

Abundance and Damage Estimation of Rootstock Borer in Sugarcane

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The rootstock borer *Emmalocera depressella* Swinhoe, is one of the destructive pest of sugarcane. Large scale infestation at early stage of crop may cause gaps in the field which results considerable yield loss. Because of the severity of its infestation, especially in the sugarcane growing area of the northern part of Bangladesh which include greater Dinajpur district. Other places of the country where incidence of the pest is increasing includes Rangpur, Joypurhat, Rajshahi and Chuadanga districts. Therefore top most priority has been placed by the Bangladesh Sugarcane Research Institute for effective control of this insect pest. The rootstock borer is reported to be distributed in almost all the sugarcane growing tracts of north and central India (Mrig, 1989). The occurrence of this insect has also been reported in Malaysia (Avasthy & Tiwari, 1986).

The experiment was conducted at the North Regional Station, Madarganj, Thakurgaon during 1990-91 cropping season. An area of 40m x 35m (0.14 ha) was planted with the variety Ist 16. All normal cultural practices were followed including pest control except rootstock borer. No chemical insecticide was applied in the field for insect pest control. Data collection on the population density of larvae and pupae commenced on the first week of March, 1991 and continued upto last week of February, 1992. Data were collected once a week by complete uprooting of growing sugarcane from 20 m² area. Weight loss of sugarcane due to attack of rootstock borer was recorded from the month of June, 1991 to February, 1992.

Number of larvae and pupae are shown in Table 1. Each month comprises data of four weeks in an area of 20 m² x 4 = 80 m² area. No larvae / pupae was found in the month of March, 1991. Only 16 larvae occurred in April and there after the population density gradually increased and reached a peak population of 202 larvae in August. When the mean maximum temperature was 32.7°C and the total rainfall was 366 mm. The larval population tended to decline from September. Although there was 833 mm rainfall in this month which was higher as recorded in other month, the gradual decrease of larval population might be due to the heavy rainfall. According to Khanna and Sharma (1969) a rainfall of 288 mm in July and 319.8 mm in August didn't decline the population of the pest. But Gupta and Avasthy (1960) reported that only after 457.2 mm rainfall its population declines. The contrasting weather conditions might influence

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on the abundance of rootstock borer throughout the year. High temperature (31.7° - 42.1° C) and low humidity condition were favourable for its multiplication reaching peak population during July and August (Easwamoorthy, 1986).

Since the infestation started from third week of March, it is assumed that the first generation of rootstock borer initiated at either first or second week of this month. The pupae recorded in the infested cane in the third week of May indicates the end of first generation. Again the appearance of pupae during second week of July indicates end of second generation. Presence of pupae in September indicates the presence of at least one more generation (third). Gupta and Avasthy (1952) reported that the rootstock borer complete three generation a year in Uttar Pradesh. Cheema (1953) reported the occurrence of the five broods of this pest in Punjab.

Table 1. Population density of larvae and pupae and percentage infestation of rootstock borer in a sugarcane field over twelve months (March 1991 February, 1992) at Madarganj, Thakurgaon.

Sampling month	Total plants (No.)	Total larvae (No.)	Total pupae (No.)	Cumulative plant infestation (%)
March	353	0	0	0.9
April	460	16	0	9.1
May	655	18	1	8.9
June	650	42	0	9.9
July	651	126	2	32.1
August	573	202	6	62.7
September	495	116	5	76.6
October	462	71	0	77.3
November	475	66	0	84.2
December	496	29	0	85.1
January	423	25	0	82.7
February	343	4	0	79.6

Table 2. Monthly weight loss of sugarcane due to attack of rootstock borer (June, 1991 - February 1992) (Weight data of sugarcane recorded on 28th on each month).

Sampling month	Mean weight per healthy cane (g)	Mean weight per infested cane (g)	Weight loss (%)
June	200	185	7.5
July	290	265	8.6
August	460	396	13.9
September	620	540	12.9
October	720	635	11.8
November	860	775	13.4
December	850	700	15.2
January	730	605	17.1
February	705	575	18.4

Percentage rootstock borer infestation ranged from 0.85 to 85.08. The infestation of April, May and June were more or less similar. The infestation was higher in July and August, the later month recording double the infestation of the former month (Table 1).

Thus the higher infestation occurred in the month of August (62.7%). Apparently there were only 22 percent increase infestation from September to December. The rootstock borer is more active in July onward, damages the underground internodes and more severe in ratoon than in plant crop (Mrig and Chaudhary, 1991). In severe cause, borer can cause a havoc by 100 percent infestation of canes leading to dryness of mature and immature canes (Miah *et al* 1986). However under field condition the infestation level may rise upto 80 percent without any control measure (Anonymous, 1984).

Due to infestation by rootstock borer weight reduction of infested canes occurred compared to healthy canes. The percentage of weight reduction at different months ranged from 7.5 to 18.4 (Table 2). The infestation (X) was found significantly related to the reduction of weight (Y) ($Y=5.987 + 0.110x$; $r=0.822$; $p<0.01$). This indicated that the damage by rootstock borer caused significant loss of weight. Cheema (1953) reported 17 percent weight reduction of infested cane in third generation compared to healthy cane. At 100 percent level of infestation a reduction of 8.8 percent in yield was recorded by Miah *et al.* (1986) and 10 percent by Gupta (1959). The weight loss due to the attack of rootstock borer in the present study had some similarity with that of Cheema (1953).

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