

Report of the work of
Simultaneous registration
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Department of Agriculture, Madras.

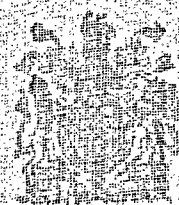
REPORT

THE COIMBATORE AGRICULTURAL STATION

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and the Central Milk Commission.

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TABLE II.

Mechanical analyses.

Constituents.	No. 20.	No. 10.	No. 13.
Fine gravel	6.8	13.8	9.5
Coarse sand	17.4	41.1	25.0
Fine sand	19.1	15.1	15.1
Silt	9.5	2.1	6.4
Fine silt	21.1	9.8	18.1
Clay	25.7	12.4	12.0
Moisture, etc.	3.9	1.2	2.8

The extreme difference between the garden soil and the dry red soil is noticeable—the soils are not far from each other and are exactly the same in type, but one is highly farmed under irrigation (see paragraph 5), while the other is single crop land unprotected from drought in any way. The black soil is extremely poor in available potash and phosphoric acid. From the physical point of view, this soil is somewhat different from the black soil of the Ceded Districts, and contains more sand: it certainly behaves differently from the Hagari soil in cultivation. The red soils are noticeable for the large amount of clay and coarse sand they contain, intermediate particles being absent. This makes them difficult to cultivate when wet, for any puddling results in the formation of what is practically a brick—the soils, as a matter of fact, do bake very hard in the hot weather and are very sticky when wet.

3. *Climate*.—The season opens with the south-west monsoon, which sets in about the beginning of June. It causes a considerable drop in temperature, but brings little rain—the slight drizzle that is received is neutralised by the high wind,—and sowings cannot in general be done until the wind begins to slacken about the middle of August, when the main crops are sown. The north-east or retreating monsoon sets in about the beginning of October, and it is then that the greater portion of the annual rainfall, never very heavy, is received. January, February, March are dry months, but thunder storms may be expected in April and May which bring rains and facilitate tillage operations generally. The temperature even in the hot weather rarely rises above 100°, and during the early part of the south-west monsoon it is distinctly cold. There is, however, no real cold weather, the temperature rarely falling below 60°.

The meteorological records, which will be found summarised in Appendix I, are kept by an assistant of the Agricultural Chemist.

4. *Systems of cultivation*—There are three main systems of cultivation practised on the farm, and they are carried out on what are known in this Presidency as 'dry,' 'garden' and 'wet' lands. The first is the cultivation of cholam (*Sorghum*), cumbu (*Pennisetum*), Bengal gram (*Cicer ariselinum*) and cotton with the help of the rainfall only, and without any assistance from irrigation. As the rainfall is only about 20 inches, such cultivation is somewhat precarious, though in a good season, very fair crops are sometimes obtained. The sorghum

crop may produce upwards of 700 lb. of grain and 3,000 lb. dry fodder, but the average is of course less than this. The assessment on such lands, of which both the red and black soils are represented on the farm, is about Rs. 2 per acre.

5. The 'Garden' lands are those that are irrigable by wells. This involves a complete change in the system of cultivation employed. Two or even three crops in the year are raised with the help of heavy dressings of manure, and the total value of crops raised off an acre in a single year is anything from Rs. 100 to Rs. 250. The Coimbatore garden land farmer is an extremely good specimen of his kind. He generally lives on his land, and has a small steading near his well, where he stores his fodder and carefully looks after the cattle on which he depends for lifting the all-important water for his crops. This is generally done by means of a mhote or leather bucket with a tail holding about 50 gallons. The bullocks lift this by walking down a long steep ramp, backing slowly up when the bucket is discharged: the wells are often 40 feet deep. The crops grown are ragi (*Eleusine coracana*), wheat (*Triticum sativum*), sorghum, cumbu (*Pennisetum typhoidum*), tenai (*Setaria italica*), Cambodia cotton, castor and "uppan" cotton, the last as a dry crop to rest the land. The assessment is the same as on the dry lands; permanent improvements not being assessed.

6. 'Wet' lands are those which are commanded by some source of irrigation, from which a copious flow of water for a comparatively short season is available, and are devoted to growing 'wet' paddy under swamp conditions. The source for the farm wetlands is a tank fed by a channel taken off from a perennial hill stream, the Noyil, which takes its rise in the Bolampatti valley of the Velliyangiri hills. Water is available from July onwards, and cultivation commences with the flooding of the fields in that month. The lands are then ploughed in puddle, and seedlings which have been raised in a nursery sown some thirty-five days previously, are transplanted in the resulting mud. The fields are generally manured with large quantities of green leaves brought from the jungles near, or collected from waste lands, which are trampled by coolies into the soft mud and quickly decompose. The fields are kept continuously flooded, the water being changed about once in ten days, until about a fortnight before harvest, which takes place according to the variety, in December or January. Where wet cultivation can be supplemented by wells, exceedingly profitable gardens of betel vine, sugarcane and coconut palms can be raised. The last two are represented on the farm, and there are upwards of 350 coconuts scattered about on bunds and along water channels, though there are none in the form of plantations, which are mainly confined to the alluvial tracts along the banks of the Noyil itself. Though wet cultivation, especially in the delta districts under a safe system of irrigation, is considered the most lucrative form of cultivation, the somewhat uncertain supply here tends to diminish the profits, especially when compared to the garden cultivation above referred to, yet there is no doubt that in good years very large profits are secured. The assessment which includes the use of Government water varies from Rs. 4 to Rs. 8.

PART I.

7. The season has again been unusual, though on the whole not a bad one. At the start, the dry weather continued with the result that the grazing was quickly finished, and this coupled with the short straw crop of the previous year caused a rather serious shortage of fodder. Sowings were first attempted with the rains in June, but though germination occurred, the subsequent drought was too much for them, and they had to be resown in September, when the first good sowing rains were received. After this the season was fair, and though the crops were thin, they grew fairly well though somewhat disappointing at harvest. Paddy was exceptionally good, though a considerable loss was caused by an unusual late rainfall in the middle of January, which delayed harvest and spoiled the quality, as well as causing loss from shed grains. A further and still more unusual fall was received on the last day of February, a period when rain is least expected: it is too early for the hot weather thundershowers, and too late for the monsoon. This brought on a good flush of grazing, both natural grass and shoots from the harvested stubbles: grazing is still available in some of the cholum stubbles, which produced a strong second (raibon) crop. The table below shows the rainfall:—

TABLE III.
Statement of rainfall.

Months.	1911.	1912.	1913.	1914.	Average.
January ... { 1-15 0.00 16-31 3.00	0.17	0.00	0.00	0.00	
February ... { 1-15 0.07 16-28 0.00					
March ... { 1-15 0.08 16-31 0.02	5.82	3.13	1.63	0.86	4.14
April ... { 1-15 0.76 16-30 1.73					
May ... { 1-15 0.18 16-31 3.15	12.65	8.27	3.53	4.81	8.23
June ... { 1-15 2.95 16-30 2.50					
July ... { 1-15 0.82 16-31 3.06	10.93	20.28	10.16	10.06	12.82
August ... { 1-15 0.00 16-31 0.02					
September ... { 1-15 0.52 16-30 2.78	10.93	20.28	10.16	10.06	12.82
October ... { 1-15 1.32 16-31 4.01					
November ... { 1-15 0.80 16-30 2.57	10.93	20.28	10.16	10.06	12.82
December ... { 1-15 2.18 16-31 0.05					
Total ...	29.77	31.68	15.73	15.73	23.85

8. Estate improvements.—The most important has been the improvement effected in the pipe supply of water to the houses. This has necessitated the erection of an oil engine, which is available also

for irrigation. Another well has also been fitted with a small installation, the 3½ H. P. engine and 2½" Gwynne centrifugal pump mentioned in last year's report. This works satisfactorily, and on a lift of 18 feet, delivers 125 gallons per minute.

