RAMA UNIVERSITY

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FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES

Lecture 15

PESTS OF SUGARCANE – BORERS AND ROOT FEEDERS

Major Pests:

1. **Early shoot borer:**

Chilo infuscatellus (Crambidae: Lepidoptera)

Distribution and status: India, Pakistan, Indonesia, Thiawan, Philippines, Korea, Afghanistan and Burma.

Host range: Pearl millet, oat, barley and maize

Damage symptoms: Dead heart in 1-3 month old crop, which can be easily pulled out, rotten portion of the straw coloured dead heart, emits an offensive odour. A number of bore holes at the base of the shoot just above the ground level can be seen. It is major pest in the early stage of the crop.

ETL: 15 % deadheart

Bionomics Larva: dirty white with five dark violet longitudinal stripes and dark brown head. Adult: Pale greyish brown moth with black dots near the costal margin of the forewings and with white hind wings.

Management:

- ✓ Apply management practice if population excess ETL of 15% dead heart o Grow resistant varieties: CO 312, CO 421, CO 661, CO 917 and CO 853.
- ✓ Planting in December – January escapes the incidence
- ✓ Intercrop with Sesbania sp.(Daincha) for reduced shoot borer incidence
- ✓ Trash mulching : 10 – 15 cm thickness on 3rd day after planting
- ✓ Earthing up – 30th day o Ensure adequate moisture
- ✓ Remove and destroy dead hearts o Apply Granulosis virus (GV) @ 1.1 x 105 granules twice on 35 and 50 DAP.
- ✓ Release tachinid parasitoid: Sturmiopsis inferens @ 125 gravid females.
- ✓ Apply carbofuran 3G @ 33 kg or fipronil 0.3 G 25.0-33.0 kg / ha in the soil before the cane setts are covered.
- ✓ Apply cartap hydrochloride 4G or fipronil 0.3 G at 25 kg /ha by mixing in 50 kg soil and sprinkle along the rows at 45 days after planting followed by earthing up.

- ✓ Spray monocrotophos 36 SL 1000 ml or endosulfan 35 EC 1000 ml or chlorpyriphos 20 EC 1000 ml or chlorantraniprole 18.5 SC 375 ml or fipronil 5 SC 1.5-2.0 L or /ha.

2. Internode borer:

Chilo sacchariphagus indicus (Crambidae: Lepidoptera)

Distribution and status: India, Pakistan and Sri Lanka

Host range: Pearl millet, rice and sorghum

Damage symptoms: Internodes constricted and shortened, with a number of boreholes and fresh excreta in the nodal region. Affected tissues become reddened.

Bionomics: Larva: White with four violet longitudinal stripes and light brown head. Adult: Pale brown with white hind wings.

Management:

- Avoid use of excessive nitrogen fertilizers
- Release egg parasitoid: *Trichogramma chilonis* @ 2.5 m.l / ha – 6 releases – 4th month onwards at 15 days intervals
- Release larval parasitoids: *Stenobracon deesae*, *Apanteles flavipes*,
- Release pupal parasitoids: *Tetrastichus ayyari*, *Trichospilus diatraeae*
- Apply carbofuran 3G granules to soil @ 30/kg per hectare, if damage is severe.
- If the damage is acute, apply carbofuran 3 G 30 kg /ha

3. Top borer:

Scirpophaga excerptalis (Pyralidae: Lepidoptera)

Distribution and status: India, Pakistan, China, Formosa, Japan, Philippines, Thailand, Bangladesh, Indonesia, Laos, Cambodia, Vietnam, Burma and Taiwan

Host range: Millets and other grasses

Damage symptoms Dead heart in grown up canes, which cannot be easily pulled; dead heart reddish brown in colour; parallel row of shot holes in the emerging leaves and red tunnels in the midribs of leaves; bunchy top appearance due to the growth of side shoots. Larva bores into the midrib of unfolded leaves and mine their way to the base.

