested.	Female flowers shed.	Nuts har-vested.	Female flowers shed.	Nuts har-vested.	Female flowers shed.	Nuts har-vested.	Female flowers shed.	Nuts har-vested.	Female flowers shed.	Nuts har-vested.	Female flowers shed.	Nuts har-vested.	Female flowers shed.	Nuts har-vested.	Female flowers shed.	Nuts har-vested.	Female flowers shed.	Nuts har-vested.
I	182	...	31	2	46	5	14	9	19	5	...	2	9	2	...	8	...	2	...	1	...	2	...	17	12
II	27	22	18	16	18	46	17	18	10	15	8	20	7	10	...	14	9	23	...	4	29	8	20	20	18
	114	24	29	12	24	84	16	29	7	27	...	15	11	29	...	12	8	11	...	8	37	5	10	23	11
III	8	48	15	68	22	71	4	84	6	16	1	11	2	10	...	6	...	12	5	8	...	5	7	38	24
	50	9	4	9	6	30	5	12	4	14	...	25	2	9	1	17	2	14	7	8	...	10	14	2	14
	73	...	2	...	1	...	3	...	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	24
IV	34	10	50	32	15	16	8	21	6	11	...	10	6	6	5	4	5	3	...	2	8	10	27	36	31
	70	4	30	5	11	5	7	11	...	6	8	2	6	1	7	3	7	1	8	...	9	1	15	...	18
V	18	27	11	14	17	10	8	...	...	19	10	9	...	13	7	8	12	1	...	...	18	13	...	36	7
	58	65	4	78	6	108	12	27	...	23	4	16	1	15	8	7	8	10	...	22	28	39	12	47	...
VI	19	6	13	7	9	14	2	24	4	7	...	22	4	4	6	4	2	12	3	5	7	13	7	5	...
VII	36	21	8	27	6	27	3	26	11	12	1	17	...	14	...	13	..	9	...	20	8	47	8	34	...
IX	44	13	1	32	15	28	14	34	...	10	6	13	5	10	5	1	...	6	3	1	4	1	8	18	...
	48	...	4	...	7	...	8	19	...	25	...	11	...	17	...	2	...	2	...	5	10	...	9	...	...
X	83	...	10	...	11	2	9	1	...	4	5	4	...	11	...	3	...	8	...	4	...	3	8	29	...
	187	2	20	2	22	11	23	13	6	11	7	7	15	5	...	3	...	2	...	2	...	1	...	8	...
	55	2	14	1	...	9	5	1	...	4	...	12	8	9	...	10	...	3	6	6	6	6	14	10	...
	76	14	28	4	15	22	5	16	...	18	2	23	7	12	...	7	8	8	1	9	4	9	5	28	...

It would be worth while to study whether any manurial or other treatment will reduce the shedding. The trees have been for this reason selected from plots receiving different manurial treatments and situated in different parts of the farm.

(v) *Pollination*.—As recorded in the last year's annual report eight good yielders and three poor yielders were artificially selfed. Out of 958 flowers so pollinated 196 developed into nuts and they are growing. These nuts when fully ripe will be planted out to learn whether the yielding characters are inherent. Further cross pollination work was started with the following 6 trees:—

(1) Tree No. 109 of Block I having green round nuts crossed with 158 of Block I red round nuts.

(2) Tree No. 58 of Block I green round nuts crossed with 146 of Block VIII green long nuts.

(3) Tree No. 138 of Block I long flower stalk crossed with 129 of Block I short flower stalk and *vice versa*. Besides one or two of the bunches of each of the above trees are artificially selfed also. This is done with a view to fix certain desirable characters which must ultimately lead to the breeding of the best type of heavy yielders.

Moisture determination.—Soils were tested by the Government Agricultural Chemist to determine the moisture contents at the different coconut stations. The results so far available were printed in the last year's report. They indicate that proper intercultivation goes a good way in preserving moisture during the hot weather. The work is being continued on a more elaborate scale in the following plots:—

- (1) Uncultivated and unmanured plot of Block III.
- (2) Green-manure plot of Block II.
- (3) No manure plot of Block II.
- (4) Complete manure plot of Block IV.
- (5) No manure plot of Block IV.
- (6) Complete manure plot of Block IX.
- (7) No manure plot of Block IX.

The moisture contents are being determined in every foot depth of soil from the surface up to six feet by an assistant kindly deputed by the Government Agricultural Chemist.

(vi) *Study of the root system of coconuts*.—Detailed investigations have been carried on to study the root system of coconuts, and the results are published in the *Madras Year Book* of 1924-25.

(vii) *Diseases and pests*.—Leaf-rot disease was much in evidence in Nos. I and II Stations where it did some damage, while its appearance in Station No. III for the first time this year was checked completely by spraying. Bordeaux mixture 1 per cent strong was used in No. I Station and the spraying was done twice. Trees in Nos. II and III Stations were sprayed with 2 per cent solution. In Station II, one tree each in Blocks III and IV and two in Block V succumbed to the disease.

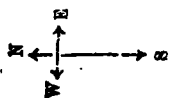
Beetle attack was more in evidence in Station No. II which is very near the village wherein there are numerous manure and other rubbish heaps for them to breed in. It has also been kept under

control by constant attention. Root disease appeared in Station No. IV and was checked by isolation and heavy manuring with fish-guano, lime and ashes.

(viii) *Subsidiary crops.*—Tapioca and pine apples are grown in all the stations. They are thriving specially well in No. II Station where pine apples were manured with 2 lb. ash, 1 lb. fish-guano and 5 lb. well-dried cattle manure per plant; the plants responded very well to the treatment. There is local demand for tapioca cuttings and roots and for the pine apple suckers from outside.

7. Plans of the first three stations showing the details of planting and expenditure up-to-date per tree are printed as Appendices A, C and D. Appendix B is a plan showing the details of manurial experiments conducted in Pilicode No. I Station. Appendix E is a plan showing the experiments conducted in Blocks VII and VIII of Nileshwar No. II Station.

M. GOVINDA KIDAVU,
Offg. Deputy Director of Agriculture.



APPENDIX A.

Pilicode No. I.

Block G.		Block C.		Block E.								
Area 4'82 acres.	Number of trees.	Area 2'97 acres.	168 trees.	Area 3'55 acres.	168 trees.							
Rows 1 to 11—Presidency varieties 115.	Date of planting.	Date of planting—23rd to 26th May 1918.	1918. 1919. 1920. 1921. 1922. 1923. 1924.	Date of planting—6th to 9th September 1919.	1919. 1920. 1921. 1922. 1923. 1924.							
Rows 12 to 23—Trial planting 126.		Manure applied to each tree.		Manure applied to each tree.								
Rows 1 to 11—21st June to 18th July 1923.	Rows 12 to 23—14th June 1923.	1918. 1919. 1920. 1921. 1922. 1923. 1924.	} Manurial experiment.	1919. 1920. 1921. 1922. 1923. 1924.	} Manurial experiment.							
	Manures applied to each plant.	LB. LB. LB. LB. LB.		LB. LB. LB. LB. LB.								
	1923.	Fish-guano ... 1'5	1'5	1'5	3	3	Fish-guano ... 1	1	3	3	3	3
	1924.	Lime ... 2 lb.	3	3	Lime ... 2	3
		Ash ... 5 lb.	10	10	10	10	Ash ... 5	5	10	10	10	10
	Cost of cultivation per plant	0 12 3 Presi. variety.	1 0 1 Trial planting.	Rs. A. P. A. P. A. P. A. P. A. P. A. P. A. P.	1 0 8 11 7 11 6 11 3 13 8 14 5 14 11	Cost of cultivation per tree.	15 7 10 6 11 1 12 1 12 2 11 4					
Block H.		Block D.		Block F.								
53 trees.		Area 2'97 acres.	168 trees.	Area 3'55 acres.	200 plants.							
Rows 1 to 4—Presidency varieties.		Date of planting—23rd to 26th May 1918.		Date of planting—24th and 26th October 1922.								
Date of planting—18th to 26th July 1923.		Manure applied to each tree.		Manure applied to each plant.								
(Other details are same as in the Presi. Vt. Plot in Block G.)		1919. 1920. 1921. 1922. 1923. 1924.		1922. 1923. 1924.								
Davy's ...		LB. LB. LB. LB. LB.		LB. LB. LB.								
Round ...		Fish-guano ... 1'5	1'5	3	3	Fish-guano ... 1	1	1'5				
Marked ...		Lime ... 3	3	Lime ... 3	3	3				
Pointed ...		Ash ... 30	7	10	10	Ash ... 5	5	10				
Orange ...		burnt earth.										
G. H.		Rs. A. P. A. P. A. P. A. P. A. P. A. P.	1 0 8 11 7 11 2 11 2 12 10 18 10 14 4	A. P. A. P. A. P.	12 8 10 6 8 7							
Non-planted.												
Row Nos. 6 7 8 9 10 11 12 13 14 15 16 17		E x t e n s i o n										
Suva Fiji V. Straits Settlements Laccas dives		Rows 21 to 23—Surface planting.										
Planted on 27th June 1924												
Manure applied in 1924 F.G. CaO. Ashes 2 lb.												
1'5 lb. 7'5 lb.												
Cost of cultivation per tree Rs. 1-1-4.												

* Rows 12 to 14—3 ft. deep planting.
 " 15 to 17—2 ft.
 " 18 to 20—1 ft.

Cable

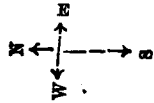
APPENDIX B.

Plan showing the details of manurial experiments at Piccode No. I.

Block C.

Block H.		Block G.	
1	Unmanured.	1	Unmanured.
2	Plot 6.	2	Plot 1.
3	Mineral N. + ash.	3	Mineral nitrogen.
4	2 lb. of Amm. sulph. + 10 lb. of ash per tree.	4	(2 lb. of Amm. sulph. per tree.)
5	Plot 7.	5	Plot 2.
6	Organic nitrogen + ash.	6	Organic nitrogen.
7	5 lb. of Fish-guano + 10 lb. of ashes per tree.	7	(5 lb. of Fish-guano per tree.)
8	Plot 8.	8	Plot 3.
9	No manure.	9	Mineral N. + P ₂ O ₅ .
10		10	(2 lb. of Amm. sulph. + 2½ lb. of Superphosphate per tree.)
11	Plot 9.	11	Plot 4.
12	Complete mineral manure.	12	Mineral N. + K ₂ O.
13	1 lb. of Pot. sulph. } per tree. 2 lb. of Amm. sulph. } 2½ lb. of Superphos. }	13	(2 lb. of Amm. sulph. + 1 lb. of Pot. sulph. per tree.)
14	Plot 10.	14	Plot 5.
15	Ashes alone.	15	Common salt and ashes.
16	10 lb. of ashes per tree.	16	2 lb. of common salt + 10 lb. of ashes per tree.
17	Plot 11.		
18	Cattle manure.		
19	100 lb. of cattle manure per tree.		
Block F.		Block E.	

Block D.



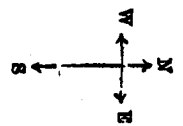
APPENDIX C.
Nileshwar No. II.

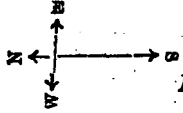
110 plants. Blocks V and VI. 105 plants.		110 plants. Blocks VII and VIII. 105 plants.	
Area 2'02 acres.		Area 2'02 acres.	
Manures applied to each plant.		Date of planting— Manures applied to each plant.	
1918. 1919. 1920.		1922. 1923. 1924.	
LB. LB. LB.		LB. LB. LB.	
Fish Guano } 1'5 1'5 1'5	3 3 3 3	Fish Guano ... 1	1 1'5
Lime ... 3 3	...	Lime ... 2	2 3
Ashes ... 30 7 10	10 10 10 10	Ashes ... 5	5 10
A. P. A. P. A. P.	A. P. A. P. A. P. A. P.	A. P.	A. P. A. P.
Cost of cultivation per tree. { V 12 9 8 6 9 4	8 6 11 1 10 8 9 7	Cost of cultivation. { VII 10 11	10 3 10 10
VI 12 9 8 6 9 8	8 8 11 0 8 11 9 9	VIII 10 11	10 7 10 0
154 plants. Blocks I and II. 147 plants.		132 plants. Blocks III and IV. 105 plants.	
Area 2'86 acres.		Area 2'31 acres.	
Date of planting— Manures applied		Date of planting— Manures applied	
18th to 20th May 1918.		1st and 2nd June 1919.	
to each plant.		to each plant.	
1918. 1919. 1920.		1919 1920. 1921.	
LB. LB. LB.		LB. LB. LB.	
Fish Guano } 1'5 1'5 1'5	3 3 3 3	Fish Guano. 1 1 3	8 8 8
Lime ... 3 3	...	Lime ... 2 2	...
Ashes ... 30 7 10	10 10 10 10	Ashes ... 3'5 5 10	10 10 10
A. P. A. P. A. P.	A. P. A. P. A. P. A. P.	A. P. A. P. A. P.	A. P. A. P. A. P.
Cost of cultivation per tree. { I 12 9 8 6 9 1	8 5 10 6 9 7 9 11	Cost of cultivation per tree. { III 12 0 7 5 8 4	10 1 9 7 10 10
II 12 9 8 6 9 7	8 10 10 1 9 5 9 1	IV 12 0 8 5 8 9	10 5 9 10 11 9
Green manure plot.		Pineapple plot.	
Gate.		Gate.	

APPENDIX D.

Nileshtar No. III.

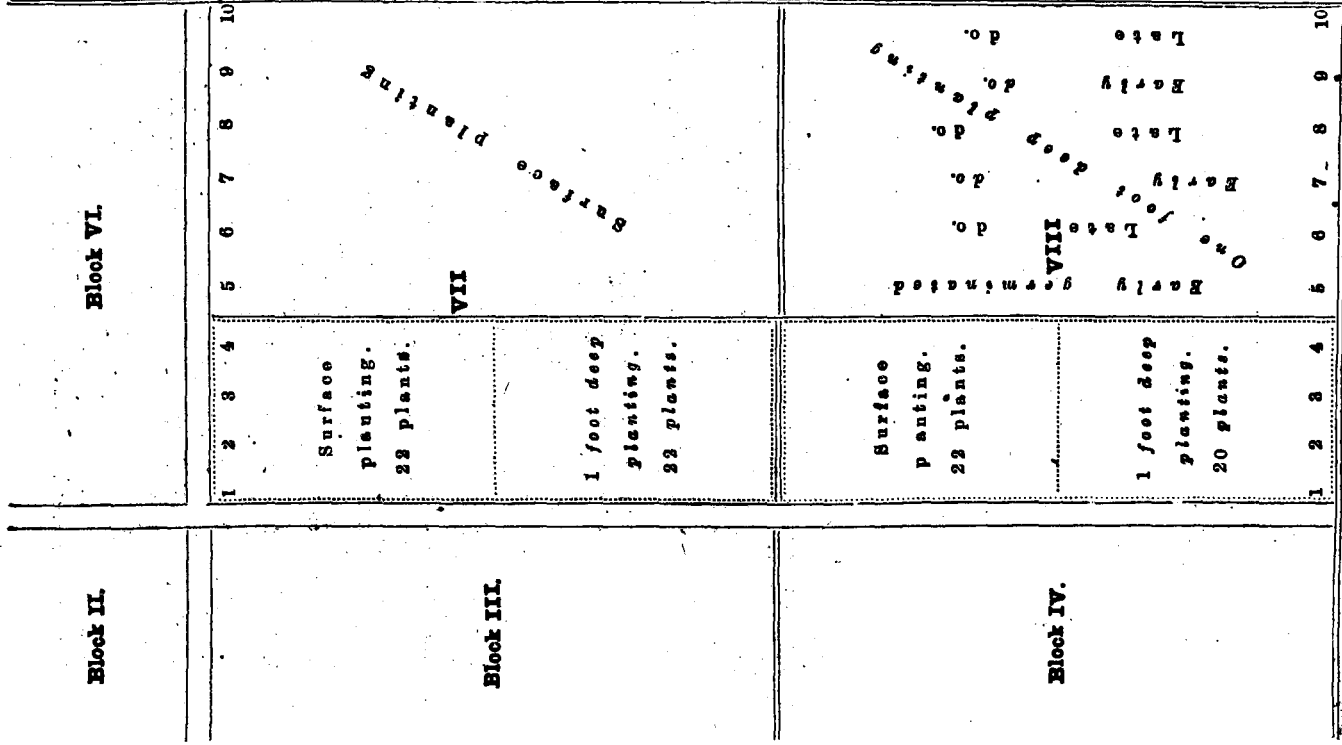
E x t e n s i o n																																																																																													
Block III. Area 5'00 acres. No. of trees 275. Date of planting.—4th and 5th June 1918. Manure applied to each tree.						Block I. Area 5'00 acres. No. of trees 275. Date of planting—30th and 31st May 1918. Manure applied to each tree.						Nursery plots ○ □ □ □	E x t e n s i o n																																																																																
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Cost of cultivation per tree.	8	5	6	3	6	4	10	7	11	1	8	11	8	11																																																																															





APPENDIX E.

Plan showing the experiments conducted in Blocks VII and VIII of Nileshwar No. II station.



APPENDIX F.

English, Vernacular and Botanical names of crops referred to in the report.

English.	Vernacular.	Botanical.
Paddy.	Wari.	<i>Oryza sativa.</i>
Sugarcane.	Cheruku.	<i>Saccharum officinarum.</i>
Groundnut.	Veru Senaga.	<i>Arachis hypogæa.</i>

An account of the local agriculture in the neighbourhood of the coconut stations of the Kasaragod taluk in the South Kanara district.

These coconut stations were opened in 1916 when it was finally decided by Government that a detailed study of the coconut crop in all its aspects should be undertaken without any more delay on the West Coast where this crop is cultivated on a very large scale and the income derived from the trade in its bye-products is considerable. The South Kanara District was preferred because the scope for development of the crop is greater in the district in having extensive areas quite suitable for the crop and the people being ignorant of the right system of coconut cultivation. After protracted tours and extensive inspection all along the coconut belt, three vacant sites and one garden in bearing were selected for starting investigations about the crop. The following lines appearing in the first report about the stations indicate clearly the reasons for selecting these particular spots:—

“In order to obtain representative soils on which coconuts are generally grown on the West Coast, three separate blocks of land were selected in 1916 and three sub-stations have been started near the village of Nileshwar. Sub-station No. I is a laterite soil, i.e., a fairly heavy loam containing laterite sand or gravel. Sub-station No. II is about $1\frac{1}{2}$ miles from the sea-coast and is a well-drained red sandy loam of great depth. Sub-station No. III is about three-fourths of a mile from the sea-coast and is a coarse sandy loam such as being continually formed along the littoral. This station though of marine sand is now actually separated from the coast by land depressions some of which form water courses during rains and others of which have been converted into paddy soils. These sub-stations were all vacant land when acquired and are now being planted up. No. IV Sub-station which is situated in the village of ‘Kudlu’ some $2\frac{1}{4}$ miles north of Kasaragod and which consists of existing gardens was acquired for preliminary investigation and experiment. This is some 25 acres in extent and consists of gardens from 20 to 40 years old. This Sub-station is about half a mile from the sea being separated from it by a shallow tidal back-water. The soil is a deep well-drained red sandy loam very similar to that of Sub-station No. II. All these four stations lie between latitudes 13° and 12° .”

2. *Local agriculture*—(i) *Rainfall*.—At Nileshwar the average rainfall is about 140 inches and at Kasaragod it is about 10 inches less. The major portion of this is received during the south-west monsoon period, i. e., from June to September. Very little rain is received during the north-east monsoon as compared to the south-west, the usual fall being about 10 inches.

(ii) *Crops*.—Paddy is cultivated all round the four stations, and the system of cultivation is more or less similar.

Nileshwar.—The soil is mostly sandy and of very poor quality. Single crop is the common rule but in low-lying lands two crops are also taken. A third crop also is sometimes taken in lands which can be irrigated from wells or small ponds near by. The first crop "Viripu" is broad-casted dry, but the second crop "Punja" is usually sown in puddle after sprouting the seeds. The third crop "Kolaka" is also sown in the same way as the second. The cultivation is generally of a very low order. The land is kept ploughed in summer and the clods are crushed and a fairly good tilth is produced. Seeds are sown broad-cast in the latter half of April. Some ashes are sprinkled just before sowing. To facilitate weeding which consumes a large amount of labour, the seeds are sometimes sown in the plough furrows either in lumps or in singles the soil of the succeeding furrow covering the preceding one. The space between the lines is sometimes filled up with plants from the well-grown portions. The second crop is manured with cattle dung and leaves and sown about a month after the harvest of the first crop. The third crop is sown in January and harvested in April. Along the back-water and in very low-lying swamps a long duration variety "Kuttanadan" is sown in March and harvested in December-January. Transplanting is also practised in these tracts for the first crop in very limited areas where the soil is heavier. In the majority of cases manuring and ploughing are done only in name.

Kasaragod.—The cropping is almost similar to that of Nileshwar. There is a very large area of double cropped lands towards the south and east of sub-station No. IV where the soil is a fairly heavy loam and consequently transplanting is resorted to for the first crop. The nurseries are sown in April and May and transplanting is done in June. The treatment of the second crop is similar to that in the Nileshwar tract. The third crop is grown along the banks of streams running through these lands. These streams are banded and the water stored for irrigating the third crop.

Unlike in the Nileshwar tract the paddy cultivation here is of a fairly high order. The lands are in most cases very well manured with the manure taken from the loose-box sheds which are very common in these parts and which are almost unknown round about Nileshwar. Consequently the average yield is higher. On the single crop lands broad-casting in the dry, is the rule here as well. The paddy crop is invariably followed by a pulse crop which in its turn is succeeded by gingelly if the season is favourable.

(iii) *Coconuts*.—In this tract there is a long belt of coconuts, but the care and attention bestowed on the gardens is miserably poor. Seeds nuts are taken in the months of February and March from trees set apart for the purpose. These are generally seen near the houses and receive all the sweepings and washings and consequently grow very well. Some of these trees are very heavy bearers. Nuts are allowed to ripen on the tree and are removed when the husk turns slightly brown. These nuts are taken and kept on a platform above the fire place for a couple of weeks and are then removed to a well or a pond where they remain for nearly a month. They are finally taken out and placed in the nursery in the month of April.

The nuts begin to germinate sometimes even within a week due to the good soaking which the husk has received. The seedlings are planted out in Chingan (September) Vinayaka Chaturthi day round about Kasaragod and in Thulam (November) the New Moon day round about Nileshwar. In the red sandy loams which are on a higher level than the adjoining paddy lands the seedlings are planted in pits three feet by three feet long and one foot broad the length is usually east to west. Such pits are made to protect the seedlings from the scorching effects of the so-called Southern Sun when the Sun is nearest the equator during the months of January, February and March. On the hills the pits are dug still deeper, even five feet, being not uncommon sometimes, whereas, in low-lying lands shallow pits are more common. On lands liable to floods or in water-logged places seedlings are generally planted on the surface or on small bunds and the intervening space is gradually filled up by transporting soil every year. The level of the land is also raised in course of time. As regards the distance from plant to plant we find more space between the plants in older plantations on the laterite gravels and in red sandy loams. Even here the gardens which are planted during the last few years are very thickly planted. In the low-lying paddy fields and along the banks of rivers very close planting seems to be the rule. The plants are watered for the first two or three years after planting and even old trees are watered towards the north of Kasaragod though the practice cannot be said to be general to the south of Nileshwar. Very little or generally no care is taken about the plants after they are about four or five years old except the pluckings of nuts when they are ripe or the tapping for toddy when the spathes come out. There is considerable variation as to the age at which seedlings begin to bear. On the sea-coast and river banks well-manured trees begin to yield in the fourth year but even there very many trees do not flower even after ten or twelve years.

The safest guide in determining this factor seems to be the farm itself, where, in the red sandy loam a few trees have flowered exactly four years and eight months after planting and in the next year the flowering was more or less general, so that we can safely put the age of flowering at six years after planting, if the plots are manured and cultivated well. As regards the yielding capacity also the same difficulty is experienced in arriving at correct figures. Here again the farm records are a better guide. The trees in the Kasaragod farm were yielding less than 30 nuts per tree on the average when they were acquired, i.e., when absolutely no care was being bestowed on them. This average has now actually doubled itself in the course of four or five years after the Government took it over. There are many trees yielding more than double the present average.

Above all the most harmful practice is planting foreign trees in the coconut tops, to quote an instance, from the Kasaragod farm of 25 acres 175 such trees had to be up-rooted soon after acquisition.

(iv) *Tobacco*.—This is another important crop grown along the sea-coast from Nileshwar northwards. The major portion of the crop is grown in the low-lying lands lying on both sides of the railway line. It is also grown very extensively in the course sand close to the sea. The first crop in these lands is invariably paddy. After the harvest of paddy in October the land is ploughed and the stubbles are removed. Shallow trenches are opened about 3 to 3½ feet apart and these are filled with manure taken from the loose-box sheds and the seedlings are planted in November. They are generally 40 to 45 days old. Fish well-rotted, alone or mixed with the loose-box manure is also applied. Three or four times after planting with an interval of 10 or 15 days between each application.

The plants are copiously watered generally in the mornings. If the seedlings are on the sands they will have to be watered more than once in a day. The plants are topped when they have put forth about 12 to 15 or even sometimes 20 leaves. Suckering is also done whenever new suckers shoot forth from the axils. The crop is cut and cured in January—February and is used both for chewing and for the manufacture of snuff. Leaves from plants grown on the high-lying coarse sand are preferred for the latter to those from the low-lying lands near the railway line.

(v) *Bananas*.—There are grown on an extensive scale round about Nileshwar in the single crop wet lands. Suckers, preferably those just below the bunch, are planted in pits about one foot to one and half feet deep, 6 to 8 feet apart in the month of September. Some ashes are applied at the time of planting and subsequently they are manured with green leaves three or four times before they flower. These are regularly watered and hoed at intervals. The suckers which spring up round the plant are removed till the time of flowering after which two or three suckers are left for the succeeding crop. The crop flowers in about nine months and the bunches can be cut in about three months more. Most of the bunches grown in these parts are exported to Mangalore.

(vi) *Minor crops*.—Cucumbers are grown extensively in single crop wet lands all over the tract. There are two seasons, the first is from October to January and the other from January to April. The second or summer crop has better keeping qualities. Water-melons are also grown in large numbers near Kasaragod. Chillies and all kinds of vegetables can be seen growing at odd corners in paddy lands throughout the year round about Kasaragod.

3 It is too early to record any improvement in the coconut cultivation of the locality. But even during these few years experiments conducted at Kasaragod and Nileshwar have proved quite conclusively that various improvements can be effected in the local methods of cultivation. Some of these are (i) coconuts have been grown quite successfully without watering the plants even in the young stages if the land is properly cultivated; plants well manured, and the surface soil kept always loose to prevent the loss of soil moisture by evaporation. (ii) The yields have been appreciably increased by regular cultivation alone without any manuring and much more so with manuring. (iii) Seedlings are supplied from the farm every year. These are grown from nuts gathered from selected trees, trees which have been found to bear well consistently for the last many years, and every year the demand for the farm seedlings is increasing.

The officers stationed at these farms and the district officers are trying to introduce improvements in the cultivation of other crops also and their services and advice are always at the disposal of the local agriculturists.

ANNUAL REPORT OF THE TALIPARAMBA AGRICULTURAL STATION AND THE AGRICULTURAL MIDDLE SCHOOL FARM FOR 1924-25.

As the control of the School and its farm was transferred from the Educational to the Agricultural Department from the 1st April 1924 and as both the farms are contiguous, their reports are amalgamated into one.

2. An account of the local agriculture in the neighbourhood of the farms is printed as an appendix to this report.

3. *Season.*—At the beginning of April there was a heavy downpour of 6·75 inches of rain on a single day which not only delayed sowing operations but also spoiled the texture of the soil. Further, the pepper vines flushed and flowered profusely very much earlier than usual and the subsequent hot spell caused severe shedding of flowers. The normal flowering was but little and the pepper crop was therefore on the whole a complete failure.

The south-west monsoon burst at the commencement of June, i.e., 10 to 15 days in advance and continued moderately heavy till the second week of July. From the 14th to the 25th 73·79 inches of rain were recorded on the farm. The heavy downpour of rain was accompanied by stormy and often cyclonic winds and streams and rivers overflowed. The farm wet lands were under water for days and the surface wash from the dry land was very great; paddy and sugarcane of the wet land and ginger and chillies of the dry land suffered most. Heavy rains early in August seriously interfered with the proper fertilization of paddy.

The north-east monsoon of October-November was a failure, the total fall for the period was only 12·21 inches against an average record of 18·06 inches for the last 19 years.

December-January and February were practically rainless. Towards the end of March, a light fall of 1·12 inches was recorded.

The total rainfall for the year was 184·82 inches against 19 years' average of 144 inches. The total for the previous year which was also an abnormal one was only 169·37 inches. Thus the season was on the whole very abnormal with the heaviest and most badly

distributed rainfall in the annals of Malabar. Statement No. I below gives details :—

TABLE I.

Rainfall statement.

Month.	Average rainfall for 19 years from 1905-06 to 1923-24.			Rainfall for 1924-25.		
	Total rainfall.	Daily average.	Number of rainy days.	Total rainfall.	Daily average.	Number of rainy days.
April	1.35	0.11	2.33	7.98	1.14	5
May	6.92	0.29	4.97	5.24	0.48	7
Total hot weather rains.	8.27	...	7.30	13.22	...	12
June 1 to 7	6.24	0.91	3.45	13.03	1.86	7
„ 8 to 14	11.82	1.71	5.71	17.00	2.43	6
„ 15 to 21	11.65	1.63	6.01	11.71	1.67	7
„ 22 to 28	11.26	1.59	5.82	1.72	0.25	7
„ 29 to July 5	8.26	1.18	5.70	5.31	0.76	7
July 6 to 12	9.35	1.33	5.75	16.59	2.37	7
„ 13 to 19	9.23	1.32	6.30	23.41	3.34	7
„ 20 to 26	11.36	1.61	5.75	24.52	3.50	7
„ 27 to August 2	9.69	1.39	5.73	4.89	0.88	5
August 3 to 9	8.49	1.36	5.63	11.10	1.85	6
„ 10 to 16	4.98	0.72	4.15	13.28	1.89	7
„ 17 to 23	4.84	0.68	5.47	4.70	0.78	6
„ 24 to 30	4.04	0.62	4.85	3.89	0.65	6
„ 31 to September 6.	2.22	0.31	3.97	6.85	0.98	7
September 7 to 13	1.54	0.27	2.58	0.77	0.38	2
„ 14 to 20	1.59	0.25	2.26	...	...	...
Total south-west mon- soon	116.66	...	79.13	158.27	...	94

TABLE I—cont.

