

out frames and remove the bees. Uncap combs with a hot uncapping knife and put frames in extractor and revolve. Honey will come out by centrifugal force. Allow the honey to settle down for few hours and then bottle it.

2. **Summer management:** In this period, bees abscond and colonies become weak due to

- a. Adverse climate
- b. Attack of wax moth
- c. Lack of bee flora

So control absconding by uniting bee colonies, providing better ventilation, ample honey stores and watching bee enemies.

3. **Winter management:** Colonies should be protected

- a. By packing 3 inches grass or dry leaves and place in wind protected place.
- b. Keep colonies strong with plenty of honey and good queen.
- c. Unite weak colonies with strong ones.

Feeding of honey bees: During scarcity period, bees have to be fed on honey or sugar syrup. Prepare sugar syrup by mixing two parts of sugar and one part of water, otherwise 50:50. Put solution in dishes with few straws floating on surface to avoid drowning of bees.

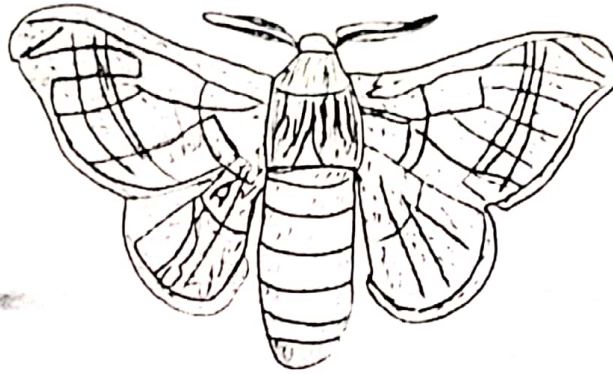
8.1.4 Bee enemies:

1. **Wax moth:** feed on the comb wax. After its attack, bees leave the hive.
2. **Hornets:** destroy bees at hive entrance and in the fields. Search their nests in the vicinity and fumigate to kill them.
3. **Black ants:** take honey, pollen and nectar and also fight with bees. Bees may abscond, after their attack.
4. **Varroa mites:** are the parasites of bees, feed on them make them weak.

8.2 SERICULTURE

The act of rearing silk moths for silk production is called sericulture. Silk is produced by a number of species of insects belonging to family Bombycidae, but silk produced by species other than *Bombyx mori* is of inferior quality and those species are attacked by a number of pests, hence do not give satisfactory results.

Bombyx mori is univoltine (one generation per year), produces one crop in a year and feeds on locally available mulberry leaves. This insect requires low temperature and little moisture and this type of climate is present along the sub-mountain tracts.



8.2.1 Silk Seed

Eggs of silkworm larvae are called “silk seed” and are available from Sericulture Inspector in each district which contains 20,000 to 22,000 eggs. Seed is brought to plains in the end of February and the mulberry trees sprout in beginning of March. For rearing 1 oz. of seed at least 15 full grown mulberry trees are required. Incubation of eggs should be started 15 days before sprouting of trees because by the time larvae hatch, tender leaves should be available.

8.2.2 Rearing of Silkworm Larvae

Eggs should be incubated in an incubator or in a clean room at 25°C. The temperature should be raised every day by 1°C. The eggs in the room should be placed on white paper in the form of thin film on a rack or stool. Eggs should be covered for safety. Proper humidity should also be maintained by keeping 2-3 buckets full of water inside the room. Eggs hatch in 10-12 days and hatching continues for 2-3 days. Larvae should not be touched with hands. Caterpillars hatching during every 24 hours should be kept separately, as the art of rearing depends on synchronizing of mulberry leaves sprouting and the eggs hatching dates. The caterpillar passes through 5 moults. In the beginning of every moult, they stop feeding and keep 1/3 of its anterior body raised up and withdraw thoracic legs. Do not feed them at that time and at that stage the larvae of the same age should be kept in the tray. After moulting, as soon as they begin to move give food to them. Requirements for larvae hatched from 1 oz. eggs are as under:

Stage of Larvae	Space required	No. of days	Mulberry Leaves
1 st	24 sq ft	3 days	5 kg
2 nd	40 sq ft	5 days	10 kg
3 rd	80 sq ft	7 days	15 kg
4 th	250 sq ft	9 days	110 kg
5 th	300-500 sq ft	9-11 days	400 kg

Sanitation is essential for rearing. Refused leaves and excreta must be removed. The trays, containing larvae should be cleaned 2 days after each moult. As they pupate under shelter, the 5th instar larvae should be provided with small boxes of cards for pupation. As soon as they get shelter, they start secreting silken threads which are spun in the form of cocoons. One caterpillar can spin about 400-500 feet long thread. Then the adults will come out of the pupa by cutting a hole in the cocoon. Therefore, to save silk, cocoon pupa is to be killed inside before changing into adult. The process of killing cocoon pupa is called "Stifling" (suffocation). It is done by 2 ways:

- i) **By sun heat:** Expose cocoons for 2-3 days to the sun, cover with black cloth and thus pupa will die.
- ii) **By steam:** Pass steam over the cocoons to kill pupa.

8.2.3 Diseases of silkworm

Silkworm is liable to infectious diseases:

- 1) **Pebrine disease:** Most serious in caterpillars and is heritable. Eggs laid by infected moths are infected and larvae from such eggs die before reaching maturity. Black spots on the body appear and secretion of serum or blood from body is observed. Healthy seeds should be reared after microscopic examination.
- 2) **Grasserie:** Larvae become restless and yellowish in color. If the body is punctured, yellow fluid comes out and on microscopic examination; millions of minute polyhedral crystals are seen.
- 3) **Muscardine or Calcine:** A contagious disease which is caused by growth of a fungus. Larvae become sluggish and black spots appear on the body.
- 4) **Flacherie or Flaccidity:** It is a fatal disease and prominent after 4th moult. All of a sudden larvae stop spinning, become sluggish and die off.