Tree planting continues, and the estate is beginning to acquire a more shady appearance: it is noticeable that the number and variety of wild birds is on the increase.

9. Implements.—The threshing machine purchased from Messrs. Barclay Ross and Tough was installed during the year. It is a high speed type, with a 2'6" drum and coss, landed, Rs. 1,270. The machine does good work with certain grains, tenai (*Sataria italica*) perhaps the best. Paddy it will not take satisfactorily, the proportion of husked grains is rather high; for this crop a peg drum is probably better. There has also been a good deal of trouble with broken grains, but this has been found to depend largely on the amount of moisture in the grain, and artificial moistening, where the grains were already too dry has been found partially successful. Further experience with the machine will no doubt improve the work.

The winnowing machine has also proved successful: a short note on it was contributed to the Pusa Agricultural Journal (Volume X, page 86). The farm now possesses a fair equipment of implements of tillage, with which the staff are gradually becoming more familiar, though they still show a lack of initiative in deciding on the particular implement needed at a particular juncture. Each year the land is becoming more amenable to treatment, and the fairly deep ploughing (7-8 inches) which is given to most of the dry red fields after harvest, requires less labour than heretofore. The late rains this year of course facilitated matters, and it is satisfactory to report that the demand for the loan of these ploughs which last year was just apparent has this year shown a large increase. The ploughs most in demand are those of the Ransome's Steel Eagle or S.A.E. plough, and over Rs. 150 have been taken for the hire of this plough at Rs. 5 an acre. One or two monsoon ploughs have also been sold. The figures sound paltry, but they mark a beginning which is satisfactory, in that no attempt has yet been made to send out into the villages to demonstrate the use of these ploughs.

10. Machinery.—About Rs. 400 has been spent in putting the well engine into good order, and most of the worn parts have been replaced. Trouble still occurs from lack of compression, and consequent loss of power: this is now being attended to. The Farm Workshop engine did a deal of miscellaneous work during the year. Over 400 tons of fodder was chaffed: 8 tons of kappas were ginned, 40 tons of cotton seed crushed, 60 tons of grain threshed out, besides the disintegrator and ice plant. The latter is at present run for convenience from this engine; it was got to work in September and worked up to November when the need for ice was not felt, and the machine was stopped. There has been a considerable loss of ammonia which is at present unexplained, and a slight breakage which occurred recently has delayed matters so seriously, that ice has not been available during the current hot weather, when it is of course most needed at the dairy.

PART II—CROPS.

11. *Paddy*.—The area was slightly decreased this year, owing partly to the expansion of the area under sugarcane and partly to the utilization of a certain portion for the selection experiments of the Government Economic Botanist. The average acre yield over the whole area was good, 2,713 lb., the highest for the last four years. It was most unfortunate that the harvesting was so hampered by the January rains, as this caused a considerable amount of shedding in the field, or loss on the threshing floor. Though the beginning of the season was dry, yet irrigation water was always plentiful, and later the rain was well distributed. The usual experiments were continued, viz., the planting experiment in block A, the manurial experiment in block C and the Patinunna substitute experiment in block H.

12. The planting experiment compares the yields obtained from crops planted in different ways, with each other and with standard plots planted as nearly as possible according to the usual methods of the locality. Owing to the unevenness of the land, which deteriorates in proportion to its distance from the tank, which is the source of supply both of water and silt, the methods are made to occupy a different plot each year, and it will only be when each of the plots has been subjected to all the methods of planting, that the results will be complete. Starting in 1910-11, five variations are on record, three more being necessary. The results of the present year's crop are given in the table below:—

TABLE IV.

Plot number.	Area in cents.	Treatment.	Yield per acre.	
			Grain.	Straw.
SPACING EXPERIMENT.				
Variety—Sadal samba.				
1. a and b	87	Locals	3,184	8,427
3. a and b	183	"	3,188	8,060
5. a and b	143	Singles 6"	3,155	6,242
7. a and b	100	" 9"	3,154	3,700
9. a, b and c	157	Doubles 9"	3,204	6,448
11. a, b and c	172	Trebles 9"	4,450	3,820
13. a, b and c	212	" 12"	4,725	5,560
15. a, b and c	192	Locals	3,344	4,875
17. a, b and c	224	Singles 6" x 2"	2,842	4,808
19. a, b and c	254	" 4"	2,938	4,079
Variety—Simma samba.				
2. a and b	94	Locals	2,678	5,645
4. a and b	155	Trebles 9"	2,290	6,452
6. a and b	97	" 12"	3,175	5,072
8. a and b	118	Locals	2,706	3,631
10. a and b	130	Singles 6"	2,677	4,881
12. a and b	113	" 5"	3,088	5,187
14. a and b	170	" 2"	2,812	4,588
16. a and b	200	Doubles 9"	2,565	4,510
18. a and b	181	Locals	2,442	4,221

The figures do not require much discussion. As in former years, plots Nos. 2 and 18, the two permanently unmanured plots, one nearest to the tank and the other the most remote, differ considerably. Of the plots themselves, the notes taken by the Assistant Farm Manager show that No. 7 a, b (9" singles) suffered somewhat from a depression which has reduced the yield: this method of planting has in former years taken a fairly high place. In the simma samba plots, Nos. 6 and 12 were both uneven. In all the plots the second, i.e., easterly bed is poorer than the western bed which is fed directly from the channel, and this difference was more marked in the case of the two plots mentioned above. Otherwise, all the plots suffered from minor inequalities which need no special notice as they will ultimately affect all the plots in turn.

The farm planting was as usual singles throughout. Naturally the care which is bestowed on the experimental planting in block A, where the seedlings are set out with strings, is not possible all through, and no doubt many doubles and trebles do get planted. The seed-rate for the whole area was 22 lb., but numbers of seedlings were left over and sold. The Assistant Farm Manager in charge reckons that 18 lb. represents about the quantity used: this quantity being rather larger or smaller in special cases. The local seed-rate is about 75 lb.

13. *Permanent manurial experiment*.—The experiment was repeated on the lines of previous years. The yields of grain are all below those of last year, but are more than made up for by the very heavy yields of straw. The only plot that is noticeably below the average, is the Bonemeal with Potash plot: this plot has in six years, only once exceeded the Bonemeal alone plot. It seems conclusive, when the yields of the other two plots are taken into account, Fish and Fish with Potash (Nos. 7 and 8) that Potash is absolutely unnecessary on these lands. The three manures, Castor-cake, Bonemeal and Fish seem extraordinarily alike both in their manurial effect and in the profits to be expected. Pondrette too, for the few years it has been tried, seems about the same as the others. The unmanured plots, which receive only the irrigation from the plots which are manured, show considerable irregularity, in one case bonemeal and potash, being higher than the manured plot! The full figures of the manured plots, and the current year's figures for the unmanured plots are given in the statement below.

