

Efficacy of Some New Groups of Insecticides in Controlling Sugarcane Rootstock borer, *Emmalocera depressella* Swinhoe

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ABSTRACT

Different dosage rates of talstar 2WP (bifenthrin), rugby 10G (cadusafos), sinolux 25 EC (quinalfos) and pyriban 15G (chlorpyrifos) were tested against sugarcane rootstock borer in 2004-2005 and 2005-2006 at Patuadangi farm, Jamalpur farm and Mohan farm of Thakurgaon Sugar mills Ltd., Thakurgaon. Talstar 2WP applied @ 200 gm ai ha⁻¹ in March and May, rugby 10G applied @ 2.0 kg ai ha⁻¹ in March and May, sinolux 25EC applied @ 2.5 kg ai ha⁻¹ in March, May and July and pyriban 15G applied @ 2.25 kg ai ha⁻¹ in March, May and July effectively controlled (over 80%) rootstock borer. The above insecticides with mentioned dosage rates may be recommended against the pest.

Key words : Sugarcane, rootstock borer, insecticides, control.

INTRODUCTION

Rootstock borer (RSB), *Emmalocera depressella* Swinhoe is a serious pest of sugarcane (SRI, 1978). The pest is more abundant in sandy and sandy loam soils. The pest causes considerable damage and loss to the crop both in early and late stages of cane growth (Biswas et al., 1994). The pest attacks sugarcane throughout the year, however, more abundant in March to October. Newly hatched larvae crawl down at the bases of canes (rootstock) and thus symptoms like dead heart or drying up of 3rd/4th leaves in early stages arise (Alam et al., 1990). In old canes side leaves become yellow while middle leaves may remain green. Miah et al. (1986) found 68.0% infestation and 8.6% reduction in yield. Infestation may reach upto 100.0% in some canes in prone areas (personal observation).

So far, only lorsban 15G (chlorpyrifos) has been recommended against RSB. More control methods are needed. In the view of above, talstar 2WP (bifenthrin), rugby 10G (cadusafos), sinolux 25 EC (quinalfos) and pyriban 15G (chlorpyrifos) were tested at field level for their efficacy at three locations in 204-2005 and 2005-2006 seasons.

MATERIALS AND METHODS

Field trials were conducted at Patuadangi farm, Mohan farm, and Jamalpur farm under Thakurgaon sugar mills Ltd., Thakurgaon during 2004-2005 and at Mohan farm during 2005-2006. Individual plot size was 6mx5m and replicated 3 times. Test insecticides were talstar 2WP, rugby 10G, sinolux 25 EC and pyriban 15G, which were applied at different doses and at different times as shown in the tables of results. Lorsban 15G (approved before) was taken as standard and there was also a control (untreated)) treatment. Granular insecticides were applied at the bases of cane plants directly and liquid insecticide was applied with a watering can after mixing in water. There after, insecticides were covered with soils using spades. Field soils was made moist through irrigation before insecticide application. For collection of data (level of infestation) five clumps per plot were uprooted randomly and were compared with the control plot.

RESULTS AND DISCUSSION

At Patuadangi farm, talstar 2WP @ 150 gm ai ha⁻¹ applied in March + May and 200 gm ai ha⁻¹ applied in March and May showed significant control with pest infestation 6.62% (80.28% control) and 5.09% (86.51% control) respectively (Table 1). Significant control was also achieved with rugby 10G @ 2.0 kg ai ha⁻¹, sinolux 25 EC @ 2.5 L ai ha⁻¹ (6.01% infestation) and higher doses and pyriban 15G @ 2.25 kg ai ha⁻¹ (6.87% infestation) with control of 72.97%, 81.83% and 79.23% respectively. At Mohan farm significant control was found in talstar 2WP @ 200gm ai ha⁻¹ applied in March + May (2.56%), rugby 10G @ 2.0 kg ai ha⁻¹ applied in March + May (2.22%), sinolux 25 EC @ 2.5 L ai ha⁻¹ applied in March + May + July (1.69%) and pyriban 15G @ 2.25 kg ai ha⁻¹ applied in March + May + July (2.56%) with 84.76%, 86.79%, 88.33% and 84.76% control respectively. At Jamalpur location no significant result was found but the above treatments showed better performance.

