SERICULTURE PROJECT No. 2
(Revised–1986)

ECONOMICS OF SERICULTURE UNDER IRRIGATED CONDITIONS

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(Central Silk Board–Ministry of Textiles–Govt. of India).
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FOREWORD

This project document was brought out in 1982. It was well received and the first print of 5000 copies became out of stock in 1984 itself. We are being pressed for this document from different spheres—technicians, sericologists, planners and administrators alike. This is a revised edition incorporating the recent research results in this field. A modest attempt has been made to bring out all practical details of "Economics of sericulture under irrigated conditions."

I sincerely hope that this revised edition will be welcomed by the readers and it will serve the purpose in the respective area of operation.

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ECONOMICS OF SERICULTURE UNDER IRRIGATED CONDITIONS

INTRODUCTION

Nearly 50 per cent of the cost of cocoon production accounts for raising the food plant, mulberry. Therefore, the productivity and the profitability in sericulture depend mainly on maximisation of leaf yield, per unit area at reasonable cost. The intensive agronomic research carried out at Central Sericultural Research and Training Institute, Mysore has resulted in formulating the 'Package of Practices' for mulberry cultivation under irrigated conditions. The technique which emphasise on the use of high yielding mulberry variety (Kanva-2), system of plantation, adequate inputs like water and manures and proper cultural practices, have helped to increase the leaf yield from 15,000 kgs to 35,000 kgs per hectare per year. As a result, sericulture today has become one of the most remunerative cash crops under irrigated condition. The mulberry cultivation under irrigation has increased to nearly 50,000 hectares in South Indian Sericultural states alone, in the last six to eight years.

While the recommendations of the "Package of Practices" have been no doubt helpful, information on the organisational and management aspects for the farmers, particularly the new entrants, to develop sericulture as a viable project, was lacking, economic holding and efficient management in sericulture are all the more important in the present context. The cost structure and profitability of establishing mulberry and raising cocoon crops, are discussed in this paper, in two parts, viz., Mulberry cultivation and Silkworm rearing.

Part—I: MULBERRY CULTIVATION

Mulberry is a perennial crop and once it is properly established during the first year, it can come to full yielding capacity during the second year and last for over 15 years without any significant deterioration in leaf yield. It is, therefore, very important that the initial planting and establishment of the crop is carried out according to scientific methods for obtaining best results in the subsequent years.

1. Selection of land

Mulberry is a hardy plant. It could be grown on any type of land and soil but a flat or slightly slopy land with red-sandy loam is ideal. The pH of the soil should be around 6.5. If the soil is acidic or alkaline, it should be corrected by addition of lime or gypsum respectively. Since mulberry is a deep rooted plant, the soil should be sufficiently deep.

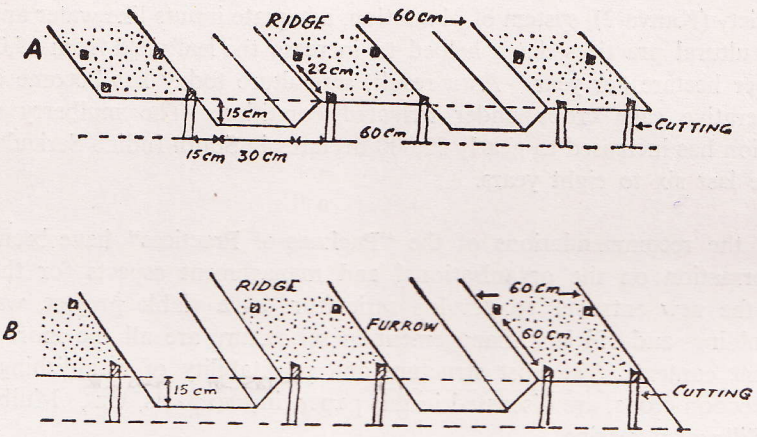
2. Preparation of land

New plantation can be taken up at any time under assured irrigation, except severe winter period in December-January. Usually pre-monsoon showers in April-May are

considered advantageous to start this operation. The land should be given a deep digging to a depth of 30 to 35 cm in order to loosen the soil and it should be ploughed once or twice to give a fine tilth. A basal dose of farm yard manure at the rate of 20 tonnes per hectare is applied and incorporated into the soil by ploughing.

3. Preparation of ridges and furrows

The prepared and levelled land is thrown into ridges and furrows alternately either by using a ridge former or manually. The furrows should be atleast 15 cm deep. The cuttings/saplings are later planted along the edges of the ridges on either side as shown in Fig. 1.



A. Row system (60×22 cm) B. Pit system (60×60 cm)

Fig. 1. Formation of ridges and furrows and correct way of planting

4. Preparation of cuttings

Mulberry is propagated vegetatively through cuttings. Improved variety (Kanva-2) should be used for advantages on leaf yield and quality. The branches which are 6 to 8 months old and 10 to 12 mm in diameter are selected for cuttings. These are cut into bits of 18 to 20 cm length with a minimum of 3 to 4 healthy buds. The cut should be clean and should not damage the bark. The greenish tender portion of the branch should be rejected.