Rainfall statement—cont.

Month.	Average rainfall for 19 years from 1905-06 to 1923-24.			Rainfall for 1924-25.		
	Total rainfall.	Daily average.	Number of rainy days.	Total rainfall.	Daily average.	Number of rainy days.
September 21 to 27 ...	1·98	0·29	2·53	2·93	0·73	4
„ 28 to October 4.	3·40	0·89	2·41	0·07	0·07	...
October 5 to 31 ...	7·68	0·46	8·57	4·03	0·40	6
November ...	5·00	0·35	5·72	5·18	0·57	8
Total north-east mon- soon ...	18·06	...	19·23	12·21	...	18
Total dry weather rains from 1st Dec. to 31st March ...	1·12	0·02	1·63	1·12	0·37	2
Annual rainfall ..	144·11	...	107·29	184·82	...	128

4. *Pepper*.—Is the most important crop of the farm occupying an area of 20·55 acres. Most of the vines were over 20 years old when the farm was started in 1904. They have been kept all along in condition by careful manuring and cultivation. Most of them are showing signs of deterioration due to old age.

The season was anything but favourable for the crop. The heavy unseasonal shower of April caused profuse flowering but the subsequent spell of hot weather witnessed heavy shedding. The seasonal flowering was therefore poor. One would expect only a low yield due to the natural depression of the vines as a result of heavy crops they gave continuously for the past two years.

On the whole the total yield was as poor as 574 m.m. of green berries for the whole farm against an average of 3,212 m.m. for the past 18 years as shown in the statement below:—

TABLE II.

Statement No. II.

	Area.	Average yield per block in 1921-22 green M.M.	Yield in 1922-23. M.M.	Yield in 1923-24. M.M.	Yield in 1924-25. M.M.	Acre yield in M.M. green for 1924-25.	Average yield green in M.M. for 18 years.
Block I ...	7·82	299	2,016	2,044	417	53·82	1,882
Block II ...	6·88	39	868	731	34	5·09	642
Block III ...	5·85	169	2,182	1,429	123	21·79	1,188
Total ...	20·55	507	5,066	4,204	574	80·20	3,212

The results of the manurial and other experiments are given in Statement No. III below :—

STATEMENT NO. III.

Statement showing the Results of Manurial Trials.

Plot No.	No. of vines.	Yield in M.M.	Yield per vine.	Treatment.
4 (a)	37	23½	0·76	Fish-guano at ¼ lb. per vine.
5 (a)	32	23½	0·73	Do.
6	137	29½	0·22	Lime ¼ m.m. plus leaf mould one basketful of about 20 lb.
6 (a)	24	9	0·38	Do.
9	107	27½	0·26	Fish-guano ¼ lb. per vine.
17	145	44½	0·30	Fish-guano ¼ lb. or ¼ m.m. of lime plus one basketful leaf mould in alternate years.
19 (a)	191	19½	0·10	Lime ¼ m.m. and leaf mould one basketful.
41	...	...	...	...
56	30	1	0·03	Mounting experiment.
57	95	2½	0·03	Leaf mould one basketful per vine.
61 (b)	39	1½	0·028	Drainage experiment.
61 (c)	47	3½	0·07	Lime ¼ m.m. leaf mould one basketful.
61 (d)	75	5½	0·07	Do.
67	31	22	0·71	Green leaf mulching in summer.
68	47	0·18	0·004	Lime ¼ m.m. plus leaf mould one basketful.

Four hundred and fifty vines were planted in about an acre of land above plot 53 in Block II and 20 per cent of them rotted on account of the heavy rains. Another small area is being cleared for planting next year. The vines planted in 11 B in 1923 are progressing satisfactorily.

5. *Pollu disease* on pepper was not much in evidence this year owing to the very poor crop and the absence of even the usual fall of rains during the north-east monsoon which used to increase the disease. The investigations started last year by the Government Entomologist and the Government Mycologist were however continued. Spraying with Bordeaux mixture was found to reduce the pollu attack last year. The sprayed vines then looked healthy. But later on when the hot weather set in, they got an increased attack of mealy bug in some cases and they suffered terribly. Investigations have therefore to be continued before declaring the efficacy of the treatment.

6. *Wet land crops* included both paddy and sugarcanes on an area of 7·6 acres of which 6·6 acres were under paddy while the remainder was under sugarcanes.

(i) *Paddy*.—Of the 6·6 acres under paddy 2·05 acres belonged to the Agricultural Station. They were sown in December with Kolinji which was but a poor crop owing to want of late rains and was supplemented with bone meal and transplanted fairly early in the season. The yield on the average was 1,454 lb. per acre against 1,870 lb. of last year. School farm paddy, 4·55 acres manured with 250 lb. per acre of fish-guano yielded 2,026 lb. per acre. The cost

of production was Rs. 34-10-8 per acre and the value of produce was Rs. 110-8-10 per acre.

The results of varietal trials made on the farm wet lands again proved the superiority of Kurumkayama as shown in Statement No. IV below:—

STATEMENT No. IV.

Variety.	Yield per acre.		
	1922-23.	1923-24.	1924-25.
	LB.	LB.	LB.
1. Thavalakannan	1,725	1,999	1,521
2. Kurumkayama	2,048	2,035	1,843
3. Ordinary Kayama	1,676	1,551	1,190
4. White-riced Kayama	1,702	1,485	1,068

The strains G.E.B. Nos. 24, 91 and Co. 1 grown as a second crop on the farm failed for want of rains in the north-east monsoon and because of rice-bug attack.

(ii) *Sugarcanes* were planted on 0.40 acres on the farm and 0.625 acres on the school farm. The varieties given were red mauritius, Java Hebbal, M. 55, B. 3,412, B. 6,450, B. 208, B. 147, Co. 1 and a couple of rows of Hebbal Mauritius from Mysore and Java 247 from Samalkota. They were being tested to see which is the most suitable to the West Coast conditions. The cages were manured with fish-guano and ashes at 1,500 lb. each per acre. In both the areas the cane crop suffered on account of floods and from the attack by toddy cats and squirrels. The damage was more severe on the farm crop than in the school area and the results of milling were not therefore of any value. The damaged canes were sold for seed or for chewing.

In the school farm an acre yield of nearly 5,000 lb. of jaggery worth Rs. 711 (against 7,237 lb. of last year) was obtained at a cost of Rs. 183 excluding the cost of labour put in by the students. The quality of jaggery obtained was good.

As could be seen from the growth of the crop Java Hebbal, Red Mauritius and M. 55 were more forward and withstood the adverse conditions better. While the floods stunted the growth, the energy of the plants was wasted in putting forth numerous side-shoots which in fact adversely affected the crop and its yield to a considerable extent. Hebbal Mauritius and J. 247 will also be tested again.

(iii) Besides the crops above mentioned the school boys grew plantains and varieties of local vegetables for their own consumption.

7. *Ooconuts*.—There are 378 bearing coconut trees on the farm. The trees growing in plots 21-A, 16 and on the bund where there are no foreign trees were manured with fish-guano and ashes at 5 and 10 lb. respectively per tree. They have shown marked improvement.

This is borne out by the progressive statement of yields relating to

STATEMENT No.

Coconuts harvested from

Plot.	Years.	Tree																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Bund ...	1920-21.	73	76	96	...	35	59	12	77	76	9	17	21	35	13	35	63	69
	1921-22.	92	65	126	18	45	99	10	87	62	27	39	45	45	38	54	60	79
	1922-23.	97	94	117	18	101	56	22	133	79	47	48	46	62	22	65	94	90
	1923-24.	91	96	103	36	19	64	18	80	49	26	46	65	46	37	70	82	54
	1924-25.	123	120	168	35	42	93	10	98	87	48	23	50	70	55	72	68	51
Average ...	...	95	90	122	27	48	74	14	95	71	31	36	45	53	33	59	73	69
16 ...	1920-21.	35	2	4	17	...	29	8	34	18	3	19	41	37	6	38	2	58
	1921-22.	40	60	4	34	11	37	6	59	24	6	64	40	16	...	40	4	61
	1922-23.	52	77	7	29	12	30	...	65	45	5	35	59	36	...	58	28	58
	1923-24.	27	43	4	15	10	32	6	42	54	4	...	43	34	...	40	26	41
	1924-25.	21	58	3	21	4	45	19	35	2	8	...	48	41	...	50	37	49
Average ...	...	35	48	4	33	9	35	10	47	29	5	39	46	33	6	45	19	53
21-A ...	1920-21.	8	40	41	33	21	24	37	7	33	13	20	52	9	7	...	...	...
	1921-22.	19	42	22	29	18	32	18	28	51	39	22	32	23	6	...	...	...
	1922-23.	15	77	68	42	37	69	43	49	60	25	16	38	25	37	...	...	...
	1923-24.	19	56	45	55	37	36	71	53	59	24	29	54	31	25	...	...	...
	1924-25.	36	96	79	69	43	68	48	41	40	50	48	114	30	23	...	...	...
Average ..	...	19	62	51	43	31	46	43	36	49	30	27	63	24	20	...	...	...

The trees on the bund which were planted after the acquisition of the farm and were given adequate space are the best. They gave an average yield of 63 nuts per tree. It is interesting to note that 6 out of 39 trees yielded above 100 nuts per tree with a maximum of 168. In plots Nos. 51 and 54, where again there are old trees growing in shaded ill-drained land, 3 coconut trees showed symptoms of budrot. They were cut and burnt at once. Plot No. 19-B was planted up with coconuts. The seedlings suffered owing to bad drainage.

8. *Dry land of the farm.*—(a) *Paddy.*—Varieties were sown in 72.25 cents. These gave an average yield of 892 lb. of grain per acre, bringing in a net profit of Rs. 31. This area was manured with 1 cwt. of fish and 5 cwt. ashes per acre. The outturn was affected by surface wash, rains at the flowering-stage and bandicoot attack. Statement No. VI given below shows the yields for four years :—

STATEMENT No. VI.

Varieties.	Yield per acre in M.M.				Average.
	1921-22.	1922-23.	1923-24.	1924-25.	
Thonnuran	625	610	440	320	499
Karutha Modan ..	474	490	424	371	440
Paramban Navara ..	300	470	515	610	481

(b) *Ragi.*—Varieties grown were Ponnani, Coimbatore and Mysore ragies as was done last year with a manuring of 1 cwt. of fish-guano, 3 cwt. of ashes and 5 cart-loads of loose-box cattle manure per acre. The Ponnani variety gave the highest yield of 905 lb. only per acre. The Mysore variety was the poorest in growth tillering capacity and uniform maturity and yielded only 185 lb. per acre whereas the Coimbatore variety gave 651 lb. per acre.

(c) *Chillies* were planted in 75 cents of dry land. The crop suffered on account of heavy rains. The growth became stunted and fruits were affected with rot. The shortage of north-east monsoon rains reduced subsequent fruiting. The crop gave a net profit of only Rs. 26 with an acre yield of 360 lb. of cured produce, the quality of which was also poor.

(d) *Ginger* was grown in 36 cents of land left bare fallow for the last three years. Although fresh seed was got from Ernad the germination of the crop was poor. the seed suffered from soft-rot due to heavy rains. The shortage of the north-east monsoon rains affected the root development also. A yield of 1,200 lb. per acre of green ginger was obtained, the quality of which was not good being very fibrous.

(e) *Horsegram* was grown over 2 acres following both paddy and ragi and in the area where kolinji and dhaincha had been grown for green manure, but had failed. The crop was sown rather

early and grew more leafy yielding 333 lb. of grain per acre—a very moderate yield for the locality.

(f) *Green manure crops* of sunn-hemp, kolinji and dhaincha were grown to improve the fertility of these dry lands. The last two sown earlier suffered too much in the rains and were a failure. Sunn-hemp grew very luxuriantly. This crop was later on used partly for seed and partly for fibre, with the object of demonstrating the method of extraction to the school boys.

(g) *Fine apples* were grown over 45 cents of land. The varieties grown are Kew, West Indian, Mauritius, Yellow Queen, Cochin and Local. They are all growing well. All the varieties except Yellow Queen have fruited. The Kew fruits are fewer but biggest. A few plants were specially manured with a mixture of bone meal, ashes and cattle manure to which the plants responded very well. Unfortunately wild boars, that have of late increased on the farm as the reserved forest area grows thicker, are damaging fruits and even flowers, in spite of the barbed wire fencing.

(h) *Fruit garden*.—This was started last year. The gaps were filled up. A few graft and Olor (Calicut) mango plants were planted by way of extension. The garden was well cleared of all the shooting stumps of trees and the slopes were made into level terraces which were kept constantly hoed. The plants were all manured with cattle manure and a mixture of bone-meal and nitrate of soda. All insects were kept out by spraying and hand-picking. Mangosteen and tree tomatoes have failed to grow. Anonas, laquot, guava, rose-apple, citrons and sapota grew fairly well. It was observed that the plants did not grow much in the heavy monsoon and in the hottest summer, yet the garden was in a fair condition on the whole.

9. *School farm dry land*.—Of the total area of 62.53 acres of the farm, 56.68 acres constitute the dry land and 0.16 acres coconut garden and the rest is wet land. Ninety cents of dry land to the west of the student's quarters were planted up with coconuts which were manured with ashes and fish-guano at 5 and 2 lb., respectively. These withstood the drought very well, and are growing remarkably well without watering indicating the suitability of the land for coconuts under the dry system. Of the hill-slopes towards the west and the south of the school buildings only 15 acres in all have been cleared up and bunded preparatory to starting cultivation of perennial crops like fruits and coconuts and for the systematic trial of annual crops by students themselves as well as for the farm. Over this area the soil is fairly deep and of a lateritic origin while in the remaining portion of the farm big patches of rocky bed exist where only thatch grasses grow.

At the bottom of the valley touching the road an acre of land was reclaimed and prepared into beds for wet land paddy cultivation. Water for which can be obtained by diverting a hill stream which was spreading out over this area.

Berseem was tried as a fodder crop on the farm. The seeds germinated well but failed to thrive further.

Ipecacuannah has been growing on the farm since 1918. It is making but a slow progress.

M. GOVINDA KIDAVU,
Offg. Deputy Director of Agriculture.

APPENDIX.

An account of the locality and agriculture of the neighbourhood of the Taliparamba Agricultural Station.

The Taliparamba Agricultural Station was opened in 1905 when it was decided by Government that the study of all the aspects of pepper cultivation should be taken up. The site was selected by Mr. (now Dr.) Barber, the Government Botanist, and was under his charge until he went on leave in January 1907. After making extended tours in the pepper growing districts, he came to the conclusion that the investigations should be carried out on the plains, and he provisionally divided the pepper tract into four divisions :—

(1) The coast region where pepper is commonly grown in nearly every compound, but is seldom cultivated on an extensive scale.

(2) The low hills between the coast and the foot of the Ghauts where, on the lower slopes of small valleys, pepper is extensively cultivated.

(3) At the foot of the Ghauts, where the yield of pepper is reputed to be the heaviest and best.

(4) The Wynaad or above Ghant country.

The site for the Agricultural Station was chosen in the second of the above divisions and lies some 18 miles north of Cannanore and some 7—8 miles from the coast. Here the Ghauts approach nearer to the sea and the site was considered to be as typical of the pepper of the plains as could be found. At first glance the country in the neighbourhood of the farm seems to be deserted. Very little cultivation is to be seen, only low ranges of hills and intervening valleys with here and there a clearing in the scrub jungle on which "modan" or hill paddy is or has been cultivated. Where the soil (a decomposed laterite) is deep enough, the upper slopes are covered with a low scrub jungle. This never has a chance to grow as it is periodically burnt for modan (hill rice) cultivation. Here and there on the flat hill tops large stretches of grass lands are to be seen which in September and October, after the monsoon, form a brilliant contrast to the surrounding jungle, but which soon dry up when the hot weather sets in. The lower slopes of the hill sides appear, from a distance, to be densely wooded and, on dipping down into the valleys, these are found to be pepper gardens. As a rule each cultivator lives in his own pepper garden which he and his family cultivate. Near the valley bottom, coconuts and arecanuts are planted, while a few jack and mango are always seen in every garden; the rest of the garden is filled with pepper standards, either jungle trees, the remnant of the clearing, or more often planted cuttings of Muruku (*Erythrina indica*) upon which the pepper vines are trained. The bottoms of the valleys are laid out into terraced and banded paddy fields. The natural stream has been made to flow down one side of the valley bottom and is usually reveted with stone. This is utilized during the monsoon for irrigation or for drainage, whichever is necessary.

2. *Climate and rainfall.*—The different seasons are very clearly defined on the West Coast. The monsoon sets in in the first or second week of June and rain is fairly continuous until the end of August. In

September this diminishes, but heavy rains, usually thunderstorms, are still experienced which continue into October. Occasional rains fall till the end of December, but January to March are dry and hot. In April "mango showers" commence, becoming heavier in May, and with their aid the paddy seed beds are sown for transplanting with the commencement of the monsoon.

3. Pepper is the principal crop in the locality of the farm. This is a perennial climber, which in its wild state is usually found in dense evergreen forest. The pepper vine does not grow quickly and does not commence even to bear a crop until after the third year. After that, the yield increases until the vine becomes too old or dies. This age varies with different varieties, and vines are known which are reputed to be over one hundred years old.

The following is a brief description of the ordinary method of cultivating pepper. A hillside slope is selected. The scrub jungle is uprooted and the ground thoroughly hoed. Often some of the better natural growth is left either as shade for the young garden or as standards for pepper vines. Muruku (*Erythrina indica*) is, however, the common and favourite standard, and cuttings, 5 to 6 feet long, are planted at intervals of 8 to 12 feet. The seed of Muruku is sown with the hill paddy and, after the latter is harvested, these are left for three or four years, when they are cut close to the ground in the hot weather, piled in a damp shady place and planted out with the monsoon rains. In June close to each standard are planted 5 to 6 pepper cuttings. Each cutting consists of 5 to 6 nodes and they are taken from runners of the previous season's growth, which come from the base of the vine, and which are carefully preserved for this purpose by coiling them up as they grow and tying them at the base of the vine till required for planting. No further attention is given to these, except tying to the standard till the dry weather has properly set in, when twigs of Iru (*Xylocopa dolabriformis*, Benth) are tied round the standard to protect the young plant through the hot weather. These are removed with the first heavy shower as there is a danger of white ants attacking the young vines, if this is not done. Many of these cuttings never strike and many more die during the first hot weather, and the standards have again to be planted up the following monsoon. After this, tying up vines, lopping shade when this becomes too heavy, and digging the garden after the heaviest of the monsoon is over, are nominally the recognized routine of work, though the last operation is often neglected or very perfunctorily done. These commence to bear during the fourth year and the crop increases with proper care and attention year by year. It is difficult to say when it is at its best, probably about from the 12th to 25th year. Hence experimental work with a crop of this description can only show results after many years. When a garden becomes old and vines begin to die this is abandoned for a fresh garden, though any crop which is borne in the old garden is collected.

The Taliparamba Agricultural Station includes the upper end of a small valley with the catchment area above. It consists of several pepper gardens, some old, some young and some in full bearing, which were under different ownership before they were acquired, besides other suitable land for planting new gardens. Nearly all the low-country main varieties were represented on the area when the farm was acquired, but they are indiscriminately, or in some cases discriminately mixed and many of them had been neglected and even abandoned for some years. The shade varies also in the same way and is chiefly composed of Muruku, but jack, mango, coconuts, arecanuts, and numerous jungle trees are also found.

Aspect and gradient are also fully represented, while some parts are naturally damp and others dry. Thus, though little can at present be done with the newly planted gardens, individual vines can be studied and observations made in the questions relating to this crop detailed hereafter. The bottom of the valley contains wet lands, where demonstrations with paddy planting and trials of new crops likely to suit West Coast conditions are being made, while fairly level hill land is available for similar trials as rain-fed crops.

4. Since the above account of the local agriculture was written in 1907, an appreciable change is to be noticed in the local agriculture which is due to the influence of the Agricultural Station. Sugarcane is now an established crop and small plots of this can be seen in most paddy flats in the neighbourhood where the drainage in the monsoon season permits. There is also a marked improvement in the cultivation of paddy though there is still much to be desired. The permanent cultivation of dry land farmed intensively has greatly increased, and considerable capital has been employed in enclosing such lands. The ginger crop formerly little known in North Malabar is becoming quite a common crop, and along with this are cultivated various vegetables which formerly were little known in the neighbourhood.

**ANNUAL REPORT OF THE SEED POTATO FARM,
NANJANAD, FOR 1924-25.**

An account of the farm together with its aim and objects, is given in Appendix No. 1 to this report.

The analysis of the farm soils was done during 1923, and is shown in Appendix No. 2.

Season.—The season was quite unfavourable. It was worse than the previous year. Though the quantity of rainfall recorded this year was nearly twice that of the previous year, viz., 93·42 inches against 49·62 inches, the distribution was uneven. Rainfall during the hot weather was only 6·43 inches spread over 22 days, and in consequence this was not beneficial to the main crop. Sprouting was greatly affected and was not uniform. Again, the south-west monsoon rains were very heavy and 75·01 inches were recorded against an average of 36 inches during the same period. July alone brought 41·71 inches. The heavy rains washed away a good percentage of the potato tubers. The north-east monsoon rains were very scanty, 10·39 inches were recorded and the same was distributed over 36 days, and hence the second or seed crop also suffered.

Statement of rainfall during the years 1922-23, 1923-24 and 1924-25.

Month.	1922-23.		1923-24.		1924-25.	
	Number of rainy days.	Rainfall	Number of rainy days.	Rainfall.	Number of rainy days.	Rainfall.
		Inches.		Inches		Inches.
1. April	3	1·74	13	2·52	7	2·14
2. May	16	5·60	12	4·45	15	4·29
3. June	17	4·09	16	3·98	19	12·48
4. July	28	8·28	30	15·86	28	41·71
5. August	20	3·92	20	11·46	21	8·74
6. September	11	1·47	10	1·24	22	12·08
7. October	21	8·79	19	5·98	15	5·23
8. November	17	4·80	6	1·24	11	3·61
9. December	8	2·88	6	1·21	10	1·55
10. January	5	0·72	7	0·73	2	0·22
11. February ... ..	...	...	...	...	4	0·66
12. March	6	2·18	4	0·95	2	0·71
Total ...	147	44·37	143	49·62	156	93·42

3. *Crops—Potatoes.*—As usual, two crops of potatoes were grown. The total quantity of potatoes planted was 750 maunds (maund=25 lb.) and the yield was 3,253 maunds, which works out nearly five-fold. The yield would have been much better had it not been for the heavy rains which washed away a good quantity of potatoes and the attack of Early Blight. For the second crop, 399 maunds of potatoes were

planted and 554 maunds were obtained. This is not even two-fold. The poor yield is due to the bad season, prevalence of ring disease, and to the tuck of potato moth. Details showing the names of varieties planted and disposed of during the year are given in the statement below :—

Statement showing the quantity of seed potatoes planted, harvested, and disposed of during the year 1924-25.

Varieties.	First crop.		Second crop.		Disposed of.	
	Quantity planted.	Quantity harvested.	Quantity planted.	Quantity harvested.	Sold.	Supplied to seed farms.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
ENGLISH VARIETIES.						
<i>First Crop.</i>						
1. Midlothian Early ...	4	8	...	...	2	...
2. May Queen ...	68	490	158	432	93	32
3. Ringleader ...	...	...	4	1	...	...
<i>Second Early.</i>						
4. British Queen ...	...	...	1	1	...	...
5. Queen Mary ...	44	81	...	...	33	...
6. Great Scot ...	108	489	143	56	113	21
7. Ally ...	61	78	...	...	22	11
8. Acquisition ...	...	...	3	2	...	...
9. Brownell's Beauty ...	46	287	9	2	128	24
10. Cambridge Kidney ...	6	13	...	...	5	...
11. Edinburgh Castle ...	9	78	...	...	40	...
12. Ninety-fold ...	30	163	4	2	75	...
<i>Main crop.</i>						
13. Arran Chief ...	...	...	1	1	...	...
14. Irish Queen ...	46	102	...	...	30	...
15. Iron Duke ...	56	332	...	...	156	8
16. Ever Good ...	19	123	...	...	49	2
17. King Edward ...	21	68	...	...	18	...
18. Dover Castle ...	...	...	...	...	...	...
19. Up-to-date ...	...	...	8	2	...	...
20. Emperor ...	...	...	64	54	21	...
21. Sensation ...	...	...	4	1	...	...
AUSTRALIAN VARIETIES.						
22. Early Carman ...	68	281	...	...	168	24
23. Late Carman ...	76	305	...	...	103	...
24. Snow Flake ...	27	146	...	...	73	...
25. Prolific ...	19	42	...	...	24	...
26. Scottish Triumph ...	42	172	...	...	84	...
Total ...	750	3,253	399	554	1,237	123

One maund = 25 lb.

Other crops.—Korali was sown in field No. 18, and the crop came up well and a yield of 1,575 lb. of grain was obtained.

Peas and beans were sown in field No. 2 and the germination was satisfactory. The crops did not grow well on account of the poor nature of the soil, and hence they were ploughed in. Oats and ragi were sown in field No. 19 and they completely failed on account of the heavy rains.

4. *Manures*.—The number of cattle during the year having been increased to 3½ pairs, a greater quantity of manure was available for manuring. In spite of the fact that there was no proper storage accommodation, 40 tons were obtained, and the manure was used for about 15 acres at about 3 tons per acre.

In addition to the cattle manure, 20 tons of fish-guano were purchased from the Co-operative Society, Mangalore, for Rs. 1,470-8-6 including railway freight. This was applied at the rate of 10 cwt. per acre in conjunction with the available cattle manure. Two cwt. of nitrate of soda were obtained free of cost for trial from the Chilean Nitrate Committee and were used for the experimental plots in field No. 4. Lime was also used for the manurial experimental plot.

5. *Green manure*.—The only green manure crop which was tried during the previous year was Lupin. During the year under report, mustard was sown in addition. The former was sown in a portion of field No. 18 of the second crop area. The crop was left for seed purposes and 80 lb. of seeds were collected for sowing in the next season. Mustard sown in field No. 1 of the main crop area did not germinate satisfactorily and the crop failed.

6. *System of preparation of land, planting harvesting, etc.*—As has been mentioned in the last year's report, the introduction of the labour saving implements has considerably facilitated the agricultural operations, viz., preparatory cultivation, planting, harvesting, etc. All the fields were ploughed by the Monsoon and Turnwrest ploughs. The clods were broken by the Guntaka, Mysore Cultivator and the Planet Junior Hoe. The furrows for planting were formed along the contours by the double mould board plough or the ridging plough. The new system of planting along the contours in all the areas of the farm has been very helpful, not only in preventing the washing of the soil and manures even during this year of exceptionally heavy rains, but the labour charges that had to be incurred in cleaning the drainage channels after each rainfall were considerably lessened. Again, during the previous years the usual practice was to open furrows for planting, by bullock power and the covering of the potatoes was done by manual power by guthalies. During this year every effort was taken to make use of the bullock power also for covering potatoes after planting and the attempt was a success, the implements used for the purpose being the Planet Junior Hoe. This was drawn close together with mould board attachments. This work is speedily done besides being very economical. The earthing-up operation was done by bullock power. In addition to the above labour saving devices, the potato digger which was received during the close of the year was used for harvesting the crop. The implement is worked with a pair of bullocks, and has a shovel-like front with a frame which oscillates as the implement moves forward. The potatoes that are dug out by

the shovel are thrown behind the frame into the furrow and are picked by the coolies. The digger was used both for the main crop and the seed crop. In the former case, there was slight difficulty to work the same on account of the wet condition of the soil and weedy nature of the field during the current year. The work of the implement was much more satisfactory for harvesting the second crop as the soil was very friable, and the field free from weeds. The work was speedily done and the cost of work is decidedly cheaper. Thus it will be seen that all operations except planting is done with the aid of bullock power.

A comparative statement showing the cost of the above operations both by manual and cattle power is given below :—

Comparative statement showing the cost of preparation of land and planting of potatoes both by manual labour and cattle-power.

Name of operation.	Field No. 16 acres 0·85.					
	1932-23			1924-25		
	Manual labour.			Cattle power.		
	Rs.	A.	P.	Rs.	A.	P.
(1) Forking	10	3	2	7	12	0
(2) Breaking clods	9	2	0	...	...	...
(3) Opening furrows and planting	5	12	6	4	12	0
(4) First earthing up	2	14	0	1	5	0
(5) Harvesting	7	13	0	4	5	0
Total	35	12	8	18	2	0

Difference per plot of 0·85 acres = Rs. 17-10-8.
 Difference per acre " 20-12-7.

During the previous year, the difference in the cost of cultivation per acre by using labour saving implements was Rs. 12—12—9 while this year the saving was greater still and works out at Rs. 20—12—7. This increased saving is due to the use of the potato-digger and partly due to the replacing of the old animals with young pairs of cattle.

7. *Pests and diseases.*—The main crop was attacked with Early Blight (*Alternaria solani*) which caused considerable damage. Spraying had to be abandoned on account of the continuous rains. Ring disease also made its appearance, and affected the crop. The second crop was badly attacked with the potato moth, for which light traps were tried, but without much success; hence the poor yield. Ring disease also was prevalent. The diseased plants were removed wholesale, and the place was treated with lime.

The tubers were treated with "Tuberol" solution against the potato moth. The treated potatoes are stored separately in order to see the effect of the treatment.

8. *Hill selection.*—The potatoes obtained by selecting from the best hills were planted in September in separate plots. The sprouting was very good, and the plants came up vigorously in the beginning. There was a marked difference between the selected and

unselected plots. The results of the experiments are tabulated below:—

Statement showing the results of the hill selection plots—Field No. 17.

No.	Varieties planted.	Hill selection.			Total.	Check plots.					
		Quantity planted. Medium.	Quantity harvested. Medium.	Quantity planted. Chats.		Quantity harvested.			Quantity selected from the selected plots.		
						Medium.	...	Total.			
1	Queen Mary ..	LB. 5	LB. 6	LB. 8	LB. 14	LB. 5	LB. 3	LB. 5	LB. 8	LB. 3	
2	Great Scot ...	19	5	10	15	19	6	4	10	12	
3	Imperator ...	1	2	3	5	1	6	2	8	4	

9. *Varietal plots.*—One hundred and fifty tubers in each of the 11 varieties of potatoes which were true to the type were selected and planted in lines with a view to find out the best yielder and also to keep up the purity of the tubers.

The following statement gives the names of the varieties, the quantity planted, harvested and selected. —

Statement showing the results of—the varietal plots, 150 tubers of each variety—Field No 17.

