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The Cultivation of Betel vine (*Piper betel*) in Poonamallee village.

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Introduction. In view of their proximity to Madras City, where there is a great demand for the leaves, betel vine cultivation is very important in the villages of Poonamallee and Kunnathoor. The area under this crop at present is about 350 acres. The crop is cultivated entirely under well irrigation, except for a few months in the year (October to March) when water from the Chembarambakkam tank is utilised. Unlike other crops which are raised by the efforts of individual farmers, a plot of betel vine garden is managed by a group comprising 15 to 20 men, who pool their resources to meet the cultivation expenses and likewise share the profit. The land is generally taken on lease, and the lease amount ranges from Rs. 75 to Rs. 100 per acre. About ten years ago, gardens when once started, used to flourish and yield well, even up to six years. Lately, the life of a garden has become shortened and now-a-days no garden thrives for more than three years. This is attributed to wilt disease, common in all the gardens in this tract. The gardens go by the name *Illangal thottam* in the first year, *Sambakkal thottam* in the second year, and *Muthukal thottam* in the third year. Each cultivator will have a share in each of the three stages of maturity, so that he may have a steady income.

Varieties cultivated. The main variety cultivated is the *Ravesi*. The leaves of this variety are of medium size, light green and not too pungent. The other varieties which are very sparingly cultivated in these parts are

Korpura and *Kammiar*. The former resembles the *Ravesi* in shape, size and colour, but it is more pungent. The *Kammiar* leaves are deeper green and broader than the other two varieties.

Planting season. There are two distinct seasons for starting a garden—January to February and June to July. In spite of the advantages present in planting in June to July season, when owing to the receipt of North-east monsoon rains fewer irrigations will be required to rear the cuttings, the cultivators usually prefer the other season, because from experience, they have realised that the gardens started in January to February season yield better. This may be probably due to the dry weather that prevails during these months which facilitates quick establishment of the cuttings.

Calendar of operations.

Operations.	Planting season.	
	Jany. to Feby.	June to July.
Preparation of land (ploughing and trenching)	Jany.—Feby.	June—July. ✓
Sowing <i>agathi</i> (<i>Sesbania grandiflora</i>) seeds in trenches.	- Do.	Do.
Planting betel vine cuttings in trenches. ...	April—May.	Sept.—October.
Initial trailing of the vines on the <i>agathi</i> 'standards'.	End of July.	End of December.
Tying bamboo or dried <i>agathi</i> poles horizontally, to the <i>agathi</i> 'standards' at a height of 6 to 7 ft. and forming arches.	September.	February.
First picking of leaves.	November.	April.

Details of cultivation. (i) *Preparatory cultivation.* Trenches, two feet broad and one and a half to two feet deep are dug along the length of the field, about four feet apart. Generally, no ploughing is done before the trenches are dug. Irrespective of the shape of the land, the total length of the trenches will be about 7,000 running feet per acre. Trench digging is usually done, on contract.

(ii) *Manuring.* The manures generally applied are cattle manure and horse dung. Sometimes, tannery refuse also is applied. Generally, no manuring is done at the time of preparing the land, but three months after planting the cuttings, farm-yard manure is applied at the rate of 25 to 30 cartloads per acre. From this time onwards manuring is done at the above dose, once in three or four months.

(iii) *Sowing the 'standard'.* On the ridges formed "*Agathi*" (*Sesbania grandiflora*) seeds mixed with "*Thagarai*" (another species of *Sesbania*) in the proportion of 4:1 are sown in lines. Generally four lines are sown with four to six seeds dropped in each hole, spaced six inches apart. Along with this, about 200 plantain suckers are also planted on the ridges. The plantain crop is raised primarily for its yield of fibre necessary for tying up the vines to the standards and for tying bundles of harvested leaves, but incidentally the crop yields a revenue from the bunches and

leaves which find a ready market. The *agathi* crop has to be irrigated from time to time and in about three months the standards will be about four to five feet high.

(iv) *Planting cuttings.* The next operation is the preparation of the flat surface of the ridges, to plant the vine cuttings. The surface is levelled and the edges are slightly raised to hold water. Cuttings with at least three nodes are planted in a slanting position, so that two of the three nodes are well covered by soil.

(v) *After cultivation.* These newly planted cuttings have to be irrigated (usually by splashing water stored in the trenches) four or five times a day during the first fortnight. During the third and the fourth weeks, watering is done twice a day and afterwards once a day. The cuttings strike root after about 30 to 40 days, and fresh shoots appear from about the 60th day onwards. About four or five months after the planting of cuttings, long bamboo poles (*agathi* stems from old gardens can be got at a cheaper rate) are tied horizontally to the *agathi* standards about six feet from the ground level. Out of the four rows of *agathi* standing on the ridges, two from one ridge and two from the next are bent and tied together just above the middle of the trench in the form of an arch. The growing shoots are generally trailed on the standards once in ten days or a fortnight. In about six months from the date of planting, the vines would have grown up to a height of about seven feet and the first picking of leaves can be done. If the vines are allowed to grow tall, gathering of leaves will become difficult. So, once in the first year and twice in the succeeding years, the vines that have grown above seven feet are brought down, the lower four feet coiled and covered up with earth. The distal ends of the shoots are trailed again on the 'standard'.