5. Spacing and planting

There are two systems of planting under irrigated condition, viz., the row system and the pit system. In the row system, the rows are made 60 cm apart and the cuttings/ saplings are planted in the row at a distance of 22 cm. In the pit system, the rows are made 60 cm apart and the cuttings/saplings are planted at a distance of 60 cm in the row. In case of row system, the leaf harvest is made by bottom pruning of shoots at a height of 7.5 cm whereas in pit system harvesting is by leaf picking. The cuttings/saplings are

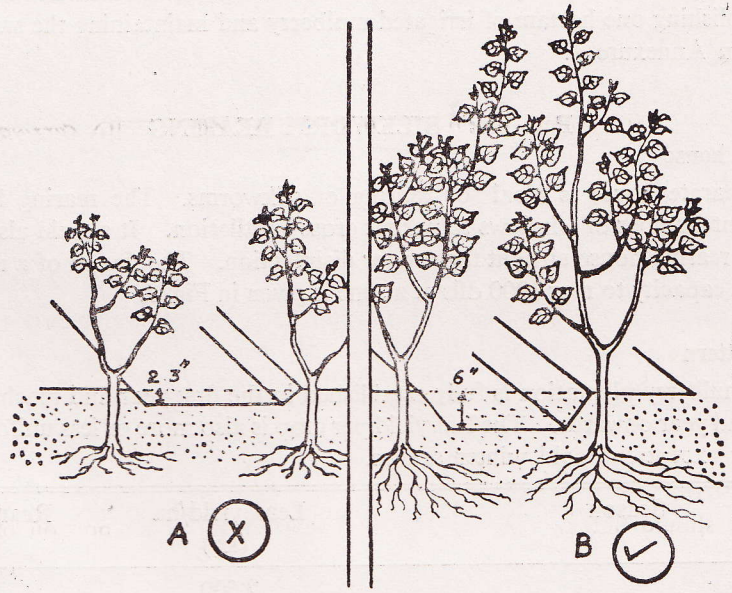
planted along the margin of the ridges in the desired system and the soil around the cuttings/saplings is pressed compactly.

6. Inter-cultivation

Two months after planting, a light hoeing and weeding should be done. A second weeding is done after another 2 to 3 months. Thereafter, inter-cultivation should be done after every pruning or harvest. The weeding operation should be thorough and the soil should be dug deep to remove the weeds with roots. This also results in loosening of the soil and stimulation to the plants to grow vigorously.

7. Irrigation

The plantation taken up during the monsoon period have the advantage of receiving fairly distributed rains from June to November. If the rain is not adequate or fails for over 10 to 12 days, it should be supplemented with the required irrigation. During the dry period from December to May, systematic irrigation should be given regularly at an interval of 8 to 14 days depending on the type of soil. About $1\frac{1}{2}$ to 2 acre inches of water is required per irrigation, so that water fills the channels completely and percolates deep and does not get depleted from the root zone easily due to evaporation. The correct method of irrigation is illustrated in Fig. 2.



A. Shallow channel and superfical irrigation B. Proper size channel and deep irrigation

Fig. 2. Correct way of irrigation

8. Manuring

Under assured irrigation, the mulberry will grow vigorously and the first dose of fertiliser should be given after two and half months of planting, at the rate of 40 kg N/

hectare. By sixth month, the plants would be ready for first harvest of leaves. Thereafter, the normal fertiliser application programme could be resorted to, following each harvest, at the rate of 300:120:120kg N:P:K per hectare per year in split doses (Annexure 1).

9. Pruning

After 5-6 months of planting, mulberry attains a height of 2 metres and will be ready for first harvest of leaves. In row system, the plants are pruned 2.5 to 7.5 cm above the ground level. Subsequent harvests are done at about 10 weeks interval.

In the pit system, the first harvest of leaf is done after 5-6 months of planting. The well established plantations are pruned twice a year, the first during early June and the second in November at a height of 8-10 cm above the ground level. The first harvest after pruning will become due after 10 weeks and thereafter subsequent harvests can be made at 6 to 8 weeks' interval depending on the growth. In all, six harvests can be taken in this system of cultivation.

The new plantation will be established in six months' time. In the first year itself, 2 to 3 harvests can be taken, depending on the growth. From second year onwards, the plantation starts yielding to full capacity. The summary of schedule of operations for both row system and pit system of plantations are given in Annexure 2 and 3. The cost of establishing one hectare of irrigated mulberry and maintaining the same are given, item wise, in Annexure 4.

Part—II: SILKWORM REARING

1. Rearing house

A separate house is ideal for rearing of silkworms. The rearing house should have sufficient number of windows to permit cross ventilation. It should also be possible to make the rearing house airtight for proper disinfection. The design of a model rearing house with a capacity to rear 1000 dfls at a time is given in Fig. 3.

2. Crop pattern

The mulberry plantation is fully established in the first year and reaches maximum yield from 2nd year onwards. The leaf yield per crop is also more or less uniform throughout the year except the cold winter season.

