

*SERICULTURE PROJECT No.1*  
*(Revised-1986)*

# ECONOMICS OF SERICULTURE UNDER RAINFED CONDITIONS



**DR. MANJEET S. JOLLY**  
DIRECTOR



**CENTRAL SERICULTURAL RESEARCH AND  
TRAINING INSTITUTE**

(Central Silk Board—Ministry of Textiles—Govt. of India).  
MYSORE-570 008 (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 rainfed 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.

**Dr. Manjeet S. Jolly**

*Director*

Central Sericultural Research &  
Training Institute, Srirampuram,  
MYSORE-570 008, India

## CONTENTS

	<i>Page</i>
<b>Introduction</b>	1
<b>Part I: Mulberry cultivation</b>	1
1. Selection of land	2
2. Preparation of land	2
3. Preparation of pits	2
4. Preparation of cuttings	2
5. Planting of cuttings	2
6. Inter-cultivation	3
7. Pruning	3
8. Manuring	3
9. Harvesting of leaves	4
<b>Part II: Silkworm rearing</b>	
1. Rearing house	4
2. Crop pattern	5
3. Preparation for brushing	5
4. Incubation of eggs and hatching	5
5. Brushing	5
6. Young age silkworm rearing	6
7. Quality and selection of leaf	6
8. Leaf preservation	7
9. Cleaning	7
10. Moulting	7
11. Late age silkworm rearing	8
12. Mounting	8
13. Harvest	8
14. Economics	9
15. Annexures	11
16. Illustrations	17

# ECONOMICS OF SERICULTURE UNDER RAINFED CONDITIONS

## INTRODUCTION

Profitability from sericulture depends largely on the production of mulberry leaf at economic cost. Mulberry being a leaf crop, maximisation of yield could be achieved mainly through agronomic inputs like water and fertiliser. Though this has been possible under conditions of assured irrigation, these are the major limiting factors in the case of rainfed mulberry. Though a rainfall of 25 to 30" is experienced in the rainfed tract, it is confined to 3 to 4 months during June to July and October to November. Thus, the advantages of mulberry cultivation in the rainfed condition are limited. Despite this, mulberry cultivation in the rainfed area is very popular among the cash crops like cotton, tobacco, groundnut etc., due to its drought resistance capacity and perennial nature. Out of the total area of 2.11 lakh hectares under mulberry cultivation in South India, as much as two-third is under rainfed condition.

The leaf yield under rainfed conditions had remained at 3,500-4,000 kg/hectare/year since decades. Mulberry cultivation in these regions were practised in the traditional way without fertiliser application. Recommendations for use of fertilisers for rainfed mulberry were first given during 1970-71 period, resulting in an increase of production to 7,000 to 8,000 kg/hectare/year.

The research conducted during 1970's at the Central Sericultural Research and Training Institute, Mysore to evolve a package of practices for rainfed mulberry cultivation in line with the irrigated mulberry have resulted in increasing the productivity further to 15,000 kg per hectare per year. The quality of mulberry leaf also has been improved considerably under the new technology. The overall result is that the sericulture under rainfed condition has become lucrative with the added scope of improving the mulberry productivity and raising successful silkworm crops.

Under the current sericulture practices in rainfed area, the problems are, either the farmer has an extensive land under mulberry cultivation with very poor productivity, or the rearing facilities are inadequate. An economical unit linking these two has not been worked out for rainfed mulberry sericulture. One hectare of rainfed mulberry is recommended as a single unit for efficient management and economical production. The details of starting such a project are discussed in this paper in two parts viz., Mulberry cultivation and Silkworm rearing.

### Part—I: MULBERRY CULTIVATION

#### Dry farming technology for mulberry

The limitations of leaf yield in the conventional system of mulberry plantation is due to lack of fertiliser application, poor initial establishment, inadequate cultural opera-

rations to preserve soil moisture and low yielding mulberry variety. These factors have been adequately remedied in the new technology of mulberry cultivation under dry farming and are explained briefly.

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 soil is ideal. The pH of the soil should be around 6.5. If the soil is acidic or alkaline, it should be corrected by adding lime or gypsum respectively. Since it is a deep-rooted and perennial plant, it will give satisfactory leaf yield over a period of 15 years.

2. *Preparation of land:* The land should be given a deep digging to a depth of 30 to 35 cm in order to loosen the soil. Prior to planting season in April to May, the land should be ploughed once or twice to give a fine tilth. This enables the soil to absorb the rain water from the early monsoon showers.

3. *Preparation of pits:* Pits of  $35 \times 35 \times 35$  cm size are made at a spacing of  $90 \times 90$  cm. ( $3' \times 3'$ ). A mixture of soil and farm yard manure is filled in the pit (Fig. 1).

