

Efficacy of Some New Insecticides in Controlling Sugarcane Termites

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ABSTRACT

Efficacy of rugby 10G, pounce 1.5G and talstar 2WP at different doses were studied at three locations and similar results were obtained at all places for the control of termites. Data taken in May and October showed satisfactory control of the pest by all the test insecticides. Mean control by rugby 10G @ 2.0 kg a.i ha⁻¹ was found 85.75 per cent. Application of pounce 1.5G @ 0.2 kg and 0.3 kg a.i ha⁻¹ showed 64.30 and 81.61 per cent and talstar 2WP @ 0.2 kg and 0.3 kg a.i ha⁻¹ showed 79.57 and 91.82 per cent control respectively. The lower dose of pounce could not control pest satisfactorily. For effective control of termites in the sugarcane field, rugby 10G @ 2.0 kg a.i ha⁻¹, pounce 1.5G @ 0.3 kg a.i ha⁻¹ and talstar 2WP @ 0.2 kg a.i ha⁻¹ may be recommended as substitutes of chlorinated hydrocarbon.

Key words: Rugby, pounce, talstar, termite & control

INTRODUCTION

Termite is a major pest of sugarcane in Bangladesh (Alam *et al.* 1964). So far, five species of this pest have been reported to be destructive to sugarcane in Bangladesh (Alam and Miah, 1997). Termites eat away buds of planted setts and hollow it and badly affect germination. As many as 40 to 60% buds are destroyed (Singh and Kishan, 1946). They attack grown up cane and also enter through the ends of stubble when ratooned. An yield loss of 33 per cent and 4.5 per cent in sugar output have been reported (David, 1987). Chlorinated hydrocarbons (Heptachlor, Dieldrin, Chlordane, BHC etc.) are extensively used against termites all over the world which is very toxic and hazardous with long residual effects. These chemicals are already banned in Bangladesh and therefore there is an urge on scientists to find out less toxic or less hazardous insecticides to control termites. So, it is a demand driven research to find out substitute(s) of chlorinated hydrocarbons. With this aim in mind some new groups of chemicals were selected for trial against termites like rugby from organophosphate and pounce and talstar from pyrethroid group. Where oral LD50 of heptachlor or dieldrin is 40 mg/kg, that of talstar, pounce and rugby are 54.5, 450 and 679 mg/kg respectively which is comparatively less toxic (Anon., 1987; Anon., 1994). The residual effects of test chemicals were also less than chlorinated hydrocarbon and thus less hazardous to the environment.

MATERIALS AND METHODS

An experiment was set up during 1997-1998 cropping season at three locations viz. i) Akandabaria farm, Carew and company, Darsana, Chuadanga ii) Bhabanipur farm,

North Bengal sugar mills, Gopalpur, Natore and iii) Growers, field, Sreepur, Gazipur. Treatments were: rugby 10G @ 2.0 kg a.i ha⁻¹, pounce 1.5G @ 0.2 kg a.i ha⁻¹ and @ 0.3 kg a.i ha⁻¹, talstar 2WP @ 0.2 kg a.i ha⁻¹ and @ 0.3 kg a.i ha⁻¹. Standard was heptachlor 40 WP @ 1.8 kg a.i ha⁻¹ and there was an untreated check plot. A randomized complete block design was followed to set up the experiment having 3 replications. Unit plot size was 6m x 5 m (30 m²). Plantation was done in November, 1997.

Test insecticides were applied at the above mentioned doses first at planting in November and second in the month of May. Data were taken first before rainy season (March) and second/final after the rainy season (October). For this purpose 6 setts/clump were uprooted randomly with a spade from each plot and number of termites were counted placing the setts/clump with soils on a broad plastic sheet (1 m²) in the field. The termites were released in the respective plots after counting.

RESULTS AND DISCUSSION

Table 1 shows the efficiency of different treatments in controlling termites in March (4 months crop). At Chuadanga satisfactory control (over 80%) was achieved in all the treatments except pounce @ 0.2 kg a.i ha⁻¹. At Natore and Gazipur locations all treatments showed satisfactory control except pounce @ 0.2 kg a.i ha⁻¹ and @ 0.3 kg a.i ha⁻¹. However, no statistically significant difference was observed among the treatments at all the locations.

Table 1. Efficacy of mid residual insecticides in controlling termites at three locations (March, 1998).