Crop No.	Season	Leaf yield/ha (kg)	Rearing capacity (dfls)
1.	August	7,500	1,000
2.	October-November	7,500	1,000
3.	January	6,000	800
4.	March-April	7,000	900
5.	June	7,000	900
		35,000	4,600

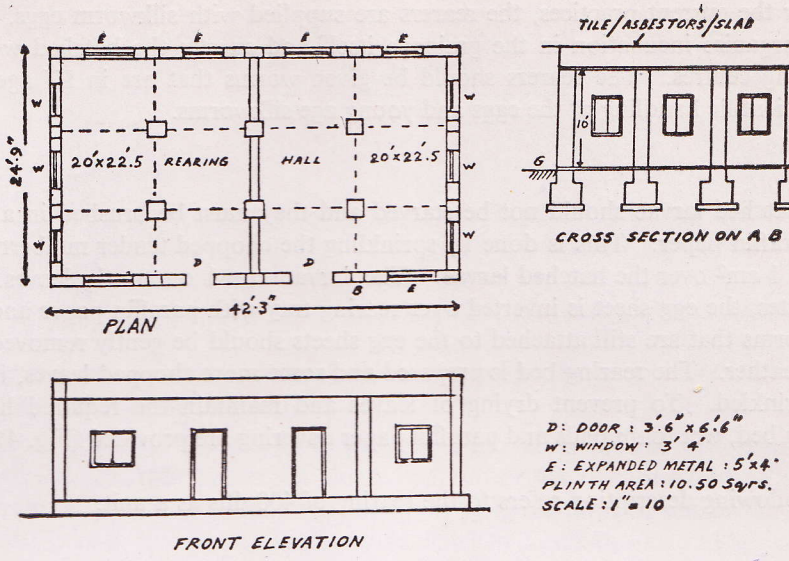


Fig. 3. Design for rearing house to rear 800–1000 layings at a time

In the pit system, though the annual yield is comparable to that of row system, six crops could be taken by leaf picking instead of 5 in row system.

Rearing of 800 to 1000 dfls at a time is a bigger unit. It is advisable to split the mulberry garden into two units of $\frac{1}{2}$ hectare each, to facilitate rearing of 400 to 500 dfls at a time. However, two separate rearing units are necessary to avoid overlapping of batches and management problems. The design of the rearing house given in Fig. 3 will suit this purpose.

3. Preparation for brushing

Before commencement of each rearing, the rearing equipments and the rearing house must be thoroughly washed, dried and disinfected with formalin. Two per cent to 4 per cent formalin is sprayed on equipments, walls, roof and floor uniformly to destroy the disease causing organisms. The room should be kept airtight for about 24 hours after disinfection. A quantity of 7 to 8 litres of 2 per cent formalin is required to disinfect 100 m^2 of area. The doors and windows should be kept open atleast for 24 hours before commencement of rearing to eliminate the smell of formalin.

4. Incubation of eggs

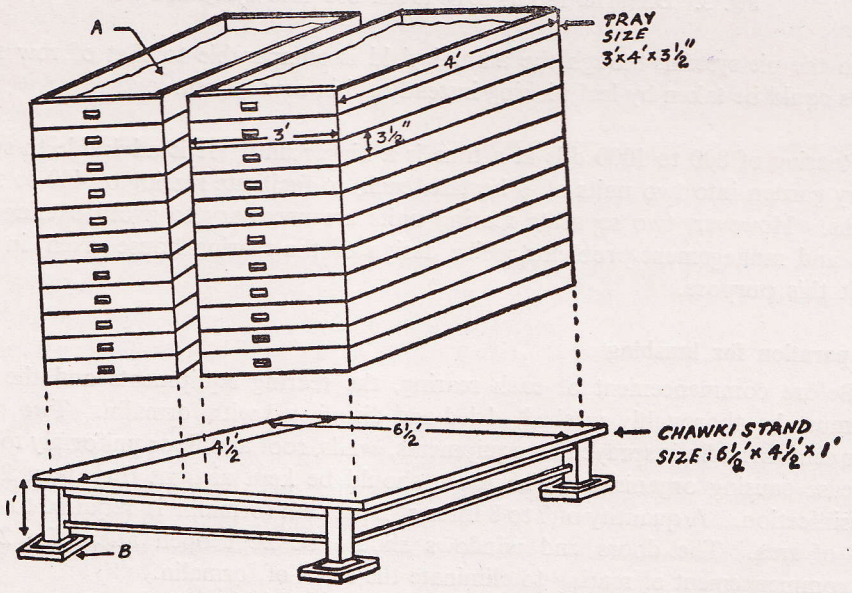
The disease free layings should be purchased from a recognised grainage. The egg sheets should be spread out in a single layer on a tray. Temperature of 25°C and humidity around 80 per cent are maintained. For this, paraffin paper and wet foam pads may be used. When the eggs come to 'head pigmentation' stage, (about 48 hours before hatching) they should be kept in darkness by wrapping them in black paper or by keeping them in a box (black boxing). On the expected day of hatching, they are exposed to light early in the morning. Most of the eggs (90 to 95 per cent) will hatch in about 2-3 hours.

Under the current practices, the rearers are supplied with silkworm eggs. It will be ideal to organise incubation in the grainage itself and supply the hatched worms to chawki rearing centres. The rearers should be given worms that are in III age. This will ensure scientific handling of the eggs and young age silkworms.

