Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 02, Issue: 04 (JULY-AUGUST, 2022)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Introduction to Insect Pests and Their Management of Mango

(*Dwarka[1], Dr. Anand Kumar Panday[1] and Dr. Sachin Balpande[2])
[1]Deptt. of Entomology, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, MP
[2]School of Agriculture, SAM Global University, Raisen, MP- 464551
*Corresponding Author's email: dwarkaprasadjnkvv512@gmail.com

Mango (*Mangifera indica* Lin.) is a very important and popular fruit in the world. It is the choicest fruit of the subcontinent and is known as king of all fruits. Its popularity is mainly due to its excellent flavour, delicious taste, and high nutritive value being rich in vit-A and C. More than 300 insect pests have been recorded to attack mango crop in different regions of world (Patel *et al.*, 2004). There are nearly 260 insects and mite pests on mango reported from Indian subcontinent of which 30 pests are serious, capable of causing losses to crop growth and yield (Kapadia, 2003).

Pests of mango Pest of national significance	Pests of regional significance
Stone Weevil	Scale
Mango hopper	Shoot webber
Mango mealy bug	Termites
Leaf Webber	Thrips
Stem borer	Loopers
Inflorescence midge	
Red ant	
Fruit fly	

1. Mango stone weevil: *Sternochetus mangiferae* (Curculionidae: Coleoptera)

Alternate host: It is a specific pest of mango. In India it is confined to humid areas in southern and coastal regions, most common in S. India.

Identification of pest: Grub: A full grown grub is legless, fleshly and yellow with dark head. Dark weevils after emergence remain inactive, hidden in the cracks and crevices on the trunk. **Adult:** Adult is dark brown with a short snout.

Nature of symptoms: Both grub and adult feed on nut.

Damage symptoms: Grub makes zig-zag tunnels in pulp; Eats unripe tissue and bore into cotyledons; Fruit dropping at marble stage; oviposition injuries on marble sized fruits; Tunnelled cotyledons in mature fruit by grubs; Grubs bore through the pulp, feed on seed coat and later damage the cotyledons; The pulp adjacent to the affected stone is seen discoloured when the fruit is cut open.

Mango stone weevil

2. Mango leaf hopper: *Ideoscopus clypealis, I. indicus and Armitodus atkinsoni* (Cicadellidae: Hemiptera)

Favourable condition: Severe during Nov-Feb when plant is at flowering stage.

Identification of pest: Nymph - Nymphs pale yellow, very active and hide in lower shoots or in cracks in the barks; The insect appears in February when mango trees come to flowering.

Adult: a. *Idioscopus niveoparsus*; Adults: dark with wavy lines on wings and three spots on scutellum. **b. *I. clypealis***; Adults: small, light brown with dark spots on the vertex and two spots on scutellum. **c. *Amirtodus atkinsoni***; Adults: large, light brown with two spots on scutellum.

Nature of damage: Adult and nymphs suck the sap from the Leaves, flowers and fruits.

Mango leaf hopper

Damage symptoms: Nymphs and adults suck the sap of inflorescence; Withering; Shedding of flower buds and flowers; Presence of honey dew segregation on lower leaves and development of sooty mould; Clicking sound - movement of jassids amidst leaves; Hoppers provide shelter in the cracks and crevices of the barks on the tree; Curling & drying of affect part; Reduce the plant vigor and destroys the inflorescence. Fruits often drop; Sooty mould development by honeydew secretion.

Favourable condition: High humidity favor the population buildup.

3. Mango mealy bug: *Drosicha mangiferae* (Green) (Margarodidae : Homoptera)

Alternate host: Feeds on as many as 62 different plant species, among them, mango, citrus, jujube and guava suffer most.

Mango mealy bug

Identification of pest: Pinkish nymph

Nature of damage: Both adults and nymphs suck sap from inflorescence, tender leaves, shoots and fruits and affect the fruit set.

Damage symptoms: Drying of leaves and inflorescence; Presence of pinkish nymphs and adult mealy bugs on fruit and fruit stalk; Sooty mold development by honey dew excretion; Heavy infestations devitalize the plant and result in reduction in fruit size and premature dropping of fruits.

4. Mango fruit fly: *Bactrocera dorsalis, B. correctus* & *B. Zonatus* (Teprhritidae: Diptera)

Alternate host: Polyphagous pest attacks all the fruit crops.

