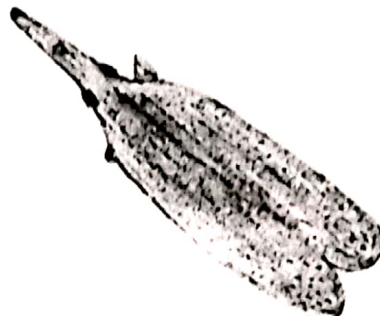


- Destruction of alternate host plants, especially sarkanda.
- Application of carbofuran G 10-15 kg/acre or diazinon G 10-15 kg/acre.

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.

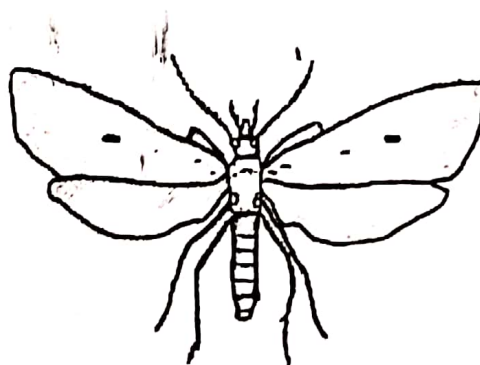
4.3 INSECT PESTS OF RICE

4.3.1 YELLOW AND WHITE STEM BORERS

T.N: *Scirpophaga incertulas* (Yellow)

Scirpophaga innotata (White)

(Pyralidae; Lepidoptera)



Identification: Yellow stem borer eggs are creamy white which are covered with yellowish brown hair of female. Larva dirty white and adult is of straw coloured. White stem borer eggs are creamy white, larva dirty white and adult colour is white with black spot on each fore wing.

Life cycle: The pest is active from April to October. The female lays 50 eggs in clusters on the underside of the leaves. These eggs hatch in one week. The larvae grow in six instars and are full grown in 4 weeks. Larvae pupate inside the attacked plant while the pupal duration is 2 weeks. About 5-7 generations in a year.

Damage: It is most destructive pest, causing up to 90 % loss. After hatching, larvae bore into the stem from the growing points downwards. Attacked plants at early stages show "Dead heart" (drying up of the central shoot) while at later stages show "White ears" (ears without grains).

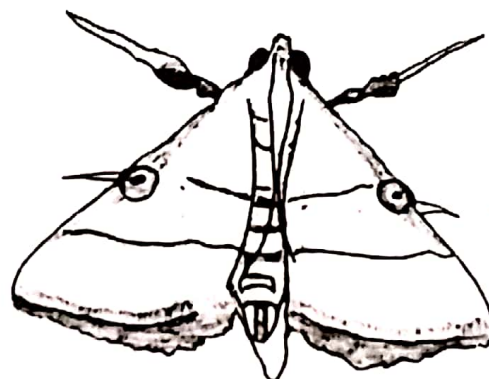
Control:

- Removal and destruction of stubbles.
- Collection of egg clusters.
- Trapping the moths by light traps.
- Rotation of crop e.g. wheat following rice.
- *Trichogramma* spp. is an effective egg parasitoid.
- Spray carbofuran G 14 kg/acre or carbosulfan G 8-12 kg/acre.

4.3.2 RICE LEAF FOLDER

T.N: *Cnaphalocrocis medinalis* L.

(Pyralidae; Lepidoptera)



Identification: Eggs are creamy white. Larvae are light yellow or greenish in colour. The moths are golden or yellowish brown. Their wings have 2-3 wavy lines characterized by dark bands.

Life cycle: The moths rest on the undersurface of the leaves during the day. They lay oval, cream-white eggs singly or in pairs on the leaves and leaf-sheaths. The eggs hatch in one week. The larval stage is completed in 5 weeks. Pupation takes place in loose silken webs in between the leaves or in the leaf-sheaths. The pupal stage lasts for 2 weeks during the active season. The life cycle is completed in 5 weeks.

Damage: The young larvae feed on tender leaves without folding them. The older larvae fasten the longitudinal margins of leaves together with a silky substance and feed inside the fold by scraping the green matter. The scrapped leaves become membranous, turn white and finally wither. A single larva may damage a number of leaves as it migrates from one leaf to another. As a result of the attack, photosynthetic activity of leaves is affected and the plants are predisposed to fungal and bacterial infections.

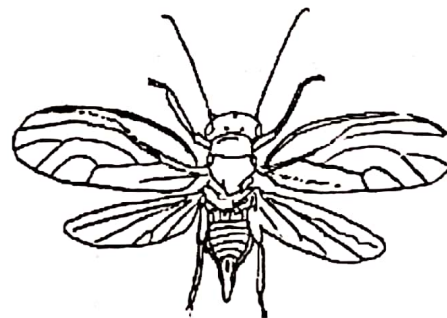
Control:

- Removal and destruction of weeds.
- Trapping the moths by light traps.
- *Trichogramma spp.* is an effective egg parasitoid.
- Application of cartap G 9 kg/acre or chlorpyrifos EC 1000 ml/acre.

4.3.2 WHITE-BACKED PLANT HOPPER

T.N: *Sogatella furcifera*

(Delphacidae; Homoptera)



Identification: The adult is a wedge shaped insect, having straw color with white back. Its nymph is grayish white which turns to dark grey when it is nears to maturity. The adults and nymphs of this insect are very active and they can easily jump from one leaf to another on a slight disturbance.

Life cycle: The adult female generally lays 100-150 eggs on the leaf sheath. After hatching, the nymphs feed on leaves and transformed into adults. The life cycle is completed in 3 weeks. The plant hopper females live for about 2 weeks. There are several generations in a year.

Damage: The adults and nymphs suck cell sap from the leaf surface and tend to congregate on the leaf sheath at the base of the plant. The leaves of attacked plants turn yellow and later on rust red. These symptoms start from the leaf tips and spread to the rest of the plant. Various brownish spots also appear on the feeding sites. Damaged plants finally dry up without producing ears. This insect also secretes honeydew on which a sooty mould appears, imparting a smoky hue to the rice fields.

Control:

- A spacing of 20 × 15 cm should be followed to avoid the rapid development of hopper population.
- Alternate drying and wetting the field during peak infestation and draining out the standing water from the field 2-3 times checks the population of the hopper to a large extent.
- Grow resistant varieties.
- Spray carbaryl D 5 kg/acre or imidacloprid SL 250 ml/acre

4.4 INSECT PEST OF MAIZE & SORGHUM

4.4.1 MAIZE BORER

T.N: *Chilo partellus*

(Pyralidae; Lepidoptera)

Identification: The adults are yellowish-grey in color while the larvae are dirty grayish white with black head and four brownish longitudinal stripes on the back.

