Fight Mango Pests

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Mango, the king of fruits, occupies the same position in India as the apple in England, France, Germany and other countries in the temperate zones of Northern Hemisphere. It is one of the most nutritive and delicious fruits and contributes in making our nation healthy. Recognised as one of the choicest fruits of the tropics, mango has been raised from times immemorial in India, attaining an importance unexcelled in any other part of the world. It is grown in almost all the states of India.

One of the most important as well as one of the most difficult problems, which the fruit growers have to face and solve, is its protection from numerous dangerous pests and diseases. There are more than a dozen harmful insects that do damage to mango ' by destroying their foliage and inflorescence, boring into the bark, wood and ripe fruits ; affecting the germination of seeds and some times killing the tree as a whole. The important pests are described below giving an information about their life-history, damage and control.

1. Mango Hoppers (*Idiocerous atkinsoni Leth.* I. *clypealis* Leth.,

I. *niveosparsus Leth.*, Family Cicadellidae ; Order Homoptera)

The mango hopper, also known as mango jassid, is the worst pest of mango trees. It is distributed throughout India. The common expression" a good mango year", or "a bad mango year," is so universal and familiar that we are apt to accept it as representing an established order of things, without inquiring into the causes. In several such bad years, mango hopper is the cause. This insect is found upon the trees during the whole summer and sucks the sap from the leaves, flowers, and young tender shoots, but it commits most damage when the trees are in blossom, by injuring the reproductive organs of the flowers and the causing interference with the setting of the fruits. Owing to drain of plant sap, the flower-buds and flowers etc. first become flaccid and then wither and die. A sticky sweet fluid is excreted by this pest. It wets the leaves and the soil around the tree. This secretion is also responsible for the development of a sooty which would give a sickly appearance and hinders thus photosynthetic activities of the leaves. Thus, this pest affects the vigour of the tree and its yielding capacity very adversely. There are two periods of its greater activity—the first from February to April and the second from June to August. It is a monophagous pest and no alternate food plant has so far been recorded.

The size of mango hoppers varies from 5 to 7 mm. About 100 to 200 eggs are laid by one adult female which hatch in about 7 to 10 days. After 2-4 weeks the nymphs reach the adult stage. Both the nymphs and adults are equally responsible for the damage.

Control—(1) 0.1 per cent DDT should be sprayed at the rate of 10-15 litres per grafted tree and 20-30 litres per seedling tree. (2) Spraying with 0.02 per cent diazinon, 0.04 per cent malathion or 0.02 per cent endrin is also effective. (3) Trapping and destroying the hoppers by means of nets, bags or screens smeared with some sticky materials.

2. Mango Mealy Bug (*Drosicha mangiferae* Green ; Family—Coccidae, Order—Homoptera)

It is a serious pest of mango and is found throughout the country in all the mango growing tracts. The Indo-gangetic area is particularly affected by this pest. It appears in clusters on the tender parts and sucks juices from the stems, leaves and friuts, and cause the tender shoots and flowers to dry up and affects the setting of the fruits. More than 50 other host trees are attacked by this pest which includes guava, plum, peach, citrus, papaya, litchi, pomegrante, jak, jamun and *Ficus* spp. It produces honeydew on which a sooty fungus grows.

The adult females are wingless with a flattened body of about 8-12 mm in length covered with a mealy power. The males have one pair of wings with a very delicate reddish body. The females live for about a month while the males have a short life. In the months of April-May, the females descend from the trees and lay eggs. About 300 to 400 pink eggs are laid by one adult female. These are found in silken sacs about 5-15 cm deep in the loose soil or in the cracks. The hatching of nymphs depends

upon the temperature and the moisture conditions. However, they hatch in November to April after which they crawl around and climb the tender parts of the tree in search of suitable food materials. After three months the males undergo some sort of pupation and turn afterwards into mature winged males.

Control—(1) The soil below the tree should be exposed to the solar heat by raking the ground so that the exposed eggs may get killed. (2) Application of aldrin or dieldrin in the soil around the base of the tree to kill the hatched nymphs. (3)—A sticky band like "Ostico" should be applied around the tree trunk at 1/2 m above the ground level to prevent the nymphs to crawl up the trees. (4) Spraying the trees with 0.04 per cent diazinon or 0.08 per cent malathion at the rate of 18 litres per tree.

3. Mango Stem Borer (*Batocera rufomaculata* De Geer and *B. rubus L.* Family Lamiidae, Order Coleoptera)

The main branches and the stem of the tree are attacked by this pest which may be killed outright. It is found throughout India but has got more significance in Bihar, Madhya Pradesh Maharastra, Mysore and Uttar Pradesh. Several other fruit trees are also attacked by this pest, like citrus, guava, pomegranate and loquat etc.

The grub which has a very strong biting mouth parts tunnels into the stem and continues to burrow inwards. The sap and the frase exude from the bored hole. The leaves begin to fall from the attacked branches and ultimately the whole attacked branch collapses. Some times the old trees die due to attack of this pest. The adult is a stout built longicorn beetle with long legs and antennae. Its colour is dull yellowish brown with yellowish spots on thorax and elytra. It measures 5 cm in length and 2 cm in breadth. The eggs are inserted singly under loose bark or diseased portion of the tree. The full grown grub is yellowish white in colour and measures about 10 cm in length. Pupation takes place inside the stem and the adults emerge in May or June.

