

## Insect pests of falsa (*Grewia asiatica* MAST.) in India and their control.

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FALSA is a sub-tropical fruit crop of Indian origin. It is grown as a catch crop amidst commercial fruit orchards specially in Haryana, Punjab, Rajasthan, Uttar Pradesh and some parts of Maharashtra and Andhra Pradesh (around Hyderabad). A wild species, *G. elastica* grows on lower hills all over India. The fruit contains 55-65 % juice with 2.8 % citric acid, 11.7 % sucrose sugar and traces of vitamin C (SINGH, 1967). This is one of the most hardy fruits, drought resistant (SINGH, 1957) and requires very little post-planting care. As usual, insect pests do take their share but except mealy bugs and a few leaf eating beetles and caterpillars the loss caused by other insect pests is negligible. These minor pests include, cotton whitefly, a few species of bugs, bark eating caterpillars, etc.

Falsa being one of the cheapest fruits, it was hitherto considered uneconomical to incur any expense on its protection against insect pests. Nevertheless, with steep rise in prices and consumers becoming quality conscious, it will certainly pay to adopt plant protection measures to improve its quality and yield. Moreover, it is likely that a minor pest of today may become major pest tomorrow ; as such it is desirable to know all about these pests and their control.

### MEALY BUGS

#### Mango mealy bug.

*Drosicha mangiferae* (GREEN) is widely distributed in India, China, Bangladesh and Pakistan. It is a polyphagous pest having a very wide range of host plants (BUTANI, 1975).

The flat, oval, waxy-whitish bugs are often seen clustered

on tender shoots and penicles and are often mistaken for fungal outgrowths. The gravid female bugs crawl down the trees during April-May, go down 80-120 mm below the soil surface and burst open giving 400-500 pinkish eggs. The eggs remain in soil and hatch with onset of winter and the hatching continues till the temperature starts shooting up (March). The nymphs crawl up the tree and start sucking the sap, thereby devitalizing the plants ; as a result of which the yield suffers adversely.

#### Ber mealy bug.

*Perissopneumon (Drosichiella) tamarindus* (GREEN) is a major pest of ber (BUTANI, 1973), occasionally found damaging apple, banana, citrus, falsa, fig, mulberry, tamarind and number of ornamental plants. The pest is more common in Northern India (VEVAL, 1971).

Oval, shining, yellow eggs are laid in soil during October-November. Incubation period is about 6 months. Nymphs hatch early in May and crawl up the trees to suck the juice from tender shoots. This mealy bug usually appears after the activity of mango mealy bug is over. The fertilized female start descending in September-October for egg-laying in the soil.

Digging the soil around the trees or repeated ploughings kill the eggs. Application of 5 % heptachlor or chlordane mixed thoroughly in the upper layer (400-500 mm) of soil is effective in controlling the population of freshly hatched nymphs. This soil application will also check the population of chafer beetles (grubs). In case of severe infestation spray 0.04 % diazinon or monocrotophos against young nymphs and 0.1 % monocrotophos or diazinon against the full grown ones.

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## LEAF DEFOLIATING BEETLES

### Cockchafer beetles.

*Adoretus* spp. are often seen on falsa trees eating the leaves. VARMA and BINDRA (1972) as also KHAN and GHAI (1974) also recorded *Anomala bengalensis* BLANCHARD, *Apogonia uniformis* BLANCHARD, *Holotrichis consanguinea* BLANCHARD, *H. insularis* BRENSKE and *Schizonycha* species. These beetles are omnipresent and polyphagous. The young ones (grubs) feed on roots and adults on foliage. In case of severe infestation, entire tree may be defoliated. Adults appear with first heavy shower on monsoon (end of May - June) and cause the damage for about two months.

Besides, *Oxycetonis versicolor* (FABRICIUS) commonly known as falsa beetle, is found on flowers, sucking the sap therefrom. The affected flowers wither and die away. This pest is more common around Hyderabad (Andhra Pradesh) and has also been recorded from South India on cotton, ground nut, sorghum, lady's finger, rose, etc. The grubs feed in farm yard manure.

### Almond beetle.

*Mimestra cyanura* HOPE (1830) has been recorded from India, Burma, Nepal and Northern Pakistan. In India, these are found in Kashmir, Kulu valley and sub-montane area of Uttar Pradesh. It is a polyphagous pest, whose host plants include, almond, apple, apricot, chestnut, falsa, fig, grapes, mulberry, pear, peach, plum, pomegranate, etc., almond being the preferred host (PRUTHI and BATRA, 1960; SINGH, 1964). Small (8-10 mm long), shining yellow beetles with long legs and oblong oval elytra (STEBBINGS, 1914) appear in swarms during May-June and defoliate the trees - both young as well as old. The maximum loss is caused during July-August.

Clean cultivation, regular removal of weeds and deep ploughing around the trees keep the population of these beetles under check. Soil application with 5 % heptachlor or chlordane is also helpful. In case of severe infestation, dust with 10 % BHC. BINDRA et al (1973) suggested spraying with 0.04 % endosulfan or 0.15 % carbaryl.

