

Efficacy of Lorsban 15G in Controlling Sugarcane Rootstock Borer

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ABSTRACT

Lorsban 15G was applied @ 2.0, 2.5 and 3.0 kg a.i ha⁻¹ in March and May; in March and July; and in March, May and July to study the suitable dose and time of application for the effective control of sugarcane rootstock borer. At Akandabaria farm, Carew & Co. and Jamalpur farm, TSM, lorsban @ 2.0 kg a.i ha⁻¹ applied three times controlled the pest over eighty percent in terms of infestation and larval population. At Kanta farm, STSM, lorsban @ 2.0 kg a.i ha⁻¹ controlled over eighty percent in terms of larval population but about seventy four percent in case of infestation. Higher doses @ 2.5 kg a.i ha⁻¹ applied three times gave better results. Considering the mean of three experiments lorsban @ 2.0 to 2.5 kg a.i ha⁻¹ to be applied three times (March, May and July) may be recommended for desired control of rootstock borer.

Key words : Sugarcane, rootstock borer, *Emmalocera depressella*, lorsban 15G, control.

INTRODUCTION

Rootstock borer, *Emmalocera depressella* Swinhoe is one of the major pests of sugarcane in Bangladesh (Anon., 1978). Canes grown in sandy and sandy loam soils are mostly vulnerable to this pest. It causes considerable damage and loss to the crop in early stage as well as grown up canes (Biswas *et al.* 1994). Newly hatched larvae crawls down at the base to reach to rootstock and attacks it by eating up inside resulting 'dead heart' symptom or 'drying-yellowing up' of 3rd/4th leaf in early stages and 'drying-yellowing' of outer leaves in mature canes. Though it attacks throughout the year, its abundance is high from March to October (Alam *et al.* 1990). Heavily infested canes easily lodge down affecting cane yield and recovery (Biswas *et al.* 1994). Miah *et al.* (1986) observed 68.0% infestation and found 8.6% reduction in yield. As high as 80% infestation was found at Mobarakganj Sugar Mills (Anon., 1980).

Information regarding chemical control are a few in Bangladesh. There is no chemical found effective in controlling rootstock borer of sugarcane (Anon., 1980). At present there is no approved chemical against this pest. Sugar mills and cane growers have an urgent demand for effective insecticides against the pest. Chlorpyrifos is used against soil pests elsewhere of the world (Yadava and Sharma, 1995; Madan and Singh, 1998). The granular formulation is preferred for advantage like ease of application and comparatively less harmful to natural enemies. Considering the need and advantage of granular formulation, Lorsban 15G was selected for this and applied at different doses and frequencies to find out the best treatment.

MATERIALS AND METHODS

A field trial was conducted with granular chlorpyrifos (Lorsban 15G) at three locations of different sugar mills to control sugarcane rootstock borer in 1996-97 crop year. The experiment was set-up during 1996-97 season at three locations viz. Akandabaria farm, Carew & Co., Darsana, Chuadanga; Jamalpur farm, Thakurgaon sugar mills, Thakurgaon and Kanta farm, Setabganj sugar mills, Dinajpur. Individual plot size was 6 m x 5 m and gap between row to row distance 1m both plot to plot and replication to replication was 2m. Ten treatments were randomly distributed in RCB design with three replications. A susceptible variety Isd 18 was planted with the following treatments :

- T₁ - Lorsban 15G @ 2.0 kg a.i ha⁻¹ (Applied in March - May)
- T₂ - Lorsban 15G @ 2.0 kg a.i ha⁻¹ (Applied in March - July)
- T₃ - Lorsban 15G @ 2.0 kg a.i ha⁻¹ (Applied in March, May - July)
- T₄ - Lorsban 15G @ 2.5 kg a.i ha⁻¹ (Applied in March - May)
- T₅ - Lorsban 15G @ 2.5 kg a.i ha⁻¹ (Applied in March - July)
- T₆ - Lorsban 15G @ 2.5 kg a.i ha⁻¹ (Applied in March, May - July)
- T₇ - Lorsban 15G @ 3.0 kg a.i ha⁻¹ (Applied in March - May)
- T₈ - Lorsban 15G @ 3.0 kg a.i ha⁻¹ (Applied in March - July)
- T₉ - Lorsban 15G @ 3.0 kg a.i ha⁻¹ (Applied in March, May - July)
- T₀ - Check (untreated)

The insecticide was applied at the bases of plants and was incorporated well in soils with a narrow spade. Irrigation was provided in the field to moisten the soil before application of granules. Data were collected on rootstock borer infestation and larval population by uprooting twelve clumps per plot in the month of September, two months after the final application of insecticides.

RESULTS AND DISCUSSION

The Table 1 shows the percent infestation and effectiveness of different treatments and Table 2 shows the larval population and percent reduction at three locations (mills farms).

At Akandabaria farm significant difference was found among the treatments (Tables 1, 2). But over 80% efficiency was found only in the treatments lorsban 15G @ 2.0 kg a.i ha⁻¹ applied in March, May and July; lorsban 15G @ 2.5 kg a.i ha⁻¹ applied in March, May and July; lorsban 15G @ 3.0 kg a.i ha⁻¹ applied in March and July; lorsban 15G @ 3.0 kg a.i ha⁻¹ in March, May and July.