TABLE V.

Paddy manurial experiments.

Plot number.	Treatment.	1908-09.		1909-10.		1910-11.		1911-12.		1912-13.		1913-14.		1914-15.		Average profits per acre.	1914-15. Unmanured except by well manured plots.
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.		
1. a and b.	Calotropis or Yerukkam 4,000.	LB. 2,809	LB. 4,955	LB. 3,537	LB. 3,523	LB. 3,756	LB. 4,268	LB. ...	LB. ...	LB. ...	LB. ...	LB. ...	LB. ...	LB. ...	LB. ...	AS. 150	LB. ...
2. a and b.	Wild indigo 4,000.	2,500	2,897	3,520	3,534	3,369	4,110	...	...	...	...	...	...	...	...	98	...
3. a, b and c.	White castor 400	2,503	2,554	3,312	3,377	3,386	5,239	2,383	3,155	2,350	4,458	3,659	4,439	3,016	10,428	118	2,128 11,946
4. a, b and c.	Black castor 500	2,435	2,814	3,115	3,418	3,619	1,647	2,647	3,784	3,410	7,310	3,303	4,703	2,956	12,368	127	2,747 13,800
5. a, b and c.	Baumeeal 500	2,584	4,025	2,740	2,761	3,406	5,078	2,487	3,718	3,661	7,883	3,187	3,786	2,961	8,828	117	2,435 7,680
6. a, b and c.	Baumeeal + * Potassium sulphate.	...	...	3,613	2,557	2,663	3,479	2,346	2,973	2,797	5,771	3,763	3,704	2,213	10,311	100	2,744 6,756
7. a, b and c.	Fish manure †	...	...	3,902	4,121	3,379	5,903	2,469	2,818	2,803	3,301	3,424	3,924	2,803	10,238	115	2,395 10,302
8. a, b and c.	Fish manure 5 cwt. + ‡ cwt. Potassium sulphate.	...	...	...	...	3,100	4,127	2,447	3,149	3,036	5,858	3,453	2,738	2,971	12,420	111	2,374 12,156
9. a, b and c.	Foudrette 2 tons + green leaf 4,000 lb. in 1912-13.	...	...	...	...	...	...	...	...	2,363	7,797	3,275	3,455	2,801	9,365	...	1,708 7,708

* Potassium sulphate 1 cwt. in 1909-10 and ‡ cwt. in other years.

† Fish manure 540 lb. in 1909-10 and 5 cwt. in other years.

14. *Pattimannu* substitute experiments.—As this is the last time these plots will be reported on, their history may be given more fully than is usual in an annual report. The attention of the department was in 1908-09 called to the shortage in the supply of *pattimannu* or village earth in the Kistna delta, an important rice growing area, where the substance was largely used as a manure for this crop. Matters had reached such a state, that sites in villages were bought for large sums, and were excavated to considerable depths, to the danger of the adjoining houses, and the ruination of any attempt at village sanitation. It seemed therefore a suitable opening for the Department to step in and supply artificial mixtures which would produce the same effect as the *pattimannu*, the conditions being generally favourable to district work of this kind. The people were rich, the crop was an assured one, and they were already accustomed to pay cash for definite quantities of what was obviously a mineral manure. On attempting to produce a substitute, it was found easy to mix a manure of similar composition to the *pattimannu*, but there was no guarantee that the various ingredients were all needed, or needed in the same proportion, and attention was thus called to the general lack of knowledge, in this Presidency at any rate, of the necessity of potash and phosphorus for the rice crop. The experiments now under report were accordingly laid down, with others in other parts, to ascertain the essential needs of the paddy crop in nitrogen, potash and phosphoric acid.

The land has proved to be extremely uneven and unreliable; plots, which one year have done well, have next year done very badly. The land is moreover not free from a suspicion of salinity, and though the water supply during the course of the experiment has never been seriously short, this has undoubtedly had an effect in the yields.

The crop is grown as is usual in Madras, in swamp conditions. Water is let on to the beds which vary from 5 to 10 cents in area, in late June: the beds are puddled usually three or four times and ultimately the crop is transplanted in August or as late as September. Harvest usually occurs about January, and until three weeks before harvest, the land is kept continually under a few inches of water. The results of the experiment, which has been in progress since 1909-10, i.e., six years, is given in the table below.

TABLE VI.
Paddymanure substitute plots.

Plot number.	Manures and quantities.	Supplying.	1908-10.			1910-11.			1911-12.			1912-13.			1913-14.			1914-15.		
			Grain.	Straw.	Grain.	Grain.	Grain.	Grain.	Grain.	Grain.	Grain.	Grain.	Grain.	Grain.	Grain.	Grain.	Grain.	Duplicates separately.	Grain.	Grain.
1b	Sunn-hemp	N ..	2,740	2,311	2,814	2,631	3,048	5,887	3,942	4,471	3,008	2,816	4,158	7,040	4,535	8,208	4,535	8,208	4,535	8,208
1c	Sunn-hemp + 1 cwt. Potassium sulphate.	N + K ..	2,702	2,271	3,224	3,226	2,739	4,503	3,682	4,186	3,432	3,183	3,449	5,800	3,782	6,773	3,782	6,773	3,782	6,773
2d	Sunn-hemp - 1 cwt. Potassium sulphate + 1 cwt. Super phosphate.	N + K + P ..	2,807	2,702	3,561	3,403	3,530	5,732	4,340	5,038	3,222	2,857	4,024	5,632	3,494	4,520	3,494	4,520	3,494	4,520
2e	Sunn-hemp + 2 cwt. Potassium sulphate.	N + K + P ..	3,180	2,229	3,609	4,000	3,267	5,555	4,450	5,198	3,573	3,288	4,000	7,032	3,856	6,070	3,856	6,070	3,856	6,070
2f	Sunn-hemp + 1 cwt. Potassium sulphate + 2 cwt. Super phosphate.	N + 2 K + P ..	3,603	2,603	3,352	4,370	3,624	6,590	4,440	5,234	3,730	4,045	3,913	7,009	4,077	6,561	4,077	6,561	4,077	6,561
3a	Sunn-hemp + 1 cwt. Super phosphate.	N + P ..	2,708	1,763	3,763	4,942	2,745	3,197	3,517	4,187	3,318	3,061	4,040	6,300	3,971	5,045	3,971	5,045	3,971	5,045
3b	1 cwt. Potassium sulphate	K ..	2,706	2,287	3,666	3,521	2,521	3,021	2,401	3,624	3,461	4,170	3,350	5,504	4,290	5,426	4,290	5,426	4,290	5,426
3c	1 cwt. Super phosphate	P ..	2,679	1,272	4,000	3,162	2,122	2,845	3,500	3,576	2,833	2,727	3,715	7,697	3,712	7,637	3,712	7,637	3,712	7,637
4a	No manure		2,675	2,700	3,322	3,134	2,420	3,792	3,802	4,923	3,115	3,435	3,972	5,490	2,324	6,140	2,324	6,140	2,324	6,140
4b															3,220	4,840	3,220	4,840	3,220	4,840

The plots it will be seen are all in duplicate with the exception of the two which receive only phosphoric acid and potash respectively, and in many cases the inequality in the land is shown in the differences between duplicates measured similarly. A few general conclusions may be drawn from the plots.