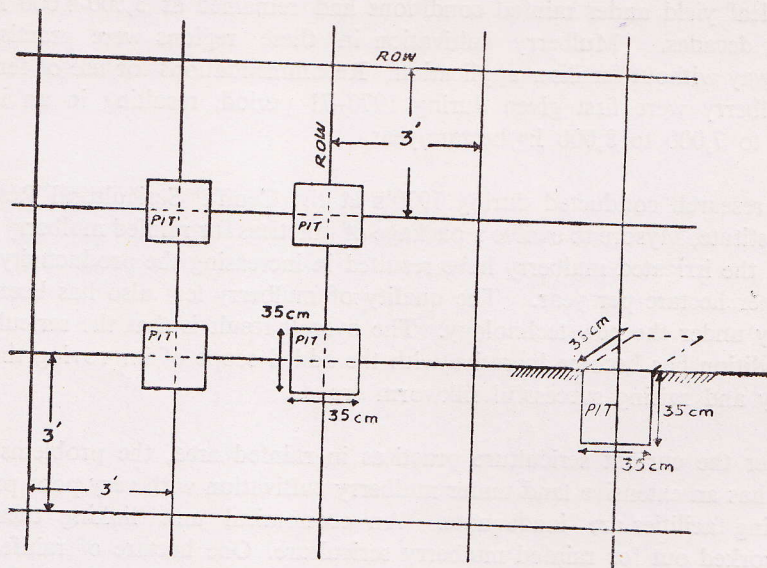


Fig. 1. Layout and pit making for planting

4. *Preparation of cuttings:* Mulberry is propagated vegetatively through cuttings. The branches which are one year old and 10 to 12 mm in diameter are selected for cuttings. These are cut into pieces of 20 to 22 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 portions of the branches should be rejected for preparation of cuttings.

5. *Planting of cuttings:* The cuttings are planted in the pits leaving only one bud exposed above the soil and the soil should be pressed compactly around the cuttings. Three

cuttings are planted in each pit in a triangular form with a spacing of 15 cm (Fig. 2). The cuttings are planted either straight or at an angle. Saplings raised in nursery could also be used for planting, in which case one sapling will be sufficient for each pit. The planting should be timed, so that the cuttings or saplings get periodic rains for atleast two months. In case of failure of rains, pot watering should be resorted to, during the initial stage of establishment.

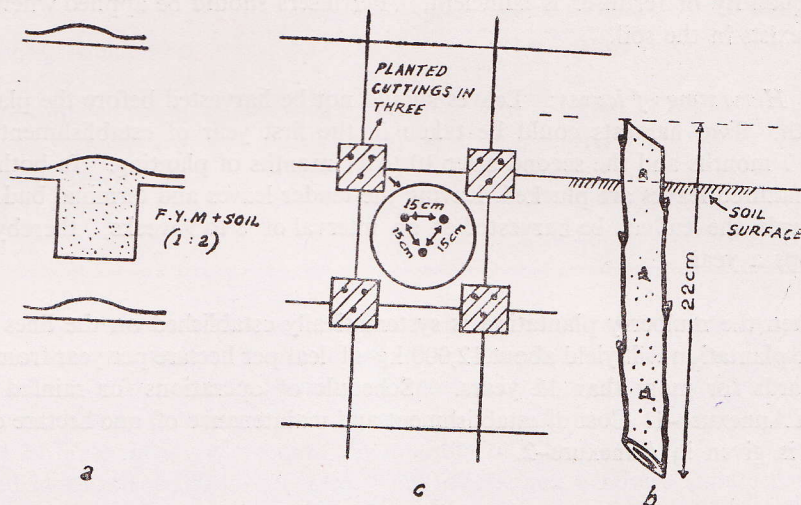


Fig. 2. a. Pit filling b. Cutting c. Planting

6. *Inter-cultivation*: Two months after planting, a light hoeing should be done to eliminate the weeds and loosen the soil. This will help aeration of the soil and also to absorb water from subsequent rains. After another two to three months, a second weeding is done by ploughing. When mulberry has sufficiently grown, its shade will automatically reduce the growth of the weeds.

7. *Pruning*: The first pruning is done after one year of plantation when the thickness of the plant at the base attains 22 to 24 mm and the stem is about 1.5 to 2m in height. The plants are pruned 15 to 20 cm above the soil with a sharp pruning sickle or saw, to give a clean cut. The bark should not get peeled off while pruning. Generally, pruning is done every year during the month of June, coinciding with the onset of monsoon. Pruning should be followed by ploughing and weeding.

