



INFESTATION OF SUGARCANE BORERS AND REMEDY BY FARMING COMMUNITY AT DARGAI MALAKAND

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ABSTRACT

A study was conducted to record sugarcane borer infestation at Dargai Malakand during the year 2012. The experiment was carried out in a randomized complete block design with three replications. Data were recorded on weekly basis from the 3rd week of June to the 1st week of September. The lowest infestation (8.30%) was recorded during the 3rd week of June with gradual increase to its peak (52.90%) in the 3rd week of July. The percentage infestation recorded in the 4th week of June was 16.1 followed by 25.8 and 42.09% in the 1st and 2nd week of July; respectively before pesticide application. After spray application the lowest infestation recorded was 19.7% during the 1st week of September and the highest (38.6%) in the 4th week of July. The infestation recorded during the 1st week of August was 32.9% followed by 28.8, 26.0 and 23.3% in the 2nd, 3rd and 4th week of August. Maximum reduction in the infestation was recorded during 1st week of September which was 56.74% followed by 52.6, 49.80, 46.39 and 37.51% in the 4th, 3rd, 2nd and 1st week of August and 26.01 % in the 4th week of July. The study concluded that Lorsban proved to be an effective chemical against sugarcane borer in the field and is recommended to use this pesticide to suppress the pest population significantly.

Keywords: Borers, Farming community, Infestation, Sugarcane

INTRODUCTION

Sugarcane (*Saccharum officinarum*) is an important cash crop of Pakistan. It is also an important source of income and employment for the farming community of Pakistan. Sugarcane provides raw materials for industries like paper and chipboard manufacturing. Its shares in value added agriculture and GDP are 3.4 percent and 0.7 percent, respectively (Food and Agriculture Division, 2009).

Total cane area in Pakistan during 2010-2011 was 987.6 thousand hectares with a total cane production of 55308.5 thousand tons with an average yield of 56.0 tons per hectare. Among this Khyber Pakhtunkhwa has 88.4 thousand hectare with a total production of 4030.3 thousand tons with average yield of 45.6 tons per hectares (Agriculture Statistics of Pakistan 2010-11)

Sugarcane is the main source of white sugar in Pakistan. It is the fourth major crop after wheat, cotton and rice. Sugar industry is regarded as the second largest industry after textile and pays around 15 billion rupees in various taxes annually. It contribute 2 % to the country's GDP and its contribution in manufacturing sector is around 12.80 % (Ashraf, 2003). The average cane yield in Pakistan ranges from 44-47 tons/ha, which is much below the other competing countries such as India (69 tons/ha), USA (84 tons/ha) and Egypt (107 tons/ha). Lower cane yield is not only due to the climatic barriers but also involves improper cultural practices, lack of irrigation, cultivation of uncertified seeds, late sowing and harvesting, unbalance nutrition, bad ratooning, insect pests and diseases. Due to these constraints, present yield of sugarcane in the country is nearly 80 % below the demonstrated achievable potential (Riaz, 2003).

Besides the severe climatic conditions and shortened growth period, insect pests as usual adjust themselves to attack this crop. These insect pests overwinter in stubbles, trash etc. and come out at the time when the conditions become suitable for growth of this crop. Various insect pests like, borers, termites, pyrilla, whitefly, thrips, bugs and mites attack this crop and cause heavy losses in terms of cane yield and lower sugar recovery (Rosa, 2005).

Sugarcane borers are among the most injurious pests attacking this crop. These include top borer, *Scirpophaga nivella* F. (Lepidoptera: Pyralidae); stem borer *Chilo infuscatellus* Snellen (Lepidoptera: Crambidae); root borer, *Emmalocera depressella* (Swinehoe) (Lepidoptera; Pyralidae) and Gurdaspur borer, *Bissetia stenillus* (Hampson) (Lepidoptera; Crambidae). Borers may reduce yield upto 80%. The damage caused by borers not only reduce the crop yield but also effect the sucrose content of cane (Kalra and Sidhu, 1955)..

Objectives of the study

1. To find out the percent infestation of sugarcane borers.
2. To screen out the remedy approaches of the farming community at Dargai Malakand.

MATERIALS AND METHODS

The present research work was conducted to study the infestation of sugarcane borers at Dargai Malakand during 2012. Sugarcane variety CP 77/400 was planted in the 2nd week of February. Sprouting occurred in five to seven weeks. When shoots gained a height of 25 cm, the usual practice of earthing up was done to give firm foundation that considered resistance to lodging. Row to row distance was maintained about 0.70 m to allow sufficient space for different operations.

Treatment

Lorsban was used in the experiment and applied @250 ml /acre to prevent further infestation of borers.

Experimental design

The experiment was laid out in randomized complete block design (RCBD) with three replications. Each plot size was 42×20 m.

