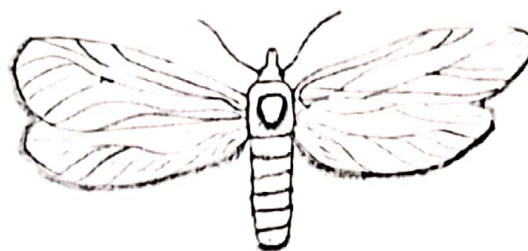


4.2.1 SUGAR CANE TOP BORER

T.N: *Scirpophaga nivella*
(Pyralidae; Lepidoptera)



Identification: Larvae are of creamy white in color with prominent dorsal vessel. The adults are pure white in color and the female has a reddish tuft of hair at the end of its abdomen. Larvae over-winter in the tops of canes.

Life cycle: Females lay about 150 eggs in clusters on the lower side of leaves. The eggs are covered under a silken cap. Eggs hatch in one week and the larvae live for 4-5 weeks. The pupal and adult period is about one week. This insect has 4-5 generations in a year. Pupation takes place within the canes, in a chamber.

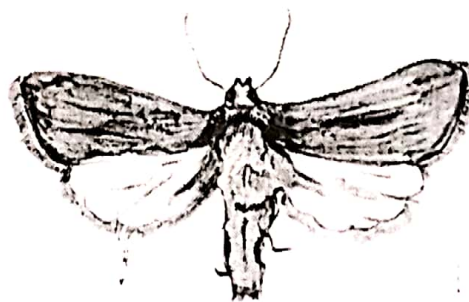
Damage: The larvae after hatching bore into the midrib of leaves and ultimately enter the canes. Attacked plants show reddish streaks on the leaf midribs. These larvae enter into the top portions of canes and cause "Dead hearts" (i.e. the top most growing portion of the plant dries up) and bunchy tops. Quantity and quality of juice is also reduced.

Control:

- Pest can also be suppressed by pulling out the dead hearts.
- By collecting and destroying egg clusters.
- Light traps for collection of adult moths.
- *Trichogramma* spp. is an effective egg parasitoid of sugarcane top borer.
- Application of carbofuran G 10-15 kg/acre or diazinon G 10 kg/acre.

4.2.2 SUGARCANE STEM BORER

T.N: *Chilo infuscatellus*
(Pyralidae; Lepidoptera)



Identification: Larvae are of dirty white color having 5 longitudinal stripes on the

body. Adults have forewings of straw color and hind wings whitish. Larvae overwinter in the stubbles.

Life cycle: Females lay 300-400 eggs in clusters on the leaves. Eggs hatch within a week. These larvae bore into the canes and live there for 3-4 week. Then the larvae pupate inside the cane in a chamber and complete their development in one week. Adult moths also live for one week; 4-5 generations in a year.

Damage: After hatching the larvae reach the plant base, bore into shoot and feed there. Borers feed in the stem and destroy the canes which results in drying up of central growing shoot called as "Dead heart" which is easily pull able.

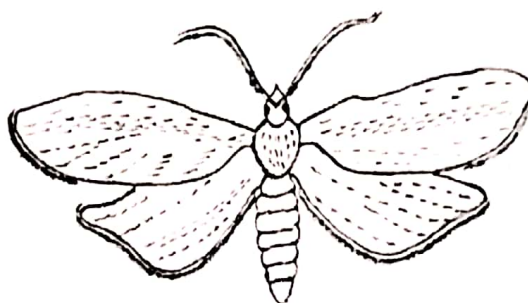
Control:

- Uprooting of stubbles.
- By collecting and destroying egg clusters.
- Light traps for collection of adult moths.
- *Trichogramma* spp. is an effective egg parasitoid of sugarcane stem borer.
- Application of carbofuran G 10-15 kg/acre or cartap G 12-15 kg/acre.

