



## ICAR-Indian Sugarcane Research Institute, Lucknow

### Advisory on Plassey borer *Chilo tumidicostalis* (Hampson) in Sugarcane

The Plassey borer, *Chilo tumidicostalis* (Hampson) came into prominence in 1956, when a large area of sugarcane under the Ramanuggar Cane and Sugar Co., Ltd., at Plassey, District Nadia, West Bengal, was severely infested. In the factory farm, an incidence of about 95% was recorded during August 1956 in several sugarcane varieties. Dr. B. D. Gupta, Sugarcane Entomologist (ICAR-ISRI, Lucknow), named the moth borer as “**Plassey borer**” because of the severe epidemic it caused at Plassey, West Bengal. This pest is endemic in the eastern part of India, starting from eastern Uttar Pradesh and extending up to Assam. Of late, this moth borer is spreading towards the central districts of Uttar Pradesh. Survey report indicated that presence of this moth borer in the districts of Hardoi, Shahjahanpur and Lakhimpur Khiri in last few years, now it is first time reported in Bijnor District.

#### Nature of Damage

Plassey borer infests sugarcane crop in two phases viz., gregarious phase in primary infestation and solitary phase or pseudo solitary phase in secondary infestation. In the gregarious phase of infestation, larval congregation takes place. Around 20-30 neonate larvae form a group and enter into an immature internode and collectively feed inside the cane tissues. In the beginning, the neonate larvae of Plassey borer appear sluggish. They feed by scrapping the leaf surface and gradually move towards the base of lamina. Finally, these larvae make an entry in the space between leaf sheath and the growing stalk. Once the larvae find the suitable portion of the immature cane stalk, they make feeding holes and enter within the stalk tissue. Collectively, all these larvae eat away the internal tissues of the internode and form a big central hollow filled with dark messy frass. The surrounding of the feeding central hollow of the internal stalk also turns brown or black. In case of primary infestation, more than 100 larvae may be found feeding in an intermingled manner in the internodes cavity staying in the midst of frass. Due to the presence of a large number of larvae at one internode and their active feeding on the surrounding stalk tissues, many relatively large feeding holes are formed on the epidermis. From this multitude of feeding holes, fresh shining red frass usually oozes out. All these actively feeding larvae collectively devour up almost the entire portion of the internal contents of the young stalk. Due to these types of feeding, the water and nutrient transport to the crown portion of the cane is greatly impaired and the entire crown turns yellow and eventually dries up. The clasping leaf sheaths help to retain the weight of drying crown. Such affected crowns often topple down with slight jerk. Presence of multitude of irregular holes (is quite an indicative of the formation of a multitude of exit hole) on the upper portion of the stalk is the very characteristics of the infestation of Plassey borer. Borer holes may be observed even without removal of the leaf sheath. In addition, profuse rooting as well as sprouting of buds in

the upper unaffected portion of the cane (just below the damaged area) takes place. Drying up of the entire crown of sugarcane (in the eastern states of the country) is very characteristics of the primary infestation of Plassey borer.



**A.** Leaf damage by neonate larva



**B.** Extrusion of frass from cane



**C.** Irregular bore holes on cane



**D.** Gregarious phase of larvae



**E.** Drying of top leaves in standing cane



**F.** Severity of Plassey borer damage in cane



**G.** Aerial rooting on cane



**H.** Natural parasitisation by *Cotesia* sp. on plassey borer

### **Management of Plassey borer**

Sugarcane ratoon crop, which commands half of the cane acreage, plays a major role to support infestation of Plassey borer. Through proper planting and judicious action, borer

menace may be contained below economic threshold level (ETL). Therefore, the fields that are not to be continued for raising a ratoon crop should be ploughed up immediately, and the field in which ratoon would continue should be properly looked after. It is suggested to restrict movement of infested cane from Eastern UP and Bihar to other parts of the country. The following management strategies are suggested for containment of Plassey borer.

#### **Mechanical method of control**

- Collection and destruction of cane tops: From mid-July to the third week of August, the tops of sugarcane plants should be collected and destroyed because they contain gregarious (closely grouped) larval and pupal stages of the pest.
- Community-wide action: Mechanical control is effective only when all farmers in a locality act together and at the same time. It should therefore be conducted as a large-scale community campaign across all sugarcane fields, rather than by individual farmers in isolated fields.

#### **Behavioural method of control**

- Mass trapping of plassey borer moths, using light traps reduces moth population and brings down the severity of subsequent broods.

#### **Cultural method of Control**

- Ensure proper drainage to prevent waterlogging and avoid excessive application of nitrogenous fertilizers.
- Grow resistant varieties with longer spindle length, as they provide considerable protection to the crop.

#### **Biological method of control**

- The larval parasitoid *Cotesia flavipes* (Hymenoptera: Braconidae), which has been reported to cause approximately 40–50% mortality in host larvae, should be conserved and released in infested fields as an important component of biological pest management.
- *Cotesia flavipes* (larval parasitoid): release 500 female parasitoids per hectare, at 7-day intervals, from July through November.
- *Trichogramma chilonis* (egg parasitoid): release 50,000 parasitoids per hectare, at 10-day intervals, from July through October. It attacks pest eggs, preventing larvae from emerging.

#### **Chemical method of control**

- As per the recommendation of Central Insecticide Board and Registration Committee (CIB & RC), Govt. of India.