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adult, 0·1 dead adult, 4·5 living nymphs and 5·3 dead or dying nymphs per plant. The population per plant was thus very much lower than before spraying; and even those insects that were alive were found gathered at the top of the curled leaves where the tobacco decoction could not probably reach.

The effect of the spraying was remarkable when the crop was examined again after 3 days when there were 6 living adults, 27 dead adults, 10 live nymphs and 67 dead nymphs for 30 plants giving an average of 0·2 living adults, 1 dead adult, 0·3 living nymphs and 2 dead nymphs per plant. The presence of more adults now may be due to the fact that they might have come in from untreated plots nearby or the ones found to be dying during the previous count may have recovered or some of the grown up nymphs might have moulted and become adults. While the total living population of thrips for 30 plants was 638 before spraying it was only 16 three days after spraying, thus giving a mortality of 97%.

For a total area of 1 acre of seedlings, 5 lbs. of tobacco was used at a cost of 5 annas at 1 anna per pound, and three coolies worked for a day costing 15 annas at 5 annas per head per day. Thus, the total cost of the operation comes to Rs. 1—4—0. If boys could be engaged for the work the cost would be 6 annas less, i.e., only Re. 0—14—0 per acre. Considering that it costs only 14 annas to treat an acre of seedlings the seeds from which could be transplanted over 13 acres the normal yield from which may be 39,000 pounds of paddy worth Rs. 1200 even in these days of depression and considering the efficacy of the treatment, spraying tobacco decoction may be considered to be one of the best ways of controlling thrips in paddy seed beds. And this method can be specially recommended in areas where water is not easily available to check the pest by flooding the nurseries.

The authors are thankful to the Paddy Specialist for having afforded facilities for conducting their trials at the Paddy Breeding Station.

AN ECONOMIC ENQUIRY OF THE CULTIVATION OF PLANTAINS IN THE ERODE TALUK

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Plantain is an important crop grown in the wetlands of the Erode Taluk, ranking next to paddy. The following table gives the acreage of the wetland-crops here for the year ending June 1933.

Crop.	Acreage in 1933.	Normal acreage.	Difference in acres.
Paddy	19,324	18,055	+1269
Plantains	1,782	864	+ 918
Sugarcane	509	634	- 125

It may be seen that the area under plantains has nearly doubled and with the present slump in the paddy market continuing and with

the relatively better prices for plantains, the area under plantains is likely to increase.

Soil. The wet-land soil of this tract is a sandy loam, well drained and the depth of the soil varies from 4 to 4½ feet. Years of manuring and cultivation have made the soils very fertile. The rich silt brought down with the irrigation water has also contributed to raise the fertility of the soil.

Varieties. The important varieties of plantains grown here are the *Monthan*, *Poovan*, *Rasthali* and *Pachainadan*. *Monthan* occupies nearly 50 per cent. of the area, the rest occupying nearly 35, 10 and 5 per cent. respectively.

Season. The suckers are planted in June—July, September or November. The November planting is considered to be the best, since the period from flowering to harvest is free from heavy winds. The mature crop of the other season plantings are often caught in the heavy westerly winds and serious loss of bunches results.

Preparatory Cultivation. After the harvest of the previous paddy crop, pits 1′ × 1′ × 1′ are dug 8 feet apart between the rows and 7½ feet apart along the rows, 726 suckers going to an acre. Well developed suckers 5 to 6 months old are selected from the standing crops in the neighbourhood and are planted in the pits. The soil round the suckers is rammed well 3 days after planting, to stimulate fresh root development.

After Cultivation. After the planting is over, the area is worked with *mamooty* and one or two ploughings are also given. Within four days of planting, trenches are dug in between alternate rows to a depth of nearly a foot, both along and across the field to enclose four plants in each bed or plot. These trenches serve both for drainage and irrigation.

If the field is water-logged and not easily drained, the trenches are deepened in the second month and again in the third or fourth month, the final depth being 3 to 3½ feet. The beds are *mamooty*-hoed at intervals of 3 weeks and the plants are earthed up. On the whole 12 diggings are done.

Manures and manuring. Manure is applied about two months after planting, usually after the second digging and the manure most in favour is ground-nut cake, applied at the rate of 2½ lbs. of the powdered cake per plant. Sometimes municipal rubbish and farm yard manure are applied. Excess of manuring is avoided for plantains as it stimulates many side-shoots detrimental to the main crop.

Irrigation. The plantain crop requires a large quantity of water and in this tract about 20 irrigations are given, about once a fortnight. Water is allowed to stand in the trenches for a day to a depth of nearly 6 inches and then drained off. Since the source of irrigation is the

Kalingaroyan channel which is closed during April and May, the crop is not irrigated these two months and the crop is entirely dependant on summer showers amounting to about 4 inches.

Removal of Side-shoots. Along with the main shoot, eyes from the planted bulb develop and compete with the main crop. They are cut close to the point of attachment with the main bulb and removed. This is done to maintain and develop the vigour of the main stock.

Maturity and Harvest. From the ninth month onwards from planting, the crop puts forth bunches which develop in 3 to 5 months, depending on the variety. The plants mature early, if the summer is unusually hot and dry. If the crop is in bunches when the westerly winds are strong, the plants are propped with bamboos.

