

C H A P T E R - I V

NATURE OF SERICULTURE AND ORCHARD CROP i.e., MANGO
SINCE INDEPENDENCE.

CHAPTER - IV

NATURE OF SERICULTURE AND ORCHARD CROP i.e., MANGO SINCE INDEPENDENCE.

Sericulture is a cottage industry with an agricultural base, Industrial superstructure and an essentially labour intensive set up. Sericulture is by nature an effective tool for generating gainful employment to the rural people especially to the retarded sectors of the community since independence.

IV.1. Nature and procedure of silk rearing:-

Malda has been enjoying the unique distinction of being the leading sericultural district of West Bengal since independence. The district accounts for more than 65% of sericulture of West Bengal at present. (55)

It may be known to few people that the fabulously famed Murshidabad Silk that are sold in the market are mostly produced from the raw silk produced in Malda district.

Topography of this district offers ample opportunity for the growth of mulberry cultivation and silk worm rearing successfully.

By the establishment of new graft nurseries the sericulture of this district has been developed to a greater extent.

55. "A glimpse into the Sericulture Industry of Malda district"(a bulletin issued by the Deptt. of Sericulture, Malda in 1985).

New cuttings of mulberry trees of high yielding variety are now supplied to sericulturists for its proper cultivation so that they can get maximum leaves from those for feeding silk worms. Moreover, at present the department of sericulture, Government of West Bengal is supplying disease free eggs of high yielding variety to the rearers of silk worms.

Sericulturists either collect leaves from others' mulberry orchard or rear up mulberry trees for feeding its leaves to the silk worms.

Firstly, the plot of land is ploughed properly and pits are arranged for planting mulberry cutting collected from different nurseries. Pits of proper size be dug at appropriate distances and filled up by adding sufficient quantity of farm yard manure.

The grafts to be planted properly and should be taken from different sericultural nurseries established at Piasbari, Sudullapur, Krishnapur, Amrity and Ramchandrapur of Malda district as per requirement.

The mulberry plantations are mainly bush types. The largest concentration of mulberry plantation is in the Southern part of the district. At Malda average yield of mulberry leaves per acre per annum has been shown in Table No. 4.1.

From Table 4.1 we can see that there are three types of mulberry plantation. The planting distance of the mulberry cuttings are ⁽⁵⁶⁾ for bush type :- from 1½" to 2" for high bush type:- from 2" to 2½" and for tree type:- from 6" to 8".

Leaves of these mulberry plants can be collected within 4-6 months in case of bush variety and within 1½ year in case of tree type and within 1 year in case of high bush variety after plantation for feeding silk worms.

Many people earn a good amount by selling mulberry leaves to the silk worm rearers from time to time.

As soon as the eggs begin to hatchout, they are covered over with young and finely chopped mulberry leaves into which the young silk worms climb. They are then removed to a clear tray, and kept separately from those which hatchout on the following day. It is essential to group worms of uniform size on each tray for the proper regulation of their diet. They are fed at intervals of 6 hours on chopped leaves during the first 4 to 6 days according to the season; and at the end of that period they lose their appetite completely and become torpid. This is the first moulting stage.

During the next 24 hours they shed their skins and

56. "Industrial potential of Malda district" - A study made by Small Industry Extension Training Institute (Government of India) Hyderabad, 1973.

enter on the second stage. While moulting is in progress, feeding is stopped completely. When it is over, a cotton net, covered with young leaves, is placed over the silk worms, which crawl through the meshes and begin to feed on the leaves. These are changed at the end of every 24 hours. A net covered with fresh leaves is placed over them, on to which they climb, and the old leaves and litter are removed.

After 3 to 5 days, according to the season, the second moult sets in. Thereafter the silk worms take on the colour and form which they preserve until the end of their larval life. They grow rapidly and eat more; and from this stage stems of mulberry plants with leaves on them are spread on the net. Three meals a day, at intervals of 8 hours, are given. The same procedure is followed during the fourth and fifth periods. By the fifth period, the silk worms are eating a very large quantity of mulberry leaves, and care has to be taken to see that a proper selection leaves is made. The final period last from 5 to 7 days. The worms develop a golden and creamy appearance and begin to look round for a corner in which to start spinning.

For this, a bamboo frame, about four fit square, called 'chandarki', is used. To it are fixed strips of plaited bamboo, an inch or two in depth, in the form of continuous spiral. The worms are placed on this spiral, and commence to spin themselves into Cocoons, a process which occupies two or

three days. The Cocoons which are required for reproduction are kept on a tray and those from which the silk is to be reeled, are put out in the sun or dried by steam, in order to kill the chrysalis. This is necessary, because the silk thread is a continuous filament, and if the chrysalis is allowed to turn into a moth, it cuts its way out through the thread, thereby greatly imparing the value of the silk for reeling.