Firstly, the value of leaf manure for this crop seems clear. The original idea was to supply this by growing a crop of sunn-hemp (*Orotaria juncea*) and ploughing it in. This was suggested by the Kistna habit of taking this as a fodder crop after paddy, though the inference that it was used as a manure was an error. Unfortunately in Coimbatore conditions, the crop cannot be looked on as at all certain, and even if it can be grown, it introduces another and a very uncertain factor, in the dry ploughing and irrigating which is often necessary to procure a stand. Accordingly, a dressing of green leaf, generally *Calotropis*, cut from waste places outside the farm, or a quantity of daincha from some other area on the farm, has been used instead. There are only four plots which do not receive this, and they are the two unmanured plots, and the two receiving only phosphoric acid and potash respectively. As far as can be told, all these are to a certain extent favoured by their position, certainly the two unmanured plots lie next the irrigation channel, and get the benefit of any silt that may come down in the water. It is therefore a legitimate conclusion from these figures that organic material is almost a necessity for the paddy crop, on this land. This is corroborated by local practice, which attaches the greatest importance to the use of green leaf of all kinds, and by the result of other experiments (See Palur, Mangalalur, Samalkota reports).

When the value of the mineral constituents is considered, the evidence is not so clear. Either, used alone, seems to have little effect: they cannot make up for the absence of the green leaf. Combined with leaf, there is a slight advantage in favour of the phosphoric acid. The plots receiving leaf and this substance, are adjacent to those receiving leaf and potash, and on the six years showing the phosphoric acid is the more necessary constituent, and has produced the best effect. It would perhaps be too much to say that phosphoric acid is on these lands, as has been found in other cases, indicated as a necessary part of any system of manuring, but its need should be kept in mind.

The plots receiving the complete manure are probably favoured by their position, but can show little or no increase over the N + P plots. Potash is thus shown not to be a necessity.

Increasing the dose of phosphoric acid is not shown to be profitable: increasing the dose of potash would naturally produce no effect, and the high yields of these plots is undoubtedly due to their position.

The experiment will be discontinued, and the conclusions drawn from it may thus be summarised:—

- The necessity for a bulky organic manure such as leaf;
- The possible value of phosphoric acid when used to supplement such a bulky manure; and
- The failure of potash to show any effect on the paddy crop.

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15. The plots which are under the process of standardization were again cropped uniformly and the results are beginning to show more uniformity; though they are not yet ready for experimental work, they are maintaining their relative positions fairly well, and tending to approximate in their total yields. B block is the better, and will be ready before N block, where the plots still show considerable variation.

Farm methods have again to confess to failure when compared to local methods as shown by the plots in Block G where the "Farm" and "Maistry's" plots are laid out alternately. Again the green manure, sunn-hemp this year, failed to grow, although it received an irrigation, and 4,000 lb. (approximately) of sunn-hemp was brought from J block and trampled in. To the maistry's 34 cents, 41 bundles of leaves were applied, i.e., at the rate of over 8,000 lb. leaf per acre. The farm plots also received 3 cwt. of bonemeal per acre: this from the experience of the experiments in Block K (see paragraph 14 *supra*) was more than was likely to be needed. Whether due to the excess of leaf, in the maistry's plots, or the effect of the flooding of the land in the farm plots, the latter have given some 400 lb. an acre less than the maistry's plots. The full yields to date are given below:—

TABLE VII.

Farm and maistry's plots.

Year.	Farm (32 cents).		Maistry (34 cents).	
	Grain.	Straw.	Grain.	Straw.
1911-12	3,234	7,974	2,859	6,508
1912-13	2,200	4,087	2,661	5,364
1913-14	2,194	2,187	2,941	3,964
1914-15	2,800	4,926	3,200	8,600
Total profit per acre, Rs.	342		445	

The low yields of straw from the farm plots is noticeable; the reason for it is not clear.

16. A more careful comparison of the "District" varieties, that is, those out of the numerous varieties grown on the farm for educational purposes, which are considered likely to do well in the locality, was made this year. They were grown in long narrow strips, the two outside plots being sadai samba 20, a unit strain of the standard variety. This yielded the best of all, the crop being exceptionally heavy, as may be seen from the table below.

TABLE VIII.

District varieties—Block E.

Variety.	Duration.	Grain.	Straw.
		lb.	lb.
Sadai samba (20)	139	4,535	5,780
Thurpu samba Akkullu (82)	107	3,215	6,100
Poombalai	120	3,720	7,860
Garudan samba	141	3,520	10,160
Tanjore sirumani (120)	140	3,130	7,580
Sadai samba (20)	139	4,170	6,420
Tanjore sirumani (120). (95 cents non-experimental).	...	3,910	5,835

Plots—20 cents.

The test is quite a fair one, and there seems little doubt as to the superiority of Sadai samba. Poombalai has done well: it is a shorter term paddy than Sadai samba, though not as short as Akkullu. This latter may be discarded, unless the unit strains referred to below, show exceptional promise.

17. *Seed selection (Sadai samba).*—No. 20 is the unit used for the bulk of the farm land, and reference has just been made to the excellent yield obtained from this strain in Block E. In Block D No. 20 was compared with the other unit strains mentioned in last year's report: Nos. 106, 107, 108, 109, 110 and 111. No. 106 has done well, but was as a matter of fact discarded last year, and was sown by mistake. Taking the yields only, No. 109 is the best; No. 110 coming next. These two will be grown next year, and compared with No. 20, which this year came out the poorest of the lot: the rest will be discarded.

Sinna samba.—The close of last season left the standard unit strain No. 22, and two unit strains Nos. 116 and 117 to be compared with it, the rest having been discarded. However all the old strains were by mistake grown in Block D. Nos. 116 and 117 were grown on a fairly large scale in Block E, but the officer in charge neglected to take any notes as to their growth or yield. The same comparison will therefore have to be repeated.

Thurpu samba Akkullu.—No. 82 is the standard strain: three strains were compared with it in block D of which one was discarded at once. A more careful comparison was made of the other three. One No. 124, showed signs of being a dwarf strain: the other 123 was an early maturing variety: No. 82 proved itself still the best, and will be kept as the only unit of this variety, and on only a limited scale.

Thuluka samba.—Further comparison of the strains mentioned in last year's report, have resulted in No. 129 taking the place of No. 130. It is slightly earlier and yields a full crop: it will be the only one kept for the next year.

Tanjore sirumani.—No. 120 remains the standard strain. A number of other strains are being kept for trial.

18. *Cholam* (*Andropogon sorghum*).—This important dry land crop suffered from the season, as it started late, and was further affected by rainfall in its later stages. A few sowings were done in the latter half of July, and germinated moderately well, but mostly could not stand the drought which lasted until late September, when advantage was taken of the rains to re-sow. One small plot in No. 56 which just managed to struggle along was left, and ultimately set seed: this will be kept as a possible source for selections of drought resistant strains. Two unit strains of "Peria Manjal" cholam Nos. 7 and 61 were compared in F. No. 3, and gave remarkably similar yields: No. 61 is superior in quality of grain and straw, and will be maintained for the present as the standard. No fresh selections were made during the year in this or in the "Thalaivirichan" cholam which was only grown in the students' series of plots.