5. Brushing

The hatched larvae should not be starved and they must be brushed in a rearing tray with paraffin paper. This is done by sprinkling the chopped tender mulberry leaves of size 0.5 to 1 cm^2 over the hatched larvae. The larvae crawl on to the leaves. After 8 to 10 minutes, the egg sheet is inverted over rearing tray with paraffin paper and gently tapped. Worms that are still attached to the egg sheets should be gently removed to the tray with a feather. The rearing bed is prepared and some more chopped leaves, if necessary, are sprinkled. To prevent drying of leaves and maintain the required humidity in the rearing bed, wet foam pads and paraffin paper covering are provided (Fig. 4).

The following description refers to the rearing of 400 dfls as a unit.



A. Paraffin paper B. Ant well

Fig. 4. Box rearing

6. Young age silkworm rearing

In a tray of 4′ × 3′ × 3½″ size, 20 disease free layings are brushed and reared till the end of second age. Temperature and humidity requirement, bed spacing for every unit of 20 dfls for each day, number of feeds and quantity, cleaning etc., are indicated in the following chart.

Age of worms	Days	Temp. °C	Humidity (%)	Bed spacing (20 dfls)	No. of feedings/day	Qty. of leaf/day (kg)	Bed cleaning
I	1st			9″×12″	4	0.200	—
	2nd			18″×12″	4	0.200	—
	3rd			18″×16″	4	0.240	1
	4th	27	90	18″×24″	2/3	0.090	(Moult)
II	5th			18″×24″	4	0.400	1
	6th			24″×24″	4	0.800	1
	7th			30″×42″	3	0.450	(Moult)

7. Quality and selection of leaf

From brushing to the end of second age, the larvae are fed with tender leaf. The leaves are selected from the largest glossy leaf, 3rd or 4th from the top. The next 6 to 8 leaves are used to rear the young age worms upto II moult. The size of the chopped leaf is around 0.5 to 1 cm^2 during the first age and 1 to 2 cm^2 during 2nd age. The selection of leaf from a fully grown branch is illustrated in Fig. 5.

8. Leaf preservation

Silkworms grow best when fed with succulent leaves which are rich in nutrients and moisture. The leaf, if not preserved properly, dries up and become unsuitable for

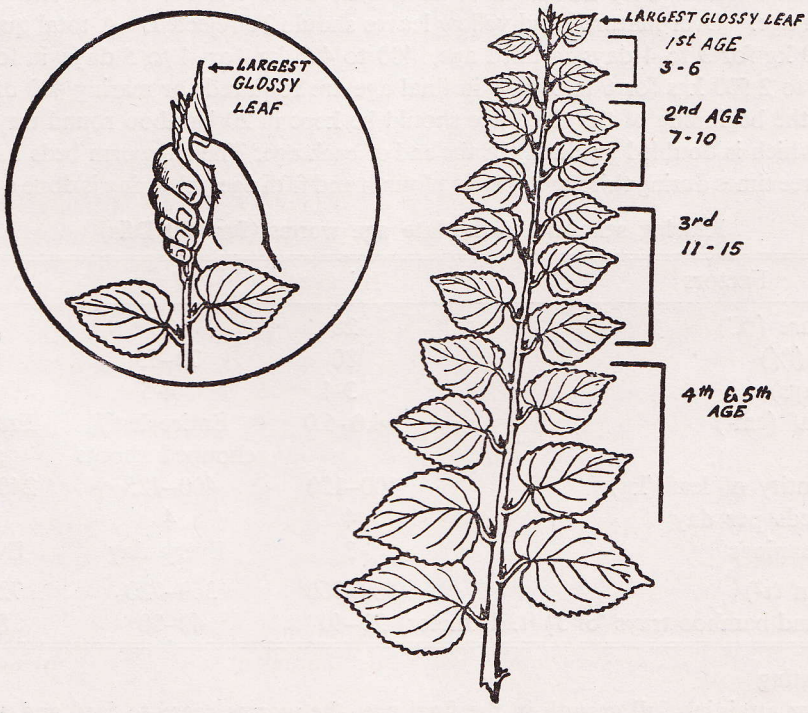


Fig. 5. Selection of leaf for rearing

feeding. Harvested leaves must be preserved in fresh condition in a wet gunny cloth. If the climate is too hot and dry, the leaves must be sprayed with water. It is better to preserve leaves in a leaf chamber which is lined with gunny cloth, that is kept wet by spraying water at frequent intervals.

9. Cleaning

Cleaning of silkworm bed is necessary to remove the excreta and left over leaf. In the first age, one cleaning is given just a day before the worms settle for moult. In the second age, two cleanings are given, one after resumption of feeding and the other a day before the second moult. A net with 'mesh' size 0.5 × 0.5 cm is spread over the rearing bed and feeding is given. The worms crawl through the net and come to fresh leaves. The net along with the worms and leaves are transferred to another tray and the left-over leaf and litter are discarded.

10. Moulting

At the time of moulting, care should be taken not to disturb the worms. Correct detection of moult and stopping or resuming feeds are very important for uniform growth of silkworms. The rearing bed should be kept thin and dry and should have proper aeration.