The Cocoons which have been retained for reproduction are kept for about a fortnight, after which the moths cut their way out, the males and females pair off and the females lay their eggs. The average number of eggs is about 300. These hatchout after a fortnight, and the cycle begins again. The maximum number of days for the whole process is 80, and the miniaum number is 40 according to the season and temperature; so that on average, six cycles can be completed in a year (57).

In this way when Cocoons will be ready, the work of spinning will start to produce silk yarn. After the reeling of silk Cocoons, the pupal is left out.

This pupal can be used for industrial purposes namely, for the extraction of fat or for use as poultry feed. This contains fats to an extent of 10% to 12%, but collection of those ~~pupals~~ pupals poses a problems, because the rearing families after reeling use these as manure or as cattle feed.

57. Field Survey.

IV.2. Problems and solutions:-

Silk worms are liable to be attacked by various infectious diseases, some of which are hereditary. The result is not only that part of the crop may be destroyed, but the quality of silk produced from disease worms appreciably deteriorates.

Flacherie and Grasserie are not disease, which may set in without warning and are generally due to incorrect dieting, bad ventilation, overcrowling, or a sudden change of temperature (58).

Pebrine is a parasitic disease, and muscardine a mould or fungus, which lodges on the body and destroys the blood corpuscles.

Another danger is fly pest. The fly attacks the silk worm and lays eggs on its body. These hatch out quickly and the maggot eats into the tissues of the silk worm and feeds on them. In the sericultural nurseries fly pest is guarded against by fitting the doors and windows with fine meshed wire-netting.

The detection of disease in silk worms is one of the most valuable branches of sericultural work. As soon as the female moth begins to lay, the eggs of each moth are covered with a small tin cone, and thus segregated from each other when the female dies, the body is pounded up and the blood examined

under a microscope.

If the moth is free from disease, the blood will appear as a liquid in which a number of minute circular corpuscles are moving about. The eggs are then allowed to hatch out. Any hereditary disease is however to be immediately detected by the experts in sericulture. For example, if flacheric is present, the microscope will reveal a number of long stick-like objects, in addition to corpuscles. The eggs from that moth have then to be destroyed.

The best thing is to procure disease free silk worm eggs from Government Sericultural Nurseries and the arrangement should be made with extension officers of the sericultural Department for getting their assistance in disinfecting rearing houses and equipments as preventive measures against outbreak of pebrine.

Stem borer is a prominent pest of mulberry tree. The damage is caused by the grubs by feeding in the stem from down to upwards. This pest can be controlled by the use of
(59)
0.05% emulsion of monocrotophos .

Disease free silk worm eggs and disease free tender mulberry leaves generally help to a greater extent in increasing the production of Cocoons.

With a view to putting this industry on a better

59. Indian Institute of Horticultural Research.

Extension Bulletin no. 9.

footing several comprehensive plans and programmes have been taken by the Department of Sericulture, Malda.

Moreover, to ensure success of crops and to produce uniform quality of Cocoons 34 young silk worm rearing centres have been set up in different tracts to supply silk worm after rearing under the "Intensive Sericulture Development Project Scheme".

Besides a Cocoon purchase committee with the District Magistrate, Malda as the Chairman, was formed under the patronage of the Khadi and Village Industries Commission with a view to facilitating marketing of Sericultural produces and ensuring fair price for Cocoons of the sericulturists who were being exploited and deprived of fair price by the middlemen so long.

With that object in view, several voluntary Cocoon markets are intended to be set up in the Cocoon growing areas within the 7th Five Year Plan period.

One such market will be set up at Kaliachak within 1985-86. These Cocoon markets will have arrangement for drying green Cocoons, a problem the Cocoon growers have been facing for long. They are also intended to be equipped with Warehouses for storing unsold silk and Cocoons - a step which will mitigate the distress of the producers.

A scheme for establishment of a new twisting plant consisting of 480 spindles has been approved by the Department of Sericulture, Malda. This will be installed within one year for production of twisted yarn required for manufacture of quality fabrics (60).

There are some problems in financing sericulture of Malda which will be discussed in details in the next Chapter.

IV.3. Supply of Capital:-

It is really a difficult task to estimate the exact amount of capital invested in sericulture of Malda. Because, capital comes to sericulture from Government sources on the one hand and from private sources on the other hand.

Government nurseries foster the mulberry orchard and rear silk worms for Cocoons at Government cost. Whereas private sericulturists cultivate mulberry crops in their own plots of land and rear silk worms with a view to preparing Cocoons and raw silk at their own cost.

Sericulturists are living in a scattered way throughout a wide area of 'Dihra' region of Malda district. So, the estimation of the total amount of capital invested by all the sericulturists is really a difficult task. Of course, from the Government record the exact volume of capital invested in Malda sericulture can be understood.

60. A glimpse into the Sericultural Industry of Malda district (a bulletin issued by the Deptt. of Sericulture, Malda in 1985.)

