



FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES

Lecture 10

PESTS OF COCONUT AND ARECANUT COCONUT

The coconut and other palm trees are attacked by specific pests like rhinoceros beetle, red palm weevil, black headed caterpillar and also by a number of polyphagous insects like white grub. Slug caterpillars occasionally major pest status. Black headed caterpillar is severe in coastal regions.

Major pests				
1.	Rhinoceros beetle	<i>Oryctes rhinoceros</i>	Scarabaeidae	Coleoptera
2.	Red palm weevil	<i>Rhynchophorus ferrugineus</i>	Curculionidae	Coleoptera
3.	Black headed caterpillar	<i>Opisina arenosella</i>	Cryptophasidae	Lepidoptera
4.	Coconut Eriophyid mite	<i>Aceria guerreronis</i>	Eriophyidae	Acari
5.	White grub	<i>Leucopholis coneophora</i>	Melolonthidae	Coleoptera
6.	Slug caterpillar	<i>Parasa lepida</i> and <i>Contheyla rotunda</i>	Cochliidiidae	Lepidoptera
Minor pests				
7.	Mealy bug	<i>Pseudococcus longispinus</i>	Pseudococcidae	Hemiptera
8.	Scale insect	<i>Aspidiotus destructor</i>	Diaspididae	Hemiptera
9.	Lacewing bug	<i>Stephanitis typicus</i>	Tingidae	Hemiptera
10.	Termite	<i>Odontotermus obesus</i>	Termitidae	Isoptera
11.	Coconut skippers	<i>Gangara thyraxis</i> and <i>Saustus gremius</i>	Hesperiidae	Lepidoptera

1. Rhinoceros beetle:

Oryctes rhinoceros, (Scarabaeidae: Coleoptera)

Host range: Pineapple, sugarcane, arecanut, sago, oilpalm, palmyra, date palm and wild dates.

Distribution and status: Widely distributed throughout coconut growing areas in India. Regular pest on coconut.

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.

Bionomics: Female lays upto 140 oval creamy white eggs in manure pits or decaying vegetable matter at a depth of 5 to 15 cm. Egg period 8-18 days, Stout, sluggish, white grub with pale brown head is found at a depth of 5 to 30 cm. 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.



Management:

- i.** Destroy and dispose all dead trees
- ii.** Avoid manure pits in the vicinity of coconut gardens
- iii.** 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.
- iv.** Encourage reduviid predators, *Platymeris laevicollis*

- v. Once in three months, drench the manure pits with carbaryl 50 WP 1 g/lit
- vi. In seedlings, place naphthalene balls @ 3 / tree, in the innermost three leaf axils once in 45 days.
- vii. 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.
- viii. Fermented toddy may be kept in wide mouthed earthen vessels in different places to attract the adults during night.
- ix. The crown region may be properly cleaned during harvests and the adults may be hooked out using a long wire.
- x. Light traps may be set up to attract the adults during monsoon months and following rains during summer.
- xi. The top-most three axils may be filled with a mixture of sand + Neem Seed Powder (2:1) once in three months (150 g/tree)
- xii. Use aggregation pheromone traps Rhinolure @ 1/ha. Instal the trap at five feet from the ground level.

2. Red palm weevil:

Rhynchophorus ferrugineus (Curculionidae: Coleoptera)

Distribution and status: Kerala, Karnataka, Tamil Nadu, Assam and Maharashtra. Enjoys major pest status.

Damage symptoms: Holes on the trunk with brownish ooze; yellowing of inner leaves and gradual wilting of central shoot in the crown. Upto 50 Nos. of grubs can be found feeding on the soft tissues inside the trunk.

Bionomics Egg: 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:

- i. Remove and disposal of damaged and wilted trees.
- ii. Avoid injuries on trunk and any injury should be plastered with clay or cemented with copper oxychloride.
- iii. Avoid cutting green fronds.
- iv. Root feeding with monocrotophos @ 10 ml + 10 ml water should be done after harvest of nuts. Observe a waiting period of 45 days.
- v. Set up attractant traps using mud pots with molasses / toddy 2.5 lit + acetic acid 5 ml + yeast 5 g + split tender coconut stems / petioles @ 30/ac.
- vi. Insert 1-2 aluminium phosphide tablets inside the tunnel and plug all the holes with clay + copper oxychloride
- vii. 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 and status: All over Peninsular India (East and West Coasts)