No.	Varieties planted.	Quantity planted in lb.	Quantity harvested.		Total in lb.	Quantity selected in lb.	Remarks.
			Medium.	Chats.			
1	Great Scot ...	13	8	12	20	6	
2	Ringleader ...	12½	8	5	13	5	
3	Brownell's Beauty.	12	12	13	25	10	
4	Sensation ...	12	12	14	26	8	
5	May Queen ...	13	14	10	24	8	
6	Arran Chief ...	12	15	5	20	7	
7	Ninety fold ...	11½	11	8	19	5	
8	Acquisition ...	11½	13	6	21	5	
9	Imperator ...	12½	16	11	27	6	
10	Up-to-date ...	13½	9	6	17	3	
11	British Queen ..	12	14	6	20	5	

No definite conclusions can be drawn and the tests will be repeated next year. Seed potatoes have also been selected for sowing during next year.

10. *Experiments—Manurial and varietal experiments.*—Manurial and varietal experiments were conducted with different kinds of manures and varieties of potatoes, in order to find out which of the manures gives the best results, and what varieties are heavy yielders. Experiments were done with fish manure, cattle manure, lime and nitrate of soda. The varieties selected were Great Scot and Queen Mary. The experiment was tried in field No. 4 in one cent plots which were repeated four times. The results are tabulated in Statements A and B.

STATEMENT A.

The following table gives the results of the manurial experiments in Field No. 4. The figures show the yield of potatoes in pounds harvested from one cent plots which have been repeated four times.

Series.	Fish manure, 10 cwt. per acre.			Fish manure, 10 cwt. per acre. Lime 4 cwt. per acre.			Fish manure, 10 cwt. per acre. Cattle manure, 5 tons per acre.			Fish manure, 10 cwt. per acre and nitrate of soda, 1 cwt. per acre.			No manure.			Remarks.
	Medium lb.	Chats lb.	Yield per acre in maunds.	Medium lb.	Chats lb.	Yield per acre in maunds.	Medium lb.	Chats lb.	Yield per acre in maunds.	Medium lb.	Chats lb.	Yield per acre in maunds.	Medium lb.	Chats lb.	Yield per acre in maunds.	
1	53	9	248	47	8	220	70	13	332	53	10	252	8	8	64	} Great Scot.
2	47	8	220	48	7	220	70	14	336	53	7	240	10	6	64	
3	32	12	176	35	13	192	52	16	272	11	6	68	4	7	44	} Queen Mary.
4	25	15	160	25	15	160	32	14	184	22	12	136	6	8	56	
Yield of plots in lb. }	201	...	...	197	...	...	...	281	...	164	...	...	...	57	...	
Yield per acre in maunds. }	...	...	201	...	...	198	...	...	281	...	...	164	...	...	57	

STATEMENT B.

The following are the results of the cattle-manure series in Field No. 4.

Series.	Cattle manure 10 tons per acre.			Cattle manure 5 tons per acre.			Cattle manure 5 tons per acre. Lime 4 cwt. per acre.			Cattle manure 5 tons per acre. Nitrate of soda 3 cwt. per acre.			No manure.			Remarks.
	Medium lb.	Chats lb.	Yield per acre in maunds.	Medium lb.	Chats lb.	Yield per acre in maunds.	Medium lb.	Chats lb.	Yield per acre in maunds.	Medium lb.	Chats lb.	Yield per acre in maunds.	Medium lb.	Chats lb.	Yield per acre in maunds.	
1	36	10	46	23	8	31	22	13	35	6	10	16	8	7	15	} Great Scot.
2	38	14	52	25	13	38	24	10	34	7	5	12	10	6	16	
3	27	13	40	22	12	34	21	13	34	4	8	12	4	9	13	} Queen Mary.
4	27	14	41	23	12	34	17	12	29	4	7	11	4	8	12	
Yield of plots in lb.	179	...	...	137	...	...	...	132	...	...	51	...	56	...	...
Yield per acre in maunds.	...	...	179	...	...	137	...	...	137	...	...	51	...	...	56	

From the above statement it is found that in the fish-manure series, application of 10 cwt. of fish guano with 5 tons of cattle manure, has given the best yield as was the case during last year; then come fish manure and cattle manure plots. The low yield of fish manure and nitrate of soda plots is partly due to the washes. In both series, ten plots have been planted with Great Scot and Queen Mary.

Average yield of the one cent plots in each variety, extra yield obtained over the unmanured plots, and the profit and loss by the application of the different manures is furnished in the following statements:—

Statement showing comparative trials of fish manure with other manures. Variety.—Great Scot.

Area of each plot—one cent.

No.	Treatment.	Yield per plot in pounds.		Extra yield over the unmanured plot.		Value of the manure applied per acre.		Value of the potatoes obtained per acre.	Net amount realized per acre in rupees.
		Medium.	Chats.	Medium.	Chats.	rs.	rs.		
1	Fish manure, 10 cwt.	50	8.5	41	1.5	60	334	274	
2	Fish manure, 10 cwt. and lime 4 cwt.	47.5	7.5	38.5	0.5	78	315	237	
3	Fish manure 10 cwt plus 5 tons of cattle manure.	70	13.5	61	6.5	80	474	394	
4	Fish manure 10 cwt. plus 1 cwt. of nitrate of soda.	53	8.5	44	1.5	88	352	264	
5	No manure ...	9	7	...	...	...	82	82

Note.—The following prices have been given in calculating the value of manures, potatoes, etc :—

	RS.	A.	P.
1. Cattle manure	4	0	0 per ton.
2. Lime	4	8	0 per cwt.
3. Nitrate of soda	28	0	0 "
4. Fish-guano	16	0	0 "
5. Table potatoes	16	0	0 per bag of 200 lb.
6. Medium sized potatoes	12	0	0 "
7. Chats	8	0	0 "
8. Cut tubes	4	0	0 "

Statement showing the comparative yields of fish manure with other manures.

Manure—Fish manure.

Variety—Queen Mary.

Area of each plot—one cent.

No.	Treatment.	Yield per plot in pounds.		Extra yield over the unmanured plot.		Value of the manure applied per acre.		Value of the potatoes obtained per acre.		Net amount realized per acre in rupees.
		Medium.	Chats.	Medium.	Chats.	Rs.	Rs.	Rs.		
1	Fish manure, 10 cwt. ...	28.5	13.5	24.5	6.5	60	225	165		
2	Fish manure 10 cwt. plus lime 4 cwt. ...	30	14	26	7	78	236	158		
3	Fish manure 10 cwt. plus 5 tons of cattle manure ...	42	15	38	8	80	312	232		
4	Fish manure 10 cwt. plus 1 cwt. of nitrate of soda ...	11	6	7	1	88	90	2		
5	No manure ...	4	7	...	...	...	52	52

Statement showing the comparative results of cattle manure with other manures.

Plots—1 cent each.

Variety—Grant Scot.

No.	Treatment.	Yield per plot in maunds.		Extra yield over the unmanured plot.		Value of the manure applied per acre.		Value of the potatoes obtained per acre.		Net amount realized per acre in rupees.
		Medium.	Chats.	Medium.	Chats.	Rs.	Rs.	Rs.		
1	Cattle manure, 10 tons per acre ...	37	12	28	5.5	40	270	234.		
2	Cattle manure, 5 tons per acre ...	24	10.5	15	4	20	186	166		
3	Cattle manure, 5 tons plus 4 cwt. lime ...	23	11.5	14	5	38	184	146		
4	Nitrate of soda, 2 cwt.	65	7.5	2.5	1	56	69	13		
5	No manure ...	9	6.5	...	...	...	80	80

Statement showing the comparative results of cattle manure
with other manures.

Plot—1 cent each.

Variety—Queen Mary.

No.	Treatment.	Yield per plot in pounds.		Extra yield over the un- manured plot.		Value of the manure applied per acre.		Value of the potatoes obtain- ed per acre.		Net amount realized per acre in rupees.
		Medium.	Chats.	Medium.	Chats.	Rs.	Rs.	Rs.	Rs.	
1	Cattle manure, 10 tons per acre	27	13.5	23	4.9	40	216	176		
2	Cattle manure, 5 tons per acre	22	12	18	3.4	20	136	156		
3	Cattle manure, 5 tons plus 4 cwt. lime ...	19	12.5	15	3.9	38	164	126		
4	Nitrate of soda, 2 cwt.	4	7.5	...	-11	56	54	-2		
5	No manure	4	8.6	..	..	...	58.4	58.4	

Size experiment.—In order to find out the relation of production of heavy ware to size of set, experiments were conducted in field No. 12 by planting cut tubers, chats, medium and big potatoes. Four plots of one cent each were sown. The results are tabulated below:—

Statement showing the relations of production of heavy ware to
size of sets in field No. 12, 1924-25.

Variety—Great Scot.

Type of potatoes.	Yield per plot in lb.		Fold.	Yield per acre in maunds.		Value.		Total value.	Average seed rate in lb.	Value of the potatoes planted per acre.		Net gain.
	Medium	Chats.		Medium.	Chats.	Rs. A. P.	Rs.			Rs. A. P.	Rs. A. P.	
Cut potatoes ...	46.5	5	46	186	20	279	0 0	20	299	1,125	22 5 0	276 5 0
Chats ...	59.25	4.25	20.9	237	17	355	5 0	17	372.5	308	12 12 0	360 3 0
Medium ...	86.0	7.0	9.1	344	28	516	0 0	28	544	1,025	61 5 0	432 5 0
Big ...	114.75	8	7.1	459	32	688	5 0	32	720.5	1,725	138 0 0	582 5 0

Notes.—Calculation has been made on the following basis:—

- Table potatoes—Rs. 3 per maund.
- Medium sized—Rs. 1-8-0 per maund.
- Chats—Rs. 1 per maund.
- Cut potatoes—Rs. 0-8-0 per maund.

It will be seen that the table potatoes have given the best results this year.

Seed farms.—One hundred and twenty-two maunds of potatoes were sent to the seed farms in Shevaroy Hills and Nilgiris. The work of the potato seed farms has been discussed in detail in the Administration Report of the VIII Circle.

Wind-belts.—The wind-belts are well established. They are now about six years old and have grown up nicely. The use of Acacia as wind-belts seems to be rather doubtful, as they do not effectively protect the crop against the south-west monsoon wind, on account of the slopy nature of the land. Further they harbour rats which cause considerable damage, and also the growth of the crop all along the wind-belt is very poor.

Fencing.—The trespass by pigs and porcupines has been greatly reduced by the wire fencing over the stone wall. The wire fencing near the old cart-stand was shifted further to the north of the road, so as to enclose the new store shed within it; and the gate was also removed to a distance of about 100 yards towards the west.

New works.—The pig sty which was under construction during the previous year was completed. The old store shed was thoroughly repaired at a cost of Rs. 2,200. A fourth store shed and a combined cart-stand and the implement shed were newly constructed at a cost of Rs. 1,700 and Rs. 1,550, respectively, very close to the road near the entrance. Besides the construction of the new buildings and the repairs to the old buildings, all the drainage channels existing on the farm have been deepened and widened, as they were found insufficient to take away the water during the heavy rains. The buck-scraper was used occasionally for levelling portions of fields.

Live-stock.—Of the three pairs of working animals the old pair was sold and a young pair was purchased for the farm, and also a single bullock for the single bullock cart.

The condition of the working animals is being maintained in spite of the heavy work, as they are being fed with concentrated food. The scarcity of fodder is keenly felt and the animals had to remain without it on certain days.

Receipts for the year amounted to Rs. 3,143-9-9 including the value of 112 maunds of seeds supplied to potato seed farms treated as transfer.

OFFICE OF THE DEPUTY
DIRECTOR OF AGRICULTURE,
VIII CIRCLE, COIMBATORE,
4th May 1925.

R. N. K. SUNDRAM,
Assistant Director of Agriculture
in charge of VIII Circle.

VI.—Results of analyses of eight samples of soil taken from the Nanjanad Farm.

Heads of analyses.	Lab. 630/22 southern slope surface soil.	Lab. 631/22 southern slope sub-soil.	Lab. 632/22 upper belt surface-soil.	Lab. 633/22 upper belt sub-soil.	Lab. 634/22 lower belt surface-soil.	Lab. 635/22 lower belt sub-soil.	Lab. 636/22 swamp surface-soil.	Lab. 637/22 swamp sub-soil.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Chemical analysis.								
Moisture	5.38	5.47	4.37	4.11	4.38	4.65	4.44	4.60
Loss of ignition	14.07	12.27	12.11	10.13	16.89	12.54	17.66	16.63
Insoluble mineral water	52.35	53.58	52.65	54.84	56.33	55.88	56.92	59.21
Iron ($Fe_2 O_3$)	10.06	10.07	12.88	12.67	11.50	10.77	6.68	4.97
Alumina ($Al_2 O_3$)	15.53	18.15	15.59	14.34	10.88	15.11	13.36	13.40
Lime (Ca O)	0.093	0.098	6.056	0.067	0.041	0.067	0.052	0.075
Magnesia ($Mg O$)	0.135	0.123	0.103	0.124	0.046	0.139	0.062	0.066
Total phosphoric acid ($P_2 O_5$)	0.151	0.120	0.150	0.139	0.145	0.121	0.128	0.113
Total potash ($K_2 O$)	0.519	0.500	0.453	0.293	0.338	0.378	0.375	0.367
Soda ($Na_2 O$)	0.063	0.024	0.027	...	0.052	0.043	0.042	0.059
Sulphuric acid (SO_3)	0.121	0.109	0.118	0.080	0.038	0.025	0.034	0.028
Carbonic acid (CO_2)	0.115	0.095	0.023	0.262	0.083	Trace	0.011	0.014
Total	98.567	100.609	98.533	97.655	100.723	99.723	99.764	99.752
Nitrogen (N)	0.259	0.214	0.207	0.153	0.214	0.160	0.405	0.319
Available phosphoric acid ($P_2 O_5$)	0.0145	0.0092	0.0071	0.0079	0.0082	0.0184	0.0147	0.0088
„ Potash ($K_2 O$)	0.0158	0.0107	0.0112	0.0136	0.0176	0.0117	0.0339	0.0146
Mechanical analysis.								
Fine gravel	7.86	7.53	10.54	9.45	6.1	4.8	3.9	2.1
Coarse sand	7.85	6.85	6.53	8.73	7.6	7.8	7.5	6.7
Fine sand	19.81	20.26	19.28	17.66	11.63	12.15	17.77	13.25
Silt	24.27	15.37	14.14	10.39	18.56	12.35	19.56	17.37
Fine silt	23.09	28.08	23.95	23.31	33.20	33.1	29.6	34.7
Clay	9.59	1.385	13.76	18.79	17.95	24.49	16.53	20.45
Moisture and loss	8.03	0.06	6.80	6.67	4.96	5.31	5.14	5.43
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Percentage of stones in samples received	4.09	5.31	13.01	21.09	5.39	6.29	8.23	9.15

Remarks.—All the soils contain more of finer particles than the coarser ones and may be classed as clayey loams. The soils of the southern slope and the upper belt are more open in texture than those of the lower belt and swamp.

All the soils, especially the swamp, are very well supplied with nitrogen and potash but the available phosphoric acid is rather on the decline in spite of the fact that the supply of total phosphoric acid is satisfactory.

The soils are very poor in lime. The content of iron and alumina is high. This is likely to set up conditions unfavourable for rendering the existing supplies of phosphoric acid available. Liming will liberate combination with iron and alumina and render phosphoric available.

This indicates a general deficiency of lime, and it is proposed to include a series of experiments with lime.

APPENDIX.

The farm was established in 1917 after a good deal of time had been spent in selecting the site. It is situated about half-way between the village of Kuruthukuli and Nanjanad and is approached from the Avalanche Road at a point about six miles from Ootacamund. It is one and a half miles across country from the Avalanche Road. Easy access to the farm is now possible by a new road constructed direct to it. This road branches off at Andy's Corner, on the Governor's Shola Road, wherefrom the farm is three miles. The total distance to the farm from Ootacamund is ten miles. The farm was originally scrub jungle and grass land and portion of it appears to have been cultivated many years ago. The soil is typical of that to be found on the Nilgiris and is therefore somewhat poor. It is all dry land excepting two acres of swamp. The farm is exposed to the south-west monsoon, the winds of which usually damage the haulms of the potatoes. The area of the farm is 90.16 acres and the portion at present under cultivation measures approximately 36 acres. The chief crop is potatoes, but barley, korali, samai, ragi and oats are grown in rotation, and mustard, lupins, peas and beans are grown as green-manure crops. The objects of the farm are (1) to import and grow disease-free potatoes of good varieties and to distribute them to the ryots for seed purposes at a reasonable price, (2) to experiment with the different kinds of manure to find out which are the best for the district, (3) to carry out various experiments with green manures, rotation of crops, etc., and (4) to encourage the ryots to adopt more up-to-date methods of cultivation and to grow better varieties of potatoes than they usually do. Two crops of potatoes are grown annually, the first being planted in March and the second in August. The best time to see the farm is during the months of May and November, the crops then being in full growth.

2. The much-needed spring showers usually commence during the first week of April, and if the rain is sufficient the potatoes planted in March soon commence to grow. Everything depends on these early showers, and if they do not occur, or if they are light, the growing period of the crop is shortened; for, when the monsoon sets in about the 10th June, the high winds which accompany it blow the haulms to pieces and growth is slow, the weather being cold. Moreover, Early Blight sets in and destroys the leaves. Towards the end of August a second crop of potatoes is planted, but these do not grow so rapidly as the first crop, the "seed" not having been kept so long; the shoots are therefore weaker: this, together with the uncertainty of the north-east monsoon and the liability of frosts occurring in November, makes the second crop an uncertain one and it is called "seed crops," i.e., for use for planting purposes in February and March. With careful storage, however, and an up-to-date store-room it is possible to keep the crop lifted in July-August until the following March; this practice is recommended as such "seed" grows more quickly and produces heavier crops.

3. The crops grown by the surrounding ryots include potatoes, barley, korali, samai, amaranthus, onions and other vegetables. The ryots' methods of potato cultivation are extremely primitive and it is a common sight to see them planting diseased potatoes, of the size of a marble. The "sets" are often planted so close as six inches apart in the rows and fifteen inches between the rows; cattle manure is used, at the time of planting, but in limited quantities, as it is difficult to obtain. Korali is sown on any poor land without any cultivation other than ploughing six inches

deep and the breaking and cleaning of land just before sowing; no manure being given as a general rule, but a weeding is given without any exception. After koralí has been grown the land is allowed to lie fallow for some years. The cattle kept by villagers are extremely poor and give little milk; the buffaloes are much finer animals, the coarse grass of the Nilgiris apparently suiting them better than it does other cattle. Much of the worn out land around the Badaga villages should be planted with Wattle (*Acacia dealbata*) or other quick-growing tree to provide fuel for the villagers, as the women have to go miles to collect wood for cooking purposes. Such worn out land if regenerated as described above would provide valuable arable land for the next generation. Wild pigs do an incredible amount of damage to the crops, and much expense is incurred in erecting walls and making trenches, etc., around the farms.

4. The ryots practice rotation of crops in a small way and they are beginning to appreciate the value of green-manure crops.

GLOSSARY.

English or local name.			Botanical name.
Ragi	...	...	<i>Eleusine coracana.</i>
Samai	...	...	<i>Panicum miliare.</i>
Koralí	...	...	<i>Setaria glauca.</i>
Barley	...	...	<i>Hordeum vulgare.</i>
Oats	...	...	<i>Avena sativa.</i>
French Beans	...	...	<i>Phaseolus vulgaris.</i>
Peas	...	...	<i>Pisum sativum.</i>
Mustard	...	...	<i>Brassica juncea.</i>
Lupins	...	...	<i>Lupinus specios.</i>
Potatoes	...	...	<i>Solanum tuberosum.</i>

**REPORT ON THE WORK OF THE CENTRAL
AGRICULTURAL STATION, COIMBATORE,
FOR 1924-25.**

The farm is situated in the village of Telungapalayam, three miles to the north-west of Coimbatore. It consists of two blocks. The whole extent is 478 acres, made up of 42.03 acres of wet lands, 331.55 acres of dry lands and 104.42 acres commanded by wells. Wet lands lie at a little distance from the main portion and under a tank fed by a channel from the Noyal river and are devoted chiefly to the cultivation of paddy under swamp conditions. Buildings, roads and wastes occupy 167.49 acres and are included under dry lands.

2. Details regarding soils, climate and systems of cultivation practised on the farm and in the neighbourhood are found in paragraphs 2 to 6 of this station's report for 1923-24 and are omitted.

3. *Seasons.*—Remarks made under this head cover a period long over the customary twelve-month and commencing from October 1, 1923, as the cotton crops sown during that month are also included in this report.

October (1923) followed a rainless September, and was marked by average rainfall which was, however, better distributed in the latter fortnight, though sufficient (1.79 inches) was precipitated in two days (5th and 6th) which gave a start for cold weather sowings.

November rains were below normal and the second half had no clouds whatever.

December was, as has often proved to be the case, extremely shaky. Thus the rainfall during the quarter, October-December, was in considerable defect, being only 7.5 inches against an average of over 11 inches.

January-March (1924) fared no better, in fact it was worse both by reason of the defective rainfall during the preceding quarter and the little amount of rain, viz., 1.1 inches received during the period. This quantity was only 50 per cent of the average for the quarter during the previous 16 years but was however a very welcome feature in that the dryness that resulted enabled crops to be harvested in time, neither was there deterioration in the quality of the grain nor was extra expense incurred.

The first day in *April* recorded 2.62 inches of rain which fell the previous day in the short space of one hour. This caused great temporary inconvenience; the bunds of the main drainage channel collapsed in places, and parts of Fields Nos. 50 and 47 were sanded. A few fields were also scoured. No previous April, however, was so favoured as this, since 3.25 inches recorded in the first fortnight facilitated early preparation of garden and dry lands to the extent of

60 acres. Grass sprang up on field bunds and gave a substantial cut of 1,500 lb. a day, cottons put forth a fine flush, and summer cholams could be sown with ease.

This character of the weather continued right into the middle of *May*. On the 16th of this month, again, there was a sudden and heavy downpour which gave in one hour 2·31 inches of rain. This time, however, there was less harm done than on the first of April. Nevertheless, wet weather at the wrong time delayed sowings of ragi in the seedbed, though wells continued to give only an inadequate supply, and one or two failed to meet the requirements of summer cholam.

June was the best month of the year, though the rains were purely of a local nature. Ideal conditions prevailed. Sufficient rain and sunshine alternated almost during the whole of the first half, during which 5·13 inches of rain fell. The second half was fairly dry, which favoured early cropping in most fields and puddling in wet lands.

An excellent first week in *July* marked unprecedented rainfall later. 13·58 inches were recorded in the fortnight ending the 24th. This was far in excess of the July average and exceeded the eighteen years' annual average for the period—June-September—by about 50 per cent. The Chitrai Chavadi channel overflowed its banks a few furlongs higher up the wet lands and was breached. Wet land operations were held up for a time. A hard crust was formed on the surface of dry fields, the soils running together as the result of rains. Early sown crops turned pale and ragi suffered worst. Cholams became sickly and the insidious fungus raised its head and showed itself quite unmistakably in both dry and irrigated cottons. None the less, canes and wet paddy seedbeds suffered little ill-effect because of the excellent drainage facilities wet lands are enjoying.

August was a most agreeable contrast with its brighter weather which was welcome. Strong westerly winds punctuated with light showers changed the whole aspect of the farm. Early sown crops which had grown pale, rapidly changed colour, and garden crops fast improved, yet one uncomfortable circumstance was the stunted and sickly nature of fodder cholams which were past recovery.

September was more rainy than in former years, and soaking rains that fell helped and hastened cotton, maize and horse-gram sowings.

The first half of *October* was both cloudless and rainless. Yet the second half witnessed a fall of 5·87 inches which is more than the average for the month; of this quantity, 5·51 inches fell on the 24th and 25th and caused temporary submersion of a few fields by surface wash, sanded and rendered unfit for cultivation portions of Fields Nos. 50 and 47 which had been similarly affected once before in April.

4·09 inches of rain fell in the first week of *November* while the rest of that fortnight recorded only 21 cents, the remaining weeks being bright and clear. Wet weather conditions in the early half of the month postponed Bengal gram and wheat sowings and harvest of ragi by about a fortnight. Paddies also lodged during the period. Work cattle were, however, usefully employed in puddling and preparing the mud thrashing floor in the yard, when there was no work in fields.

December was very much wetter than usual, the quantities received on two days, 2nd and 15th, being 1.76 inches and 0.11 inches respectively. This threatened paddy and cholam harvests which were pushed on with vigour during the bright spell which followed.

January (1925) was ushered in by a very insignificant drizzle which brought down 3 cents. The weather continued dry and agreeable during the rest of the month.

There was no rain during the next six weeks, while in the second fortnight of March, 3.78 inches of rain fell. This was timely, adequate and was fully utilized for preparing land and sowing cholams.

Thus the year under report with a total rainfall of 45.44 inches was the wettest on record for a period of 54 years. The two years which proved abnormal were 1884-85 and 1903-04 and the rainfall recorded during these two years was 41.52 inches and 41.55 inches respectively. The annual average for 18 years is 25.37 inches. Table No. 1 details quantities of rain recorded during the year and compares them with the rainfall of the previous four years. The average noted in the last column refers to a period of 18 years including 1924-25.

TABLE I.

Statement of rainfall for the quinquennium ending March 31, 1925.

Months.	1920-21.	1921-22.	1922-23.	1923-24.	1924-25.	Average for 18 years.
April ... { 1-15 16-30	1.26 1.74	0.64 1.89	0.04 0.39	2.10 0.01	3.45 0.03	6.71
May ... { 1-15 16-31	0.04 1.55	0.12 0.04	2.42 0.17	0.00 0.61	0.59 3.65	
June ... { 1-15 16-30	0.89 1.09	0.70 0.25	0.02 2.06	0.81 0.06	5.13 0.26	7.49
July ... { 1-15 16-31	1.06 0.25	0.89 1.58	1.58 0.80	0.94 2.08	2.85 11.33	
August ... { 1-15 16-31	0.45 0.25	0.91 0.99	0.07 0.26	2.66 0.55	0.05 0.27	32.88
September ... { 1-15 16-30	0.12 0.52	0.42 0.02	0.05 0.25	0.29 0.00	0.80 2.19	
October ... { 1-15 16-31	1.51 0.53	1.45 3.22	4.56 2.96	1.79 2.95	0.00 5.87	11.81
November ... { 1-15 16-30	3.76 3.81	4.99 0.00	3.04 1.00	2.01 0.00	4.80 0.00	
December ... { 1-15 16-31	0.00 0.00	0.00 0.25	5.98 0.00	0.01 0.74	1.87 0.00	2.16
January ... { 1-15 16-31	1.41 2.40	1.29 0.00	0.39 0.68	0.11 0.00	0.08 0.00	
February ... { 1-15 16-28	0.00 0.00	6.09 0.00	0.00 0.00	0.00 0.80	0.00 0.00	25.37
March ... { 1-15 16-31	0.00 0.00	0.31 0.00	1.41 0.58	0.00 0.99	0.00 3.78	
Total ...	21.64	25.36	27.31	18.74	45.44	

TABLE II.

Statement of daily rainfall.

Date.	Quantity in inches.		Date.	Quantity in inches.		Date.	Quantity in inches.	
	Useful.	Not use-ful.		Useful.	Not use-ful.		Useful.	Not use-ful.
1923.			1924.			1924.		
October 3 ...	.50	...	May 15 ...	...	.08	August 16 ...	...	.17
4 ...	.82	...	17 ...	2.31	...	19 ...	...	.09
10 ...	...	.13	20 ...	...	.14	27 ...	...	.01
15 ...	.34	...	23 ...	...	.16	September 3 ...	...	.02
16 ...	...	.02	26 ...	...	.01	5 ...	...	.05
17 ...	...	.04	28 ...	...	.03	7 ...	...	.13
18 ...	1.26	...				17 ...	...	.19
20 ...	...	.07	June 4 ...	.50	...	19 ...	...	.21
21 ...	...	.03	5 ...	2.36	...	23 ...	1.41	...
23 ...	.32	...	7 ...	...	.03	24 ...	...	.10
24 ...	.29	...	11 ...	...	.02	25 ...	...	.02
26 ...	.21	...	12 ...	...	.26	26 ...	...	.10
27 ...	.11	...	13 ...	...	.42	30 ...	...	.16
28 ...	.17	...	14 ...	...	1.15			
29 ...	.43	...	15 ...	...	.39	October 17 ...	...	.05
			16 ...	...	.23	19 ...	...	.30
November 3 ...	1.00	...	18 ...	...	.03	21 ...	...	.01
4 ...	.15	...				24 ...	2.26	...
5 ...	.58	...	July 3 ...	...	.02	25 ...	2.61	...
7 ...	.28	...	4 ...	...	.39	27 ...	.42	...
			6 ...	...	.19	30 ...	...	.22
December 4 ...	...	.01	10 ...	...	.27	November 1 ...	.89	...
16 ...	...	.04	11 ...	...	.20	2 ...	1.75	...
17 ...	.67	...	12 ...	...	.39	3 ...	.43	...
21 ...	...	.03	13 ...	...	.60	4 ...	.68	...
			14 ...	...	.02	5 ...	.30	...
1924.			15 ...	...	.77	6 ...	...	.04
January 8 ...	...	.11	16 ...	2.96	...	9 ...	...	.01
			17 ...	1.96	...	12 ...	...	.04
March 22 ...	.63	...	18 ...	.38	...	13 ...	...	.16
25 ...	...	.05	19 ...	.64	...	December 2 ...	1.76	...
31 ...	.31	...	20 ...	.69	...	15 ...	...	.11
			21 ...	.22	...			
April 1 ...	2.62	...	22 ...	2.50	...	1925.		
2 ...	...	.04	23 ...	1.17	...	January 13 ...	...	.03
6 ...	...	.14	24 ...	.72	...			
10 ...	...	.02	25 ...	...	.12	March 16 ...	1.29	...
12 ...	.63	...	26 ...	...	.03	17 ...	1.87	...
17 ...	...	.01				18 ...	.25	...
19 ...	...	.01	August 4 ...	...	.01	19 ...	...	.03
			6 ...	...	.27	20 ...	.34	...
May 5 ...	.83	...	8 ...	...	.10			
	...	.18	11 ...	.27	...			

N.B.—A useful rain day is one on which either 25 cents was recorded or sufficient to make up the quantity with the rain that fell just the preceding or succeeding day so as to facilitate agricultural operations or to benefit a crop.