In 1983-84, 31,26,634 kg of Cocoons valued at
(61)
Rs. 1,81,01,450 were produced in this district .

Formerly the silk industry was mainly financed by Marwaris. But at present this industry is being financed by the Government through the establishment of different Co-operative Societies.

In 1985 there are 12 silk Co-operative Societies. Out of these societies, the Sujapur Resham Katuni Samabaya Sangha Ltd., is in the most flourishing condition. Its paid up share capital is Rs. 1,600. The Society produces 3,200 kg of raw silk annually valued at Rs. 3 Lakhs. The Government use to extend loan to different types of Silk Co-operative Societies by which the artisan - members of the Society rear Cocoons, utilise the silk waste and arrange for spare-time occupation of their family members.

At Malda huge loans are generally granted annually from the District Collectorate to Artisan members and the producers of mulberry leaves.

The Collector of Malda District advances every year various types of loans. Out of these most important are:- (a) Artisans' Loan, (b) Mulberry loans, (c) Loans for encouraging the raising of silk Cocoons.

61. Deputy Directorate of Sericulture, Malda.

Artisans' loans are granted to artisans in times of distress as a measure of relief. Mulberry loan, as its name implies, is advanced to enable the recipient to effect improvement in mulberry cultivation.

The loan for helping the raising of silk Cocoons is another loan which is special to this district.

The Malda district Central Co-operative bank has extended term loan in 1971 to the Silk Spinners of this district amounting to Rs. 27,000. In 1985 the amount of term loan has been extended nearly to lakh.

The agro-based sector of sericulture industry requires small investment, say, approximately, Rs. 10-15 thousands of which recurring expenses is only around Rs. 1500 to Rs. 2000 per bigha of mulberry land.

At Malda if an agriculturist has at least one bigha of mulberry land, he can produce 6 'Dharas' of Cocoon annually. That means 180 kg. That means 180 kg. Cocoons can be produced annually.

In 1985 the average price of 40 kg. of Cocoon is Rs.700 So, 180 kg = $4\frac{1}{2}$ maunds x Rs. 700 = Rs. 3000 (Approximately) will be the annual subsistence income of that agriculturist.

From the total income Rs. 3000
 if he deducts his cost Rs. 1500
 his profit will be..... Rs. 1500 (62)
 provided he can give his own labour .

IV.4. Employment:-

Sericulture is an essentially labour intensive set up. It is an effective tool for generating gainful employment to the rural people especially to the retarded sectors of the community. Presently sericulture provides wholetime and part-time employment to about 1,50,000 persons in the rural Suburban and Urban ~~xxxxxx~~ areas of Malda district of whom more than 20% (63) belong to the Schedule caste and Schedule tribes .

At present there are about 34,250 rearers families in this district spreading over 394 villages under 14 blocks and raising 4 commercial crops annually viz : Jaistha, Bhaduri, Agrahayan and Chaitra consuming about 4 crores disease free layings.

Apart from this, about 1,50,000 people are indirectly engaged in the ancillary trade of sericulture. Availability of cheap skilled labours is one of the most important factors for the growth and development of sericulture. Malda district has got past glory of sericulture. So, the labourers of Malda district specially of Diara region become skilled in sericulture by tradition.

Sericulture is the most prevalent subsidiary business of the farmers of Malda district, it supplies the largest source of finance that farm women and children can contribute to

63. "A glimps into sericulture industry of Malda district" - A bulletin published by the Directorate of Sericulture, Malda, 1985.

the household. So, it is clear that a large section of the farmers of Malda district gets training in their own houses from their very childhood regarding sericulture from the adult members. Firstly the children become the helpers of their parents in their subsidiary works of sericulture. Later on when they reach at maturity of their age they become skilled labours of sericulture. Moreover, most of the silk is also reeled in the home even to-day at Malda by women and children.

According to census report of 1961 only 22,118 persons were engaged in the rearing of silk worms and the production of Cocoons and raw silk in Malda district. Most of these workers are women. In 1966 there are about 34,260 rearers family in this district. The industry is at present confined within the police station of Kaliachak and Englishbazar. Of course sericultural workers are also found in Old Malda, Habibpur, Ratua and Manikchak. But maximum number of workers engaged in this industry are in Kaliachak Police Station area.

The number of workers engaged in sericulture has been increasing day by day and it is a good sign for the development of sericulture at Malda.

IV.5. Other related issues:-

It is known that at Malda, soil and climatic conditions favour growing mulberry and tending silk worms.

In many sections spring, summer and autumn broods of

worms are raised each year. In other words this may be pointed out that at Malda 4 Commercial crops are raised annually. These are : Jaistha, Bhaduri, Agrahayani and Chaitra consuming about 4 crores disease-free layings.