4.2.3 SUGARCANE ROOT BORER

T.N: *Emmalocera depressella*

(Pyralidae; Lepidoptera)



Identification: Eggs are creamy white. Larvae are of creamy white color with brown head and wrinkled body. The adults are of brown color and have white hind wings.

Life cycle: Larvae over winter in the stubbles. Female lays 250-350 eggs singly on leaves, stem etc. Eggs hatch in one week and the larvae complete their development in 4 weeks. The pupa lives for 2 weeks and the adults lives for one week. There are 4

generations in a year.

Damage: The young larvae bore into the stem below the soil surface. Damage results in the drying up of the central growing shoot called "Dead heart" which cannot be easily pulled out. Sugar contents of the canes are also reduced.

Control:

- Destruction of stubbles.
- Sugarcane ratooning should be avoided.
- Light traps for collection of adult moths.
- Canes should be harvested below the soil surface to kill the larvae.
- *Trichogramma* spp. is an effective egg parasitoid of sugarcane stem borer.
- Application of chlorpyrifos along with irrigation water with the ratio of 1:300 to 1:500.

4.2.4 SUGARCANE GURDASPUR BORER

T.N: *Acigona stenniella*

(Pyralidae; Lepidoptera)

Identification: Eggs are white. Larvae are creamy white with four longitudinal reddish brown stripes on the body. Adults are dull brown with many black spots near the outer margin of forewings. Hind wings are white.

Life cycle: Female lays 100-300 eggs in clusters on the upper surface of leaves. Eggs hatch in one week. Larvae live for 4 weeks. The pupal stage lasts for 2 weeks and adults live for one week; 2-3 generations in a year. Larvae over winter in stubbles.

Damage: The young larvae enter the top portions of canes through a hole from node. There they feed by making upward spiral galleries. In the beginning, its attack is in the patches in the field and later on it spread to the entire field where the canes dry up. The attacked node portions of the canes break even by slight disturbance; by air, animal etc. Sugar contents of the canes are also reduced.

Control:

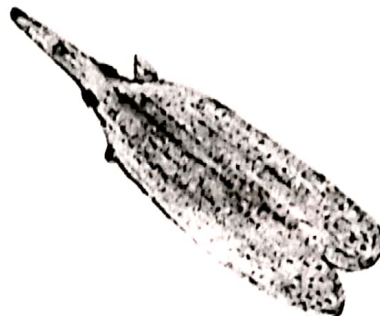
- Destruction of stubbles.
- By cutting the attacked portions of the canes.
- No ratooning of crop.

- Destruction of alternate host plants, especially sarkanda.
- Application of carbofuran G 10-15 kg/acre or diazinon G 10-15 kg/acre.

4.2.5 SUGARCANE PYRILLA OR SUGARCANE LEAFHOPPER

T.N: *Pyrilla perpusilla*

(Lophopidae; Homoptera)



Identification: Adult is brown in color and has a long stout or beak in front of head. Nymphs are of brown color with two feathery filaments at the end of abdomen.

Life cycle: Female lays 300-550 eggs in clusters on the underside of leaves. The eggs are covered with a white fluffy or cottony material. Eggs hatch in 2 weeks during summer. There are 5 nymphal instars in 8 weeks. Adults live for 4-6 weeks in summer; 3-4 generations in a year.

Damage: Both nymphs and adults suck cell sap from lower side of the leaves. Due to this loss of sap, leaves first become yellow and then dry. It secretes large quantity of honey dews on which black mold grows that affects the photosynthesis of the plant.

Control:

- By collecting and destroying egg clusters.
- Use of hand net for nymphs and adults collection.
- Clean cultivation should be done.
- Lady bird beetle and *Epipyrops spp.* are important biological control agents of this pest.
- Granular insecticides used for the control of borers are equally effective against pyrilla.

4.3 INSECT PESTS OF RICE

4.3.1 YELLOW AND WHITE STEM BORERS

T.N: *Scirpophaga incertulas* (Yellow)

Scirpophaga innotata (White)

(Pyralidae; Lepidoptera)