From the above it will be evident that during 1924-25 rain was recorded on 86 days, and of the total quantity of 45.44 inches, 3.51 inches was not useful and fell on 43 days, the percentage of rain that was, not beneficial, to the total received being 7.85.

TABLE III.
Statement of comparative rainfall.

Month.	Average.		1924.	1925.
	1870—1923.			
January	0.62	1.45	0.11	0.03
February	0.30		0.00		0.00
March	0.53	3.90	0.99	3.78
April	1.57		3.47		6.71
May	2.33	3.24	22.88	
June	1.85	5.39		...
July	1.60	5.99	...	
August	1.14	11.12		0.92
September	1.50		2.39	
October	6.20	12.04	5.87	...
November	3.80		4.30	
December	1.12	1.87	...	...
Total	22.47		42.73	...

N.B.—Rainfall figures in inches.

This statement compares rainfall during the several months of the year 1924 with the monthly averages during 1870—1923 and shows the extremely wet character of the year that has just passed.

WET LANDS.

4. The actual area under cultivation this year was 42.03 acres and this includes 5 cents of land reclaimed and added to M block.

Paddies occupied 40.24 acres, sugarcane 1.30 acres, turmeric 44 cents and betel vine 5 cents. This last was grown at the instance of the Government Mycologist for his study on betel vine diseases. After the harvest of paddy, gingelly was sown on a small area for demonstration to students. Owing to scarcity of water it failed.

5. *Green-manure crops* (32.92 acres).—Like last year, three kinds of crops were grown for green-manure purposes, viz., daincha, sunnhemp and cholam. This last is not generally sown as a green-manure crop, but was raised on the farm by preference, as most suitable for the experiment where a nitrogen gatherer had expressly to be ruled out.

(a) *Cholam*.—This was sown on 22nd March 1924 in C and B blocks on an area of 1.75 and 0.70 acres, respectively. The plots had, for this purpose, received very good preliminary cultivation. The rainfall of 2.62 inches on the 30th of the month adversely affected germination at the outset, and growth of seedlings later. Cholam in C block was cut for fodder and that in B block was ploughed in, in the plots themselves.

(b) *Sunnhemp*.—This fickle legume occupied 1.65 acres in M block and 3.50 acres in J block. M had carried a crop of canes and J, paddy. The two fields were given good ploughings and seeds were sown on 19th May and 25th March, respectively. Germination and growth were fair in M block, while indifferent in J block. This was visible in the quantities of green stuff obtained which were 10,000 lb. and 6,000 lb. an acre in M and J, respectively. Of the total quantity from J block, 2,000 lb. was transferred to canes in M block.

(c) *Daincha*.—Daincha is the most handy and popular crop on the farm and was raised in the bulk of the fields. Varying with the nature of the field and the necessities of the case at the time, sowing was done from 22nd February to 27th March 1924. In some instances, re-sowing was rendered necessary. Showers at intervals were beneficial, but the absence of necessary warmth in its early stages retarded growth somewhat and the acre-yield ranged from 2,500 lb. in A block to 15,000 lb. in E and F blocks though the total average stood at 10,128 lb. All the green stuff obtained was disposed of in one of two ways: (1) ploughing in the whole quantity in the field itself, (2) ploughing in part and cutting and carrying part to other fields. Below are furnished the extent, acre-yield and cost of raising the two crops—sunnhemp and daincha.

TABLE IV.

Statement of green-manure crops in wet lands.

Block.	Area.	Kind of green manure.	Sown on	Quantity of leaf per acre.	Cost per acre.		Cost per 1,000 lb.
					Rs.	A. P.	
A ...	0.12	Daincha.	1924. 22nd Mar.	2,500	4	3 0	1 10 8
C ...	2.00	Do.	{ 3rd " 4th "	7,500	7	2 0	0 15 3
*D ...	2.84	Do.	3rd "	5,000	9	5 0	1 13 10
E ...	2.46	Do.	2nd "	15,000	7	13 0	0 7 6
†F ...	4.95	Do.	Do.	15,000	7	14 0	0 7 6
G ...	0.78	Do.	Do.	10,000	5	13 0	0 9 4
H ...	1.00	Do.	3rd Mar.	8,000	3	4 0	0 6 6
K ...	2.00	Do.	{ Do. 4th Mar. }	14,000	4	10 0	0 5 3
L ...	3.50	Do.	{ 3rd " 28th "	8,000	3	13 0	0 7 7

* Caterpillar damage necessitated second sowing: heavy rain on 31st March 1924 revived plants.

† Green caterpillar attack.

TABLE IV—cont.

Statement of green-manure crops in wet lands—cont.

Block.	Area.	Kind of green manure.	Sown on	Quantity of leaf per acre.	Cost per acre.	
					Rs. A. P.	Rs. A. P.
			1924.			
M ...	0.75	Daincha.	27th Mar.	7,398	5 13 0	0 12 9
N ...	2.27	Do.	2nd "	10,000	6 15 0	0 11 2
O ...	2.65	Do.	22nd Feb.	5,660	7 11 0	1 5 9
	25.32			10,128		
M ...	1.65	Sunn hemp.	19th May	10,000	13 14 0	1 6 3
J ...	3.50	Do.	{ 9th Apr. 22nd May }	6,000	17 2 0	2 13 8
	5.15			...		

6. Nurseries (2.95 acres).—Both dry and wet nurseries were, as usual, raised during the year.

Dry nursery.—This form of nursery is a useful preparation and when successful ensures heavy yields of paddy. Nurseries raised in this way afford sufficient time for attention and soon after the receipt of water in the channel enable planting to be done irrespective of fluctuations of weather in the beginning of the monsoon which affect nurseries if sown then. This was put down in J block with Co. 1. The plots were ploughed a number of times and sheep were penned for a fortnight in April, the total number being 9,700, and the cost per acre Rs. 48-8-0. The nursery measured 23.2 cents. Seeds were sown on the 12th of June, the earliest date for a period of 10 years except 1916. The following six days witnessed a total rainfall of 2.19 inches and this ensured full germination. Favourable weather later invigorated the seedlings which grew strong and healthy, so much so that 22.2 cents of the nursery could plant 3.5 acres.

Wet nursery.—The wet seedbeds were prepared in time, daincha was ploughed in, in most plots, while to a few erukkam leaves were added. The total quantity of organic matter worked in, per acre, ranged from 2,500 lb. in M block to 37,750 lb. in O block. Sowing was commenced with M and O blocks on the 24th of June and continued at intervals until 12th July when it finished with D block. The total area of wet nursery was 271.8 cents of which 204.6 cents alone were used up to plant 32.52 acres. Seedlings from the Paddy Breeding Station planted an additional area of 3.26 acres. The cost per cent of nursery varied from 8 annas 6 pies in D block to 22 annas 5 pies in O block. G.E.B. 91 could plant only eight times the area of the seedbed, while this figure went up to 29.7 in the case of Co. 3 in M block. Seedlings were healthy at the time of planting.

7. *Paddy (40.26 acres).*—Seven varieties were planted in bulk in different blocks. Conditions were very favourable for paddy this year. Early outburst of the monsoon, earlier pre-monsoon rain in sufficient quantities, satisfactory growth of the green-manure crops and germination and growth of paddy seedlings, well-distributed rainfall during the growing period of the crop, ideal dry weather at the maturing time, and absence of cloud or drizzles at harvesting time, cumulative effect of several years, improved methods of cultivation and accumulated fertility of liberal manuring in previous years—all contributed to the heaviest yields on record this year, viz., 4,085 lb. grain and 4,542 lb. straw per acre.

This year's outturn would have been greater had not Co. 3 and Co. 2 lodged badly and shed their grains.

Yields per block are furnished below :—

TABLE V.

Block.	Area in acres.	Yield per block.		Yield per acre.		Variety.
		Grain.	Straw.	Grain.	Straw.	
A	3.11	9,411	7,927	3,026	2,549	G.E.B. 24.
B	3.47	10,539	14,651	3,037	4,222	Sadaisamba 374.
C	3.75	17,399	16,032	4,642	4,275	Co. 2.
D	2.84	11,180	13,596	3,936	4,787	Co. 2, Sinnasamba, Jeeragasamba and Jeeragasannabatta.
E	2.46	12,473	14,332	5,069	5,826	Co. 3
F	4.95	21,207	29,838	4,800	6,028	Co. 3, G.E.B. 91, Kalarsamba.
G	0.80*	3,070	4,525	3,833	5,656	Varieties.
H	1.00	3,775	7,083	3,775	7,083	Sinnasamba, Sadaisamba 374.
J	3.60	14,529	12,330	4,036	3,425	Co. 1, CO2, District varieties.
K	2.00	8,730	8,217	4,365	4,109	Co. 1 and G.E.B. 91.
L	3.50	14,900	13,168	4,257	3,762	Co. 1.
M	2.68	8,902	10,008	3,321	3,734	G.E.B. 24.
N	3.34	13,328	13,861	3,990	4,150	Co. 3.
O	2.76	10,867	16,286	3,937	5,901	Co. 3, Co. 1, Sadaisamba 374, Kalarsamba, mixed varieties (G.M's).
		827	1,037			Mixed grain from water channels.
		345				Screenings from the accumulated chaff and sweepings.
Total	40.26	164,462	182,891	...	...
Average.	...	...	...	4,085	4,542	

* Includes 2 cents—area under volunteer paddy left to grow before paddy was planted in the main season.

Of the varieties noted above, paddy strains Co. 3, Co. 2, Co. 1, G.E.B. 24, G.E.B. 91 and the locals Sadaisamba and Sinnasamba occupied areas ranging from 1.06 acres in the case of Sinnasamba to 9.285 acres under Co. 3.

TABLE VI.
Statement of yields of chief paddy varieties.

Block.	Ares.	Variety.	Yield.		Percentage of straw to grain.
			Grain.	Straw.	
A	3.11	G.E.B. 24	9,411	7,926	
M	1.70	"	5,749	6,840	
"	0.98	"	3,153	3,168	
	5.79	Average per acre ...	18,318	17,934	97.9
B	3.47	Sadaisamba	10,539	14,651	
H	0.94	"	3,583	6,440	
O	2.18	"	8,750	12,518	
	6.59	Average per acre ...	22,880	33,609	146.9
C	3.75	Co. 2	17,399	16,032	
D	1.60	"	7,876	7,628	
J	1.04	"	3,731	3,726	
	6.39	Average per acre ...	29,006	27,386	94.4
D	0.45	Sinnasamba... ..	1,095	2,332	
"	0.55	"	1,736	2,580	
H	0.06	"	192	643	
	1.06	Average per acre ...	3,023	6,055	200
E	2.46	Co. 3... ..	12,473	14,332	
F	2.77	"	15,988	19,410	
G	0.565	"	2,699	3,544	
N	2.27	"	9,121	9,736	
"	1.07	"	4,207	4,125	
O	0.15	"	415	408	
	9.285	Average per acre ...	44,903	51,555	115
J	2.190	Co. 1	9,264	6,936	
"	.230	"	804	632	
"	.080	"	477	535	
K	1.500	"	7,127	6,050	
L	3.500	"	14,900	13,168	
O	0.150	"	452	816	
	7.65	Average per acre ...	33,024	28,137	85.2
F	2.10	G.E.B. 91	8,000	9,668	
G	0.08	"	52	241	
"	0.02	"	20	30	
"	0.025	"	77	94	
K	0.50	"	1,608	2,167	
	2.705	Average per acre ...	9,752	12,200	125
			3,605	4,510	

N.B.—Yields in pounds.

From the above it is evident that in respect of grain Co. 3 stands first with 4,833 lb. an acre. Co. 2 follows with a decrease of 300 lb. whereas this and Co. 1 differ by about 200 lb. G.E.B. 91 is a distinct fourth while G.E.B. 24 is only two-thirds of Co. 3. Of the locals, Sadaisamba accounts for an acre yield of 3,472 lb., and Sinnasamba, 2,852 lb.

In regard to straw, Sadaisamba and Co. 3 are far ahead of other varieties, the former having to its credit 147·4 per cent of the weight of grain, and the latter, 123 per cent. In places like Coimbatore where straw is scarce and always in demand, this is a distinct advantage and decides the continued popularity of the variety with the ryot.

8. *Experiments (1).—Standardization.*—Both the blocks B and N that were under this experiment last year were continued to be treated in the same way this year also. Plots in B block were ploughed on July 14—August 6th, and Sadaisamba seedlings transplanted on August 7th. The crop suffered a slight setback in growth in the middle of October which did not, however, affect the yields. Harvest was done on 10th January.

The results are below :—

TABLE VII.

Standardisation plots in B block. Variety : Sadaisamba—1924-25.

Plot No.	Area in cents.	Treatment.	Per acre.	
			Grain.	Straw.
16	14·7	No manure	2,809	3,870
17	14·8	Do.	2,601	3,703
18	34·4	Do.	2,663	3,765
19	7·6	Do.	3,817	4,750
20	7·6	Do.	3,395	4,197
29	8·1	Do.	2,602	3,284
30	6·8	Do.	2,853	3,544
31	5·0	Do.	2,560	4,080

N.B.—Yields in pounds.

N block was started earlier and all preparation was over by 25th July. Co. 3 seedlings were transplanted on 25th July. Westerly winds in early October depressed the crop somewhat. Cutting was done on December 16th.

The results are below :—

TABLE VIII.

Standardization plots in N block. Variety: Co. 3—1924—25.

Plot No.	Area in cents.	Per acre.		Plot No.	Area in cents.	Per acre.	
		Grain.	Straw.			Grain.	Straw.
1a	4.4	4,727	4,682	3a	6.0	4,183	4,233
1b	6.2	3,968	3,596	4a	4.1	3,634	3,219
1c	6.6	3,530	3,651	5a	3.8	3,526	3,579
1d	5.0	3,420	3,200	6a	3.4	3,068	3,117
1e	6.8	3,544	3,176	7a	4.2	2,905	2,762
2a	5.8	4,138	4,138	3b	7.9	3,797	3,481
2b	6.8	4,647	4,809	4b	4.5	4,044	3,800
2c	6.4	4,784	5,328	5b	4.0	3,825	3,450
2d	6.0	4,666	4,783	6b	3.8	3,395	3,395
2e	6.6	4,757	4,182	7b	4.8	2,875	3,146

N.B.—Yields in pounds.

(2) *Green-manure experiments.*—Green-manure trials were made as noted under (a), (b), (c) with the same three objects as last year, as detailed under (d) to compare sodium nitrate and ammonium sulphate with and without superphosphate and as discussed under (e) to note the effect of amo-phos.

(a) to determine whether the effect of application of a green manure to swamp paddy was manurial or physical. Under this scheme three series of five plots each have been laid out. In each series, one plot carries cholam in summer under irrigation if necessary and the green cholam is ploughed in before paddy. A second plot is similarly treated but in addition receives at the time of planting 20 lb. nitrogen per acre. A third plot is given the same treatment as plot 1 except that no cholam crop is grown in it but is brought from outside. A fourth is treated like the third but receives in addition 20 lb nitrogen like plot 2. The rate of green manure, viz., cholam applied, is the same in all the four plots, and nitrogen is applied in the form of ammonium sulphate. Plot 5 remains uncultivated. Plots 3 and 4 though lying fallow are given during the growth of cholam in plots 1 and 2 as many irrigations as plots 1 and 2. All the plots received bone meal at 2 cwt. an acre unlike last year when superphosphate was applied at 4 cwt. an acre. Puddling

was done on 7th August, and 42 days' old Sadaisamba seedlings from the wet nursery were planted on 19th August. From the start the nitrogen plots showed themselves as distinct from other plots. Stem borer was bad in all plots and the loss was estimated at five per cent. The crop was cut on 10th January 1925.

This experiment which was started in 1917 has run an eight years' course. The results up to date are below :—

TABLE IX.
Green-manure experiments (a) in B block.

Year.	Green fallow.	Green fallow + nitrogen.	Cultivated fallow with green manure from outside.	Cultivated fallow with green manure from outside + nitrogen.	Uncultivated fallow.	Green fallow.	Green fallow + nitrogen.	Cultivated fallow with green manure from outside.	Cultivated fallow with green manure from outside + nitrogen.	Cultivated fallow.
	Grain.					Straw.				
1917 ...	2,770	1,971	2,009	2,123	2,178	2,171	2,146	1,978	2,439	2,296
1918 ...	2,107	2,235	2,421	2,653	2,223	3,303	3,574	3,113	3,873	3,039
1919 ...	2,093	2,738	2,078	2,878	2,354	2,955	3,955	2,845	3,645	3,045
1920 ...	1,929	2,559	2,003	2,708	2,099	2,518	3,518	2,536	4,146	3,262
1921 ...	2,243	2,464	2,430	2,701	2,440	2,239	3,288	2,611	3,055	2,480
1922 ...	2,219	2,584	2,031	2,739	2,325	1,914	2,364	1,729	2,542	1,893
1923 ...	2,919	3,374	2,590	2,946	3,149	3,119	3,834	2,901	3,437	3,477
1924 ...	3,203	3,314	2,825	2,689	3,032	4,304	4,644	3,777	4,289	4,407
Total ...	19,483	21,239	18,387	21,437	19,795	22,635	27,323	21,490	27,426	23,999
Average .	2,435	2,655	2,298	2,680	2,474	2,829	3,415	2,686	3,428	2,989

N.B.—Yields in pounds per acre.

(b) The object here is to determine whether the addition of a phosphate to a green manure increases the yield of paddy. Plots 21—28 in B block, which were started last year with a view to conduct the trial for eight years, have thus seen a second year under the experiment.

All the plots received green manure in the shape of daincha from F block at 5,000 lb. an acre on 10th August, and Sadaisamba

seedlings from M block were transplanted on 12th August, and Trichinopoly phosphate supplied by the Government Lecturing Chemist was applied on 11th August at 500 lb. an acre. The seedlings established themselves in time. The dry westerly winds in early October temporarily arrested growth. No differences were visible between plots during the growing period.

The results are below :—

TABLE X.

Trichinopoly phosphate experimental plots in B block—1924-25.

Plot No.	Area.	Green manure alone.				Green manure and Trichy phosphate.			
		Grain.		Straw.		Grain.		Straw.	
		23-24	24-25	23-24	24-25	23-24	24-25	23-24	24-25
21	9.5	...	...	...	...	3,242	3,768	3,790	4,958
22	9.2	2,891	3,424	3,043	4,848	...	...	...	...
23	8.8	...	...	...	...	2,955	3,580	2,818	4,535
24	8.5	2,929	3,470	2,870	4,482	...	...	...	...
25	7.7	...	...	...	...	2,623	3,532	3,065	4,934
26	7.9	2,582	2,698	3,646	4,304	...	...	...	...
27	9.3	...	...	...	...	2,817	2,917	3,871	4,312
28	8.9	2,944	3,000	3,506	4,011	...	...	...	...
	Average ...	2,836	3,148	...	...	2,909	3,459	...	...

N.B.—Area in cents. Yields in pounds per acre.

(c) The object is the same as in (b), but two phosphatic manures are compared with each other. These plots are laid out in A block and bear numbers 9 to 24. All the plots received on 7th August green manure (daincha from F block) at 2,000 lb. an acre, while plots 9, 13, 17, 21 received, in addition, tetraphosphate to supply 30 lb. phosphoric acid an acre, and plots 10, 14, 18, 22 had, besides green manure, Trichinopoly phosphate to supply 30 lb. phosphoric acid an acre. The phosphates were applied on 14th August when G.E.B. 24 was planted. The seedlings established themselves all right. Growth was checked somewhat in early October when dry winds blew. The crop however recovered, but was attacked by borer, the damage from which was slight.

The results are below :—

TABLE XI.

Statement showing comparison between tetraphosphate and Trichy. phosphate. A block.

Plot No.	Area in cents.	Treatment.	Grain.		Straw.	
			23-24	24-25	23-24	24-25
9	5	Green manure 2,000 lb. plus tetraphosphate.	3,680	3,920	3,600	2,650
13	5	Do.	3,000	2,980	2,900	2,330
17	6.25	Do.	3,132	2,848	3,040	2,472
21	6.25	Do.	2,944	2,928	2,816	2,296
		Average ...	3,156	3,169	3,071	2,437
10	5	Green manure 2,000 lb. plus Trichy. phosphate.	3,800	3,720	3,400	2,930
14	5	Do.	3,289	3,000	3,040	2,830
18	6.25	Do.	3,083	3,136	3,216	2,552
22	6.25	Do.	2,848	3,040	2,416	2,360
		Average ...	3,222	3,224	3,000	2,656
11	5	Green manure 2,000 lb. ...	3,520	3,540	3,380	3,090
12	5	Do. ..	3,360	3,080	2,850	2,120
15	5	Do. ...	3,720	3,480	3,580	3,020
16	5	Do. ...	3,740	3,260	3,360	2,520
19	6.25	Do. ...	2,720	2,784	2,656	2,368
20	6.25	Do. ...	2,964	2,624	2,656	2,488
23	6.25	Do. ...	2,512	2,816	2,304	2,320
24	6.25	Do. ...	2,400	2,624	2,176	2,320
		Average ...	3,051	3,026	2,827	2,530

N.B.—Yields in pounds per acre. Area in cents.

(d) Duplicate 10-cent plots were laid out in K block to test the effects of sodium nitrate on paddy, as is reported to be done in Spain where enormous yields are obtained. Ammonium sulphate was also added to the experiment and it was decided to compare these two, with and without superphosphate, keeping green manure as the basal manure.

Daincha at the rate of 15,000 lb. per acre was ploughed in on 16th June, concentrated super was applied at 100 lb. an acre on 24th August, and Co. 1 seedlings transplanted. Sodium nitrate and ammonium sulphate were top-dressed at 50 lb. an acre in two doses on 3rd September and 7th October after draining the fields thoroughly. The nitrogen plots were darker a week after the manures were applied. Sodium nitrate plots were leading at the start but later ammonium sulphate plots overshadowed the others. The second dose of manure had no effect.

During the rains all plots lodged uniformly. The results are below :—

TABLE XII.

Plot No.	Treatment.	Per plot.		Per acre.	
		Grain.	Straw.	Grain.	Straw.
1	Green manure	525	406	5,250	4,060
9		Do.	401	316	4,010	3,160
	Average ...	463	361	4,630	3,610
2	Green manure plus Sodium Nitrate	529	442	5,290	4,420
8			428	342	4,280	3,420
	Average ...	478.5	395	4,785	3,950
3	Green manure plus Ammonium sulphate	534	459	5,340	4,590
10			470	401	4,700	4,010
	Average ...	502	430	5,020	4,300
4	Green manure plus Sodium Nitrate plus Superphosphate	449	355	4,490	3,850
6			534	479	5,340	4,790
	Average ...	491.5	432	4,915	4,320
5	Green manure plus Ammonium sulphate plus Superphosphate	532	457	5,320	4,570
7			619	525	6,190	5,250
	Average ...	575.5	491.5	5,755	4,910

N.B.—Yields in pounds. Green manure—daincha—15,000 lb. an acre.

(e) The Cyanamide Company of New York forwarded a few bags of their fertilizer—ammonium phosphate—for trial on the farm, and trials were conducted with this manure in a portion of K block. Green manure—daincha—at 15,000 lb. an acre was ploughed in, in the usual course, and paddy seedlings were transplanted on 24th

August. Amo-phos was top-dressed to supply 50 lb. nitrogen per acre in two doses on 3rd September and 7th October.

The application of this manure seems to have a tendency to increase the straw. The results are below:—

TABLE XIII.

Plot No.	Treatment.	Per plot.		Per acre.	
		Grain.	Straw.	Grain.	Straw.
1	Green manure ...	525	406	5,250	4,060
9	Do. ...	401	316	4,010	3,160
	Average ...	463	361	4,630	3,610
11	Green manure and amo-phos.	415	590	4,150	5,908

N.B.—Plots 10 cents each. Yields in pounds.

9. *Cyanamide experiments.*—These experimental plots have been laid out in A block, and this is the second year of trial under the scheme sketched out for five years. There are four series of four plots each. In each series the first plot receives super, the second cyanamide and super, the third cyanamide alone, while the last is left unmanured. G.E.B. 24 was planted this year and cyanamide was applied on 14th August and superphosphate was top-dressed on 29th August. In the cyanamide plots there were many failures which were replaced. In the middle of the growing period, the crop suffered a temporary check in growth, but later turned much better than could be expected. The results are below:—

TABLE XIV.

Cyanamide and superphosphate experiment in A block.

Plot No.	Area.	Treatment.	Grain.		Straw.	
			1923-24.	1924-25.	1923-24.	1924-25.
1	5	Super, 1½ owt. ...	2,120	2,560	2,000	2,165
5	5	Do. ...	2,460	2,760	2,040	2,355
25	6.25	Do. ...	2,176	2,240	2,080	1,928
29	6.25	Do. ...	2,176	2,688	1,856	2,008
		Average ...	2,227	2,562	1,991	2,114

TABLE XIV—cont.

Cyanamide and superphosphate experiment in A block—cont.

Plot No.	Area.	Treatment.	Grain.		Straw.	
			1923-24.	1924-25.	1923-24.	1924-25.
2	5	Cyanamide, 2 cwt. ; Super, 1½ cwt.	3,040	3,100	2,820	2,945
6	5	Do. do.	3,880	3,280	3,100	3,230
26	6·25	Do. do.	3,040	3,104	3,200	3,280
30	6·25	Do. do.	2,768	3,008	2,800	2,576
		Average ...	3,040	3,123	3,040	3,008
3	5	Cyanamide, 2 cwt. ..	2,880	2,960	2,780	3,015
7	5	Do. ...	3,840	3,560	3,800	3,885
27	6·25	Do. ...	2,560	2,688	2,464	2,592
31	6·25	Do. ...	2,448	2,368	2,720	2,040
		Average ...	2,885	2,894	2,458	2,883
4	5	No manure ..	2,580	2,640	2,020	2,030
8	5	Do. ...	3,860	3,200	2,780	2,300
28	6·25	Do. ...	2,064	2,320	1,824	2,018
32	6·25	Do. ...	1,904	2,208	1,744	1,600
		Average ...	2,422	2,592	2,058	1,986

N.B.—Area in cents. Yields in pounds per acre.

10. *Sugarcane*.—The same varieties as were raised last year, viz., Poovan, Java Hebbal, Co. 1 and Vellai were grown this year in the southern portion of M block on a total area of 1·30 acres. Poovan and Java Hebbal occupied relatively less areas, viz., 20 and 22 cents, and the other two more, and of the latter, Co. 1 accounts for 54 cents. Preparation of the seedbed proceeded from January 3rd until the latter part of March 1924 when the setts were planted. Sheep were penned from 11th February to 27th March, the total number being 6,700. Farmyard manure and fish-guano were applied at 10 tons and 350 lb. per acre, respectively, before planting. Germination was fair in Vellai and Poovan, but was noted to be late with Java Hebbal and Co. 1, and the heavy rain on the 31st March, viz., 2·61 inches, affected their germination. 896 lb. ammonium sulphate to supply 120 lb. nitrogen an acre was applied on July 29th—31st, in addition to sunnhemp and daincha which had been raised for the benefit of the crops on 22nd—30th May 1924. Subsequent growth was observed to be more rapid, necessitating propping. Java Hebbal lodged completely, while a few clumps were affected in Co. 1 as the result of heavy rains that then fell; neither did Vellai supported though it was on wires, escape from the effects. In addition Poovan and Vellai, suffered from red rot, and Vellai very badly. Flowers were profuse in all the varieties. Jackals were more active than ever, though the damage due to this cause was inappreciable. Milling was commenced on 10th February 1925 with Vellai. The yields of

jaggery are noted below. The field, besides, furnished enough setts for planting this season in J block, and 16,520 setts for distribution.

TABLE XV.

	Area milled.	Weight per acre.		Percentage.
		Canes.	Jaggery.	
	CENTS.	TONS.	LB.	
Co. 1	50	25.4	5,544	9.9
Poovan	19	23.0	5,275	10.2
Vellai	32	17.2	3,906	10.1
Java Hebbal	17	23.5	4,324	8.5

11. *Turmeric*.—This was grown on a more extended scale this year. Turmeric was cultivated in two blocks, M and J. In the first field, sugarcane preceded turmeric, and in the second, paddy. J block was ploughed several times from 8th April, while preparation was not commenced in M block until the 2nd May. M block is poor soil being the result of dumping long ago gravelly debris from the well near. Planting was done in both on June 21st. Rhizomes were used in M, and fingers in J, and therefore the seed-rate remained the same, namely, 80 lb. though the plots in M and J measured 9 and 35 cents respectively. Germination was fair. Growth was indifferent in J until trenches were opened to dry out the beds, while M showed no satisfactory change at any state of its growth. The application of ammonium sulphate had not much affected the crops. It is doubtful if sheep-penning which was given in April to J block at 9,000 sheep an acre costing Rs. 45 at 8 annas per 100 sheep had given any impetus to the growing crop. The effects were perhaps marked to some extent, as would be judged by disparity of growth in the eastern and western halves of the plot.

Leaf-spot disease was in evidence in M block as early as 16th October and was spreading. J received 13 waterings and M two waterings. The total quantity of green turmeric obtained from J block worked out to 19,491 lb. an acre and M gave a poor yield of 538 lb. green from 5 cents. 5,000 lb green was cured and 1,181 lb. dry turmeric was obtained. The rest has been preserved for seed.

GARDEN LANDS.

12. *Irrigated cotton* (15.82 acres).—Webber cotton and cambodia cotton were grown under wells this year. Webber was sown on 2nd October 1923 on 1.45 acres in 60-B. Germination was satisfactory but the crop suffered later from browning of the leaves and bore few bolls. Only 242 lb. kappas was obtained and the crop proved a failure. *Cambodia* was raised in F. Nos. 5-C, 42, 39, 20, 44, 40 and

21-B on a total area of 14.37 acres. Planting was done between 28th September and 4th October. Dibbling was resorted to in all fields except F. No. 20 where the seeds were sown broadcast and covered by the country plough. Germination was satisfactory. As the result of copious rains at frequent intervals, the crops ran into leaf. Picking commenced on 11th February 1924 and was continued in F. No. 44 alone until 29th July 1924, very much longer than in other fields. This accounts for the high yield noted against that field. Barring this, the highest yield, viz., 876 lb. was obtained from F. 5-C. It may be suspected that cambodia has ceased to give the very high yields that it did a few seasons ago. It is however to be added that the figures recorded then cover a period of growth now limited by the enforcement of the Pest Act.

TABLE XVI.

Yield of cottons planted in October 1923.