Control—(1) Light traps should be used to attract the adults. (2) If the tunnel is superficial the grub may be extracted through the bored holes by hooked wires (3) The borer hole should be traced and 30 ml of DDT or BHC at 0.2 per cent concentration should be poured into the hole through a funnel or syringe and the hole should be plugged with mud soaked in tar. (4) Saintary methods like cutting and destroying all affected dry plant parts, scraping loose bark from tree stems may be followed.

4. Bark-eating Caterpillar (*Indarbela quadrinotata* Wlk., *I tetraonis* M., Family Metarbelidae, Order Lepidoptera)

It is found throughout the country. It is a very harmful caterpillar which tunnels the stem and branches in zigzag manner. These tunnels are mostly 2 mm in width and 50 to 60 cm or even more in length, composed of silken webs which are filled with excreta and fine chips of wood. The older trees are more susceptible to this pest. The caterpillar feeds on the bark and destroys the phloem vessels which transport the plant nutrients to different parts. Thus, the growth of the plant is very much affected and the infested branches or in some cases the whole tree is killed. The fruit bearing capacity is also very much reduced. There are several other host trees which are attacked by this caterpillar and some of these are guava, loquat, citrus Jamun, pomegranate etc.

The adult is about 3 to 4 cm in wing span, pale brown in colour with grey patches on the wings. The eggs are laid in May & June on the barks which hetch after 1 to 2 weeks depending upon the ecological conditions. The caterpillars feed on the bark and pupate during December—January inside the feeding gallaries. Pupal period lasts for about a month. The adults live for a very short period.

Control—(1) The webs should be cleaned and the caterpillars should be destroyed. (2) Spray the bark with 0.2 per cent DDT of BHC. (3) Fumigate the tunnel by pouring petrol or kerosene in the hole and closing it thereafter with mud. (4) Inject insecticide, having both contact and stomach poson effects into the hole and smear that well around the hole. This will kill the caterpillars when they come out side of their tunnels to feed on the bark.

5. Mango Stone Weevil (*Sternochetus mangiferae* Fab.,

Family—Curculionidae, Order—Coleoptera)

It is also known as mango nut weevil and is found throughout the tropical tracts. The adult weevil is about 8 mm in length and about 4 mm in breadth. It is dark brown in colour and is found mostly inside the ripe fruits. Generally it is found inside the nut and some times burrowing into the pulp. In the non-fruiting season, this pest is found hiding under the bark and in other niches and may remain there for several months. This pest may survive without food and water for months. It is nocturnal in habit.

The adult female lays about 300 eggs in about three months. These are white and are laid under the rind of the ripening fruit. The grubs are yellowish white and burrow into the nut through the developing pulp. They grow and pupate in the nut. If, however, the seed coat has hardened before the larva has bored it, then the larva has little chance of survival. The whole life-cycle is completed in 50 to 60 days. The injuries done to the skin and pulp soon get healed up and the fruit looks quite normal and healthy, although several developed insects are present inside the stone. This is a monophagous pest and attacks mango only. The main damage is done to the seeds which subsequently affect their viability in the nursery.

Control—(1) Proper disposal of stones and fallen mangoes. (2) Destruction of the weevil when seen in the garden and general cleanliness. (3) Hot water treatment kills the insects inside the stone without causing any harm to the fruit itself.

6. Mango Fruit Fly (*Dacus dorsalis* Hendel ; Family Tephritidae, Order Diptera)

About half a dozen species of fruit flies have been noted to attack mango fruits in different parts of the country. Of these *Dacus dorsalis* is the most destructive and has displaced most of the other species. Although it is found throughout the country yet its attack is particularly serious in Sooth India. The infested fruit does not always show clear symptoms of attack but one can find it out by its sickly surface and a brown rotten patch around the site of oviposition. The maggots feed on the pulp turning it to dirty brown in colour. The attacked fruits drop off and the yield is much reduced. The ripe mangoes are damaged and become unfit for human consumption. The adult fly is small in size marked with yellow and brown patches on its body and wings. About 200 eggs are laid by one adult female in its life time. The maggots feed in fruit for about 2 to 3 weeks and then come out and pupate in the soil.

Control—(1) Collection and destruction of fallen and badly infested fruits. (2) Ploughing or raking the soil under the trees destroys the overwintering pupae. (3) Bait spraying consisting of protein hydrolysate (110 gm), brown sugar (20 gm) malathion (1 ml) and water (4.5 lt.)

7. Termites (*Odontotermes obesus* and *Neotermes* gardneri ;

Family—Termitidae, Order Isoptera)

They are also know as white ants and are very injurious. They are often reported to damage the seedlings and young trees. In its serious attack the whole tree may be killed. These are well known pests which damage a number of trees.

Control—(1) Clean cultivation. (2) Frequent irrigation. (3) The soil around the trees should be treated with aldrin or chlordane.

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be established in all districts with a view to imparting technical literacy on skills to the illiterate peasantry.

Agricultural Universities should develop an inbuilt mechanism for promoting learning through work experience. Practical training should receive the greatest attention.

The suggestions of the Agricultural Universities Students' Association for the establishment of an All India Agricultural Service and the institution of a system of Registered Farming Practitioners may be examined.

Mass Communication Media :

Greater coverage of agricultural information in the language press, farm magazines for new-literates, greater use of radio and preparation for the use of T.V. medium all require emphasis.