11. Late age silkworm rearing

The silkworms of third, fourth and fifth ages are considered as late age worms. The temperature and humidity requirement gradually comes down as the stage advances. Leaves of medium maturity are fed in the third and fourth age and coarser leaves are fed in the fifth age. Over matured and yellow leaves should be rejected. A total quantity of 100 to 120 kg for 3 to 4 days in third age, 400 to 425 kg for 4 to 5 days in fourth age and 2,400 to 2,500 kgs for 6 to 7 days in final age are required for rearing 400 dfls. The worms in the beginning of the third age should be kept in 20 bamboo round trays of 3½/ diameter which is doubled gradually by the end of each age. The silkworm beds have to be cleaned three times during third age. During fourth and fifth ages, cleaning is done every day.

Rearing schedule of the late age worms (for 400 Dfls)

Factors	III age	IV age	V age
Temperature (°C)	26	25	24
Humidity (%)	80	70–75	70
Period (days)	3-4	4-5	6-7
Size of leaf (cm^2)	4.0–6.0	Entire leaf/ chopped shoots	Entire leaf/ shoots
Total quantity of leaf (kg)	100–120	400–425	2400–2500
No. of feeds per day	4	4	4
No. of cleanings	3	Every day	Every day
Spacing (in ft^2)	180–360	360–720	720–1440
No. of round bamboo trays (of 3½ ft. diameter)	20–40	40–80	80–160

12. Mounting

After attaining full growth in the final age, the worms cease to feed and are ready to spin. Such worms are slightly translucent and also raise their heads to find a place

fors pinning. These worms have to be picked up and transferred to a mountage (chandrike) for spinning cocoons. Mounting of worms should not be delayed as the ripened worms will waste silk. About 40 to 45 worms per square foot are to be kept on a mountage. Thus around 1000 worms can be mounted in a 'Chandrike' of 6′ ×4′ size. For 400 dfls, about 120 'Chandrike' are required. Mountages should be kept in shade in a well ventilated place during spinning.

13. Harvest

The silkworms complete spinning in 48 to 72 hours but the cocoons should not be harvested at this time, as the worms inside are still soft in the pre-pupal stage. Harvesting should be done on the fifth day, when pupae are fully formed and hard. Dead and diseased worms on the mountages should be removed before harvest. Marketing of cocoons should be done on the 6th day.

14. Economics

During the first year of plantation only two crops can be taken with a rearing capacity of 650 to 700 dfls each. The plantation is fully established during the first year and reaches optimum productivity from second year onwards, with the leaf yield around 35,000 kg/annum and rearing capacity of about 4600 dfls in five crops. The net profit per hectare per year is about Rs. 15,173. The details of rearing expenditure and the economics are given below:

Investment on equipment for rearing 400 disease free layings

	Equipment	Total cost (Rs.)	Utility (year)	Value per year (Rs.)
1.	Rearing trays (wooden) 20 trays @ Rs. 80 each (size 4′ ×3′ ×3½″)	1,600	10	160
2.	Chawki rearing stand 2 Nos. @ Rs. 125 each	250	10	25
3.	Leaf chopping board 2 Nos. @ Rs. 125 each	250	10	25
4.	Chopping knives 2 Nos. @ Rs. 20 each	40	3	13
5.	Antwells 64 Nos. @ Rs. 10 each	640	10	64
6.	Rearing stands 16 Nos. @ Rs. 350 each	5,600	10	560
7.	Bamboo round trays 3½′ diameter 160 Nos. @ Rs. 15 each	2,400	3	800
8.	Feeding stands 4 Nos. @ Rs. 60 each	240	10	24
9.	Leaf chamber 5′ ×2½′ ×2½′ 1 No. @ Rs. 250	250	10	25
10.	Sprayer 1 No. @ Rs. 620	620	10	62
11.	Hygrometer 1 No. @ Rs. 150	150	10	15
12.	Foam pads 1 kg @ Rs. 100 per kg.	100	4	25
13.	Silkworm bed cleaning nets 400 Nos. @ Rs. 3 each	1,200	3	400
14.	Bamboo mountages 120 Nos. @ Rs. 38 each	4,560	3	1,520
	Total	17,900		3,718
15.	Building 1046 ft² @ Rs. 5,000/100 ft²	52,300	50	1,046

Expenditure on rearing for 400 dfls

1. Cost of 400 dfls
   (@ Rs. 30 per 100 dfls) — Rs, 120
2. Cost of labour wages
   Young age 12 days, 3 men per day = 36 Mandays
   Late age 12 days, 5 men per day = 60 Mandays
   Spinning and harvesting 2 days,
   8 men per day = 16 Mandays
   Total = 112 Mandays
   @ Rs. 12 per day/labour — Rs. 1,344
3. Paraffin paper, formalin, newspaper, marketing of cocoon etc. — Rs. 300

Total — Rs. 1,764

Returns

Yield for 4,600 dfls @ of 35 kg cocoons for 100 dfls = 1,610 kg
and Marketing @ Rs. 38 per kg — Rs. 61,180

Expenditure

Non-recurring expenditure on rearing equipments
(Rs. 3,718 × 2 units) — Rs. 7,436

Rearing expenditure for 4600 dfls
@ Rs. 1764 for 400 dfls — Rs. 20,286

Leaf production (35,000 kg per year)
(@ 49.25 paise per/kg) — Rs. 17,239

Total — Rs. 44,961

Building value (Rs. 52,300 ÷ 50) — + Rs. 1,046

Grand Total — Rs. 46,007

Net profit per hectare per year (2nd year onwards)

Return through sale of cocoons — Rs. 61,180

Total expenditure — (—) Rs. 46,007

Net profit — Rs. 15,173

ANNEXURE—1.