Field No.	Area in acres.	Sown on	Last picked on	Kappas.		Profit + loss (-)	Previous crop.	Remarks.
				Per plot.	Per acre.			
<i>Cambodia.</i>								
(a) 5-C	1.78	28 Sep. 1923	18 Apr. 1924	1,517	876	187	Chitrai cholam.	Value of Kappas at Rs. 70 per 250 lb.
(b) 20	3.70	25 Oct. 1923	20 Apr. 1924	1,516	410	50	Ragi ...	
(b) 21-B	1.25	30 Sep. 1923	19 Apr. 1924	675	540	69	Chitrai cholam.	Yields in pounds.
(b) 40	2.80	4 Oct. 1923	2 June 1924	1,950	698	124	Do.	
(a) 39	1.10	3 Oct. 1923	Do.	918	391	45	Do.	(a) Strain 295.
(a) 42	1.25	Do.	Do.				Do.	(b) Cambodia mixture.
(b) 44	2.54	30 Sep. 1923	28 July 1924	2,777	1,093	223	Fodder cholam.	
<i>Webber.</i>								
60-B	1.45	2 Oct. 1923	18 Mar. 1924	242	167	-9	Chillies and sweet potato.	

13. *Summer Cholam.*—As is usual, the two local varieties of cholam—white and yellow—were cultivated on 24.7 acres during the year. The white variety occupied 18.81 acres and the yellow 5.89 acres. The season being favourable, an attempt was made to try transplanting both with seedlings raised in a nursery in F. 19-A and those obtained by thinning broadcasted fields. Sowing was commenced on 29th February 1924 with the white variety on F. 15-A and F. 45 and was over on 16th March 1924 with the yellow variety in

F. 54. Yellow cholam seedlings were 25 days old at the time of planting, and white 30 days old except that F. 19-B had seedlings 22 days old. Owing to the severe attack of green ear-head bug (*Calocoris angustatus*) the whole crop was a failure. It was a redeeming feature of this season's crop however that the straw yields were not affected. The luxuriant growth of crops and the heavy tonnage of stalks have in most cases converted a probable loss into an appreciable gain in cultivating them, tending as they did to mitigate the ill effects of fodder famine that raged during the year. Details of yields are found in the statement below:—

TABLE XVII.

- Summer Cholam.

Field No.	Area in acres.	Variety.	Planted on	Cut on	Plot.		Acre.		Profit + loss (-)
					Grain.	Straw.	Grain.	Straw.	
					Broadcasted.				
54	4.54	Yellow.	16 Mar.	29 June	2,067	60,852	456	13,360	+71
15-A	2.66	White.	29 Feb.	16 "	1,060	21,968	399	8,259	+41
43-A	2.25	Do.	8 Mar.	22 "	788	14,500	350	6,444	+15
43-B	2.25	Do.	Do.	26 "	1,008	10,948	448	4,866	0
45	3.25	Do.	29 Feb.	17 "	190	35,616	58	10,958	+24
18	3.00	Do.	13 Mar.	28 "	280	31,374	93	10,457	+1
74	2.95	Do.	7 Mar.	12 "	...	15,696	...	5,889	-52
					Transplanted.				
49	1.35	Yellow.	11 Apr.	19 June	30	19,192	21	14,215	+54
19-B	0.85	White.	11 Mar.	17 "	82	5,864	96	6,664	+2
48	1.60	Do.	30 Mar.	27 "	480	12,564	300	7,852	+20

N.B.—Yields in pounds. The straw figures include figures of green fodder and empty ears also.

F. No. 18 was under cyanamide experiments under the charge of the Government Agricultural Chemist, while in F. No. 74 the Government Entomologist was essaying to study and find remedies for the control of *calocoris*.

14. *Ragi*.—During the year under report ragi was raised on 19.10 acres. Planting lasted from 6th June to 26th August. Bulk of the fields were planted by the 1st of July. That month there was only one planting, while the 1st and the 26th of August witnessed the planting of two fields, 18 and 45. Nurseries were sown on four

occasions—15th to 19th May, 27th to 31st May, 25th to 26th June, and 3rd July. The wet weather spoiled nurseries to some extent. The growth of seedlings at planting time was fair. The cost of raising one cent of nursery was Re. 1-2-1, and one cent could plant out 36 cents.

Yields are noted in the statement below :—

TABLE XVIII.

Ragi—1924-25.

Field No.	Area.	Planted on	Cut on	Per plot.		Per acre.	
				Grain.	Straw.	Grain.	Straw.
			Early.				
5-A	1.52	21 June	29 Sep.	3,321	6,950	2,185	4,572
5-C	1.78	6 "	15 "	2,594	24,568	1,500	14,201
15-C	1.30	10 "	17 "	1,159	12,224	892	9,403
20	3.70	17 "	18 "	4,574	26,642	1,236	7,200
38	2.00	23 "	29 "	4,258	30,352	2,129	15,176
69	1.50	27 "	1 Oct.	4,401	24,616	2,933	16,411
			Late.				
18	3.00	26 Aug.	7 Nov.	4,757	25,253	1,586	8,418
39	1.10	27 July	16 Oct.	1,629	6,438	1,478	5,853
45	3.25	1 Aug.	24 "	5,162	14,472	1,588	4,453

N.B.—Yields in pounds. The straw figures include weights of empty ears also.

It is evident that July and August plantings have been distinctly behind, though of the earlier planted fields 5-C, 15-C and 20 are below the average. F. Nos. 5-C and 20 carried good crops of cambodia cotton which was pulled out only just four and six weeks before, respectively. 15-C bore a tobacco crop previously. Last year's observation that fields carrying a cereal fodder crop give a higher outturn is confirmed by results of this year also. Thus 5-A, 38 and 69 which had fodder maize and fodder cholam the previous season have all given big outturns. The heavy rains during the growing period tended to accelerate vegetative growth and affected optimum conditions for grain development generally, so much so that the straw figures have stood pretty high and grain yields have gone low in 5-C, 15-C and 20.

15. *Wheat*.—This irrigated crop was grown on an area of 1.75 acres in F. 60-A during the year. This field had carried a crop of fodder cholam and after its harvest was ploughed three times commencing from 13th August. Sheep were penned in September at a cost of Rs. 22 an acre. Seed was dibbled behind the country plough on 19th November. Germination was satisfactory. The crop made fair growth and was cut on 6th March 1925. The yield obtained was 1,001 lb. grain an acre besides 2,208 lb. straw.

16. *Tobacco*.—This was grown on a small area reclaimed and brought to cultivation in the southern portion of the farm. It was raised dry under conditions largely representative in the Presidency. The Indian Leaf Tobacco Company, Guntūr, kindly sent seeds of three foreign varieties—Goldfinder, Adcock and Goldleaf. These were sown in the nursery. Goldleaf failed to germinate. The other seedlings were planted in a part of F.64 under irrigation from the yard well and compared with the local tobacco for collecting seed for the next year.

17. *Permanent manurials*.—This experiment which was laid out in 1909 and has been continued since in a red soil plot of 43 cents between the students' hostel and the present Club road carried 42 crops by the beginning of the year under report, and results have formed the subject of a "Memoir" of the Department of Agriculture in India, Chemical series, Vol. VI, No. VIII, entitled "Note on the Permanent Manurial Plots, Coimbatore" by Dr. R. V. Norris, published during the year. Three crops—chitrai cholam (white), ragi and wheat were raised during the year, each crop receiving the same manurial treatment as the ones that had gone before. For the cholam crop seedlings raised in a nursery were transplanted unlike in previous years when seeds were sown broadcast in the plots themselves. Flowering was irregular. Ear-head bugs attacked the crop very badly which consequently ended in a failure. No grain was obtained, but the straw from the cattle-manure plot topped the list with 9,598 lb. an acre, and N + K + P was a distant second with 1,544 lb. less.

Ragi proved distinctly better. Seedlings 30 days old were transplanted on ridges on 30th July 1924. Gaps were prominent in the no-manure plot. Growth was uneven and maturity irregular in no manure, N and N + K plots, while those that received phosphoric acid were comparatively fair and the cattle manure plots indifferent, though the whole series was below normal.

Wheat was sown broadcast on 16th November 1924. Germination was good, growth was not satisfactory, the maximum yields of both grain and straw, viz., 814 lb., and 2,600 lb., respectively, were obtained from the cattle manure plot, N + K + P following. Trenches were dug on the roadside and they were cleaned and kept in good repair during the period of growth of each crop.

It was felt during the year that necessity had arisen for conducting the experiments on bigger areas under better conditions of soil, freedom from effects of the roots of avenue trees, nearness to public road, difficulties in controlling water-supply; and as this subject had been under consideration for a few years previously, and as the results had been worked out for 36 crops and embodied in the note referred to already, F. No. 45 was selected for this purpose. At the same time it was decided to continue the experiments in the smaller plots also, which will run, however, as a parallel series.

Two crops have already been taken from F. 45. Ragi and fodder maize were grown without manure to find out the capacity of individual plots and have formed a good preparation for starting the test with chitrai cholam which was sown towards the close of the year.

18. *Fodder crops*.—These have consisted of guinea grass, elephant grass, lucerne, kikuyu grass, efwatkala grass, berseem and fodder maize and fodder cholam. Guinea grass and elephant grass have afforded substantial cuttings throughout the year, efwatkala and kikuyu are just being felt as of any significance. Efwatkala is foul-smelling in certain stages and is rejected by cattle on occasions. Kikuyu was found to spread quickly without any effort, but seems more suited for a pasture land than in a field intended to be cut. Berseem is like lucerne; this last season was found to dry up in the stubble when hardly two cuttings had been taken, and is given another lease of life to decide its merits. Fodder maize and fodder cholam were regularly raised under wells in the southern flock.

The quantity of all fodder received during the year, most of which was fed to the dairy animals, was 1,508,897 lb. The importance of maintaining the dairy herd necessitates the production of large quantities of fodder for which a portion of the southern block has been found suited. The areas sown to fodder cholam and fodder maize which were cut within the year aggregated 64.24 acres.

DRY LANDS.

19. *Dry cottons* (46.85 acres).—The three cottons, uppam, karunganni and hagari 25 were grown during the year, of which uppam occupied 41.85 acres. All the three were sown in October, and germination was satisfactory. Growth was accelerated by the showers that fell during the growing period. This tended to enliven the plants to the detriment of kappas. Karunganni and hagari succumbed and were pulled out in May, while uppam resisted the ill effects and gave fairly good pickings resulting in acre-yields of 410 lb. and 422 lb. in the case of the pure crop.

The results are below:—

TABLE XIX.

Field No.	Area in acres.	Sown on.	Last picked on.	Kappas.		Previous crop.	Remarks.
				Per plot.	per acre.		
36-A	20.0	1923, 5th Oct.	1924, 11th July	8,198	410	Periamanjol cholam.	Cotton pure.
62	9.0	21st "	27th "	3,800	422	Do.	Do.
10	10.0	4th "	13th "	3,802	380	Do.	Cotton mixed with tenal.
28	2.85	4th "	7th "	855	300	Do.	Do.
				<i>Karunganni.</i>			
36-B	3.0	6th Oct.	29th May	368	123	Periamanjol cholam.	Cotton pure.
				<i>Hagari 25.</i>			
36-B	2.0	6th Oct.	16th May	208	104	Periamanjol cholam.	Cotton pure.

N.B.—Yields in pounds—

20. As cotton is engrossing a fair amount of attention of workers of the Agricultural Department in Madras and elsewhere, it would seem useful to record a few particulars regarding pickings of both cambodia and uppam on this farm.

Statements below furnish details.

TABLE XX.

Details of cotton pickings—cambodia cotton.

Field No. 44 (Garden land.)				Field No. 5-C. (Garden land.)			
Date.	Number of picking.	Quantity picked.	Percentage to total picking.	Date.	Number of picking.	Quantity picked.	Percentage to total picking.
1924.		LB.		1924.		LB.	
Feb. 12 ..	1	38	1.7	Feb. 11 ...	1	24.5	1.6
„ 21 ...	2	63	2.8	„ 16 ...	2	37	2.4
„ 26 ...	3	97	4.3	„ 20 ...	3	51	3.4
Mar. 3 ...	4	170	7.5	„ 23 ...	4	166	10.9
„ 6 ...	5	124	5.5	Mar. 1 ...	5	164	10.8
„ 11 ...	6	184	8.1	„ 6 ...	6	192	12.7
„ 18 ...	7	470	20.7	„ 7 ...	7	456	30.1
„ 20 ...	8	226	10.0	„ 24 ...	8	312	20.1
„ 24 ...	9	250	11.0	Apr. 12 ...	9	64	4.2
„ 27 ...	10	216	9.5	„ 18 ...	10	50	3.2
Apr. 7 ...	11	278	12.2				
„ 14 ...	12	72	3.2				
„ 17 ...	13	35	1.5				
„ 24 ...	14	33	1.0				
May 5 ...	15	10	0.4				
		2,266	99.4				
June 27 ...	16	65	12.7				
July 1 ...	17	88	17.2				
„ 7 ...	18	268	52.4				
„ 23 ...	19	23	4.5				
Aug. 1 ...	20	67	13.1				
		511	99.9			1,516	99.4

TABLE XXI.

Uppam cotton.

Date.	Field No. 36-A. (Black soil).			Date.	Field No. 53 (Black soil).		
	No. of picking.	Quantity picked.	Percentage to total picking.		No. of picking.	Quantity picked.	Percentage to total picking.
1924.		LB.		1924.		LB.	
Feb. 12 ...	1	24	0.2	Feb. 27, ...	1	8	0.2
„ 21 ...	2	58	0.7	Mar. 3 ...	2	24	0.6
„ 25 ...	3	46	0.6	„ 10 ...	3	272	7.1
„ 28 ...	4	121	1.5	„ 17 ...	4	558	14.7
Mar. 6 ...	5	698	8.5	„ 24 ...	5	917	24.1
„ 14 ...	6	151	1.8	Apr. 2 ...	6	443	11.6
„ 16 ...	7	1,610	19.8	„ 8 ...	7	246*	6.5
„ 24 ...	8	1,717	20.9	„ 14 ...	8	150	3.9
Apr. 2 ...	9	704	8.6	„ 17 ...	9	86	2.2
„ 12 ...	10	415	5.0	„ 22 ...	10	28	0.7
„ 21 ...	11	133	.6	„ 26 ...	11	52	1.4
May 2 ...	12	14	0.1	May 9 ...	12	15	0.4
„ 31 ...	13	68	0.8	„ 30 ..	13	11	0.3
June 8 ...	14	287	3.5	June 2 ..	14	49	1.3
„ 17 ...	15	772	9.4	„ 17 ..	15	181	4.7
„ 23 ...	16	156	1.9	„ 20 ...	16	239	6.3
„ 27 ...	17	454	5.6	„ 29 ...	17	282	6.1
July 1 ...	18	213	2.6	July 2 ...	18	29	0.8
„ 7 ...	19	166	2.0	„ 9 ...	19	177	4.9
„ 11 ...	20	392	4.8	„ 26 ...	20	52	2.2
		8,197	99.9			3,300	100.0

TABLE XXII.

Uppam cotton.

Date.	F. 28 (Red soil).			Date.	F. 10 (Mixed red and black soil).		
	No. of picking.	Quantity picked.	Percentage to total picking.		No. of picking.	Quantity picked.	Percentage to total picking.
1924.		LB.		1924.		LB.	
Feb. 11 ...	1	27	3.1	Feb. 11 ...	1	5	0.1
" 16 ...	2	48	5.6	" 18 ...	2	6	0.2
" 23 ...	3	43	5.6	" 20 ...	3	15	0.4
" 26 ...	4	47	5.5	" 25 ...	4	22	0.6
" 29 ...	5	32	3.7	Mar. 1 ...	5	63	1.7
Mar. 3 ...	6	56	6.5	" 6 ...	6	57	1.5
" 11 ...	7	137	16.0	" 15 ...	7	395	10.4
" 22 ...	8	132	15.4	" 22 ...	8	449	11.8
Apr. 2 ...	9	50	5.9	" 30 ...	9	998	26.2
" 10 ...	10	16	1.9	Apr. 4 ...	10	547	14.4
" 14 ...	11	12	1.4	" 11 ...	11	189	5.0
June 2 ...	12	43	5.0	" 13 ...	12	232	6.1
" 10 ...	13	62	7.3	" 15 ...	13	83	2.2
" 26 ...	14	119	13.9	" 21 ...	14	71	1.9
July 4 ...	15	26	3.1	" 29 ...	15	22	0.6
				May 31 ...	16	30	0.8
				June 10 ...	17	181	3.5
				" 19 ...	18	66	1.7
				" 21 ...	19	185	4.9
				July 1 ...	20	154	4.1
				" 18 ...	21	82	2.2
		855	39.9			3,802	100.3

From the tables it is evident that in the case of cambodia raised on garden land 74.6 per cent of the total produce from F. 5-C was obtained between February 23rd and March 24th, and 63.4 per cent of the produce from F. 44—a heavier soil than F. 5-C—was picked between March 11th and April 7th, though kappas from both was

first picked on the same day—February 12th—and the quantities were 1·6 per cent and 1·7 per cent, respectively, of the whole produce.

Uppam has, however, behaved differently in the four fields under notice. In F. No. 36-A, a stiff black soil, 42·5 per cent was picked in 11 days, from 14th to 24th March. Between 11th and 22nd March it gave only 31·4 per cent kappas in Field 28 (red soil). In Field 10, a mixed red and black soil, 62·8 per cent of the kappas was picked in three weeks from 15th March. F. No. 62, a poor representative of the black soil, gave 50·4 per cent between 17th March and April 2nd.

TABLE XXIII.

Comparative statement of labour for picking cotton.

Variety.	Field No.	Quantity	Labour.	Labour per 1,000 lb.	Maximum
		picked.			quantity picked per woman on any day.
		LB.			LB.
Cambodia	5-c	1,516	75	50	50
Do.	44	2,717	135	50	69
Do.	20	1,515	81	54	24
Uppam	36-A	8,197	702	83	21
Karunganni	36-B	368	34	93	24

From the above, it is interesting to note that the number of women required for picking 1,000 lb. cambodia kappas oscillated about 50, while it rose through 82 for uppam to 93 in the case of karunganni; and the maximum quantities picked by a woman on any day have followed a downward scale.

21. *Periamanjul cholam*.—This variety of cholam which is raised as a fodder crop all through the year and as a grain crop in the rains was grown for grain on 67·14 acres. 8·35 acres out of the total area sown for fodder purposes were also allowed to mature grain in this season. Thus the grain-crop area during the year was 75·48 acres. This area was distributed over 14 fields. Five fields had been lying fallow the previous season. Two carried a crop of Periamanjul cholam, two cottons, one tenai, one red gram and tenai, one was partly under cholam and partly cotton. Linseed was cropped in one, while Bengal gram was raised in another. Owing to the diversity in these crops preparation of these fields for cropping during the period was taken up on different dates, but sowings were limited to four days in June—8th, 11th, 19th and 23rd—two days in July, 6th and 31st, one day in August, viz., 4th.

In no case was any manure applied. In one field, namely, Field 3, lablab—a pulse—was mixed with the cholam, and in Field 28 thinnings

from Field 23 were transplanted during the showery weather, as is common in parts of Ganjam and Vizagapatam. June plantings, except in Field 72, were all harvested between 24th and 27th November, and were closely followed on 1st December by Field 28. July 31st sowings were cut on 17th December.

The abnormally wet season of this year was disastrous for this crop. The excellent preparation given proved unavailing, if not positively harmful, in fields in the northern block. This year's rains, however, established one thing, that the alkalinity of fields which were reclaimed during the last two years is such that, under normal conditions of weather and cropping, the outturns are likely to be negligible and for fair yields very heavy manuring and rainfall are an absolute necessity.

TABLE XXIV.

Dry cholam yields.

Field No.	Area.	Previous crop.	Preparation begun on	Sown on	Cut on	Per plot.		Per acre.	
						Grain.	Straw.	Grain.	Straw.
8	2.74	Periamanjol cholam.	19 Dec. 1923	8 June 1924	25 Nov. 1924	143	7,134	52	2,611
8	2.54	Tenai and Red gram.	19 Jan. 1924	9 June 1924	24 Nov. 1924	785	12,076	29	4,754
10	10.00	Uppam cotton.	30 July 1924	31 July 1924	18 Dec. 1924	1,446	11,688	145	1,169
18	84.00	Bengal gram.	16 Feb. 1924	19 June 1924	27 Nov. 1924	8,225	125,520	242	3,691
14	1.75	Tenai ...	1 Dec. 1923	8 June 1924	24 Nov. 1924	258	5,032	147	2,875
28	1.25	Linseed.	23 Mar. 1924	11 June 1924	25 Nov. 1924	365	7,581	292	6,069
28	2.85	Uppam ..	6 July 1924	6 July 1924	1 Dec. 1924	182	10,864	64	3,811
36b	12.00	Cotton	18 Feb. 1924	4 Aug. 1924	3 Dec. 1924	786	18,04	66	1,550
		Periamanjol cholam.							
70	1.25	Fallow ...	8 Apr. 1924	Do.	12 Dec. 1924	1,588	6,824	1,270	5,619
71	2.10	Do. ...	4 Mar. 1924	31 July 1924	17 Dec. 1924	2,915	14,696	1,310	6,998
72	2.75	Periamanjol cholam.	29 Mar. 1924	23 June 1924	Do.	826	3,648	119	1,328
78	1.25	Fallow ...	4 Mar. 1924	10 June 1924	21 Dec. 1924	270	4,737	216	3,887
79	.50	Do. ...	2 July 1924	31 July 1924	17 Dec. 1924	263	2,500	526	5,000
80	.50	Do. ...	31 July 1924	Do.	Do.	155	2,868	310	5,786

N.B.—Yields in pounds. The straw figures include weights of empty ears also.

22. *Bengal gram*.—This cold-weather crop was cultivated on 35.70 acres during the year and gave 10,716 lb. grain.

23. *Miscellaneous crops*.—Other crops of minor importance which were sown during the year were *tenai*, *cumbu*, *panivaragu* and *horse-gram*. These have occupied relatively small areas and have proved a failure owing to the wetness of the cropping season.

Daincha and *sunnhemp* amongst the legumes, were also raised in garden lands as time suited, but the crops were not anything great and were ploughed in mostly, sunnhemp alone in a few instances being utilized as fodder.

Sunflower was a new introduction for this last purpose, but has yet to be tried again to pronounce any opinion.

Students' specimens crops in Fields 63, 64 and 56-B were many and varied.

24. *Cocoanuts*.—The total number of ripe and tender nuts gathered was 5,858.

25. The effects of the root development of avenue trees have been noted for several years now, and two years ago it was suggested that trenches dug alongside might minimize the evil. This was done, appreciable improvement has been effected and a large area has been added to the effective cropped area. Photographs below compare the two stages and are instructive.

CENTRAL FARM,
COIMBATORE,
18th May 1925.

D. BALAKRISHNAMURTI,
*Offg. Professor of Agriculture and
Superintendent, Central Farm.*

APPENDIX A.

Statement showing the mean maximum, mean minimum, highest maximum, lowest minimum, mean temperature and humidity at 8 a. m., rainfall and average wind velocity per day at the Agricultural College and Research Institute Meteorological Observatory for the year 1924-25.

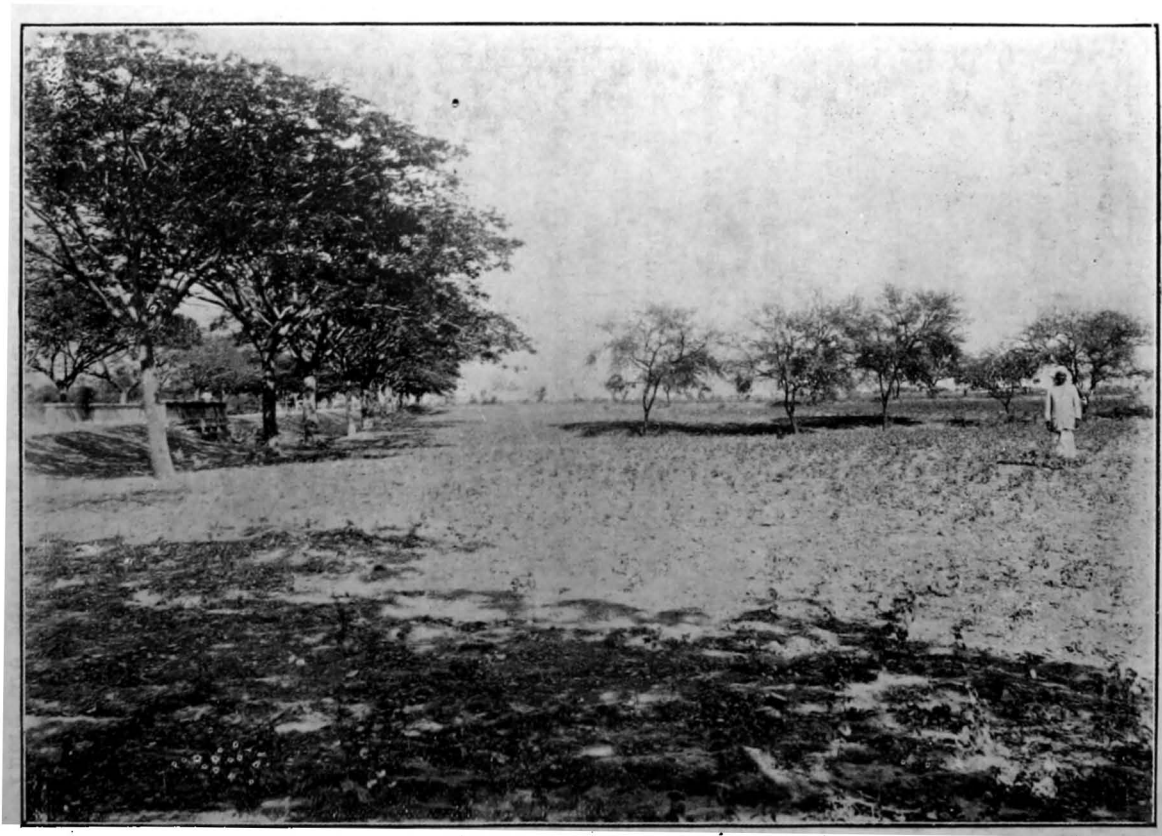
			Mean maximum in shade.	Mean minimum in shade.	Highest maxi- mum in shade.	Lowest mini- mum in shade.	Mean tempera- ture at 8 a.m.	Mean humidity at 8 a.m.	Total rainfall	Average wind velocity per day--miles per hour.
			°F.	°F.	°F.	°F.	°F.	PER CENT.	INCHES.	
April	1924	...	95.9	74.2	100.6	70.0	82.6	70.9	3.47	4.0
May	"	...	95.8	77.4	101.7	71.5	85.3	72.3	3.24	5.1
June	"	...	86.1	70.2	94.0	66.9	78.0	75.5	5.89	9.6
July	"	...	82.9	71.6	89.0	69.4	76.5	79.0	14.18	11.7
August	"	...	76.7	62.7	89.0	69.5	68.0	64.8	0.92	10.3
September	"	...	87.3	70.9	91.0	68.0	77.8	78.9	2.38	6.1
October	"	...	87.7	69.0	92.2	68.5	77.5	75.8	5.87	5.8
November	"	...	84.8	68.1	89.0	57.3	75.2	80.6	4.30	3.2
December	"	...	83.8	64.2	88.0	56.6	72.3	75.2	1.67	4.7
January	1925	...	86.9	61.4	92.5	55.0	70.8	71.2	0.08	4.3
February	"	...	91.2	61.3	94.0	57.5	73.5	65.9	0.00	4.4
March	"	..	92.4	69.1	98.5	62.8	77.3	74.2	3.78	3.6
Average for 1924-25...			87.7	68.6	*101.7	*55.0	76.2	73.7	45.43†	6.1

* Highest maximum and lowest minimum for the year.

† The difference of 1 cent between this and the statement at the beginning is due to rounding of decimals.



EFFECT OF DIGGING A DEEP TRENCH BETWEEN AVENUE AND FIELDS.



EFFECT OF AVENUE TREES ON ADJOINING FIELDS.

**CENTRAL CATTLE FARM, HOSUR,
ANNUAL REPORT FOR 1924-25.**

This farm, which is situated in Mattigiri village nearly three miles south of Hosur, in the Hosur taluk of Salem district, was taken over by the Madras Government on 1st September 1924 as a cattle breeding farm. It had previously been in the occupation of the Army Remount Department for 96 years.

Description.—The soils vary in texture from a rich and retentive loam to a poor, hard red gravel.

The total acreage of the estate is 1,635.33 acres.

Sixty-five acres are irrigable from tanks, of which there are three; these are purely rain-fed. This land is a rich, black and red clay loam and is commonly called the Lucerne Garden. It comprises 35 fields in which lucerne was grown in rotation along with rhodes grass, cholam, etc.

Masonry irrigation channels convey the water to the fields from the tanks.

The large area of pasture land is divided up into 16 paddocks, and it is beautifully laid out with roads running in different directions with avenues of trees along each, containing timber and fruit trees such as sheeshum, vagai, mangoes, tamarind, casuarina, etc.

The farm is fenced in with a good aloe fence, and several of the paddocks are enclosed with a good, thorny hedge. There are about 3,000 sandalwood trees and saplings on the estate.

The lie of the land is generally from south to north with wide undulations. The maximum difference in the levels between any two points within the farm is about 80 feet, the highest level being 3,005 feet and the lowest 2,925 feet above sea level.

The farm thus presents an appearance of a large English park.

Buildings.—There are four lines of buildings, and these will provide accommodation for about 1,000 head of cattle.

The dairy yard is built of solid stone and will accommodate about 100 milk cows; besides this there are calving sheds, dairy and food stores.

There are several large godowns, blacksmith's shop, joiner's shop, store sheds, etc.

There are two imperial bungalows and four smaller ones on the estate.

The Sub-Collector and the Deputy Director of Agriculture, Live-stock, occupy the two imperial bungalows, whilst the District Forest Officer, North Salem, and the Farm Manager occupy two of the smaller ones; the remaining two have been divided up and occupied by the assistant farm managers on the estate.

Other buildings comprise—

Guest house,
Small rest house,
Church,
Cricket pavilion,
Human hospital (District Forest office),
Office of the Deputy Director of Agriculture, Live-stock.

The depot village of Mattigiri which contains a great number of well-built houses adjoins the farm.

The Hosur Railway Station is three miles distant, and Bangalore 27 miles by road.

There are seven wells on the estate, of which four are useful. One of these is closed in and provides very good drinking water for the estate.

The farm is supplied with water for irrigation purposes from three tanks. These are named—

Jeegur,
Appareddy,
Poonapalli.

