



IPM of Sugarcane pests

Sugarcane whitefly, *Aleurolobus barbodensis*; *Neomaskellia bergii* (Aleurodidae: Hemiptera)

- Adults of *A. barbodensis* are tiny, moth-like with white powdery coating, while *N. bergii* have spotted translucent wings.
- Both nymphs and adults suck the sap from leaves which show characteristic *yellow streaks*.
- In severe cases the leaves dry and plants remain stunted. Yield and sucrose content are drastically reduced.
- Loss of 30-40 per cent in sucrose and 20-25 per cent in total solids was estimated due to its attack.



Integrated pest management (IPM) strategies

A. Cultural practices:

- Remove stubble and debris of previous crops.
- Deep summer ploughing.
- Inter culture and hand weeding.
- Timely irrigation.
- Proper crop rotation: paddy, wheat, maize, jowar, potato, vegetables, pulses, oilseeds etc.
- Collect and destroy the adult beetles on trees like *Azadirachta indica* (neem), *Ailanthus excelsa* and *Acacia* *sps.* Helps in minimizing root grub infestation

Contd...,

• **Resistant/tolerant varieties:**

Early shoot borer	CO 312, CO 421, CO 661, CO 917 and CO 853
Internode borer	CO 975, CO 7304, COJ 46 CO-285, CO-453 and CO-77-1
Top shoot borer	COJ-69, CO-1158, CO-67, CO 419, CO 745, CO 6516, CO 859, CO1158 and CO 7224
Scales	CO-617, 678, 671, 1132
Woolly aphid	COVC 2003 165
White grubs	Co 6304, Co 1158, Co 5510
Mealy bug	CO 439, CO 443, CO 720, CO 730 and CO 7704

- **Earthing up after 4-5 weeks after planting (Early shoot borer).**
- **Planting in deep furrows of 20 cm depth.**
- **Always use well rotten Farm Yard Manure (FYM) to avoid the damage by termites.**
- **Avoid untimely high nitrogenous fertilizers to minimize the pyrilla, white woolly aphid and stalk borer attack.**
- **Irrigation at closer intervals for managing early shoot borer.**
- **Detrashing of canes in the scale insect, mealy bugs, white woolly aphid and stalk borers prone areas.**
- **Inter crop: Onion or Garlic or Coriander for early shoot borer.**



- **Removal of water shoots to destroy scale insect stages, stalk borers and white woolly aphid.**
- **Practice deep harvesting to destroy stubbles. Take green burning which will be helpful to conserve moisture, predators and parasitoids and minimize the weeds growth except in black bug endemic pockets.**
- **Trash mulching at the rate of 3 tons per ha immediately after planting for early shoot borer.**
- **Dig the termatoria and destroy the queen.**
- **Paired row system of planting.**
- **Rapping of canes all along the rows for woolly aphids.**
- **Propping the canes to prevent lodging to reduce the damage by stalk borer and rodents.**



B. Physical control

For termite management:

- **Locate and destroy the termite colony and affected setts.**
- **Set up light trap for trapping of white grubs adults and kill them in kerosene oil water.**
- **At onset of monsoon collect and destroy the adult beetles by shaking the branches of trees on which they settle during night.**

For scale insects:

- **De-trash the crop at 150th and 210th day of planting.**

B. Mechanical control

- **Collection and destruction of adult moths, egg masses and dead hearts**
- **Installation of light trap @ 1 per acre**
- **Use of pheromone traps @ 4-5/acre for monitoring of early shoot borer**
- **Installation of yellow sticky traps for woolly aphids and white fly**



Contd....

- **Sett treatments with moist hot air at 54 °C for 2-2.5 hours for the control of RSD and GSD.**
- **Snap traps made of bamboo may be employed for rodent management in sugarcane, rice, wheat based cropping system**
- **Growing of arhar around the fields to prevent root borer attack.**
- **Collection of white grub adults from favored host plant and grubs behind the ploughing operation.**
- **Avoid the planting of sugarcane under and around trees in order to prevent the perpetuation white woolly aphid.**
- **Use blind hoeing at 7-10 days after planting. After that use power/ bullock/hand operated implements at 20-25 days interval for 3-4 times.**

Biocontrol practices

- Conservation of biocontrol agents :
Sturmiopsis, stenobracon, isotima, Rhaconotus, Telenomus, Trichogramma, Beauveria, Metarhizium, Encarsia, Brumus, Menochilus, Pharoscymnus, Chilocorus, chrysopa, Dipha, Micromus, coccinellids, syrphids and spiders.
- Avoid trash burning to prevent destruction of hibernating *Epiricania* eggs on dry leaves, alternatively collect it and staple it in *Pyrilla* infested field in February so also to prevent of white woolly aphid.

Augmentation:

Pests	Natural enemies	Rate
Early shoot borer, root borer	<i>Sturmiopsis inferens</i> (Tachinidae)	125 gravid females per acre
Borer	<i>Trichogramma chilonis</i> (Trichogrammatidae)	20,000/acre 10 days interval at six releases
Termites and Root grubs	Entomopathogenic nematodes (EPNs)	100 million nematodes per acre (during May/ June and/or September for sugarcane root grub control.)



Augmentation:

Pests	Natural enemies	Rate
Pyrilla	<i>Epiricania melanoleuca</i> (Epiropyidae)	3,200 to 4,000 cocoons or 3.2-4.0 lakh eggs per acre



Pyrilla nymph carrying the larvae of *E. melanoleuca*



Pupa of *E. melanoleuca*



Egg laying female



Adult

Natural enemies of sugarcane wooly aphid



Dipha aphidivora



**Hover fly maggots feeding on
sugarcane wooly aphids**

Chemical control

Early shoot borer

- Fipronil 5% SC @ 600-800 ml in 200 l of water/acre
- Chlorantraniliprole 0.4% GR @ 7.5 g/acre

Scales: Monocrotophos 36% SL @ 600 ml in 200-400 l of water/acre

Termite: Chlorantraniliprole 18.5% SC @ 200-250 ml in 400 l of water/acre or
clothianidin 50%WDG @100 g in 400 l of water/acre or
imidacloprid 17.8% SL @ 140 ml in 750 l of water/acre or

Contd..,

White grubs **Fipronil 40% + imidacloprid 40% WG@175-200 g in 400-500 l of water/acre or phorate 10% CG @ 10,000 g/acre**

Top shoot borer **Chlorantraniliprole18.5% SC @150 ml in 400 l of water/acre**
Phorate10% CG @ 12,000 g/acre
Carbofuran 3% CG @ 26640 g/acre
Chlorantraniliprole 0.4% GR @ 7.5 Kg/acre

Pyrilla

- **Chlorpyrifos 20% EC @ 600 ml in 200-400 l of water/acre**
- **Dichlorvos 76% EC @ 150.4 ml in 200-400 l of water/acre**
- **Monocrotophos 36% SL @ 200 ml in 200-400 l of water/acre**

Sugarcane white fly **Foliar sprays with quinalphos 2 ml/l against young nymphs and fenitrothion - 1 ml/l against puparia are effective measures.**