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

Bionomics: Greyish white small moth lays about 180 eggs in groups on leaves. Egg 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

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

ARECANUT

Major pests				
1.	Spindle bug:	<i>Carvalhoia arecae</i>	Miridae	Hemiptera
2.	Sorghum or white mite	<i>Oligonychus indicus</i>	Tetranychidae	Acari
3.	Palm or red mite	<i>Raoiella indica</i>	Tenuipalpidae	Acari
4.	Root grub	<i>Leucopholis burmeisteri</i>	Melolonthidae	Coleoptera
5.	Inflorescence Caterpillar	<i>Tirathaba mundella</i>	Pyralidae	Lepidoptera
6.	Pentatomid bug	<i>Halymorpha marmorea</i>	Pentatomidae	Hemiptera
Minor pests				
7.	Scale insects	<i>Aonidiella orientalis</i>	Diaspididae	Homoptera
8.	Stem weevil	<i>Diocalandra stigmaticollis</i>	Curculionidae	Coleoptera

1. Spindle bug:

Carvalhoia arecae (Miridae: Hemiptera)

Distribution and status: Serous pest in Kerala, Karnataka and parts of Tamil Nadu

Damage symptoms: Inhabit the inner most leaf axils, usually below the spindle. Both nymphs and adults suck sap. Infested portions develop necrotic patches leading to drying. Spindle fails to open. Severe infection leads to stunting of the palm.

Bionomics: Adult bugs are brightly coloured red and black Eggs are laid singly between the leaflets of the spindle. The eggs hatch in 9 days. There are five nymphal stages and it is completed in 15-24 days. The light violet brown nymphs have greenish yellow border.

Management

1. Maintain proper drainage in the plantation area.
2. Uproot the heavily infested palm and burn it. 3. Drench the spindle with lindane 1.3 D at 2.5 g/L of water.

2. Sorghum or white mite:

Oligonychus indicus (Tetranychidae: Acari)

Adults and nymphs of this spider mite colonise the lower surface of leaves, suck sap, which causes yellowing and drying of leaves. The colony is found below a white web on the leaves. Life cycle is of short duration. The total duration of the immature stages varies from 6.5 to 9.0 days.

Management:

Spray dicofol 18.5 EC 2 ml /L or dimethoate 30 EC 1.5 ml /L of water.

3. Palm or red mite:

Raoiella indica (Tenuipalpidae: Acari)

Host range: Arecanut, coconut, date and ornamentals.

Damage symptoms

Neglected and poorly irrigated gardens and nurseries, particularly those in exposed conditions are prone to severe infestation. Colonies of these mites start declining with the onset of rains in June.

Bionomics: Nymphs and adults are seen in large numbers on the lower surface of leaves, in severe cases of infestation they may be seen on the leaf stalks and on the spindles. The life cycle lasts 13 days. . **Management:** As given for sorghum/white mite

4. Root grub: *Leucopholis burmeisteri* (Melolonthidae: Coleoptera)

Distribution and status: Areca tracts of Kerala and Karnataka. Root grubs or 'white' grubs occur in low lying and clayey soils where the water table is high.

Host range: Roots of arecanut, grasses, banana, cocoa, tapioca, yams etc.

Damage symptoms: Grubs feed voraciously on areca roots which results in dropping and drying of leaves. Affected seedlings come off easily. Palms with few years of infestation show a sick appearance, with yellowing of leaves, tapering of stem, and reduction in yield. The palms topple in case of severe loss of root system

Bionomics Adult beetles (cockchafers) emerge during May-June after few days of premonsoon showers i.e., after 8-10 days of showers, between 6.30 to 7.30 PM. These beetles lay eggs in soil mostly up to 10 cm depth. Eggs hatch out in about 12 three weeks. The early instar grubs feed on the roots of grasses and other humus. The grub period with three instars is completed in 7 to 8 months. The pupation is in soil in cocoons of mud. This period lasts about one month. The adult beetle is chestnut brown in colour. The second and third instar grubs of these beetles feed on

tender and mature roots of the palm, in severe cases of incidence, the bole of the palm is also eaten up.

Management

1. Collect the beetles in the evening after the pre-monsoon showers and kill them.
2. Apply phorate 10 G 15 g per palm to the soil twice a year. Repeat for 2- 3 years continuously.