Fertiliser schedule for irrigated mulberry

	Row system	Pit system
1st application	60 kg N+60 kg P+60 kg K as complex fertiliser	60 kg N+60 kg P+60 kg K as complex fertiliser
2nd application	60 kg N as straight fertiliser	40 kg N as straight fertiliser
3rd application	60 kg N+60 kg P+60 kg K as complex fertiliser	40 kg N as straight fertiliser
4th application	60 kg N as straight fertiliser	60 kg N+60 kg P+60 kg K as complex fertiliser
5th application	60 kg N as straight fertiliser	40 kg N as straight fertiliser
6th application	—	40 kg N as straight fertiliser
Total	300 kg N+120 kg P+120 kg K	280 kg N+120 kg P+120 kg K

ANNEXURE—2.

Schedule of operations for irrigated mulberry (Row system—60 cm × 22 cm)

Operations	Timings
1. 1st pruning combining harvest	With the commencement of south west monsoon rains (early June)
2. 1st weeding and inter-cultivation	Within a week after pruning (2nd week of June)
3. Application of bulky organic manure at the rate of 20 tonnes per hectare and incorporation of the same	Within a fortnight after pruning (mid-June)
4. 1st dose of fertiliser application	Within a month after pruning (early July)
5. 1st harvest of leaves	By pruning (mid August)
6. 2nd weeding and inter-cultivation	Within a week of last harvest (2nd week of August)
7. 2nd dose of fertiliser application	Within a month of last harvest (mid September)
8. 2nd harvest of leaves	By pruning (early November)
9. 3rd weeding and inter-cultivation	Within a week of last harvest (2nd week of November)
10. 3rd dose of fertiliser application	Within a month of last harvest (early December)
11. 3rd harvest of leaves	By pruning (mid January)
12. 4th weeding and inter-cultivation	Within a week of last harvest (3rd week of January)
13. 4th dose of fertiliser application	Within a month of last harvest (mid February)
14. 4th harvest of leaves	By pruning (late March)
15. 5th weeding and inter-cultivation	Within a week of last harvest (1st week of April)
16. 5th dose of fertiliser application	Within a month of last harvest (late April)
17. 5th harvest of leaves	By pruning (early June)

Following the above schedule of operations, leaf yield of 35,000 kg/ha/annum is obtained.

ANNEXURE—3.

Schedule of operations for irrigated mulberry (Pit system—60 cm × 60 cm)

	Operations	Timings
1.	1st bottom pruning	With the commencement of south-west monsoon rains (early June)
2.	1st weeding and inter-cultivation	Within a week after pruning (2nd week of June)
3.	Application of bulky organic manure at the rate of 20 tonnes per hectare and incorporation of the same	Within a fortnight after pruning (3rd week of June)
4.	1st dose of fertiliser application	Within a month after pruning (early July)
5.	1st harvest of leaves	By leaf picking (mid August)
6.	2nd weeding and inter-cultivation	Within a week of last harvest (3rd week of August)
7.	2nd dose of fertiliser application	Within three weeks of last harvest (2nd week of September)
8.	2nd harvest of leaves	By leaf picking (early October)
9.	3rd dose of fertiliser application	Within three weeks of last harvest (4th week of October)
10.	3rd harvest of leaves	By leaf picking (late November)
11.	2nd bottom pruning	Immediately after 3rd leaf harvest (late November)
12.	3rd weeding and inter-cultivation	Within a week after 2nd pruning (first week of December)
13.	4th dose of fertiliser application	Within a month after 2nd pruning (3rd week of December)
14.	4th harvest of leaves	By leaf picking (early February)
15.	5th dose of fertiliser application	Within 3 weeks after last harvest (4th week of February)
16.	5th harvest of leaves	By leaf picking (first week of April)
17.	4th weeding and inter-cultivation	Within a week after last harvest (second week of April)
18.	6th dose of fertiliser application	Within 3 weeks after last harvest (late April)
19.	6th harvest of leaves	By leaf Picking (late May)

Following the above schedule of operations, leaf yield of 35,000 kg/ha/annum is obtained.

