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Department of Agriculture, Madras.

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REPORT

THE TALIPARAMBA AGRICULTURAL STATION

1914-15

H. C. SIMPSON.

Deputy Director of Agriculture, Southern Division.



MADRAS.

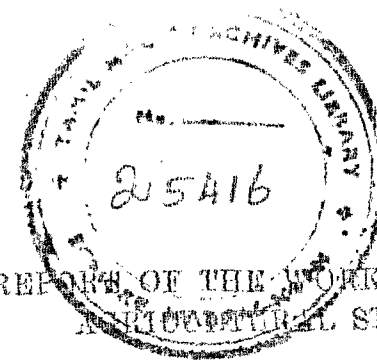
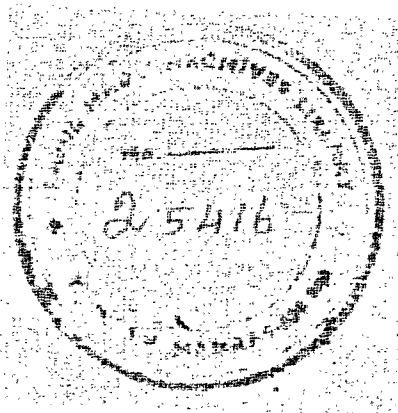
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REPORT OF THE WORK OF THE TALIPARAMBA AGRICULTURAL STATION FOR 1914-15.

An account of the local agriculture of the neighbourhood of this Agricultural Station is printed as appendix I to this report.

2. *Season*.—This year the rains have been abnormal as can be seen from the rainfall statement printed in the appendix. This is summarised below:—

		1914-15. Average.	
		INCHES.	INCHES.
Hot weather rains	...	1.08	8.24
South-west monsoon rains	...	129.10	113.93
North-east do.	...	14.79	15.40
Dry weather period	...	2.60	1.10
Total	...	147.57	138.67

The dry weather commenced at the end of October 1913 and from then till the end of May 1914, i.e., seven months only 1.56 inches of rain fell, of this 1.08 inches fell in May. Although heavy rain commenced in the first week in June, the weather conditions were not those of the monsoon. The rain fell in sharp showers with intervening bright weather and the dull cloudy weather with continuous rains, which usually prevail in the monsoon, was not experienced. These conditions continued until the 3rd week of June and it was fortunate for the crops that these conditions prevailed. After this, heavy rains fell and these, with a short break, at the beginning of September continued until the 3rd week of that month. Taking the south-west monsoon period as 16 weeks from the 1st of June, this year's rainfall is compared below with the average:—

		1914. Average.	
		INCHES.	INCHES.
First quarter (4 weeks)	...	27.21	40.94
Second do. (do.)	...	54.43	39.63
Third do. (do.)	...	30.17	25.92
Fourth do. (do.)	...	17.29	8.05

This well-distributed rainfall coupled with the favourable north-east monsoon rains turned what would have been a disastrous year for most crops into a very good season.

3. *Pepper*.—This received a very severe check on account of the prolonged drought. The pepper, which likes a moist situation and

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சுறிபார்க்கும்
உதவியாளர்
கையொப்பம்

light shade, suffered very much from the dry hot weather. Not only was there little or no rain, but there was very little protection from the shade trees which had no opportunity to form fresh cover after the branches were lopped in March. The result was that at the beginning of June there was not a leaf on any of the vines. All the old leaves had fallen and none of the new ones had formed. Never since the Agricultural Station was opened in 1905 have the vines been known to shed all their leaves like this. Thus all fresh leaves as well as pepper spikes, which are formed from the axils of the new leaves, had to form during the monsoon. The crop was, therefore, some six weeks late in flowering as well as in ripening. The flowering was not very profuse and at first it was thought that the season would be a failure, but fortunately good rains continued on in December, very little of the pepper shed, and the yield obtained was the highest on record since this Agricultural Station was started. The yield was 4,741 Madras measures of green pepper against last year's yield of 3,926 Madras measures which was the previous highest yield recorded. Of this year's yield 4,176 Madras measures were obtained from old vines and 565 from young vines planted since 1906. The old vines averaged 94 Madras measures of green pepper per vine while the young vines 30 Madras measures. Last year, these figures were 67 and 30 respectively. One result of this prolonged drought was that the young vines suffered much more than the old ones, while those plots which had been manured suffered much more than those which had not been manured. Only those manured plots which are situated in low-lying places and which are well shaded were unaffected by the drought.

In previous reports mention has been made of a disease known as "pollu" which is caused by the larva of a flea beetle feeding in the berry. This pest hardly did any damage this season and this diminution can only be attributed to the prolonged dry weather preceding the monsoon.