8. *Manuring*: The low yield and poor quality of leaves in rainfed conditions is due to lack of inputs like manures and proper care to maintain soil moisture. This deficiency could be corrected by adding manures and fertilisers to the soil.

8.1. *Farm yard manure*: A quantity of 10 tonnes of farm yard manure per hectare per year should be added immediately after pruning and intercultivation. This will add organic matter to the soil and improve its tilth and water holding capacity. In the absence of bulky organic manures like farm yard manure, green manure crops such as sunhemp could be grown in the field during rainy season and mulched into the soil.

8.2. *Chemical fertilisers*: In addition to farm yard manure, chemical fertilisers should also be applied so as to provide NPK at the rate of 100:50:50 kg/ha/year. These are given in two split doses. The first application will be 50:50:50 kg of N:P:K in late August, i.e., 6 to 8 weeks after application of organic manures. This is done by applying a complex fertiliser. The second dose of 50 kg of nitrogen is applied in late November through a straight fertiliser. However, during the first year of plantation, half the quantity of fertiliser is sufficient. Fertilisers should be applied when sufficient moisture exists in the soil.

9. *Harvesting of leaves*: Leaves should not be harvested before the plants attain full growth. Two harvests could be taken in the first year of establishment, the first after 6 to 7 months and the second after 10 to 11 months of planting. In both harvests, only the matured leaves are plucked, leaving the tender leaves and terminal bud. Second year onwards, the leaf can be harvested at an interval of 8 to 9 weeks, thereby yielding 5 to 6 crops a year.

When the mulberry plantation is systematically established on the lines indicated above, the plantation will yield about 12,000 kg of leaf per hectare per year from the third year onwards for more than 12 years. Schedule of operations for rainfed mulberry is given in Annexure-1. Cost of establishment and maintenance of one hectare of rainfed mulberry is given in Annexure-2.

### 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. Provision should be made to make it air-tight for proper disinfection. The design of a model rearing house with a rearing capacity of 400 to 500 dfls at a time is given in Fig. 3.

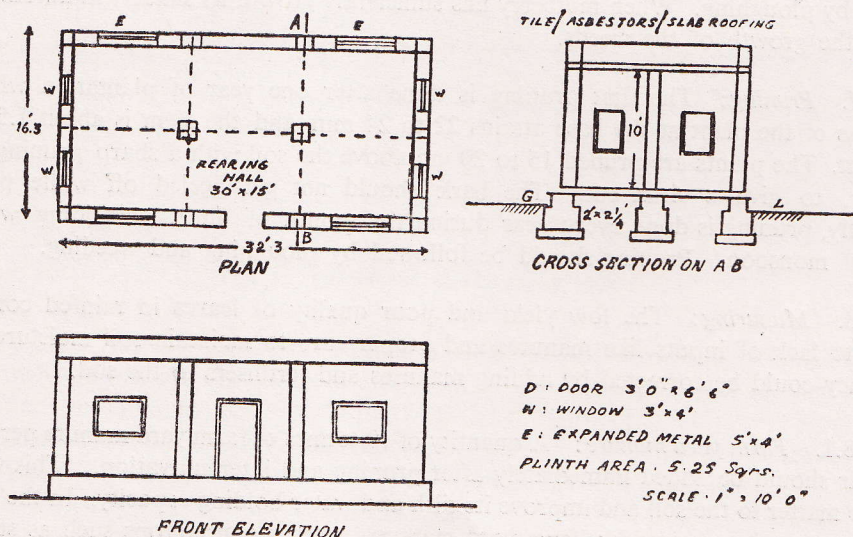


Fig. 3. Design for rearing house for 400-500 layings at a time

2. *Crop pattern*: The mulberry plantation is fully established in one year and reaches maximum yield from 3rd year onwards. However, the leaf out put is not uniform in different seasons. The pattern of yield is indicated below. Rearing schedules will have to be programmed accordingly.

