IPM of Sugarcane pests
Sugarcane

• Grown throughout sub tropical and tropical parts of South and South-East Asia.
• India is the second largest producer of cane sugar next to Brazil.
• Sugarcane infested by 287 species of insect pests and non insect pests.
• Out of them 14 are major pests of sugarcane in India
Production status of countries

Major Producing Countries

- Brazil: 28%
- India: 18%
- China: 10%
- Thailand: 8%
- Mexico: 5%
- Pakistan: 3%
- Others: 28%

Source: USDA

Production status of states

Major producing states

- Uttar Pradesh: 36%
- Maharashtra: 24%
- Karnataka: 11%
- Tamil Nadu: 11%
- Andhra Pradesh: 5%
- Gujarat: 4%
- Punjab: 2%
- Haryana: 2%
- Uttarakhand: 2%
- Bihar: 3%

Production in India (2014-15): 278.29 lakh tons

Source: Ministry of Agriculture, GoI
Pest status

- Root borer, *Emmalocera depresella* – Eastern India
- Shoot borer, *Chilo infuscatellus* and
- Top shoot borer, *Scirpophaga nivella*
- Gurdaspur borer, *Bissetia steniella* - North Western parts
- Stalk borer, *Chilo auricilius* - Western UP, Haryana, Northern Rajasthan.
- Mealy bug, *Saccharicoccus sacchari* - tropical India.
- Pyrilla and whitefly - extremely destructive pests in certain years.
- Root grub and Termite: Endemic pests
Early shoot borer, *Chilo infuscatellus* (Pyralidae: Lepidoptera)

**Egg**
- Flat – scale like eggs are laid in 3-5 rows on the lower surface of leaves in masses of 4-100.
- **IP:** 4-6 Days

**Larva**
- **PP:** 7-9 Days

**Adult**
- Straw coloured fore wings with black dots and white hind wings
- 2-4 days
- **TLC:** 5-6 weeks

**Pupa**
- Pupation takes within the tunnel
- **LP:** 16-30 Days
- Dirty white with five dark violet longitudinal stripes
- **TLC:** 5-6 weeks

**Additional Information**
- Egg: Flat – scale like eggs are laid in 3-5 rows on the lower surface of leaves in masses of 4-100.
- IP: 4-6 Days
- Adult: Straw coloured fore wings with black dots and white hind wings
- 2-4 days
- TLC: 5-6 weeks
- Pupa: Pupation takes within the tunnel
- LP: 16-30 Days
- Dirty white with five dark violet longitudinal stripes
- TLC: 5-6 weeks
Symptoms of damage

- **Attack 1-3 months old crop, and cause Dead heart**, which can be easily pulled out.
- **Rotten portion** of the straw coloured dead heart emits an offensive odour.
- **Number of Bored holes** at the base just above the ground level.
Internode borer: *Chilo sacchariphagus indicus* (Pyralidae: Lepidoptera)

- **Egg**: Oval to flat and shiny waxy white in colour which later turn grey.
- **Larvae**: White body with dark spots.
- **Adult**: Straw colour with dark spot on forewings, dirty white to light brown hind wings (male) and Silky white (female).
- **TLC**: 50-70 days
Symptoms of damage

- Constricted and shortened internodes
- Bored holes on internodes
- Frass in the Nodal region.
- Reddening of affected tissues.
- Fresh borer attack is mostly found in the top five immature internodes and its activity continues till harvest
Top shoot borer, *Scripophaga excerptalis* (Pyralidae: Lepidoptera)

- Egg: in clusters covered with buff coloured hairs particularly near midribs on lower surface of top leaves.
- Larva: creamy white with a red coloured mid – dorsal line.
- Pupa: Within the larval tunnel in a chamber with an exit hole constructed by the caterpillar.
- Adult: White Coloured moth
Symptoms of damage

- Parallel rows of shot holes
- Dead heart reddish brown in colour
- Bunchy top due to growth of side shoots
Woolly Aphid: *Ceratovacuna lanigera* (Aphididae: Hemiptera)

- **Egg:** Spherical yellow in colour and microscopic.
- **Nymph:** Nymph takes 6 to 22 days to complete four instars.
- **Adult:** Adult emerged after fourth moult and viviparous reproduction. Apterous (Wingless) female reproduce parthenogenetically.
Symptoms of damage

- Nymph and adults suck the sap from leaves
- Yellowing of leaves
- Honey dew excrete – development of sooty mould fungus
- White chalk powder coating on the ground and leaves.
Sugarcane leaf hopper, *Pyrilla perpusilla* (Lophopodae: Hemiptera)

Pale greenish yellow eggs in clusters on the underside of leaves, covered with a white filamentous waxy material, 8-10 days

Newly hatched nymphs are milky white in colour. Feather like processes covered by wax. 8 weeks

Adults are straw coloured with wings folded like a roof on the back 27-52 days
Symptoms of damage

- Leaves become yellow
- Covered with black sooty mould
- Top leaves get dried up and lateral buds germinate
- Affect the quality of juice
Root grub, *Holotrichia serrata* and *H. consanguinea* (Melolonthidae: Coleoptera)

- **Egg**: pear like white enclosed in earthen cells. A female lays on an average of 27 eggs in the soil.
- **Grub**: Fleshy ‘C’ shaped, whitish yellow in colour
- **Pupa**: Pupae are tan to brown, and occur deeper in the soil in earthen chambers.
- **Adult**: Rusty-red colour just after emerging from the pupal stage, but turn nearly black.
Symptoms of damage

- Yellowing and wilting of leaves
- Drying of crown
- Affected canes come off easily
Scale, *Melanopsis glomerata* (Diaspididae: Hemiptera)

- **Adult**: Grayish black, irregularly oval, slightly convex and protected by the waxy covering.
- **Nymphs**: Light yellow in colour.
Symptoms of damage

Nature of damage: Nymphs and females attach to the cane, look like an encrustation, suck the sap and devitalize the cane.

- Shrivelng and stunting of canes
- Reduces germination
- Inhibition of cane growth
- Reduction in quality of juice and yield
- Loss in jaggery production
Termite, *Odontotermes obesus* (Termitidae: Isoptera)

- **Egg**: Dull, kidney shaped and hatches in 30-90 days.
- **Nymph**: Moult 8-9 times and are full grown in 6-12 months.
- **Adult**: Creamy coloured tiny insects resembling ants with dark coloured head.
Symptoms of damage

- Poor germination of setts (after Planting)
- Gappy appearance in the seedling stage.
- Characteristic semi-circular feeding marks on the leaves in the standing crop.
- Entire shoot dries up and can be pulled out easily
- Setts hollow inside and may be filled with soil
- Cane collapses if disturbed
- Rind filled with mud