Taking advantage of the favourable climatic condition from November to February the commercial rearers also rear Japanese 'Bivoltine' layings. 'Nistari' layings are reared in Agrahayani, Chaitra and Bhaduri. At present about 100 kg. 'Bivoltine' eggs are consumed annually in this district. Consumption of 'Bivoltine' eggs means the ultimate production of quality silk.

The sericulture Department of Malda in this respect can claim credit in being able to persuade the rearers to take up rearing of Bivoltine races which are qualitatively and quantitatively better than the indigeneous races like 'Nistari' layings.

The importance of mulberry plants lies in the fact that the green leaves of these plants are the only food for the silk worms. Mulberry plantation therefore, has occupied an important position in the economy of Malda.

In West Bengal the area under mulberry cultivation is 13,439.05 acres (1971) whereas at Malda there are 12,000 acres of land under mulberry cultivation. This shows that the area under mulberry cultivation in this district constitute about 90% of that of the whole of West Bengal. This is scattered in as much as 499

villages of Malda district.

As regards the variety of mulberry it should be noted that the mulberry plantation at Malda is mainly of bush type. Bush type mulberry plantation yields 9,600 kg annually per acre and occupies first position in comparison to other varieties of mulberry plantations like High bush type and Tree type.

IV.6. Nature of orchard crop of Malda:-

As regards orchard crop of this district, the name of mango comes first. Mango is considered to be the king of fruits of Malda. Besides having a delicious taste, excellent flavour, attractive fragrance, it is an excellent source of vitamin A and C. The tree is hardy in nature and has comparatively low maintenance costs. Well-maintained orchards give good yields.

Mango fruits is utilised at all stages of its development, both in its immature and mature state. Raw fruits are used for making chutney, pickles and drinks. The ripe fruits are utilised for preparing several products like squashes, syrups, nectars, Jams and Jellies. Even the Kernel is dried, roasted and eaten. The mango Kernel also contains 8-10 percent good quality fat which can be used for soap and also as substitute for Cocoa in confectionary.

IV.7. Propagation of mango:-

Mango can be raised from seed or vegetatively propagated. Propagation from seed though easy and cheap is unable to perpetuate characters of the parent tree because most commercial varieties in Malda are cross-pollinated and monoembryonic plants also take more time to bear fruit. Accordingly several methods of vegetative propagation have been tried with varying success. However, it is essential to raise seedlings to be used as root stocks. For this purpose, seed stones are sown in June-July in beds mixed with well rotten farm yard manure at the rate of 8-10 tonnes per Hectare. When the seedlings attain the age of 2-3 months, one transplanting given in well prepared beds or pots. In this season proper care should be exercised in irrigating the young transplanted seedlings. The seedlings should also be protected from frost by putting the pots under big trees or thatching the young seedlings in the field. Plants are generally propagated using random seedling root stocks.

IV.8. Different methods of propagation:-

The method commonly consists of uniting the selected shoot of a desired parent tree (mother plant) to the potted or transplanted seedling (root stock) by approach grafting. At Malda July is the best month for inarching.

Veneer grafting is a method of propagation which

possesses promise for mass scale commercial propagation.

Budding, stone-grafting and air-layering are also other methods of mango propagation.

Prior to planting the plants, field should be deeply ploughed, harrowed and levelled. Pits of proper size be dug at appropriate distances and filled by adding sufficient quantity of farm yard manure. The grafts to be planted should be procured from reliable places few days before actual transplanting.

The best time for planting mango grafts is during the monsoon when there is sufficient moisture in the atmosphere. The plant with its ball of earth should be taken out of the soil or pot without breaking it. The plant can then be placed with the help of a planting board in the centre of the pit by excavating as much soil as necessary to accommodate the root-ball. The moist soil of the pit is then pressed all around the root-ball and now the planting is complete.

The planting should not be done so deep as to bury the graft union in the soil or so high as to expose the upper roots. It is always better to adjust it at the same height/depth in which it was in the pot or the nursery bed.

IV.9. Irrigation:-

In the first year when the plant is very young with a shallow root system water should be applied at 2-3 days inter-

val during dry season. When the trees are 2-5 year old water should be applied at 4-5 days interval during dry period. For the 5-8 year old plants, interval can be increased to 10-15 days during dry season. When trees are in full bearing stage generally 1-2 irrigations are given after the fruit ~~xxxxx~~ setting.

IV.10. Fertiliser:-

Fertilisers should be applied in the month of June-July when the fruits have been harvested. Copper, Sulphate, Lime and Urea are recommended generally as fertilisers of mango trees.

Climatic condition:-

Temperature, rainfall, wind velocity and altitude are the main climatic factors which influence the growth of mango tree and its fruiting. It can be grown on a commercial scale in areas from sea level to an altitude of 600 m. The mango is very well adapted to tropical and sub-tropical climate. It can not stand severe frost, especially, when the tree is young. High temperature alone is not so injurious to the mango, but if accompanied by low humidity and high winds, it affects the trees adversely.