Table 2 shows efficiency of same treatments in the month of December. Significant control was achieved by treatments talstar 2WP @ 200gm ai ha⁻¹ in March + May, sinolux 25 EC @ 2.5 L ai ha⁻¹ applied in March + May + July and pyriban 15G @ 2.25 kg ai ha⁻¹ applied in March + May + July at Patuadangi farm, Mohan farm and Jamalpur farm. However, satisfactory control (over 80%) was achieved only at Patuadangi and Mohan farms. But at Jamalpur farm higher control was achieved (58.04%) with talstar 2 WP @ 200 g ai ha⁻¹

Similar results were found in 2005-2006 experiments. In the first data taken in June (Table 3) highly significant control was found in talstar 2WP @ 200gm ai ha⁻¹ applied in March + May, rugby 10G @ 2.0 kg ai ha⁻¹ applied in March + May, pyriban 15G @ 2.25 kg ai ha⁻¹ applied in March + May + July and sinolux @ 2.5 L ai ha⁻¹ applied in March + May + July with mean infestation 4.46%, 6.50%, 6.72% and 7.17% respectively and showed over 80.0% efficiency. Table 3 also shows data taken in October when similar efficiency was shown by the above treatments.

Information regarding chemical control of RSB is lacking. In India application of gamma HCH was recommended against RSB (Agarwala and Parsad, 1955; Gupta and Avasty, 1954). But Khan and Joshi (1969) found HCH effective against the pest in Rajasthan. Sikchi *et al.* (1987) reported that granular quinalphos, carbofuran and phorate are effective against RSB. Miah *et al.* (1986) conducted experiments with dieldrin 20 EC and furadan 5G but no effective control was achieved. Biswas *et al.* (1994) found only 35.1-70.0 control of RSB with different doses of furadan 5G, miral 3G and padan 10G at Carew and Co's farm and Rangpur sugar mills' farm. However, Alam *et al.* (2000) found effective and significant control with lorsban 15G @ 2.0 kg ai ha⁻¹ and 2.5 kg ai ha⁻¹ at Carew and Co., Chuadanga, Thakurgaon sugar mills Ltd., Thakurgaon and Setabganj sugar mills Ltd., Dinajpur.

The results revealed that treatments talstar 2WP @ 200gm ai ha⁻¹, rugby 10G @ 2.0 kg ai ha⁻¹, sinolux @ 2.5 L ai ha⁻¹ and pyriban 15G @ 2.25 kg ai ha⁻¹ controlled RSB satisfactorily (80% or above) and therefore, insecticide Talstar 2WP @ 200 g ai ha⁻¹ (March + May), Rugby 10G @ 2.0 kg ai ha⁻¹ (March + May), Sinolux 25 EC @ 2.5 Kg ai ha⁻¹ (March + May + July) and pyriban 15G @ 2.25 kg ai ha⁻¹ (March + May + July) may be recommended for effective control of RSB infestation.

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Table 1. Efficacy of different insecticides in controlling Rootstock borer at Patuadangi, Mohan and Jamalpur farms, Thakurgaon, May, 2005.

