

## Lecture 19: INSECT PESTS OF COCONUT (*Cocos nucifera*) AND THEIR MANAGEMENT:

### Learning Objectives

- Distribution, biology, nature and symptoms of damage and management strategies of major pests of Coconut:

1. Rhinoceros beetle: *Oryctes rhinoceros*, (Scarabaeidae: Coleoptera)
2. Red palm weevil: *Rhynchophorus ferrugineus* (Curculionidae: Coleoptera)
3. Black headed caterpillar: *Opisina arenosella* (Cryptophasidae: Lepidoptera)
4. Coconut Eriophyid mite: *Aceria guerreronis* (Eriophyidae Acari)
5. White grub *Leucopholis coneophora* (Melolonthidae Coleoptera)

1. **Rhinoceros beetle: *Oryctes rhinoceros*, (Scarabaeidae: Coleoptera)**

### **Distribution:**

It Is regular pest on coconut, found throughout coconut growing areas in India. It *is native to Asia*,. It has since spread to Yemen, Reunion, and Hawaii. Throughout this distribution, the coconut rhinoceros beetle is most closely associated with its preferred host plant, *Cocos nucifera* L., the coconut palm:

### **Damage symptoms:**

Central spindle appears cut or toppled; fully opened fronds show characteristic diamond shaped cuttings. Holes with chewed fibre sticking at the base of central spindle.



**Life history:**

Adult females deposit eggs inside dead palms, decaying plant material, soil with high organic matter content, and, occasionally, wooden structures at a depth of 5 to 15 cm. Egg period 8-18 days, Grubs feed on the decaying matter and grub stage lasts for 99 to 182 days. Grub pupates in earthen cells at a depth of 0.3 to 1 m and emerges as adults in 10-25 days. Adult beetle is stout, black and has a long horn projecting dorsally from the head in male. Horn is short in female. Adults spend most of their time feeding on fresh leaves. Adult females live up to nine months,

**Management strategies:**

- ☐ Destroy and dispose all dead trees
- ☐ Avoid manure pits in the vicinity of coconut gardens
- ☐ Rake and turn up the decaying manure to expose the developing grub, egg and pupae to sun drying and predation. Then apply the fungal culture of *Metarrhizium anisopliae* to manure pits during cooler months of October - December.
- ☐ Encourage reduviid predators, *Platyeris laevicollis*
- ☐ Once in three months, drench the manure pits with carbaryl 50 WP 1 g/lit
- ☐ In seedlings, place naphthalene balls @ 3 / tree, in the innermost three leaf axils once in 45 days.
- ☐ Soak castor cake @ 1 kg/5 lit of water in wide mouthed mud pots and keep them in the garden to attract and kill adults. Replace the slurry once in 30 days.
- ☐ Light traps may be set up to attract the adults during monsoon months and following rains during summer.
- ☐ Use aggregation pheromone traps Rhinolure @ 1/ha.

**2.Red palm weevil: *Rhynchophorus ferrugineus* (Curculionidae: Coleoptera)**

**Distribution:** The pest is found in almost all the coconut growing areas of India

**Damage symptoms:**

Holes on trunk with with brownish ooze. Yellowing of inner leaves Gradual wilting of central shoot in the crown



### Life history:

Female lays upto 276 oval, white eggs in scooped out small cavities on palms of upto seven years, and on older trees it deposits in the hands and other cut injuries of trunk. Egg period 2 to 5 days. Grub: Apodous light yellowish grub with a red head becomes full grown in 36-78 days and pupates in a fibrous cocoon inside the trunk itself. Reddish brown adult weevil has six dark spots on thorax. Male has conspicuous long snout with tuft of hairs.