The first one is the main source of supply for the garden land but it requires considerable repairs during this dry weather in order to get the maximum benefit from it during this next year. Appareddy tank provides drinking water for the animals for about six or seven months in the year; it also irrigates a small portion of guinea grass.

Poonapalli tank is about 1 mile distant from the farm, the water rights having been purchased about 20 years ago. The ryots farming the land surrounding this tank, however, have been illicitly drawing water from it by digging wells near the bunds, etc. It is proposed to repair the bunds of this tank and to deepen the channel which conveys the water to Jeegur tank, and so the farm will receive more water from it than it does at present.

The Karanoor tank is of no use for irrigation purposes but it supplies drinking water for the cattle.

The chief reasons for taking over this farm are—

1. The breeding of Kangayam cattle.
2. The breeding of cross-bred milch animals for the Madras milk supply.

Season.—The climate is considered healthy, and the temperature in the hot weather does not exceed 90° in the shade. It is cold at nights during November to February.

The average rainfall for the last 22 years is about 31 inches which is fairly well distributed over the year, as will be seen from the statement attached. The hot-weather rains this year were the heaviest for the last 20 years, and these contributed to the very foul appearance of the farm in its neglected condition.

Farm operations.—As already stated, the farm was taken over in a very foul condition, no work having been done to it since February 1924. Most of the garden land was overgrown with deep-rooted grasses and weeds to a height of 2 to 3 feet. These had to be cut by hand before any ploughing could be done. The pasture land was very weedy and covered in places with thorny bushes. The roads and irrigation channels were in very bad repair.

I was able to save only four acres of lucerne and some rhodes grass.

The expense incurred in cleaning the land and removing thorns, etc., was very heavy.

The farm was very short-staffed for the first three or four months, and everything was strange to the farm managers: they had never seen horses ploughing and cutting hay on a very large scale before.

Tillages.—There were heavy rains in September (about eight inches), and advantage was taken of these in October in ploughing up some of the garden land. About 13 acres were ploughed up, harrowed, etc., and sown with fodder cholam and Berseem ($\frac{1}{2}$ acre experimental). The weeds in this land had not been properly exterminated, with the result that the crops had to be weeded at least once a month. Since harvesting the crop, the land has been worked two or three times, and it is hoped that this, together with the dry weather, has killed the majority of the weeds. Besides this, about 29 acres of the uncultivated portion has been cleaned and ploughed several times. Twenty-two acres are now fit for sowing, and 19 require another ploughing. There are still 14 acres to be ploughed up. Owing to the long drought from the first week in November to the end of

March it has not been possible to do this as the land was too hard.

At the end of the year there were about 4 feet of water in Jeegur tank and this should last until we get rains in April and May.

When all the irrigable land is under cultivation again we shall not have so much water in the tank as this unless steps are taken to repair the bunds, etc.

About 20 acres of dry land were ploughed up, manured and sown with horsegram in November but for want of rain this crop did not do well and the crop was eaten off by cattle.

After-cultivation.—Due to the foul condition of the land through deep rooted weeds this had to be done continuously in the lucerne, rhodes grass and cholam fields.

Harvest.—128,694 lb. of fodder cholam were harvested from 12.6 acres which works out at an average yield of 10,214 lb. per acre. I expected more than this. It would have been more, had we had the time to work the land better.

Most of this crop was made into silage and will be used during May and June to feed cows in milk.

68,780 lb. of green lucerne were harvested from 3.77 acres, the average yield per acre being 17,183 lb. We have been able to take five cuttings from this crop since September last.

4,985 lb. of Berseem were obtained from an half acre experimental crop. It was sown in the middle of October and gave three cuttings. The crop had to compete with a lot of deep-rooted weeds and it looked at one time as though we should have to plough all of it up but by perseverance and continual weeding the crop has done fairly well. It has now been attacked with some kind of insect pest.

36,399 lb. of green rhodes grass and 14,300 lb. rhodes grass hay has been obtained from 4.22 acres giving an average yield of 8,625 lb. green fodder and 3,388 lb. of hay per acre.

20,000 maize cobs and 5,650 lb. fodder were harvested from about one acre of land in the old vegetable garden.

About eight acres of guinea grass has yielded 48,000 lb. of green fodder. A lot of this guinea grass cannot be irrigated during the summer and so it only yields for about eight months in the year.

A small plot of potatoes were also tried and these did well.

Garlic, beet, beans, cabbage, peas, spinach, turnips and tomatoes were also tried and did very well. These found a ready market a total of Rs. 92 being realized for vegetables.

Orange trees, raspberries and strawberries have been planted and these are doing well.

Some vegetable produce has been fed to the pigs and poultry.

Sale of usufruct of trees and mango fruits.—The usufruct of tamarind, jack, pungam, etc., was sold for Rs. 240. The sale of mangoes realized Rs. 131.

The latter crop is very poor this year due to scarcity of rain.

HAY.

About 1,100 acres of hay were cut and this yielded about 760 tons of hay. Hay-making commenced about the middle of November and finished in the latter part of February.

Great difficulty was experienced at first, due to inexperienced staff who had to be trained to the work. Organization of labour during hay time on a farm of this description is only obtained through years of experience.

There were several breakages in the machines due to ant hills, etc. Spare parts could not always be obtained and so this handicapped the work also.

On the average four machines were kept at work daily besides four men with scythes who cut the grass on the bunds.

Seven large stacks containing about 550 tons have been built besides ten small ones which contain about 220 tons.

About 20 tons of hay were sold to the Dragoons on their march through to Madras from Bangalore and back.

Hay has also been sent to Madras and Ootacamund for the stud bulls stationed there. Ten tons will also be supplied to the Potato Farm, Nanjanad, as fodder for their work cattle.

ROADS AND HEDGES.

Road repairing has been taken in hand.

Most of the hedges on the Farm have been cut and trimmed.

Some of the old brick feeding troughs in the fields have been demolished and this material is being used for road repairing.

Buildings handed over—

One imperial bungalow in occupation by the Sub-Collector.

One small bungalow in occupation by the District Forest Officer, North Salem.

Human Hospital as District Forest Officer's office.

House and godowns for the Agricultural Demonstrator, Hosur.

Prior to our taking over this farm there was a lot of stealing going on. Trees were chopped down, wire fencing and posts stolen and this went on for two or three months after I took over also. Theft of grass, locks, etc., were also common. During the first month 375 head of stock were impounded for trespass, this gave a great deal of trouble at first but now it is well in hand.

EXPERIMENTS.

Nitrate of soda.—The Chilean Nitrate Committee offered me 6 cwt. of nitrate of soda free to experiment with.

Two half-acre plots were taken in the cholam crop. One of these received nitrate of soda at the rate of 2 cwt. per acre in two dressings (three weeks interval) immediately after the monsoon broke. The manured portion yielded at the rate of 16,912 lb. per acre as against the unmanured portion of 11,872 lb. per acre.

	RS
An increase of 5,040 lb. say at 120 lb. a rupee ...	42
Cost of 2 cwt. of nitrate of soda say	40

The manure has just about paid its way. Possibly 120 lb. per rupee is rather high, if the value is taken at 150 lb. per rupee, i.e., Rs. 34, for the whole then the experiment is a loss.

Lucerne.—Lucerne yielded four cuttings on the manured portion 5,955 lb. as against 5,483 lb. on the unmanured plot. The difference was 472 lb.

Rhodes grass.—The manured plot yielded at the rate of 9,500 lb. per acre as against 8,200 lb. on the unmanured crop.

Application of nitrate on both lucerne and rhodes grass has not proved a profitable operation. (See statement attached.)

LIVESTOCK.

Transfers and purchases.—Sixty cows and heifer calves and 21 bulls and bull calves, transferred from the Coimbatore dairy, arrived on the farm on 2nd October 1924.

Nineteen Kangayam cattle and six Ongole work cattle were received from Chintaladevi on the 10th October 1924.

One Scindh bull from Coimbatore herd loaned to the Imperial Dairy Expert, Bangalore, returned to Hosur on 23rd October 1924.

Thirty-one cross-bred heifers purchased from Bangalore arrived on the farm on the 28th November 1924.

Eight work animals were transferred from the Central Farm, Coimbatore, to Hosur on the 8th December 1924.

Twenty-six Ongole cattle (18 cows, 7 calves and 1 bull) and one Kangayam bull were received from Chintaladevi on 11th January 1925.

Thirty Kangayam heifers purchased from the Pattagar of Palayakottai arrived at Hosur on 28th January 1925, making a total of 203 animals.

Besides these there were 30 horses on the farm which had been taken over from the Military for work purposes, such as ploughing, carting, hay-making, etc. Nineteen of these were purchased at Rs. 80 each and the other 11 were earmarked for destruction but I persuaded the Superintendent to let me take these free. I find that these horses cost very little more to maintain than a work bull and that they do twice as much work in a day.

Births.—There were seven births on the farm as stated below :—

Serial No.	Cow No.	Breed.	Date of calving.	Sex of calf.	Remarks
1	4	Kangayam ...	23rd Dec. 1924.	...	Abortion. Still-born.
2	105	Ayr. Scind ...	2nd Feb. 1925.	...	
3	45	Montgomery ...	4th " "	Heifer.	
4	47	Do. ...	16th " "	Do.	
5	44	Ongole ...	20th " "	Do.	
6	6	Do. ...	25th " "	Do.	
7	7	Kangayam ...	6th Mar. 1925.	Do.	
8	23	Ayr. Scind ...	21st " "	Bull.	

Deaths.—There were eight deaths on the farm including two controls which were used for Rinderpest inoculation.

It was very unfortunate that an outbreak of Pyroplasmosis occurred amongst the 31 newly-purchased cross-bred heifers from Bangalore. All the animals were in poor condition when I purchased them. About three weeks after they arrived on the farm two animals fell sick, these were separately housed and the next morning one died at 6 a.m. and

the other at 12 noon. I saw several more with temperatures and at once wired to Bangalore and Madras for veterinary assistance.

The Military Veterinary Surgeon, Bangalore, came over the same day and conducted the post-mortem on the two animals. He also attended the others and left medicine and instructions. The next day the Veterinary Bacteriologist arrived and took blood smears from all the animals and discovered the Pyro germ. He treated all the sick animals but we lost a further three making a total of 5. All the remaining animals are thriving well now.

Brand No.	Sex.	Breed.	Date of death.	Cause.
107	Heifer ...	$\frac{1}{2}$ Hol. Cross ...	19th Dec. 1924.	Pyroplasmosis.
114	Do. ...	$\frac{1}{2}$ Hol. Ayr. Hansi ...	19th " "	Do.
119	Do. ...	$\frac{1}{2}$ Ayr. Saniwal ...	22nd " "	Do.
134	Do. ...	$\frac{1}{2}$ Ayr. Tan. Parker ...	1st Jan. 1925.	Do.
128	Do. ...	Ayr. Scindh ...	3rd " "	Do.
59	Do. ...	Do. ...	21st " "	Snakebite.
Control bull calf.		Cross-bred ...	10th Feb. 1925.	Rinderpest
59	Heifer ...	Do. ...	17th " "	controls.

One horse died of Gastritis.

Health of cattle.—This has been good except for the outbreak of Pyroplasmosis. All the cattle are growing well and have very fine coats.

The Ongoles and Kangayam cows are doing very well on grazing alone, supplemented by hay. In fact one or two of them are inclined to put on too much flesh.

In a normal year, with rainfall in December and January, the cattle should do much better even than this year.

Most of the calves are thriving, there are one or two of the cross-breds not doing as well as they should do, but now that I have a full staff, it should be possible they will pay special attention to these animals and improve their condition. I find that very few Managers will take an interest in backward calves and try to improve their knowledge in this rearing work which is very important.

Sales.—There were three animals sold—

Cow No. 5, Ayrshire Scindh ...	Rs.
Yearling bull No. 42, cross-bred ...	200
Bull No. 62, Ayrshire Scindh ...	60
	160
Total ...	<u>420</u>

The stock at present consists of—

Breed.	Cows and heifers over one year.	Breeding bulls and bull calves over one year.	Bull calves.	Heifer calves.	Work animals.	Total.
Bangalore	19	15	1	3	...	38
Opimbatore	35	...	3	3	...	41
Scindh	4	2	2	2	...	10
Montgomery	6	1	4	2	...	13
Kangayams	41	7	3	3	...	54
Ongoles	18	1	4	5	...	28
Work cattle ... ..	...	...	...	...	16	16
Horses ... ..	...	...	...	...	29	29
Controls ... ..	...	2	...	...	...	2
Total	123	28	17	18	45	231

DAIRY.

Owing to the shortage of staff, hay-making and the inoculation against Rinderpest, it has not been possible to get the dairy into a thorough working condition before March, but now work is going well, with a dairy Manager in charge.

A number of the Ongoles transferred from Chintaladevi to Hosur were in milk but the railway journey upset them and their yields diminished.

As the Montgomery cows which were transferred from Coimbatore were advanced in their lactation they were allowed to suckle their calves in order to save labour, etc., of milking.

Statement showing milk yield for the year 1924-25.

No.	No. of cows.	Name	Breed.	Date of calving.	Current lactation up to 31st March 1925.	Days in milk.	Average per day.	Remarks.
					LB.		LB.	
1	23	Bangalore Herd. Pitohy	H.B. Ayr. Scindh.	21st Mar. 1925.	54	10	5'4	In milk.

Statement showing milk yield for the year 1924-25—cont.

No.	No. of cows.	Name.	Breed.	Date of calving.	Current lactation up to 31st March 1925.	Days in milk.	Average per day.	Remarks.
		<i>Coimbatore Herd.</i>			LB.		LB.	
1	96	Ankamma ...	Nellore.	11th Apr. 1924.	2,390	247	11·9	Now dry
2	105	...	{ 15/16 Ayr. Sc.	2nd Feb. 1925.	469	57	8·2	In milk.
		<i>Scindh Herd.</i>						
1	32	Kanakam ...	Scindh.	31st May 1925.	1,004	195	5·1	Dry.
		<i>Montgomery Herd.</i>						
1	43	Singia ...	Montgo.	16th May 1924.	2,648	231	11·5	Dry.
2	45	Imarti ...	Do.	4th Feb. 1925.	823	56	14·7	In milk.
3	47	Imambi ...	Do.	16th Feb. 1925.	271	45	6·5	Do.
		<i>Ongole Herd.</i>						
1	44	Ratnavali ...	Ongole.	20th Feb. 1925.	325	39	8·3	In milk.
2	6	Janaki ...	Do.	25th Feb. 1925.	195	34	5·7	Do.
3	48	Ramatilaka ...	Do.	21st Sep. 1924.	2,045	192	10·7	Do.
4	30	Meenaka ...	Do.	10th Aug. 1924.	3,072	233	13·2	Do.
5	4	Seetha ...	Do.	9th Oct. 1924.	2,431	173	14·0	Do.
6	25	Gowri ...	Do.	22nd Aug. 1924.	3,050	221	13·8	Do.
7	1	Rosamma ..	Do.	9th July 1924.	2,351	199	11·8	Do.
8	13	Badha ...	Do.	14th June 1924.	3,037	213	14·3	Do.
		<i>Kangayam Herd.</i>						
1	8	Lokam ...	Kanga- yam.	1st Aug. 1924.	1,046	126	8·3	
2	3	Ranie ..	Do.	15th Sep. 1924.	853	112	7·9	
3	2	Ramba ...	Do.	3rd July 1924.	1,649	186	8·8	
4	7	Saradha ...	Do.	6th Mar. 1925.	72	25	2·9	In milk.

Dairy.—A small commencement was made in January last with dairy work. Surplus dairy utensils were transferred from Coimbatore. Altogether about 2,041 lb. of milk were sold and 33·8 lb. of butter were made. Two pounds of

cream were sold as cream. Twenty-four pounds of butter were sold and 10·8 lb. converted into ghee. About 30 to 40 lb. of milk is sold daily on the estate now and the demand at present for good milk is greater than the supply.

Services.—There were 29 farm animals served during the period and 4 reservices.

Serum simultaneous inoculations.—Four controls were purchased in Bangalore for Rs. 57-8-0. Seventy head of stock were inoculated against Rinderpest by the serum simultaneous method. There were no casualties with the exception of two controls.

Six Ongole cows which were inoculated two years ago were sent to the yard along with their calves which were being inoculated. The calves suckled their dams and the disease had no effect on the cows, thus showing the immunity.

Sheep.—The following sheep arrived from Hagari on the farm on the 22nd of March 1925:—

Rams	10
Ewes	84
Ewehoggs	19
Ram lambs	28
Ewe lambs	29
	<hr/>
	170
	<hr/>

The majority of these were in poor and some in very poor condition. Two lambs died in the train and another expired on arrival at the farm. The deaths are chiefly due to poverty of condition.

Deaths are as follows:—

Ram lamb 329 died en route ...	Exhaustion.
Ram lamb 328 Do. ...	Do
Ewe lamb 330 died on 22-3-1925.	Do.
Ewe lamb 324 died on 28-3-1925.	Do.

Five more have died up to the time of writing this report, 3 of Pneumonia, but I suspect the old disease Hæmorrhagic Septicæmia and have isolated them. Next year it is hoped to purchase some half-bred Merino rams and cover these ewes with them in order to increase their wool.

Pigs.—Three Berkshire sows, one Berkshire boar and one Yorkshire boar were transferred from Coimbatore to Hosur about January 1925. One pigling was purchased.

Sow No. 2 farrowed 9 piglings on 23rd January 1925. One was still-born and another died the next day.

Sow No. 1 farrowed 9 piglings on 10th March 1925. One died soon after it was born and two others later.

Four days after farrowing this sow died of inflammation of the stomach and the piglings had to be handfed.

This took up a great deal of time at first but all the six piglings are doing well.

The strength now is—

Boars	...	...	...	...	...	...	2
Sows	...	...	...	...	...	...	3
Piglings	...	...	...	...	...	...	13

The pigs are allowed to roam about the fields and seem to thrive well at Hosur.

When the dairy gets into working order, we shall be able to fatten a lot of these up for sale.

POULTRY.

Nine Leghorn pullets, one cockerel and seven chickens were transferred from Coimbatore on the 18th December, 1924. One chick was taken by a hawk. Twenty chicks were hatched out, eight of these were killed by rats and trampled on by the mother hen and two died of abscesses. In February 37 more chicks were transferred from Coimbatore.

There were six deaths due to chicken-pox, etc. The number on hand at present is 57 plus three country hens used for setting purposes.

The number of eggs laid by the pullets up to 31st March was 434. Three-hundred and seventy-seven were sold at one anna each and 40 kept for hatching.

It is hoped to go in for poultry on a big scale here, as the birds have a wide range of grass land to wander over and there should be a good market for eggs in Madras and Bangalore. It is proposed to keep only White Leghorns at this farm.

RECEIPTS.

					RS.
By sale of cattle	...	...	...	...	420
Do. hay	...	...	...	...	31
Do. seeds from trees	...	...	...	...	240
Do. milk	...	...	...	...	80
Do. butter	...	...	...	...	16
Do. eggs	...	...	...	...	24
Do. hay and Green Fodder to the Military	...	...	...	...	632
Do. vegetable Garden produce	...	...	...	...	92

Total ... 1,535

VISITORS.

His Excellency the Governor of Madras accompanied by his Military Secretary and Private Secretary visited the Farm on the 9th February and spent the whole day inspecting the Farm.

Other prominent visitors to the farm included the Collector of Salem, the Chief Conservator of Forests, the Secretary to Government, Development Department, the Postmaster-General, the Agricultural Adviser to the Government of India and the Imperial Dairy Expert.

Rainfall statement for 1924-25.

Date.	April 1924.		May 1924.		June 1924.		July 1924.		August 1924.		September 1924.		October 1924.		November 1924.		December 1924.		January 1925.		February 1925.		March 1925.	
	In.	C.	In.	C.	In.	C.	In.	C.	In.	C.	In.	C.	In.	C.	In.	C.	In.	C.	In.	C.	In.	C.	In.	C.
1	30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	8	1	88	...	...	...	...	...	...	...	...	16	...	...	...	...	...	...	...	...	...
3	47	...	43	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...
4	16	...	...	...	12	...	...	...	8	...	...	...	...	...	...	...	...	...
5	19	...	5	...	...	13	...	...	...	68	...	...	...	...	...	...	...	...	...
6	22	...	...	...	...	...	...	...	...	...
7	8	...	...	...	...	...	...	...	...	...
8
9	1	2	...	26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	3	10	...	...	...	...	...	15	...	...	...	...	...	...	...	...	...	...	...
11	26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	18	...	...	...	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...
15	94	1	2	...	92	...	...	...	...	...	...	...	...	...	...	...	...	...
16	40	...	27	...	11	...	...	7	...	...	24	...	...	...	...	...	...	...	...	...	42	...
17	43	...	...	...	...	...	...	...	6	...	...	...	...	...	...	...	...	...	...	...	...	2
18	26	...	...	...	...	...	42	...	65	...	...	...	...	...	...	...	...	...	...	...
19	1	10	...	...	...	16	2	4	...	76	...	...	...	...	...	...	...	...	...	...	...
20	5	...	...	15	...	...	...	...	...	...	...	...	...	...	...	...	...
21	33	...	...	9	...	19	...	...	32	...	...	...	...	...	...	...	...	...	...	...
22	1	40	...	...	6	...	3	...	...	85	...	...	...	...	...	...	...	...	...	...	...
23	23	...	...	...	...	34	...	...	...	...	...	...	...	...	...	...	...
24	3	...	...	1	27	...	...	...	...	...	...	...	...	...	...	...	...
25	6	...	...	...	...	...	...	...	...	...	...	...	...	...
26	39	...	...	...	...	30	...	23	...	...	...	...	...	...	...	...	...	...	...	...
27	22	...	...	...	...	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...
28	80	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	2	36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	75	...	24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31
Total	...	2	62	7	89	2	84	2	37	1	77	8	5	1	83	2	22	...	...	...	...	...	...	44
Grand total	...	3	41	10	51	13	35	15	72	17	49	25	54	27	87	29	59	...	...	...	...	...	30	3
Average for past 6 years.	...	1	25	4	5	1	41	2	7	2	21	4	75	4	68	3	66	...	17	...	43	...	39	47
Total average for past 6 years.	...	2	69	6	74	8	15	10	22	12	48	17	18	21	86	25	73	25	89	...	...	97	1	44

Statement showing yields of lucerne, rhodes grass, and fodder cholam from plots manured with nitrate of soda during 1924-25—Central Cattle Farm.

Application of nitrate of soda.		Date of cutting.	Number of cuttings.	Manured plot yield in lb.			Unmanured plot yield in lb.			Outskirts yield in lb.			Remarks.
Date.	Rate per acre.			Area.	Per plot.	Per acre.	Area.	Per plot.	Per acre.	Area.	Per plot.	Per acre.	
<i>Lucerne in Field No. 8.</i>													
10th and 24th November 1924.	2 cwts. in 2 doses.	17th to 30th December 1924.	I	50	2,784	5,588	25	1,134	4,536	71	1,575	2,218	+ 22.7 per cent.
		10th to 24th January 1925.	II	50	2,875	5,750	25	1,434	5,736	71	2,350	3,310	+ 0.2 per cent.
		24th February to 8th March 1925.	III	50	2,684	5,368	25	1,122	4,488	71	1,794	2,527	+ 19.6 per cent.
		17th to 23rd March 1925.	IV	50	3,568	7,136	25	1,793	7,172	71	2,311	3,255	- 0.5 per cent.
		Total			11,911	5,955*		5,483	5,483*	...	8,030	2,827*	+ 8.6 per cent.
<i>Rhodes grass in Field No. 12.</i>													
11th and 24th November 1924.	2 cwts. in 2 doses.	27th February to 6th March 1925.	I	50	4,750	9,500	50	4,110	8,220	90	9,811	10,346	
<i>Fodder cholam in Field No. 10.</i>													
9th and 26th November 1924.	2 cwts. in 2 doses.	19th January 1925 ...	...	50	8,456	16,912	25	2,698	11,872	189	22,930	12,132	

* Average per acre.

*Statement showing amount of concentrated cattle food consumed at
the Central Cattle Farm, Hosur, during September 1924
to March 1925.*

Month.	Groundnut cake.	Rice bran.	Wheat bran.	Horse- gram.	Salt.	Dholl husk.	Treacle.	Broken chulam.	Fish-meal.	Cotton seed.
	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
1924.										
September.	...	...	...	400.0	6.14	...	...	...	...	...
October ...	8,101.0	4,049.0	123.0	1,412.0	134.13	18	...	132.0	2.8	...
November...	8,056.0	4,279.8	...	1,719.0	219.11	...	...	...	...	...
December...	4,811.8	7,847.8	392.0	1,450.0	437.8	...	...	...	...	53
1925.										
January ...	6,453.0	11,302.12	2,460.0	1,919.0	596.15	...	16	...	...	...
February ...	3,790.0	6,912.4	1,419.0	1,930.0	864.12	...	41	11.0	...	...
March ...	6,210.8	8,243.0	1,927.0	1,860.0	367.0	...	86	...	...	...
Total ..	27,412	42,134	6,321	10,690	2,127.9	18	143	143.0	2.8	53

*Statement showing amount of bulky fodder fed to stock from
1st September 1924 to 31st March 1925.*

Month.	Hay.	Fodder chulam.	Lucerne.	Berseem.	Rhodes grass.	Guinea grass.	Green grass.
	LB.	LB.	LB.	LB.	LB.	LB.	LB.
1924.							
September	...	9,000	...	...	...	...	5,920
October	...	19,820	...	...	...	...	99,500
Novembr	...	32,830	...	9,190	...	...	81,290
December	...	39,720	...	13,313	...	1,900	26,431
1925.							
January	...	44,950	...	12,342	560	6,039	19,995
February	...	49,600	32,270	11,512	2,400	30,031	200
March	...	56,180	...	18,418	2,025	6,368	11,625
Total ...	252,000	32,270	64,775	4,985	36,899	7,939	244,961

HOSUR CATTLE FARM P.O.,
15th May 1925.

R. W. LITTLEWOOD,
Deputy Director of Agriculture,
Live-stock.

**ONGOLE CATTLE FARM, CHINTALADEVI,
ANNUAL REPORT, 1924-25.**

The Ongole Cattle farm is situated about a mile from the village of Chintaladevi in the Kavali taluk of the Nellore district. It is 36 miles from Kavali, the nearest Railway station, and at about the trijunction of the three taluks, Kavali, Udaiyagiri and Kandukur. The farm is about 800 acres in extent, consisting of black, red gravelly and sandy soils. The farm was opened in the year 1918-19 with a view to improve the Ongole breed of cattle. This breed, and the necessity for its improvement has already been explained in previous reports. Considering the quality and the condition of the cattle in the breeding tracts at the present time, the necessity for the work being undertaken by Government has become more intense. Breeding from very indifferent and bad animals is resorted to, consequently the breed is quickly deteriorating and if not checked in time the breed may become quite useless. The tract is thinly populated and good labour is scarce. Large herds of sheep and a few cattle are reared and the trade in this is largely carried on by local men in the slack season and as a subsidiary occupation.

SEASON.

The total rainfall during the year was 37.77 inches which was spread over 42 days. This is about 85 per cent more than last year and about 5 inches more than the average rainfall of the last six years. More than half of the rain fell in October and November and in the course of a fortnight. There were 10 inches of rain in one day—6th November 1924—which did considerable damage to the bunds, roads, houses, stacks, etc. The months of April and May were practically rainless. The rains in the "Edaikar" (first crop season) were timely and favourable for the crops sown in July and August. Crops in the Pyru season (second crop season) suffered for want of rain at the later stages of their growth, as the last three months of the year, January to March were practically rainless. On the whole the season has been favourable.

The rains did a lot of good to the pasture area, and good grazing and grass were obtained.

CATTLE.

At the beginning of the year there were 164 head of cattle including 21 work animals, 2 controls and 15 Kangayams as detailed below :—

Herd.	Ongole.	Kangayams.	Cross-breds.	Total.
Cows	48	5	...	53
Heifers	26	3	...	29
Heifer calves	17	3	...	20
Bull calves	9	1	...	10
Breeding bulls	3	1	...	4
Young bulls over a year	22	2	1	25
Work animals	20	...	1	21
Controls ... ..	...	...	2	2
Total	145	15	4	164

Births.—The total number of births during the year were 38.

Deaths.—The total number of deaths during the year were 5, this included 3 controls.

ONGOLE HERD.

On the 31st March 1925 the stock consisted of the following :—

Cows and heifers	59
Breeding bulls	3
Young bulls over one year	16
Bull calves under one year	13
Heifer calves under one year	9
Work animals	22
Control calf	1
Total	123

There were 33 births in this herd during the year, 20 bull calves and 13 heifer calves.

There were four abortions during the year, cows Nos. 54, 32, 6 and 2. Two of these were caused through dipping the animals to prevent ticks.

Cow No. 77 gave birth to a deformed bull calf which died soon after birth.

Eight Ongole heifers calved during the year at about the age of $3\frac{1}{2}$ and one of them calved before it attained the age of 3 years.

Deaths.—The deaths were very few this year, there being only two deaths in the Ongole herd and those were calves;—

Number.	Date of death.	Cause.
Heifer calf No. 132	29th May 1924	Colic.
Bull calf No. 152	7th Dec. " ...	Deformed calf died soon after birth.
Control	1st Apr. " ...	Debility.
Two controls	Feb. 1925 ...	Binderpest.

Sales.—During the year, 19 animals were sold—

	RS.
One cross-bred control was sold for ...	15
One cow with calf and three heifers were sold to the Travancore Government for ...	630
Two heifers and one breeding bull were sold to a Cochin planter for	500
Two undersized bull calves were sold for ...	100
Two bulls were sold locally for breeding purposes for	260
Three bulls were sold for breeding purposes in the Ongole district for	630
One breeding bull was sold to a Forest Panchayat in the district for	150
One bull one year old was sold for	120
One two-year old heifer was sold for	150

The total amount realized by the sale of animals was Rs. 2,555.

	RS.
Seven two-year old bulls averaged ...	180 each.
Six heifers and one cow averaged	151 ,,

Transfers.—One breeding bull was transferred to Hagari Agricultural Station for stud purposes in the district.

One red Ongole cow and two heifers together with two calves were transferred to the Coimbatore dairy herd.

Eighteen cows and one breeding bull together with seven calves were specially selected for a dairy herd and sent to Hosur at the end of December.

Six Ongole work cattle were transferred to Hosur.

The total number of Ongole cattle transferred being 38.

Milk records.—Milk records are kept for each cow. All animals are milked out one day per week in order to find out

their milk-yielding capacities and also to discover if the cow is giving enough milk for the calf, on other days the calves are allowed to suckle. In the case of a cow yielding a lot of milk, some of this milk is drawn off by hand and fed to calves whose mothers are not giving sufficient milk.