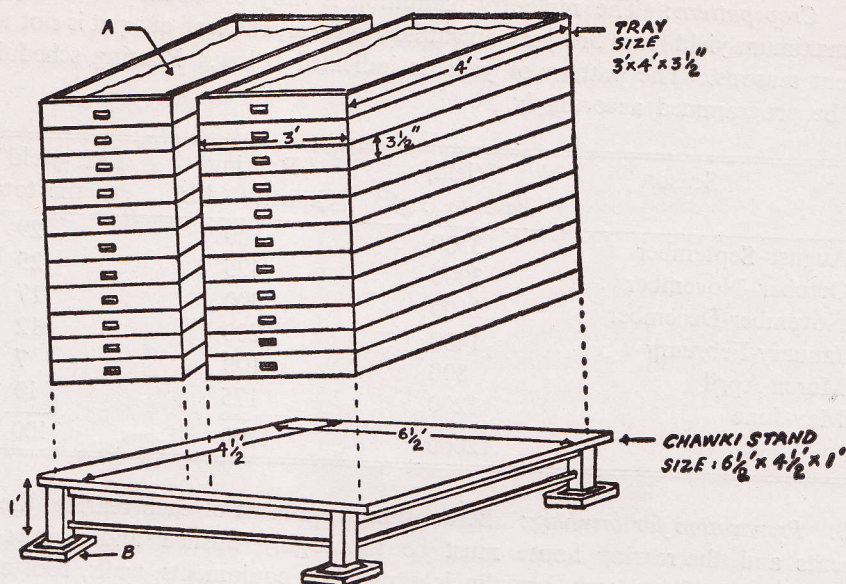
Crop No.	Season	Yield/ hectare (kg)	Rearing capacity (dfs)	Leaf yield ratio to the total (%)
1.	August-September	3500	500	29
2.	October-November	3000	425	25
3.	November-December	2100	300	17
4.	January-February	1400	200	12
5.	March-April	800	100	7
6.	May-June	1200	175	10
		<u>12000</u>	<u>1700</u>	<u>100</u>

3. *Preparation for brushing*: Before commencement of each rearing, the rearing equipments and the rearing house must be thoroughly washed and disinfected with formalin. Two 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 air-tight for about 24 hours after disinfection. A quantity of 7 to 8 litres of 2 per cent formalin is required to disinfect 100 m<sup>2</sup> of area. The doors and windows should be kept open atleast for 24 hours before commencement of rearing to avoid smell of formalin.

4. *Incubation of eggs and hatching*: 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 of 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 to 3 hours.

Under the current practices, the rearers are supplied with silkworm eggs. It will be ideal to organise the 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 both at the egg stage and young age silkworms.

5. *Brushing*: The hatched larvae should not be starved and they must be brushed on a paraffin paper in a rearing tray. This is done by sprinkling chopped tender mulberry leaves of size 0.5 to 1 cm<sup>2</sup> over the hatched larvae. The larvae crawl on to the leaves. After 8 to 10 minutes, the egg sheet is inverted over rearing tray and gently tapped. Worms that are still attached to the egg sheets should be gently removed to the tray with a feather. A 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).



A. Paraffin paper B. Ant well

Fig. 4. Box rearing

6. *Young age silkworm rearing*: In a tray of  $4' \times 3' \times 3\frac{1}{2}''$  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 feeds per day	Qty. of leaf/ 20 dfls (in kg)	Bed cleaning
I	1st	27	90	$9'' \times 12''$	4	0.200	—
	2nd			$18'' \times 12''$	4	0.200	—
	3rd			$18'' \times 26''$	4	0.240	1
	4th			$18'' \times 24''$	(2-3)	0.090	(Moult)
II	5th			$18'' \times 24''$	4	0.400	1
	6th			$24'' \times 24''$	4	0.800	1
	7th			$30'' \times 42''$	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 1.0  $\text{cm}^2$  during first age and 1 to 2  $\text{cm}^2$  during 2nd age. The selection of leaf from a fully grown branch is illustrated in Fig. 5.