### Management strategies:

- ☐ Remove and burn all wilting or damaged palms in coconut gardens to prevent further perpetuation of the pest.
- ☐ Avoid injuries on stems of palms as the wounds may serve as oviposition sites for the weevil. Fill all holes in the stem with cement.
- ☐ Avoid the cutting of green leaves. If needed, they should be cut about 120 cm away from the stem.
- ☐ Use aggregation pheromone traps @ 1/ha or use ferrolure in combination with food baits consisting of 1kg sugarcane molasses + 5g of yeast + 5ml glacial acetic acid + split petioles of coconut taken in a bucket of 10 L capacity

### 3. Black headed caterpillar: *Opisina arenosella* (Cryptophasidae: Lepidoptera)

**Distribution:** The pest is found in almost all the coconut growing areas of India

**Damage symptoms:**

Dried up patches on leaflets of the lower leaves. Galleries of silk and frass on underside of leaflets.

**Life history:**

The adults are Greyish white in colour lays about 180 eggs in groups on leaves. Incubation period is 5 days. Greenish brown larva with dark brown head and prothorax, and a reddish mesothorax. Larval period 40 days, pupal period 12 days. It pupates inside the web in a thin silken cocoon.

**Management strategies:**

- ☐ Cutting and burning all the infested leaves and fronds.
- ☐ In small plantations, carbaryl 50 WP 2 g/L may be sprayed.
- ☐ In summer, release bethylids, braconid and eulophid parasitoids from January at 1:1:10 per tree.
- ☐ Root feeding with monocrotophos @ 10 ml + 10 ml water with a waiting period of 45 days after root feeding.

**4.Coconut Eriophyid mite: *Aceria guerreronis* (Eriophyidae Acari)****Distribution**

Tamil Nadu, Karnataka and Andhra Pradesh. Recently, observed in Andaman and Lakshadweep Islands. Dispersal of mite also occurs through insects, birds, lizards, squirrels and coconut husk.

**Damage symptoms:**

The mite infests and develops on the meristematic tissues under the perianth. Initial symptoms exhibit as triangular pale white or yellow patches close to the perianth. Continuous feeding results in necrosis of tissues leading to formation of brown color patches, longitudinal fissures and splits on the outer surface of the husk; oozing of brown gummy exudation; reduced



nut size, copra content and malformation of nuts.

**Life history:**

Pale coloured, elongated, worm like mite is very minute in size measuring 200-250 micron length and 36-52 micron in width with two pairs of legs in the anterior end ,head with piercing and sucking mouth parts. Life cycle consists of egg, two larval instars and an adult-stage and is completed in 10-12 days.

**Management strategies:**

- ☐ Apply urea 1.3 kg, super phosphate 2.0 and muriate of potash 3.5 kg/palm/year
- ☐ Neem cake @ 5 kg and organic manure 50 kg/palm/ year
- ☐ Borax 50 g + gypsum 1.0kg + Manganese sulphate 0.5 kg/palm/ year
- ☐ Grow intercrop (sun hemp, four crops/year) and shelter belt with casuarina all round the coconut garden to check further entry
- ☐ Triazophos 40 EC 5 ml/lit or monocrotophos 36 WSC @ 2 ml / lit or carbosulfan 25 EC 2 ml/ lit in alternation with neem azal 1% 5ml/lit as spot applicati

**5. White grub *Leucopholis coneophora* (Melolonthidae Coleoptera)**

**Damage symptoms:**

Leaves turn yellow, immature nuts shed, flowering delayed. White grubs are exposed when base of the tree is dug.

**Life history:**

The adult Female lays eggs in the soil at a depth of 7 to 15 cm. Incubation period 20 days, grub lasts for 10-11 months, pre pupal period 9-12 days. pupal period 25 days. Pupation occurs in soil. Adult beetle emerges after monsoon showers.

**Management strategies:**

- ☐ Summer ploughing exposes the immature stages
- ☐ Sow the crop early in the kharif season.
- ☐ Treat the seeds with chlorpyrifos @ 12 ml/kg of kernels.
- ☐ Apply phorate 10 G 10 kg or carbofuran 3 G 30 kg per ha in the soil at or before sowing.
- ☐ Spray 500 g carbaryl 50 WP 500 g in 250 L of water per ha on the preferred hosts like ber, guava, banana, in the vicinity