Although 48 cows were in milk at different periods of the year the average number of cows in milk throughout the year amounted to 18.6. The approximate total milk yield of these cows was 74,333 lb. and this averages nearly 11 lb. per cow per day, which is good.

A statement showing the milk yields of individual cows is attached.

It will be seen from the above statement that 17 cows have yielded 3,000 lb. and over in one lactation. Though the average milk yield per cow works out to 11 lb. there are some cows which have yielded over 15 lb. per day as their average. Cow No. 13 is a regular breeder and calves regularly once in a year, and in this her last lactation she has given over 3,000 lb. of milk in 206 days. She was in milk at the time of her transfer to Hosur. She gave over 4,700 lb. of milk in her previous lactation. Cow No. 33 has given over 4,000 lb. in one lactation. Cow No. 25 has given 4,000 lb. and its daily average yield in the current lactation is over 17 lb. Cow No. 8 yielded up to 18 lb. per diem in her current lactation. There are a good many other cows which calve regularly which is an important consideration from a breeding point of view, but their daily average milk yield is only about 10 lb.

The best milkers have been selected and sent to Hosur where steps are being taken to form a good Ongole dairy herd. A bull specially selected for its dam's milking qualities will be used for this herd.

Weaning of calves.—Some attempts were made this year to wean calves at birth from first calvers. The calves of cows Nos. 67, 68 and 59 were weaned at birth. On account of weaning the calf at birth cow No. 68 went dry completely within 72 days with a poor milk yield of 338 lb. In the case of the other two cows there was big reduction in milk yield and the calves did not do so well as the ones which were suckling. It was therefore decided to allow the calves to suckle.

The experiment was not continued any further and the calves born subsequently were allowed to suckle as usual.

Breeding bulls.—One of the Ongole breeding bulls of the farm was transferred to Hosur, thereby leaving only three

Ongole bulls on the farm. Of these three No. 31 is a recent addition, having been selected from among the farm stock. These are all good animals and were specially chosen for the milking qualities of their dams.

Farm services.—The total number of services on the farm was 67 of which 49 may be taken as effective. The number of effective and ineffective services by individual bulls is tabulated below :—

Bull number.	Effective.	Ineffective.	Total.	Remarks.
12	21	8	29	
8	5	6	11	
20	22	4	26	Sent to Hosur, January 1925.
31	1	...	1	Admitted from March 1925.
Total ...	49	18	67	

A perusal of the bull service register for 1924-25 further reveals the fact that some 12 cows have taken the bull more than once, but in most cases the second service seems to have been effective.

Outside services.—Nineteen outside cows were served during the year.

KANGAYAM HERD.

At the beginning of the year the herd consisted of—
8 cows and heifers over one year.
1 breeding bull.
2 yearling bulls.
4 calves.

Births.—There were five births in this herd during the year, three bulls and two heifers.

Deaths.—Nil.

Transfers.—All this herd was transferred to Hosur in November 1924.

RATIONS.

The following statement shows the concentrated as well as the bulky fodder consumed in the year 1924-25. Rations were curtailed during November and December when good grazing was available.

Name of cattle food.	Quantity.	Remarks.
<i>Concentrated food.</i>		
	LB.	
Groundnut cake	78,939½	Purchased.
Rice bran	107,484½	Do.
Jonna grain	16,400½	Farm produce.
Salt	3,952—11½	Purchased.
Gingelly cake	11,446½	Do.
Sajja grain	280	Farm produce.
Horsegram grain	745	Do.
Ragi grain	26	Purchased.
Rice	88½	Do.
Jaggery	1,082	Do.
<i>Bulky dry fodder.</i>		
Jonna straw	169,780	27,982 lb. purchased. Rest farm produce.
Jonna and sunnhemp hay	12,534	Farm produce.
Paddy straw	3,725	Purchased.
Horsegram pottu	3,238	Farm produce.
Sajja hay	7,577	Do.
Sunnhemp hay	13,250	Do.
Dry fodder mixed	83,380	Do.
<i>Bulky green fodder.</i>		
Sweet potato vines	65,987	Farm produce.
Guinea grass	47,339	Do.
Elephant grass	900	Do.
Green grass	107,096	Do.
Green jonna fodder	106,345	32,830 lb. purchased. Rest farm produce.
Kuduraivali	108	Farm produce.
Green sajja fodder	51,620	4,550 lb. purchased. Rest farm produce.
Green jonna and sunnhemp fodder... ..	4,438	Farm produce.
Green sunnhemp fodder	4,698	Do.
Green jonna and grass mixed	9,427	Do.

Some nine cows which had not taken the bull for six months after calving were fed with boiled horsegram mixed with a little jaggery in addition to their ordinary ration to see if this special feeding would bring them into season quicker and this proved a success. All the animals took the bull within two months of the commencement of this experiment.

SERUM SIMULTANEOUS INOCULATION.

Thirty-five animals were inoculated this year against Rinderpest by this method. These 35 animals consisted of—

6 Cows and heifers over one year,	6 Bulls,
7 Heifer calves,	6 Bull calves and 10 Working animals.

There were no casualties except the two crossbred calves used as controls. No outside animals were inoculated.

SHOWS.

This year five animals entered for the cattle show at Venkatagiri. They were—

2 Cows,	1 Bull calf over one year,
1 Breeding bull,	1 Heifer calf.

All the five animals won prizes, cow No. 49 securing the gold medal for the best cow in the show and all the other animals, getting first-class prizes except bull No. 12 which was awarded a second prize. The total money value of prizes awarded to all the animals was Rs. 63 together with the gold medal.

Grazing land.—The timely rains of July–August were highly beneficial for the growth of grass in the grazing area. Chéngali gaddi and some leguminous plants which have high feeding value came up profusely especially in December–January. Kolukkattai grass has not established itself and more seed will have to be sown. Owing to scarcity of labour it was not possible to make as much hay as was desired. However the total quantity of hay made was about 56,857 lb. More attention will be paid to the pasture land in the current year, by way of manuring, bunding up, etc. The pruning of the babul trees in the paddocks was also taken up.

Guinea grass.—The area under Guinea grass was extended by nine acres, thus raising the total area under this crop to $13\frac{1}{2}$ acres. Three acres of this were planted early in April and the crop has fairly established itself. Three cuttings of 19,686 lb. of grass have been obtained to date from these three acres. The remaining six acres were planted in January–February and this has since given 1 cutting of 4,720 lb. The old crop of $4\frac{1}{2}$ acres yielded 29,800 lb. in three cuttings. When this crop establishes itself well in all the fields, there will be no difficulty in the supply of fresh green grass at all times of the year.

Elephant grass.—This was planted in about 40 cents in field No. 18. This grass has not been doing so well as it ought to and only two cuttings of 5,800 lb. of grass per acre were obtained in the year 1924–25. With better cultivation and good manuring and irrigation the crop should do better in the current year.

Sunflower as silage.—Sunflower was grown for the first time on the farm on an area of about four acres. The crop came up well and was cut in the flowering stage and made

into silage by the pit method. The pit was opened after four months and the silage was quite good, and was much relished by the cattle during the dry season. It provided fodder for about two months.

Cyanamide Experiments.—Manurial experiment with calcium cyanamide and superphosphate on a fodder crop of jonna was repeated this year in field No. 21. Twenty plots of four cents each were laid out north to south. The manures tested were.

- i. Cyanamide at 2 cwt. per acre.
- ii. Super at 1 cwt. per acre.
- iii. Cyanamide at 2 cwt. and super at 1 cwt. per acre.

The series were repeated five times and there was a "No Manure" plot in each of the series. Cyanamide was applied on 20th November 1924 and periyamanjal jonna was sown on 22nd November 1924. Super was applied on 14th December 1924 when there were signs of impending rain. All the plots were harvested on the same day, viz., 19th February 1925 and both the wet and air dry weights recorded. The plot and acre yields of all the plots in the experiment are tabulated below:—

Manure applied.	No. of plot.	Yields.				Average yield per acre of the five plots.		Comparison of air dry weights taking yields of controls as 100.
		Per plot.		Per acre.		Green.	Air dry.	
		Green.	Dry.	Green.	Dry.			
No manure... ..	1	66	23	1,650	575	} 1,405	490	100.00
	5	67	24	1,674	600			
	9	44	16	1,100	400			
	13	34	11	850	275			
	17	70	24	1,750	600			
Cyanamide, 2 cwt. ..	2	82	33	2,050	825	} 1,870	740	151.02
	6	75	30	1,875	750			
	10	65	25	1,625	625			
	14	68	27	1,700	675			
	18	84	33	2,100	825			
Super, 1 cwt. ...	3	80	30	2,000	750	} 1,450	585	109.20
	7	64	24	1,600	600			
	11	50	18	1,250	450			
	15	45	17	1,125	425			
	19	51	18	1,275	450			
Cyanamide, 2 cwt. plus super, 1 cwt.	4	170	73	4,250	1,825	} 2,830	1,175	239.80
	8	135	50	3,375	1,250			
	12	80	30	2,000	750			
	16	88	36	2,200	900			
	20	98	46	2,325	1,150			

The average yield of all the 5 control plots has been taken as 100 and compared with those of other series. It will be seen therefore that the average yield of "2 cwt. Cyanamide and 1 cwt. Super" plot is more than double of that of the control. Next comes 2 cwt. Cyanamide per acre. Practically there is no difference in yield between the no manure series and that of the "Super at 1 cwt. per acre."

OTHER CROPS.

232.95 acres were under cultivation in the first-crop season. Sunnhemp and sajja mixture for fodder were grown in 29.64 acres, sajja for grain in 39.75 acres, sunnhemp for fodder in 33.88 acres and periyamanjal jonna for fodder in about 84 acres. In about 7 acres sweet potato was grown mainly as fodder for the cattle. As already referred to, about 14 acres were put to guinea grass and elephant grass. The rest of the cultivated area was sown with different crops of the locality such as cowpea, arika, red gram, etc. In the second-crop season the area cropped was 174.13 acres. The chief crops grown in the second-crop season were a mixture of pyru jonna and green gram as a grain crop in 52.43 acres, horsegram with a slight mixture of daincha in 60.32 acres, black gram in 4 acres, sunnhemp for fodder in 13.72 acres and a mixture of periyamanjal jonna and cowpea as a fodder crop in 14.2 acres. Many of these crops, especially those grown in the second-crop season, proved unremunerative owing to adverse weather conditions as well as the poor nature of the soils. Some fields have since been considerably improved as a result of which better results have been obtained.

Improvements to lands, wells, etc.—No new land was taken up this year or reclaimed for cultivation purposes except about 30 cents of land adjoining the new well in the red soil block which was levelled and brought under irrigation. An ordinary mhote was fitted up in the well and one of the parapet walls built before the close of the official year. The western boundary of the farm was fenced with iron posts and wire fencing. About 200 young seedlings of shade-giving trees and mangoes were planted in either side of the main roads and in the rest-house compound.

BUILDINGS.

Two blocks of work cattle sheds—Design No. 8—were handed over by the Public Works Department in June 1924.

By the end of July all the cattle sheds were provided with cement feeding troughs. The construction of water troughs was nearly completed, but they have not yet been handed over. All the principal roads in the buildings area were laid by the Public Works Department but not handed over.

VISITORS.

The Honourable the Minister for Development along with the Director of Agriculture visited the farm during the year.

Rainfall Statement of Chintaladevi cattle farm 1924-25.

Month.	Fort-night.	1918-19.		1919-20.		1920-21.		1921-22.		1922-23.		1923-24.		Average for the past six years.		1924-25.		
		Rain-fall.	Rainy days.	Rain-fall.	Rainy days.	Rain-fall.	Rainy days.	Rain-fall.	Rainy days.	Rain-fall.	Rainy days.	Rain-fall.	Rainy days.	Rainfall.	Rainy days.	Rainfall.	Rainy days.	
April ...	First ...	...	...	...	...	...	...	1.80	1	...	...	0.83	1	0.86	0.51	0.8	...	...
	Second ...	...	...	0.85	1	...	...	...	...	0.08	1	0.08	1	0.15	0.51	0.3	...	...
May ...	First ...	...	...	...	...	...	...	...	...	...	...	...	...	0.02	...	...	...	...
	Second ...	...	...	0.81	1	2.18	3	...	...	2.83	3	0.62	3	0.97	0.92	1.2	0.10	0.10
June ...	First ...	...	...	0.20	1	...	...	...	...	3.24	1	0.17	2	0.80	...	0.7	0.78	...
	Second ...	1.50	1	1.82	2	0.83	1	...	...	0.75	1	0.20	2	0.77	1.37	1.0	0.82	1.60
July ...	First ...	...	...	2.40	6	...	...	1.84	4	0.66	2	0.44	2	0.90	2.08	2.8	3.34	4.09
	Second ...	...	...	2.86	5	...	...	2.37	7	1.09	6	0.43	2	1.13	2.08	3.8	0.75	4.09
August ...	First ...	1.00	1	0.06	1	0.08	1	...	...	0.42	3	0.09	2	0.28	...	1.3	...	...
	Second ...	...	...	0.55	1	0.05	1	0.01	3	2.13	3	...	...	0.45	0.73	1.3	3.09	3.09
September.	First ...	0.80	1	1.04	2	2.40	4	1.81	4	0.17	2	3.87	6	1.52	4.40	3.0	5.89	8.81
	Second ...	3.28	5	2.61	2	5.15	5	1.85	3	1.82	3	3.04	6	2.88	4.40	4.0	3.42	8.81
October ...	First ...	...	...	1.08	5	5.87	6	3.24	6	0.61	3	...	...	2.63	...	3.2	1.21	...
	Second ...	0.98	2	0.73	2	12.17	8	3.68	3	4.58	9	3.80	11	5.36	7.96	6.0	2.04	3.25
November.	First ...	35.02	13	10.55	9	0.62	4	3.42	3	13.07	10	0.23	1	10.65	12.80	7.0	15.53	16.83
	Second ...	3.37	6	0.11	1	5.34	4	...	...	4.02	6	0.06	1	2.15	12.80	3.0	1.80	16.83
December.	First ...	1.48	4	0.06	1	...	...	...	...	0.94	1	0.14	2	0.44	0.95	1.3	...	...
	Second ...	0.22	1	2.65	2	...	...	...	...	0.02	1	0.18	1	0.51	0.95	1.0	...	...
January ..	First ...	0.18	2	0.52	1	0.30	1	2.74	5	0.01	1	0.16	1	0.65	0.88	2.0	...	...
	Second ...	0.68	3	...	...	0.40	1	...	...	...	...	...	...	0.15	0.88	0.6	...	...
February.	First ...	...	...	...	...	...	...	...	...	1.10	3	...	...	0.15	0.20	0.5	...	...
	Second ...	...	...	...	...	...	...	...	...	...	...	...	...	0.20	0.5	...	...	...
March ...	First ...	...	...	...	...	...	...	...	...	0.50	1	...	...	0.09	0.09	0.2	...	...
	Second ...	0.65	1	...	...	...	...	...	...	...	...	...	...	0.09	0.2	...	...	...
Total ...		48.66	40	28.96	43	34.89	89	27.52	40	37.99	60	20.24	44	32.89	44	37.77	42	

Statement showing milk yield of individual cows.

Serial number.	Number of cow.	Previous lactation.				Current lactation.				Remarks.					
		Number of days in milk.	Total yield in lb.	Daily average lb.	Number of days dry.	Date of calving.	Number of days in milk.	Total yield in lb.	Daily average.						
1	3	336	3,421	0	10	3	124	14 Mar. 1924.	298	3,632	4	12	3	Dry on 3 Oct. 1924.	
2	5	207	2,283	8	11	0	373	26 Dec. 1923.	341	2,856	8	8	6	Dry on 1 Dec. 1924.	
3	6	19	201	0	11	2	386	3 Nov. 1923.	315	2,997	8	9	8	Dry on 13 Sep. 1924.	
4	16	398	2,936	5	7	6	163	20 Dec. 1923.	348	3,266	3	9	6	Dry on 1 Dec. 1924.	
5	18	301	2,714	13	9	0	83	18 Mar. 1925.	19	223	4	11	12	In milk.	
6	27	417	3,897	14	9	4	125	11 Apr. 1924.	71	1,031	6	14	8	Sent to Coimbatore, 3 July 1924.	
7	33	262	819	9	3	2	52	19 June 1923.	361	4,022	2	11	2	Dry on 14 June 1924.	
8	35	302	2,919	5	9	7	155	2 Mar. 1924.	294	2,914	14	9	15	Dry on 20 Dec. 1924.	
9	36	201	1,681	0	8	4	319	13 Mar. 1924.	295	3,005	7	10	3	Dry on 1 Jan. 1925.	
10	39	355	2,823	10	7	15	89	11 Dec. 1924.	111	923	2	8	5	In milk.	
11	41	28	116	0	4	2	820	10 Sep. 1923.	295	2,319	12	8	0	Dry on 5 July 1924.	
12	44	392	3,238	10	8	2	77	17 Dec. 1923.	271	2,810	14	10	6	Dry on 13 Sep. 1924.	
13	49	195	1,105	7	5	11	418	7 Dec. 1923.	281	2,625	9	9	6	Do.	
14	51	362	2,347	0	7	14	111	22 Mar. 1925.	10	95	0	9	8	In milk.	
15	52	284	1,870	1	6	9	109	15 Oct. 1924.	168	1,327	6	7	14	Do.	
16	55	291	2,839	2	9	12	60	25 Mar. 1925.	7	52	8	7	8	Do.	
17	57	...	...	...	...	...	...	81 Mar. 1924.	301	2,249	15	7	8	Dry on 24 Feb. 1925.
18	64	362	2,819	13	7	13	152	13 Nov. 1924.	139	1,651	1	11	14	In milk.	
19	67	...	...	...	...	...	...	...	284	2,303	7	8	2	Dry on 24 Jan. 1925.
20	68	...	...	...	...	...	...	13 Mar. 1924.	72	338	6	4	11	Dry on 24 May 1924.
21	65	...	...	...	...	...	...	19 Mar. 1924.	Not milked.			Dry on 24 Jan. 1925.		
22	59	...	...	...	...	...	...	9 May 1924.	270	1,995	5	7	6	Dry on 3 Oct. 1924.
23	24	417	2,973	0	7	2	161	17 May 1924.	21	136	8	6	8	Dry on 7 June 1924.	
24	17	227	2,089	11	9	3	299	12 June 1924.	Calf died.	228	2,326	10	10	3	Dry on 24 Jan. 1925.
25	12	Not milked.				31 May 1924.	Not milked.			Do.					

Statement showing milk yield of individual cows—cont.

Serial number.	Number of cow.	Previous lactation.				Current lactation.				Remarks.	
		Number of days in milk.	Total yield in lb.	Daily average lb.	Number of days dry.	Date of calving.	Number of days in milk.	Total yields in lb.	Daily average.		
26	21	404	3,498	5 8 11	166	26 June 1924.	194	2,737	0 14 2	Sent to Hosur, 5 Jan. 1925.	
27	13	364	4,723	3 13 5	133	14 June 1924.	206	3,004	4 14 9	Do.	
28	1	380	3,432	15 9 1	179	9 July 1924.	181	2,325	15 12 14	Do.	
29	30	332	3,825	14 10 9	190	10 Aug. 1924.	148	2,414	11 16 5	Do.	
30	69	...	...	...	...	14 June 1924.	17	170	0 10 0	Sold 1 July 1924.
31	25	294	3,806	6 13 3	202	22 Aug. 1924.	136	2,319	0 17 1	Sent to Hosur, 5 Jan. 1925.	
32	48	440	3,341	15 7 10	253	21 Sep. 1924.	106	1,400	14 13 3	Do.	
33	15	253	2,330	12 9 2	145	4 Oct. 1924.	179	1,820	7 10 3	In milk.	
34	53	452	2,815	11 5 1	471	20 Oct. 1924.	163	1,626	8 10 0	Do.	
35	61	...	...	...	...	3 Nov. 1924.	1 8	614	5 5 3	Dry on 1 Mar. 1925.
36	4	279	3,567	6 12 8	250	9 Oct. 1924.	92	1,543	0 16 12	Sent to Hosur, 5 Jan. 1925.	
37	71	...	...	...	...	19 Nov. 1924.	133	1,613	4 12 2	In milk.
38	14	390	2,896	6 7 4	299	27 Nov. 1924.	124	1,182	0 9 9	Do.	
39	73	...	...	...	...	Do.	123	999	14 8 2	Do.
40	40	390	2,163	0 5 6	307	5 Dec. 1924.	117	891	4 7 10	Do.	
41	77	188	1,347	0 7 2	305	6 Dec. 1924.	16	64	0 4 0	Dry on 22 Dec. 1924.	
42	75	...	...	...	...	16 Jan. 1925.	75	622	8 8 5	In milk.
43	8	37	518	0 14 0	293	22 Jan. 1925.	69	1,222	4 17 11	Do.	
44	78	...	...	...	...	30 Mar 1925.	2	9	0 4 5	Do.
<i>Kangayams.</i>											
45	K-1	215	1,349	14 6 4	216	14 Aug. 1924.	Not milked.			Sent to Hosur, Oct. 1924.	
46	K-2	250	1,450	6 5 13	82	3 July 1924.	92	867	6 9 7	Do.	
47	K-4	Not available.				...	15 Aug. 1923.	296	3,496	13 11 13	Dry on 7 June 1924.
48	K-3	290	1,788	7 6 3	114	15 Sep. 1924.	18	135	0 7 8	Sent to Hosur, 3 Oct. 1924.	
49	K-7	...	...	...	...	24 Feb. 1924.	223	1,023	9 4 9	Do.
50	K-6	...	...	...	...	9 Apr. 1924.	178	1,710	9 9 9	Do.
51	K-8	...	...	...	...	1 Aug. 1924.	64	597	0 9 5	Do.

Statement of crops.

Field No.	Area.	Crop grown.	Date of sowing.	Date of harvest.	Yield per plot.			Yield per acre.	
					Grain.	Green fodder.	Dry fodder.	Grain.	Fodder.
1	10.64	Sunnhemp and Sajja ...	30 June 1924.	24 Oct. 1924.	...	...	3,600	...	338
...	...	Periamanjai Jonna, Cow pea and Daincha	19 Nov. 1924.	...	...	...	Crop failed.	...	...
2	5.00	Sunnhemp and Sajja ...	3 July 1924.	28 Oct. 1924.	...	...	1,650	..	330
...	...	Pyrri Jonna and Green gram.	2 Dec. 1924.	...	...	...	Crop failed.	...	...
3	5.00	Sunnhemp and Sajja ...	4 July 1924.	28 Oct. 1924.	...	...	2,400	...	480
...	...	Pyrri Jonna and Green gram.	2 Dec. 1924.	...	...	...	Crop failed.	...	...
4	4.00	Sunnhemp and Sajja ...	4 July 1924.	28 Oct. 1924.	...	...	1,800	...	400
...	...	Pyrri Jonna and Green gram.	1 Dec. 1924.	...	...	...	Crop failed.	...	...
5	5.00	Sunnhemp and Sajja ...	5 July 1924.	25 Oct. 1924.	...	...	850	...	170
...	...	Horsegram and Daincha.	16 Nov. 1924.	...	...	...	Crop failed.	...	...
6	14.35	Do.	17 Nov. 1924.	10 Mar. 1925.	450	...	1,800	31	166
7	15.27	Periamanjai Jonna, Green gram and Daincha.	1 Dec. 1924.	...	...	...	Crop failed.	...	...
8	7.00	Sweet Potato Vines ...	12 Apr. 1924.	15 Sep. 1924.	...	41,812	...	...	5,944
9	5.70	Sajja	7 July 1924.	15 Oct. 1924.	301	...	4,400	53	772
...	...	Variga, Gogu and Red gram.	12 Nov. 1924.	14 Feb. 1925.	21	...	250	7	83
10	7.88	Sajja	7 July 1924.	12 Oct. 1924.	524	...	3,800	71	379
11	6.20	Do.	6 July 1924.	14 Oct. 1924.	300	2,460	4,400	48	908
...	...	Sunnhemp	1 Dec. 1924.	20 Feb. 1925.	...	...	1,400	...	225
12	4.55	Sajja	5 July 1924.	12 Oct. 1924.	...	8,060	1,660	...	1,251
...	...	Horsegram	12 Nov. 1924.	8 Mar. 1925.	260	...	1,200	62	264
13a	2.92	Sunnhemp	25 July 1924.	12 Oct. 1924.	...	...	6,750	...	2,312
...	...	Pyrri Jonna and Green gram.	30 Nov. 1924.	4 Mar. 1925.	...	...	4,700	...	1,619
13b	5.56	Sunnhemp	25 July 1924.	8 Oct. 1924.	...	...	9,250	...	1,664
...	...	Pyrri Jonna and Green gram.	30 Nov. 1924.	4 Mar. 1925.	...	...	3,800	...	683
14	4.00	Sunnhemp	26 July 1924.	7 Oct. 1924.	...	950	9,575	...	2,513
...	...	Pyrri Jonna and Green gram.	29 Nov. 1924.	5 Mar. 1925.	...	...	2,200	...	550

Statement of crops—cont.

Field No.	Area.	Crop grown.	Date of sowing.	Date of harvest.	Yield per plot.			Yield per acre.	
					Grain.	Green fodder.	Dry fodder.	Grain.	Fodder.
31	4.00	Jonna	11 Apr. 1924.	30 July 1924.	...	12,635	...	...	3,159
...	...	Horsegram	13 Nov. 1924.	23 Feb. 1925.	...	...	4,050	...	1,012
32	3.00	Sajja	19 July 1924.	12 Oct. 1924.	...	...	3,200	...	1,067
...	...	Horsegram	11 Nov. 1924.	24 Feb. 1925.	...	...	5,100	...	1,700
33	3.00	Sajja	18 July 1924.	4 Oct. 1924.	...	7,000	...	...	2,332
...	...	Horsegram	11 Nov. 1924.	25 Feb. 1925.	...	...	3,200	...	1,067
34	2.50	Sajja	19 July 1924.	12 Oct. 1924.	...	...	1,650	...	660
...	...	Horsegram	10 Nov. 1924.	6 Mar. 1925.	190	...	800	76	320
35	2.00	Sajja	19 July 1924.	1 Oct. 1924.	...	10,380	1,180	...	3,185
...	...	Horsegram	10 Nov. 1924.	7 Mar. 1925.	180	...	600	90	300
36	2.42	Sajja	13 July 1924.	2 Oct. 1-24.	...	...	1,500	...	620
...	...	Horsegram	11 Dec. 1924.	26 Feb. 1925.	...	...	1,800	...	744
37	2.96	Jonna	19 Mar. 1924.	1 July 1924.	...	4,980	...	...	1,676
...	...	Cow pea	13 Nov. 1924.	23 Feb. 1925.	...	500	400	...	220
38	2.42	Do.	Do.	...	...	...	Crop failed.		
39	3.00	Sun flower	17 July 1924.	17 Oct. 1924.	...	30,000	...	...	10,000
...	...	Periamanjai jonna	14 Nov. 1924.	6 Mar. 1925.	...	...	1,800	...	600
40	4.00	Cow pea	29 July 1924.	30 Dec. 1924.	...	...	6,400	...	1,600
41	4.68	Sunnheup	17 July 1924.	1 Oct. 1924.	...	3,513	9,000	...	2,298
...	...	Pyr jonna and green gram	22 Nov. 1924.	19 Feb. 1925.	...	3,250	...	...	694
42	4.27	Sunnheup	17 July 1924.	20 Oct. 1924.	...	...	4,800	...	1,124
...	...	Pyr jonna and green gram	24 Nov. 1924.	19 Feb. 1925.	...	4,900	...	...	1,148
<i>Red Soil Southern side.</i>									
...	3.00	Sajja	29 June 1924.	21 Sep. 1924.	...	14,650	...	...	4,833
...	25.00	Periamanjai jonna	15 July 1924.	29 Dec. 1924.	...	364	6,400	...	263
...	4.00	Arika and redgram	Do.	24 Dec. 1924.	1,158	...	2,000	290	500

Statement of crops—cont.

Field No.	Area.	Crop grown.	Date of sowing.	Date of harvest.	Yield per plot.			Yield per acre.	
					Grain.	Green fodder.	Dry fodder.	Grain.	Fodder.
...	ACS. 3-00	Periamanjai jonna ...	4 Nov. 1924.	27 Feb. 1925.	...	...	1,800	...	600
...	10-00	Horsegram ...	27 Nov. 1924.	...	...	Crop failed.			
		<i>Red Soil Western side.</i>							
...	25 00	Periamanjai jonna ...			Daincha failed.		Red gram standing.		
		Red gram and daincha ...	17 July 1924.	26 Dec. 1924.	...	1,266	9,200	...	398
...	3-00	Pyrri jonna and green gram ...	...	...	Crop failed completely.				
		<i>Shelter Belt.</i>							
...	0-15	Guinea grass ..	11 Apr. 1924.	...	...	4,100	...	...	27,383
...	1-00	Jonna and hemp ...	July.	3 Oct. 1924.	...	4,578	...	...	4,578

HOSUR CATTLE FARM P.O.,
17th May 1925.

R. W. LITTLEWOOD,
Deputy Director of Agriculture,
Live-stock.

ANNUAL REPORT OF THE BUFFALO-BREEDING STATION, GUNTÜR, FOR THE YEAR 1924-25.

This farm which is situated about five miles north of Guntür was opened on the 12th June 1923. The extent of the farm is 150 acres, the whole of this being grass land. The main object of the farm is to improve both the size and the milk-yielding capacity of buffaloes by crossing the ordinary country buffaloes with Delhi buffalo bulls. The breeding of Delhi buffaloes will also be continued. The demand for a good buffalo bull in the Presidency is great and it is hoped to satisfy some of the demands of the districts from this farm in another two or three years. The farm also demonstrates to the ryots and milkmen in Guntür district where buffalo breeding is much carried on how to rear and feed their stock in order to obtain good bulls and she-buffaloes.

Season.—The season has been good, the total rainfall was 32·79 inches distributed over 74 days as shown in the statement. The south-west monsoon commenced earlier than usual and this was very favourable for the growth of grasses in the reserve, which are mostly Chengali and Kunduru.

Half of the area is kept for grazing purposes and other half is reserved for hay.

60,790 lb. of green grass were cut and converted into hay during December and this was stacked along with 50,000 lb. of jonna straw which was transferred from the Guntür Agricultural Station. Manure from the buffalo farm is given to this farm in exchange for fodder.

Cattle.—At the commencement of the year there were 15 head of cattle on the farm.

Transfers.—Twelve animals including four she-buffaloes, two heifers in calf, five heifer calves and one bull calf were transferred from Coimbatore to Guntür in July 1924.