Bionomics Larva: Smooth, white or cream coloured with a red coloured mid-dorsal line and yellow head. Adult: White coloured moth (with a buff coloured anal tuft in the abdominal tip of female).

Management:

• Grow resistant varieties: Co 724, CoJ 67, Co 1158, Co 1111

• Collect and destroy the egg masses

• Release bio control agents like ichneumonid parasitoid: *Isotima javensis* @ 100 pairs/ ha (prepupal parasitoid); egg parasitoids: *Telenomus beneficiens*, *Tetrastichus schoenobi*,

Trichogramma chilonis; larval parasitoids: *Goniozus indicus*, *Chelonus* sp.; pupal parasitoid: *Tetrastichus ayyari*

• SprayChlorantraniprole18.5 SC 375 ml in 1000 L water per ha

4. **Whitegrub:**

Holotrichia consanguinea (Melolonthidae: Coleoptera)

Distribution and status: Throughout India

Host range: Sorghum, maize, pearl millet, chillies, bhendi and brinjal

Damage symptoms Drying of crown, preceded by yellowing and wilting of leaves. Affected canes come off easily when pulled. Cause extensive damage to roots. Grub 'C' shaped, whitish yellow in colour found close to the base of the clump. Adults are dark brown and attracted to neem tree in monsoon season

Management:

• Grow resistant cultivars like Co 6304, Co 1158, Co 5510

• Set up light trap to attract and destroy the adults

• Provide adequate irrigation

• Crop rotation in endemic areas

• Collect and destroy the adult beetles – neem, Ailanthus and Acacia Termites

5. **Termites:**

Odontotermes obesus (Termitidae: Isoptera)

A major problem in light soils. poor germination of setts (after planting), characteristic semi-circular feeding marks on the margin of the leaves in the standing crop. Entire shoot dries up and can be pulled out. Setts hollow inside and may be filled with soil. Cane collapses if disturbed; rind filled with mud. Adults are cream coloured tiny insects resembling ants with dark coloured head.

Management:

• Locate and destroy the termite colony

• Destroy the affected setts from the field

• Treat setts with Imidacloprid 70 WS 100-150 g per 100 setts.

• Spray chlorantraniprole 18.5 SC 500-625 ml or imidacloprid 17.8 SL 350 ml with 500 L water/ha.

Sugarcane Sap and Foliage Feeders

Major Pests:

1. Whiteflies

a. *Aleurolobus barodensis* (Aleyrodidae: Hemiptera)

Damage symptoms: Leaves, turn pinkish and gradually dry later. Infested leaves look white, while those below are black due to the growth of sooty mould on the honeydew.

Bionomics: The female lays 60 - 65 creamy white conical eggs and are glued to the surface of the leaves. Egg period 8-10 days. Neonate nymphs are pale yellow, flat and oval, later turn shiny black. Its body surrounded by fringes of wax. Nymphal period 25 - 30 days. Pupal period 10-111 days. Adult is pale yellow with hyaline wings dusted with waxy bloom, exhibit brisk fluttering movements. The adult live only for about 24-48 hours. The insect completes 9 generations in a year.

b. *Neomaskellia bergii*, *Neomaskellia andropogonis* (Aleyrodidae: Hemiptera)

Black, grey or white dot like pupae on the undersurface of leaves. Nymph oval in shape and brownish. Their bodies are surrounded by white wax. Pale brown adult has black bands on wings.

Management:

• Avoid excessive use of nitrogenous fertilizers

• Conserve nymphal parasitoids viz., *Azotus delhiensis*, *Encarsia isacci*

• Encourage predators viz., *Chilocorus nigritus*,*Scymnus nubilus*

• Spray Moncrotohphos 36 SL 2 L /ha

2. **Leaf hopper/Sugarcane pyrilla:**

Pyrilla perpusilla (Lophopidae: Hemiptera)

Distribution and status: India, Pakistan

Host range: Sugarcane, wheat, barley, oats, maize, sorghum, baru, guinea grass and sudan grass

Damage symptoms: It can cause severe damage when long spells of rainy or cloudy days are prevalent. As high nitrogen applicaton favours multiplication, it is also referred to as richman's pest. Symptoms are yellow leaves, covered with black sooty mould; top leaves get dried up and lateral buds germinate.