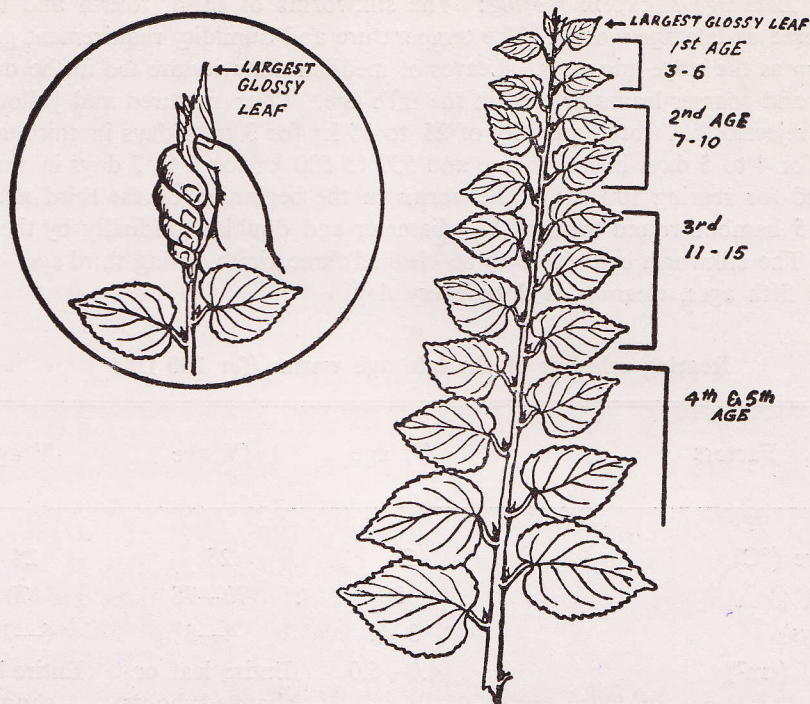


Fig. 5. Selection of leaf for rearing

8. *Leaf preservation*: Silkworms grow best when fed with succulent leaves which are rich in nutrients and moisture. The leaves if not preserved properly, dry up and become unsuitable for 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 resuming feeding and the other a day before second moult. A net with 'mesh' size of  $0.5 \times 0.5$  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. 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. During moult 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 age 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 25 to 35 kg for 3 to 4 days in third age; 100 to 110 kg for 4 to 5 days in fourth age and 550 to 580 kg for 6 to 7 days in final stage are required for rearing 100 dfls. The worms in the beginning of the third age should be kept in 5 bamboo round trays of  $3\frac{1}{2}$ ' diameter and 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 100 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 <sup>2</sup> )	4.0—6.0	Entire leaf or chopped shoots	Entire leaf/shoots
Total quantity of leaf (kg)	25—30	100—110	550—580*
No. of feeds per day	4	4	4
No. of cleanings	3	Every day	Every day
Spacing in ft. <sup>2</sup>	45—90	90—180	180—270*
No. of bamboo trays ( $3\frac{1}{2}$ ft. diameter)	5—10	10—20	20—30*

\* @ 30,000 larvae at spinning stage per 100 dfls; To be increased accordingly for increased population.

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 raise their heads to find a place for spinning. These worms have to be picked up and transferred to a mountage for spinning cocoons. Mounting of worms should not be delayed as the ripened worms will waste silk. About 40 to 45 worms per ft<sup>2</sup> are to be kept on a mountage. Thus around 1,000 worms can be mounted in a 'Chandrike' (mountage) of 6' x 4' size. For 100 dfls about 30 'Chandrikes' 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 prepupal 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 sixth day.

14. *Economics*: The full impact of the yield and economics will be seen from third year onwards only. During the first year, two crops can be taken and the leaf yield and rearing capacity is limited to about 400 dffs. In the second year, the leaf yield increases to 10,000 kg per hectare with a rearing capacity of around 1,400 dffs. During the third year yield reaches the optimum level of 12,000 kg per hectare with the rearing capacity of around 1,700 dffs. From third year onwards, the net profit per hectare is about Rs. 5,818 per annum. The details of rearing expenditure and the economics are given below:

**Investment on equipments for rearing (400 Dffs)**

Equipments	Total cost (Rs.)	Utility (years)	Value/ 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' @ Rs. 250 (1 No)	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	1,200	3	400
14. Bamboo mountages 120 Nos. @ Rs. 38 each	4,560	3	1,520
	<u>17,900</u>		<u>3,718</u>
15. Investment on rearing building (Fig. 3) 528 ft <sup>2</sup> for 500 Dffs rearing @ Rs. 5000/100 ft <sup>2</sup> (Tiled roof)	26,400	50	
			(depreciation 2% @ Rs. 520/Year)

*Expenditure on rearing:*

1. Cost of dffs @ Rs. 30 per 100 dffs for 400 dffs	..	..	120
2. Cost of labour—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	..	..	1344
3. Paraffin paper, formalin, newspaper, marketing of cocoon etc.	..	..	300
		<b>Total</b>	<b>1764</b>

## Returns

Yield at the rate of 35 kg cocoons per 100 dfls  
for 1700 dfls = 595 kg. and  
marketing @ Rs. 38/kg cocoons

Rs. 22,610-00

*Expenditures:*

Non-recurring expenditure on rearing equipments

Rs. 3,718-00

Rearing expenditure for 1,700 dfls

(@ Rs. 1,764 for 400 dfls)

Rs. 7,497-00

Leaf production cost

Rs. 6,570-00

Total Rs. 17,785-00

Building (depreciation value)