4. *Pepper Experimental Plots—Manurial Plots—(a) Lime and leaf mould.*—This plot suffered severely from the dry weather and many of the vines died in consequence.

Year.	Number of vines bearing.		Yield in Madras measures.*		Yield per vine in Madras measures.	
	Old.	Young.	Old.	Young.	Old.	Young.
1907	107	...	5.8	...	.05	...
1908	117	...	28.5	...	.24	...
1909	120	...	26.0	...	.30	...
1910	155	...	78.5	...	.51	...
1911	137	99	91.0	16.0	.66	.16
1912	109	185	63.5	50.5	.58	.27
1913	124	204	82.5	57.5	.66	.28
1914	115	209	91.0	128.8	.79	.61
1915	114	175	69.0	57.25	.60	.33

* 1 Madras measure of green pepper approximates to 1 lb. of dried pepper.

(b) *Fish manure.*—It is difficult to draw conclusions from this plot. It has a north-east aspect and portions of it are very exposed: possibly these portions suffered more than the rest of the plot. The yield per vine is more than it has been during the previous two years.

Year.	Number of vines bearing.		Yield in Madras measures.		Yield per vine in Madras measures.	
	Old.	Young.	Old.	Young.	Old.	Young.
1907	101	...	37.75	...	.37	...
1908	149	...	72.25	...	.48	...
1909	135	...	83.25	...	.64	...
1910	129	...	156.5	...	1.21	...
1911	138	...	98.5	...	.71	...
1912	125	...	163.25	...	.83	...
1913	89	...	72.5	...	.73	...
1914	153	6	37.75	4.75	.61	.79
1915	114	...	87.5	...	.77	...

(c) *Ashes.*—This plot adjoins the preceding and is very similar to it in aspect and gradient. There has been a considerable decrease in the number of old vines bearing and there have been many deaths in the plot.

Year.	Number of vines bearing.		Yield in Madras measures.		Yield per vine in Madras measures.	
	Old.	Young.	Old.	Young.	Old.	Young.
1907	197	...	24.50	...	.27	...
1908	35	...	61.75	...	.65	...
1909	86	...	61.50	...	.64	...
1910	111	...	114.25	...	1.03	...
1911	84	...	37.25	...	.40	...
1912	54	...	56.25	...	.37	...
1913	67	15	22.25	1.00	.33	.06
1914	133	8	33.63	7.25	.29	.16
1915	100	13	22.25	2.13	.23	.13

(d) *Cattle manure.*—This plot has been able to withstand the drought much better than others to which more concentrated manures have been applied. It is also a cooler plot having an eastern aspect with good natural shade from the south-east. Many of the shade trees in the plot also are not deciduous; hence it was able to withstand the drought better. With the alternate high and low yields of the variety of pepper found in the plot, the improvement is marked.

Year.	Number of vines bearing.		Yield in Madras measures.		Yield per vine in Madras measures.	
	Old.	Young.	Old.	Young.	Old.	Young.
1907	42	...	2.75	...	.06	...
1908	64	...	32.50	...	.51	...
1909	68	...	35.50	...	.52	...
1910	88	...	88.25	...	.95	...
1911	78	...	43.53	...	.59	...
1912	68	23	68.00	3.00	1.00	.12
1913	58	11	25.50	1.00	.48	.09
1914	77	15	69.25	3.00	.90	.20
1915	79	24	78.25	4.75	.99	.20

(e) *Oil cake*.—This plot adjoins the cattle manure plot and is very similarly situated as the average yield per vine for the first three years of the experiment show. It is evident that this plot has felt the effects of the drought considerably more than the cattle manure plot.

Year.	Number of vines bearing.		Yield in Madras measures.	Yield per vine in Madras measures.
	Old.	Young.		
1907	25	...	1.75	.07
1908	29	...	13.50	.47
1909	52	...	27.00	.52
1910	59	...	50.25	.85
1911	33	...	12.03	.33
1912	41	...	49.75	1.21
1913	30	...	9.00	.30
1914	53	...	35.50	.63
1915	41	...	34.50	.84

(f) *Leaf mould*.—Here again the value of a bulky organic manure in retaining the soil moisture seems to be proved. Not only have the old vines yielded well, but even young vines in this plot have given a yield of $\frac{1}{2}$ Madras measure per vine. A part of this improvement must, however, be ascribed to the absence of "pollu," which is usually severe in this part of the farm.