Most of the mango varieties thrive in places with good rainfall and dry season. The distribution of rainfall is more important than its amount. Rain during flowering is, however detrimental to the crop as it interferes with pollination.

Dry period before blossoming is conducive to profuse flowering. Rain during fruiting time is good but heavy rain causes damage to ripening fruits. Strong winds and cyclones during the fruiting season can play havoc and blow away the crop completely, Malda district experiences good rainfall and dry season in general (64).

Mango is grown on different types of soils such as lateritic, alluvial, sandy loam and sandy soils. The loamy, alluvial well drained soils are most ideal for mango cultivation. That means mango orchards.

Orchards are grown on soil where properties of sand is excessive. That is why the 'Diara' area of Malda is notable for mango orchards covering vast area.

In 1958, 44,000 acres of land in a compact area were under mango cultivation at Malda district. In 1985 it has been raised to 51,000 acres.

No where in India such a vast area suitable for mango plantation exists because of its advantageous climatic and soil conditions discussed above.

In recent years many mango orchard owners of Malda are using scientific manures in the monsoon season and spraying the mango trees just before the flowering and after flowering and the result seems to be very satisfactory regarding the increase of production of Malda-Mango.

64. Field Survey.

IV.11. Acreeage production and utilisation of mangoes:-

From the Table No. 4.2 as shown at the end of the Chapter it is seen that production of mango fell from 82.5 thousand tonnes in 1968 to 50.5 thousand tonnes in 1969. Generally a season of heavy production of mango is followed by a lean season. Some of the climatic conditions such as flood, etc., are also responsible for fall in mango production. But the percentage of export of mango to other districts accounted 69% in 1968 and 74% in 1969.

There was steep fall in production in 1970 viz., 25.0 thousand tonnes, but the percentage of export was 84%. In 1971, the production of mango increased to 50.0 thousand tonnes and export was 69%.

IV.12. Problems and remedies: -

The problem of fruit drop in some of the commercial varieties of mango is quite serious and causes great loss to the mango owners. It can be controlled by the sprays of NAA 20 PPM (65) or something like that .

The problem of biennial bearing in mango i.e., the tree carries optimum load of crop in one year but in the following year it fails to flower and produce satisfactory crop, is well known and causes tremendous loss to the mango industry of Malda district.

Moreover, malformation is another malady of Mango

causing heavy loss to the orchardists.

Another acute problem is that mango trees can be prone to the attack of various pests.

To solve the problem of biennial bearing in mango five sprays in all are usually recommended to be made beginning from middle of September at monthly interval.

To solve the problem of malformation of mango one spray of 200 PPM NAA or planofix in the month of October is recommended.

To solve the problem of the attack of various pests in mango trees the following measures can be taken after detection of exact pest of mango.

Mango hoppers are the most specific and destructive insect pest of mango. Sweet sticky substance exuded by these hoppers covers whole shoots and the foliage giving a glazed and shining appearance which indicates presence of the pest in an orchard. This honey dew also encourages the growth of black sooty mould which covers the entire foliage and hinders the plant activity. The pest is found practically throughout the year but the peak activity is confined to the flowering season of mango. This pest is commonly known as 'Madhua' at Malda.

To control this pest effectively spray of Carbaryl 0.15% or Monocrotophos 0.04% or Metacid 0.05% is recommended (66)

The attack of fruit fly, another pest, starts when the fruits are about to ripe. The females lay eggs just below the skin near the pulp and hatching start feeding on the pulp. Mangoes start rotting from inside. Maximum damage to the mangoes is done in June and July.

Bait sprays with 0.1% malathion + 0.1% molasses be given thrice at fortnightly intervals before ripening of the fruits in order to control fruit flies (67).

Powdery mildew is one of the worst disease of mango affecting almost every variety. The disease appears mostly during February - March and sometimes earlier due to congenial temperature and humidity. Warm humid weather and cool nights favour the spread of the disease. It produces white, powdery growth of the fungus on flowers, fruits and leaves. Newly set fruits may be covered entirely by the mildew. As the fruit grows, its epidemic in the infected area cracks and corky tissues are formed. The infected fruits after attaining pea size usually drop (68). The disease can be kept under control by spraying with microsul 0.2% Karathane L.C. 0.1% at an interval of 10 days. The first application should be given soon after flowering and subsequent two more spray at 10 days interval (69).

Mango trees are prone to the attack of various pests. Insect pests which cause serious losses to the mango

67. Ibid, Extension Folder No. 12.

68. Central mango Research Station - Lucknow (U.P.) Extension Bulletin No. 9.

69. Extension Folder No. 3 Central Mango Research Station - Lucknow (U.P.).

orchardists of Malda district are hopper and fruit fly.

