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FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES

Lecture 17

PESTS OF MANGO

	Major pests			
1.	Mango hoppers	*Idioscopus niveosparsus, I. clypealis, Amritodus atkinsoni*	Cicadellidae	Hemiptera
2.	Stemborer	*Batocera rufomaculata*	Cerambycidae	Coleoptera
3.	Fruit fly	*Bactrocera dorsalis*	Tephritidae	Diptera
4.	Mango nut weevil	*Sternochaetus mangiferae*	Curculionidae	Coleoptera
5.	Mango mealy bug	*Drosicha mangiferae*		
6.	Bark eating caterpillar	*Indarbela tetraonis, I. quadrinotata*	Metarbelidae	Lepidoptera
7.	Flower gall midge	*Procystiphora mangiferae, Erosomyia indica, Dasineura amaramanjarae*	Cecidomyiidae	Diptera
8.	Mango leaf webber	*Orthaga exvinacea*	Noctuidae	Lepidoptera
9.	Shoot borer	*Clumetia transversa*	Noctuidae	Lepidoptera
10.	Leaf caterpillar	*Bombotelia jacosatrix*	Noctuidae	Lepidoptera
11.	Flower webber	*Eublemma versicolor*	Noctuidae	Lepidoptera
	Minor pests			
12.	Leaf caterpillar	*Euthalia garuda*	Nymphalidae	Lepidoptera
13.	Leaf miner	*Acrocercops syngramma*	Gracillariidae	Lepidoptera
14.	Leaf twisting weevil	*Apoderus transquebarius*	Curculionidae	Coleoptera
15.	Red ant	*Oecophylla smaragdina*	Formicidae	Hymenoptera
16.	Eriophyid mite	*Aceria mangiferae*	Eriophyidae	Acarina

1. **Mango hoppers:**

Idioscopus niveosparus, *I. clypealis*, *Amritodus atkinsoni* (Cicadellidae : Hemiptera)

Distribution and status: India, Indonesia, Formosa, Philippines, Taiwan, Vietnam, Srilanka, Burma, Pakistan, Bangladesh and Malaysia. Major pest prevalent in the flowering season and devastating in all mango growing areas.

Host range: Mango

Damage symptoms: Both nymphs and adults suck the sap from tender shoots and inflorescence resulting in withering and shedding of flower buds and also wilting and drying of shoots and leaves. The flower stalks and leaves in infested trees become sticky due to the deposition of honey-dew secreted by the hoppers that encourages the growth of black sooty mould on foliage and other parts. The hoppers take shelter in cracks and crevices on the bark during non-flowering season. Bionomics Eggs are laid in single into the tissues of the young leaves, shoots, flower stalk and unopened flowers. Incubation period: 4-7 days. Nymphal period: 8-13 days, 5 instars. Life cycle completed in 2-3 weeks.

IPM

• Avoid close planting, as the incidence very severe in overcrowded orchards
• Orchards must be kept clean by ploughing and removal of weeds
• Pruning of dense canopy to facilitate aeration and sunlight
• Avoid excess use of nitrogenous fertilizers
• Spray dimethoate 30 EC or moncrotophos 36 SL 2.5-3.3 L , methyldemeton 25 EC or malathion 50 EC 1.5 -2.0 L in 1500 – 2000 L of water per ha or acephate 75 SP @ 1 g/L, phosalone 35 EC @1.5 ml/L, or new molecules like buprofezin 25 SC 1-2ml/L of water or imidacloprid 17.8 SL 2-4ml/tree or lambda cyhalothrin 5 EC 0.5-1.0ml/L of water at 10 -15 L of water per tree • Neem oil 5 ml/lit of water can be mixed with any insecticide for spray • Spray 3 per cent neem oil or neem seed kernel powder extract 5 per cent.

2. **Stemborer:**

Batocera rufomaculata (Cerambycidae : Coleoptera)

Distribution and Status: India, Bangladesh

Host range Mango, rubber, jack-fruit, fig, papaya, apple, eucalyptus and mulberry, morings and silk cotton.

Damage symptoms: The grubs feed by tunneling the bark of branches and main stem. Shedding of leaves and drying of terminal shoots takes place in early stage of attack while damage to main stem causes tree death.

Bionomics: Eggs laid singly on the bark or cracks and crevices on the tree trunk or branches. Incubation period: 1-2 weeks. Grubs yellow, grub period 6 months, and pupal period is 19-36 days. Adults grey with two pink dots and lateral spine on the thorax with a longevity of 6 months.

