

A photograph of a sugarcane field. The foreground is filled with rows of young, green sugarcane plants growing in reddish-brown soil. In the background, there is a dense grove of tall palm trees. A small, thatched-roof hut is visible among the trees on the left side. The sky is overcast.

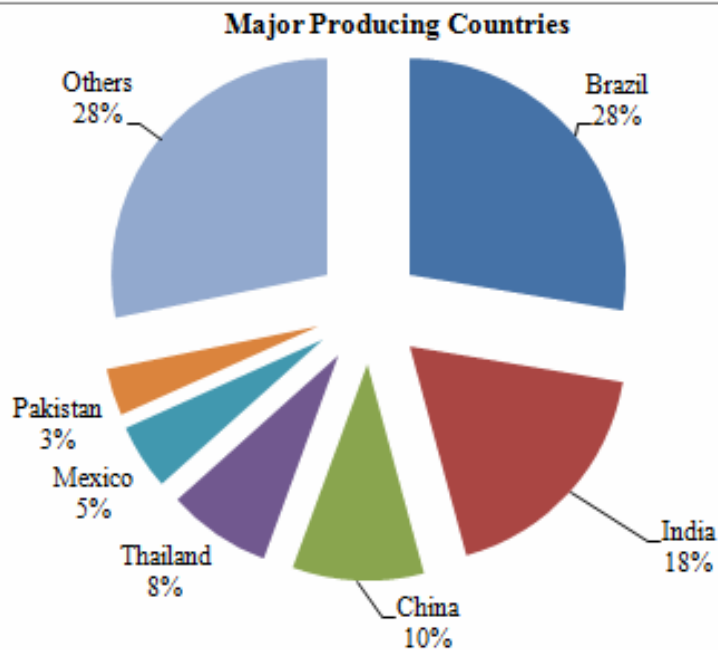
*IPM of Sugarcane pests*

# ***Sugarcane***



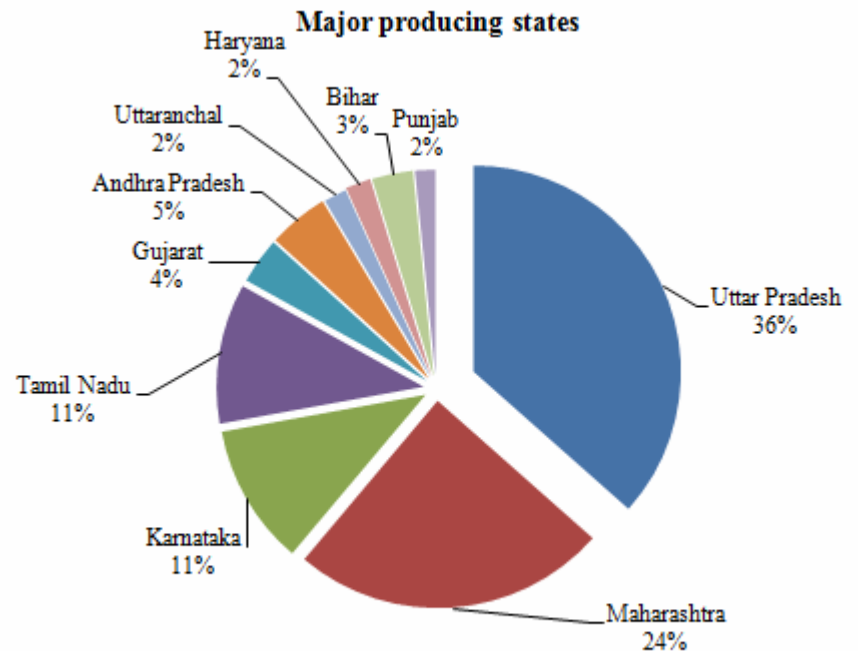
- **Grown throughout sub tropical and tropical parts of South and South-East Asia.**
- **India is the second largest producer of cane sugar next to Brazil.**
- **Sugarcane infested by 287 species of insect pests and non insect pests.**
- **Out of them 14 are major pests of sugarcane in India**

## Production status of countries



Source: USDA

## Production status of states



Source: Ministry of Agriculture, GoI

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

# Pest status

- Root borer, *Emmalocera depresella* – Eastern India
- Shoot borer, *Chilo infuscatellus* and
- Top shoot borer, *Scirpophaga nivella* } Throughout India
- 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)

Straw coloured fore wings with black dots and white hind wings

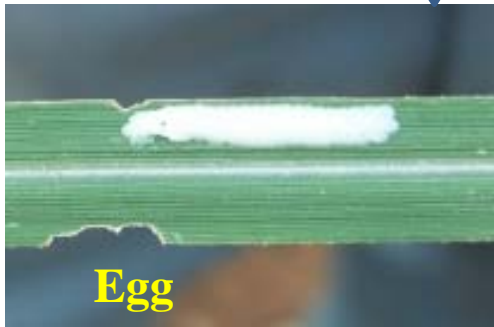
2-4 days

TLC: 5-6 weeks



Adult

Pupation takes within the tunnel  
PP: 7-9 Days



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



Pupa

Dirty white with five dark violet longitudinal stripes  
LP: 16-30 Days

# 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**

5-6 days



37-53 days



3-4 days



7-8 days

- **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- 5-7 days



Larva- 4-5 weeks



Pupa – 7-9 days



Adult-4- 5 days

- **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* (Lophopoda: 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.

- ✚ Shriveling 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)



Eggs



Workers



Soldiers

- **Egg:** Dull, kidney shaped and hatches in 30-90 days.
- **Nymph:** Moults 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