Yields were low all round: 475 lb. per acre of grain and 2,800 lb. of straw as the best, being very much below what is expected. The yields in F. Nos. 1 and 2 for the last seven years show this, in the Table below, wherein the results of the Rotation experiment are brought up to date.

TABLE IX.
Rotation experiment.

Year.	Field No. 1.		Field No. 2.	
	Grain.	Straw.	Grain.	Straw.
1908-09	LB. 578	LB. 3,123	LB. 560	LB. 3,201
1909-10	Castor. Lablab.	165 81	Castor.	185
1910-11	536	3,609	562	3,922
1911-12	Castor. Lablab.	36 196	Castor.	272
1912-13	850	5,058	573	4,392
1913-14	Castor. Lablab.	124 191	Castor.	352
1914-15	313	3,014	475	2,885

The effect of the pulse up to date appears to be nil. In 1912-13, it looked as if it was increasing the yield of the succeeding grain crop, but this year the yield has dropped below the plot on which no legume is ever grown.

The yield of cholam on the black soil was disappointing, even after the thorough disc ploughing that this field had had with the aid of a motor tractor sent for trial. It seems more and more probable that

cholam is unsuited to such land in this district, being too far south and that if the season is not exceptionally good, the crop will be a failure. The equivalent in straw might be got by growing fodder cholam over a portion, and *Setaria Italica* which seems to do well, over the rest, in the year when the cereal is to be grown in the rotation.

19. *Irrigated cholam*.—This is usually sown about the end of March and is known as Chitrai Cholam, though there are varieties which are sown earlier: this year for instance there are two crops of Thai cholam, sown in January. The profits from the crop vary largely according to the amount of irrigation needed, though it is surprising how well the crop yields in a dry year. Farm methods of cultivation, especially the rather deeper ploughing and the inversion suit these garden lands, and the crops this year have been uniformly good, the highest yield being 2,600 lb. with over 6,000 lb. of straw to the acre.

Irrigation being such an important feature of this crop, experiments were continued to test the value of irrigating by furrows, but have again been marked by failure. It is not easy, as pointed out before, to get a crop which needs normally a sprout irrigation, sown in lines, with sufficient moisture to keep it going until the lines can be earthed up. Transplanting is one way out of the difficulty, but has been proved unsuccessful, an experiment carried out this year merely corroborating previous failures. The usual experiment to compare the two system so far as yield of crop and economy of water are concerned, was located in F. No. 18. Germination on the ridges was unsatisfactory, and the blanks had to be filled in later by transplanting, which necessitated heavier irrigation, and has thus upset fair comparison as far as this side of the experiment is concerned.

The yields have come out practically the same so far as the grain is concerned, though the straw from the bed planted plots was a good deal heavier. One of the ridge plots was very poor and pulled down the average and some allowance should certainly be made for this, so that on the whole ridge planting has kept up its yield. These irrigation experiments are now discontinued, though the plots are being cropped a little longer to ascertain their natural variation under uniform conditions.

20. *Wheat*.—This crop occupied an area of 6.8 acres but was a failure. The yield was disappointing, and the grain was light and poorly filled: irrigation charges were high and the crop was most unprofitable.

21. *Ragi* (*Eleusine Coracana*).—An unwelcome feature of this crop this year was a severe attack of the Root Aphis, * referred to in last year's report, which attacked the early planted crops with severity. Two fields were given up and cut green, as the casualties were so heavy that it was not worth while continuing irrigation. There is reason to believe that this pest is favoured by the ridge and furrow system adopted in the farm, the dry and aerated ridges being more congenial than the completely wetted beds. The later planted fields

* Some South Indian Insects: T. Bainbrigge Fletcher: page 502.

were all planted in beds, and escaped serious damage, but this might have been due to other causes. The early crop was expensive to water, owing to the dry weather, and the later crops were more profitable: the best yields were 2,200 lb. per acre in F. No. 23 and 42, both early planted fields, which recovered wonderfully from the aphid attack, and 2,000 lb. as a late crop in F. No. 20.

22. *Cumbu* (*Pennisetum typhoides*).—The introduced cumbu was sown in No. 4, with Red Gram. It started well and looked promising, but was virulently attacked with rust, and ultimately gave a very small yield. The grain of the imported cumbu is beginning to find favour in the locality and the trial will be continued. A small quantity of African cumbu from the Congo is at present under trial: the seed was obtained from Mr. Sampson.

23. *Italian Millet*.—This crop seems to be suited to the conditions obtaining here, and again good yields have to be recorded, between 500 and 900 lb. an acre having been reaped: as a dry crop mixed with cotton nearly 300 lb. an acre was obtained.

The comparison of the three unit strains, Nos. 4, 9 and 14 referred to in last year's report, was carried out in Field No. 26, where each strain was sown in triplicate along with four of the Behar strains, Nos. 4, 7, 8 and 9. The latter failed completely and practically gave no crop and have consequently all been discarded. Of the Coimbatore strains No. 14 seems the most vigorous, and will be more largely utilised in future: No. 4 will be discarded.

A trial was also made of some hill tenai sent from Anakapalle in the Vizagapatam district. This is characterised by an unusually large head. It was sown in a small area in No. 54, but appeared to be too weak in the straw to carry such large heads, and was badly laid. Seed has been kept, and a further trial will be made this year.

24. *Maize*.—The climate is on the whole unsuitable to this crop which does not grow well on a field scale. An imported variety Hickory King seems to be the best to sell and the green cobs are readily disposed of on the estate.

25. *Pulses*—*Bengal gram* (*Cicer arietinum*).—The crop was fair on the main black cotton area, and in one other field where a good deal of heavy levelling had been done, and where in consequence it might have been expected to be patchy. An attack of a swarming caterpillar (*Lophygma erigia*) and the grain caterpillar (*Chloridea obsoleta*) was recorded in field No. 13; three acres gave no yield: the pest was treated by the Entomological staff, assisted by its natural enemies. The volume weight is said to be rather low, showing that the quality of the seed is not up to the mark. The seed-rate problem has not yet been solved: a saving of 40 lb. of seed an acre can be made by broadcasting or drilling the crop, instead of dibbling it by hand in a furrow behind the plough, but the yield suffers more. It is presumably a question of the depth at which the seed should be set.

Red grain (*Oryza indica*) was only sown in one field No. 4, mixed with cumbu. It started late, and has produced nothing, though still green and leafy when pulled out in April: it seemed to

respond to the rain of January, February and April with a fresh flush of leaves and flowers but nothing came of them.

Selected strains of American cowpea (*Vigna catjang*) were sown in No. 56 with cholam. Red Ripper (No. 6) and unknown (No. 5) failed and will be discarded: of Iron cowpea there were four units: No. 1 was poor and will be discarded: the other three will be kept for further trial.

26. *Uppam Cotton* (1913-14).—Only one field was devoted to this crop, containing however 47 acres of black soil. Room was found here for two sets of experiments; one to compare the effect of broadcasting the cotton, the usual way in which it is sown in these parts with drilling it, a practice which the Department is successfully recommending elsewhere. Here this has not proved uniformly successful as will be seen from previous reports, last year's figures for instance were conclusively in favour of the broadcast crop from the point of view of yield. It is largely a matter of skill in drilling, and there is no reason to doubt that if the lines are full, drilling is not only more profitable from the saving it effects in seed and labour, but gives a larger crop. This year's figures are given below:—

TABLE X.