(vi) *Harvesting.* The first picking of the leaves can be done at the end of the sixth month after planting. In the first and second years the leaves are gathered once in a fortnight, while in the third year, the interval between two successive pickings is reduced to ten days and the quality of leaves obtained is slightly inferior. Usually the cultivators themselves and the members of their family attend to picking of leaves. Occasionally, outside labour is engaged, and each labourer is paid at the rate of one to one and a half annas for a basket full of leaves (6,400) gathered. Apart from the betel leaves, the growers gather tender *agathi* shoots at intervals of about one month and sell them in the market. There is a great demand for it as 'greens' and for feeding milch cattle. From the plantain suckers, about 175 bunches are got by the end of the first year. After harvesting the bunches, the mother plants are cut off, leaving one side-sucker in each stool. Thus, every year, about 175 bunches of plantains are also obtained; besides these, plantain leaves are also cut and sold. In addition, vegetables like brinjals, chillies, etc., are also grown (as a catch crop) here and there in the gardens. They are mostly used for domestic consumption and rarely sold.

Cost of cultivation per acre.

Details.	1st year.	2nd year.	3rd year.
(a) <i>Expenditure.</i>	Rs. a. p.	Rs. a. p.	Rs. a. p.
1. Digging trenches, 2 ft. broad and 1½ ft. to 2 ft. deep, 4 ft. apart, @ 2½ annas for 50 running feet of the trench. ...	20 0 0		
2. Marking lines on the ridges making holes 6" apart on the lines and sowing <i>agathi</i> seeds 12 men at 4 annas each. ...	3 0 0		
3. Cost of <i>agathi</i> and <i>thagarai</i> seeds (24 M. M. at Rs. 2-8-0 per M. M.*) ...	60 0 0		
4. Cost of 200 plantain suckers at 1 anna each.	12 8 0		
5. Cost of labour for planting the suckers 8 men at 4 annas each. ...	2 0 0		
6. Cost of watering <i>agathi</i> on alternate days from the time of sowing to the time of planting the betel vine cuttings (3 months) at Re. 1-4-0 per watering. ...	56 4 0		
7. Taking mud from the trenches, plastering the sides of the ridges and rectifying the ridges just at the time of planting the cuttings and subsequently once in a month (9 times in the first year and 12 times in the succeeding years) 30 men for each operation at 4 annas each. ...	67 8 0	90 0 0	90 0 0
8. Cost of betel vine cuttings 135 bundles of 220 cuttings each at 3 bundles for a <i>Varahan</i> (Rs. 3-8-0). ...	157 0 0		
9. Cost of labour for planting the cuttings 20 men at 4 annas each. ...	5 0 0		
10. Cost of irrigation during the first fortnight (splashing water 4 or 5 times daily) at Rs. 2 per day. ...	30 0 0		
11. Cost of irrigation during the second fortnight (splashing water twice a day) at Rs. 1-8-0 per day. ...	22 8 0		
12. Subsequent irrigations (splashing water from the trenches) once a day at Re. 1-4-0 per watering—about 240 irrigations in the first year and 300 irrigations in the succeeding years. ...	300 0 0	375 0 0	375 0 0
13. Cost of tying up the cuttings to the <i>agathi</i> stems once in a fortnight from the 6th month onwards (12 times in the first year and 24 times in the second and third year) 10 men at 4 annas each for each operation. ...	30 0 0	60 0 0	60 0 0
14. Cost of 3,500 bamboos for tying the <i>agathi</i> standards at Rs. 5 for 120 bamboos. ...	137 8 0		
15. Cost of ropes required for tying the above. ...	15 0 0		
16. Labour required for the above item, 40 men at 4 annas each. ...	10 0 0		
17. Cost of labour for picking leaves at 1½ annas for basketful of leaves (6,400)—four pickings in the first year, 24 in the second and 36 in the third year. In the first and second years 100 baskets per picking and in the third year only 50 baskets per picking. ...	31 4 0	187 8 0	140 10 0

* M. M. = Madras Measure (roughly three pounds).