Data collection

From each plot three rows were selected randomly. In each row, total number of infested and healthy plants were counted. Weekly data was recorded on dead heart from 3rd week of June to 1st week of September. The recorded infestation was finally converted to percentage infestation by the formula.

$$\text{Percentage infestation} = \frac{\text{Number of infested plants}}{\text{Total Number of plants}} \times 100$$

Data analysis

The collected data were subjected to ANOVA and means were separated using least significant difference test at 5% probability level. Statistical package STATISTIX[®] was used to analyze the data.

RESULTS AND DISCUSSION

The experiment was carried out at Dargai Malakand during 2012 at farmer's field to record the percentage infestation and reduction of Sugar cane borers. Significant reduction in borer's infestation was recorded after the application of insecticides.

Data collection started from the 3rd week of June and continued until the 1st week of September. The infestation started after mid of June. In the 3rd week of June, the infestation recorded was 8.30% and gradually increased to its highest 52.9% in the 3rd week of July followed by 42.9% in 2nd week of July, 25.8% in the 1st week of July, 16.1% in the 4th week of June before the spray application (Table 1). Highest damage was recorded during the month of June and July due to favorable environmental conditions for borers. Results showed that after spray the percent infestation recorded was 38.6% in the 4th week of July, followed by 32.9, 28.8, 26.0, 23.3 and 19.7% in the 1st, 2nd, 3rd, 4th week of August and 1st week of September respectively. The lowest infestation (19.7%) was recorded during the 1st week of September (Table 1). The results are correlated with Jabbar *et al.* (1986) who reported that the maximum damage of top borer (10.30 %) was during July when the borers were comparatively more active. According to Bhatti (2008) stem borer appeared during April and maximum average damage (21.44 %) was caused during the month of September. Jabbar *et al.* (1986) observed that stem borer infestation was 4.0, 8.5, 22.0, and 28.8 during July, August, September and October respectively. Bhatti *et al.*, (2008) reported that the stem borer regarded severe pest which destroy the young canes and shoot during April to June. Root borer appeared in the month of April with maximum infestation of 10.21 % during August followed by September, June, July, October, May and April with average damage of 8.25, 7.91, 7.74, 6.38, 3.82 and 1.63 % respectively (Bhatti *et al.*, 2008). Root borer larvae bore in to the stem below the soil surface, the central leave of attacked plant dry up “dead hearts” before the cane forming stage. The dead hearts can not easily pulled out. While Gurdaspur borer passes winter and early part of summer (Nov-Jun) in sugarcane stubbles (Hashmi, 1994). According to Bashir *et al.* (2007) the young plants attacked by top borer show reddish streak on the mid rib and a number of small holes in the leaves ultimately cause dead hearts, which can be easily pulled out. The 1st two brood of this pest attack young plants before formation of cane and cause complete loss. The maximum reduction was recorded in the 1st week of September which was 56.74% followed by 52.6% in the 4th week of August, 49.80% in the 3rd week of August, 46.39% in the 2nd week of August, 37.51% in the 1st week of August and 26.01 % in the 4th week of July (Table 2). Percentage reduction in infestation was significantly different from each other.

Table 1

Percentage infestation of sugarcane borers before and after spray during 2012 at Dargai Malakand.

Weeks	Infestation before spray	Weeks	Infestation after Spray
3 rd week of June	8.3	4 th week of July	38.6
4 th week of June	16.1	1 st week of August	32.9
1 st week of July	25.8	2 nd week of August	28.8
2 nd week of July	42.09	3 rd week of August	26.0
3 rd week of July	52.9	4 th week of August	23.3
		1 st week of September	19.7

Table 2

Percentage reduction in sugarcane borer infestation at Malakand during 2012

Treatments (Lorsban)	Time interval (week)					
	4 th week of July	1 st week of August	2 nd week of August	3 rd week of August	4 th week of August	1 st week of September
R	20.99	36.87	44.97	48.42	49.67	56.59
R ₂	28.19	38.06	46.66	50.40	54.55	55.89
R ₃	28.85	37.60	47.54	50.60	53.58	57.75
Overall Mean	26.01 E	37.51 D	46.39 C	49.80 BC	52.6 B	56.74 A
LSD value	3.98					

CONCLUSION AND RECOMMENDATIONS

The study concluded that the sugarcane borer infestation started after the 2nd week of June and reached to its peak in the mid of July. Highest infestation was recorded in the months of June and July. After spray application maximum reduction in sugarcane borer infestation was recorded in the months of September and August as compared to the month of July and June where the infestation was recorded minimum. It is suggested for the control of borer population that integrated pest management practice should be followed from the sowing time up to harvesting. Awareness should be created among the growers through extension workers and training workshops about different sugarcane borers, their life cycle, time of damage and use of management practices. Resistant varieties should be grown to minimize economic losses.

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