Broadcast and drilled cotton.

No.	Treatment.	Yield per acre.	Number of plants 5 cont. plots.
14	Drilled	320	535
16		350	770
18		368	718
15	Broadcast	321	1,046
17		302	815
19		185	493

The last two plots were noticed to have suffered in their early stages, No. 19 especially, so that the average would not give a fair comparison. The drilled plots have fully maintained their yield and considering the saving in the cost of cultivation, may fairly be called a success. The drilling as shown by the figures is still poor: in 5 cents there are 2,178 square feet, so that if the lines are 2 feet apart, there will be over 1,000 running feet of drill and at 1 foot apart in the drills, probably not so wide a spacing, there should be this number of plants in a plot of this size. This is not attained in any of the drilled plots, the highest being only 770 plants. The matter remains where it was last year: drilling is certainly advantageous, but its full effects depend on the skill with which the operation is performed: that it is not impossible to obtain this skill is shown by the success of the introduction of the drill in the cotton areas further south.

In comparing the rates of picking of the two sets of plots, it is noticeable that the drilled plots matured more quickly and rather

more evenly. It would not be expected on theoretical grounds that picking would finish earlier when a much more effective surface cultivation had been effected, but this was the case. The greater irregularity of the broadcast plots is presumably due to the fact that the spacing was irregular, and there were consequently many plants crowded together and many widely spaced, with the natural effect on their growth.

The other set of experiments compared the effect of growing cotton with certain subsidiary mixtures. There were thirteen plots in all, each of an acre in size: the odd numbers were drilled with pure cotton, the even numbers had three mixtures tried in two ways: the seeds were either mixed before drilling, or else one separate line of the subsidiary crop was drilled between every two lines of cotton:—

TABLE XI.
Field No. 13.—Cotton mixtures.

No.	Treatment	Yield of cotton.
		Lb.
1	Cotton	304
2	Cotton two lines; horsegram one line	174
3	Cotton	341
4	Cotton two lines; coriander one line	216
5	Cotton	356
6	Cotton two lines; tenei one line	226
7	Cotton	369
8	Cotton and horsegram mixed	328
9	Cotton	394
10	Cotton and coriander mixed	282
11	Cotton	311
12	Cotton and tenei mixed	209
13	Cotton	178

The figures require a certain amount of discussion. The yields from the 'cotton alone' plots show that the field naturally improves from No. 1 to 13, i.e., from south to north. The last plot No. 13 is to be rejected as it was very uneven: with this exception the yields lie along an even curve. When the mixtures are plotted, the curve is roughly similar except in the case of No. 3, cotton and horsegram mixed, which stands well above the rest. This mixture is common in Nandyal and other places, but is not generally practised in these parts. The ultimate test of such an experiment is of course financial, but with cotton at its normal price, it would probably not be profitable to grow any mixture, though the demand for fodder and grain may sometimes make it good farming.

27. *Cambodia*.—There is nothing much to record about this crop, which continues as profitable as any grown on the farm. It was sown as a pure crop in all cases, and the second or late season flush gave a heavier picking than the early season crop. This as remarked in last year's report, was only moderate: a yield of about 1,000 lb.

was then estimated. This has as a matter of fact been largely exceeded, the highest yield of 1,492 lb. per acre, being obtained in field No. 44: two other fields giving over 1,200 lb. to the acre. The single strain was grown in 20 cents in field No. 57 B, and was not a very striking success. It has been sown this year in No. 15 A, and will if satisfactory, sow the whole area next year. The demand for seed is brisk, and most of the farm Cambodia seed is sold each year to neighbours. It is also satisfactory to know that Messrs. Stanes & Co., the proprietors of some local spinning mills, speak very highly of the quality of the farm lint. This it may be pointed out is not due to any selection, but merely to the adoption of ordinary precautions in keeping the seed free from admixture, and picking the inferior kappas separately: it should not be difficult to effect a still greater improvement by means of selection, and this work has been definitely taken up during the current year.

The first consideration is to find a plant with a less objectionable habit than the present straggling brittle plant which collapses with the least wind, or even under the weight of its own bolls. A number of plants have been selected with this end in view.

The crop for the current year is again only moderate and up to the present there are no signs of its being a heavy one. Germination was bad almost throughout.

28. *Sugarcane* (1913-14).—As foreshadowed in last year's report, experimental work with this crop has been given up. The area devoted to cane was somewhat reduced, occupying only 75 cents. This was planted mostly with 'Vellai' the local white cane, a small collection of varieties still being kept up for the benefit of the students. The yield of the whole area was 2,800 lb. of jaggery, which allowing for these varieties, may be put at about 4,000 lb. an acre, a not very satisfactory figure, though profitable enough: the expenditure being Rs. 278 an acre and the receipts from the same area Rs. 430.

Planting followed the lines found satisfactory in previous years; heavy dressings of leaf, with artificials to give 125 lb. Nitrogen, and 80 lb. each of phosphoric acid and potash. The seed rate was raised to 15,000 setts per acre.

It is also possible to report upon the present season which is practically over. The collection of varieties was continued: B. 1753 failed to germinate and has been discarded: the Mauritius canes did well, Red Mauritius and Striped Mauritius giving the best returns of the varieties, but not so much as the local Vellai which is an excellent cane. The general growth of the canes was good, the total area of 140 cents gave an acre yield of nearly 6,000 lb. of jaggery, which has been sold for Rs. 670. Altogether, including the revenue from sale of setts, canes kept for next year's planting and so on, the net profit has been well over Rs. 300 per acre.

An innovation is being tried this year in the way of a ratoon crop. Counting on the continuance of high prices for sugar products, the area has again been somewhat increased, and includes a portion of last year's crop.

A few seedling and other canes were grown for the Government Sugarcane Expert, and a few have been added by him to the list of varieties grown for the students, during the current year.

29. *Tobacco*.—The crop was not so heavy as last year's, but was healthy and sold well. A yield of 1,350 lb. per acre, realised Rs. 112 with a profit of about Rs. 25. The crop is rather a risky one, and as compared, e.g., with Cambodia, is a difficult and complicated one to grow. It is planted here in lines, with an irrigation furrow between alternate rows, and the Planet Junior Hoe worked by a single bullock, is kept going up and down the rows as long as possible.

30. *Guntur chillies*.—These have again failed this year and will be discontinued. As was the case last year, the crop was neatly planted in lines running both ways, and with careful intercultivation, the land was kept in excellent condition. The crop was well manured with 20 cartloads farm yard manure, 3 cwt. of castor cake and 1 cwt. of bone meal and also benefited by the rains, but in spite of all a wretched yield was obtained.

31. *Fodder crops*.—The amount of fodder which is necessary for the dairy herd, makes the problem of fodder growing one of some importance. Up to the present reliance has been placed on successive crops of fodder cholam grown under irrigation, the variety used being the ordinary dry peria manjal, which, sown thick under irrigation, gives a fair cut.