On the 31st March 1925 there were the following stock :—

Breed.	She-buffaloes and heifers	Buffalo bulls.	Bull calves.	Heifer calves.	Total.
Delhi	5	2	2	1	10
Crossbred Delhi ...	15	2	3	4	24
Total	20	4	5	5	34

Births.—There were 13 births during the year.

No.	Name.	Date of calving.	Sex of calf.	Remarks.
5	Adambi	5-9-24	Bull.	
17	Vanajakshi	25-9-24	Heifer	Died on 24-10-24.
15	Gurjahan	2-10-24	Bull.	
2	Mani	8-10-24	Bull.	
13	Lakshmi	17-10-24	Bull ...	Died on 28-10-21.
12	Kumari	18-10-24	Heifer.	
8	Nurjahan	22-10-24	Heifer ...	Still born.
14	Ramani	7-11-24	Heifer.	
19	Dhanakoti	13-11-24	Heifer.	
6	Pushpavadi	25-11-24	Heifer.	
16	Rambha	25-11-24	Bull.	
1	Nizambi	26-11-24	Bull.	
4	Kanakam	4-12-24	Heifer.	

All the calves with the exception of one were weaned at birth and handfed in order to see whether weaning would shorten the period between calving and the time of taking the bull. This has not been the case however.

Deaths—

No.	—	Date.	Cause.
1	Stud buffalo	30 Aug. 1924	Hæmorrhagic septicæmia.
5	Yearling buffalo bull	29 May 1924	Suspected anthrax.
5	She buffalo	16 Sep. 1924	Eversion of the uterus.
8	Heifer calf	24 Oct. 1924	Suspected Hæmorrhagic septi-cæmia.
6	Bull calf	28 Oct. 1924	Gastritis.

Farm services.—There were three farm animals served.

Outside services.—93 outside animals were served.

Two breeding buffaloes were sent out on tour last year into the surrounding villages in order to advertise our animals and the farm,

and as a result of this, over 90 she-buffaloes have been brought to the farm for service.

- Bull No. 2 served 42 outside animals.
- Bull No. 3 served 51 outside animals.

Milk and dairy produce.—Up to the 31st March there were 12 she-buffaloes in milk and these produced 16,762½ lb. of milk, the daily average being 10·28 lb. per animal.

• The calves received from 7 to 10 lb. of milk daily according to their ages ; this amounted to 10,261½ lb.

1,417½ lb. of milk were sold as milk and the balance left over was made into ghee and this produced 170 lb. 5 oz. which was sent to Madras for sale.

No. 12 Kumari which calved in October last had produced 2,701½ lb. of milk in 164 days, the daily average being 16·4 lb.

No. 14 Ramani which calved on 7th November has produced 1,896½ lb. of milk in 145 days, the daily average being 13·1 lb.

On the whole the milk yields of the she-buffaloes have been very disappointing. I expected several buffaloes to give over 3,000 lb. of milk judging by their last lactation. These low yields must be due to several things such as:—

- (1) Animal getting acclimatised to Guntūr district.
- (2) Want of good green fodder daily.
- (3) Scarcity of water for drinking purposes and wallowing in.
- (4) Inexperienced milkmen.

I think that if more attention had been displayed by the Manager, better results could have been obtained, as all these animals have very good records.

Managers do not study the history sheets of the animals sufficiently and this is very important.

The water-supply on this farm should be improved. In the hot weather water has to be carted to the farm for drinking purposes from nearly a mile distant.

• I give below the milk yields of the she-buffaloes up to 31st March 1925. The daily average per she-buffalo in milk being 10·28 lb.

No.	Name.	Date of calving.	Yield up to 31 Mar. 1925.	No. of days in milk.	Average daily yield.	Remarks.
17	Vanajakshi.	25 Sep. 1924	LB. 1,411½	188	LB. 7·5	Calf died 24 Oct. 1924.
15	Gourjahan.	2 Oct. 1924	1,981½	181	10·9	
2	Mani	8 Oct. 1924	2,038½	175	11·7	

No.	Name.	Date of calving.	Yield up to 31 Mar. 1925.	No. of days in milk.	Average daily yield.	Remarks.
13	Lakshmi ...	17 Oct. 1924	LB. 178	23	LB. 7.4	Calf died 28 Oct. 1924. Dried on 9 Nov. 1924.
12	Komari ...	18 Oct. 1924	2,701½	164	16.4	
3	Nurjahan ...	22 Oct. 1924	65	18	3.4	Calf still born. Dried on 9 Nov. 1924.
14	Ramani ...	7 Nov. 1924	1,866½	145	13.1	
19	Dhanakoti.	13 Nov. 1924	1,320½	130	9.5	
6	Pushpavathi	25 Nov. 1924	1,578½	127	12.4	
16	Bamtha ...	25 Nov. 1924	1,130½	127	8.9	
1	Nizambi ..	26 Nov. 1924	851	105	8.0	Dried on 11 Mar. 1925.
4	Kanakam ...	4 Dec. 1924	1,609½	118	13.6	

Fish meal experiments.—A small quantity of fish meal daily has been fed to two yearling calves during the year, viz., bull calf No. 4 and heifer calf No. 21. Both animals have grown well and are much bigger than other animals of the same age not fed on fish meal.

Heifer No. 21 took the bull when she had just completed two years.

The bull has grown into a very big animal with strong and well-built limbs and has every sign of becoming one of our best bulls.

The amount of cattle food consumed on the farm during the year is as follows:—

Month.	Rice bran.	Ground nut cake.	Cotton seed.	Ragi flour.	Fish meal.	Fajja flour.	Green grass.	Dry fodder.
1924.	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
April ...	788	655	418	150	4-13	...	...	5,100
May ...	744	585	317	107	3-14	...	...	5,267
June ...	705	570	330	15	1-14	...	...	4,860
July ...	833	636	375	5	2-10	...	...	4,580
August ...	1,220	1,009	531	...	5-13	...	800	4,188
September ...	1,092	513½	398	...	5-10	48	880	1,610
October ...	1,117	496½	429	...	1-15	90	5,025	140

Month.	Rice bran.	Groundnut cake.	Cotton seed.	Ragi flour.	Fish meal.	Sajja flour.	Green grass.	Dry fodder.
<i>1924—cont.</i>	LB.	LB.	LB.	LB.	LB.	LB.	LB.	LB.
November ...	1,088	500	376	...	1-14	101	5,717	2
December ...	1,209	802½	583½	...	...	...	...	4,352
<i>1925.</i>								
January ...	1,220	817	589	...	...	...	1,050	9,250
February ...	1,120	751½	521½	...	...	...	...	6,020
March ...	1,298	1,019½	696	...	3-14	...	...	8,292
Total ...	12,434	8,355½	5,564	277	32-5	239	13,472	53,879

Buildings.—During the year one temporary palmyrah thatched shed for buffaloes, one temporary store shed for cattle food and one calf shed were erected.

The permanent Assistant Farm Manager's quarters on the Guntūr Agricultural Station were handed over to this section in February last for use of the Farm Manager in charge of the Buffalo Breeding Station.

Visitors.—A great number of ryots and other people visited the farm and inspected the buffaloes during the year.

Staff.—Assistant Farm Manager, M.R.Ry. T. Seshachalam Nayudu, was in charge of the Buffalo Breeding Station up to the 23rd March 1925 when he was relieved by Farm Manager M.R.Ry. A. Gopala-krishnayya.

Receipt.—

By sale of milk	...	...	...	...	RS.	A.	P.
By sale of ghee	...	...	...	...	131	12	6
By sale of curds	...	...	...	...	176	1	1
By sale of buttermilk	...	...	...	...	32	8	0
By service fees	...	...	...	...	0	6	4
					46	8	0

387 3 11

Now a start has been made to manufacture ghee and supply customers in Madras, it is hoped that when all the young stock grow up and come into milk we can send a regular consignment into Madras; this will take at least another two years.

HOSUR CATTLE FARM P.O.
18th May 1925.

R. W. LITTLEWOOD,
Deputy Director of Agriculture, Live-stock.

Statement of rainfall, Buffalo Breeding Station, 1924-25.

Month.	Fort-night.	1922-23.	1923-24.	1924-25.	No. of rainy days.	Average for the last three years.
April ...	1st ...	Not recorded.	1.45	0.07	1	
	2nd ...		0.00	0.00		
May ...	1st ...	Do.	0.32	2.70	3.35	1
	2nd ...		0.93	2.61	5	
June ...	1st ...	Do.	0.49	0.86	3	
	2nd ...		0.36	0.30		
July ...	1st ...	Do.	4.82	8.62	8.83	4
	2nd ...		0.95	2.01	6	
August ...	1st ...	0.41	0.54	1.37	5	
	2nd ...		4.55	0.29			4.78
September ...	1st ...	7.06	10.12	17.43	15.00	10
	2nd ...		0.53	8.43	3.61	9
October ...	1st ...	1.33	0.00	2.49	6	
	2nd ...		1.67	5.26			0.37
November ...	1st ...	8.96	2.69	8.42	7.61	2
	2nd ...		0.75	0.47	1.74	7
December ...	1st ...	0.00	0.00	0.00	...	
	2nd ...		0.00	0.00			0.00
January ...	1st ...	0.00	0.08	0.00	...	
	2nd ...		0.00	0.00			0.00
February ...	1st ...	1.15	0.00	0.08	0.00	0.41
	2nd ...		1.08	0.00	0.00	...
March ...	1st ...	0.00	0.07	0.00	...	
	2nd ...		0.00	0.00			0.00
Total ...		17.17	35.25	32.73	74	...

**REPORT ON THE WORK OF THE POMOLOGICAL
STATION AT COONOR, AND THE BURLIAR
AND KALLAR FRUIT GARDENS FOR THE YEAR
1924-25.**

POMOLOGICAL STATION, COONOR.

1. *Season and rainfall.*—The rainfall for the year was 69·25" against 61·06" the previous year, and it was well distributed. The heavy rainfall of July was caused by the storm which wrought such havoc in many parts of the Presidency. On the 10th July no less than 4·29" were registered, this being the heaviest rain in the year. Frosts occurred on the 19th November, the 4th to 28th December and on the 17th and 19th January, but little damage was done to plant life.

*Statement showing rainfall in the Pomological Station, Coonor,
for 1923-24 and 1924-25.*

Months.	1923-24.		1924-25.		Remarks.
	Number of rainy days.	Rainfall.	Number of rainy days.	Rainfall.	
1924					
April	5	0·74	9	2·55	
May	6	2·30	11	4·38	
June	12	1·11	14	5·62	
July	23	3·49	21	15·21	
August	16	3·53	19	4·97	
September	12	2·86	19	3·82	
October	21	15·10	16	8·72	
November	8	10·75	15	7·92	
December	13	5·29	10	8·10	
1925					
January	10	8·42	2	0·51	
February ... ..	...	...	3	3·15	
March	6	7·47	9	4·20	
Total ...	132	61·06	148	69·25	

2. *Fruit growing*.—No fruit trees were imported from Australia during the year, but 120 Apples were purchased from a fruit grower in Yercaud. The consignment consists of the following varieties which are recommended as the most suitable for South India :—

Apple Braddock's Nonpariel.	Apple Rome Beauty.
„ Delicious.	„ Sandringham.
„ Jonathan.	„ James Grieve.
„ Bramley's Seedling.	„ Paragon Winesap.

The above have been planted in the nursery attached to the station where they are to remain until their permanent quarters are ready for them.

3. *Peaches*.—“Watt's Early Champion” planted in field No. 2 last year (vide paragraph 4 of last year's report) have not grown well and 13 of the worst plants have been replaced by stronger ones of the same variety. I fear the site is not suitable for peaches, as none of the varieties have produced good crops. In field No. 3 the 6 plants of the variety “Elberta” which were not thriving have been replaced by the variety “Flat China,” which promises better than the others.

4. *Apples*.—The plantation of apple trees (field No. 5) has improved and the failures are gradually being made good. There now remains only nine empty pits, in addition to which a number of failures are expected to occur in the newly grafted plants.

The apples in field No. 1 which were imported from Australia in 1920 are not growing satisfactorily and many have died of root disease. The variety “King Edward VII” produced some fine fruits, the largest of which weighed 15½ ozs.

The small plantation of imported apple trees planted in 1916 continue to bear good crops, the varieties “Rome Beauty” and “Irish Peach” being the heaviest bearers.

5. *Pears*.—The plantation of pears in field No. 4 is improving, the varieties making most growth being “Keiffer's Hybrid” and “Beurre de Capiamont.” It will be several years, however, before the trees reach the fruiting state.

6. *Plums*.—These continue to thrive, and the varieties “Yellow,” “Wright's Late,” “Hale,” “Shiro,” “Rubio,” “October Purple” and “Kelsey” produced good crops, but a large portion of the fruits were spoilt by “Fruit-fly,” a pest which made its appearance on the plums for the first time. The strawberry guavas (*Psidium cattleianum*) planted in the interstices of the plum trees were also attacked badly. The Government Entomologist is investigating, and has already suggested certain preventive measures, such as removing affected fruits and burning them at the outset of the attack, and keeping the surrounding clean and the soil constantly stirred to destroy larvæ.

The variety “Yellow” produced the heaviest crop and 12 trees yielded 475 lb. of fruits or 39 lb. per tree; “Hale” produced 425 lb. for 12 trees or 35 lb. per tree. Both these varieties are producing heavy crops again this year.

7. *Quinces*.—The quinces in fields Nos. 2, 4 and 5 continue to thrive and produced good crops. This delicious but little known fruit has yet to become more widely known before there is likely to be much demand for it.

8. *Persimmons* (*Diospyrus Kaki*).—This fruit is a native of Japan where it is known as the Kaki and by Europeans as the Japanese date plum. The few trees in the station that have reached the bearing stage produced good crops, and the fruits were readily purchased by travelled people with a knowledge of it. The local population have yet to be educated to appreciate this delicious fruit, which, by the way, must be dead ripe before eaten, otherwise it is astringent and unpalatable.

The young plantation in field No. 2 is thriving and the trees have recently flowered profusely. There is no doubt that the climatic conditions of Coonoor are suitable for this fruit tree, and the only drawback I see to its becoming widely distributed on the Nilgiris is the difficulty about propagation, "stocks" not being available locally for grafting purposes; plants, therefore, have at present to be imported from Australia at considerable cost.

9. *Oranges*.—The small plots of the varieties "Washington Navel" and "Jaffa" bore well and there is a demand for young grafts. During the year about 150 plants were grafted by the method known as "grafting by approach," which is the only mode of grafting that has been at all successful. The "stock" used is the Pomelo seedling which after some years of experiment has been proved to be the best for this purpose.

10. *Figs*.—These are not bearing fruits so well as anticipated and some difficulty was experienced in preventing birds from eating them. The varieties grown are "White Marseilles" and "Brown Turkey." There is a steady demand for plants and these are easily propagated by cuttings.

11. *Strawberries*.—The plots of these which cover an area of 610 square yards produced 545 lb. of fruits, of which 237 lb. were first-grade ones. The yield would have been much greater had not a plague of cockchafer grubs attacked the plants. The growing of strawberries has become quite common on the Nilgiris, due to the demand for these fruits by the Jam Factory. The other berries grown are "Bangalore Raspberries" and "American Blackberries," and 38 lb. of the former and 3 lb. of the latter were harvested. Owing to the difficulty in protecting these fruits from birds, I fear a large portion of the crop was lost.

12. *Miscellaneous fruits*.—The tree tomatoes (*Cyphomandra betacea*), strawberry guavas (*Psidium cattleyanum*), passion fruit (*Passiflora edulis*) all produced good crops. The tomatoes which are grown in the interstices of the fruit trees also fruited well, but the Cape gooseberries (*Physalis peruviana*) have ceased to thrive. Apparently the latter require a very rich soil as they only grew well for the first few years after the establishment of the station and before the surface soil was washed away by heavy rains. The *Keijoa sellowiana* plants flowered well, but set few fruits.

13. The following statement gives particulars of the crop harvested during the year under report:—

Kind and variety.	Quantity
	harvested.
	LB.
Tomatoes	2,011
Passion fruits	1,702
Plums	1,581
Strawberry guavas	1,473
Oranges	783
Strawberries	545
Tree tomatoes	271
Quinces	123
Cape gooseberries	142
Apples	112
Yellow guavas	91
Kumquar	59
Raspberries	38
Persimmons	33
Figs	28
Peaches	17
Total	8,999

14. *Nurseries*.—The demand for young fruit trees and plants was poor, and only 416 grafted plants and 801 seedlings were distributed against 847 and 964 the previous year. There remains on hand 1,165 grafted fruit trees from the previous year's stock. During the year 1,010 plums, 158 oranges, 310 peaches, 55 apples, 20 almonds and 8 China pears were grafted and budded; many of which have already "taken."

15. *Green-manure crops*.—Three hundred and fifty plants of *Crotalaria sp.* were planted between the fruit trees in fields Nos. 4 and 5 where the soil is poor and very steep. These are growing satisfactorily and many plants are already providing green dressings for the fruit trees. *Indigofera endecaphylla* seedlings were planted around the revetments of 466 fruit trees, but they have not made much growth. Weeds of all species were allowed to grow throughout the station to prevent soil erosion, but after the danger of heavy rains had ceased the whole orchard was clean weeded with the exception of plants belonging to the natural order *Leguminosae*.

16. *Manures*.—The following fruit trees were manured during the year. Apples Nos. 1 to 90 were each given half a bushel of cattle manure and half a bushel of leaf mould. Plums Nos. 348 to 350, 356 to 468, 470 to 473, 481 to 492, 530 to 553, 602 to 637, 1165 to 1179, 1194 to 1197, 1201 to 1211, 1215 to 1216, 1220, 1221, 1227, 2243, 1306, 1309, 1311 to 1316, 1323, 1334 to 1340, 1375 to 1386 and 1390 to 1396, or in all 163 trees, were each given a bushel of cattle manure when in bloom; and after fruits had set, plums Nos. 383 to 394, 406 to 456, 602, 637, 1167 to 1175, 1201, 1220, 1221, 1227, 1243 and 1334 to 1340, or in all 86 trees, were each given 2 lb. sulphate of potash and a bushel of cattle manure.

In order to understand the above figures it must be explained that every permanent fruit tree in the orchard is numbered serially so that a record can be kept of the treatment given to every tree, and the purpose of the somewhat detailed statement given above is to have on record the exact amount of manure applied to each. It will be noticed that the manuring was not continuous throughout any given plot; the reason for this is, that there are only 12 plants of any one variety in the orchard, and many have not produced fruits this year, and only those bearing good crops were manured.

17. *Financial.*—The receipts by sale of fruit trees and plants were Rs. 577-11-8 against Rs. 1,142-10-2 the previous year; this decrease is due to the demand for plants being less, brought about most probably by the rumoured closing of the Jam Factory. The receipts by the sale of fruit, on the other hand, showed an increase, and a sum of Rs. 1,396-0-3 was realized against Rs. 1,050-7-10 last year. The expenditure on the upkeep of the station was Rs. 1,744-13-8 against Rs. 2,720-14-9 the previous year. This reduction was brought about mainly through exercising strict economy and carrying out only those works absolutely necessary. The gain on the year's working was therefore Rs. 228-14-3 against a loss of Rs. 527-12-9 the previous year.

BURLIAR EXPERIMENTAL FRUIT GARDEN.

18. *Season and rainfall.*—The rainfall for the year was 65·05 inches against 57·33 inches last year. The heaviest rain occurred on the 21st October when 5·45 inches were recorded. Rain fell in every month, and January was the driest only 19 cents being recorded.

Statement showing rainfall in the Burliar Garden for 1923-24 and 1924-25.

Months.	1923-24.		1924-25.	
	Number of rainy days.	Rainfall.	Number of rainy days.	Rainfall.
1924				
April	4	0·62	6	2·54
May	2	0·60	12	5·20
June	7	1·32	11	3·85
July	14	2·81	17	9·41
August	15	3·89	15	1·77
September	9	1·37	14	3·80
October	16	21·41	14	14·23
November	7	8·21	14	10·48
December	10	3·08	7	5·56
1925				
January	10	6·21	1	0·19
February	2	0·30	4	1·92
March	5	7·51	10	6·10
Total	101	57·33	125	65·05

19. *Fruit growing*.—The outstanding feature of the year was the record crop of mangosteens, and Rs. 1,422-10-6 was realized by the sale of these fruits which were sold at As. 8 per lb. The heavy crop was brought about by the failure of the previous year's crop and by application of bonemeal and cattle manure. Many of the older fruit trees in the garden are showing signs of requiring manure, and 14 orange trees were each given 5 lb. bonemeal; 22 mangosteens 2 lb. each of nitrate of soda; 7 clove trees 3 lb. each of bonemeal and the plantains were also given light dressings of bonemeal and nitrate of soda. All the fruit trees in the garden were pruned and the cuts tarred over to prevent decay. Leaves, weeds and other organic matter were placed around the trees to form a mulch. By these means it is hoped to improve the bearing capacity of the trees. Four hundred and sixteen plantain shoots, 300 tapioca cuttings, a plant each of *Rauvenala madagascariensis* and *Dipladenia*, sp. were planted during the year. The small staff were otherwise employed in gathering and packing fruits, repairing roads and revetments, irrigating, etc.

20. The mangosteen (*Garcinia mangostana*, L).—The young mangosteens mentioned under paragraph 25 of last year's report have not made much growth, with two exceptions, and one or two failures had to be replaced. Advantage was taken of the heavy crop of mangosteens to reserve a portion for seeds, and 1,300 seedlings were raised in specially prepared seed beds. Many of the seedlings have already put forth secondary leaves, but others show signs of wilting, a disease common to the mangosteen seedling in this stage.

21. The durian (*Durio zibethinus*, Murr).—The mature trees in the garden produced good crops, but there was some difficulty in disposing of the fruits before decay set in and many were spoilt in consequence. The seeds, however, were used for raising young plants and we have a number of seedlings both at Burliar and Kallar. The plants put out in 1923 are thriving with one or two exceptions, and the tallest is now over three feet in height.

22. The avocado pear (*Persea gratissima*, Gaertn.)—The two original trees which had not produced fruits for some years gave a few fruits from which some seedlings were raised. The trees have responded to pruning and manuring and are at the time of writing setting another crop. The five trees planted in 1923 are making satisfactory growth, and the two surviving seedling trees planted in 1919 and also the imported trees presented by the Rev. Bullard the same year, have reached the flowering stage, and should produce fruits next year.

23. *Feijoa sellowiana*, Berg.—The 18 plants of this new and interesting fruit tree planted in 1919 have grown well and have recently borne some blossoms. Those planted at the same time in the Pomological Station bore flowers for a year before fruiting, and the Burliar plants may therefore be expected to come into bearing in a year or two.

24. *Financial*.—The past year was a successful one, if receipts by the sale of produce may be taken as a criterion. The receipts by the

sale of fruits and spices amounted to Rs. 2,119-15-1 and for plants Rs. 205-6-0, against Rs. 593-13-9 and Rs. 115-9-4, respectively, last year. The expenditure was Rs. 1,275-9-7, against Rs. 2,034-11-10 the previous year, showing a profit of Rs. 1,049-11-6 on the year's working, vide statement attached to this report.

KALLAR EXPERIMENTAL FRUIT GARDEN.

25. *Season and rainfall.*—The rainfall in this garden was 61·21" against 50·57" the previous year. The heaviest rainfall occurred on the 21st October when 5·65" were recorded. This normal rain did considerable damage to the garden. Rain fell in every month throughout the year and there was no serious drought.

Statement showing rainfall in the Kallar Garden for 1923-24 and 1924-25.

Months.	1923-24.		1924-25.	
	Number of rainy days.	Rainfall.	Number of rainy days.	Rainfall.
1924				
April	5	0·84	7	2·97
May	3	0·51	10	4·71
June	7	1·20	11	3·59
July	13	1·94	16	7·64
August	12	2·98	6	0·58
September	9	0·87	14	2·59
October	15	20·62	13	13·77
November... ..	8	6·94	14	10·93
December	8	1·94	7	6·56
1925				
January	8	4·35	2	0·11
February ... ..	...	...	4	1·26
March	5	3·38	8	6·50
Total	93	50·57	112	61·21

26. *Fruit growing.*—Attention was paid to the manuring of fruit trees, as the crops at present are very poor. Two lb. of sulphate of potash were applied to each of the 183 orange and pomelo trees, and a dressing of 3 lb. of slaked lime was also applied to each tree at another time of the year. Recently 10 lb. of fish guano each were given to 23 of the orange trees, but it is yet too early to state whether they have benefited by this latter manure. The orange crop was a good one and Rs. 600 was realized by the sale of these fruits. The pines were given a dressing of nitrate of soda at the rate of 2 ozs. per plant on two occasions and recently a dressing of fish guano was applied to a small plot. Quantities of green manure in the form of tephrosia clippings were also applied to the pineapple plantation and the result is an improvement in the size of the fruits. Every indication points to the Kallar soils requiring abundance of organic matter and this is now being applied in the form of green manure, and *Tephrosia candida* is being grown extensively for this purpose. The

grafting of plants, and their propagation generally, received attention, and the nursery is well stocked with fruit plants, such as loose jacket orange seedlings, mango grafts, pomelo seedlings, *Annona palustris*, mangosteens, etc., and recently a hundred each of sapodilla and *Mimusops hexandra* plants were purchased for use in grafting an improved variety of sapodilla. The crop of fruits was better than the previous year, as the receipts show, but the sales of fruit plants remain poor. Much time was spent in renewing the bamboo fence to keep out wild animals, and monkeys continue to do a lot of damage to the fruits and tender plants.

The cultivation of Ipecacuanha was continued, details of which are given under medicinal plants in the Administration Report for Government Botanic Gardens and Parks:

27. The Government Mycologist visited the garden on several occasions and sprayed the mango trees for mildew and examined and treated other fruit trees for fungoid diseases. The Overseer of the gardens derived some benefit by the instruction given, and I think it would be a good thing if the Mycologist or his assistants were to make more frequent visits to these branch gardens.

28. The mangosteen (*Garcinia mangostana*, L.).—Of the 30 mangosteens planted last year (vide paragraph 35 of the report for 1923-24) the majority are growing, but slowly. The failures have been filled with newly raised seedlings and these do not appear to have suffered in transplanting. Forty-six new pits were made adjoining the abovementioned plot, and two mangosteen seedlings were planted in each, and although these were very small, in fact were in the cotyledon stage, they stood the shock of transplanting well and are beginning to send out secondary leaves.

Large quantities of mangosteen seeds were brought from Burliar and sown in the nursery, and the stock raised numbers approximately 1,000 seedlings, the majority of which are looking healthy. The only mature tree in the garden produced a fair crop of fruits, the size and flavour of which compared favourably with those grown at Burliar.

29. The pineapple (*Ananas sativus*, Schult.).—The plantation mentioned under paragraph 3 of last year's report received liberal treatment as regards manures and at the time of writing is bearing fruits. The soil, which is composed mainly of broken rocks and sand, is not very suitable for pines as it dries out too rapidly; shade also appears to be required for the variety grown (Yellow Queen); and to provide this, Tephrosia has been planted at intervals. Large quantities of Tephrosia clippings have been placed over the soil as a mulch and this has helped to keep it cool and moist and at the same time added the much needed organic matter to the soil.

30. The Surinam cherry (*Eugenia uniflora*, L.).—The plants mentioned under paragraph 27 of last year's report have made satisfactory growth, and the original plants have fruited well. A number of seedlings have also been raised and are kept ready for distribution.

31. The custard apple (*Anona squamosa*, L.).—Forty-eight seedlings were planted out during the year, and these and those planted last year are making satisfactory growth. Twelve plants were also received from Bangalore and they were planted and are growing fairly well.

32. The sapodilla (*Achras sapota*, L.).—A difficulty is being experienced in raising seedlings for grafting purposes, and although 400 seeds were saved from last year's crop, only a dozen germinated. A hundred plants each of sapodilla and *Mimusops hexandra* were obtained from Calcutta, and the larger plants have been used as "stocks" for grafting.

33. The mango (*Mangifera Indica*, L.).—The mangoes fruited well, but the majority of the fruits were attacked by "Fruit-fly" and rendered useless. Fruits attacked by this pest are buried deep in the ground to destroy the larvæ, which seems to be the only way to keep down this pest.

The varieties of mangoes grown in the garden are Amini, Mulgoba, Badamee, Koothathath, Neelam, Sundershaw and Raspuri, and graft of these were taken and are in stock.

34. The plantain (*Musa sapientum*, L.).—The only variety grown to any extent at present is that known as "Doravalai" and this is perhaps the best suited to local conditions and is of good flavour. In order to test whether there are other varieties that will thrive equally well, 26 varieties, one plant of each, were obtained from Bangalore and all have taken root excepting one plant.

35. *Financial*.—The receipts by the sale of fruits and plants were Rs. 1,007-4-3 against Rs. 610-1-6 last year. The expenditure was Rs. 2,258-3-0 against Rs. 2,991-0-4 the previous year. The loss on the year's working was therefore Rs. 1,250-14-9 against Rs. 2,380-14-10 last year, vide statement attached to this report.

OCTACAMUND,
Dated 2nd May 1925.

F. H. BUTCHER,
Curator,
Government Botanic Gardens and Parks,
The Nilgiris.

No. 1.—Comparative statement showing receipts and charges of the Pomological Station, Coonoor, and Burliar and Kallar Gardens for 1923-24 and 1924-25.

Particulars.	Pomological Station.		Burliar.		Kallar.	
	1923-24.	1924-25.	1923-24.	1924-25.	1923-24.	1924-25.
<i>Receipts.</i>	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
1. Sale of fruit plants.	1,142 10 2	577 11 8	115 9 4	205 6 0	287 15 0	198 2 0
2. Sale of fruits.	1,050 7 10	1,396 0 3	593 13 9	1,998 5 1	322 2 6	809 2 3
3. Miscellaneous.	...	...	...	123 10 0*	...	...
Total ...	2,493 2 0	1,973 11 11	709 7 1	2,325 5 1	610 1 6	1,007 4 3

* Sale of spices.

Charges.	1923-24.	1924-25.	Remarks.
1. Pomological Station.	RS. A. P. 2,720 14 9	RS. A. P. 1,744 13 8	
2. Burliar ...	2,034 11 10	1,275 9 7	
3. Kallar ...	2,991 0 4	2,258 3 0	
Total ...	7,746 10 11	5,278 10 3	

OFFICE OF THE CURATOR,
GOVERNMENT BOTANIC GARDENS
AND PARKS, OOTACAMUND,
Dated, 2nd May 1925.

F. H. BUTCHER,
Curator.

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