Details.	1st year.			2nd year.			3rd year.			
	Rs.	a.	p.	Rs.	a.	p.	Rs.	a.	p.	
18. Cost of labour for gathering <i>agathi</i> leaves twice in the first year, 10 times in the second year and 6 times in the third year.	3	0	0	15	0	0	9	0	0	
19. Manuring, twice in first year 4 times in the second and third years at 25 cartloads each time at Re. 1-8-0 per cartload. ...	75	0	0	150	0	0	150	0	0	
20. Cost of labour for bringing down the grown up vines making coils of the lower portions, putting soil over them and trailing the young shoots to the standards—twice in the second year and twice in the third year, 80 men at 4 annas each for each operation. ...					40	0	0	40	0	0
21. Lease amount (Land). ...	100	0	0	100	0	0	100	0	0	
22. Cost of levelling the fields and bringing to the original condition. ...							14	14	0	
Total. ...	1,138	0	0	1,017	8	0	979	8	0	
Grand Total. ...									Rs. 3135/-	

(b) Receipts.

1. By sale of betel leaves at Rs. 2 per basket of 6,400 leaves—1st year, 4 pickings, 100 baskets for each picking. 2nd year, 24 pickings, 100 baskets each time, third year 36 pickings, 50 baskets each time. ...	800	0	0	4,800	0	0	3,600	0	0
2. By sale of <i>agathi</i> leaves at 2 annas a bundle—400 bundles in 2 cuttings in the first year, 2,000 bundles in 10 cuttings in the second year, and 900 bundles in 6 cuttings in the third year. ..	50	0	0	250	0	0	112	8	0
3. By sale of plantain bunches (175) at 6 annas each. ...	65	10	0	65	10	0	65	10	0
4. By sale of plantain leaves, vegetables grown in the garden, etc. ...	10	0	0	50	0	0	30	0	0
Total. ...	925	10	0	5,165	10	0	3,308	2	0
Grand Total.				Rs. 9,899	6	0			
Gross income for three years ..				9,899	6	0			
Gross expense for three years ..				3,135	0	0			
Net profit for three years ..				6,764	6	0			
Net profit per annum ..				2,254	12	8	or	Rs. 2255/-	

This amount has to be shared by about 15 cultivators, so, the net gain per cultivator per annum, will be about Rs. 150.

(vii). *Marketing.* The chief market for the leaves, is the city of Madras. Every day about 3 p. m. all the betel vine growers of the village assemble in a common place with the gathered leaves, cleanly washed, counted and arranged in baskets. The unit of sale is one *Kavuli* or hundred leaves. Merchants from the city come to the spot, the price for the day is fixed, and sales are effected.

Some years back there was considerable demand for these leaves from Northern India, but now-a-days those far off markets, have been reported to be captured by the betel vine growers of Sankaridrug (Salem District) and other places.

Pests and Diseases. The betel vines of these parts do not suffer from any insect pest, but the wilt disease is causing considerable damage. About 20 years ago each garden is reported to have fared well up to six years. Gradually, due to wilt disease, the life has been reduced and the gardener must now consider himself lucky if it survives for full three years. Recently, cases have been noticed where the vines have begun to wither even in the second year. The main cause of wilt disease is reported to be due to (i) cultivation of vine in the same land without adopting any rotation, or (ii) keeping the trenches always moist, a condition much favourable to the growth of the fungus. The ryots abandon the gardens when the disease has advanced to a fair extent.

The *agathi* 'standards' have been found to suffer from two insect pests, (a) *Agathi* stem borer, (*Azygophleps scalaris*) and (b) *Agathi* weevil (*Alcidodes bubo*). Generally these appear only as minor pests, but some times the attack may be severe. When the *agathi* plants are very young, if these pests appear on a large scale, the plants never grow above two feet, and in such cases also, the ryots abandon the garden and start afresh.

***Phaseolus sublobatus* Roxb. A new green manure and forage plant.**

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A specimen of a leguminous plant (*Phaseolus sublobatus* Roxb.) known in Tamil as *Karum payar* was received from Sri. C. S. Seshagiri Ayyar, Agricultural Demonstrator, Perambalur, Trichinopoly District, for identification and on requisition he has given the following information regarding its cultivation in the Trichinopoly taluq.

An area of about 10,000 acres is grown under this plant in the Trichinopoly taluq as a mixture with irrigated *Cumbu* (*Pennisetum typhoides* Steud and Hubbard) from April-May to July-August. After the harvest of the *cumbu* crop, the *Karum payar* crop is allowed to be grazed by cattle or used as green manure by puddling *in situ* for the next paddy crop. The plants which are grazed by cattle will soon shoot up and give sufficient quantity of green manure. The crop is also raised as a mixture in dry lands with *cholam* (*Sorghum* sp.) red gram (*Cajanus Cajan* (Linn) Millsp.), etc., and from this crop seeds are gathered for sowing in the next season. Seeds are not collected when it is grown in the wellands. This green manure crop is preferred by the ryots first because it does not smother *cumbu* like