Flies breed on fruits that are mature and population increases rapidly during summer.

Identification of pest: Larva: Yellowish apodous maggots; Adult: Light brown with transparent wing.

Mango fruit fly

Nature of damage: Female punctures outer wall of mature fruits to insert eggs and causes egg laying injury. Maggots feed on mesocarp.

Damage symptoms: Maggot bore into semi-ripen fruits with decayed spots and dropping of fruits; Oozing of fluid; Brownish rotten patches on fruits; Ovipositional punctures on pericarp; Feeding injury causes secondary infection like fruit rot.

5. Mango stem borer: *Batocera rufomaculata* (Cerambycidae : Coleoptera)

Alternate host: Mango, fig, rubber, Jack, mulberry and eucalyptus *etc.*

Nature of damage: Grub is the damaging stage which tunnels through the trunk or branches.

Damage symptoms: Grubs tunnel into the stem through trunk and branches. In severe cases causes wilting.

Mango stem borer

6. Thrips: *Coliothrips indicus, Rhipiphorothris cruentatus, Scirtothrips dorsalis* (Thripidae: Thysanoptera)

C. *indicus and R. cruentatus feed on leaves* and *S. dorsalis* on inflorescence and young fruits

Nature of damage: Nymphs and adults lacerate the tissues and suck the oozing cell sap. Leaf feeding species feed on mesophyll near leaf tips.

Damage symptoms: Affected leaves show silvery sheen and bear small spots of faecal matter; Affected fruits show corky appearance.

Thrips

7. Red ant: *Oecophylla smaragdina* (Formicidae: Hymenoptera)

Identification of pest: Reddish ant, queen – olive green in colour.

Nature of damage: The ants web and stitch together a few leaves.

Damage symptoms: Webbed of leaves with ants forming nests; Top leaves of the branches webbed and build their nests; They mainly problematic during harvesting the mangos.

Red ant

8. Leaf miner: *Acrocercops syngramma*

Damage symptoms: Tiny caterpillars mine under the dorsal epidemics of tender leaves and feed within as a result grayish white blisters appear on leaves.

9. Inflorescence/leaf/twig midge: *Erosomyia indica, Dasineura amaramanjarae* (*Cecidomyiidae: Diptera*)

Nature of damage: Maggots bore in to tender leaves, inflorescence and small fruits.

Damage symptoms: Maggot tunnel the axis of inflorescence and destroy it completely. It causes bending and drying of the inflorescences; Young maggots bore into tender fruits which slowly turn yellow and finally drop; The inflorescence shows stunted growth and its axis bends, at the entrance point of larva.

10. Scale: *Chloropulvinaria polygonata, Aspidiotus destructor* (Diaspididae: Hemiptera)

Nature of damage: Nymphs and adults suck the sap from tender parts.

Damage symptoms: The nymphs and adult scale suck the sap of leaves and other tender parts reducing vigor of plants; They also excrete honeydew which helps in the development of sooty mould on leaves and other tender parts.

11. Loopers: *Thalassodes quadraria* & *Chloroclystis* sp.

Symptoms of damage: Webbed inflorescence and subsequent drying of inflorescence.

Identification of pest:

A. *Thalassodes quadraria*: Grey greenish looper; Adult: green with angular wings.

B. *Chloroclystis* sp: Brownish looper; Adult: Greyish moth with wavy lines.

Integrated Pest Management

Cultural practices:

- Plough the field before planting to destroy existing weeds in the field.
- Use resistant/tolerant varieties.
- Provide timely irrigation, organic manure, fertilizer as per the recommended dose, drainage, weeding, mulching *etc*.
- Collection and destruction of infested and fallen fruits at weekly interval till harvest fruit.
- Ploughing of orchard after harvest to expose hibernating adults, reduce, infestation levels.
- Destroy all left over seeds in the orchard and also in the processing industries.

Mechanical methods:

- Collect and destroy crop debris and insect damaged plant parts.
- Remove weed plants.
- Handpick the gregarious caterpillars and the cocoons which are found on stem and destroy them in kerosene mixed water.