Treatments	% RSB infestation and efficiency					
	Patuadangi farm		Mohan farm		Jamalpur farm	
	Mean (%)	Efficiency (%)	Mean (%)	Efficiency (%)	Mean (%)	Efficiency (%)
T ₁ Talstar 2WP @ 100gm ai /ha March+May)	17.96 abcd*	45.69	7.93bcd	52.80	5.47	45.03
T ₂ Talstar 2WP @ 100gm ai /ha (May)	27.25 ab	17.59	9.37 bc	44.23	8.43	14.77
T ₃ Talstar 2WP @ 150gm ai /ha (March+May)	6.52 d	80.28	4.52bcde	73.09	5.00	49.75
T ₄ Talstar 2WP @ 150gm ai /ha (May)	25.60abc	22.59	4.32bcde	74.29	9.34	6.13
T ₅ Talstar 2WP @ 200gm ai /ha (March+May)	5.09 d	86.51	2.56bcde	84.76	0.00	100.00
T ₆ Talstar 2WP @ 200gm ai /ha (May)	15.05 bcd	54.49	9.79 ab	41.73	3.04	19.20
T ₇ Rugby 10G @ 1.0 kg ai /ha (March+May)	13.50bcd	59.18	4.23bcde	74.82	8.51	14.47
T ₈ Rugby 10G @ 1.0 kg ai /ha (May)	26.38abc	22.23	5.92bcde	64.76	9.14	8.14
T ₉ Rugby 10G @ 1.5 kg ai /ha (March+May)	11.01 cd	66.71	1.96 de	88.33	5.91	40.60
T ₁₀ Rugby 10G @ 1.5 kg ai /ha (May)	12.97bcd	60.78	7.01bcde	58.27	9.02	9.35
T ₁₁ Rugby 10G @ 2.0 kg ai /ha (March+May)	8.94 d	72.97	2.22cde	86.79	5.93	40.40
T ₁₂ Rugby 10G @ 2.0 kg ai /ha (May)	15.29bcd	53.76	4.23bcde	74.82	8.83	11.26
T ₁₃ Sinolux 25EC @ 2.5 kg ai /ha (March+May+July)	6.01 d	81.83	1.69 de	88.33	3.60	63.82
T ₁₄ Sinolux 25EC @ 3.0 kg ai /ha (March+May+June)	6.27 d	81.04	3.66bcde	78.21	1.67	83.22
T ₁₅ Sinolux 25EC @ 3.5 kg ai /ha (March+May+July)	7.14 d	78.41	0.00 e	100.00	2.87	71.16
T ₁₆ Pyriban 15G @ 2.25 kg ai /ha (March+May+July)	6.87 d	79.23	2.56bcde	84.76	4.08	51.99
T ₁₇ Lorsban 15G @ 2.25 kg ai /ha (March+May+July)	6.27 d	81.04	1.23 de	92.68	1.96	80.30
T ₀ Control (Untreated)	33.07 a	-	16.80a	-	9.95	-
LSD (0.05)	15.50		7.299		NS	

*Figures accompanied by same letter are not significantly different as 5% level

Table 2. Efficacy of different insecticides in controlling Rootstock borer at Patuadangi, Mohan and Jamalpur farms, Thakurgaon, December, 2005.