At Jamalpur farm significant difference was also observed among the treatments (Tables 1, 2). However, over 80% effectiveness was observed when lorsban 15G was applied @ 2.0 kg a.i ha⁻¹ in March, May and July and applied @ 2.5 kg a.i ha⁻¹ or @ 3.0 kg a.i ha⁻¹ either two times (March and July) or three times (March, May and July). However, at Kanta farm over 80% efficiency was shown by treatment lorsban 15G applied @ 2.5 kg a.i ha⁻¹ (March, May and July) and lorsban 15G @ 3.0 kg a.i ha⁻¹ (March, May and July) in case of infestation as shown in Table 1 and lorsban 15G @ 2.0 kg a.i ha⁻¹ (March, May and July), Lorsban 15G @ 2.5 kg a.i ha⁻¹ (March, May and July), lorsban 15G @ 3.0 kg a.i ha⁻¹ applied 2 times (March and July) or 3 times (March, May and July) as shown in Table 2. Significant difference was also observed at Kanta farm.

Information regarding chemical control of rootstock borer is lacking except a few.

Miah *et al.* (1986) conducted experiments with dieldrin 20EC and furadan 5G with no significant control of the pest. Biswas *et al.* (1994) conducted experiment against this pest with different doses of furadan 5G, miral 3G and padan 10G at Akandabaria farm, Carew & Co. and Shahebganj farm, Rangpur sugar mills with no significant control (range 35.1% to 70.0% effectiveness). In India soil application of gamma HCH was recommended against rootstock borer (Agarwala and Prasad, 1955; Gupta and Avasthy, 1954). But Khan and Joshi (1969) found HCH ineffective in Rajasthan against the pest. Sikchi *et al.* (1987) reported that granular quinalphos, carbofuran and phorate are effective in controlling rootstock borer.

The present results as shown in Tables 1 and 2 revealed that Lorsban 15G @ 2.0 kg a.i ha⁻¹ applied in March, May and July controlled the pest over eighty percent in respect to infestation and larval population except at Kanta (73.85%) in respect to infestation and over eighty percent in case of larval population at all the three locations. However, the mean data for infestation and larval population when applied @ 2.0 kg a.i ha⁻¹ in March, May and July showed 81.94% (Table 1) and 86.21% control (Table 2) respectively supports the recommendation of lorsban 15G @ 2.0 kg to 2.5 kg a.i ha⁻¹ against sugarcane rootstock borer.

Table 1. Efficacy of Lorsban 15G in controlling rootstock borer (infestation) at different locations, 1996-97.

Treatments	% infestation (Mean of 3 replications)						Mean % efficiency
	Akandabaria farm		Jamalpur farm		Kanta farm		
	Mean	% control	Mean	% control	Mean	% control	
T ₁	29.12 b*	38.68	28.63 bc	71.19	40.04 bc	55.71	55.19
T ₂	30.68 b	35.40	32.06 b	67.39	40.78 b	55.23	52.67
T ₃	8.22 cd	82.69	10.53 def	89.29	23.64 dc	73.85	81.94
T ₄	28.28 b	40.45	19.73 de	82.99	23.49 de	74.02	65.82
T ₅	22.26 b	53.13	19.55 cd	80.12	29.28 cd	67.61	66.95
T ₆	9.48 c	80.04	12.00 def	87.80	15.72 ef	82.81	83.55
T ₇	11.03 c	76.77	19.29 ef	90.55	28.49 d	68.49	78.58
T ₈	8.64 cd	81.81	19.25 cde	80.42	22.58 de	75.02	79.08
T ₉	3.48 d	92.67	6.35 f	93.54	10.43 f	88.46	91.56
T ₀	47.49 a	-	98.33 a	-	90.41 a	-	-
LSD 5%	1.277		10.13		10.87		

* Figures followed by the same letters are not significantly different at 0.05 level (LSD)

Table 2. Efficacy of Lorsban 15G in controlling sugarcane rootstock borer (larval population) at different locations, 1996-97.

Treatments	Larval population (Mean of 3 replications)						Mean % efficiency
	Akandabaria farm		Jamalpur farm		Kanta farm		
	Mean	% control	Mean	% control	Mean	% control	
T ₁	3.00 bcd*	62.50	7.33 bc	80.36	9.67 b	57.34	66.73
T ₂	3.33 bc	58.38	8.67 b	76.77	10.67 b	53.93	62.69
T ₃	1.33 cde	83.38	2.00 cd	94.64	4.33 cd	80.61	86.21
T ₄	4.00 b	57.13	5.33 bcd	85.72	5.00 cd	77.94	74.26
T ₅	4.33 b	45.88	5.00 bcd	86.61	6.33 bcd	72.08	68.19
T ₆	1.00 de	87.50	3.33 bcd	91.08	4.00 cd	82.33	86.97
T ₇	3.00 bcd	62.50	2.67 cd	92.85	6.67 bc	70.58	75.31
T ₈	1.33 cde	83.38	6.67 bc	82.13	4.00 cd	82.36	82.62
T ₉	0.33 cde	95.88	1.00 d	97.32	3.00 d	86.77	93.32
T ₁₀	9.33 a	-	37.33 a	-	22.67 a	-	-
LSD 5%	0.7135		1.250		0.8316		

* Figures followed by the same letters are not significantly different at 0.05 level (LSD)

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