Mango is a subject to a number of diseases at all stages of its development. Some of these diseases have become a limiting factor in mango orcharding in some regions. Of these powdery mildew is the worst disease affecting almost every variety of Malda Mango. This can be controlled by the help of above mentioned sprays.

IV.13. Supply of Capital for mango production:-

Huge fixed capital is required for fostering a mango garden. Circulating capital is required just at the time of ripening the fruits. Huge number of labourers are required to collect mangoes from the trees. Wages are to be paid to those workers. Moreover carrying cost of mangoes from garden to the market is to be borne from circulating capital. Certain amount of money may be spent for packing mangoes.

Spending the amount mentioned in the Table No. 433 per acre for mango orchard at Malda one owner can earn the following amount of profit from the production of mango provided he has got his own land.

Income from the production of mango:-

1 acre = 18 trees x 5 baskets	=	90 baskets.
90 baskets x 20 kg	=	1,800 kg.
1,800 kg x 0.50 per kg	Rs. =	900
Less expenses	Rs. =	579.00 (70)
Profit	Rs. =	<u>321.00</u>

Mangoes worth Rs. 4 to 5 crores are sold from Malda district in the good mango year to other parts of West Bengal, Assam, Bihar etc. Most of the sale are made by road transport.

Huge amount of money are invested in mango trade of Malda. There is a Malda Mango Merchants' Association which Co-ordinates the entire mango trade of this district. In 1958-59, Rs. 1,00,000 were advanced as loan to the Mango Processing Co-operative Society situated at Old Malda. The same society received a further instalment of Rs. 60,000 in 1959 - 60.80

The collector of Malda district advances loans for the improvement of mango orchards and it is a special feature of this district as it abounds with mango orchards.

IV.14. Workers Employed:

During mango season 25% of the total population of Malda district are engaged directly or indirectly as garden watchmen, mango-pluckers, cartmen, basket makers, packers, 70. Field Survey.

Sutli-makers, loaders, truck owners and businessmen in mango trade and earn their livelihood.

As a seasonal activity green mangoes are sliced and preserved in salt on a cottage scale basis. This activity employs a considerable number of rural population. There are about 25 such licensed units operating in this district employing 100 persons each on an average for three months. The workers of these units are almost all ladies.

IV.15. Other related issues regarding mango:-

There are nearly 1000 mango varieties in India. Of these, however, only 30 varieties are grown on a commercial scale. At Malda the earliest mangoes are the Gopalbhog and Brindabani - small but fine flavoured fruit. Then come to Lengra, Khirsapati. The last but one and largest is the Fazli, the last one is the Aswini. Ordinary mango grown from seed directly is known as 'Cuti'. Mango which is grown from Graftings is known as KALAM. KALAM mango is of superior quality and fetches a higher price. At Malda grafting of Mango trees is generally done in Jute-Arapur-Kotwali area under Englishbazar Police Station. (71)

IV.16. Mango Products:-

Both unripe and ripe mangoes can be used for preparation of various products. Unripe mangoes are used for preparation of mango chutney, mango pickle and AMCHOOR (Dried mango slices). Ripe mangoes are used for the preparation of the

following products:

Mango pulp:-

Fresh and ripened mangoes are washed in water. The pulp is softened by pressing between the palms and squeeze the pulp in a stainless steel vessel. The fibre and other coarse materials from the pulp is removed by straining them through a cloth. Since the sugar content of the mango depends upon the variety, sufficient sugar are to be added to the pulp to get the required taste. Depending upon the acid content of the fruits citric acid is to be added to the required acidity. The contents are to be mixed thoroughly, heated and filled hot in sterilized bottles. The product is to be pasteurized and stored in a cool place.

2). Mango Leather (AMSWATTA):

Obtain the pulp first spread the pulp as a thin layer in a tray the inner surface of which is covered with butter in order to avoid sticking of the pulp in the tray. Then dry the pulp - layer in the sun. After drying place another layer of pulp over it. Repeat this process until a thick layer of dried pulp is obtained. Cut the dried mango leather into small pieces, wrap them in butter paper and store in a suitable container.

3). Mango Squash:-

Obtain the pulp first. Add 1 kg. of Sugar, 1 Litre of water and 25-30 Gram of citric acid to 1 kg of pulp. Small

amounts of orange yellow edible colour can be added to give attractive colour. Add potassium metabisulphite at the rate of 500-600 mg. per Kg. of squash as preservative. Bottle the squash and store in a cool place.

4). Thick mango syrup:

Obtain under-ripe fruits and wash them in water. Remove the peel with a knife and cut in large pieces. Place the pieces in 2-3% salt water to prevent the slices getting black. Place the slices in a cloth and dip in boiling water for 5-10 minutes to soften. Spread the slices on stainless steel tray and sugar syrup. The sugar syrup is prepared by boiling sugar equal to the weight of slices in water with small content of citric acid. Heat the preserve till the syrup is thick. Cool the product and store in a sterilized bottle (22) .