ANNEXURE—4 (a)

Economics of mulberry cultivation—First year

Cost of cultivation of one hectare of mulberry under irrigated condition, **—Plantation and establishment cost (non-recurring), row system (60 cm × 22cm)**

Sl. NO.	Operations	Requirements	Rate (Rs.)	Amount (Rs.)
1.	Deep ploughing by mould board plough (Tractor power)	10 hr	90 per hour	900–00
2.	Disc harrowing (Tractor power)	6 hr	90 per hour	540–00
3.	Final preparation of land (Bullock power)	10 pairs	20 per pair	200–00
4.	Farm yard manure	20 tonnes	100 per tonne	2,000–00
5.	Application of farm yard manure	20 Mandays	12 per Manday	240–00
6.	Planting material	10 cart loads	50 per cart load	500–00
7.	Preparation of cuttings (1,10,000)	45 Mandays	12 per Manday	540–00
8.	Making ridges and furrows	25 Mandays	12 per Manday	300–00
9.	Planting	50 Mandays	12 per Manday	600–00
10.	Hoeing and weeding (5 times)	125 Mandays	12 per Manday	1,500–00
11.	Miscellaneous expenditures	—	—	130–00
				7,450–00

This is the initial expenditure for planting. The garden is expected to give consistantly good yield for a period of 15 years. So the cost has to be divided over a period of 15 years as non-recurring expenditure=Rs. 497.

Continued on next page

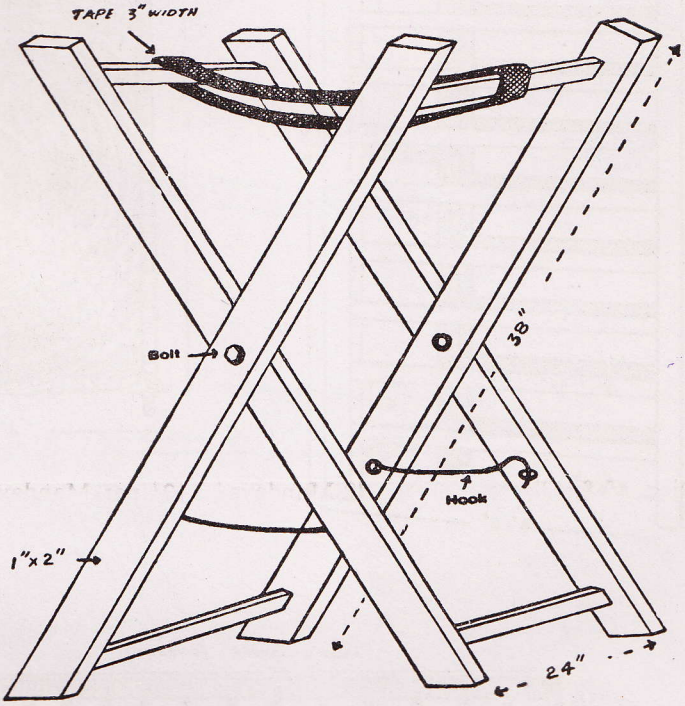
Sl. No.	Operations	Requirements	Rate (Rs.)	Amount (Rs.)
12.	Digging, weeding and making ridges and furrows	3 times a year-300 Mandays	12/- per Manday	3,600–00
13.	Irrigation	25 times a year–200 Mandays	,,	2,400–00
14.	Fertilizer 100 kgN: 50kgP: 50kgK			
	(*i*) Suphala	333 kg	@ Rs. 1,900/- per tonne	633–00
	(*ii*) Urea	111 kg	@ Rs. 2,105/- per tonne	234–00
15.	Application of fertilizer	12 Mandays	12/- per Manday	144–00
16.	Harvesting of 12,000* kg leaf	50 kg leaf/ day/labour– 80 Mandays	12/- per Manday	960–00
	*(Harvesting of 4,000kg of leaf by plucking method and 8,000 kg of leaf by shoot harvest method)	125 kg leaf per labour in the form of shoot or 250 kg shoot/ labour– 64 Mandays	12/- per Manday	768–00
17.	Non-recurring	—	—	497–00
18.	Land revenue	—	—	20–00
				9,256–00

ANNEXURE—4 (b)

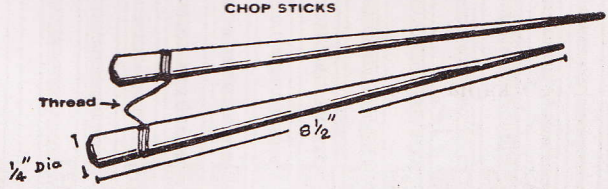
Cultivation expenditure from 2nd year onwards