## LEAF EATING CATERPILLARS

### Falsa caterpillar.

*Giaura sceptica* SWINHOE is a sporadic pest recorded from India, Bangladesh, Burma, Sri Lanka, etc. Though falsa is its main host, the caterpillars also feed on soybean, velvet bean and a few ornamental plants. In India, the pest is more common at Delhi, Bihar and Maharashtra. Caterpillars feed on leaves and if the attack is severe, the entire tree may be

defoliated.

### Plum hairy caterpillar.

*Euproctis fraterna* (MOORE) is a polyphagous pest, reported from Burma, Bangladesh, India, Pakistan, Sri Lanka, etc., on apple, apricot, ber, citrus, grapes, mango, mulberry, peach, pear, plum, pomegranate, strawberry and falsa, etc. Eggs are laid in clusters on ventral leaf surface. These are covered with dense hairy coating. On hatching the young caterpillars feed gregariously on epidermis of leaves, later they spread out and eat the leaves voraciously, often defoliating the tree completely. Full grown caterpillar is 35-40 mm long, reddish brown in colour with tufts and tussocks of hair on entire body. Egg, larval and pupal periods are, 1, 6 and 8 weeks respectively during summer and little longer during winter. There are three generations a year.

To control these caterpillars dust 5-10 % BHC. It will be far more convenient and economical to kill the freshly hatched larvae which are gregarious in habit and against these 5 % BHC is good enough. To control *E. fraterna*, JOSHI et al (1967) recommended spraying with 0.2 % carbaryl as soon as the pest appear (initiation of flowering). Repetition may sometimes be necessary.

## MINOR PESTS

### Cotton whitefly.

*Bemisia tabaci* GENNADIUS (*Gossypiperda* MISRA and LAMBA) is a major pest of cotton, tobacco and some winter vegetables. In absence of these hosts, this whitefly migrate to other trees around both wild and cultivated including falsa and papaya. The pest is widely distributed in tropical and sub-tropical countries (CIE Mao No. A 284). In India, as a pest of falsa, it has been reported from Delhi, Naryana and Punjab. Numerous nymphs are occasionally seen sticking on lower leaf surface, sucking the sap therefrom thereby lowering the vitality of the plants. They also secrete honeydew which falls on the upper surface of the leaves below. On this honeydew sooty mould developpes covering the leaf surface with black coating.

Cotton being one of the main host, most of the studies have been carried out on this crop. The pest has been found to be more abundant in drier areas having high temperature and humidity. Its seasonal activities have been studied by HUSAIN et al (1936; earlier HUSAIN and TREHAN (1933) studied its life-history and bionomics. Eggs are light yellow in colour, pear shaped about 2 mm long anchored on the leaf by means of an appendage that is firmly inserted in stomata. Nymphs are greenish white in colour, oval in shape. On hatching these crawl a bit in search of succulent

spot where they settle down permanently. Last nymphal instar is 0.6-0.8 mm long and red eyes of adult are visible through its transparent integument. Adult is tiny, fragile insect having yellowish body and all four wings covered with white waxy powder. During summer, egg and nymphal periods last for 3-5 and 9-14 days respectively while pupal (last nymphal instar) last for 2-8 days. This period is prolonged considerably in winter. There are as many as 12 generations a year. Parthenogenesis also occurs (NARAYANAN, (1962).

The pest can be controlled by spraying with 0.03 % phosphamidon, dimethoate or dicritiphos. Repeat if necessary.

#### Falsa bug.

*Gargara mixta* BUCKTON is a specific pest of falsa. It is found in a mild form, all over India, Burma, Sri Lanka, Bangladesh and Pakistan. Eggs are laid on tender shoots during March-April. Incubation period is about a week; nymphs on hatching occupy the leaf axils and suck plant juice therefrom. The bugs also excrete honeydew which attracts the ants, *Camponotus compressus* FABRICIUS.

Besides, two more bugs, namely, *Leptocentrus taurus* FABRICIUS and *Scutellera mobilis* FABRICIUS have been reported from Uttar Pradesh. The former is more common on citrus and the later on grapes.

Control measures suggested against whitefly will check

these bugs as well. Dusting with 5 % BHC is also effective against these bugs.

#### Bark eating caterpillar.

*Indarbella tetraonis* (MOORE) - a major pest of guava (BUTANI, 1974) also attacks ber, citrus, falsa, jamun, litchi, mango, sapota, etc. On falsa, it has been reported from Uttar Pradesh and is more common in orchards that are not well maintained. Female moth lays eggs in clusters under the loose bark of the trees around June. These hatch in 8-10 days. The freshly hatched larvae nibble the tree trunk for a day or two then bore inside and feed within till next March. Pupation takes place when the temperature start rising (end of March). Huge webby mass comprising of minute wood particles and excreta of the insect, are seen conspicuously plastered on tree trunks and main branches specially near the forking of branches. In case of severe infestation, translocation of cell sap is interrupted, which adversely affects the growth and fruiting capacity of the tree.

To control these caterpillars, clean the tree trunks and branches by removing all the webs etc and insert in the holes swab of cotton wool soaked in chloroform (LAL, 1952) or kerosene (PATEL et al., 1964) or 0.04 % DDT, malathion or dimethoate (SRIVASTAVA, 1972). KHURANA and GUPTA (1972) suggested injecting 0.013 % dichlorvos (DDVP), 0.05 % trichlorfon or 0.05 % endosulfan. Seal the holes after treatment with cow dung or mud and such of the holes as may reopen need be retreated.

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