Raw unripe mangoes are used for the preparation of the following products:

1). Mango Kascondy:-

It is prepared by Raw unripe mangoes. Firstly Raw mangoes are sliced and pressed to half-liquid form. Then mustard pest is added with that. Proportionate salt is added to make it a tasteful thing. Then the entire materials are placed in a sterilised bottle for sale.

2) Mango Pickles:-

The process of making mango pickle is to some extent same as to mango KASOONDY. But here mustard pest is not added. Instead of that only salt, sugar and chilly are added and placed in a sterilised bottle for sale.

3). Anchoor or dried mango slices:-

Here raw unripe mangoes are sliced and added with some salt only. Then these are dried in the sun. These can be preserved even for a year (73).

IV. 17. Production, export and value of mango:-

From the Table No. 4.4 the actual trend of yearly production of mango can be easily understood. Inspite of having several difficulties mango production at Malda has been increasing.

Moreover, from the Table No. 4.4 it can be understood that by exporting huge quantity of mango annually Malda district earns huge amount of money. That is why the importance of this orchard crop viz. Mango on the economy of this district can not be exaggerated.

From the above discussion it is clear that there are several problems of Malda sericulture and Mango Orchard. Out of these problems the most important one is the problem of financing sericulture and mango trade at Malda which has been discussed in the next Chapter.

IV.18. Comparative Study:-

In the production of mulberry raw silk China stands first, Japan stands second and India stands third. China's detailed informations are not always available that is why Japan has been chosen as a country of developed economy for comparing its any district with Malda district of India regarding sericulture.

In Japan, any district of Central Honshu is really developed in the production of silk.

Fortunately for this densely populated land the mulberry tree grows well on infertile, thin, acid or sandy soil and being a tree crop, can be relegated to the rugged lands without undue soil erosion.

Women and children of the district which is densely populated, representing the majority of the workers in the raw silk industry, do most of the tedious, delicate tasks necessary in sericulture.

In general, mulberry trees are planted on poor soils and on boundary lines between properties. Mulberry trees are also grown in unirrigated barley, bean and upland rice fields, but they do not damage these crops because the leaves and small branches near the ground are cut to feed the spring silk-worm brood.

In any district of Central Honshu a long growing seasons with high temperatures and a heavy, evenly distributed Summer rainfall bring a flush growth of tender leaves as feed of worms. In this district the area of mulberry fields per household averages less than an acre. Three forms of mulberry trees are cultivated:- low, middle and high. The low form, which buds early and matures quickly, a dwarf variety. In a district of Central Honshu it constitutes about 75 percent of the total growth. It can be raised in the shortest period of time, does not shade the land used for other crops, can be picked up earlier than the middle or high forms and in harvesting may be cut break almost to the ground without injury.

At Malda the dwarf variety of mulberry is known as bush type. High and Middle variety of Japanese mulberry are known as tree type at Malda. Climatic conditions do seldom affect the mulberry plantation of Malda. But in Japanese district mulberry bushes are carefully planted. Because climatic conditions affect often the mulberry bushes. There hard winter freezes may kill the bushes or late spring frosts may kill tender leaves, and the chilly changeable weather of April and May may injure the delicate worms. Also unusually damp and hot weather in Summer in the district sometimes spread disease among worms. At Malda there is no problem of climatic condition regarding the rearing of mulberry. But precautions are taken at the time of rearing silk worms just like the precautions taken in any district of Central Honshu in Japan against unusually damp

and hot weather. Because weather conditions influence greatly the health and the quality of Cocoons of all crops of worms.

Just like at Malda in any district of Central Honshu in Japan three main broods of worms - Spring, Summer and the Autumn are hatched and tended. At Malda three main broods of worms - Jaistha, Agrahani and Bhaduri are hatched and tended. Here lies the similarity of Sericulture in any district of Central Honshu with that in Malda. Of course there is another brood of worm - Chaitra at Malda. But that is not so important. At Malda sericulture is located in the densely populated area of the district. Similarly, sericulture is located in the densely populated area of any district of Central Honshu. Because tremendous amount of labour is required in tending the silk worms and that labour must come from the skilled labourers.

In a district of Central Honshu the process of rearing silk worms is similar to that at Malda. In Japan only the rooms and tools for silk worm raising are thoroughly disinfected with formaline, bleaching powder and so on (74). At Malda absolute cleanliness is maintained in the rooms where the silk worms raising is done.

At Japanese districts the tedious tasks of preparing the fibre from the Cocoons is done at present mostly in filatures or reeling factories, where as at Malda the maximum portion of the total production of Cocoons is reeled by the women and children in the homes and a negligible part of Cocoons

74. Darkenwald G.G. and Jones C.F. - Economic Geography published by the Macmillan Company, New York.

are reeled in filatures or reeling factories.