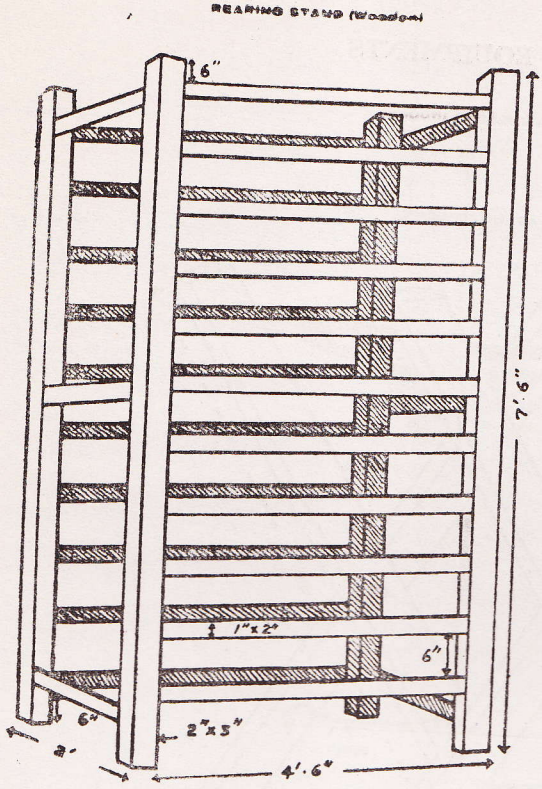
Sl. No.	Operations	Requirements	Rate (Rs.)	Amount (Rs.)
1.	Digging, weeding and making ridges and furrows	5 times a year 500 Mandays	12/per Manday	6,000–00
2.	Irrigation	25 times– 200 Mandays	12/per Manday	2,400–00
3.	Farm yard manure	20 tonnes	100/per tonne	2,000–00
4.	Application of farm yard manuare	20 Mandays	12/per Manday	240–00
5.	Fertilizers (300 kg N: 120 kg P 120 kg K)			
	(*i*) Suphala	800 kg	@ Rs. 1,900/- per tonne	1,520–00
	(*ii*) Urea	400 kg	@ Rs. 2,105/- per tonne	842–00
6.	Application of fertilizers	30 Mandays	12/ per Manday	360–00
7.	Harvesting of 35,000 kg leaf (If leaf picking is done 700 man days required, costing Rs. 8,400/-)	125 kg leaf/ Day/Labour or 250 kg shoot/Day/ Labour-280 Mandays	12/- per Manday	3,360–00
8.	Non-recuring	—	—	497–00
9.	Land revenue	—	—	20–00
	Leaf yield 35,000 kg/ha. Cost of production of one kg of leaf 49.25 paise			17,239–00

FEEDING STAND (Wooden)

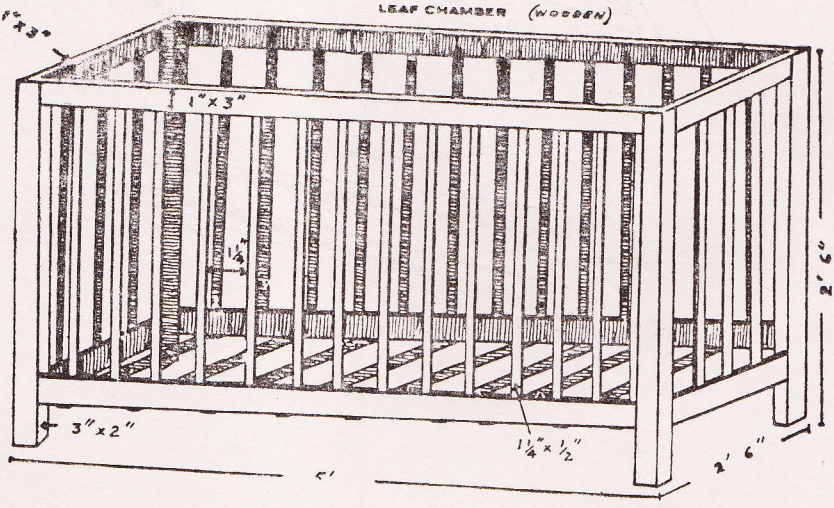


CHOP STICKS

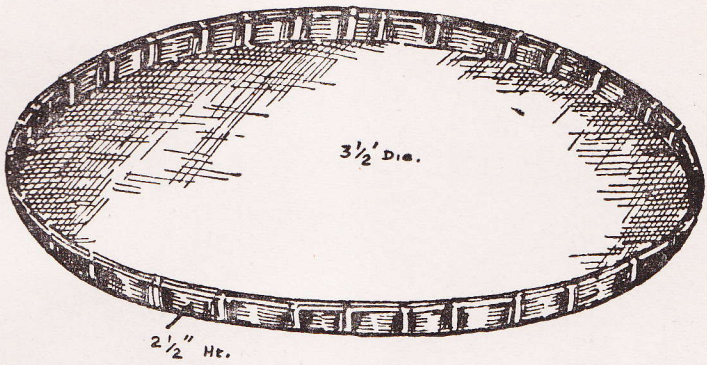



REARING STAND (Wooden)
6"
7'.6"
1"x2"
6"
6"
2"x3"
2'
4'.6"

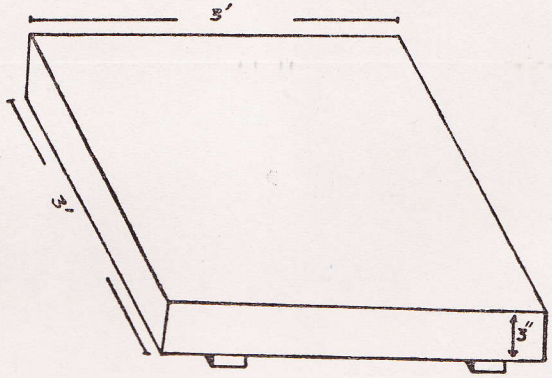

CHANDRIKE
6'
4'


LEAF CHAMBER (WOODEN)
1"x3"
1"x3"
1¼"
3"x2"
1¼"x½"
2'.6"
5'
2'.6"

BAMBOO TRAY (Round)



CHOPPING BOARD (WOODEN)



CHOPPING KNIFE