Latterly however Guinea grass has been tried, at first tentatively, successive patches being added until now there are 8½ acres under this crop. A careful comparison has been made of the merits of these two. Taking two typical fields in which fodder cholam has been grown, the records of the last six or seven crops show that acre yields of 25,400 lb. and 33,400 lb. respectively were obtained in twelve months. In the case of Guinea grass, though the continued increase in the area, makes it difficult to calculate, the yield over a period of just on two years, has been 22,400 lb. and 36,000 lb. per acre per annum. If these figures are taken to be accurate, Guinea grass is undoubtedly the better crop, as it is far more economical to grow: once indeed it has been put down, it wants little but an occasional hoeing, and once a year the tufts dividing. The quality of the grass is better than the cholam, and there is not so much waste. The area will accordingly be extended as opportunity occurs.

At the same time another introduced crop has done remarkably well, and deserves attention if only as a means of affording some variation in diet. This is Silver Beet or Swiss Chard, which was grown for the second time this year. In spite of a very thin plant and a severe attack of leaf eating caterpillars, the yield has been just over 25,000 lb. in six cuttings from October to April. The crop will be grown again, greater attention being paid firstly to getting a full stand, and secondly to trying to get it to set seed, which it at present shows no signs of doing. The seed for the last two years has been obtained from Messrs. Vilmorin Andrieux & Co., Paris. An analysis was given in last year's report.

Tell grass (*Eragrostis Abyssinica*) was again grown as a catch crop, to relieve a temporary scarcity of fodder. It was cut within seven weeks of sowing, and was made into hay. The yield was disappointing, a little over three tons being cut from nearly three acres, and though the quality appeared good, the labour of making the hay was excessive.

Owing to the distribution of the rains in the latter part of the year, the natural grazing was better than usual, and a large quantity of grass was cut and fed in the stalls.

32. *Permanent manurials*.—These are manured according to the following scheme.

TABLE XII.

Permanent manurials.

No.	Treatment.	Supplying.		
1	No manure	N	K	P
2	Ammonium sulphate 1 cwt. per acre	N	K	P
3	Ammonium sulphate 1 cwt. per acre	N	K	P
4	Potassium sulphate 1 cwt. per acre	N	K	P
5	Ammonium sulphate 1 cwt. per acre	N	K	P
6	Potassium sulphate 1 cwt. per acre	N	K	P
7	Calcium superphosphate 3 cwt. per acre	N	K	P
8	Ammonium sulphate 1 cwt. per acre	N	K	P
9	Potassium sulphate 1 cwt. per acre	N	K	P
10	Calcium superphosphate 3 cwt. per acre	N	K	P

The next table shows the crops which have been taken since the last report.

TABLE XIII.

Permanent manurials.

No.	Crop.	Sown.	Harvested.
15	Chitral Cholam	17-4-1914.	29-7-1914.
16	Fodder Cholam	18-9-1914.	Failed.
17	Bengal gram	6-11-1914.	6-2-1915.
18	Chitral Cholam	24-3-1915.	

The fodder cholam plant was extremely uneven and patchy and it was thought better to remove it: the manures were not applied afresh to the Bengal gram crop. The gram crop, the first pulse crop this series has received, did not do well though the comparison is on the whole a fair one, with the exception of No. 8 when the plant was very thin. The yields are given in the Table below.—

TABLE XIV.

Plot No.	Treatment	Crop No. 15.		Crop No. 17.
		LB. Grain.	LB. Straw.	LB. Grain.
1	Nil	725	4,600	100
2	N	875	5,800	175
3	N+K	1,000	6,900	250
4	N+P	2,000	6,800	250
5	N+K+P	1,825	7,000	175
6	K+P	1,700	6,300	125
7	K	1,225	6,800	100
8	P	1,350	4,100	50
9	Farmyard	2,500	8,500	175
10	"	2,750	9,700	300

When the results to date are tabulated, by taking the no manure plot as 100, and scaling the others as percentages, the results are very similar to those obtained last year: a slight increase in most of the manured plots is noticeable, showing that the exhaustion of the unmanured plot is more complete. The plots are now fenced, and more efficient arrangements have been made for the distribution of the water. Trouble is still experienced with tree roots, this time from the roots of trees planted on the opposite side of the road, and this will be prevented by digging a trench along one side of the road, and cutting through the roots which experience has shown lie mainly on the surface. Probably the two farmyard manure plots are slightly better than they should be, while No. 8 which receives P. alone, is rather poorer.

TABLE XV.

Plot No.	Manure.	Per cent. of plot No. 1.
1	Nil	100
2	N	138
3	N+K	140
4	N+P	168
5	N+K+P	170
6	K+P	144
7	K	120
8	P	107
9	Farmyard	164
10	"	278

The good results obtained from the use of Phosphoric acid with Nitrogen, will be put into practice in the farm cropping.

33. *Plantations.*—These mainly consist of palms, coconuts being the most valuable. Attention has been paid to manuring these in the last two years, and the result has been most gratifying. During the last year, some Rs. 30-40 were spent on manure, (exclusive of the labour of applying, which was largely done by students), on some 350

trees, the yield obtained was 8,300 nuts which sold for Rs. 300. This is of course nothing unusual for coconuts, but the trees are merely put in alongside the irrigation channels, and cost little to maintain, and the use of manure evidently pays. A large number of seedlings have been planted in the last year or two, to utilise bunds and other odd corners which it is not worth while cultivating: these seedlings have been purchased from outside, but with the knowledge now possessed of the individual variation, nuts are being selected for seed purposes from the best yielding trees.

The palmyras and the tamarinds on the estate produce a certain amount of revenue: their usufruct is sold in auction every year.

34. *Livestock.*—The following table gives the changes in the herd during the past year and the present state,

TABLE XVI.

College herd 1914-15.

Stock.	Number at the beginning of the year.	ADDITIONS.			LOSSES.			Number at the close of year.
		Births	Transfer (growth).	Purchase	Deaths.	Transfer (growth).	Sales.	
Bulls ...	11	...	2	2	...	...	1	14
Bullocks ...	85	...	5	16	...	...	16	90
Cows ...	28	...	8	4	...	...	8	30
Buffalo cows ...	5	...	4	...	...	...	2	7
Heifers ...	14	...	6	...	...	12	2	6
Bull calves ...	27	20	...	1	1	7	6	34
Heifer calves ...	22	11	...	3	2	6	7	24

which shows a general increase. More bulls are needed to cope with the increasing outside demand, while the extra number of bullocks are to make up for the short work they do when worked in the students' classes, not merely from the students' lack of skill, but from the broken time, and time lost in coming and going to the fields. The breeding herd has been increased, but more cows are still required. There were 34 births during the year as against 35 in the previous year, and the proportion of bull calves is more satisfactory. The herd is generally in a promising state. Many of the heifers born on the estate, and therefore of known parents on both sides, are now coming to maturity, and the inheritance of the qualities of their parents can be tested. It is a slow business, especially slow from the late maturity of the average Indian bovine—many of the heifers do not take the bull until they are over three years old—but short of introducing foreign blood, there is no quicker way. Even if it is decided ultimately to introduce European or Australian blood, the herd at Coimbatore will represent the best possible indigenous material with which to cross it. The two buffalo heifers mentioned in last year's report, calved in November and December and have proved fair milkers, about 15

pounds a day has been their average, but they are very uncertain and frequently fail to milk at all, a fault which is rather serious in such young animals. The stud bulls were well worked throughout the year: they get as far as possible regular though light work and this keeps them in excellent condition. Mapillai, the head of the herd, was discarded during the year on account of age, and though not castrated, has been sent to work with the bullocks. The Kangayam bull, Sivamalai takes his place: he has rather failed to come up to expectations and is scarcely as good as he was last year when he won at Tiruppur. Rangan, a mediocre Ongole bull, has been castrated, and his place taken by Kalyanan, a pure Ongole bull out of Kalyani, a cow bought at the Ongole show by Mr. Aitchison, and the Ongole bull at the Madras Veterinary Hospital. Basha has also been put on the shelf, and has been replaced by Rajam, out of a good milking Ongole cow "Rajah" by Basha.