Management

i. Grow tolerant mango varieties viz., Neelam, Humayudin
ii. Remove and destroy dead and severely affected branches of the tree
iii. Avoid injury at the base of trunk while pruning
iv. Remove alternative hosts like moringa, silk cotton in the near vicinity.
v. During off-season, apply absorbent cotton soaked in 10 ml monocrotophos 36 SL per tree by padding without unnecessarily injuring the trunk.
vi. Use a needle or long wire to pull out the grubs from the bore holes. The bore holes may be filled with DDVP @ 5 ml or monocrotophos 36 WSC 10 to 20 ml or one celphos tablet (3 g aluminum phosphide) or apply carbofuran 3G 5 g per hole and plug with clay + copper oxychloride paste. vii. Swab Coal tar + Kerosene @ 1:2 or Carbaryl 50 WP 20 g / L (basal portion of the trunk - 3 feet height) after scraping the loose bark to prevent oviposition by adult beetles.

3. **Fruit fly:**

Bactrocera dorsalis (Tephritidae: Diptera)

Distribution and Status: India, Pakistan, South-East Asia, Malaysia, Indonesia, Formosa, Philippines, Australia, China, Hawaii Islands, China and Taiwan.

Host range: Mango, guava, peach, apricot, cherry, pear, ber, citrus, banana, papaya, avocado, passion fruit, coffee, melons, jack fruit, strawberry.

Damage symptoms: The maggots destroy and convert the pulp into bad smelling, discoloured semi liquid mass unfit for human consumption. Infestation results in fruit drop and liquid oozes out from the fruit upon pressing.

Bionomics:l The adult fly is brown or drak brown with hyaline wings and yellow legs. Adult lays up to 200 eggs in a month in clusters of 2-15 just beneath the skin of the ripening fruits. The egg period is 22-23 days. The maggot feeds on pulp and become full grown in about 7 days. It pupates 3-7 inches below the soil.

Management

- **i.** Row interspaces may be ploughed to expose and kill the soil borne puparia.
- **ii.** The infested and fallen fruits should be carefully disposed of.
- **iii.** Apply a bait-spray of malathion 50 EC @ 2 ml/ L with molasses or jaggery (10 g/L) before ripening.
- **iv.** Male annihilation technique: Set up fly trap using methyl eugenol. Prepare methyl eugenol 1 ml/L of water + 1 ml of malathion solution. Take 10 ml of this mixture per trap and keep them at 25 different places in one ha between 6 and 8 am. Collect and destroy the adult flies.

4. **Mango mealy bug:**

Drosicha mangiferae (Pseudococcidae: Hemiptera)

Distribution and Status: India, Bangladesh, China and South East Asia

Host range: Mango, apple, apricot, ber, cherry, Citrus spp., fig, grape vine, guava, jack, jamun, litchi, mulberry and pomegranate.

Damage symptoms: Damages caused by nymphs and wingless females. They infest the leaves and inflorescence. Nymphs climb up the tree congregate together and suck juice from young shoots, panicles and flower pedicels. The affected parts dry up and yield is reduced substantially.

Bionomics: Oval, shining pink eggs laid in the soil upto 15 cm. Egg hatching starts at the end of December and continues upto month. First instar nymphs climb and ascend the trees immediately. They pass 3 nymphal instars. Adult longetivity for male and female are 7 and 15-35 days respectively. Female lays eggs for 22-47 days during april-may. Adults are oval, flat, body covered with white mealy powder. Males have one pair of black wings and are crimson red.

IPM

• Remove weeds like Clerodendrum inflortunatum and grasses by ploughing during June-July.
• Plough orchards during summer to expose the eggs to natural enemies and extreme heat.
• Band the trees with 20 cm wide alkalthene of polythene (400 gauge) in the middle of December (50 cm above the ground level and just below the junction of branching).Tie stem with jute thread and apply a little mud of fruit tree grease on the lower edge of the band.
• Release Australian ladybird beetle, Cryptolaemus montrouzieri @ 10/tree
• If necessary spray dimethoate 30 EC or moncrotophos 36 SL 2.5-3.3L , methyldemeton 25 EC or malathion 50 EC 1.5 -2.0 L or chlorpryriphos 20 EC 3.0 – 4.0 L or methyl parathion 50 EC 1.5 – 2.0 L in 1500 – 2000 L water per ha • Once the pest reaches the top of the plant, control becomes rather difficult.

