

Efficacy of Fipronil in Controlling Sugarcane Termites

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ABSTRACT

Two insecticides viz. regent 3GR and regent 50SC of the chemical fipronil were tested in the experiment against sugarcane termites. Different doses of both the formulations (50g, 75g, 100g and 125g a.i ha⁻¹) controlled pest satisfactorily in two experiments at Gazipur but lower doses like 50g and 75g a.i ha⁻¹ could not show satisfactory control at Chuadanga. However, doses of 100g a.i ha⁻¹ and above revealed 85-100 per cent control. For desirable control of termites in sugarcane, regent 3GR or regent 50SC may be applied @ 100g a.i ha⁻¹.

Key words: Fipronil, termites, control

INTRODUCTION

Five species of Termites of the genus *Odontotermes* and genus *Microtermes* have been reported injurious to sugarcane crop in Bangladesh and considered major pest (Anon., 1979). Termites damage buds of planted sugarcane setts and hollow it up by eating tissues inside. It also causes damage to young shoots at germination and lower part of internodes when the cane is mature (Khanna *et al.* 1956). Their early attack to setts cause failure in germination and may result as high as 33% loss in yield (Ananthanarayana and David, 1986). Substantial loss is caused due to their attack in later stages.

Chlorinated hydrocarbons like heptachlor, dieldrin were recommended against termites in Bangladesh which are now banned items. Some chemicals of organophosphorus group like chlorpyrifos, dursban, pyrifos, classic, lorsban etc have been recommended against termites. But chlorpyrifos chemicals have short residual effects and thus have to apply several times to control the pest in prone areas during the crop's growth period for satisfactory yield. Fipronil is a new group of chemical which comprises regent with different formulations like regent 3GR and regent 50 SC. Half-life of fipronil in the soil is about 7 months which is suitable for termites control in sugarcane giving protection for longer period if applied once at planting.

MATERIALS AND METHODS

Three experiments were set up in November during the cropping seasons 1996-97 and 1997-98 at different locations, two at Gazipur (grower's field) and one at Chuadanga (Carew and Company's farm). Two formulations of regent (granular and

soluble concentrate) were tested. Treatments were regent 3GR @ 50, 75, 100, 125g a.i ha⁻¹ and regent 50SC @ 50, 75, 100, 125g a.i ha⁻¹. Heptachlor 40WP @ 1.8 kg a.i.ha⁻¹ was included as standard and there was one control (untreated) plot. The doses were applied at planting. After placement of setts in the trenches, regent 3GR should be broadcasted and regent 50SC was mixed with water and sprayed over the setts and thus covered with soils immediately. A randomised complete block design was followed with 3 replications. Individual plot size was 6m x 5m (30m²).

For the purpose of comparison of treatments that is to find out the efficacy of different doses of test insecticides, termites population was taken in 6 setts/clumps per plot by uprooting, twice in the season. Data were analysed statistically whenever applicable for interpretation.