(-) Rs. 520-00

Grand Total Rs. 17,265-00

*Net profit/hectare/year (third year onwards)*

Return through sale of cocoons

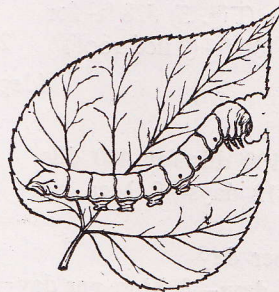
Rs. 22,610-00

Total expenditure

(-) Rs. 17,265-00

Net profit

Rs. 4,345-00



## ANNEXURE—1.

(Based on CSR&TI, Bulletin No. 1)

### A. Schedule of operations for rainfed mulberry (1st Year)

Sl. No.	Operations	Timing
1.	Digging (crowbar/disc plough)	November-December
2.	First ploughing	January-February
3.	Second ploughing (also levelling to give a fine tilth)	March-April
4.	Pit preparation	April
5.	Planting	May
6.	Hand weeding (first)	June
7.	Hand weeding (second)	July
8.	Hand weeding (third)	August
9.	Hand weeding (fourth)	September
10.	Ploughing (first)	October-November
11.	Harvest (first)	December
12.	Ploughing (second)	December
13.	Harrowing (first)	January-February
14.	Harrowing (second)	February-March
15.	Harvest (second)	April
16.	Pruning	May-June

**B. Schedule of operations for rainfed mulberry  
(Second year onwards)**

Sl. No.	Operations	Timings
1.	Annual bottom pruning	With commencement of South-West monsoon rains (Early June)
2.	First weeding and inter-cultivation	Within a week after pruning (Mid-June)
3.	Application of bulk organic manure @ 10 tonnes/hectare and incorporation of the same	Within a month of pruning (Early July)
4.	First picking of leaves	About 2½ months after pruning (Mid-August)
5.	Application of first dose of fertiliser @ 50 N, 50 P, and 50 kg K per hectare	6-8 weeks after application of organic manure and following first harvest of leaves (Late August)
6.	Second weeding and inter-cultivation	5-6 weeks after the first picking of leaves (Early October)
7.	Second picking of leaves	Two months after the first picking of leaves (Mid-October)
8.	Application of second dose of fertiliser @ 50 kg N per hectare	Three weeks after the second picking of leaves (Early November)
9.	Harrowing and weeding	November
10.	Third picking of leaves	Two months after the second picking of leaves (Mid-December)
11.	Third weeding and inter-cultivation	2-3 weeks after the third picking of leaves (Early January)
12.	Fourth picking of leaves	Two months after the third picking of leaves (Mid-February)
13.	Fourth weeding and inter-cultivation	With receipt of pre-monsoon rains. 6-7 weeks after the fourth picking of leaves (Early April)
14.	Fifth picking of leaves	7-8 weeks after the fourth picking of leaves (Early April)
15.	Harrowing and weeding	May
16.	Sixth and final picking of leaves	7-8 weeks after the fifth picking of leaves (May-June)

ANNEXURE—2.

**A. Economics of mulberry cultivation:**  
**(cost of cultivation of one hectare of mulberry under rainfed conditions)**  
**Package of practices**

**Plantation and establishment cost (Non-recurring)**

Sl. No.	Operations	Requirements	Rate (Rs.)	Amount (Rs.)
1.	Deep ploughing by mould board plough (tractor power)	10 hrs	90/- per hour	900-00
2.	Disc harrowing (tractor power)	6 hrs	90/- per hour	540-00
3.	Final preparation of land (bullock power)	10 pairs	20/- per pair	200-00
4.	Planting material	5 cart loads	50/- per cart load	250-00
5.	Preparation of cuttings (36,300 Nos)	15 Mandays	12/-	180-00
6.	Farm yard manure	10 tonnes	100/- per tonne	1,000-00
7.	Digging pits, application of Farm yard manure, planting with 3'×3' spacing	300 Mandays	12/-	3,600-00
8.	Hoeing and weeding (3-4 times)	125 Mandays	12/-	1,500-00
9.	Miscellaneous expenditures			130-00
				<b>8,300-00</b>

This is the initial expenditure for planting. The garden is expected to give consistently 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 (i.e. Rs. 553-00/annum)

**B. First year cultivation expenditure**

Sl. No.	Operations	Requirements	Rate (Rs.)	Amount (Rs.)
1.	Harrowing	2 times/4 pairs twice (crosswise)	20/- per pair	320-00
2.	Fertilisers NPK 50:25:25 1st dose as complex fertiliser (Suphala)	166 kg	1,900/- per tonne	316-00
	2nd dose N : 25 (Urea)	55 kg	2,105/- per tonne	116-00
3.	Application of fertilisers	12 Mandays	12/-	144-00
4.	Leaf harvest @ 50 kg/day/labourer; (3000 kg/ha)	60 Mandays	12/-	720-00
5.	Pruning	15 Mandays	12/-	180-00
6.	Non-recurring	—	—	553-00
7.	Land revenue	—	—	10-00
				2,359-00