Year.	Number of vines bearing.		Yield in Madras measures.		Yield per vine in Madras measures.	
	Old.	Young.	Old.	Young.	Old.	Young.
1907	55	...	7.50	...	.20	...
1908	92	...	52.50	...	.57	...
1909	77	...	21.25	...	.28	...
1910	94	...	73.00	...	.78	...
1911	72	76	19.00	9.75	.26	.13
1912	112	68	41.50	5.50	.37	.08
1913	74	41	29.75	6.25	.36	.15
1914	75	104	56.25	19.75	.75	.19
1915	59	42	79.13	34.00	1.34	.80

(g) *Leaf mulch*.—In this plot, the surface of the ground is covered at the commencement of the dry weather with a mulch of green leaves. Thus, though this forms a considerable quantity of organic matter, it is applied purely on the surface and this probably explains why this has not done so well as the previous plot to which leaf mould is dug in when applied.

Year.	Number of vines bearing.		Yield in Madras measures.		Yield per vine in Madras measures.	
	Old.	Young.	Old.	Young.	Old.	Young.
1907	64	...	19.13	...	.30	...
1908	72	...	50.00	...	.70	...
1909	81	...	110.50	...	1.21	...
1910	108	...	99.00	...	.96	...
1911	103	...	95.63	...	.84	...
1912	108	70	83.50	4.50	.79	.15
1913	83	37	105.25	2.00	1.27	.05
1914	102	37	105.00	8.00	1.03	.22
1915	97	52	113.00	2.50	1.16	.05

5. *Methods of cultivation*.—(a) *Mounding*.—The yields from this plot have been unexpectedly high. The variety of pepper grown normally gives alternate high and low yields, but in spite of this, this year's yield has been a record one, the yield per vine being one Madras measure. This seems to indicate that either the conclusions drawn in the 1912-13 report were wrong or that the altered conditions of fertility have caused the development of a deeper root system.

Year.	Number of vines bearing.		Yield in Madras measures.		Yield per vine in Madras measures.	
	Old.	Young.	Old.	Young.	Old.	Young.
1907	65	...	14.50	...	.22	...
1908	92	...	75.00	...	.82	...
1909	66	...	39.00	...	.59	...
1910 *	116	...	193.00	...	.89	...
1911	106	...	25.63	...	.24	...
1912	79	20	65.50	1.50	.83	.075
1913	71	14	18.25	1.00	.26	.07
1914	88	51	80.05	7.75	.91	.15
1915	85	29	86.00	7.00	1.00	.24

* The plot was enlarged this year and fresh vines were added.

(b) *Intensive cultivation with pepper vines on dead standards*.—The yields have this year been very small and seem to indicate that the vines suffered severely from the hot weather and the heavy

manuring. It is probable that such intensive cultivation requires to be supplemented with irrigation to make it pay.

Year.	Number of vines bearing.	Yield in Madras measures.	Yield per vine in Madras measures.
1910	16	1.50	.08
1911	32	7.75	.24
1912	47	6.50	.14
1913	33	8.25	.25
1914	50	17.00	.34
1915	51	7.00	.14

6. *Varieties of pepper.*—The table below shows how these varieties crop under conditions, as far as possible, similar as regards to shade, aspect, gradient and fertility. These vines are all of the same age. The average yield per vine for the last six years *i.e.*, since the time when the first of these varieties commenced to yield is .0252 Madras measure in the case of Utterancotta, 2145 in the case of Balamcotta and .1880 in the case of Kalluvalli. Although the last variety commenced to bear a year later than the Balamcotta, it has given a higher yield per vine for the last three years. All the varieties, however, have suffered severely from the prolonged drought this season :—

Year.	Utterancotta plot No. 74.		Balamcotta plot No. 73.		Kalluvalli plot No. 75.	
	Number of vines bearing.	Yield per vine in Madras measure.	Number of vines bearing.	Yield per vine in Madras measure.	Number of vines bearing.	Yield per vine in Madras measure.
1910	...	...	30	.008	...	...
1911	4	.0016	58	.180	38	.055
1912	...	...	52	.310	43	.099
1913	10	.0195	50	.2650	53	.380
1914	42	.1140	93	.330	58	.400
1915	23	.0250	74	.0740	61	.200

7. *Wet lands.*—No special remarks need be made on the paddy crops which were treated as in previous years both as regards manuring and cultivation. The yields per acre were 2,487 lb. and 2,143 lb. respectively for the two main varieties grown, *viz.*, *kayama* and *thavalakannan*.

As usual, varieties of sugarcane were under cultivation to test their suitability to West Coast conditions.