Mechanical operations in particular insect pests

Operation	Target insect pest
Hand picking of gregarious forms of larvae	Leaf webber, Shoot webber
Banding of tree trunk with alkathene (400 gauge) 25 cm wide sheets	Mango mealy bug
Pruning the overcrowded shoots	Leaf hoppers, red ants, leaf miner and scale
Collection and destruction of infested and fallen fruits at weekly interval till harvest fruit.	Fruit fly and stone weevil
Destroy all left over seeds and fruits in the orchard	Mealy bug, fruit fly and stone weevil

Physical operations

- Install methyl eugenol traps @ 10 to 12/acre for mass trapping: Fruit fly

Biological*:* Parasitoids are unknown on stone weevil. The natural enemies *mite Rhizoglyphus sp.*, Ants (*Camponatus sp.*, *Monomorium sp*. and *Oecophylla smaragdina*) and fungus *Aspergillus sp, Beauveria bassiana* has been found to be pathogenic on mango weevil.

Bio-agents	Target pests
Verticillium lecanii	Mango hoppers
Beauveria bassiana, Menochilus sexmaculatus	Mango mealybug
Metarhizium anisopliae or *Beauveria bassianna*	Stem borer

Chemical management

- Spraying Dimethoate (0.1%) twice at 15 days interval when fruits are of marble size.
- Spray main trunk, primary branches and junction of branches prior to flowing (November, December) with carbaryl (0.2%) or fenthion (0.1%) or chlorpyriphos 20 EC @ 2.5 ml/l to control beetles hiding in the bark.
- Spray Acephate 75 SP @ 1.5 g/l when fruits are of lime size (2.5 to 4 cm diameter) followed by Deltamethrin 28 EC @ 1ml/l after two or three weeks.
- Vapour heat treatment of fruits.
- Irradiation of fruits with 0.25 to 0.75 KGY to control stone weevil.

Target insect pests	Chemicals
Mango leaf hoppers	Imidacloprid17.8% SL @ 3ml / l, or Lambda-cyhalothrin 5% EC @ 0.5-1.0 ml/l
Leaf webber	Quinalphos @ 0.05%
Scale	Dimethoate @ 0.06%
Leaf miner	Quinalphos @ 0.05% and Fenthion @ 0.1%
Mango thrips	Dimethoate @ 0.15 %
Red ant	Dimethoate 1.5 ml/l of water after disturbing the nest

Fruit fly Management

- Prior to harvest (30 to 40 days) collect and dispose off infested and fallen fruits to prevent further, multiplication and carryover of population.
- Ploughing of orchard during November-December to expose pupae to sun heat which kills them.
- Hanging of methyl eugenol wooden block traps soaked in ethanol, methyl eugenol and malathion (6:4:1) during fruiting period from April to August @10 traps/ha tie them tightly at 3-5 feet above ground level.
- To control adult flies during severe infestation placing poison bait *viz* Protein hydrolysate + malathion 50 ml + 200 ml molasses in 2 litres of water be sprayed adding an additional 18 liters of water to bait poison. Commencing at pre oviposition period and repeat at 15 days interval. Addition of 10 ml methyl eugenol in place of molasses is also recommended.
- Hot water treatment of fruit at 48 ±10 C for 60 min.
- Three weeks before harvesting, spray Deltamethrin 2.8 EC @ 0.5 ml/l + Azadiractin (3000 ppm) or 2 ml/l.
- Irradiation of fruits 400 Grays using cobalt 60 to control fruit fly.
- If infestation is heavy, bait splash on the trunk only, once or twice at weekly interval is recommended. To prepare bait splash, mix 100 gm of jaggery in one litre of water and add 1 ml of Deltamethrin by using an old broom.
- Managing fruit flies also reduces anthracnose disease and prevents late fruit fall.

References

1. Patel JR, Shekh AM and Ratanpara HC. 2004. “Seasonal incidence and effect of minimum temperature and vapour pressure on the population of mango hoppers in middle Gujarat” *Gujrat Agricultural University Research Journal*. 20, pp. 5-8.
2. Kapadia MN. 2003. Insect pest of mango and their management. *National symposium on* mango, Gujarat Agricultural University, Junagadh, June 14-15.

Web links

https://agritech.tnau.ac.in
https://mkisan.gov.in/
https://farmer.gov.in/
https://agricoop.nic.in/
https://kisan.mp.gov.in/