**C. Second year cultivation expenditure**

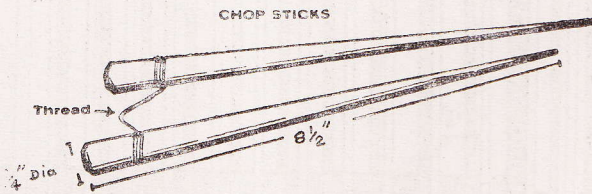
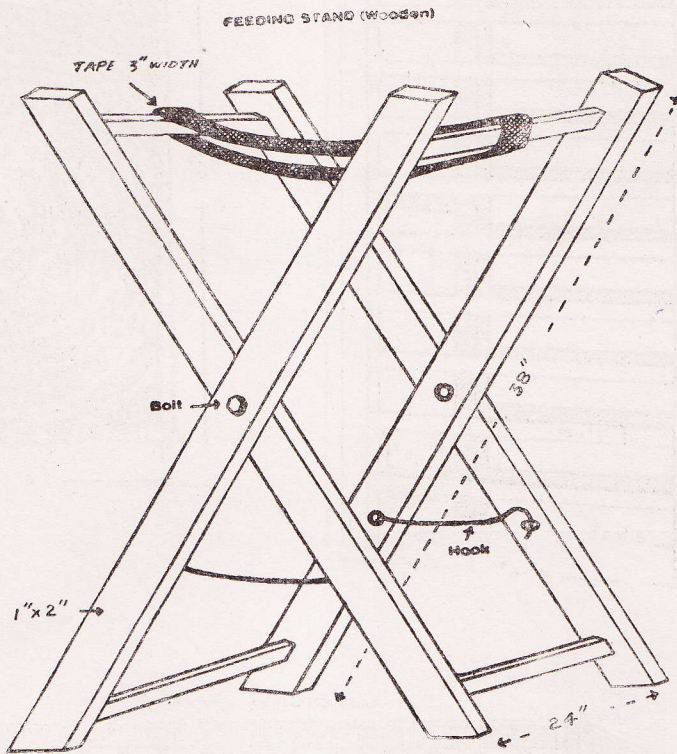
Sl. No.	Operations	Requirements	Rate (Rs.)	Amount (Rs.)
1.	Ploughing	4 times (4 pairs at a time)		
		16 pairs	20/- per pair	320-00
2.	Harrowing	2 times (4 pairs at a time) 8 pairs	20/- per pair	160-00
3.	Weeding around the plants	20 Mandays	12/-	240-00
4.	Farm yard manure	10 tonnes	100/- per tonne	1,000-00
5.	Application of Farm yard manure	8 Mandays	12/-	96-00
6.	Fertilisers NPK 100:50:50 1st dose—50:50:50 (Suphala—complex fertiliser)	333 kg	1,900/- per tonne	633-00
	2nd dose N:50—(Urea—straight fertiliser)	111 kg	2,105/- per tonne	234-00
7.	Application of fertilisers (2 times)	12 Mandays	12/-	144-00
8.	Leaf harvest @ 50 kg/day/labourer; (9000 kg/ha)	180 Mandays	12/-	2,160-00
9.	Pruning	20 Mandays	12/-	240-00
10.	Non-recurring expenditure	—	—	553-00
11.	Land revenue	—	—	10-00
				5,790-00