5. **Bark eating caterpillar:**

Indarbela tetraonis, *I. quadrinotata* (Metarbelidae: Lepidoptera)

Distribution and status: Throughout India, Burma, Bangladesh and Sri Lanka potential major pest.

Host range: Mango, guava, zizyphus, litchi, orange, pomegranate, bauhinia, loquat, mulberry, moringa, rose, guava and eugenia.

Damage symptoms: Young trees succumb to the attack. Caterpillars bore into the trunk or junction of branches make zig zag galleries. Presence of gallery made out of silk and frass is the key symptom. They remain hidden in the tunnel during day time, come out at night and feed on the bark. Under severe infestation, flow of sap is hindered, plant growth arrested and fruit formation is drastically reduced.

Bionomics: Adults emerge in summer and lays 15-25 eggs in clusters under loose bark of the trees. Eggs hatch in 8-10 days. Larvae makes webs and feeds making zig zag galleries on the wood filled with frass and excreta and later bores inside the wood. Larval period is 9 -11 months and then pupates inside the stem. Pupal stage is 3-4 months.

Management

• Kill the caterpillars by inserting an iron spike into the tunnels.

• Injecting ethylene glycol and kerosene oil in the ratio of 1:3 into the tunnel by means of a syringe and then seal the opening of the tunnel with mud.

• Dip a small piece of cotton in any of the fumigants, like chloroform or petrol or kerosene, introduce into the tunnel and seal the opening with clay or mud.

6. **Flower gall midge:**

Procystiphora mangiferae, *Erosomyia indica, Dasineura amaramanjarae* (Cecidomyiidae: Diptera)

Distribution and status: Distributed throughout India

Host range: Mango

A. Procystiphora mangiferae

Damage symptoms: The maggot feeds on stalks of stamen, anthers, ovary.

Bionomics: The adult fly is light orange in colour. It lays eggs inside the flower buds. The maggots pupates inside the bud itself. The life cycle is completed in 12- 24 days.

B. Erosomyia indica

Damage symptoms: Maggots attack the inflorescence stalk, flower buds and small developing fruits. Inflorescence is stunted and malformed and buds do not open.

Bionomics: Adult fly is yellowish and lays eggs on the inflorescence peduncle or base of the developing fruit. Pupation occurs in soil.

C. Dasineura amaramanjarae

Damage symptoms: Maggots feed inside buds and the buds fail to open and drop down.

Bionomics: Maggots hibernate in soil and carry over to the next year and when favourable condition occurs pupate and emerge as adults.

Management

Spray dimethoate 30 EC or methyl demeton 25 EC 3.0 - 4.0 L in 1500-2000 L of water per ha (10-15 L of spray fluid per tree)

7. **Flower webber:**

Eublemma versicolor (Noctuidae: Lepidoptera)

Distribution and status: widely distributed in India.

Host range: Mango Damage symptoms Flowers in the inflorescence are webbed together by the larvae, hich remain inside the silk lined gallery and feed. They also bore into the inflorescence stalk.

Bionomics: Female has purplish pink or light orange wings with an apical patch. Adult lays 8 - 10 reddish hemispherical eggs on sepals and the incubation period is 3-4 days. Larva is smooth, greenish yellow with light brown head and prothoracic shield.

Management:
Spray phosalone 35 EC 3.0 - 4.0 L or carbaryl 50 WP 3.0 kg in 1500-2000 L of water per ha (10-15 L of spray fluid per tree)

8. **Mango leaf webber:**

Orthaga exvinacea (Noctuidae: Lepidoptera)

Distribution and status: Common in South India.

Host range: Mango

Damage symptoms: Larvae web up leaves into clusters and feed within. Leaves surface are scraped and they wither and dry up.

Bionomics: Moth is grayish with brownish wings and has wavy lines on fore wings. Adults lays upto 30 50 yellowish green eggs singly near the leaf veins. Egg period is 4 days. Caterpillar pale greenish with brown head and prothoracic shield. Pupation occurs in leaf web. Adult emerges in 11- 14 days.

Management

Remove and destroy the webbed leaves along with larvae and pupae Spray carbaryl 50 WP at 2.0 L Conserve predators like carabid beetle *Parena lacticincta, reduvid Oecama* sp, parasitoid *Hormiusa* and fungus *Paecilomyces farinosus*.