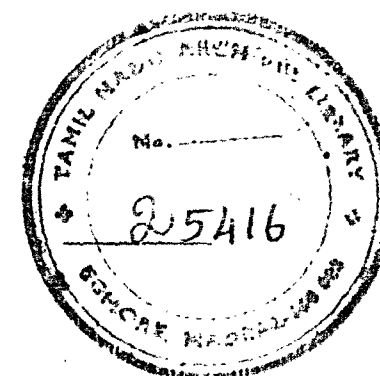
8. *Dry land crops.*—The cropping this year was very similar to that of last season. The outturn of ginger and turmeric is estimated at 876 lb. and 1,412 lb. respectively of dried and prepared produce and, as the prices this season are very similar to those ruling last year, the same remarks apply, *viz.* that neither of these crops pay directly for the cost of cultivation.

Ragi.—The yields of *ragi* following ginger and turmeric are this year all low. This is largely due to the failure of the hot weather rains which prevented the crops from being planted and becoming established before the heavy rains of the monsoon. Planting could only be done in the third week of June. The yields are less than half those obtained last year and averaged only 962 lb. per acre for local varieties and 630 lb. for varieties introduced from Coimbatore.

Chillies.—Four varieties of these were grown, *viz.*, two West Coast varieties and two introduced from Coimbatore. The West Coast varieties, being acclimatised at present pay better and it is estimated that, at this year's local price of Rs. 7 for 30 lb. the profit from cultivation was at the rate of Rs. 170 and 225 per acre for the South Malabar and the South Canara varieties respectively. The Coimbatore varieties are in greater demand however in retail sale as the fruits are larger and not so pungent and one of those is improving in yield as it is becoming acclimatised. The other was grown from freshly introduced seed and only yielded a small crop. The variety introduced from the Erode taluk yielded an acre profit of about Rs. 95 and the other variety from Pollachi showed a loss of Rs. 35 per acre.

TRICHINOPOLY,
May 1915.

H. C. SAMPSON,
Deputy Director of Agriculture,
Southern Division.



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APPENDIX I.

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 Wynnad or above Ghaut 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 land 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 revetted with stone. This is utilised 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 100 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 Irul (*Xylia 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 recognised 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 twelfth to twenty-fifth 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 on 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 rainfed 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.

APPENDIX II.

Rainfall Statement of the Taliparamba Agricultural Station for 1914-15.

Month.	Average rainfall for 9 years from 1805-06 to 1813-14.			Rainfall, 1914-15.		
	Total rainfall.	Daily average.	Number of rainy days.	Total rainfall.	Daily average.	Number of rainy days.
April	1.22	0.0895	0.811	6.00	0.10	...
May	7.02	0.2370	2.760	1.98	0.065	3
Total hot weather rains ...	8.24	...	3.57	1.98	...	3
June 1 to 7	6.45	0.92	2.53	6.04	0.89	3
" 8 to 14	14.58	2.03	5.62	3.09	0.44	4
" 15 to 21	11.73	1.68	5.69	7.97	1.03	6
" 22 to 28	8.18	1.18	5.22	9.51	1.36	6
" 29 to July 5	7.90	1.13	5.26	12.82	1.83	7
July 6 to 12	8.45	1.21	6.00	14.85	2.12	7
" 13 to 19	10.47	1.50	5.66	11.19	1.59	7
" 20 to 26	12.20	1.74	5.58	15.57	2.22	7
" 27 to August 2 ...	8.04	1.14	5.22	11.49	1.64	6
August 3 to 9	9.77	1.40	5.03	6.19	0.88	7
" 10 to 16	2.92	0.41	3.09	6.05	0.86	6
" 17 to 23	5.19	0.74	4.91	6.44	0.92	5
" 24 to 30	4.55	0.65	4.14	5.05	0.80	5
" 31 to September 6 ...	1.97	0.27	2.08	1.15	0.16	2
September 7 to 13 ...	1.08	0.15	1.45	5.32	0.76	7
" 14 to 20	0.45	0.06	0.47	5.17	0.73	5
Total south-west monsoon rains ...	113.93	...	67.86	129.10	...	90
September 21 to 27 ...	2.05	0.28	1.78	0.00	0.00	...
" 28 to October 4 ...	2.14	0.30	0.98	1.04	0.14	3
October 5 to 31	7.28	0.27	5.32	12.07	0.45	16
November	8.95	0.13	3.11	1.68	0.56	3
Total north-east monsoon rains ...	15.40	...	11.17	14.79	...	22
Total dry weather rains from 1st December to 31st March ...	1.10	...	1.00	2.60	...	6
Annual rainfall	138.67	...	82.00	147.57	...	121

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