### D. Third year onwards cultivation expenditure

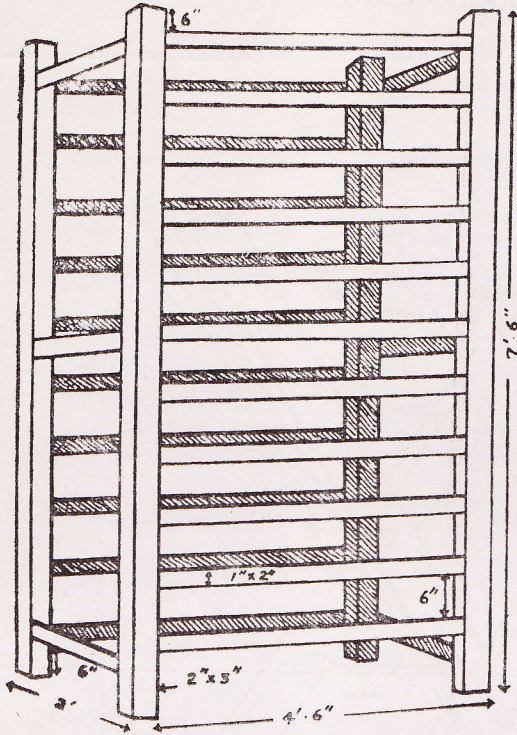
Sl. No.	Operations	Requirements	Rate/ (Rs.)	Amount (Rs.)
1.	Ploughing	4 times/4 pairs at a time		
2.	Harrowing	(16 pairs) 2 times/4 pairs at a time	20/- per pair	320-00
3.	Weeding around the plants	(8 pairs)	20/-	160-00
4.	Farm yard manure	20 Mandays	12/-	240-00
5.	Application of farm yard manure	10 tonnes	100/- per tonne	1,000-00
6.	Fertilisers NPK 100:50:50	8 Mandays	12/-	96-00
	1st dose—50:50:50 (Suphala-complex fertilizer)	333 kg	1,900/- per tonne	633-00
	2nd dose N: 50 (Urea-straight fertilizer)	111 kg	2105/-per tonne	234-00
7.	Application of fertilizers	12 Mandays	12/-	144-00
8.	Leaf harvest @ 50 kg/day/labourer; (12,000 kg/ha)			
9.	Pruning	240 Mandays	12/-	2,880-00
10.	Non-recurring expenditure	—	—	300-00
11.	Land revenue	—	—	553-00
				10-00
				6,570-00

Leaf yield 12,000 kg/ha. Cost of production of 1 kg leaf 55 paise.

# REARING EQUIPMENTS



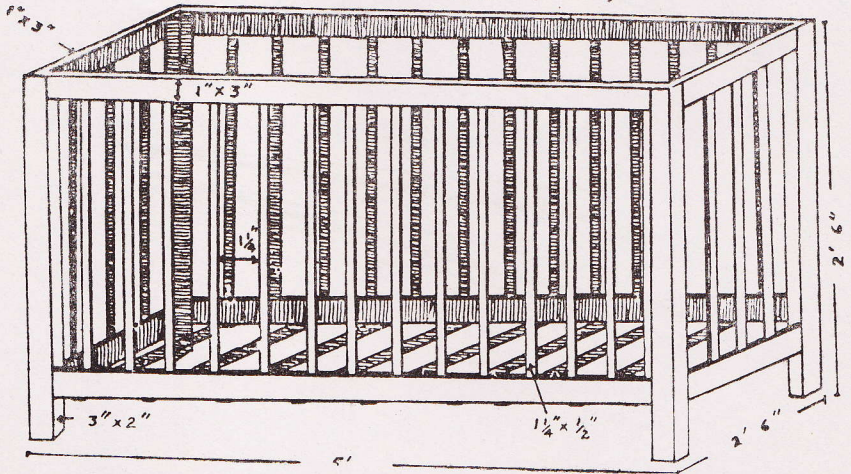
REAPING STAND (WOODEN)



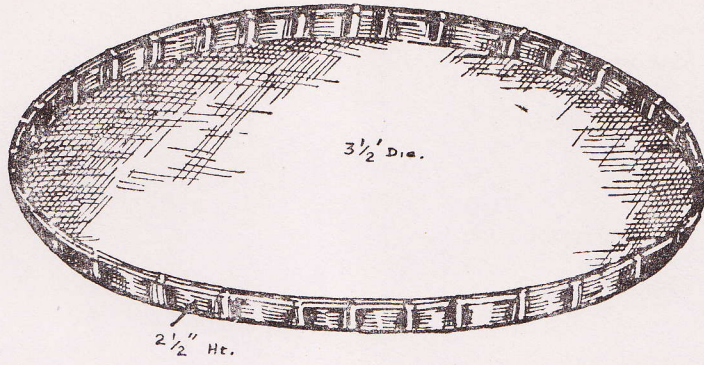
CHANDRIKE



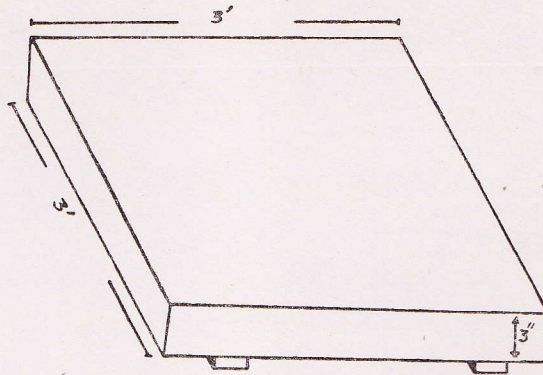
LEAF CHAMBER (WOODEN)



BAMBOO TRAY (Round)



CHOPPING BOARD (WOODEN)



CHOPPING KNIFE