RESULTS AND DISCUSSION

Both the granular (regent 3GR) and soluble concentrate (regent 50SC) forms of test chemical showed excellent performance in controlling sugarcane termites at all locations by test doses (Table 1). Table 1 shows the efficiency of regent 3GR and regent 50SC at two locations of Gazipur in 1996-97 and one location at Chuadanga (Carew & Co. Sugar mills' farm) in 1997-98. At Gazipur location termites populations were negligible at both in treated plots of at all farmers location the times data taken. But populations were high in untreated (check) plots. All the doses of test insecticides and standard showed excellent efficacy in controlling termites (93.03-100.00%). At Chuadanga (1997-98) location the insecticides also proved their efficiency, however efficiency showed by lower doses like 50g a.i ha⁻¹ and 75g a.i ha⁻¹ were not upto desired level for both the formulations. Since fipronil is in the group of a new molecule literature in this aspect is scarce. Regent has been tested to some extent on insect pests of corn, rice, cotton, potato and citrus including foliar and soil pests throughout the world with varying dose from 25-300g a.i ha⁻¹. For sugarcane stem borer and termite 50-200 g a.i.ha⁻¹ was reported (Anon. 1996a). Effective dose for sugarcane borers was reported to be 100-200g a.i. ha⁻¹ and for termites 50-200 g a.i. ha⁻¹ (Anon. 1996b). Quimio *et al.* (2001) reported that regent 3GR effectively controlled white grubs of sugarcane in the Philippines when applied @ 60-90g a.i ha⁻¹. Chowdhury (1996) at Vidan Chandra Krishi Viswavidyalaya, India found that among the organophosphate tested dursban 10G @ 0.075 kg a.i. ha⁻¹ and thimet 10G @ 1.0 kg a.i ha⁻¹ controlled 95.47 and 98.27% termite respectively. Madan and Singh (1998) found that only chlorpyrifos 20EC @ 1.25 kg a.i ha⁻¹ satisfactorily controlled sugarcane termites among the test organophosphates including sevidol 4G and quinalphos 5G. In India at present HCH 5% dust and aldrin 30EC @ 1.0 kg a.i ha⁻¹ are recommended against sugarcane termites (David *et al.* 1991).

Considering the results of present study and suggested doses found effective in other countries against different pests including termites we recommend the dose 100g a.i ha⁻¹ for both the formulations against sugarcane termites in Bangladesh.

Table 1. Efficacy of regent 3GR and regent 50SC in controlling sugarcane termites at different locations; (A BSRI experiment) 1996-1998.

Treatments		Sreepur, Gazipur				Mouna, Gazipur				Carew and Co., Darsana, Chuadanga			
Chemical	Dose kg ai/ha	1st data (26.5.97)		2nd data (28.10.97)		1st data (26.5.97)		2nd data (29.10.97)		1st data (19.3.98)		2nd data (5.10.98)	
		Mean	% control	Mean	% control	Mean	% control	Mean	% control	Mean Ln (x+1)	% control	Mean Ln (x+1)	% control
Regent 3GR	0.050	14.00	95.28	15.00	96.91	0.00	100.00	0.00	100.00	37.33 (1.576)	362.67	107.33b (4.090)	71.98
Regent 3 GR	0.075	0.00	100.00	2.00	99.59	0.00	100.00	0.00	100.00	41.33 (2.135)	58.67	83.33b (4.280)	78.24
Regent 3GR	0.100	0.00	100.00	0.00	100.00	0.00	100.00	0.00	100.00	3.00 (0.768)	97.00	10.00c (2.330)	97.39
Regent 3GR	0.125	0.00	100.00	0.00	100.00	0.00	100.00	0.00	100.00	0.00	100.00	4.33cd (0.880)	98.87
Regent 50SC	0.050	0.00	100.00	11.33	97.66	0.00	100.00	0.00	100.00	11.00 (1.175)	89.00	121.67ab (4.490)	68.23
Regent 50 SC	0.075	0.00	100.00	0.00	100.00	0.00	100.00	0.00	100.00	36.33 (1.567)	63.67	65.00b (4.190)	83.03
Regent 50SC	0.100	20.67	93.03	0.00	100.00	0.00	100.00	0.00	100.00	15.00 (1.276)	85.00	6.67cd (1.600)	98.26
Regent 50SC	0.125	0.00	100.00	0.00	100.00	0.00	100.00	0.00	100.00	0.00	100.00	2.67cd (0.730)	99.30
Heptachlor 40WP	1.8	0.00	100.00	6.67	98.62	0.00	100.00	0.00	100.00	17.67 (1.330)	82.33	0.00	100.00
Control	-	296.67	-	485.00	-	100.00	-	46.00	-	100.00 (3.330)	-	383.00a (5.910)	-
LSD (5%)		-		-		-		-		NS		1.598	

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