Treatments (Chemicals)	Termites population (6 setts/clump plot)						Mean % control
	Carew & Co. farm Darsana, Chuadanga		NBSM farm Gopalpur, Natore		Sreepur, Gazipur (Grower's field)		
	Mean Ln (x + 1)	% control	Mean Ln (x + 1)	% control	Mean Sqrt. (x + .5)	% control	
Rugby 10 G @ 2.0 kg a.i ha ⁻¹ (Planting + May)	26.33 (2.357)	81.19	3.00 (0.768)	6.16	79.33 (7.500)	81.61	82.99
Pounce 1.5 G @ 0.2 kg a.i ha ⁻¹ (Planting + May)	4.33 (0.880)	96.61	8.00 (1.677)	63.08	251.00 (15.794)	41.81	67.17
Pounce 1.5 G @ 0.3 kg a.i ha ⁻¹ (Planting + May)	37.33 (1.576)	73.33	6.00 (1.521)	72.21	110.00 (8.750)	74.34	73.23
Talstar 2WP @ 0.2 kg a.i ha ⁻¹ (Planting + May)	16.00 (1.297)	88.57	2.67 (0.732)	87.68	0.00	100.00	92.08
Talstar 2WP @ 0.3 kg a.i ha ⁻¹ (Planting + May)	16.00 (1.155)	88.57	0.00	100.00	0.00	100.00	96.19
Heptachlor 40WP @ 1.8 kg a.i ha ⁻¹ (Planting)	0.00	100.00	0.00	100.00	0.00	100.00	100.0
Control (check)	140.00 (4.937)	(-)	21.67 (3.016)	(-)	413.33 (20.589)	(-)	(-)
LSD (5%)	NS		NS		NS		

Table 2 shows results of October (11 months crop). At Akandabaria except pounce @ 0.2 kg a.i ha⁻¹ all treatments controlled pest satisfactorily. At Natore and Gazipur location rugby @ 2.0 kg a.i ha⁻¹, pounce @ 0.3 kg a.i ha⁻¹, talstar @ 0.3 kg a.i ha⁻¹ showed control over 80% which is desirable. But significant difference among treatments were only observed at Chuadanga location. Minimum 80% efficiency over control is the requirement for getting recommendation of an insecticide against the pest as per pesticide regulatory rules in Bangladesh.

In most of the sugarcane growing countries where termites are menace, generally chlorinated hydrocarbons are still in use. However, because of its high toxicity there is a need to switch over to less toxic insecticides of newer groups of organophosphate, pyrethroids etc. In India HCH 5% dust @ 1.0 kg a.i ha⁻¹, aldrin 30EC @ 1.0 kg a.i ha⁻¹ and heptachlor @ 3.0 kg a.i ha⁻¹ is still in use against termites (David and Sithanathan, 1986; David *et al.* 1991).

Table 2. Efficacy of mid residual insecticides in controlling termites at three locations (October, 1998).

Treatments (Chemicals)	Termites population (6 setts/clump plot)						Mean % control
	Carew & Co. farm Darsana, Chuadanga		NBSM farm Gopalpur, Natore		Sreepur, Gazipur (Grower's field)		
	Mean Ln (x + 1)	% control	Mean Ln (x + 1)	% control	Mean Sqrt. (x + .5)	% control	
Rugby 10 G @ 2.0 kg a.i ha ⁻¹ (Planting + May)	0.67 b (0.370)	99.16	5.00 (0.924)	81.71	17.33 (1.888)	84.66	88.51
Pounce 1.5 G @ 0.2 kg a.i ha ⁻¹ (Planting + May)	34.67 b (2.000)	56.48	9.00 (1.763)	67.01	44.33 (1.633)	60.77	61.42
Pounce 1.5 G @ 0.3 kg a.i ha ⁻¹ (Planting + May)	2.00 b (0.650)	97.49	4.00 (0.855)	85.36	14.00 (1.254)	87.16	90.00
Talstar 2WP @ 0.2 kg a.i ha ⁻¹ (Planting + May)	6.00 b (0.980)	92.47	6.66 (1.599)	75.63	75.67 (3.156)	33.04	67.05
Talstar 2WP @ 0.3 kg a.i ha ⁻¹ (Planting + May)	2.33 b (0.690)	97.08	4.33 (0.880)	84.16	21.33 (1.391)	81.12	87.45
Heptachlor 40WP @ 1.8 kg a.i ha ⁻¹ (Planting)	0.00	100.00	0.00	100.00	0.00	100.00	100.00
Control (check)	79.67 a (3.710)	(-)	27.33 (3.123)	(-)	113.00 (4.715)	(-)	(-)
LSD (5%)	1.671		NS		NS		

However, trials with different organophosphates have been reported elsewhere. Chowdhury (1996) conducted an experiment with different doses of dursban 10G and thimet 10G and found that dursban 10G @ 0.75 kg a.i ha⁻¹ gave 95.47% control and thimet 10G @ 1.0 kg a.i ha⁻¹ gave 98.23% control. Madan and Singh (1998) in Hariyana, India conducted experiment with chlorpyrifos 20EC, chlordane 20EC, sevidol 4G and

quinalphos 5G @ 1.25 kg a.i ha⁻¹ in 1991 and 1992. Maximum termites control was achieved with chlorpyrifos, 42.47% in 1991 and 48.57% in 1992.

The new organophosphate (rugby) and pyrethroid (pounce, talstar) insecticides showed promising control of termites in the sugarcane field in three locations. As a substitute of organochlorine compounds (heptachlor, dieldrin) effective doses of the tested insecticides may draw attention of the users.

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