The Plantation. When the standing crop is in bearing two side shoots that develop at that stage are allowed to grow for succeeding the mother-plant after it is removed. Sometimes one plant may be retained and the rest removed to plant new areas. Some ryots keep two suckers, gather leaves regularly from one of them, the other being allowed to develop for the bunch. The plantain is maintained for nearly three years, and 3 crops of bunches are gathered, leaves alone being harvested from the plantation after the harvest of the third bunch crop.

After the harvest of the bunch, the mother-plant is cut leaving five feet of the stem in the ground. After the sucker starts vigorous growth, the stem is cut back farther leaving about a foot in the ground.

The other cultural operations for the second and third generation of plants is the same as for the first generation.

The cost of cultivation of plantains in two holdings at Surampati village in Erode Taluk are given below. *Poovan* plantains were grown in both the holdings, for 3 years from 1931. Each holding had a permanent cooly at Rs. 3 - 0 - 0 a month, for guiding water and watching the crop. Additional labour was hired on contract whenever necessary. Bullocks were not maintained by either.

Holding A is 1½ acres in extent and is cultivated by Mr. Subbanna Goundan and holding B is 2½ acres and cultivated by Mr. Kandasamia Pillai.

Cost of cultivating plantains in the two holdings reduced to an acre in each case, for 3 years that the plantation was maintained.

	Holding A. Rs. As.Ps.	Holding B. Rs. As.Ps.
1. Ploughing once and digging pits 1' deep, in the first year	7—5—4	8—0—0
2. Suckers bought at Rs. 20—0—0 per 1,000 ...	13—5—4	14—6—5
3. Charges for collecting suckers from various gardens, carrying and planting them at Rs. 0—12—0 per 100 ...	5—0—0	5—6—5
4. Fencing in the first year	12—0—0	10—0—0
5. Trenching in the first year at Rs. 20—0—0 per acre, on contract	20—0—0	20—0—0

6.	Deepening the trenches in the second and third year	3—5—4	4—0—0
7.	Digging with *mamooties* and earthing up, spent every year	120—0—0	138—0—0
8	Cost of ground-nut cake, 2 barams an acre a year for 3 years, at Rs. 13—0—0 a baram of 1,000 lbs. ...	78—0—0	78—0—0
9.	Applying the groundnut cake	4—0—0	3—9—7
10.	Guiding water and removing suckers by a man at Rs. 3-0-0 a month, with a little extra labour at times	73—2—0	43—3—2
11.	Bamboos for propping, purchased in the first year; ⅙th the number of plants being propped in holding A and ¼th the No. in B	10—0—0	20—0—0
12.	Harvesting the bunches and taking them to the owner's house 1½ miles off, at Rs. 0—1—6 a bunch ...	178—2—0	191—4—0
13.	Land revenue for 3 years	36-12—0	37—8—0
14.	Interest for 3 years on the value of the land at Rs. 3 per cent.—Value of land at Rs. 1,500—0—0 an acre ...	135—0—0	135—0—0
	Total expenditure in 3 years ...	696—0—0	708—5—7
	Receipts.		
1.	By sale of bunches at Rs. 0—8—0 each, in 3 years ...	950—0—0	1,020—0—0
2.	By sale of suckers, at Rs. 20-0-0 per 1,000, in 3 years	20—0—0	36—0—0
	Total receipts in 3 years ...	970—0—0	1,056—0—0
	Net receipts—total receipts minus expenditure for 3 years	274—0—0	347-10—5
	Net receipts in an year—i.e. income from an acre a year	91—5—4	115-14—2

[*Note*:—The income from the two holdings under the plaintains are Rs. 91 and 116 respectively, and compare favourably with what is obtainable by cultivating Paddy. The holding A had 666 plants to the acre and the holding B had 720 plants to the acre, and the difference of Rs. 25 between the incomes of the two holdings is clearly due to the difference in the number of bunches obtained. The cultivation operations and their cost are more or less the same for both the holdings. Both had a man on Rs. 3—0—0 a month for guiding water and watching the crop and the cost of his maintenance is distributed over 1½ acres in A and 2½ acres in B. which has increased the cost of cultivation in A by nearly Rs. 10—0—0 a year, per acre. This incidentally indicates the desirability of having economic-sized holdings with reference to the manual and cattle labour on the farm. For the one-man farm under plantains, 2½ acres would appear to be nearer the economic limit. So small factors in farming, like the number of plants in an area, or the number of men or pairs on the land, which may not be apparent always, operate and lead to failure or success in farming.

Such enquiries are very helpful in locating the weak spots in the cultivation programmes, which ultimately lead to failure. In the present case, the charges for harvesting and carrying the bunches to the ryot's house would appear to be enormous and economy on this item of expenditure is clearly indicated.

Plantains are cultivated at a heavy cost requiring an investment of Rs. 240—0—0 an acre a year, which stands in the way of expansion of cultivation of the crop. Further, the plantain bunch is a perishable product and wholesale expansion of the area under plantains is not likely or possible. Nevertheless, a certain amount of expansion would be stimulated by quicker transport facilities to the North Indian markets at economic rates. Cold storage facilities and researches on packing methods would improve the keeping quality of the fruit. All these would help to enlarge the market for the fruit and the area under the crop would automatically keep pace with the increased demand.—V. T. S.]