

Vivekanand College, Kolhapur
(Empowered Autonomous)

Department of Botany

B. Sc. II Plant- Protection

Topic- Jowar Stem Borer

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Jowar –Stem borer

Classification

Kingdom: Animalia

Phylum: Arthropoda (invertebrate animal having an exoskeleton, a segmented body, and paired jointed appendages.)

Class: Insecta

Order: Lepidoptera (characteristic covering of microscopic dustlike [scales](#) on the wings.)

Family: Crambidae (closely folded postures on grass stems where they are inconspicuous)

Genus: *Chilo*

Species: *Chilo partellus*

Host Range

C. partellus is an important pest of cultivated cereals, especially maize, sorghum and pearl millet (*Pennisetum glaucum*).

Marks of identification

Eggs

Eggs are flat and oval (scale-like), about 1.5 mm across, creamy-white and laid in overlapping batches of 10-80 eggs on the upper and underside leaf surfaces, mainly near the midribs.

Larvae

Larvae are up to 25 mm long when fully grown, with a prominent reddish-brown head. The body is creamy-white to yellowish-brown, with four purple-brown longitudinal stripes and usually with very conspicuous dark-brown dorsal spots. The prothoracic shield is reddish-brown to dark-brown, shining and with a pale medial furrow. Prominent dark-brown plates give the larva its characteristic spotted appearance.

Pupae

Female pupae are up to 15 mm long and male pupae are a few millimetres shorter. They are light yellow-brown to dark red-brown.

Adults

Adults are relatively small moths with wing lengths ranging from 7 to 17 mm. Females are generally larger than males. The forewings are generally light yellow-brown with some darker scale patterns forming longitudinal striations which are usually darker at the wing margins. The hindwings are white.

Eggs



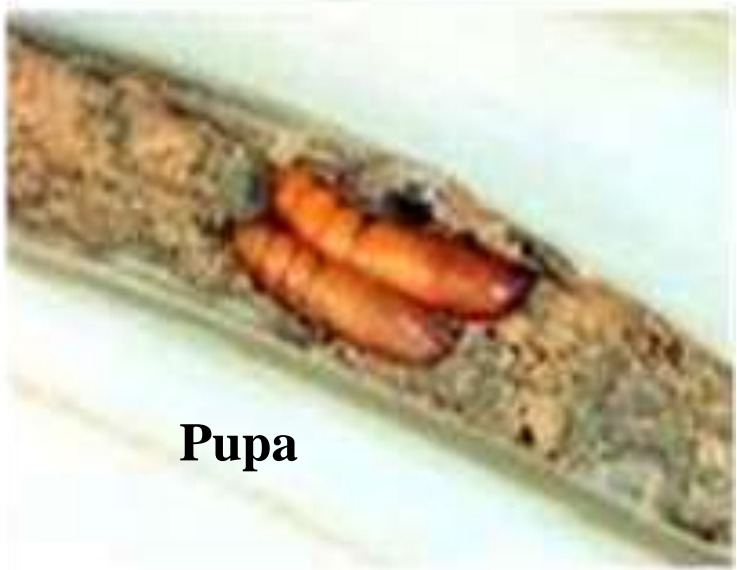
Larvae



Adult



Pupa



Life Cycle

There are four stages in the life cycle of jowar stem borer

- 1) **Eggs** are laid in batches on leaf surfaces, usually close to the midrib. They hatch after 4-10 days.
- 2) After hatching of the egg, **larva** comes out and feed initially on the leaf whorl. Older caterpillars tunnel into stems, eating out extensive galleries, within which they feed and grow for 2-3 weeks. When larvae are fully grown, they **pupate** inside tunnel and remain inside the stem.
- 3) After 7-14 days **adults** emerge from pupae and come out of the stem. They mate and lay eggs on plants again and continue damaging the crop.
- 4) During the dry season, larvae may enter a state of suspended development for several months and will only pupate with the onset of rains. Adults emerge from pupae in the late afternoon or early evening. They are active at night and rest on plants and plant debris during the day. They are rarely seen, during the day unless they are disturbed.
- 5) The whole life cycle takes about 3-4 weeks, varying according to temperature and other factors. Five or more successive generations may develop in favourable conditions. In regions where there is sufficient water and an abundance of host plants, the spotted stem borer can reproduce and develop all year-round.

Symptoms of damage

- 1) After hatching from the eggs, larva initially feeds on tender leaf whorls causing series of holes in the leaf lamina and later bore in to the stem and feeds on the central conducting tissue. Due to this , stem tissues get injured and stops supply of water and minerals to the growing point. Hence stem shows withering and drying of central shoot, which is called as “dead heart”.
- 2) However, this condition does not occur in the stage when the stem is so thick that even a large number of larvae can continue to tunnel therein, without leading to any external symptom. Hence, the attack in the earlier stage of the crop is more destructive and causes more loss than in the grownup crop.
- 3) Larva also feeds on head of the jowar.



Management practices

- 1) Crop rotation
- 2) Good crop hygiene, including the destruction of crop residues (stems and stubbles), and removal of weeds and/or alternative hosts reduces carryover of larvae and active populations from one growing season to the next.
- 3) Manipulation of sowing dates may also be used to avoid periods of peak adult activity.
- 4) The stubbles should be ploughed up during winter and burnt to destroy the hibernating larvae.
- 5) Grow resistant cultivars.
- 6) Dead hearts should be pulled out and used as fodder or buried in manure pits.
- 7) Set up light trap till midnight to attract and kill the stem borer moths.
- 8) Bio-control agents *viz.*, *Trichogramma chilonis* (egg parasitoids) *minutum*, *Bracon chinensis* and *Apanteles flavipes*, (larval parasitoids) should be encouraged.
- 9) Mix any one of the following insecticides with sand to make up the total quantity of 50 kg and apply in the leaf whorls. Phorate, carbofuran, endosulfan (or) carbaryl.

Thank You