For sericulture, storage establishments are necessary because Cocoon production is essential, whereas reeling is a 12-month activity. In any district of Central Honshu there are storage facilities of Cocoons. But at Malda there is no such organised storage facilities of Cocoons. Cocoons are kept here in the room of the houses of sericulturists.

In the district of Japan local experiment stations breed healthy, disease free worms and distribute them to farmers
(75)
mers .

Similarly at Malda different sericultural nurseries breed healthy, disease free layings and distributed them to the farmers of this district. Even Japanese 'Bivalent' variety of layings are also distributed to the farmers for better production.

In the districts of Central Honshu, Japan Government schools instruct students in the art of sericulture. But at Malda only a few get training in sericulture from time to time in different nurseries of Malda under the Department of sericulture, Malda.

In Japan reeling is done completely under Government supervision. But at Malda reeling is done purely on private basis. There is only one Government factory at Madhughat under

Kaliachak Police Station of Malda district for reeling of the silk.

Moreover, in the districts of Central Honshu of Japan there is the system of examining the required standard of the produced silk before export. But there is no such arrangement here at Malda.

Japan is an economically developed country. That is why it has become possible to make all arrangements for the establishment of organised associations to look after the interests of the growers of mulberry food, breeders of silk worm eggs, Cocoon tenderers, raw silk reelers, raw silk merchants and silk exporters in the districts of Central Honshu. But India is a developing country and the district Malda is also economically backward. Under such circumstances, only the Governments (both provincial and central) are trying to develop sericulture in its different phases at Malda.

Table - No. 4.1Average yield of mulberry leaves per acre at Malda.

Type	Quantity	Period	Price per Kg.
Bush type	9,600 kg	Annually	Rs. 5 to Rs. 20
High bush type	7,200 kg	Annually	"
Tree type	3,600 kg	Annually	"

Source : "Industrial potential of Malda district" - A study made by small Industry Extension Training Institute (Government of India) Hyderabad, 1973.

Table- 4.2Acreage, production and pattern of utilisation of mangoes of Malda.

Year	Total acreage.	Production in '000' tonnes.	Utilisation at green stage (in '000' tonnes).	District's consumption at ripe stage in '000' tonnes.	Export outside the district (in '000' tonnes)
1968	44,600	82.5	7.5	9.7	57.3
1969	45,000	50.5	5.6	4.6	37.4
1970	45,000	25.0	1.5	1.5	21.0
1971	45,000	50.0	5.0	2.5	34.5

Source: District Agricultural Officer, Malda.
District Agricultural Marketing Officer, Malda.

Table - 4.3COST OF PRODUCTION OF MANGO1 Acre : = 18 trees

Rent	..	Rs. 9.00
Ploughing = 12 x Rs. 10 =		120.00
Labour for jungle:		
Cutting 6 x 5 =		Rs. 30.00
Watchman 70 x 3 =		Rs. 210.00
Agricultural Income Tax		Rs. 60.00
Plucking labour 15 x 8 =		Rs. 120.00
Cartman 6 x 5		Rs. 30.00
		<u>Rs. 579.00</u>

Source : Field Survey.

Table - 4.4

Yearly production, export and value of mango

Total	No. of baskets exported.	In Qtls.	Edible made & consumed locally in Qtls.	Total of 3 & 4	Value per Qtls. Rs.	Total amount in Rupees.
1	2	3	4	5	6	7
1970	9,37,873	2,34,468	58,617	2,93,085	80.00	2,34,46,800
1971	15,09,623	3,07,407	94,352	4,71,759	"	3,77,40,720
1972	5,96,219	1,49,055	37,264	1,86,319	"	1,49,05,520
1973	5,71,454	1,42,863	35,716	1,78,579	"	1,42,86,320
1974	5,96,830	1,49,208	37,302	1,86,510	"	1,49,20,800
1975	13,74,409	3,43,603	85,900	4,29,502	"	3,43,60,160
1976	8,95,200	2,23,380	1,11,190	3,43,570	"	2,67,65,600
1977	27,31,200	6,08,280	1,52,070	7,60,350	"	6,08,28,000
1978	5,90,300	1,43,250	47,750	1,91,000	100.00	1,91,00,000
1979	2,95,000	75,000	25,000	1,00,000	125.00	1,25,00,000
1980	5,00,000	1,25,000	25,000	1,50,000	"	1,87,50,000
1981	3,00,000	2,00,000	20,000	2,20,000	"	2,75,00,000
1982	6,51,000	1,63,000	17,000	1,80,000	"	2,25,00,000
1983	20,00,000	7,50,000	30,000	7,80,000	100.00	7,80,00,000

Source: Bulletin issued by Malda Mango Merchants' Association on 17.7.84.

Figure - 4.1

PRODUCTION AND EXPORT OF MALDA MANGOES:-