Treatments	% RSB infestation and efficiency					
	Patuadangi farm		Mohan farm		Jamalpur farm	
	Mean (%)	Efficiency (%)	Mean (%)	Efficiency (%)	Mean (%)	Efficiency (%)
T ₁ Talstar 2WP @ 100gm ai /ha (March+May)	33.89 de	64.81	38.73 ef (6.215)	60.25	45.45 d	48.63
T ₂ Talstar 2WP @ 100gm ai /ha (May)	46.12 bc	52.10	46.31 cd (7.124)	52.47	64.35 b	27.26
T ₃ Talstar 2WP @ 150gm ai /ha (March+May)	36.51 cd	62.09	38.06efg (6.167)	60.94	44.34 d	49.88
T ₄ Talstar 2WP @ 150gm ai /ha (May)	38.33 cd	60.20	28.21gh (5.299)	70.05	62.24 b	29.65
T ₅ Talstar 2WP @ 200gm ai /ha (March+May)	17.35 f	81.98	17.63 i (4.194)	81.91	37.12 d	58.04
T ₆ Talstar 2WP @ 200gm ai /ha (May)	39.90bcd	58.57	42.89de (6.325)	55.98	65.35 e	27.26
T ₇ Rugby 10G @ 1.0 kg ai /ha (March+May)	41.76bcd	56.64	42.74de (6.533)	56.14	47.50cd	46.31
T ₈ Rugby 10G @ 1.0 kg ai /ha (May)	51.38 b	46.65	66.07 b (8.126)	32.19	62.50 b	29.35
T ₉ Rugby 10G @ 1.5 kg ai /ha (March+May)	37.35 cd	61.21	32.96fg (5.633)	66.17	63.60 b	28.11
T ₁₀ Rugby 10G @ 1.5 kg ai /ha (May)	41.98bcd	56.41	58.61bc (7.645)	39.85	68.69 b	22.6
T ₁₁ Rugby 10G @ 2.0 kg ai /ha (March+May)	16.53 f	82.83	16.55 i (4.057)	83.02	45.04 d	49.09
T ₁₂ Rugby 10G @ 2.0 kg ai /ha (May)	33.60 de	65.11	52.38cd (7.234)	46.24	71.40 b	19.29
T ₁₃ Sinolux 25EC @ 2.5 kg ai /ha (March+May+July)	18.01 f	81.30	14.64 i (3.826)	84.98	64.55 b	27.04
T ₁₄ Sinolux 25EC @ 3.0 kg ai /ha (March+May+June)	16.19 f	83.19	21.98hi (4.633)	77.44	68.96 b	22.38
T ₁₅ Sinolux 25EC @ 3.5 kg ai /ha (March+May+July)	19.92 f	79.31	28.85gh (5.335)	70.39	59.19bc	33.10
T ₁₆ Pyriban 15G @ 2.25 kg ai /ha (March+May+July)	22.38 ef	76.76	18.04 i (4.241)	81.49	48.00cd	44.84
T ₁₇ Lorsban 15G @ 2.25 kg ai /ha (March+May+July)	19.95 f	79.28	18.57 i (4.294)	80.94	43.94 d	50.33
T ₀ Control (Untreated)	96.30 a	-	97.44 a (9.869)	-	88.47 a	-
LSD (0.05)	12.07		0.8717		13.00	

Figure in parenthesis are transformed mean

*Figures accompanied by same letter are not significantly different as 5% level

Table 3. Efficacy of different insecticides in controlling Rootstock borer at Mohan farm, Thakurgaon, 2006.

Treatments	% RSB infestation and efficiency			
	1st data (June)		2nd data (October)	
	MEAN (%)	Efficiency (%)	Mean (%)	Efficiency (%)
T ₁ Talstar 2WP @ 150 gm ai ha ⁻¹ in March	8.78 bcd	76.02	43.17 b	50.46
T ₂ Talstar 2WP @ 150 gm ai ha ⁻¹ in March+May	15.17 b	58.56	42.35 bc	51.41
T ₃ Talstar 2WP @ 200 gm ai ha ⁻¹ in March	11.19 bcd	69.43	35.67 cd	59.07
T ₄ Talstar 2WP @ 200 gm ai ha ⁻¹ in March+May	4.46 d	87.82	18.47 e	78.81
T ₅ Rugby 10G @ 1.5 kg ai ha ⁻¹ in March	11.82 bcd	67.71	38.66 bcd	55.64
T ₆ Rugby 10G @ 1.5 kg ai ha ⁻¹ in March + May	12.87 bc	64	34.00 d	60.99
T ₇ Rugby 10G @ 2.0 kg ai ha ⁻¹ in March	4.52 cd	85	37.16 bcd	57.36
T ₈ Rugby 10G @ 2.0 kg ai ha ⁻¹ in March + May	6.50 cd	87.65	16.61 e	80.94
T ₉ Pyriban 15G @ 2.25 kg ai ha ⁻¹ in March+May + July	6.72 cd	82.25	17.38 e	80.06
T ₁₀ Sinolux 25EC @ 2.5 litre ha ⁻¹ in March+May + July	7.17 bcd	81.64	16.88 e	80.63
T ₁₁ Sinolux 25EC @ 3.0 kg ai ha ⁻¹ March+May+July	8.81 bcd	80.42	17.99 e	79.36
T ₁₂ Lorsban 15G @ 2.25 kg ai ha ⁻¹ March+May+July	5.16 cd	75.94	17.27 e	80.18
T ₀ Control (Untreated)	36.61 a	(-)	87.15 a	(-)
LSD (0.05)	8.348	(-)	7.115	

*Figures accompanied by same letter are not significantly different as 5% level

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