The two buffalo stud bulls have been very popular as will be seen from the figures below: two more were bought from the Military Dairy, authorities for Rs. 400, but have proved so far failures at stud: they are old and have not been used to work, and as they fight each other viciously, though very docile to handle, it is difficult to arrange work for them. They are both said to be of a good milking strain.

The figures for the outside work of the Veterinary Section are given below and are again very satisfactory. The steady increase reflects credit on the hospital staff, whose capabilities are not considered to be limited to the treatment of animals: human patients may be seen there any morning. The increase of price has apparently had no effect in the numbers brought for service, and the numbers for the last few years show that there must be very few cows within anything like a reasonable distance of the estate, which have not been brought here. The effect on the locality must in time be considerable.

TABLE XVII.

Year.	Number of animals brought for service.			Fee.	Outside cases to the hospital.
	Cows.	Buf-faloes.	Total.		
1903-09	5	...	5	NIL.	...
1909-10	6	...	6	1-0-0	...
1910-11	52	...	52	NIL.	103
1911-12	139	...	139	NIL.	270
1912-13	247	...	247	0-1-0 to 0-3-0	486
1913-14	316	109	425	0-8-0	407
1914-15	355	215	570	0-8-0 to 0-12-0	521

An outbreak of foot and mouth disease occurred in September and lasted to the end of October: it was milder than in previous years, and as on former occasions caused little mortality, except among the youngest animals, three of whom died. The usual annual sale was held in February and was well attended: fair prices were obtained. The appointment of a Veterinary Assistant Farm Manager has enabled the correct feeding of the animals to be placed on a more systematic basis: the arrangement of special rations for the best cows, or for hastening to maturity the heifers which are likely to prove good animals, or for helping on sickly calves, needs a good deal of personal attention.

A start has been made during the year to introduce poultry keeping as subsidiary to general arable farming. A few Leghorns have been purchased to grade up the country chickens which find their living in the yard, and one pen of the same breed has been obtained.

The farm has also become the possessor of its own pony and jutka: a young animal was bought for Rs. 230 under advice from Mr. Aitchison of the Veterinary College.

35. *Dairy.*—Under present arrangements, the dairy purchases all the milk it requires either from the farm or from outside suppliers, at a uniform price of one anna per pound. This probably represents rather above its cost price: the average daily yield per cow for the whole herd, including dry cows varies from 3 to 4 lb. which means from Rs. 6 to 7 worth of milk in a month, a figure which is certainly more than the cost of keeping the animal. In any case there are a number of indigenous dairy concerns, working entirely with purchased milk, and it is interesting to see that in these conditions, the dairy has paid its way and is left with a small balance. The building and equipment, on which nearly Rupees 300 depreciation has to be paid, is of course much larger and more elaborate than would be needed for a working dairy, while nearly Rs. 400 goes in establishment, a sum which would be much reduced if a proprietor devoted some of his time to supervising the concern. It seems clear that there is an opening for a creamery in many localities, even if the more ambitious business of cow-keeping is not included, and it is equally obvious that the main source of greater profit is to be found in the improvement of the indigenous (or cross bred) cow, both in the amount of milk she will give, and the regularity with which she will breed.

The quantities of the various products handled by the dairy in the year will be seen from the subjoined statement. The sale of fresh cream is the most profitable line of business, but there are difficulties in the way of transport, and it has been found that if the cream is too thick the profit will be reduced, while if this cream is made and not sold, increased trouble is experienced in churning. The ghee made is for educational purposes; pure ghee can be and is made locally and sold extremely cheap, but as compared to other dairy products, it seems below its market value as butter fat, and its manufacture is not profitable. The College dairy butter appears to be appreciated, and the increase in the business from last year, from 1355 to 1886 lb. is welcome not only as showing that the quality of the butter is good, but also affording the students an excellent opportunity of seeing a well-run dairy at work.

TABLE XVIII.

COLLEGE DAIRY.

Profit and loss statement for 1914-15.

Receipt.	Rs. A. P.	Expenditure.	Rs. A. P.
Milk—Sale of milk ...	3,090 3 9	Milk—53,357 lb. of farm milk at 1 anna per lb. ...	3,334 13 0
Cream—Sale of— ...	91 4 3	25,952½ lb. of outside milk at 1 anna per lb. ...	1,622 0 6
Butter—Sale of— ...	1,909 2 0	Depreciation of building at 2 per cent. per annum on Rs. 9,000 ...	180 0 0
Ghee—Sale of— ...	132 10 10	Depreciation of machinery at 12 per cent. on Rs. 930 ...	111 9 7
Skim-milk—Sale of— ...	498 8 4	Establishment—Cost of— ...	395 9 0
Butter milk—Sale of— ...	52 1 4	Contingencies ...	63 14 2
Curds—Sale of— ...	2 12 10	To balance being Profit during the year ...	60 7 1
Stock on hand—Total cost of ghee and butter on hand on 1st April 1915 ...	0 10 0		
Total ...	5,777 5 4	Total ...	5,767 5 4

R. CECIL WOOD,
Principal.

APPENDIX

STATEMENT showing the mean temperature, highest maximum, lowest minimum, humidity, rainfall and wind velocity at the Agricultural College and Research Institute Meteorological Observatory, for the official year 1914-15.

Period.	Mean maximum in shade.	Mean minimum in shade.	Highest maximum in shade.	Lowest minimum in shade.	Mean temperature at 8 A.M.	Mean humidity at 8 A.M.	Total rainfall.	Average wind velocity per day.
	°F.	°F.	°F.	°F.	°F.	Per cent.	Inches	Miles.
April 1914 ...	96.8	73.1	100.4	70.0	81.6	64	...	96.1
May " ...	95.9	75.2	101.5	70.4	83.0	67	0.86	140.6
June " ...	90.3	73.0	93.3	68.9	80.5	69	0.69	230.4
July " ...	85.1	72.4	91.1	68.6	77.3	73	2.37	* 293.7
August " ...	87.2	71.5	90.3	68.9	76.7	77	0.21	Anemometer out of order.
September ...	80.1	71.9	93.1	68.9	77.5	74	1.54	
October " ...	86.3	71.0	91.8	69.3	75.9	85	7.50	
November ...	86.0	68.5	88.6	59.5	74.7	84	1.09	
December ...	83.5	65.8	89.1	57.0	71.8	85	1.47	81.2
January 1915 ...	85.4	64.7	88.0	57.0	71.0	78	2.39	92.9
February " ...	90.2	67.1	94.2	60.8	78.3	75	0.10	78.8
March " ...	92.6	70.8	97.9	65.0	77.2	76	3.69	82.9
Year 1914-15.	89.0	70.4	101.5	57.0	70.7	76	21.91	...

* Average of the first twenty days of the month only as the anemometer was out of order for the remaining portion of the month.

R.
J. 2118 '014

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