Bionomics: The adults lay 300 - 536 eggs in clusters on the underside of leaves. Egg period 8-28 days. Nymphs are soft and pale brown to pale orange with two characteristic tufts of waxy secretion at the end of abdomen. Pupal period 2 - 6 months. Adult is soft, straw coloured with the head pointing forward as snout. Wings fold over the abdomen like hood; densely veined and transparent. Adult live for about 2 - 5 months. 3- 4 generations are completed in a year.

Management:

• Avoid excessive use of nitrogenous fertilizers
• Set up light trap
• Detrash on 150 and 210 DAP.
• Release 4000 -5000 cocoons or 4-6 lakhs egg of Epiricania melanoleuca (Lepidopteran predator)per ha
• Conserve predators viz., *Brumus suturalis*, *Chilomenes sexmaculatus* and *Coccinella septumpunctata*
o Spray endosulfan 35 EC 2 L in 1000 L water/ ha

3. Sugarcane woolly aphid:

Ceratovacuna lanigera (Aphididae: Hemiptera)

Distribution and status: India. It has been posing threat as a major pest in Maharashtra since a few years and is fast spreading to new areas.

Damage symptoms: It is a congregation of large number of white coloured nymphs and adults on the undersurface; honeydew secretion with sooty mould on upper surface of the leaves. Canes with short internodes and narrow leaves with reduced girth.

Bionomics: Yellowish alate nymphs white in colour with less powdery substance. Two forms of adult viz., apterate and alate occur. Alate forms predominantly white in colour. Apterate often possesses crenulated margins of wax glands in rows. Such wax glands are absent in alate forms. C. lanigerae produces parthenogenetically and has an holocyclic (absence of sexually producing generation) life cycle. Cornicles are highly atrophied in adults. Population peaks from early August to September and again from November to February. The season from March to July appears to be a lean period. High rainfall temporarily retards proliferation, which re-colonizes with the cessation of rains.

Management:

1. Monitor the fields especially areas under shade where the colony establishes first.

2. Avoid transport of sugarcane for crushing from SWA infested area.

3. If seed material is to be moved, treat setts in malathion 0.1% solution for 15 minutes, pack in gunny bags and transport without using green or dry leaves as packing or cushion material.

4. Practice wide-row/paired-row planting and de-trashing that allow greater aeration and light.

5.Avoid late application of nitrogenous fertilizer and excessive irrigation.

6. Spray infested crop with acephate 75 SP 2.0 kg or monocrotophos 36 WSC 2.0L or dimethoate 30EC 2.0 L in 1000 L of water directing the spray fluid towards the under surface of leaves. Un-infested clumps in about 3 metre radius of the infested clumps may also be similarly treated with the insecticide.

7. Collect leaves bearing predators from other parts of the field and release 8.Mass produce predators viz.,*Dipha aphidivora , Micromus igorotus* and *Eupeode confrater* in shadenet houses and release them in infested fields.

Minor Pests

Minor Pests				
6.	Black winged bug	*Proutista moesta*	Derbidae	Hemiptera
7.	Aphid	*Melanaphis sacchari*	Aphididae	Hemiptera
8.	Skipper	*Telicota augias*	Hesperiidae	Lepidoptera
9.	Gurdaspur borer	*Bissetia steniellus*	Crambidae	Lepidóptera
10.	Grasshopper	*Oxya velox*	Acrididae	Orthoptera
11.	Spiny beetle	*Asamangulia cuspidate*	Hispidae	Coleoptera
12.	Sugarcane mite	*Schizotetranychus andropogoni*	Tetranychidae	Coleoptera